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Analysis: Understanding the drivers of homophobia in Ghana

DAKAR, 1 August 2011 (PlusNews) — Recent condemnation of homosexuality by religious and political leaders in Ghana has led to a climate of fear preventing men who have sex with men (MSM) from accessing vital health services, say local NGOs.

The minister of Ghana’s Western Region, Paul Evans Aidoo, publicly described homosexuality as “detestable and abominable” after media reports in late May that 8,000 homosexuals had registered with health NGOs in the country’s west (the information appears to come from records kept by the NGOs of people who accessed services for MSM). Aidoo has since called for increased security in the region and the arrest of all homosexuals. Other religious leaders and politicians have followed suit, condemning homosexual activity.

As a result, far fewer MSM are accessing safe sex education and support programmes run by the Centre for Popular Education and Human Rights (CEPEHRG) to prevent the spread of HIV, said MacDarling Cobbinah from the Coalition against Homophobia in Ghana and a member of CEPEHRG.

“It has brought about a lot of fear and stigma for the people. It is difficult to organize programmes,” Cobbinah said. “It is very difficult for people to walk freely on the street... The call for arrest has really pushed people down.”

He added that one of his colleagues was recently accused of being gay and beaten up by a group of men.

Cobbinah said numbers had dropped at a regular HIV peer education programme that once had more than 20 people attending; two weeks ago only half the people came, and last week no one came, he told IRIN on 27 July. “They said, ‘If we come, we might be arrested.’”

An estimated 25 percent of Ghanaian MSM were HIV-positive in 2006, according to the US Agency for International Development (USAID).

According to the UN World Health Organization, since the beginning of the epidemic in the early 1980s, MSM have been disproportionately affected by HIV. The organization said social discrimination of MSM led them to delay or avoid seeking HIV-related information, care and services.

Other organizations in Ghana are also facing obstacles to providing vital services. An NGO based in the Western Region’s capital Sekondi-Takoradi, which distributes condoms and safe sex information to MSM, told IRIN that since Aidoo increased security and called for arrests they have felt threatened.

Male-to-male sexual relations are a crime in Ghana. Considered a misdemeanor, it carries a maximum sentence of six months, according to Kissi Agyabeng, a law lecturer at the University of Ghana. However, despite Aidoo’s calls for a crackdown, arrests do not yet appear to be taking place.

A spokesperson for the Sekondi-Takoradi NGO, who did not want his name or the organization’s name published for security reasons, said the NGO was now coming under pressure from the government to stop their work on HIV prevention if they did not reveal the names of MSM who have registered to use their services.

Stopping this work would affect thousands of people. In 2008, 2,900 people accessed their services, and by this year numbers had quadrupled, the spokesperson said.

Motivations

Cobbinah said the current climate of homophobia is a reaction to growing awareness of homosexuality in the country. When the figure of 8,000 homosexuals surfaced, he said, “it shocked most people... They thought [the number of gays was growing].”

Rachel Sproenk, a Ghana-based researcher on sexuality, said in this environment homophobic sentiment feeds off itself. “Leaders feel they have to respond to it,” she said. “People who have never [previously] thought about it are speaking out.”

Researchers and human rights workers have also indicated an underlying motivation for the current condemnation may be political point-scoring as the 2012 elections approach.

Sproenk said the current public debate “is not happening by coincidence... Leaders have to make their position [and themselves] visible for election.”

Graeme Reid, director of Human Rights Watch’s lesbian, gay, bisexual and transgender rights programme, pointed out it was not uncommon for “gay issues [to be] used as a distraction against economic and political concerns, uniting people against a common enemy”.

Un-African behaviour?

While hardly unique to Africa, homophobia appears to be rising on the continent.

Reid said this began when Zimbabwe’s President Mugabe condemned homosexuals at an international book fair in 1995 after a gay and lesbian group applied to open a stand there. “This was the
first time there was a public statement from the president of an [African] country condemning gays and lesbians.”

He said this was followed by statements by other African presidents, and more recently there had been a wave of anti-homosexual sentiment in sub-Saharan Africa.

Spronk said part of the reason for the spread of homophobic statements is the use of language such as “un-African”. When this is used in one country, it invokes issues of identity across the continent, she said. “It appeals to African identity and culture, people feel they have to respond to it.”

Ghana’s Deputy Information Minister Samuel Okudzeto Ablakwa told IRIN the president considered homosexuality “alien to our culture”.

“It also ties into ideas about colonialism,” Reid said. “People say it has been imposed on Africa by the West.”

Fred Degbe, general secretary of Ghana’s Christian Council, said Ghanaians and Africans cherished “rich values on such issues as homosexuality” and must not allow others “to impose what is acceptable in their culture on us”.

**Coercive Forms of Sexual Risk and Associated Violence Perpetrated by Male Partners of Female Adolescents**

*Perspectives on Sexual & Reproductive Health Vol. 43; No. 1: doi:10.1363/4306011, (03..2011)* Jay G. Silverman; Heather L. McCauley; Michele R. Decker; Elizabeth Miller; Elizabeth Reed; Anita Raj

While partner violence is associated with STD infection among female adolescents, “the mechanisms underlying this association remain unclear,” the authors wrote. “Sexually coercive and deceptive behaviors of male partners that increase female STD risk may be factors in this relationship.”

The current study concerned 356 females ages 14–20 who attended adolescent health clinics in Greater Boston between April and December 2006. The subjects were assessed for physical and sexual violence perpetrated by male partners and for exposure to sexual risk factors. Adjusted logistic regression models were employed to study the associations between intimate partner violence and standard sexual risk behaviors (e.g., multiple partnerships) and coercive or deceptive sexual risk factors (e.g., coerced condom nonuse).

Intimate partner violence was reported by more than two-fifths of the sample. In adjusted analyses, young women reporting intimate partner violence were more likely than others to report standard sexual risk behaviors: multiple partners, anal sex, and unprotected anal sex (odds ratio, 1.7-2.2). These participants also were more likely to report coercive or deceptive sexual risk factors: partner infidelity, fear of asking that a condom be used, negative consequences of requesting condom use, and coerced nonuse of condoms (2.9-5.3).

“The high prevalence of intimate partner violence against young women attending adolescent clinics strongly indicates the need to target this population for abuse-related interventions,” the authors concluded. “This need is underlined by the observed association between partner violence and sexual risk involving coercion or deception by male partners. Clinic-based STD and pregnancy prevention efforts should include assessment of sexual risk factors that are beyond the control of young women, particularly for those experiencing abuse.”

**Prevalence of Sexually Transmitted Co-Infections in People Living with HIV/AIDS: Systematic Review with Implications for Using HIV Treatments for Prevention**

*Sexually Transmitted Infections Vol. 87: P. 183-190, (04..2011)* Seth C. Kalichman; Jennifer Pellowski; Christina Turner

Through local inflammatory processes, sexually transmitted co-infections increase the infectiousness of HIV. “The prevalence of STI among people living with HIV/AIDS has implications for containing the spread of HIV in general and the effectiveness of HIV treatments for prevention in particular,” wrote the authors, who reported on a systematic review of such co-infections.

The study focused on STI acquisition after infection with HIV. Electronic database and manual searches identified 37 clinical and epidemiological studies of STIs that increase the infectiousness of HIV. Studies of adults with HIV/AIDS from developed and developing countries noted STI rates for 46 different samples (33 samples had clinical/laboratory-confirmed STI). Overall mean point-prevalence for confirmed STI was 16.3 percent (SD=16.4) and median 12.4 percent STI prevalence in people living with HIV/AIDS.
The most common STIs studied were syphilis (median 9.5 percent prevalence), gonorrhea (9.5 percent), chlamydia (5 percent), and trichomoniasis (18.8 percent).

“STI prevalence was greatest at the time of HIV diagnosis, reflecting the role of STI in HIV transmission,” the authors wrote. “Prevalence of STI among individuals receiving HIV treatment was not appreciably different from untreated persons. The prevalence of STI in people infected with HIV suggests that STI co-infections could undermine efforts to use HIV treatments for prevention by increasing genital secretion infectiousness.”

Tackling the Reality of Teen Sex

Orange County Register, (07.26.2011) Yvette Cabrera

For 15 years, Planned Parenthood of Orange and San Bernardino Counties has offered its Peer Educator Program, which aims to end ignorance of sexual health among young people.

Breathing new life into the program are participants such as Zach Bradley, 16, of Northwood High School. Bradley recounted recently counseling a friend who thought sex in a hot tub was safe because she “couldn’t get pregnant” there.

“I totally took her off the page,” said Bradley. “Before that I was all fun and games and then I turned serious and she’s like, ‘What just happened?’”

Another peer educator—Arthur Medrano, 17 — seized “the opportunity to teach others” and co-founded Arroyo Valley High School’s Healthy Living Club in 2009 when a friend got pregnant at 16.

Public Health Institute 2009 data found there were 2,730 teen births in Orange County at a cost of $59 million in lost revenue and public assistance.

Bradley, also president of Northwood’s Gay-Straight Alliance, welcomes blunt discussion on sexual health. After passing out condoms at a park near their school, one person told him via Facebook that he didn’t know what sex was yet. “I told him it’s not about sex ... [but] educating yourself about all sexual health.”

The program prepared Bradley to discuss myriad topics including healthy relationships, safe dating, body image, and the facts on Planned Parenthood’s services, which are primarily preventive and educational. Stephanie Kight, Planned Parenthood’s senior vice president of community affairs, described Bradley’s effectiveness with his peers as “incredibly powerful and normalizing.”

Science Magazine Special Section Examines World’s Population Growth

The current issue of Science magazine features a special section that explores issues surrounding population growth, “many of which continue to split demographers,” according to the section’s introduction. "Debate continues over ... whether rapid population growth is best dealt with by expanding family planning programs or implementing policies that will improve livelihoods and increase the education of girls and young women – or both. Still, many experts remain optimistic that with the right mix of policies, countries can harness the opportunities for economic growth and development offered by a young and educated workforce, congregating in dense, networked urban environments," Science reports (Chin/Marathe/Roberts, 7/29).
Increasing Potency of HIV-Battling Proteins

ScienceDaily (Aug. 1, 2011) — If one is good, two can sometimes be better. Researchers at the California Institute of Technology (Caltech) have certainly found this to be the case when it comes to a small HIV-fighting protein.

The protein, called cyanovirin-N (CV-N), is produced by a type of blue-green algae and has gained attention for its ability to ward off several diseases caused by viruses, including HIV and influenza. Now Caltech researchers have found that a relatively simple engineering technique can boost the protein’s battling prowess.

"By linking two cyanovirins, we were able to make significantly more potent HIV-fighting molecules," says Jennifer Keeffe, a staff scientist at Caltech and first author of a new paper describing the study in the Proceedings of the National Academy of Sciences (PNAS). "One of our linked molecules was 18 times more effective at preventing infection than the naturally occurring, single protein."

The team’s linked pairs, or dimers, were able to neutralize all 33 subtypes of HIV that they were tested against. The researchers also found the most successful dimer to be similar or more potent than seven well-studied anti-HIV antibodies that are known to be broadly neutralizing.

CV-N binds well to certain carbohydrates, such as the kind found in high quantities connected to the proteins on the envelope that surrounds the HIV virus. Once attached, CV-N prevents a virus from infecting cells, although the mechanism by which it accomplishes this is not well understood.

What is known is that each CV-N protein has two binding sites where it can bind to a carbohydrate and that both sites are needed to neutralize HIV.

Once the Caltech researchers had linked two CV-Ns together, they wanted to know if the enhanced ability of their engineered dimers to ward off HIV was related to the availability of additional binding sites. So they engineered another version of the dimers—this time with one or more of the binding sites knocked out—and tested their ability to neutralize HIV.

It turns out that the dimers’ infection-fighting potency increased with each additional binding site—three sites are better than two, and four are better than three. The advantages seemed to stop at four sites, however; the researchers did not see additional improvements when they linked three or four CV-N molecules together to create molecules with six to eight binding sites.

Although CV-N has a naturally occurring dimeric form, it isn’t stable at physiological temperatures, and thus mainly exists in single-copy form. To create dimers that would be stable under such conditions, the researchers covalently bound together two CV-N molecules in a head-to-tail fashion, using flexible polypeptide linkers of varying lengths.

Interestingly, by stabilizing the dimers and locking them into a particular configuration, it seems that the group created proteins with distances between binding sites that are very similar to those between the carbohydrate binding sites in a broadly neutralizing anti-HIV antibody.

"It is possible that we have created a dimer that has its carbohydrate binding sites optimally positioned to block infection," says Stephen Mayo, Bren Professor of Biology and Chemistry, chair of the Division of Biology, and corresponding author of the new paper.

Because it is active against multiple disease-causing viruses, including multiple strains of HIV, CV-N holds unique promise for development as a drug therapy. Other research groups have already started investigating its potential application in prophylactic gels and suppositories.
"Our hope is that those who are working to make prophylactic treatments using cyanovirin will see our results and will use CVN2Lo instead of naturally occurring cyanovirin," Keeffe says. "It has higher potency and may be more protective."

**Journal Reference:**

**Poor CD4 cell recovery after starting HIV treatment should be a cause for concern, close monitoring needed**
Michael Carter
Published: 01 August 2011
Patients whose CD4 cell count does not recover despite achieving virologic control with HIV therapy require continued medical attention, results of a large European study presented to the recent International AIDS Society conference in Rome show.

Researchers found that individuals whose CD4 count failed to increase above 200 cells/mm\(^3\) were significantly more likely to experience a new AIDS-defining event or die than patients with more robust CD4 cell count increases.

"In virologically suppressed patients, lack of increase in CD4 cell count is relevant for prognosis and poorer outcome," comment the investigators.

Encouragingly, the research also suggested that patients whose CD4 cell count increases to above 500 cells/mm\(^3\) have an excellent long-term prognosis.

Modern HIV therapy is potent, easy to take and generally causes only mild side-effects. The goal of treatment is suppression of viral load below 50 copies/ml, and over 90% of patients can achieve this outcome within a year of starting antiretroviral treatment.

In most patients, suppression of viral load is accompanied by a gradual increase in CD4 cell count. Long-term HIV therapy can result in the restoration of CD4 cell count to normal levels.

However, despite having a successful virologic response to treatment, CD4 cell count fails to increase in some patients.

Investigators from the Collaboration of Observational HIV Epidemiology in Europe (COHERE) wished to determine the prognostic implications of poorer CD4 cell increases in patients whose viral load was suppressed.

A total of 66,147 individuals were included in their research. All experienced a fall in their viral load to undetectable levels after starting antiretroviral therapy. Their average age was 37 years, 73% were men, 26% had a prior AIDS diagnosis and 14% had a history of injecting drug use.

Median CD4 cell count at the time HIV therapy was started was high – 396 cells/mm\(^3\), and the patients had a baseline viral load of 4.6 log\(_{10}\) copies/ml.

When viral load was first suppressed below 50 copies/ml, 34% of patients had a CD4 cell count above 500 cells/mm\(^3\), 25% had a count between 350 and 500 cells/mm\(^3\), 26% a count of between 200 and 350 cells/mm\(^3\), and 16% had a CD4 cell count below 200 cells/mm\(^3\), including 1% with a count beneath the dangerously low level of 50 cells/mm\(^3\) – a factor well known to be associated with a poor prognosis.

There were few new AIDS events or deaths among patients whose CD4 cell count was above 500 cells/mm\(^3\) (5 per 1000 patient-years). Events were also rare for patients in the 350 to 500 cells/mm\(^3\) and 200 to 350 cells/mm\(^3\) strata (7.9 and 12.0 per 1000 patient-years respectively).

However, incidence was markedly higher for patients with a CD4 cell count below 200 cells/mm\(^3\) (30.5 per 1000 patient-years), especially so for those with a CD4 cell count beneath 50 cells/mm\(^3\) (94.9 per 1000 patient-years).

The investigators plotted the impact of CD4 cell count on long-term outcomes.

The prognosis for patients with virologic suppression and a CD4 cell count above 500 cells/mm\(^3\) was excellent. The investigators calculated that they had a 95% probability of survival and avoidance of AIDS.

Projected outcome for patients with a well-controlled viral load and CD4 cell counts between 500-350 or 200-350 cells/mm\(^3\) were also good, with event-free survival projected for approximately 90%.

However, at lower CD4 cell counts the chance of remaining alive and AIDS-free were significantly poorer. The projected event-free survival rate for patients with a CD4 cell count beneath 200 cells/mm\(^3\) was in the region of 65%.
There was also robust evidence that the time to an event was significantly shorter for patients whose CD4 cell count did not increase above 200 cells/mm$^3$ despite virological suppression (HR = 0.21, 95% CI, 0.19-0.24 vs. HR = 0.92, 95% 0.90-0.94 for patients with a CD4 cell count above 200 cells/mm$^3$).

“In virologically suppressed patients an increase in CD4 cells reduces the risk of AIDS or death,” comment the investigators, “lack of increase in CD4 cell is relevant for prognosis and poorer outcome.”

Reference
Bucher HC et al. Risk of progression to AIDS or death in relation to CD4 cell levels in HIV-infected patients with sustained viral response to cART. Sixth International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention, Rome, abstract WELBB01, 2011.

Low but detectable viral load during HIV treatment involves a risk of resistance
Michael Carter
Published: 02 August 2011

Drug resistance frequently develops in patients who have a persistent low detectable viral load when taking HIV therapy, US investigators report in the August 15th edition of the Journal of Infectious Diseases. Treatment guidelines which set the bar for virological failure at 200 copies/ml could mean that patients are not being switched soon enough, the authors argue.

Resistance developed in 37% of patients who had a viral load measurement between 50 copies/ml and 1000 copies/ml on two occasions after six months of HIV treatment.

New resistance mutations were detected in over a third of patients who had a maximum viral load below 200 copies/ml. The investigators believe this is “an important observation considering recent guidelines that virological failure in clinical practice can be defined as VL [viral load] > 200 copies/ml.”

The aim of HIV therapy is persistent suppression of viral load below 50 copies/ml. Even low levels of detectable virus have been associated with higher levels of immune activation, the virological failure of treatment, and an increased risk of poorer clinical outcomes, including illness and death.

Tests for resistance to antiretroviral drugs do not perform well at low viral loads, and few studies have looked at resistance in the context of low-level viraemia in patients taking first-line HIV therapy.

Therefore a research team led by Dr Banefami Taiwo undertook a study to describe new resistance mutations in patients taking their first combination of anti-HIV drugs who had low but detectable viral load. They also conducted a series of analyses to see if any risk factors predicted the emergence of new resistance mutations.

Their study sample included 1158 antiretroviral naïve patients enrolled in the ACTG A5142 and A5095 studies. These studies examined the safety and efficacy of triple-drug antiretroviral therapy that included either the protease inhibitor lopinavir/ritonavir (Kaletra) or the non-nucleoside reverse transcriptase inhibitor (NNRTI) efavirenz (Sustiva).

Low-level viraemia was defined as two viral load measurements between 50 and 1000 copies/ml after six months of therapy.

Patients who had a low level viral load during therapy were monitored for the emergence of new reverse transcriptase or protease resistance.

Overall, 6% of patients experienced low level viraemia. These patients had a median pre-treatment viral load of 5.1 log$_{10}$ copies/ml and a baseline CD4 cell count of 121 cells/mm$^3$.

The median time from the initiation of therapy and the appearance of low levels of virus was 39 weeks, and low-level viraemia persisted for a median of 30 weeks.

Over two-thirds (68%) of patients with a viral load between 50 and 1000 copies/ml subsequently resuppressed their HIV to undetectable levels on at least one occasion.

Patients taking an antiretroviral regimen comprising nucleoside reverse transcriptase inhibitors (NRTIs) plus Kaletra were almost three-times more likely to experience low-level viraemia than patients treated with two NRTIs and efavirenz (HR = 2.7; 95% CI, 1.4-5.0).

A pre-treatment viral load above 6 log$_{10}$ copies/ml was associated with a doubling in the risk of having a low detectable viral load (HR = 2.2; 95% CI, 1.0-4.6). In addition, each 50 cell/mm$^3$ reduction in CD4 cell count increased the risk of low level viraemia by approximately 10%.

Resistance data were available for 56 patients with low viraemia. New resistance mutations during follow-up were detected in 20 (37%) of these individuals.

In all but one of these patients, the new mutation conferred resistance to reverse transcriptase inhibitors. The most common resistance mutations were M184I/V, K103N, and M230L.
The remaining individual developed the D30D/N mutation which confers resistance to the protease inhibitor nelfinavir (Viracept). This leading the investigators to speculate that this may have been a case of transmitted resistance.

The level of viral load during low-level viraemia was the main risk factor for the development of resistance mutations.

“Patients in whom new mutations were detected tended to have a higher VL at the start of low-level viraemia (p = 0.03) and higher minimum (p < 0.001), maximum (p < 0.001), and mean VL during low-level viraemia (p < 0.001),” observe the authors.

No new resistance mutations were detected in patients whose maximum viral load was between 50 and 100 copies/ml. However, resistance developed in 38% of patients whose viral load was in the region of 100-200 copies/ml.

A larger proportion of patients who developed resistance were black (65% with vs. 24% of those without). But the authors are cautious about attaching too much significance to this finding “because of the small number of events and the confounding effect of VL.” They add “if confirmed, possible explanations could include differential adherence or race-based genetic factors that may influence drug metabolism and plasma concentrations.”

The investigators conclude “techniques for detecting resistance during low-level viraemia should be validated for clinical use, and the clinical consequences of low-level viraemia and mutations detected during low-level viraemia should be investigated further.

Reference

Narrow window to avert HIV epidemics among MSM in Middle East and North Africa
Michael Carter
Published: 02 August 2011

HIV epidemics are emerging among men who have sex with men (MSM) in a number of Middle Eastern and North African countries, an international team of investigators report in the online journal PLoS Medicine.

Prevalence of HIV was as high as 28% among some populations of MSM in Pakistan, and in 2008 over 50% of new HIV infections in Lebanon were in men who reported anal sex with another man.

High levels of risk behaviour in many countries suggested that there was the potential for further spread of HIV.

Alarmed by their findings, the investigators suggest “there is an urgent need to expand HIV surveillance and access to testing, prevention, and treatment services in a rapidly narrowing window of opportunity to prevent the worst of HIV transmission among MSM in the Middle East and North Africa.”

Worldwide, MSM are one of the groups most affected by HIV. The epidemic in most industrialised countries is focused on MSM, and research conducted in sub-Saharan Africa has found evidence of large but generally hidden MSM epidemics. Moreover, epidemics in MSM are well established and growing in Latin America and South East Asia.

In contrast, little is known about the MSM HIV epidemic in Middle Eastern and North African countries. Sex between men is often highly stigmatised in this setting, and in five countries homosexuality is punishable by death.

Given this lack in knowledge, a team of investigators lead by Dr Ghina Mumtaz undertook a systematic literature review to gain a better understanding of the HIV prevalence in MSM, their risk behaviour and knowledge of HIV in 23 North African and Middle Eastern Countries.

The authors believe their study “provides an integrated analysis and synthesis of the evidence to address the gap in our knowledge of what could potentially materialise as the key risk group for HIV sexual transmission in this region in the next decade.”

A total of 26 studies were included in the investigators’ analysis. They defined MSM as men who had insertive or receptive anal sex. However, the researchers emphasised that there was a huge diversity in MSM self-identity, role and behaviour in the region.

Overall, the prevalence of MSM behaviour was consistently between 2-3%. However, in some populations such as truck drivers (9%-49%) or street children (15%-77%) it was considerably higher.

Surveillance in 2006 suggested that 6% of MSM in Egypt were HIV-positive, but prevalence differed between countries and was as high as 28% among some populations of MSM in Pakistan. (Pakistan is treated as part of the Eastern Mediterranean region by the World Health Organization).
There was also some evidence that the epidemic was gaining pace among MSM. In Lebanon, 13% of all HIV infections are in MSM, but in 2008, 52% of new HIV diagnoses were in this population. The investigators also found a trend for more recent studies to find a higher HIV prevalence. However, they caution that this could be because of improved methodology or MSM populations becoming more visible.

Significance evidence emerged of high levels of HIV risk behaviour among MSM. In many of the populations surveyed over 90% of MSM reported multiple or concurrent sexual relationships. Paying for anal sex with commercial sex partners was reported at rates of between 12% and 80%. Overall condom use was low and generally below 25%. Use of lubricants was as low as 18% in one study.

Although over 80% of MSM had heard of condoms, only 30%-50% of men knew that their use offered protection against HIV. Difficulty obtaining condoms was widespread, and many men reported that they disliked using them. Male sex work was common and reported by between 20%-76% of men and almost 100% of transgender hijras in Pakistan.

Up to 70% of MSM reported ever having had sex with a woman, and between 3%-35% said they were currently married. A significant proportion of men also reported using female sex workers and injecting drugs.

Levels of basic knowledge about HIV were high. Between 82%-100% of men reported ever hearing of HIV in Egyptian studies.

MSM in Lebanon and Tunisia had a good knowledge of HIV, its transmission, and the role of condoms in its prevention. However, in other countries knowledge of HIV was limited.

Despite their comparatively good understanding of HIV 33% of MSM in Lebanon thought they had no chance of acquiring HIV. There was also a widespread belief that anal sex involved a lower risk of HIV transmission than vaginal sex.

“MSM in MENA engage in considerable levels of sexual risk behaviors. Multiple sex partnerships of different kinds are practiced by the majority of MSM; commercial sex work including selling and paying for sex is prevalent; condom and lubricant use is limited; and overlap with opposite sex sex and injecting drug risk behaviors is substantial,” comment the investigators.

A high prevalence of sexually transmitted infections was detected in some MSM populations. Over a quarter of MSM in Pakistan and Turkey had genital herpes, and syphilis and gonorrhoea were detected in between 8%-9% of Egyptian MSM.

“The window of opportunity for prevention further HIV transmission among MSM is narrowing, and prompt action and robust interventions are needed,” conclude the authors.

Reference

Minister’s comment on HIV/Aids careless, say experts
Kampala
The Health Minister Christine Ondoa’s remarks that HIV/Aids can be cured through prayer have not been received well by both health practitioners and born-again preachers who called it careless and misleading remarks.

Yesterday, Ms Ondoa was quoted by the Observer newspaper to have had a firsthand experience with people she claimed were infected by the HIV/AIDS virus but after a series of prayer, tested negative.

She, however, observed that medical workers and the general public should be cautious about people who claim they were healed of HIV, adding that as a scientist she is often careful not to automatically believe a person who comes to her presenting negative results after being prayed for. Such a person’s sero status must be checked and their medical records that show they tested positive must be scrutinised, Ms Ondoa added.

Dangerous comments
The Head of The Aids Support Organisation (TASO), Mr Richard Ochai, who refused to believe that a minister could say such a thing, said such statements, most especially from born-again churches, are continuously curtailing TASO efforts to fight against HIV/Aids whose prevalence in recent years is said to have increased in the country.
He said science has proved that if one takes ARVs the viral load will become low such that they may not be detected but once they stop taking the drug, the virus will definitely be seen again. "We know God can do miracles if he so wishes but these many possibilities still need scientific prove," Dr Ochai said.

Pastor Solomon Male of Arising Christ Ministries, a preacher for 20 years, said the minister should keep her spiritual beliefs to herself as she is likely to mislead the weaker Christians.

Quoting from 2nd Kings Chapter 22, Pastor Male gave a testimony of King Hezekiah who was cured by both medication and prayer, castigating other born again pastors known to be prescribing prayer to cure HIV/Aids. He said through his evangelism he has encountered countless believers asking for prayer to cure them of diseases like HIV/Aids, many of whom have succumbed to death when they do not heed to taking ARVs.

South African President Jacob Zuma recently received international criticism after he pronounced that showering after having sex with a HIV/Aids infected person could prevent one from acquiring the diseases. Ms Ondoa was, however, not available to ascertain her claims despite several calls.

**Clinic forces HIV tests**

McKeeq Kotloko | 02 August, 2011 01:08

**Staff at a government clinic are forcing patients to take HIV tests and those who refuse are denied treatment for their ailment.**

At the Ikhutseng Community Clinic, in Klipgat, North West, staff are illegally making treatment for any illness conditional on patients agreeing to being tested for HIV.

They must take the test or go home untreated.

Clinic staff began using HIV tests as passports to treatment after the Department of Health launched its massive HIV counselling and testing campaign in April last year. The campaign was intended to result in the HIV testing of 15 million people by the end of June.

After being told it was "the law" to undergo HIV tests, some panicked patients forged information on their files to show that they had been tested.

On Friday, The Times accompanied a teenage girl, who wanted advice on contraception, to her first appointment at the clinic. In five hours in the queue, The Times spoke to patients who all told the same story.

Some patients said they did not object to the compulsory testing because they had not been sexually active for years.

But a 27-year-old mother who had taken her baby for a check-up said: "I have already been tested more than five times since late last year. I was afraid and highly traumatised, and they insisted that they were only following the law. I was left with no choice but to be tested because I needed treatment."

Another patient, speaking on condition of anonymity, said: "If your working neighbour asks you to take her child to the clinic for immunisation, both of you must be tested [for HIV] before the child can be immunised."

A 44-year-old patient with diabetes and high blood pressure said HIV testing was not negotiable: "It is either you take a compulsory HIV test or you go home without any medication."

She claims that she was turned away when she told nurses that she had come to the clinic for her monthly check up, not for an HIV test.

"I was just not ready for it at that moment. They did not hesitate to tell me that 'no HIV test, no treatment'," she said.

She charged that, after the tests, loose-lipped staff revealed the status of patients.

"Say I test positive—before the end of the day the whole village would be knowing that I am positive," she said.

A hawker outside the clinic agreed, saying: "We know who is positive and who is not because the workers here cannot keep a secret."

After five hours in the queue, The Times put the patient's allegations to the nurse in charge, Sister R Makgatho, who refused to reveal her full name. She denied that her staff forced patients to undergo HIV tests and referred queries to the health department's district office.

It was at that point that the teenaged girl we had accompanied to the clinic was refused contraception after declining an HIV test.

"They told me that I will not get any treatment," she said.

Written in her file was: "HCT not done, advice to came (sic) back for follow-up counselling."
What They Say:
- Jonathan Berger, of the Aids Law Project, says compulsory HIV testing is "crazy". "That is not part of any policy or law. under our law you can force someone to be tested only if that person is a sexual offender. The policy is to encourage people to be tested, not force them."
- North West health department spokesman Tebogo Lekgethwane says no one should be forced to take an HIV test but they can be advised to do so.
- "I just do not get it why people were forcing others to take the test," he said.
- He criticised the community for telling the media about the problem instead of his department.
- "We will send our people to investigate," he said.
- National health spokesman Fidel Hadebe says compulsory HIV testing is "not acceptable".
- Hadebe said clinics were not pressured to test as many people as possible during the testing campaign.
- "It was not a numbers campaign. the aim is to inculcate a new culture, to have people know their status and start receiving treatment."
- The clinic concerned would be investigated. he said.
- Treatment Action Campaign spokesman Caroline Nenguke says she strongly advises patients to find out about their HIV status so that they can deal with the virus appropriately, but forcing patients into testing was "unethical and there is no policy" of support for that approach.
- "Even if they did not want to take the test, they should be treated for any sickness they have," she said.

HIV-infected, recycled syringes sting Kolkata
Prithvijit Mitra & Krishnendu Bandopadhayay, TNN | Aug 2, 2011, 05:24AM IST
KOLKATA: It is wobbly with a crooked needle and a depressed piston. The tip looks blunt, the cap is loose and the tube has a pale exterior. 'For single use only', says the instruction printed on the syringe but it looks far from a fresh one, safe enough for use. And it is not the only one which doctors at SSKM Hospital in Kolkata suspect to have been recycled from clinical wastes that are routinely dumped in the hospital backyard.

Hundreds of syringes, saline bottles, blood bags, slides and other medical equipment—all recycled—are believed to have infiltrated SSKM through a network that has been active for some years. The result could be disastrous and might have started taking effect already, fear doctors.

TOI got hold of a syringe bearing lot number 11071 bought by the hospital in June. Tightly wrapped in a transparent packet, it looks like any other syringe. But, the piston is unsteady and loose while the needle is blunt. "It is clear that this is a recycled product and could be carrying deadly germs. Hepatitis B is the most common virus that recycled instruments like these could be carrying. Even HIV can't be ruled out," said Rezaul Karim, a senior faculty at the hospital.

The recycled syringes are mixed up with new ones in a batch. "It's a fifty-fifty mix so you don't know what you are going to get," said a doctor. Ironically, the genuine ones were priced lower—at Rs 7 per piece—as against the recycled variety that cost Rs 7.10. It's not just syringes that are being recycled. Slides for collecting blood samples are regularly found to have been used before. The stains on recycled slides are a giveaway but they are not easy to spot. But doctors don't fail to notice them. "Blood reports are likely to be inaccurate if these slides are used. We often advise patients to get slides from College Street instead of buying them from shops around the hospital," said Karim.

SSKM authorities admit to an inefficient disposal system. The waste is dumped in an open space behind the superintendent's office and remains uncollected till 11am. "We do try and put them into three separate bags as per the norm. The agency which collects the waste is at fault as well. They don't collect the waste in time," said Provash Chakrabarty, medical superintendent of the hospital. The waste is taken to Dhapa where they are sold at slums on the city's Basanti Expressway and Tangra-Topsia Road, off EM Bypass. Here, the reusable parts are segregated and sent to fringe areas like Mahishbathan, Dum Dum and Garia for cleaning. From there, the recycled wastes make their way to the "manufacturing" units at Burrabazar where they are repackaged and sold back to retailers.

AIDS Issues Update: C2EA: Features:
Rep. Lee to Introduce Anti-HIV Criminalization Bill
Thirty-four states and two U.S. territories have statutes that penalize HIV exposure.
A new bill could put an end to HIV criminalization laws that impose cruel and unfair penalties on people with HIV.

U.S. Congresswoman Barbara Lee (D-CA) plans to introduce the legislation in September. A draft shows it would require a review of all federal and state laws, policies, regulations and judicial precedents regarding criminal cases involving people living with HIV/AIDS.

The bill, called the Repeal HIV Discrimination Act, would then charge the Attorney General and the Secretary of Health and Human Services with developing guidelines for state and federal governments. The guidelines would assist governments in altering discriminatory policies.

Laws would change that 1) place an additional burden on HIV-positive individuals because of their HIV status or 2) are not consistent with evidence-based, medically accurate public health initiatives.

“The criminalization of exposure to and/or transmission of HIV without the requirement of malicious intent violates the civil and human rights of individuals who are HIV-positive,” reads the draft.

Thirty-four states and two U.S. territories have statutes that penalize HIV exposure. While their supporters claim these policies protect the public health, evidence shows they do more harm than good.

**A few examples:**

- A man with HIV in Texas is serving 35 years for spitting at a police officer.
- A man with HIV in Iowa had an undetectable viral load and had a sexual encounter during which he used a condom and HIV was not transmitted. He received a 25-year sentence. The sentence was eventually suspended, but he was required to register as a sex offender. This barred him from unsupervised contact with his nieces, nephews, and other young children.
- A woman with HIV in Georgia received an 8-year sentence for nondisclosure of her HIV status to a sexual partner, despite the testimony of two witnesses that the partner knew of her HIV status.
- A man with HIV in Michigan was charged under the state’s anti-terrorism statute with possession of a “biological weapon” after he allegedly bit his neighbor.

The legislation’s expected introduction is part of a growing effort to limit or end laws that punish individuals for HIV exposure or transmission. In February, the National Alliance of State and Territorial AIDS Directors became the most recent group to speak out, calling for an end to laws that impose disproportionately harsh penalties for HIV nondisclosure, exposure or transmission.

“The passage of this bill will make it safer for people with HIV to disclose their status and it will remove an important barrier to those at risk from getting tested,” said Sean Strub, co-founder of the Positive Justice Project, which works to combat HIV-related discrimination in the justice system. “The result will be less transmission of HIV.”

**Syphilis Up Among Minority Gay, Bisexual Men**

*Reuters Health*, (08.01.2011)  Amy Norton

Rates of primary and secondary syphilis disproportionately increased in recent years among black, Hispanic, and young men who have sex with men, CDC researchers reported on Monday. Syphilis has been on the rise since 2000, and studies suggested MSM accounted for a majority of the new cases. However, the sex of the sexual partners was not reported for national syphilis data until 2005.

While the decade’s initial outbreak especially hit MSM in their 30s, the new study of 27 states found the largest increase in the 2005-08 period to be MSM in their teens and 20s. In 2008, MSM ages 20-29 had the biggest increase in syphilis, to about 12 cases per 100,000.

That same year, the absolute increases in syphilis rates among black and Hispanic MSM were 8.0 and 2.4 times, respectively, the rate for white MSM. Black MSM had 19 cases of syphilis per 100,000 population, Hispanic MSM had over 7 cases per 100,000, and white MSM had 4 per 100,000.

In 2000, the US syphilis rate was 2.1 cases per 100,000 population. By 2009, men had a rate of just under 8 syphilis cases per 100,000 population, and women had 1.4 cases per 100,000.

The magnitude of the racial disparities is concerning, said Dr. John R. Su, a CDC medical epidemiologist. Reasons for the disparities are hard to pin down, but they could be fueled by poorer income, educational levels, and health care access, he said. Some recent studies suggest an uptick in unprotected sex and multiple partners among MSM.

Education and screening efforts need to target MSM where they are: online, at clubs, bars, and bathhouses, the Boston-based Fenway Institute’s Dr. Kenneth H. Mayer and Matthew J. Mimiaga wrote in an accompanying editorial. “Many MSM with newly diagnosed syphilis or HIV met their sexual partners recently on the Internet,” they noted.
“First, you have to know you’re at risk,” said Su, who cited peer educators as another promising approach. Getting tested for STDs at least annually, practicing monogamy with a partner who gets tested, and consistent condom use reduce the risk of syphilis and other STDs.


San Francisco’s Anti-Circumcision Vote Cut from Ballot; Judge: State Law Preempts Measure

Washington Times, (07.29.2011) Valerie Richardson
San Francisco Superior Court Judge Loretta Giorgi on Thursday ruled against a ballot proposal that would have banned infant male circumcision in the city, citing a state law that prevents local governments from regulating medical professionals.

Despite last week’s University of Versailles announcement that circumcision cut the rate of HIV among men by 76 percent in one South African township, ban supporters insist the operation has no health benefits and therefore is not legally a medical procedure. However, Giorgi found the presented evidence “overwhelmingly persuasive that circumcision is a widely practiced medical procedure,” and that California law “leaves no room for localities to regulate in this area.”

Lead anti-circumcision activist Lloyd Schofield, who maintains the practice is cruel and should be outlawed like female genital mutilation, is considering an appeal. “We will not stop until all men are protected from this damaging and harmful surgery,” he said.

The measure was widely opposed by Jewish and Muslim groups that considered it an affront to their religious freedoms. City officials and medical associations also opposed the ban, with the American Civil Liberties Union and the San Francisco Medical Society backing the lawsuit. The San Francisco City Attorney’s Office even filed a brief contesting the proposal’s constitutionality.

Had it been ratified by voters, the ban would have made circumcising any male under age 18 in San Francisco a crime punishable by a $1,000 fine or up to one year in jail.

“San Francisco is a city that doesn’t stand for extremism,” said Jewish Community Relations Council Associate Director Abby Porth-Michelson. “The idea that they would put doctors in jail for performing a procedure with proven medical benefits is outrageous.”

Woman in Jail for Stopping TB Treatment

Ottawa Citizen, (08.02.2011) Mike McIntyre, Winnipeg Free Press
Invoking a section of the Public Health Act, authorities in Winnipeg obtained a court order to detain a woman who has repeatedly stopped treatment for her infectious TB. The woman was diagnosed with TB in December and put on a treatment regimen lasting six to nine months. According to an affidavit, she stopped treatment five times, forcing authorities to search for her and bring her in to begin the process anew. “I am concerned that without proper treatment, [she] may eventually develop drug-resistant tuberculosis that is difficult or impossible to treat,” Dr. William Libich of the Winnipeg Regional Health Authority wrote in the affidavit. The 90-day detention order issued in April was extended this week.

Health authorities say the woman, who previously worked in the sex trade, was putting others at risk of infection.

4-Drug Regimen Can Cure Genotype 1 Hepatitis C in 12 Weeks

Published on Tuesday, 02 August 2011 00:00
Written by Press release
Interim results from the Phase 2 ZENITH study show that previously untreated people with HCV genotype 1 can achieve sustained response in as little as 12 weeks using a quadruple regimen consisting of telaprevir (Incivek), the experimental HCV polymerase inhibitor VX-222, pegylated interferon, and ribavirin. A newly added arm will evaluate telaprevir, VX-222, and ribavirin without interferon.
Below is an edited excerpt fro a Vertex Pharmaceuticals press release describing the study and its findings.

Interim Data from Phase 2 Study of Combination Regimen Including VX-222 and Incivek Suggest Potential to Treat Genotype 1 Hepatitis C in as few as 12 Weeks and No More Than 24 Weeks
Famine Will Spread In Somalia Unless ‘Massive’ Response Mounted, U.N. Says

The drought and hunger crisis in the Horn of Africa is getting worse, and unless there is "a massive increase in the response, the famine will spread to five or six more regions" in Somalia, Valerie Amos, the U.N. under-secretary-general for humanitarian affairs, told reporters on Monday, Reuters reports. Amos
said the U.N. needs an additional $1.4 billion to help those in need and that the African Union would soon hold a funding conference, the news agency notes (Charbonneau, 8/1).

"The response to the disaster has been difficult and slow owing to security concerns and restrictions placed on aid agencies by the militia group al-Shabab, who banned some organizations from working in their areas," according to the Guardian (Rice, 8/1). The New York Times reports that al-Shabab "is blocking starving people from fleeing the country and setting up a cantonment camp where it is imprisoning displaced people who were trying to escape Shabab territory" (Gettleman/Ibrahim, 8/1).

The Christian Science Monitor notes "Ethiopia's government is enacting a resettlement program that it hopes will be a long-lasting solution to a longstanding burden," but which some advocates "say ... will be coercive and rob people of their ancestral lands" (Davison, 8/1).

A spokesperson for the U.N. Food and Agriculture Organization said on Tuesday that "Uganda may be the next country hit with these same sort of alarming malnutrition and drought conditions," Agence France-Presse reports (8/2).

The Guardian's "Data Blog" presents figures on aid funding for the crisis, which will be updated weekly (8/1). The New York Times examines how a lack of media coverage of the situation could be contributing to a lack of donations from the public (Strom, 8/1).

Neglected Tropical Diseases Becoming More Common In Europe, Study Shows
"Worm infestations, food parasites, Chagas disease, sand fly-transmitted infections and other neglected tropical diseases usually found in Africa and Asia are turning up more often in Europe, according to a new study" published recently in the International Journal of Infectious Diseases by researchers from the Sabin Vaccine Institute, the New York Times reports.

"The problems were worst in Eastern Europe, Turkey, former Soviet states and the Balkans, and weak economies and migratory populations were blamed," according to the newspaper. The research found that "Gypsies, African immigrants and children destined for international adoption" were particularly vulnerable to the diseases, the New York Times notes (McNeil, 8/1).

Anti-Evolution Vandals?
Pro-evolution bumper stickers and emblems are being removed from the cars of biologists in Florida.
By Edyta Zielinska | August 1, 2011
Presumed anti-evolution vandals are repeatedly defacing the cars of biologists from the University of Florida, according to the University's student newspaper, The Independent Florida Alligator.

Over the course of several months, a number of biology professors who had "Darwin fish" emblems and pro-evolution stickers on their cars noticed that the symbols had been pulled or scraped off. In some cases, religious prayers were left on the cars. Most recently, Brian McNab, a professor emeritus of ecology at the University, noticed that his tires had been punctured with two-inch nails. Zoologist Betty Smocovitis told the Florida Alligator that she would simply continue to replace the Darwin fish on her car.

The biologists suspect the culprits to have strong anti-evolution sentiments, and have reported the crimes with the University Police Department. (Hat tip to The Chronicle of Higher Education.)

Steady HIV infection rate in the US conceals large increases in young gay and black men
Gus Cairns
Published: 04 August 2011
About 50,000 adults a year are being infected with HIV in the US, a new estimate by the country's Centers for Disease Control (CDC) revealed today in an article in the open-access journal PLoS One.
This infection rate, equating to an annual incidence of 0.019% or about one infection a year in every 2000 US citizens over 13, has stayed steady in the last four years for which we have complete figures (2006-2009).

However this unchanging incidence conceals large increases in the new infection rate in young people, gay men, black men, and particularly the group including all those categories – young black gay men.

Between 2006 and 2009 new HIV infections increased by 20.5% in young people aged 13-29, by 34% in young gay men, by 43% in young black men, and by 48% in young black gay men.

**Survey methods**

The CDC’s estimate is based on extrapolations of figures from surveillance areas in 16 states and two cities which use an incidence assay to estimate the proportion of newly-diagnosed cases of HIV that are recent infections (in the last six months). These surveillance areas cover 65% of the US population, though some significant high-prevalence HIV areas are omitted, including California and the District of Columbia.

They then calculate how many new HIV infections there are per year – both diagnosed and undiagnosed – in the whole country. This task has been made easier since 2008 when all states began to participate in anonymised name-based reporting of all new HIV diagnoses.

New diagnoses are not the same as new infections, as they could be picking up on infections caught many years ago. However the CDC finds that, despite their own campaign to standardise HIV testing in primary care, emergency rooms and in high-prevalence areas, the number and frequency of HIV tests performed in the US did not increase between 2006 and 2009. Because of this, any increase in diagnoses is more likely to reflect actual increases in incidence, rather than the diagnosis of more long-term infections in previously untested people. The CDC estimate now that only one in five people with HIV in the USA – 21% – is undiagnosed, but that the undiagnosed may still be transmitting the majority of new infections.

**Detailed results**

The detailed figures in the report include:

- There were 31,162 new diagnoses (allowing for late reports) in the surveillance areas in 2009. This was more or less the same as in 2006. There was a significant rise in diagnoses in 2007 – why is not clear – but whole-population figures then declined in the next two years.
- Extrapolating these figures to the whole country and including the undiagnosed would mean that there were 48,100 new HIV infections in the whole USA in people over 13 in 2009.
- A steady 56.5% of people who tested positive had had a previous HIV-negative test and amongst those, 42% (24% of all diagnosed) had had a negative test less than a year previously. The percent classified as having been infected in the last six months according to the incidence assay was a consistent 31% of all diagnosed.
- Three-quarters of new infections were in men, 44% in African-Americans (who make up 12.5% of the population) and, in 2009 61% were in men who have sex with men (MSM).
- Infections increased significantly in young people aged 13-29 in the four years of the survey, from 15,600 in 2006 to 18,800 in 2009 (a 20% increase). However this increase only remained significant in young African-American men, where infections rose from 5300 in 2006 to 7600 in 2009 (a 43% increase).
- Infections in MSM increased from 27,000 to 29,300 in the four years – a non-significant increase of 8.5%. When analysed, the increase in MSM only remained significant in black MSM, where new infections increased by 20% from 9000 to 10800 in the four years, and in young MSM aged 13-29, where infections increased by 34% from 9600 in 2006 to 12,900 in 2009.
- When this was broken down further, the majority of this increase was in black MSM aged 13-29, where new infections increased from 4400 in 2006 to 6500 in 2009 – a 48% increase. This accounts for almost all the increase in new infections in gay men.
- The highest rate of infections in Hispanic gay men also occurred in the 13-29 age group, though it showed no sign of increase, but the highest infection rate in white men was in the 30-49 age range.

**Comments**

“The estimates for 2006-2009 continue to underscore the disproportionate toll that the HIV epidemic has taken...on racial/ethnic and sexual minorities,” comment the CDC.

“Adequate funding and services should be directed to individuals at greatest risk for acquiring and transmitting HIV infection, if we are to make a further impact on the HIV epidemic in the United States,” they conclude.
Man who murdered two women by knowingly infecting them with HIV to spend 'rest of life' behind bars

By Daily Mail Reporter

A Canadian man convicted of murder for knowingly transmitting the virus that causes AIDS could stay in jail indefinitely.

Johnson Aziga, 55, could spend the rest of his life in prison even if he succeeds in appealing his conviction on two counts of murder – two of the women Aziga slept with after he was diagnosed with HIV later died of AIDS.

‘Don’t stand, because these are the only murder convictions that have ever been obtained in this context,’ said Isabel Grant, a law professor at the University of British Columbia.

Canada has no death penalty, and a first degree murder conviction normally carries a sentence of life in prison with no possibility of parole for 25 years.

The ‘dangerous offender’ designation keeps those criminals thought most likely to commit more violent offences in prison indefinitely.

In April 2009, a jury convicted Aziga of two counts of first degree murder, 10 counts of aggravated sexual assault, and one count of attempted aggravated sexual assault.

Prosecutors said Aziga had unprotected sex with at least 11 women over a period of years, after learning that he was HIV positive, putting his partners at risk.

Seven were diagnosed with AIDS and two later died from the illness.

In 1998, the Supreme Court of Canada found that knowingly exposing a partner to HIV could be prosecuted under existing laws against assault.

Several people have been convicted of lesser charges since then, including aggravated sexual assault, and the number of prosecutions has been increasing. But Aziga was the first to be found guilty of murder.

Grant said that charge might be excessive.

‘We are better able to deal with HIV now. We know how to minimize transmission, and we have effective anti-retroviral medications, and hopefully we’re reducing the stigma of HIV/AIDS, so I really don’t know why the prosecutions are increasing,’ she said.

HIV epidemic emerging in Middle East

Thursday, August 4th, 2011 13:42:00

DUBAI: The AIDS virus is spreading like an epidemic in some Middle East and North African countries because of homosexual encounters between men, a study warned on Wednesday.

“This systematic review and data synthesis indicate that HIV epidemics appear to be emerging among MSM (men who have sex with men) in at least a few MENA countries,” said a study published in PLoS Medicine.

The study, titled "Are HIV Epidemics among Men Who Have Sex with Men Emerging in the Middle East and North Africa?", warned that the levels "could already be in a concentrated state among several MSM groups."

It showed that the rates of HIV infection among MSM in some countries have exceeded the five percent threshold which defines concentrated epidemics, namely in Egypt, Sudan and Tunisia.
The study put the rates of HIV infection among MSM in Egypt's main cities of Cairo and Alexandria at 5.7 percent and 5.9 percent respectively, while the rate among receptive MSM in Sudan's capital reached 9.3 percent.

Tunisia's total rate was put at 4.9 percent, ranging between 0.8 and 6.3 percent in three regions.

"There is an urgent need to expand HIV surveillance and access to HIV testing, prevention, and treatment services in a rapidly narrowing window of opportunity to prevent the worst of HIV transmission among MSM in the Middle East and North Africa," the study said.

"Prevention of male-to-male HIV transmission must be set as a top priority for HIV/AIDS strategies in MENA," it added.

**Boys who masturbate likelier to have safe sex?**

NEW YORK | Mon Aug 1, 2011 5:41pm EDT

(Reuters Health)—Masturbation could play an important role in sexual self-awareness and condom use in teenage boys, according to a new report.

Researchers found 86 percent of boys who said they’d worn a condom last time they had sex also reported masturbating over the past year, compared to only 44 percent of boys who didn't masturbate.

While that link doesn't prove that masturbation itself leads to safer sex, "the association of any behavior with increased condom use deserves further investigation, given the rates of unintended pregnancies and sexually transmitted infections in adolescents," the report says.

In 2009, there were nearly 410,000 births to girls aged 15 to 19 in the U.S., where teen motherhood racks up public costs of an estimated $9.1 billion.

The new study, supported by Trojan condom maker Church & Dwight Co, is based on a nationally representative survey of 820 adolescents between 14 and 17 years old.

Dr. Cynthia Robbins at Indiana University in Indianapolis and colleagues found that nearly three-quarters of boys said they masturbated, while less than half of girls did so.

Those kids who masturbated reported having more sex than those who didn't, including oral sex and vaginal intercourse.

After taking age and partner status into account, sexually active boys who masturbated were about eight times as likely to have used a condom during their last intercourse as boys who didn't masturbate.

For unknown reasons, there was no such link for girls.

Writing in the Archives of Pediatrics & Adolescent Medicine, the researchers note that masturbation is a highly stigmatized topic in the U.S., and that many doctors shy away from discussing the common phenomenon.

"The findings of this study together with existing publications on masturbation should be used by health care providers to inform, educate and reassure adolescents about masturbation to provide competent and comprehensive sexuality education in the clinical setting," they conclude.


**Reasons for Not HIV Testing, Testing Intentions and Potential Use of an Over-the-Counter Rapid HIV Test in an Internet Sample of Men Who Have Sex with Men Who Have Never Tested for HIV**

Sexually Transmitted Diseases Vol. 38; No. 5: P. 419-428, (05..2011) Duncan A. MacKellar and others

The correlates of the main reasons for not HIV testing, HIV testing intentions, and the potential use of an over-the-counter rapid HIV test (OTCRT) among men who have sex with men who have never tested for HIV (NTMSM) are unknown, the authors wrote. They evaluated these correlates among 946 NTMSM in six US cities who took part in an Internet-based survey in 2007.

The chief reasons given for not testing were perceived low risk (32.2 percent of respondents), structural barriers (25.1 percent), and fear of testing positive (18.1 percent). Perceiving one’s risk as low was associated with having fewer unprotected anal intercourse partners and less use of the Internet for HIV information. Structural barriers were associated with younger age and more UAI partners. Fear of testing positive was associated with black and Hispanic race/ethnicity, higher number of UAI partners, and more frequent use of the Internet for HIV information.

Strong testing intentions were held by 25.9 percent of all the men and by 14.8 percent of those who perceived their risk as low. Likely use of an OTCRT, if one were available, was reported by 47.4 percent of those who were somewhat unlikely to test, 76.5 percent of those who were somewhat likely to test, and 85.6 percent of those who were very likely to test.
“Among NTMSM who use the Internet, main reasons for not testing for HIV vary considerably by age, race/ethnicity, UAI, and use of the Internet for HIV information,” the authors concluded. “To facilitate HIV testing of NTMSM, programs should expand interventions and services tailored to address this variation. If approved, OTCRT might be used by many NTMSM who might not otherwise test for HIV.”

**Awareness of Post-Exposure HIV Prophylaxis in High-Risk Men Who Have Sex with Men in New York City**

*Sexually Transmitted Infections Vol. 87: P. 344-348,* (06..2011) Sapna A. Mehta; Richard Silvera; Kyle Bernstein; Robert S. Holzman; Judith A. Aberg; Demetre C. Daskalakis

The team designed the current study to assess factors associated with knowledge of non-occupational post-exposure prophylaxis (nPEP) and pre-exposure prophylaxis (PrEP) for HIV. The study’s subjects were 554 MSM clients of two New York City (NYC) bathhouses; the men were given a standardized survey on nPEP and PrEP at the time of HIV testing.

Sixty-three percent of the men reported unprotected sex with a male partner in the preceding 90 days, while 7 percent reported any sex with a known HIV-positive male partner. Fewer than half the men reported having a primary care provider who was aware of their MSM behavior. Awareness of nPEP or PrEP was reported by 201 men (36 percent).

In univariate analyses, the following factors were each significantly associated with being aware of nPEP or PrEP: race/ethnicity; previous HIV testing; self-identifying as gay; higher education level; having a primary care provider who was aware of their MSM behavior; reported interaction with the health care system; use of the Internet for meeting sex partners; reporting unprotected sex in the previous 90 days; reporting any sex with an HIV-positive male partner in the previous 90 days; and having a higher number of sex partners.

Multivariate analyses found that having a higher number of sex partners was significantly associated (odds ratio 5.10, p=0.02) with post-exposure prophylaxis/PrEP knowledge. Disclosure to a primary care provider also was associated, though less robustly (OR 2.10, p=0.06).

“Knowledge of nPEP or PrEP among sexually active MSM in NYC is low and is associated with having a primary provider aware of their patient’s same-sex behaviors,” the authors concluded. “These findings show the need for improving education about nPEP among high-risk MSM in NYC and the role of providers in these efforts.”

**Famine Declared In Three More Regions Of Somalia**

"The famine gripping parts of southern Somalia has spread to three new areas of the country, with the entire south likely to be declared a famine zone within the next six weeks, the United Nations said on Wednesday," Reuters reports (Mohamed, 8/3).

U.N. Humanitarian Coordinator for Somalia Mark Bowden said the Afgoye corridor outside Mogadishu, the capital itself, and the Middle Shabelle region are now in a state of famine, joining the Lower Shabelle and Bakool regions, in which famine was declared on July 20, according to the U.N. News Centre (8/3).

"A humanitarian emergency persists across all other regions of southern Somalia, and tens of thousands of excess deaths have already occurred,” the U.N.’s Food Security and Nutrition Analysis Unit (FSNAU) said in a joint statement with the U.S.-based Famine Early Warning Systems Network (FEWS-NET), according to BBC News (8/3).

Valerie Vencatachellum, a senior policy adviser with the African Union, said on Wednesday that a donor conference to raise money for the crisis has been postponed for at least two weeks to allow heads of state to attend, the Associated Press/Guardian reports (8/3).

**TrustLaw Publishes Special Report On Child Marriage**

TrustLaw, a Thomson Reuters Foundation service, on Thursday published a series of articles, infographics and videos in a special report on child marriage. According to the series homepage, "[e]very day, 25,000 girls under the age of 18 are married worldwide. For many child brides, a future of poverty, exploitation and poor health awaits” (8/4).

A FactBox on the issue states that girls and younger women are more likely to die as a result of pregnancy, more likely to develop obstetric fistula, more likely to be infected with HIV by their older husbands and less likely to attend school (Whiting, 8/4).
**FACTBOX-Child marriage threatens girls' health and rights**

04 Aug 2011 08:00

Source: trustlaw // Alex Whiting

This story is part of a TrustLaw special report on child marriage

LONDON, Aug 4 (TrustLaw)—Every day, more than 25,000 girls under the age of 18 are married worldwide, rights groups estimate. For many child brides, a future of poverty, exploitation and poor health awaits.

Following are key facts on child marriage around the world.

- Every three seconds, a girl under the age of 18 is married somewhere in the world, mostly in Africa, the Middle East and South Asia.
- The practice affects a third of girls—and some boys—in developing countries, according to UNICEF, which describes child marriage as "perhaps the most prevalent form of sexual abuse and exploitation of girls".
- The U.N. Convention on the Rights of the Child says 18 years should be the minimum age for marriage.
- Child rights activists say marriage at a young age violates a child's basic human rights because they are too young to be able to give "free and full consent"—a right enshrined in Article 16 of the Universal Declaration of Human Rights.
- Child marriage is most common in South Asia, sub-Saharan Africa, Latin America and the Caribbean.
- In many developing countries the practice is illegal but the law is often not enforced or it operates alongside customary and religious laws.
- Girls younger than 15 are five times more likely to die as a result of pregnancy and childbirth than women in their 20s. If they are 15-19, they are twice as likely to die.
- Girls under the age of 18 are more likely to develop obstetric fistula, which causes severe incontinence. This condition occurs during childbirth when a hole develops between the vagina and bladder or rectum.
- Girl brides are more likely to be infected with the HIV virus by their older husbands. A study in Kenya and Zambia by University of Chicago researchers found that among 15- to 19-year-old girls who are sexually active, being married increased their chances of having HIV by more than 75 percent.
- A girl bride is more likely to be beaten or raped by her husband and experience abusive relationships with her in-laws.
- The babies of child brides are 60 percent more likely to die before the age of one than children of women older than 19.
- Child brides are rarely allowed to go to school. Many are expected to bear and raise children and carry out domestic work for their in-laws.
- Girls from poor families are nearly twice as likely to marry before 18 than girls from wealthier families.
- The number of child marriages often increases during conflicts or natural disasters.
- Some families use marriage to build and strengthen alliances, to seal property deals, settle disputes or pay off debts.


(Reporting by Alex Whiting; editing by Tim Large and Sonya Hepinstall)

**Newly Discovered B Cells Suggest Why Women Suffer More Autoimmune Disease**

Researchers at National Jewish Health have discovered a type of cell that may contribute to autoimmune disease. The findings also suggest why diseases such as lupus, multiple sclerosis and rheumatoid arthritis strike women more frequently than men.

The cells, a subset of immune-system B cells, make autoantibodies, which bind to and attack the body’s own tissue. The researchers report in the August 4, 2011, issue of the journal Blood, that they found higher levels of these cells in elderly female mice, young and old mice prone to autoimmune disease, and humans with autoimmune diseases. National Jewish Health has applied for a patent for a method to treat autoimmune disease by depleting these cells.

“We believe these cells could be useful in the diagnosis and treatment of autoimmune diseases, and may help us understand general mechanisms underlying autoimmunity,” said senior author Philippa
Autoimmune diseases occur when the immune system begins attacking its own tissues rather than external pathogens. Several autoimmune diseases, including lupus, rheumatoid arthritis and multiple sclerosis, afflict women anywhere from two to 10 times as often as they do males. Although sex hormones are known to play a role in autoimmune disease, other factors are involved in these gender differences.

The research team came across the new cells when they were examining differential expression of X-chromosome genes in healthy male and female mice. They discovered a previously undescribed type of B cell, which expressed the cell-surface protein CD11c. The protein is an integrin, which helps cells attach to other cells or to an extracellular matrix. The researchers are not certain what role integrin might play in autoimmunity or if it is merely a marker for another mediator of autoimmunity.

These cells increase as healthy female mice age, but remain at constant low levels in healthy male mice. As a result, the researchers named the cells Age-associated B Cells or ABCs. The researchers also found higher levels of ABCs in young and old mice that are prone to autoimmune disease. They could detect the elevated ABC levels before any disease developed and even before autoantibodies appeared, suggesting a role for these cells in early detection of disease.

The researchers also found an almost identical type of cell in the blood of many human autoimmune patients. In women with rheumatoid arthritis the presence of these cells increased with age.

ABCs in mice produce antibodies against chromatin, the combination of proteins and DNA that make up chromosomes in the cell nucleus. When they depleted the ABCs in mice, autoantibody levels fell, suggesting a potential treatment for autoimmune diseases. National Jewish Health has applied for a patent on the method of depleting the cells to treat autoimmune disease.

The researchers also found that activation of these cells requires stimulation of TLR7, a cell-surface receptor involved in innate immune responses. The gene for TLR7 is located on the X chromosome. Women have two X chromosomes, men an X and a Y chromosome. Normally one copy of the X chromosome in women is silenced so that it does not produce excess protein. But the silencing is not always complete, and women commonly express elevated levels of some X-chromosome genes.

“Not only do these cells appear more frequently in females, their activation depends on a gene of which women have two copies and men only one,” said Anatoly V. Rubtsov, PhD, first author and postdoctoral fellow at National Jewish Health. “This could help us understand why women suffer many autoimmune diseases more often than men.”

**Bellybutton Microbiomes: Ecological Research On the Human Biome**

ScienceDaily (Aug. 4, 2011) — Public awareness about the role and interaction of microbes is essential for promoting human and environmental health, say scientists presenting research at the Ecological Society of America’s (ESA) 96th Annual Meeting from August 7-12, 2011. Researchers shed light on the healthy microbes of the human body and other research on microbial and disease ecology to be presented at ESA's 2011 meeting in Austin, Texas.

**Bellybutton microbiomes**

Human skin is teeming with microbes—communities of bacteria, many of which are harmless, live alongside the more infamous microbes sometimes found on the skin. Nina Rountree from North Carolina State University and colleagues set out to dispel the myth that all bacteria on the skin are disease-causing germs. The researchers cultured the bacterial communities living within bellybuttons of 391 individuals from across the U.S. and published photos of the cultures anonymously in the online Bellybutton Bacteria Culture database. They chose bellybuttons as an area of the body that is generally protected from excretions, soaps and ultraviolet ray exposure.

The experiment generated interest among citizen scientists and provided clues about the stability of bacterial communities over time, the significant turnover between participants’ bacterial communities and similarities of bacterial communities between family members. The Bellybutton Bacteria Culture database received 55,000 visitors in only three months.

The research entitled "Beta-diversity of human skin bacteria studied with the citizen science approach" led by Nina Rountree from North Carolina State University, will be presented Friday, August 12 during the "Biodiversity“ poster session.

**Natural Killer Cells Participate in Immune Response Against HIV**

ScienceDaily (Aug. 3, 2011) — A new study shows for the first time that natural killer (NK) cells, which are part of the body’s first-line defence against infection, can contribute to the immune response against HIV. In an article in the August 4 issue of Nature, a research team based at the Ragon Institute of MGH, MIT
and Harvard reports that the HIV strains infecting individuals with particular receptor molecules on their NK cells had variant forms of key viral proteins, implying that the virus had mutated to avoid NK cell activity.

"This study suggests for the first time that NK cells can impose immune pressure on HIV, something that had previously been described only for T cells and antibodies, adding an additional cell to the repertoire of those with anti-HIV activity," says Marcus Altfeld, MD, PhD, of the Ragon Institute and Massachusetts General Hospital (MGH), senior author of the Nature report. "The challenge now will be to translate those findings into new preventive or treatment strategies."

NK cells are part of the innate immune system, which mounts a generalized response against invading organisms. In contrast to the adaptive immune system, which includes T cells and antibodies, innate immune responses are thought to be short-lived and not directed against a particular virus or bacteria. NK cells bind to virus-infected cells or tumor cells and release cell-killing proteins that destroy their targets. Because NK cells have very strong cytotoxic activity, they need to be closely controlled, so their cell membranes are studded with both activating receptors that unleash the cell-killing response and inhibitory receptors that keep it in check.

Previous research has shown that NK cells multiply during the earliest phase of HIV infection and that the cells can suppress HIV replication in cultured tissues. It also has been observed that infected individuals with particular versions of genes coding for the NK cell receptors called KIRs (killer immunoglobulin-like receptors) are better able to control HIV viral levels. But whether these genes allow NK cells to control HIV replication through direct recognition of infected cells or through another indirect mechanism is unknown. The researchers designed their study to test the hypothesis that mutations in the HIV proteins recognized by particular KIRs could allow the virus to escape NK cell activity, a finding that would support a role for NK cells in HIV control.

The Ragon investigators and colleagues at Microsoft Research began by analyzing the sequences of both HIV proteins and the genes encoding KIR molecules that regulate NK cell activity in samples from 91 infected individuals. Using tools designed to identify drug resistance mutations by detecting alterations in the viral genome found in the presence of drug, they associated particular variants in viral proteins with the presence of specific KIR genes, suggesting that the virus mutates in response to NK-cell-mediated anti-HIV activity.

The researchers also found that viral strains infecting individuals whose NK cells included an inhibitory receptor called KIR2DL2 were more likely to have variant forms of HIV that enhance viral interaction with that receptor, turning off the cell-killing activity. In cell cultures featuring NK cells with this receptor, replication of common forms of HIV was strongly suppressed, but the variant HIV continued to reproduce. Those results imply that, in the presence of NK cells expressing KIR2DL2, HIV mutates into a form that can "flip the off switch" and prevent NK cells from attacking infected cells.

"In those individuals that expressed KIR2DL2, HIV developed mutations that allowed it to evade killing by KIR2DL2-positive NK cells, but those mutations did not develop in participants who did not express that receptor," explains co-lead author Galit Alter, PhD, of Ragon and MGH. "We know that HIV mutates rapidly, and this is one of several ways that it has evolved to escape immune system pressure. But HIV does not have an unlimited ability to change its sequence, so a challenge for the future will be to combine the different anti-HIV arms of the immune system to control HIV or—if vaccines can generate the responses—to prevent infection."

Adds Altfeld, "The results of this study raise a number of interesting new questions. We need to better understand the molecular mechanisms that allow NK cells to recognize HIV-infected cells and learn how to manipulate these cells in humans for therapy or prevention. Recent animal studies have suggested that NK cells may develop immunologic memory responses, and if that ability is found in human cells, inducing such a response through vaccination is an exciting possibility we’d like to explore." Altfeld is an associate professor of Medicine and Alter an assistant professor of Medicine at Harvard Medical School.

**Journal Reference:**
Galit Alter, David Heckerman, Arne Schneidewind, Lena Fadda, Carl M. Kadie, Jonathan M. Carlson, Cesar Oniangue-Ndza, Maureen Martin, Bin Li, Salim I. Khakoo, Mary Carrington, Todd M. Allen, Marcus Altfeld. **HIV-1 adaptation to NK-cell-mediated immune pressure.** Nature, 2011; 476 (7358): 96 DOI: [10.1038/nature10237](https://doi.org/10.1038/nature10237)
Pregnancy doubled risk of female-to-male HIV transmission in Partners in Prevention study

Carole Leach-Lemens
Published: 05 August 2011

Pregnancy increased the risks of female-to-male HIV transmission two-fold among over 3300 serodiscordant couples from seven African countries Nelly R Mugo and colleagues reported in a prospective study published in the advance online edition of AIDS.

The risks of becoming infected with HIV during pregnancy increased at the same rate. However, this was partly explained by other factors including unprotected sex.

Women now account for 60% of HIV infections in adults in sub-Saharan Africa. Many African countries with high HIV prevalence also have high fertility rates and often women are pregnant for a considerable part of their adult lives.

Pregnancy brings biological and behavioural changes that may make a woman more susceptible to getting HIV as well as making her more infectious, so increasing the risks of transmission.

To date limited prospective studies have found inconsistent results, showing both an increased risk and no elevated risk of acquiring HIV during pregnancy. However, evidence shows that women infected during their pregnancy have a high rate of HIV transmission to their infants.

The authors note one study which showed increased HIV shedding in genital secretions during pregnancy, suggesting increased infectiousness, yet no prospective study has looked specifically at pregnancy as a risk factor for female-to-male transmission.

The authors chose to look at the association between pregnancy and the risks of getting HIV as well as the risks of transmitting HIV from females-to-males in a secondary analysis of a prospective study of African HIV serodiscordant couples.

From November 2004 to April 2007 3408 HIV serodiscordant couples from Botswana, Kenya, Rwanda, South Africa, Tanzania, Uganda and Zambia were enrolled in the Partners in Prevention HSV-2/HIV transmission study, a randomised, placebo-controlled, clinical trial of aciclovir as herpes simplex virus-2 (HSV-2) suppressive therapy for the prevention of HIV transmission. Aciclovir did not decrease HIV transmission risk within the couples.

Of the 3321 couples in the analysis about a third (1085) included an HIV-infected male partner and the remaining two-thirds (2236) included an HIV-infected female partner.

Eligibility included being over 18 years of age, having three or more episodes of vaginal intercourse in the three months before screening and having the intention of remaining a couple.

HIV infected partners were positive for HSV-2, had CD4 cell counts over 250 cells/mm$^3$ and were not taking antiretrovirals. HIV-infected women pregnant at the screening were excluded from the study.

Women who became pregnant stopped the study medication until the end of pregnancy. Pregnant HIV-uninfected women were included as were those who became pregnant during follow-up.

HIV infected partners were seen monthly and HIV uninfected partners were seen every three months. Sexual behaviour data including condom use was recorded at each visit as was contraceptive use.

Comprehensive prevention services included individual and couple HIV risk reduction counselling, quarterly syndromic management of sexually transmitted infection treatment and free condoms.

The majority were married and living together. Median CD4 cell count was 461 cells/mm$^3$. The couples were followed for up to 24 months; median time for HIV-negative and HIV-positive partners was 20.9 months (IQR: 15.6-24.1) and 19.9 months (IQR: 14.3-23.9), respectively.

Of the 61 HIV seroconversions among women close to 30% (17) happened during pregnancy. HIV incidence during pregnancy was 7.35 per 100 person years compared to 3.01 per 100 person years during non-pregnant periods, (HR: 2.34, 95% CI: 1.33-4.09, p=0.003). Risk was high during both early and late pregnancy. However, in multivariate analysis after controlling for age, contraceptive use and unprotected sex, the effect of pregnancy on HIV risk was not statistically significant.

Of the 58 HIV transmissions to men, 12 (20.7%) happened during pregnancy. The incidence of female-to-male transmission was 3.46 per 100 person years during pregnancy compared to 1.58 per 100 person-years when the female partner was not pregnant. This was statistically significant (HR 2.31, p=0.01) and remained significant after adjusting for confounding factors (HR 2.47, p=0.01).

The authors underscore the public health importance of these new findings showing pregnancy increases the risk of female-to-male transmission two-fold. New strategies, they add, are needed “to strengthen family planning and maternal health services for women with and at risk for HIV in order to
reduce unwanted pregnancies and avert HIV transmission to pregnant women and from pregnant women to their infants and partners.”

Strengths of the study include a large sample size and multinational cohort. The study also established a genetic viral linkage of transmitted HIV within partnerships so minimising the potential for misclassification of female-to-male transmission.

The authors note their findings can be generalised; all participants were co-infected with HSV-2 as are over 80% of all HIV infected adults in sub-Saharan Africa.

The authors conclude increased risk for HIV female-to-male transmission during pregnancy requires “further studies to understand the possible biologic mechanisms that may explain this finding.” They add: “Prenatal couples HIV counselling and testing, implementation of repeat HIV testing in pregnancy, and earlier initiation of combination ART should become part of routine antenatal care to protect mothers, infants and male partners from HIV.”

Reference

Some View CDC Data as 'House on Fire'
Tri-State Defender (Memphis), (08.04.2011)

In releasing new HIV incidence data on Wednesday, CDC stated that the “alarming increase among young black gay and bisexual men requires urgent action.” The statistics show that blacks represent just 14 percent of the US population but accounted for 44 percent of new HIV infections in 2009. Among young black men who have sex with men, new HIV infections rose by 48 percent from 2006 to 2009.

“That is an outrage,” said Phill Wilson, president and CEO of the Black AIDS Institute. “That number is completely unacceptable. Especially now when the prevention toolbox is literally exploding with new options.”

The release of the data came one year after the publication of the Obama administration’s National HIV/AIDS Strategy.

“We now have the tools that could dramatically drive down new infections,” Wilson said. “We have a roadmap to victory. We understand that people must be tested and know their status. We understand that linking ‘poz’ people to care right away saves lives. And we know that providing antiretrovirals to healthy people can also save lives.

“They’re calling this ‘alarming,’ but it’s clearly past that point,” Wilson said. “Our house is on fire.”

Jonathan Mermin, MD, director of CDC’s Division of HIV/AIDS Prevention, said, “We are deeply concerned by the alarming rise in new HIV infections in young, black gay and bisexual men and the continued impact of HIV among young gay and bisexual men of all races. We cannot allow the health of a new generation of gay men to be lost to a preventable disease.

“It’s time to renew the focus on HIV among gay men and confront the homophobia and stigma that all too often accompany this disease,” Mermin said.

Experts Urge Cervical Cancer Vaccine Switch: Alternative Could Save NHS Millions of Pounds
The Guardian (London), (08.04.2011) Sarah Boseley

The National Health Service could save millions of pounds if it switched from using the Cervarix human papillomavirus vaccine to Gardasil, suggests a new study by the Health Protection Agency (HPA). NHS in 2008 launched its HPV vaccine program for schoolgirls, opting to use UK-based GlaxoSmithKline’s Cervarix.

At the time, many sexual health doctors were perplexed. While both Cervarix and US-based Merck & Co.’s Gardasil protect against the same two HPV strains that cause most cervical cancer cases, Gardasil additionally targets two other HPV types linked to most genital wart cases.

The government refused to reveal the price Glaxo offered for Cervarix during the contracting process. However, to be as cost-effective as Gardasil, Cervarix would have to be £13-21 (US $21-34) less per dose, determined an HPA study published in 2008.

The new HPA study estimates that genital warts cost NHS about £17 million (US $27.7 million) a year. In 2008, about 149,000 cases were seen in general practice surgeries, sexual health clinics and hospitals. The average cost to NHS per genital wart case was £113 (US $184).

Genital warts “exert a considerable impact on health services, a large proportion of which could be prevented” by using Gardasil, wrote HPA’s Dr. Kate Solden and colleagues. One year after Gardasil’s 2007 introduction in Australia, genital wart diagnoses declined 25 percent among young women, they noted.
The government’s three-year contract for Cervarix is coming up for renewal, so the new study could stimulate further debate over the vaccines’ relative advantages.

**USDA Scientists Develop New Food Aid Product**
Scientists from the U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS) "have developed a fully cooked food-aid product called **Instant Corn Soy Blend** [ICSB] that supplements meals, particularly for young children," a [USDA news story](https://www.usda.gov) reports (Bliss, 8/4).
ICSB has been designated by the USDA's Farm Service Agency "as a supplemental food for emergency rations, displaced-persons assistance, and as a weaning food in maternal and child health programs and other programs," according to [Agricultural Research](https://www.ars.usda.gov) magazine (Bliss, August 2011). In addition to being used in food emergencies, ICSB "could also soon be purchased for the USDA Foreign Agricultural Service-administered McGovern–Dole International Food for Education and Child Nutrition Program, which provides U.S. agricultural products for school feeding and other projects in more than 30 countries," according to the news story (8/4).

**U.S. Should Demand Human Rights-Based Approach To HIV Prevention Programs In Uganda**
"Uganda has sometimes been considered a success story in fighting HIV and has been a darling of international donors," including the U.S., which "has poured over $1 billion into the country for AIDS programs. But throughout Uganda there are people ... who are passed over, denied treatment, or simply invisible to the country’s HIV prevention and treatment programs. Groups such as gay men, migrants, drug users, sex workers, and people with disabilities, as well as prisoners, are commonly left out," Kathryn Todrys, a researcher with Human Rights Watch (HRW) writes in GlobalPost’s "Global Pulse" blog.

Todrys notes that her research for an HRW report on health in Ugandan prisons "found conditions ripe for the spread of both tuberculosis and HIV." She writes, "Pressuring the Ugandan government to end abusive practices that increase HIV transmission, for example, costs very little compared with treating HIV after infection has occurred" and says "there is a better approach: fund human rights-based approaches, which emphasize government accountability and evidence-based programs." Todrys concludes, "The U.S. government continues to lead the world in its financial contributions to the global HIV epidemic. Pressing for a rights-based response is not only effective, it is also cost-effective" (8/4).

**Sending Surplus Medical Supplies To Developing Country Hospitals 'Not The Antidote' To Poor Conditions**
"Every year, hospitals in America throw away thousands of tons of usable medical supplies and equipment – by some measures 7,000 tons a year, a value of $20 billion. ... Yet every year, hospitals in developing countries around the world turn away patients or provide substandard care because they lack even the most basic medical equipment," journalist and author Tina Rosenberg writes in the New York Times' "Opinionator" blog. She describes the work of several organizations that collect excess or unwanted medical supplies and redistribute them to hospitals in need in developing countries.

Rosenberg writes, "Sending needed surplus medical supplies to poor countries is an elegant concept. But it is not the antidote for the barren conditions of many third-world hospitals." She says there is often a lack of training for health workers on new machines, supplies run out, and machines break, with "very little chance of being repaired" (8/4).

**Measles Initiative Vaccinates One Billion Children**
The Measles Initiative on Thursday "announced it has helped vaccinate one billion children in more than 60 developing countries since 2001, making significant gains in the global effort to stop measles," according to a Measles Initiative [press release](https://www.measlesinitiative.org). "Looking ahead to its second decade, the Measles Initiative will focus on achieving a series of interim targets toward the eventual eradication of measles. The first of these milestones will be to reduce measles mortality by 95 percent by 2015 (compared to 2000). The Measles Initiative estimates it will need approximately $212 million between 2012 and 2015 to reach the targets," the release states (8/4).
Mutations not inherited from parents cause more than half the cases of schizophrenia

Columbia University Medical Center researchers have shown that new, or "de novo," protein-altering mutations—genetic errors that are present in patients but not in their parents—play a role in more than 50 percent of "sporadic"—i.e., not hereditary—cases of schizophrenia. The findings will be published online on August 7, 2011, in *Nature Genetics*.

A group led by Maria Karayiorgou, MD, and Joseph A. Gogos, MD, PhD, examined the genomes of patients with schizophrenia and their families, as well as healthy control groups. All were from the genetically isolated, European-descent Afrikaner population of South Africa.

These findings build on earlier studies by Karayiorgou, professor of psychiatry at Columbia University Medical Center. More than 15 years ago, Karayiorgou and her colleagues described a rare de novo mutation that accounts for 1–2 percent of sporadic cases of schizophrenia. With advances in technology, three years ago the Columbia team was able to search the entire genome for similar lesions that insert or remove small chunks of DNA. The mutations found accounted for about 10 percent of sporadic cases.

Encouraged by their progress, they wondered whether other, previously undetectable, de novo mutations accounted for an even greater percentage of sporadic cases. Using state-of-the-art "deep sequencing," they examined the nucleotide bases of almost all the genes in the human genome. This time they found 40 mutations, all from different genes and most of them protein-altering. The results point the way to finding more, perhaps even hundreds, of mutations that contribute to the genetics of schizophrenia—a necessary step toward understanding how the disease develops.

"Identification of these damaging de novo mutations has fundamentally transformed our understanding of the genetic basis of schizophrenia," says Bin Xu, PhD, assistant professor of clinical neurobiology at Columbia University Medical Center and first author of the study.

"The fact that the mutations are all from different genes," says Karayiorgou, "is particularly fascinating. It suggests that many more mutations than we suspected may contribute to schizophrenia. This is probably because of the complexity of the neural circuits that are affected by the disease; many genes are needed for their development and function." Karayiorgou and her team will now search for recurring mutations, which may provide definitive evidence that any specific mutation contributes to schizophrenia.

The potentially large number of mutations makes a gene-therapy approach to treating schizophrenia unlikely. Researchers suspect, however, that all of the mutations affect the same neural circuitry mechanisms. "Using innovative neuroscience methods," says co-author Dr. Joseph Gogos, MD, PhD, and associate professor of physiology and neuroscience at Columbia University Medical Center, "we hope to identify those neural circuit dysfunctions, so we can target them for drug development."

The study's results also help to explain two puzzles: the persistence of schizophrenia, despite the fact that those with the disease do not tend to pass down their mutations through children; and the high global incidence of the disease, despite large environmental variations.

Targeting Innate Immunity in Malaria: Novel DNA Sensing Pathway Linked to Increased Susceptibility to Malaria

ScienceDaily (Aug. 5, 2011) — Scientists at the University of Massachusetts Medical School have uncovered a novel DNA-sensing pathway important to the triggering of an innate immune response for malaria. Activation of this pathway appears to stimulate production of an overabundance of type-1 interferon by the immune system that may contribute to inflammation and fever in malaria patients and could play a part in susceptibility for the most common and lethal form of malaria known as *plasmodium falciparum*. Published online in the journal *Immunity*, the study offers the first evidence that recognition of parasite DNA by the innate immune system may play a key role in malaria.

Caused by a parasite transmitted through mosquitoes, malaria is often characterized by successive waves of high fevers, which contribute to the lethality of the disease and cause many of its complications. The disease initially incubates in liver cells where it can gestate and multiply for up to 30 days. In the second stage, the parasite infects blood cells where it continues to multiply. Invisible to the immune system while inside the blood cells, the malaria parasite periodically bursts through to infect new cells and further multiply. Once the malaria parasite is outside of the blood cells, the immune system is able to detect its presence and attempts to mount a defensive response. It is this response and the corresponding inflammation that accounts for the periodic and deadly waves of fever experienced by malaria patients.
"Traditionally, immunologists have investigated how the adaptive immune system responds to foreign bodies such as virus, bacteria and parasites. It's only over the last 10 to 15 years that we've begun to understand the complex and important role the innate immune system plays in responding to all different classes of pathogens," said Katherine A. Fitzgerald, PhD, associate professor of medicine at UMMS and one of the lead authors of the Immunity study. "In this study, we set out to understand what role the innate immune system plays in this fever response, the dominate symptom found in malaria patients."

Looking at blood samples from febrile malaria patients, Fitzgerald and colleagues found the typical genetic signs expected from patients infected by a pathogen. What they weren't expecting to find, however, were elevated levels of interferon-expressing genes. Typically produced when a virus is detected, interferon triggers the protective defenses of the immune system that can eradicate viruses or tumors. "What we saw when we looked at the samples from malaria patients was a type 1 interferon signature in the immune cells that were responding to the malaria," said Fitzgerald. "This surprised us at the time because traditionally we thought of interferon only in the context of virus infections."

Working with Douglas T. Golenbock, MD, chief of the Division of Infectious Diseases and Immunology at UMMS, Dr. Fitzgerald and colleagues set out to find what was triggering the innate immune response and what effect that response was having on the host cells. What they found was a part of the malaria genome containing a dense portion of the nucleic acids adenine and thymine, two of the building blocks in DNA, which were responsible for activating a novel signaling pathway, including STING, TBK1 and IRF3-IRF7, in the host that enabled innate immune cells to produce type 1 interferon.

When Fitzgerald and colleagues proceeded to test the importance of this pathway to the progression of the disease in small animal models they found another surprise. Those which expressed the normal STING, TBK1 and IRF3-IRF7 pathway all succumbed to the infection within 12 days. However, those that lacked some or all of these genes survived the infection, suggesting that this novel DNA-sensing pathway that leads to type 1 interferon production may play a vital role in the progression of malaria in the host. "Normally interferon works to eradicate viruses from our body," said Fitzgerald. "In malaria it appears that the interferon response produced by the innate immune system might actually be harmful to the host rather than beneficial. It's not clear yet how or why this occurs but these findings suggest that immune system recognition of DNA and the corresponding production of interferon may play an important role in the parasite's pathogenesis."

Fitzgerald also theorizes that these finding will have broader implications for other infectious and autoimmune diseases. It's possible that with other infectious agents dense portions of the nucleic acids adenine and thymine might also alert the innate immune response to the presence of infection. Additionally, some forms of autoimmunity are associated with overproduction of interferon and it's possible that pathways like those defined here in the context of malaria may be involved in exacerbating these diseases. "More work needs to be done to fully understand these issues" she said.

Journal Reference:

**Innate Cells Shown to Form Immunological 'Memory' and Protect Against Viral Infection**

ScienceDaily (Aug. 5, 2011) — Researchers have demonstrated that cells of the innate immune system are capable of "memory," and of mounting rapid protection to an otherwise lethal dose of live vaccinia virus. The study, published in the Open Access journal *PLoS Pathogens* on August 4th, challenges previous thought that only B cells and T cells can store memory to ward off future infection.

The finding, by researchers from Beth Israel Deaconess Medical Center, Harvard Medical School, and Hebrew University and Duke University, has potentially significant consequences for the design of future vaccines, particularly for HIV.

Immunological "memory" is what the immune system builds to respond more effectively to pathogens (such as bacteria and viruses) that the host organism has encountered previously. Traditionally, immunological "memory" has been thought to reside within the cells of the adaptive arm of the immune system (B cells and T cells) that recognize highly specific portions of pathogens through unique receptors.

This study, lead by Dr. Geoffrey Gillard, shows that an innate population of cells, called natural killer (NK) cells form "memory" to vaccinia virus infection despite the fact that they lack the receptors of traditional "memory" cells. Transfer of "memory" NK cells into immunodeficient
mice was enough to protect these mice against a normally lethal exposure to vaccinia virus. Because the NK cell population lacks the receptors that allow B and T cells to develop highly specific "memory" responses to pathogens, the study raises important questions to the manner in which "memory" NK cells are capable of recognizing virus upon a second exposure.

Understanding how innate "memory" functions will be critical for incorporating this property into more effective vaccines, particularly as part of a vaccine against HIV. The properties of NK memory, most notably the ability to respond very rapidly, may be helpful in exerting early control of HIV infection by limiting the ability of the virus to overwhelm the host immune system in the early stages of infection.

**Journal Reference:**

**Accelerated hardening of the arteries in patients with HIV; traditional risks the main cause**
Michael Carter
Published: 08 August 2011
Atherosclerosis is accelerated in HIV-positive patients, according to research published in the online edition of the *Journal of Acquired Immune Deficiency Syndromes.*

Investigators monitored hardening of the carotid and coronary artery over a three-year period. Traditional risk factors for cardiovascular disease were the most important predictors of the acceleration of atherosclerosis.

“Carotid and coronary atherosclerosis is accelerated in HIV-infected persons. This increased rate of atherosclerosis was mainly explained by traditional risk factors,” comment the investigators. They suggest “early diagnosis, treatment and control of atherogenic risk profiles might reduce the heightened risk of vascular disease that often accompanies HIV.”

There is now a substantial body of research showing that HIV-positive people have an increased risk of cardiovascular diseases such as heart attack and stroke.

Controversy surrounds the exact causes, but it seems likely they include traditional risk factors, as well as the inflammatory effects of HIV and the side-effects of some antiretroviral drugs.

Monitoring the development of atherosclerosis in the carotid artery (carotid intima-media thickness, or c-IMT) and the coronary artery (coronary artery calcium, or CAC) can help predict a patient’s risk of cardiovascular disease.

Investigators from the CARE sub-study of the Nutrition for Healthy Living study therefore used ultrasounds and CT scans to determine three-year changes in the carotid and coronary arteries of 255 HIV-positive individuals.

The patients had an average age of 45 years at baseline. Just over a quarter were women, approximately 50% were white, and 44% were smokers.

Baseline analysis was conducted between 2002 and 2003. Two measurements of c-IMT were taken (the common and internal). Tests were repeated between 2005 and 2007.

In healthy adults in early middle age, an average common c-IMT is 0.4 mm at birth and 0.7 mm at age 80, and approximately 13% have c-IMT greater than the 75th percentile. Three-quarters of healthy young middle-aged people have a CAC score of zero.

There was significant evidence of more aggressive hardening of the arteries in the study population. At baseline, approximately a quarter of patients had common and internal c-IMT scores above the 75th percentile. After three years, this had increased to 38% for common c-IMT and 30% for internal c-IMT.

The mean common c-IMT progression was 0.016 mm per year; with internal c-IMT increasing by a mean of 0.020 per year.

“The progression of carotid atherosclerosis in our study of 0.016 mm/year appears accelerated. It should be emphasized that these small changes are clinically significant, as a change in IMT thickening of 0.012 mm per year has been shown to result in a 5% change in CV events,” comment the authors.

Yearly progression of c-IMT was significantly higher for men than women (p = 0.03). There was some evidence that progression was faster in patients whose antiretroviral therapy included a protease inhibitor compared to a non-nucleoside reverse transcriptase inhibitor (0.018 vs 0.011), but the difference was not significant.

Progression was not associated with either CD4 cell count or viral load.
However, traditional risk factors were important. At both baseline and follow-up, the Framingham Risk Score (ten-year risk of heart attack) was significantly higher for those with common and internal c-IMT above the 75th percentile. Metabolic syndrome was also significantly more common in patients with baseline evidence of c-IMT
than those without.

Further analysis showed that a number of traditional risk factors were significantly associated with progression of c-IMT. These included age, systolic blood pressure, triglycerides, insulin resistance, fasting glucose above 125 mg/dl, use of glucose lowering medication, and smoking.

The investigators then turned their attention to coronary artery calcification. They note: “In the non-HIV population approximately 7% of those over the age of 45 years and without coronary calcium are estimated to develop coronary calcium per year.”

However, a third of the HIV-positive patients “had annual progression of coronary calcium deposits indicating a more rapid progression of coronary atherosclerosis as well in this population”.

Significantly more patients with an intermediate or high Framingham risk score than a low score had CAC progression (42 vs 26%, p = 0.04). Progression was also more common in the over 50s and in men compared to women (31 vs 21%).

No HIV-related factors were associated with hardening of the coronary artery, but traditional factors such as insulin resistance, and triglycerides were significant.

“Both c-IMT and CAC progression rates in HIV-infected patients appear higher than expected in this age group; however traditional CV risk factors remain the strongest determinants of carotid and coronary atherosclerotic disease progression in this population,” comment the investigators.

They note, “aggressive CV risk reduction with lipid-lowering and hypertensive medications appears to be effective at slowing the progression of atherosclerosis in HIV-infected patients.”

Reference

**HIV-positive teen arrested, charged**

17-year-old girl faces two counts of aggravated assault

By Julianna Cummins, Edmonton Journal August 8, 2011

Edmonton police have filed criminal charges against a 17-year-old girl accused of having unprotected sex without disclosing her HIV-positive diagnosis.

The teen was arrested in Edson on Saturday, one day after the Edmonton Police Service issued a public safety warning that named her.

People who fail to notify sexual partners of their HIV-positive status can be charged with aggravated sexual assault under the Criminal Code.

The girl has been charged with two counts of aggravated sexual assault. She is set to appear in court on Tuesday. Additional charges are pending.

Because of the girl’s age, police obtained a court order to release her name, picture, and other personal information. The court order was applicable only until the girl was taken into police custody, a police spokesman said in a release. The girl can no longer be identified under the Youth Criminal Justice Act.

Shortly after the warning was made public on Friday afternoon, police received a number of calls from people who spotted the girl hitchhiking out of Edmonton.

Later, she was seen getting into a truck in Edson.

With the help of RCMP, she was arrested in Edson on Saturday.

City police issued the warning after two young men came forward alleging that the girl had been engaging in unprotected sexual intercourse without telling her partners of her HIV-positive status.

The complainants are around her age, and told police they had sex with the girl in the past month. A third complainant came forward after the warning was issued.

Police say the girl has no fixed address. She is known to police.

In their warning to the public, police had asked that anyone who had engaged in sexual activity with the girl to call police and seek medical attention as soon as possible.

“This is a safety concern for the community, and we want to ensure that the teen and anyone she has had sexual contact with get the appropriate medical care that they need,” Det. Barb Glover of the EPS sexual assault section said.
HIV Edmonton, a non-profit organization that provides support for people with HIV, encourages all HIV-positive people to disclose their condition to any partners, said Shelley Williams, the group's interim executive director.

Williams said identifying HIV-positive people in the media can add to the stigma associated with the infection: "It doesn't exactly make you want to disclose it."

She stressed the importance of safe-sex education regarding HIV, and the need to fund such programs. Williams also said HIV-positive people need to have sufficient support programs in place to feel safe when they do disclose their diagnosis.

**Judge Blocks Kansas Law Defunding Planned Parenthood**

*Associated Press*, (08.02.2011) Roxanna Hegeman

A federal judge on Aug. 1 granted a temporary injunction against a Kansas statute that would have cut federal Title X funding to Planned Parenthood of Kansas and Mid-Missouri. The new law would have precluded PPKM from receiving federal family planning funds through the state.

Title X funds are used to provide low-income individuals with reproductive health care, including contraception, cancer screenings and STD testing. No funds are used for abortions.

PPKM claimed the Kansas law violates the federal Supremacy Clause by imposing restrictions on a federally funded program, and that it targets the group for its advocacy of abortion rights. The Supremacy Clause prohibits state conditions over federal program eligibility that are not required by federal law.

PPKM cited several state lawmakers who boasted that defunding the agency would be an anti-abortion victory. The law intended to punish PPKM for its political advocacy, infringing its First and Fourteenth amendment rights of association, the agency contended.

The state argued that an injunction was not needed, since other entities could provide the same services PPKM delivers. A federal injunction also would violate the sovereign rights of Kansas to exercise discretion in the matter, the state said.

“The purpose of the statute was to single out, punish and exclude [PPKM],” US District Judge J. Thomas Marten said, noting the agency is likely to prevail on the merits of its case.

The state plans to appeal the ruling, which orders Kansas to continue providing PPKM Title X funding. The court did not engage “in the fact-finding one would expect before reaching such a conclusion,” said a statement by Kansas Attorney General Derek Schmidt.

**Community also Has a Role in Preventing TB**

*Inter Press Service*, (08.02.2011) Soumaila T. Diarra

Behavior change plays an important role in TB prevention in Mali, according to health experts.

Dr. Farane Sissoko, a lung disease specialist at the Pape Clinic in Bamako, said behaviors like public spitting can contribute to the spread of the airborne infection. "Tuberculosis continues to be an important cause of mortality in Mali," said Sissoko, citing 2009-10 estimates by the World Health Organization showing a country prevalence rate of 142 cases per 1,000 residents.

In the teeming Lafiabougou market in Bamako, shoppers traverse muddy soil mixed with spittle. "If you don't pay attention, you risk being caught full in the face by someone's spit, because around here, people are used to spitting anywhere, even in public places," said vegetable vendor Ramate Guindo.

Many Malians believe TB is a terrifying and incurable illness, and stigma continues to surround the infection. But an awareness campaign to change public perceptions has made an impact. "I had heard on the radio or on the television that when a cough lasts more than 15 days, one has to go for a tuberculosis test, so I didn’t hesitate. I think I owe a lot to the awareness messages," said patient Salif Traoré, who underwent six months of TB treatment. He added, however, “Even after I had recovered, I noticed that people were still afraid to shake my hand.”

The educational campaign was jeopardized by the suspension of funds from the Global Fund to Fight AIDS, TB and Malaria due to misappropriation. Fourteen people, including the country’s former health minister, were charged with fraud related to the Global Fund grant. However, new financing for 2011 and 2012 was agreed upon in June, and the popular effort will resume.

**Experimental Pharmacoenhancer Cobicistat Matches Ritonavir as Booster**

The novel boosting agent cobicistat (formerly GS 9350)—which does not have anti-HIV activity itself—performed as well as the sole available pharmacoenhancer, ritonavir (Norvir), when combined with
atazanavir (Reyataz) plus tenofovir/emtricitabine (the drugs in Truvada), researchers reported in the August 1, 2011, advance online edition of AIDS.

Richard Elion from the Whitman Walker Clinic and fellow investigators with the Gilead Study 216-0105 team assessed the safety and efficacy of cobicistat versus ritonavir as pharmacoenhancers for atazanavir in people starting HIV treatment for the first time.

Like ritonavir, cobicistat works by interfering with the CYP450 system that metabolizes drugs in the liver. These agents inhibit enzyme activity and slow processing of other drugs that use the same pathway—for example, protease inhibitors—thereby keeping concentrations of the other drug higher for a longer period.

In this partially placebo-controlled multicenter study, 85 treatment-naive participants were randomly assigned (2:1) to receive either cobicistat or ritonavir as part of a combination antiretroviral regimen with atazanavir and tenofovir/emtricitabine; 6 never received treatment, so the intent-to-treat analysis included 79 people.

Most participants (about 90%) were men, the mean age was about 35 years, and about half were white. The mean CD4 count was right around the treatment initiation threshold of 350 cells/mm$^3$.

Safety and efficacy were assessed at weeks 24 and 48. Week 24 results were previously reported at the 17th Conference on Retroviruses and Opportunistic Infections (CROI 2010); the AIDS report extends those findings to week 48.

**Results**

- At 24 weeks, 84% of patients receiving cobicistat and 86% receiving ritonavir achieved undetectable viral load (<50 copies/mL), demonstrating non-inferiority.
- The 2 boosters continued to show similar efficacy at 48 weeks, with viral suppression rates of 82% and 86%, respectively.
- Average CD4 cell gains were also similar: 203 vs 199 cells/mm$^3$ at 24 weeks, and 208 vs 177 cells/mm$^3$ at 48 weeks, respectively.
- Overall, treatment-related adverse events were less common in the cobicistat arm compared with the ritonavir arm, 36% vs 48%, respectively.
- Frequency of treatment discontinuation due to adverse events, however, was comparable through 48 weeks, 4% with cobicistat and 3% with ritonavir.
- Almost all patients (96% on cobicistat and 100% on ritonavir) developed hyperbilirubinemia, or elevated bilirubin, a known side effect of atazanavir.
- Similar proportions, 14% and 17%, respectively, had bilirubin high enough to cause jaundice or ocular icterus (yellowing of the skin or eyes).
- The mean estimated glomerular filtration rate (eGFR; Cockcroft-Gault) decreased in both treatment groups, with changes apparent by week 2 but stabilizing thereafter:
  - Week 2: -8% with cobicistat vs -3% with ritonavir;
  - Week 24: -13% vs -11%, respectively;
  - Week 48: -12% vs -11%; respectively.

Based on these findings, the study authors concluded, "Using cobicistat and ritonavir as pharmacoenhancers for atazanavir and administered with emtricitabine/[tenofovir] achieved comparable rates of virologic suppression and CD4 count increase with satisfactory safety profiles."

The kidney safety signal reflected in the larger 2-week decrease in eGFR in the cobicistat arm was no longer significantly different by week 24, and remained stable through week 48.

The results of this Phase 2 study helped guide the design of an ongoing 96-week Phase 3 randomized trial to further evaluate the safety and efficacy of atazanavir/cobicistat vs atazanavir/ritonavir, again both with tenofovir/emtricitabine. Cobicistat is also being tested in Gilead's 4-drug single-tablet regimen known as the "Quad" (elvitegravir/cobicistat/tenofovir/emtricitabine). 8/5/11

**Reference**


**IAS 2011: HIV NNRTI Rilpivirine Effective and Well-Tolerated at 2 Years**

Published on Tuesday, 02 August 2011 00:00
Written by Liz Highleyman
The recently approved next-generation non-nucleoside reverse transcriptase inhibitor (NNRTI) rilpivirine (Edurant) continued to show efficacy comparable to efavirenz (Sustiva) at 96 weeks, but with fewer...
Jean-Michel Molina from Saint Louis Hospital in Paris and colleagues reported 48-week findings from the ECHO study in the **July 16, 2011, issue of The Lancet**. Cal Cohen from the Community Research Initiative of New England and colleagues presented 48-week data from THRIVE in the same issue.

ECHO and THRIVE were similar multinational Phase 3 randomized, controlled trials with a combined total of 1368 treatment-naive HIV patients. Both studies compared 25 mg once-daily rilpivirine vs 600 mg once-daily efavirenz, but used different NRTI backbones. All ECHO participants received tenofovir plus emtricitabine (the drugs in Truvada). THRIVE participants could use either tenofovir/emtricitabine or zidovudine/lamivudine (Combivir) or abacavir/lamivudine (Epzicom).

**ECHO 48-Week Results**

- In a 48-week intention-to-treat (ITT) time to loss of virological response (TLOVR) analysis of 690 participants in ECHO, 83% of patients in both the rilpivirine arm and the efavirenz arm achieved viral load < 50 copies/mL.
- The difference of 0.4% easily fell within the 12% non-inferiority margin.
- Virological failure—either failure to achieve undetectable viral load or viral rebound—was more common in the rilpivirine arm, 11% vs 4% in an ITT-TLOVR analysis.
- Conversely, grade 2-4 (moderate to severe) adverse events occurred significantly less often in the rilpivirine arm (16% vs 31%), and there were fewer discontinuations due to adverse events (2% vs 8%).
- Central nervous system side effects including dizziness and abnormal dreams or nightmares were more common with efavirenz, as was skin rash.
- People in the rilpivirine arm had significantly smaller increases in blood lipids (LDL "bad" cholesterol and triglycerides).

Based on these findings, the study authors concluded, rilpivirine showed non-inferior efficacy compared with efavirenz, with a higher virological failure rate, but a more favorable safety and tolerability profile."

**THRIVE 48-Week Results**

- In a 48-week ITT-TLOVR analysis of 680 participants in THRIVE, 86% in the rilpivirine arm and 82% in the efavirenz arm achieved viral load < 50 copies/mL.
- The difference of 3.5% was again within the 12% non-inferiority margin.
- 7% of rilpivirine recipients experienced virological failure compared with 5% of efavirenz recipients.
- Again, grade 2-4 treatment-related adverse events were significantly less common in the rilpivirine arm (16% vs 31%), as were treatment discontinuations for this reason (4% vs 7%).
- Here, too, rash and dizziness occurred significantly less often and lipid increases were significantly lower with rilpivirine than with efavirenz.

"Despite a slightly increased incidence of virological failures," the researchers concluded, "a favorable safety profile and non-inferior efficacy compared with efavirenz means that rilpivirine could be a new treatment option for treatment-naive patients infected with HIV-1."

**Combined 96-Week Results**

- In a combined ITT-TLOVR analysis at week 96, both rilpivirine and efavirenz had a virological response rate of 78%.
- Additional virological failures after week 48 were uncommon in both arms, 3% and 2%, respectively.
- Proportions of failing patients who developed NNRTI resistance mutations were also similar, 57% vs 54%, respectively; NRTI resistance mutations however, were more common with rilpivirine (56% vs 31%).
- CD4 cell gains were similar in both arms, 228 vs 219 cells/mm³, respectively.
- No new safety issues were identified between weeks 48 and 96.
- Grade 2-4 treatment-related adverse events remained less frequent in the rilpivirine arm, 17% vs 33%, respectively.
- Rates of treatment discontinuation due to adverse events were 4% and 9% respectively.
Central nervous system symptoms and rash remained more common and lipid increases remained larger in the efavirenz arm.

"Rilpivirine gave sustained antiviral efficacy that was similar to efavirenz over 96 weeks," the researchers concluded. "While the [virological failure] rate was higher with rilpivirine than efavirenz, similar small increases in [virological failure] for both groups beyond Week 48 were observed." 8/2/11

References

Maternal Mortality Rate Quadruples in South Africa, According To Human Rights Watch Report
"South Africa's maternal mortality rate has quadrupled while most African countries have cut that crucial health indicator – from 150 to 625 deaths for each 100,000 live births between 1998 and 2007," according to the Associated Press, citing a new Human Rights Watch (HRW) report that used data from the South African government. The report "describes the suffering of scores of women in South African government hospitals and clinics," the article states (Faul, 8/8).

"A lack of oversight and accountability for recurrent problems in the health system and abuses committed by health personnel contributes to South Africa's substandard maternity care and undermines one of its top health goals: to reduce its high maternal death rate," according to an HRW press release (8/8). "The surge in South Africa's maternal death rate was probably due to an increase in cases being reported and actual deaths, especially among HIV-positive women, HRW said," TrustLaw notes (Migiro, 8/8).

Leprosy Spreading in India, WHO Official Warns
"Six years after leprosy was declared officially eliminated in India, officials and doctors are warning that the disfiguring disease is spreading in poverty-stricken pockets of the country," Agence France-Presse reports. According to Nata Menabde, head of the WHO in India, the number of new cases of leprosy exceeds the agency's target of less than 10 new cases per 100,000 in about 209 out of 640 districts in the country, the news agency notes.

"India is the biggest contributor to the global burden with 120,000 new cases per year" and almost one-third of India's districts need "urgent attention to address the spread of new infections," Menabde told AFP. "Ten percent of the new cases occurring in India involve children," according to Menabde, which she said "shows that the transmission rate is very high," AFP notes (Kannampilly, 8/6).

Seattle Times Examines Gates Foundation's Efforts To Enhance Vitamins In Crops For Africans
The Seattle Times on Sunday examined efforts by the Bill & Melinda Gates Foundation "to boost the levels of vitamins and minerals in crops many Africans rely on for the bulk of their diets."

"The approach epitomizes Gates' belief in the power of science to combat hunger, and mirrors many of the giant philanthropy's other investments in improved seeds and fertilizers. But some agricultural experts are skeptical that tweaking nutrient levels and other tech-heavy approaches will make much of a dent in malnutrition, because they ignore the complex social, political and economic roots of the problem," the newspaper writes (Doughton, 8/7).

USC scientist develops virus that targets HIV
Using a virus to kill a virus
In what represents an important step toward curing HIV, a USC scientist has created a virus that hunts down HIV-infected cells.
Dr. Pin Wang’s lentiviral vector latches onto HIV-infected cells, flagging them with what is called "suicide gene therapy" — allowing drugs to later target and destroy them.

"If you deplete all of the HIV-infected cells, you can at least partially solve the problem," said Wang, chemical engineering professor with the USC Viterbi School of Engineering.

The process is analogous to the military practice of "buddy lasing" — that is, having a soldier on the ground illuminate a target with a laser to guide a precision bombing strike from an aircraft.

Like a precision bombing raid, the lentiviral vector approach to targeting HIV has the advantage of avoiding collateral damage, keeping cells that are not infected by HIV out of harm’s way. Such accuracy has not been achieved by using drugs alone, Wang said.

So far, the lentiviral vector has only been tested in culture dishes and has resulted in the destruction of about 35 percent of existing HIV cells. While that may not sound like a large percentage, if this treatment were to be used in humans, it would likely be repeated several times to maximize effectiveness.

Among the next steps will be to test the procedure in mice. While this is an important breakthrough, it is not yet a cure, Wang said.

"This is an early stage of research, but certainly it is one of the options in that direction," he said.

'Good' prion-like proteins boost immune response, UT Southwestern scientists report

DALLAS – Aug. 8, 2011 – A person’s ability to battle viruses at the cellular level remarkably resembles the way deadly infectious agents called prions misfold and cluster native proteins to cause disease, UT Southwestern Medical Center researchers report.

This study marks the first discovery of so-called "good" prion–like proteins in human cells and the first to find such proteins involved in innate immunity: the way the body recognizes and responds to threats from viruses or other external agents, said Dr. Zhijian "James" Chen, professor of molecular biology and senior author of the study in the Aug. 5 print edition of the journal Cell.

"An understanding of how cells maintain good prion-like proteins called MAVS [mitochondrial antiviral signaling] protein may help us understand how some prions turn bad," said Dr. Chen, a Howard Hughes Medical Institute investigator at UT Southwestern. Moreover, the research may also deepen our knowledge of innate immunity and host defense, he said.

Prions are misfolded, self-perpetuating proteins responsible for fatal brain infections such as bovine spongiform encephalopathy – so-called mad cow disease – in cattle and the extremely rare variant Creutzfeldt-Jakob Disease (vCJD) in some people who eat beef from infected cattle. Currently all prion-related diseases are untreatable and are fatal.

The MAVS prion-like proteins usually are scattered on the membranes of the energy-producing organelles called the mitochondria that reside inside cells throughout the body, he explained.

UT Southwestern researchers, investigating the cellular response to invasion by a member of the family of viruses that includes influenza and hepatitis, discovered that the MAVS proteins change shape and recruit other MAVS proteins to misfold and aggregate [cluster] in tough clumps on the surface of the mitochondrial membranes to defend against viral assault, Dr. Chen said.

The researchers created a setup that mimicked the human immune response, but in a controlled laboratory environment where they were able to break open cells and study the cellular components. When those components were mixed with viral RNA (the genetic material also known as ribonucleic acid), the MAVS proteins still formed large clusters.

"Remarkably, the MAVS proteins behave like prions and effectively convert nearby proteins into aggregates on the mitochondrial membrane," Dr. Chen said. He noted that the aggregates are necessary for the cells to churn out immunity-boosting interferon molecules. When the MAVS activity is blocked, the antiviral defense stops.

The MAVS' prion-like mechanism gives no indication of the out-of-control replication seen in disease-causing prions, Dr. Chen said, providing an intriguing area for future research.
Small Molecules Hit It Big: New Therapeutic Approaches Against Viruses, Bacteria, and Cancer

ScienceDaily (Aug. 5, 2011) — Scientists from Freie Universität Berlin and the NeuroCure Cluster of Excellence led by biochemist Volker Haucke in collaboration with colleagues from Australia and the Leibniz Institute for Molecular Pharmacology (FMP) in Berlin have developed small molecules that inhibit the internalization of important signaling molecules but also of pathogenic organisms such as the immunodeficiency virus (HIV) and bacteria into cells.

These compounds inhibit the function of the cellular scaffold protein clathrin and could thereby serve as a starting point for novel therapeutic approaches for the treatment of cancer, viral or bacterial infections, or neurological disorders.

These results were published in the latest issue of the journal Cell.

The uptake of important signaling molecules such as growth factors but also communication within the nervous system depends on the intracellular scaffold protein clathrin. Clathrin is involved in the production of small only about 100 nm sized vesicles (a nanometer equals as little as 1/billion meter). These vesicles shuttle signaling molecules into the cell interior or serve as storage sites for the triggered release of transmitter in the nervous system. The scientists used small molecule compound libraries comprising about 20,000 different substances paired with medicinal chemistry-based synthesis to identify small molecules that specifically inhibit binding of clathrin to its partner proteins. These compounds termed pitstops are able to prevent within minutes the uptake of signaling molecules, which stimulate cell growth and division, or the entry of human immunodeficiency virus (HIV) into cells. Using shiny fluorescent proteins the scientists could identify impaired dynamics of clathrin and its partners as the underlying reason for the internalization block.

"Vesicle formation appears stalled as if you had put your cells into the freezer," explains Professor Haucke. Similar effects have been observed in lamprey and in cultured nerve cells from mice or rats treated with pitstops resulting in a block in vesicle reformation and neurotransmission. As many neurological disorders, such as epilepsy are caused by overexcitability of nerve cells dampening of neurotransmission by pitstops and like substances could open new avenues for the therapy of these diseases.

"Clathrin-mediated uptake into cells is of such fundamental importance that with the development of these inhibitors we might be able to devise new concepts for the treatment of so far incurable cancers such as brain tumors—tumors whose growth depends on the internalization of signaling molecules, which promote cell division," explains NeuroCure scientist Volker Haucke.

Journal Reference:

Key Molecule That Keeps Immune Cell Development On Track Described

ScienceDaily (Aug. 8, 2011) — In the latest issue of Nature, researchers at the Perelman School of Medicine at the University of Pennsylvania clarify the role of two proteins key to T-cell development. They found that one well-known protein called Notch passes off much of its role during T-cell maturation to another protein called TCF-1. T cells are required for many aspects of immunity, and understanding how these proteins influence the production of infection-fighting cells could improve treatments for immune-suppressed patients.

The research group, led by senior author Avinash Bhandoola, MBBS, PhD, associate professor of Pathology and Laboratory Medicine, found an important role in early T-cell development for T-cell factor 1 (TCF-1), which is turned on by Notch signals.

"Notch triggers the process of T-cell development, and turns on expression of TCF-1, but Notch itself doesn't stick around; it's more of a kiss-and-run molecule," says Bhandoola. In contrast, once induced by Notch, TCF-1 is faithfully expressed throughout T-cell maturation.

T cells are made in the thymus, a small organ situated under the breastbone near the heart. However, T cells, like all blood-cell types, originate from blood-producing stem cells in the bone marrow. Immature T-cell progenitors leave the bone marrow, settle within the thymus, and eventually give rise to T cells.

Notch regulates cell-fate decisions in many cell types in addition to immune cells. Past work at Penn helped demonstrate that Notch is active in early T-cell progenitors in the thymus of mice, and drives the differentiation of these progenitors down the T cell pathway.

Co-first authors, Anthony Wei-Shin Chi, MD, PhD, and Brittany Nicole Weber, BS, were graduate students together in the Bhandoola lab. They used retroviruses to express TCF-1 in immature blood
progenitor cells. "If you expose progenitor cells to Notch signals in culture, we know that they will express TCF-1 and take on other features of T cells," says Chi.

However, when they forced expression of TCF-1 in cells using retroviruses, Weber noticed expression of T-cell proteins on the surface of cells—even when Notch signals were absent. The team further characterized these new T-lineage cells by looking at gene expression on microarrays and found they expressed many T-cell specific genes. They concluded that Notch normally turns on TCF-1 early in development, and that TCF-1 then does the job of turning on T-cell genes and keeps T-cell maturation on the right track.

"The data are telling us that Notch delegates much of its work during T-cell development to TCF-1," says Bhandoola, "But we now have many questions about what comes next."

Adds Weber, "Some of the new questions are: How is TCF-1 regulated after Notch steps off stage? What keeps it on? What is TCF-1 doing? And how is it doing it?"

In many clinical settings, early T-cell progenitors are likely to be deficient, especially in patients undergoing bone marrow or blood-cell-producing stem cell transplantation—situations in which new T cells fail to be produced for long periods of time. In some patients, especially elderly ones, there is never true recovery of T cells, and this non-recovery can be associated with infection.

"To improve the outcome of transplant patients, the process of T-cell development needs to be better understood," says Chi. This may also be important in cancer patients who get profound immunosuppression from treatments and in AIDS patients when T cells are not made at a rate sufficient to replenish the T-cell pool.

"It's possible that one day we will use molecules like TCF-1 to improve T-cell development for people," says Weber.

**Journal Reference:**

### Variations in mitochondrial DNA affect CD4 gains in black patients taking successful HIV therapy

Michael Carter
Published: 09 August 2011

Variations in mitochondrial DNA are associated with poorer CD4 cell gains after the initiation of antiretroviral therapy in non-Hispanic black patients, US investigators report in the online edition of the *Journal of Acquired Immune Deficiency Syndromes*.

Black people who had a certain cluster of variations in mitochondrial DNA were less likely to experience an increase in their CD4 cell count above 100 cells/mm³ after a year of HIV therapy than patients with a differing genetic profile.

All the patients had a viral load below 400 copies. There was no evidence of a similar influence of these variations, or haplogroups, of mitochondrial DNA (mtDNA) on CD4 cell changes in white or Hispanic patients. However, the investigators note that in other research involving Caucasian patients not taking HIV therapy certain haplogroups have been associated with increased progression to AIDS and faster falls in CD4 cell count.

They comment that their study “provides insight into the contribution of mitochondrial genomics to CD4 cell recovery in individuals of non-European descent.”

Measurement of CD4 cell count is the key prognostic test for patients with HIV. Generally patients who are not taking antiretroviral therapy experience a gradual decline in their CD4 cell count, meaning that they become vulnerable to potentially life-threatening infections and malignancies.

The initiation of HIV therapy and suppression of viral load is usually accompanied by increases in CD4 cell count, often to normal levels.

However, some patients do not have an increase in their CD4 cell count after starting therapy with anti-HIV drugs, even if this treatment suppresses viral load.

Human genetic variation has been shown to play a role in CD4 cell count recovery. For example, single nucleotide polymorphisms were associated with a decreased chance of having a recovery of CD4 cell count above 200 cells/mm³ a year after starting HIV therapy.

Single nucleotide polymorphisms in mitochondrial DNA can be clustered into haplogroups, and investigators from the AIDS Clinical Trials Group (ACTG) 384 study wanted to see if these were associated with gains in CD4 cell count when taking suppressive HIV therapy.
Patients’ mitochondrial DNA was characterised at baseline and the impact of their genetics on CD4 cell gains after 48 and 96 weeks of therapy was assessed. The primary outcome was the impact of mitochondrial DNA on the chances of a CD4 cell count increase of at least 100 cells/mm³ a year after starting HIV therapy. Results were adjusted to take account of other factors that can influence CD4 cell gain.

A total of 423 patients starting antiretroviral therapy for the first time were included in the analysis. Their median age was 36 years and 83% were men. The study population was racially diverse – 50% were white, 30% black and 20% Hispanic.

Median baseline CD4 cell count was 278 cells/mm³ and median viral load was approximately 100,000 copies/ml.

Overall the patients had a good immunological response to HIV treatment. The median 48-week increase in CD4 cell count from baseline was 176 cells/mm³ and the median 96-week increase was 253 cells/mm³. CD4 cell count changes did not differ significantly according to race.

However, the investigators found that a number of polymorphisms in mitochondrial DNA were associated with significantly poorer CD4 cell gains in both black and white patients.

In black patients, these polymorphisms could be clustered into three major haplogroups – L1 (25%), L2 (32%), and L3 (29%).

Analysis of the L2 haplogroup showed that it was associated with a decreased change of a CD4 cell gain of at least 100 cells/mm³ at week 48 (OR = 0.17; 95% CI, 0.06-0.53; p = 0.002).

Moreover, black patients with the L2 haplogroup had significantly lower CD4 cell increases at weeks 48 and 96 than individuals with other haplogroups (96 vs. 181 cells/mm³, p = 0.01; 177 vs. 317 cells/mm³, p = 0.05).

The difference in CD4 gains at week 48 remained significant (p = 0.001) after adjustment for potentially confounding factors such as baseline CD4 cell count, viral load, and the ratio of naïve and memory CD4 cells.

Five major haplogroup were identified for white patients and three for Hispanic patients. However, no significant association was identified between haplotype and CD4 cell increase for either racial group.

“Race-stratified analysis of mtDNA variants suggests possible associations between the African L2 haplogroup and reduced magnitude of CD4 cell recovery during ART [antiretroviral therapy] in non-Hispanic black participants,” comment the authors, “the association was seen in analyses of a discrete outcome of 100 cell/mm³ increase at 48 weeks, and with CD4 count increase as a continuous variable.”

They note that their research was limited by the small sample size and therefore conclude “further study in larger populations is necessary to more definitively determine the role of mtDNA variation in CD4 T cell dynamics.”

Reference

Why the Proposed Massachusetts HIV Testing Bill is Bad for Patients
Paul Sax • August 3rd, 2011
As I’ve written about here multiple times, I’m not a big fan of the HIV testing law in our state.

First, there’s the requirement for written informed consent, something that every state (except a couple) has wisely abandoned. Second, it’s more than a testing law — it’s also an HIV privacy law, which is arguably unnecessary in this post HIPAA era and has all sorts of unintended consequences.

Last year, two bills were proposed — one simply removed the requirement for written consent, while the other replaced it with a requirement for verbal consent. The groups backing these respective bills (I was part of the former) didn’t work out a compromise, and so no bill was passed.

This year? Something very strange has happened. We have a bill pending “An Act to Increase routine screening for HIV” that would remove written consent but would also expand HIV-related privacy protections and mandate that primary care and ID providers “offer” HIV tests to their patients. The bill is working its way through government channels, on its way to being passed.

And you know what? I’m not aware of a single ID or HIV clinician who supports it.

This includes providers at hospitals, community-based clinics, group practices, and the largest medical practice in the state for gay and lesbian people. That’s right — most of the people dedicating their careers to HIV care don’t like it.

Here’s why this bill is a problem:
1. **It requires documentation that verbal consent for HIV testing was obtained.** I’ve been told that in NY, where a similar law exists, many institutions haven’t removed the requirement for written consent because of this provision — patients still have to sign a form. In short, practice hasn’t changed even though the law has.

2. **The definition of protected “HIV-related information” has been broadly expanded, with a requirement for written patient consent before this information is shared.** As currently written, the proposed law would block clinician-to-clinician referrals if they are not in the same facility, or a simple release of information from a hospital to a community PCP — discharge summaries, test results, diagnoses, medications. All would require written consent from the patient first. (Note that this goes well beyond the existing requirement for written consent to release medical records — this we already do for everyone, not just those with HIV.) Needless to say, no other disease has this restriction, and to say this is an obstacle for good patient care is a huge understatement. How would this even be applied to electronic medical records, which are increasingly being used in the community?

3. **There is language mandating that primary care and ID clinicians must offer an HIV test to a patient unless it is documented that the test has been done before.** Is there another screening test (colonoscopy, mammography, TB skin testing, hepatitis C) where a law exists that clinicians must offer the test? Does this increase a clinician’s legal risks around HIV testing? And how do we access whether the test has been done if it’s protected information, as noted in #2? Recommendations for HIV testing should fall under the province of clinical guidelines (such as those issued by CDC), not under law.

4. **There is no way to test critically ill patients who are unable to give consent unless they have a health care proxy to consent for them.** Anecdote: I saw a 35-year-old woman with a large brain abscess late last year who was comatose. An HIV test would have been invaluable to help distinguish bacterial brain abscess from possible toxoplasmosis — conditions which obviously require different therapies — but she couldn’t give consent and, as is very common in younger patients, she had no health care proxy. Wouldn’t it make more sense to allow HIV testing in instances like this, where the treating clinician could provide better care if he/she knew the patient’s HIV status? This is obviously how testing for other conditions in critically ill patients is done. Notably, the argument to allow testing for HIV in this setting was brilliantly made by a bioethicist writing way back in 2005.

5. **There is no way to allow testing of source patients in occupational exposures unless the source gives consent.** In some states, antibody testing on previously-obtained blood samples is permitted. I’ve expressed this view before, but in occupational exposures, the benefits of knowing a source patient’s HIV status extend to both the source patient and the exposed health-care worker. Shouldn’t we do everything we can to make obtaining this information as easy as possible? I know the proposers of the bill have the best interests of people living with HIV in mind, but the problems listed above suggest that clinicians were not part of the development process. Since the bill has been on the table, several HIV clinicians and researchers (including me) met with the sponsor to discuss our concerns, but to no avail. For the record, the bill is also opposed by the Massachusetts Medical Society, who articulated these concerns at a public hearing earlier this year.

So let’s change the law, yes. But let’s get it right please:

1. Remove the requirement for written consent.
2. Allow existing privacy protection statutes (which did not exist in 1986, when the current HIV testing law was enacted) to apply to HIV.

If you live in Massachusetts and care about this, find your Senator and Representative, and let them know that this bill is bad for patients — and has the unintended effect of being discriminatory, leading to inferior care for people living with HIV.

You can bet I’ll do the same.

**Manhunt is no way to deal with HIV-positive minor**

*Edmonton teen needed help, not a virtual posse hunting her down*

By Paula Simons, edmontonjournal.com August 9, 2011

EDMONTON — Last Friday afternoon, the Edmonton Police Service issued an urgent news bulletin. Officers were on the lookout for suspect accused of at least two cases of aggravated sexual assault.

Police released the suspect’s name and photograph to every media outlet, and posted it on the EPS website, imploring the public to call in with tips.
It was a 21st century, high-tech version of an Old West “Wanted” poster — with the whole community deputized, through the blanket media coverage, as members of the posse.

It worked. The fugitive was spotted by tipsters hitchhiking west out of town and later apprehended by RCMP in Edson.

So should we all breathe a sigh of relief? After all, an accused serial sexual assailant is now in custody. But this case isn’t quite so simple.

The accused in this case is a slim 17-year-old girl, a minor, a child of the streets, who, according to police, lives without a fixed address in Old Strathcona.

She isn’t accused of forcing anyone to have sex against his will.

Instead, three unnamed men, whose identities are protected by the rape shield law, have complained to police that this girl had consensual sex with them without first disclosing the fact that she was allegedly HIV positive.

Normally, under the terms of the Youth Criminal Justice Act, police aren’t allowed to release the name or photograph of an accused under the age of 18.

In this instance, the police sought and were granted an order to identify this girl for the purpose of finding her and taking her into custody. The order allowed them to spread her photograph and her medical condition far and wide.

The teenager was arrested Saturday. But even after she was safely in custody, police continued to send out that damning private information to the press, despite the fact that the court order was only granted for the purposes of taking the minor into custody. Many media outlets, including this one, followed the police department’s lead, temporarily naming the girl and broadcasting her picture.

The Edmonton police department only removed the girl’s name and picture from its website Monday morning.

Too little, too late. In this Internet age, she will never have her privacy back. Her name and face are out there for anyone with Google to find.

The police won’t say how or why they believe the girl is HIV positive, nor will they release the court order they sought, granting permission to name her.

How did this teen come to be living on the streets? How did she come to be infected with HIV — if, indeed, she is? Where are her parents, her guardians? Is she a ward of the province? If not, should she have been? Is she a drug addict? Was she trading on sex to survive? Does she have a mental health condition, or any other kind of cognitive impairment, such as fetal alcohol syndrome, which would diminish her capacity to make prudent, responsible sexual choices?

We don’t know the answers to any of those key questions.

If, as police allege, this teen does have a dangerous communicable disease, the Crown had a very legitimate reason to want to find her, and to find her previous sexual partners. But the Alberta government already has plenty of powers under the Public Health Act and the Child, Youth, and Family Enhancement Act to apprehend her, trace back her sexual contacts, and get them all appropriate care and counselling.

Treating her like a dangerous criminal on the lam, rather than a sick, desperate and vulnerable minor, may not have been the most useful or appropriate strategy to dealing with a public health problem. Criminalize the disease, and you only add to the stigma and shame that keep people from disclosing their HIV status in the first place.

“If your goal is to protect the public, you don’t jump right to putting up wanted posters,” says Richard Elliott, executive director of the Canadian HIV/AIDS Legal Network in Toronto.

“This isn’t a bank robber, running around with a gun. But when it comes to HIV, there’s an immediate panic that sets in. People think there are these HIV predators out there on the loose.”

Under Canadian criminal law, a person who is HIV positive has a duty to disclose his or her status before engaging in conduct that poses a “significant risk” of transmitting the virus. Any failure to disclose is treated as a form of fraud, which renders the other person’s consent to have sex invalid — and which turns otherwise consensual sex into an assault in the eyes of the law.

Elliott says Canadian courts have prosecuted approximately 130 people with HIV/AIDS for having sex without informing their partners of their health status, giving us one of the highest rates of such prosecutions in the world. But of those prosecutions, he says, only about a dozen of the accused have been women, and few, if any, have been minors.

Of course, we want everyone who tests positive for HIV, or any other sexually transmitted infection, to inform their partners before sex. No one should ever spread any venereal disease, be it HIV or syphilis or
herpes, maliciously or recklessly. Having sex without telling your partner you're infected is wrong. But that shouldn’t absolve the rest of us of taking responsibility for our own sexual choices.

There’s an old legal adage: “The risk to be perceived defines the duty to be obeyed.” In this day and age, if you decide to have casual unprotected sex, you have to assume a certain degree of risk.

At least three men allegedly chose to have sex — unprotected sex, it would seem — with a 17-year-old homeless girl. Their sexual behaviour was also irresponsible, perhaps even exploitative. Yet they're the victims whose identities are protected, while she is the accused criminal, pilloried in the virtual public square.

Sadly, it’s far easier for the police to launch a successful media manhunt for one sick girl, than it is for our community to deal with the social woes that put her on the street, diseased and desperate, in the first place.

### Proportion Of New HIV Cases Increasing Among Older Population In China

The case of a Chinese man nearly 80 years old who was recently diagnosed with HIV is "shedding light on a segment of the Chinese population said to be overlooked by the country's AIDS education efforts," according to "a recent report from state-run media Xinhua News Agency," the Wall Street Journal's "China Real Time" blog reports.

Xinhua cited data from the Chinese Center for Disease Control and Prevention showing that this year, "14.9 percent of newly diagnosed HIV cases were over the age of 50, up from 7.8 percent a year earlier," according to the blog. While "China has taken steps in recent years to improve HIV prevention ... the rise of HIV in the aging signals a major oversight in the country's AIDS education and awareness programs, which have typically focused on younger generations, homosexuals, sex workers and migrant workers from rural regions, Xinhua said," the blog notes. "Some experts say the rise in the aging population's HIV rates can be attributed to a cheap commercial sex industry that attracts China's older population, China Daily said," according to the blog (Burkitt, 8/8).

### Spermless Mosquitoes Could Reduce Spread of Malaria, Study Suggests

In an effort to curb the spread of malaria, researchers from Britain and Italy have genetically altered male mosquitoes so that they do not produce sperm, according to a study published Monday in the Proceedings of the National Academy of Sciences, the Los Angeles Times' "Booster Shots" blog reports (Khan, 8/8).

"Scientists at Imperial College London said that by genetically tweaking male mosquitoes to produce no sperm, females would still mate with them but would lay unfertilized eggs that would not hatch into mosquito larvae," Agence France-Presse writes (8/8). In the study, the females, who mate only once in their life, did not attempt to mate again even though they produced unfertilized eggs, BBC News notes. "Experts say that this is an important first step toward releasing sterile males into the wild to reduce the size of mosquito populations," the news service writes (Carpenter, 8/8). "The next challenge is finding a way to produce sterile males in sufficient quantity," malaria researcher Elena Levashina of the French Centre for Scientific Research said, according to Nature (Gilbert, 8/8).

### When Zinc Fingers Miss the Mark

Two new techniques identify how often zinc fingers nucleases cleave off-target sites.

**By Tia Ghose | August 7, 2011**

Zinc finger nucleases are designed to be like heat-seeking missiles, precisely targeted to find and cut specific sequences of DNA. Occasionally, however, they may snip the wrong spot, causing unintended breaks. Two papers published today (August 7) in Nature journals describe ways to systematically find such off-target action, which could one day help design gene therapies that avoid collateral damage.

“Until this time there hasn’t been a really comprehensive way of defining zinc finger nuclease specificity,” said Carlos Barbas, a chemical biologist at the Scripps Research Institute in La Jolla, Calif., who was not involved in the study. “As we begin to treat patients with zinc finger nucleases and modify genomes, we need to know where those modifications are being made.”

Zinc fingers, so named because their structure resembles a hand...
with a pointed finger, bind to different three-letter nucleotide sequences. By stringing together several zinc fingers and adding a DNA-cleaving nuclease, researchers can precisely target specific genes to be cut. Such specificity raises the possibility of developing zinc finger nuclease (ZFN) gene therapies. Indeed, Sangamo Biosciences, a pharmaceutical company, is testing an HIV-treatment candidate in human safety trials which uses a ZFN to modify the CCR-5 T-cell receptor that HIV uses to enter a cell.

But it’s not a perfect system: sometimes the molecule may bind and clip a different, nearly identical DNA sequence, potentially killing cells.

To systematically characterize those off-target cleavage sites, Harvard chemical biologist David Liu and his colleagues tested two ZFNs against a library of 100 billion snippets of DNA, some of which appear in the human genome. Most often, the nuclease cleaved the target site. But they occasionally cut other similar sequences as well—including one gene associated with a cancer signaling pathway.

“A superficial interpretation of our paper might lead one to be pessimistic about zinc finger nucleases, but actually I’m optimistic,” Liu said. In addition to confirming that the fraction of off-target breaks decreased with lower concentrations of ZFNs, the researchers found that using ZFNs that bind less avidly to the target sequence seemed to have fewer unintentional breaks, he said. That suggests it may be possible to design ZFN therapies in a way that minimizes those off-target effects. The researchers published their results in Nature Methods.

In the second study, published in Nature Biotechnology, researchers dosed human leukemia cells with a ZFN which cuts the CCR-5 receptor. They identified the cut locations by transfecting the cells with tagged virus particles that bound to the broken ends of the DNA, and found that by and large, the ZFN bound to the target CCR-5 DNA. About 1 in 20,000 times, however, it cleaved a second receptor gene nearly identical in sequence, as well as a few other similar sequences even more rarely. But the researchers used an extremely high concentration of ZFN, and used a cell line that is very permissive of ZFN action, to see what the worst case scenario would be, said coauthor Phillip Gregory, chief scientific officer of Sangamo BioSciences. The low rate of off-target cutting even under these conditions “validates our expectations that the proteins would be tremendously specific,” and suggests that much lower medical doses applied in the clinic would almost never be expected to cause off-target cuts, he said.

The methods might one day be used in early drug development to pick candidates with the best specificity, Barbas said. It’s unclear, however, just how comprehensive the new ZFN tests are, he said. The tagged virus particle method, for example, may miss some off-target cleavage, because the viral tags may not bind to every single break. Furthermore, Barbas added, unlike DNA in a test tube, cellular DNA is tightly wound into chromatin, so many of the binding sites found by the test tube method might be shielded from ZFNs and never be cut in living cells.

So while the new tests may be key tools for early drug development, a complete picture will only come once a person’s entire genome sequence can be had for $1000, he said, when researchers can test people who receive ZFN treatments for every off-target break.


Opinion: Vaccinate at Birth

Improved immunization efforts are required to prevent infections during the first 6 months of life, when newborn and infants are highly susceptible to disease.

By Ofer Levy | August 9, 2011

More than 2 million newborns and infants under the age of 6 months die from infection worldwide each year—that’s more than 200 every hour. In this context, vaccines are second only to clean drinking water as a cost-effective measure to reduce infant morbidity and mortality. The global eradication of smallpox and the hopefully forthcoming eradication of polio demonstrate the potential power of immunization programs. But despite a suite of vaccinations recommended by the World Health Organization (WHO), including those for tuberculosis, diphtheria, tetanus, pertussis, hepatitis B, and measles, neonates and infants continue to fall victim to such infections each year, highlighting early-life susceptibility and an unmet global need for improved immunization.

Immunization of pregnant mothers, with the consequent, passive trans-placental transmission of antibodies to the fetus, is one potential option to protect neonates. However, this promising strategy might be limited by safety and medico-legal concerns that could be triggered by any real or perceived associations between immunization and premature delivery or other adverse pregnancy outcomes.
Another option is to vaccinate newborns at birth. Most infant vaccines are given at 2, 4, and 6 months of age, leaving a 2 to 6 month window of susceptibility in which immune immaturity and incomplete vaccine protection render infants particularly vulnerable to infection. Because birth is the single most reliable point of healthcare contact worldwide, vaccines given at birth, such as bacille Calmette Guérin (BCG) given to prevent tuberculosis early in life, achieve high population penetration and could substantially reduce that window of susceptibility. Unfortunately, there are currently only three vaccines licensed for immunization at birth—those for hepatitis B, tuberculosis, and polio—and only the hepatitis B vaccine (the first dose of a multi-dose immunization series) is given at birth in the United States.

Furthermore, even those vaccines approved for neonate use are based on ad hoc evaluations of vaccinations originally developed for use in older individuals. Optimal development of novel vaccine formulations should take into account a growing body of research characterizing age-dependent development of immunity. White blood cells (leukocytes), in particular antigen-presenting cells, demonstrate impaired immune responses to many stimuli in the first months of life, including reduced production of certain immune signaling proteins (cytokines) required for robust cell-mediated immunity. Adjuvants, molecules that enhance responses to vaccine antigens, can be added to vaccine formulations and represent an important strategy to boost immune responses, but neonatal leukocytes demonstrate distinct responses to different adjuvants when compared to adult leukocytes.

To consider these differences when developing novel vaccines for infants, researchers can use human neonatal and infant primary leukocytes cultured with the relevant human humoral components, including autologous blood plasma that contains distinct components that modulate early-life immunity. Results from such in vitro studies should inform the selection of appropriate preclinical animal models that most closely mimic the neonatal and infant immune responses. Follow up clinical trials should ensure that rigorous biomarker evaluation, including genome-wide transcriptional and proteomic approaches, are used to further refine age-specific markers of safety and efficacy, and should be designed to test earlier ages of initial immunization.

Optimizing neonatal and infant vaccine formulations will also entail evaluation of distinct routes of administration, combination vaccines, live vector vaccines, and the possibility of genetic immunization. Finally, post-approval phase IV clinical evaluations can ultimately verify that immune responses known to be protective in adults or older children are also protective against disease in neonates and young infants. Although there are several challenges in developing vaccines for newborns and infants, proof-of-concept exists that this approach can be safe and effective and represents a promising strategy to reduce infant mortality. The time for change is now. More than 3 newborns and young infants die each minute from infection worldwide, but improved vaccination programs can go a long way to mitigating this terrible loss.

**Ofer Levy**, MD, PhD, is a staff physician in the Division of Infectious Diseases at Children’s Hospital Boston and an Assistant Professor at Harvard Medical School. His laboratory studies immunity in immunocompromised hosts. He can be reached at ofer.levy@childrens.harvard.edu. For more on Levy’s views on infant vaccinations, see his recent perspective in Science Translational Medicine.

**comments**

Jim
Why not vaccinate the fetus while we are at it? It’s so normal to have “random stuff” injected into people. How did we ever live without it. Seriously, it would be safer to feed them their mom’s milk, which contain the necessary antibodies. —oh that’s right, you can’t get a patent on mom’s milk.

Has anybody done a study on how these early vaccinations skew the resulting immune cell population in an individual. Sure they may protected against, say pathogen A. (I use the word "may" because it’s not 100% effective) But does it also make them more susceptible to pathogen B? allergies?

Lilly
Dr. Paul Offit says it’s safe to give 10,000 vaccines at once. Why not give all newborns 10,000 vaccines on the day of birth? Then they’ll be protected from 10,000 diseases. Any adverse reactions will obviously be just a coincidence, anecdotal, reports by parents who don’t understand science.

Teeba Karn
It is about time new clinical trials guidelines were adopted, where investigators can only enroll babies and subjects of those who will benefit from the profit-making experiment or project, test the drugs on their kids first and then recruit other subjects.

So the new question now should be as the AAP said, when they found out the children were over taxed with Thimerosal this 50% mercury by weight.

Yr’s ago the AAP said upon finding out the vaccines contained mercury this. This is accumulative in the body, we must find the best chelating agent and get with it!!!

Then they went to the secret Simpson wood meeting, where they were all informed they were all in a bad position from the standpoint of defending law suits.
Chelating a child from that day forward, was to be viewed as voodoo science only one problem. If this new study is right, it was chelation that halted the pinks pandemic in fact their words from history was this; chelation worked so fast they could not get a study together fast enough, before it chelation had eradicated pinks.

The reason the AAP said that, was they must have read the MSDS of Thimerosal

Thimerosal is accumulative in the body,and it targets the organs of the body in particular the brain and the lining around the brain, so the question should be, if we had listened to the parents in the beginning and chelated the children. Would we still be supporting trillion babies for life??????

Here is a warning from 1948 that should have made them err on the side of caution when allowing Thimerosal as a preservative.

Dr. Engley 1948 we find Thimerosal toxic down to an unbelievable level down to one onemillionth of a gram,and that's about as toxic as you can get as toxic

AMA paid for blue ribbon panel study on Thimerosal from 1948 back when the AMA had integrity "Dr. Frank Engley is a retired chairman and professor of Microbiology at the University of Missouri. He served on various committees and panels and has consulted for the CDC, NASA, the FDA, and EPA. He did some of the first research on the toxicity of thimerosal." His work is in two prestigious journals, isn’t it strange how no one can recall his work or his dire warnings on Thimerosal. It should be noted that this article was published in the January 1948 issue of the Journal of the American Medical Association. It should be noted that this article was published in 1950 in the Annals of the New York Academy of Sciences. Maybe we should be asking the AMA why they don’t come forward on this important subject and save the children. After all it was their money that paid for the study. It seems greed runs ramped in the AMA and they care little or not at all, for little children. The reason they are fighting this so hard is that they ignored two very strong warnings one from 1948 and another from 1982 and now the damage is to wide spread and severe hence this statement from Dr. Engley QUOTE

"If they had followed through on our 82 report the vaccines would have been freed of thimerosal and all this autism they tell me would not have occurred" (That makes you wonder who all knows) This was taken from the actual report It is clear from this research supported by a grant from the Medical Association that Thimerosal is neither efficacious nor safe, and should be removed as a preservative in prescription biologics and pharmaceutical products, as well as from topical over-the-counter products such as Butt-Balm that have Thimerosal present in their formulations as an active ingredient." Just before this courageous researcher died he set the record straight, with this quote from Dr. Engley and probably the most important of all. That truly shows how the CDC, FDA, AAP, IOM, and the NIH, all were asleep at the switch for decades. And even to present, QUOTE "if they had followed through on our 82 report the vaccines would have been freed of Thimerosal and all this autism they tell me would not have occurred" In other words no trillion dollar babies, to support for life.

My son was born in 1990 if they had listened to the report and followed through my son would be playing football in school instead he is being baby sited in school with the mental capacity of a about a two yr old thanks CDC FDA AAP IOM you truly are serving the people well NOT!!!!

Who was this courageous researcher that apparently loved children, here are the credentials of this great man Dr. Frank Engley studied thimerosal as far back as 1942. Dr. Engley is responsible for the 4 year School of Medicine at the University of Missouri. He has consulted for the CDC, IOM, NASA, FDA, EPA, CIA, AAMI, USP, Armed Forces Epidemiological boards, Army, Navy, Air Force as well as Director of research grants and training grants for NIH. Engley Served on the Council of the NIH Institute of Allergy and Infectious Disease and a consultant on many Epidemiological Boards too many to list. Dr. Engley has been a visiting Professor in over 40 foreign countries medical schools. He has produced films, written text books, Laboratory Manuals, over 100 publications, served on editorial boards for numerous scientific journals and periodicals, including four American, two British and one German. Engley is certified by the American Board of Micro Biology and served as the Chair of the Laboratory of American Public Health Association. He has been listed in American Men and Women of Science, Who's Who in America, Who's Who in American Education, Who's Who among Consultants and Who's Who in the World. His toxicity studies of mercurials in human tissue culture revealed the mercurials were extremely toxic for human cells and the Thimerosal — the most active, toxic down to the nanogram. The amounts of mercury have gone down but vaccines still have 100 times that amount when they are in preservative free and reduced thimerosal vaccines. Now who do we listen to ? a man who is nearing the end of his life and has nothing to gain, or Paul Offit vaccine sales man extraordinaire with a vacc. patent that he will not even disclose how much money he has made off the broken bodies of little children.

Dr. Jonas Moses

Well, I confess that—after reading this article— I was intending to write a scathing refutation of Dr. Levy’s assertions. However, a review of the comments previously posted revealed that there are many others who have already done an excellent job of blasting Levy. Well done, folks! Thank you for weighing in so articulately and emphatically against the practice of immunizing newborns.

For those of you who think such vaccinations are a good idea, I recommend that you review the Nuremberg trials...those were designed to publicize the atrocity of wholesale human experimentation and prevent this from ever happening again. Now, you want to experiment on our young? For shame.

Respectfully submitted, Dr. Jonas Moses

Amy G.

Medical doctors are not gods, dude... and I bet you’re one of those idiots who doesn’t believe in chiropractors too?

Jacks

Medical doctors gods? No but I’m willing to bet they know a bit more about Medical issues like vaccines. Oh and I’m just one of those idiots with a degree in science so don’t mind me.

Rhssj

"Improved immunization efforts are required to prevent infections during the first 6 months of life"

The best immunization given at birth is colostrum from the breast, nothing this pharma shill can induce could remotely compare

Angela McNabe
Dr Levy is either stupid, uneducated in his field, lacking wisdom or being paid by you know who...

Anna
I vote for "being paid by you know who..."

Ahaim
Yes, the world population shrinks so drastically because of all these newborn-related diseases that we have to do something about this right now without further delay! Anyway, Dr. Levy, once you vaccinate your own newborns the way you preach, I will vaccinate mine...

Ginger Taylor
Dr. Levy forgot to disclose 2.4 million other reasons that he might be advocating for newborn vaccinations.
http://www.healthtechzone.com/... "June 21, 2010Healthcare Technology and News: The Bill & Melinda Gates Foundation Offers a Funding of $2.4 Million Grant to Children's Hospital Boston Shares

odigg
A $2.4 million grant has been received by Children's Hospital Boston, from the Bill & Melinda Gates Foundation. The research concerning the development of novel vaccines for newborns, spearheaded by Ofer Levy, MD, Ph. D., a principal investigator in the Division of Infectious Diseases at Children’s, is supported by the grant...."

Anna
Dr. Levy, what is wrong with you? Are you determined to have 100% of children with autism and neurological diseases? And yes, I’m the mother of a vaccine injured beautiful girl that is paying the price of me listening to my idiotic pediatrician, that just like you, cared more about getting the money from the pharmaceutical companies than the health of my baby.... What amazes me is how arrogant doctors are becoming and how little they care about the results of their actions... Will you even feel guilty when the number of children with neurological diseases becomes 100% or will you sleep nice and tight in your pharma mac-house?

Amy
Medical interventions in the first days after birth may cause poor feeding. When the neonate does not latch on to to breast often and effectively, it disrupts the establishment of the mother’s milk supply. The infant is at risk of dehydration, weight loss and jaundice. At this point, many new mothers begin to supplement with infant formula, which further disrupts the supply-and-demand regulation of milk production. Fewer interventions during this critical post-natal period and greater support for well-established breastfeeding are needed. A recent study showed that the US alone would save $13 Billion in health care costs if infants received their mother’s milk for at least the first 6 months of life.

Joe
The Emperor ( CDC ) never had any clothes.

1st they say, if you do not like the findings on your child’s NVICP case you have the right to sue the manufacturer. Next the law makers under the disguise of tort reform, create a 250,000 cap all the while knowing it cost that much to bring forth a vaccine suit in state court.

Thus achieving their goal of a parent being able to get an attorney to take these cases.

When they find they have no!!!!! science to defend in a court of law, the Supreme Court rules that the parents cannot sue the Manufacturer. For even those Idiots know, you cannot win with useless, and worse than useless that was done in Denmark House Appropriations Committee asked the NIH to evaluate the CDC ‘s vaccines as a cause for Autism science, the NIH charged the NEIHS to do the task. The head of the NEIHS ‘s panel said in a report to Congress that the science was so riddled full of design flaws that it rendered them to be in effect useless. The CDC's Dir. was asked to defend her studies by Congressional com[m]ittee, she did not! in fact she agreed to the findings. Even to the point, that she the CDC Dir. said any further use of the VSD looking at vaccines as a cause for Autism environmental would be misleading.. She the Dir said, that they would not be using the VSD any more for looking for a environmental cause for Autism....If someone reading this, says that you are just interpreting what she said wrong, The CDC Dir. set it in stone the fact that she was using junk studies all along with the following statement, that makes it Dam clear! that the Emperor [ the CDC ] had no clothes all along. She the Dir. then said; "but if you do give us more time we will do good quality studies" The NEIHS panel head said this, which says it all "that leaves the CDC with very little to say, that Vaccines and Autism are not connected in any way. The NEIHS panels head also said this; As bad as the studies that were done in the VSD were, they were an improvement over the other two [ the two Denmark studies ]. Since this was years before the indictment of the author of the Denmark studies, it appears [ the NEIHS panels head researcher, knows fraud when she sees it ].Also, even knowing this. That the CDC had only junk studies, That’s, according to the NIH’s NIEHS findings. The special masters of the Vaccine compensation program was to rule on the Autism vaccine test cases, the special masters said that the science was so over whelming against the parents, they had no choice to rule how they ruled against the parents. What science special masters Hastings would that be?? the en effect useless or the worse than useless that was done by a Danish researcher that is now being indicted for 13 counts of wire fraud and 9 counts of money laundering. Like I said, you cannot win in a real court..... [with useless and worth than useless as a defense]....So, you get the Supreme court to take away a child’s due process. Now that’s, Democracy at it’s best! Destroy a child’s brain, and then deny them the very remedy that Congress created for the protection of the industry. This is the greatest scandal, in American history. And the most cruel, that shows how low Senators Congressman and Presidents and Media people can go. Oh! I forgot the Pharma co’s The national vaccine compensation program was supposed to be a non confrontational & no fault system. Congressman Dan Burton said at a vaccine compensation hearing this; You are not doing! the spirit of the law, we including myself who created the law meant if you even think a child’s been harmed!!! then you pay them, and you pay them very well.Everything they heard, (speaking of the Vaccine compensation program Dir. that was representing the program) that day went in one ear, and out of the other. It is corrupted to it’s core, the people in charge the special masters, are paid for life only after judging a few cases a year. What a Gig! And the Dir. of the CDC after misleading the public, is now is employed by the very industry that profited from her deceiving the American public. For her deceit she was rewarded with 2 million a year contract with Merck. I recently found out this, Medco the company that we get 440 diapers a month from a tax payers paid program [ is owned by Merck ].( End User License:}
Merck-Medco Managed Care, L.L.C. The perfect crime, destroy neurologically a child to a point they are now 20 yr’s old and still in diapers with their mandated tax payer vaccine program. And make a cool billion doing so, and then sell the government diapers and wet wipes. For the life of the child. Our elected representatives, wonder why we are trillions in debt. Here’s the answer [they are paying it out, to their constituents.]

[ the pharmaceutical co's ] for the damage!!! they done, to our American children..... Ps the big question here that should be on everybody's minds, should be if Congress finds an agency committing something as close to treason as this is Why did they not act to protect the American children????????And by not acting they are responsible for the prolonging of the Autism Pandemic not Epidemic.....costing Trillions for the life long care cost. The head of the IACC Thomas Insel, said this after yr's of denial that the increase in Autism is real. It is appearing the increase cannot be explained away. He then said this, how we prepare a Nation for 1 million Adults that may need significant amounts of services. They are working their way through system like a wave.... He left out the Key word [ TIDAL ] WAVE

Roma

It's so easy for those of us in the US to denigrate the value of infant/childhood vaccination. We don't live with polio, diphtheria, and the potentially life-long effects of Rubella anymore, nor do we see much in the way of infant killers like pertussis. Ask the Somalian refugee mother with a 3 month old dying of pertussis if she would have liked her child to have been vaccinated at birth, and I think you'll get a different answer—one that's not half-baked in complacency and conspiracy theories

Hilary Butler

Actually Roma, if you look at USA pertussis statistics, you will see that whooping cough is now endemic throughout USA with most of the cases in fully, appropriately vaccinated children. Go to CDC and read —do a pubmed search and educate yourself.

A properly nourished mother, breastfeeding a 3 month baby with whooping cough—if taught correct management of the infection, will manage just fine. Many of us have been there, and done that.

The key is "knowledge of skills"—not promote a vaccine which has an unlisted side effect called "Learned Helplessness". The only person here who mentioned "complacency" and "conspiracy" was you. And given the fact that you appear to have no idea what's happening in your own country with regard to whooping cough, what does that say?

Roma

Hillary, I specialize in infectious disease, and I can assure you, I'm not uneducated—there's no reason to be nasty just because someone disagrees with your opinion. Endemicity simply refers to the level of presence of a disease organism in a population—not it's virulence, periodic or otherwise. Pertussis outbreaks occur predominantly in unvaccinated infants and in adolescents and adults in whom immunity has waned. The reservoir is maintained in the latter group, hence the new CDC recommendation for one-time adolescent/adult administration of the DTaP vaccine.

While I agree with you that nursing can offer some protection and is the best source of infant nutrition, (I nursed my children until they self-weaned at 8 and 16 mos.), it is only protective if the mother has sufficient immunity to the specific antigen. If the mother’s immunity to Bordatella pertussis has waned, what do you think will be available to the child? Really, probably the best way to protect young infants until they can achieve sufficient immunity is to make sure that the adults and children around them have either been sufficiently vaccinated or avoid contact if they are ill. BTW, there’s only two ways to gain that immunity past the initial 3–6 months of nursing: get the disease and build the immunity (assuming the child survives, or get vaccinated. Both achieve the same results via the same mechanisms of the immune system. (If you don’t believe me, take a basic immunology course.)

You’re right—this has been an epidemic year, especially in CA, where I live. Epidemic is a somewhat relative term, however. It doesn’t mean that everyone will get a particular disease, only that a greater than average incidence is observed. In 2010, the CDC reports that 9,477 cases were reported (although many more presumably were unreported), but with a population of just over 37 million, that’s a drop in the bucket (2.5 cases/100,000). Compare this to the 1958 incidence of 26.0 cases/100,000, before immunization was as wide spread (although available). Of the 9,477 cases reported in CA in 2010 (approximately 17K US), 60% occurred in babies < 6mos of age, in other words, the unimmunized or underimmunized. Of the 9,477 cases reported (although many more presumably were unreported), but with a population of just over 37 million, that’s a drop in the bucket (2.5 cases/100,000). Compare this to the 1958 incidence of 26.0 cases/100,000, before immunization was as wide spread (although available). Of the 9,477 cases reported in CA in 2010 (approximately 17K US), 60% occurred in babies < 6mos of age, in other words, the unimmunized or underimmunized. The remaining 40% occurred in adolescents over 12 and adults—most likely because immunity had waned, but also possibly because the vaccine failed. That does happen—no vaccine is 100% effective, and as with any host/pathogen interaction, in all likelihood there are some strains of B. pertussis capable of evading the immune system as a mechanism of natural evolution. In those with at least partial immunity, however, the disease may have milder and less recognized symptoms, thus contributing to its spread.

In my opinion—and this is purely my opinion, many parents have become complacent in this country, to some extent indicated by waning immunization rates. Additionally, untoward immunization fears were generated by the unprincipled actions of Wakefield, which may take a generation or more to undo. What a shame, because immunizations have truly reduced the disease burden in the last 50 years. Consider the trade off, using pertussis again as an example: a vaccine series costing as little as $61, vs. the cost of hospitalization for several days, administration of oxygen, and antibiotics (with concomitant side effects), not to mention the incalculable cost of the risk of other morbidity or mortality. Personally, I’ll take the vaccine.

As far as my use of the term "conspiracy" is concerned, perhaps it was a bit extreme, but what better term to use when the accusation is raised that a health care professional's/researcher's sole interest in developing preventative or curative stra...
children at all. The Oral Polio Vaccine has wreaked havoc. It is not only causing 200 to 600 cases of Vaccine Attributed Paralytic Polio every year but has also lead to a sharp rise in cases of Acute Flaccid Paralysis in children the number of which is stated to be 1,25,000 up to 2006. It has also let loose a vaccine virus strain of polio in the country.

But on top of this BMGF is lobbying hard to introduce the Rotavirus, the Pentavalent, and the HPV vaccine into the UIP.

In urban setting the schedule of the Indian Academy of Pedriatricians is being followed that subjects children to 36 vaccine shots. Unlike in the developed countries we are still saddled with thiomersal in vaccines.

Autism in our country has steadily risen from 1 in 500 a few years ago to 1 in 37 today. One in 6 children of our country suffer from developmental disorders, 54% suffer serious chronic disorders, and 1 in 34 children and youth suffer neuro-psychiatric ailments. You must realize that there is no system of vaccine damage compensation in our country and parents simply cannot bear the burden of treating vaccine damaged children.

What is needed in our country is not vaccines but an end to rural poverty, provision for clean drinking water, sanitation, and nutrition. We are amazed that all the people shedding tears about the appalling rates of infant mortality in our country are unable to comprehend this. We would be vastly benefited if instead of saddling our economy with the burden of vaccines that we can ill afford both in terms of cost as well as effects, those claiming to be working for health and welfare of humanity would concentrate on the true causes of the misery that children of our country face.

ChuckUA
Roma,

You may also want to do some fact checking to your own assertions and arguments as well. According to CDC and census data for 1998 there were 32,148 cases of pertussis and a population of 174,881,904. That would be 18.4 cases per 100K, not 26.0. You exaggerated the severity by 41%. The last time the number of cases per 100K of population was double digits was 1959. In the 21st century we are averaging 4 deaths per 100,000,000 population. Which has higher odds, the odds of dying from pertussis or the odds of having an adverse reaction to the vaccine?

Dr Wakefield, not “Wakeland”, in a discussion concerning pertussis is irrelevant. His work is associated with the measles vaccine. Any reason for any drop in pertussis coverage cannot be associated with Wakefield’s work. Find a better scapegoat.

The “disease burden” has only increases in the past 35 years when it comes to pertussis with 80% of all US children under 2 receiving all recommended DTAp vaccinations, and all components of the MMR vaccine have shown only decreases in the number of cases since Wakefield published his study in 2000.

Lon Jones DO
According to my copy of Bacterial Adherence B Pertussis is effectively unattached by substances is breast milk. I agree with the critics.

Debycarr
You don't know what your talking about. I know at least 20 babies who now have autism because of the shots. I know they don't need all the shots that your giving to babies today. a whole lot more than when my kids had them. Your not stopping the disease Your causing more babies to be sickly. I tell all moms not to give there babies the shots there killing the babies and your being paid to say all these lies.

Teeba Karn
Would it not be better to spend all that money on feeding starving mothers and infants, rather than wasting it on harmful toxins? If you really care about the health of newborns, you should implement methods to eradicate world hunger and advocate for breast feeding.

Garbosmed
There’s little doubt vaccine developers are excited by the prospect of shooting up the world’s infants at birth, but in their zeal to ply their trade they fail to consider that the immature infant immune system’s failure to produce sufficient cytokines may actually be a feature rather than a bug. If low or suppressed inflammatory cytokine production is biologically normal and has a protective effect on the brain during critical early neurological development, what long-term neurological and immunological consequences will be seen when this perceived “deficit” is overcome by artificially overstimulating the immature infant immune system with adjuvants and multiple antigens? One must hope that the answer to this question will be required as part of any approval process for new birth vaccines, and will be taken into account when cost/benefit analyses are done.

Joe
Let see the CDC get out of this corner they have painted there selves into. The CDC Danish studies the CDC had done revealed that a little mercury was actually good for a childs IQ. We now know why, the researcher the CDC hired to do the studies on Thimerosal was Poul Thorsen from Denmark. The CDC gave him 11 million Dollars and told him pfft! were only interested in what will exonerate. the CDC and Vaccines. Well as the story goes, the researcher the CDC hand picked to do all those fraudulent studies that proved putting mercury into our young babies is 100% safe and does not cause Autism. Is now indicted on 13 counts of wire fraud an 9 counts of money laundering here in the US. He bought him self a house, next to the CDC and a new harley motorcycle two cars and wired himself almost 1 million dollars of CDC Autism research dollars. Why Oh! Why wouldn’t this knowledge be breaking news ????? Answer the media is being controlled by the CDC and Pharma to suppress this Bomb shell. This new research from Australia destroys the credibility of the corrupted CDC ATLANTA, Aug. 9, 2011 /PRNewswire-USNewswire/ -- Researchers from Australia have identified an ancestry of Pink Disease (Infantile Acrodynia) as a risk factor for Autism Spectrum Disorders. Pink disease was common in the first half of the 20th century ...

The new study, published July 28th in the Journal of Toxicology and Environmental Health available at http://www.tandfonline.com/d,... investigated the hypothesis that autism can result from the interaction between mercury exposure and a genetic predisposition to sensitivity to mercury. Currently, 43 peer-reviewed studies support a link between mercury and autism, and experts agree that autism is caused by the interaction of genetic susceptibility and environmental exposures. The Australian researchers, David Austin, Ph.D. and Kerrie Shandley investigated whether individuals with a known hypersensitivity to mercury were more likely to have descendants with an autism spectrum disorder. They surveyed 522 adult survivors of Pink Disease
about the health of their grandchildren. They found that 1 in 25 of these grandchildren had an autism spectrum disorder compared to 1 in 160 children of the same ages in the general population in Australia, a staggering six-fold increase in relative risk. Dr. Austin had the following comment, "The large elevation in autism prevalence in this group of children was startling especially given that rates of other childhood disorders were at expected levels. The thing that differentiates these children from the general population, to which they were compared, is a family history of mercury sensitivity. We were simply blown away by the results."

**Hilary Butler Collapse**

Dr. Levy, in your Science article abstract you say: "Immune responses of human newborns and infants are distinct and cannot be predicted from those of human adults or animal models. Therefore, understanding and modeling age-specific human immune responses will be vital to the rational design and development of safe and effective vaccines for newborns and infants."

You are right. While you like to think you know something about antibodies, what is the state of your understanding of the neonatal immune system? The information already available, might suggest that anyone who is considering vaccinating PREGNANT women and new born babies need their heads examined: See [http://www.beyondconformity.org/](http://www.beyondconformity.org/)

I seriously wonder how you educated doctors cannot see this. Furthermore, vaccines aren't the second most important medical intervention. If you're lucky they come a miserable tenth. I can think of a list of things which are far more important.

**Odds of Detecting HIV Varies by Method, New Study Finds**

ScienceDaily (Aug. 10, 2011) — The odds of effectively detecting HIV in African-American men vary by method, researchers have found. The study, which appears in the *Annals of Behavioral Medicine*, suggests that HIV-prevention efforts must be multi-faceted, taking into account differences in within this demographic.

The study was done by researchers at New York University's Steinhardt School of Culture, Education, and Human Development, the U.S. Centers for Disease Control and Prevention, and Harlem United Community AIDS Center.

The research sought to address findings from a 2008 Centers for Disease Control (CDC) report. The survey showed that men who have sex with men (MSM) accounted for more than 50 percent of new HIV cases and African Americans comprised 74 percent of new infections. Overall, among African Americans, approximately half of new infections were among MSM; in New York City, African American MSM accounted for 38 percent of the new HIV diagnoses.

Responding to the 2008 CDC report, which underscored the need for increased testing of African American MSM, the researchers sought to comprehend which methods are best at identifying positive cases of HIV among this heterogeneous demographic.

To do so, they examined three different avenues for testing among African American MSM in New York City and looked at which methods showed the highest rates of positive HIV tests. By linking a method for getting tested with positive HIV results, the researchers could then better understand which methods were most likely to identify new HIV cases.

The three approaches for HIV testing included the following:

- Partner services, which involves identifying, locating, and interviewing HIV-infected persons to provide names and contact information of their sex and needle-sharing partners, notifying partners of their exposure to HIV, and providing HIV counseling, testing, and referral services to those partners;
- Alternative venue testing, in which rapid HIV testing is conducted in bars, churches, or mobile units;
- The social networks strategy, where HIV testers engage either HIV-positive individuals or those at high risk of seroconversion to become "recruiters." Through active enlistment and coaching processes, staff build relationships and help recruiters engage people in their social circles into HIV testing.

For the study, the researchers collected data on HIV testing from local sources matching each of these three methods. For "Partner services," the New York City Department of Health and Mental Hygiene provided Harlem United with HIV testing data for African American MSM engaged in partner services during the studied period (April 2008-August 2009). For "Alternative venue testing," the researchers used the results from a mobile health van placed in locations throughout New York City known to have significant African American MSM populations. For "Social Networks," the researchers recruited men through Harlem United who identified other men, through a first name or nickname only, in their social and/or sexual network(s) to engage for HIV testing.
The detection rates of HIV-positive cases varied by method. Alternative venue testing showed a rate of 6.3 percent, much lower than the rates for the social networks strategy (19.3 percent) and partner services (14.3 percent). The odds for detection of HIV-positive MSM were 3.6 times greater for the social networks strategy and 2.5 times greater for partner services than alternative venue testing.

The researchers also noted differences within the studied group. For instance, men tested through alternative venue testing were younger and more likely to identify themselves as “gay” than men tested through the social networks strategy. Meanwhile, men who tested through the social networks strategy reported more sexual risk behaviors than men tested through alternative venue testing.

"HIV prevention efforts must not view African American MSM as a monolith but rather as a diverse group of individuals, where differences in developmental stage and sexual identity are crucial factors in understanding both the risk behaviors of these men and also the environments and venues in which they may socialize,” said NYU Steinhardt Professor Perry Halkitis, one of the study’s co-authors and director of NYU’s Center for Health, Identity, Behavior & Prevention Studies (CHIBPS).

**Journal Reference:**

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**UK’s HIV dentists to practise again?**

10th Aug 2011

If you take a week’s holiday away from the surgery, on the first day back to work you may well decide to arrive at the surgery a little earlier than usual in anticipation of a few things that you need to catch up with.

A little preparation before the first patient arrives can help prevent you from running late, while your adrenal levels struggle to adjust from the relaxed holiday setting into something a little more energised.

**The lapse of time**

If you take a month off work, not only do you have a lot more to catch up with, but there may also be some aspects of previously planned treatment that you may feel less confident about tackling, deciding instead to reschedule them for another day; all the more so if you find an unfamiliar dental nurse has been allocated to assist you on your first day back.

'Dental students who are currently required to take an HIV test before starting their training can progress through their course without the fear that they might suddenly be forced to discard the time and money invested in tuition because of a momentary indiscretion'

Taking a career break to raise a family or to pursue other interests can leave the clinician even more insecure. Periods of a year or more which are spent away from clinical activity can result in significant de-skilling for any clinician and, consequently, a loss of confidence.

In the past, the Department of Health funded the Keep in Touch Scheme (KITS) in an effort to attract back-to-work female dentists who had left the profession to raise a family. The deaneries now operate a ‘get back to work’ scheme that allows individual dentists to undertake training to support their own personal skills development.

**Back to work**

This is exactly the same situation that could soon be facing dentists and hygienists who stopped practising when they discovered they were HIV positive. 2012 may be the first time in almost 20 years that this group of individuals will not be subject to the precautionary guidance that took them away from their chosen careers – or at least the exposure-prone elements of dentistry which is almost everything apart from making full dentures and the examination of the edentulous mouth.

Why were these precautions required?

Most undergraduates entering dental schools this year were not yet born when, in 1990, the world witnessed the public demise of an American dental patient named Kimberly Bergalis. She was one of six dental patients believed to have been infected with HIV by a dentist (Dr David Acer) in Florida, who was known to have AIDS.

The facts surrounding this one and only presumptive transmission of HIV from a dentist to a patient have been the subject of an extended debate that has failed to establish the route of transmission in the six patients. Nor could any criminal intent be excluded on the part of the dentist.

Regulatory bodies in most countries responded to the extensive emotional coverage in the media in very different ways – some banned HIV-infected oral healthcare professionals (OHCP+) from working
outright, others promulgated updated infection control guidelines. In the UK the government and its advisors opted for the ultimate precaution.

They decided to prohibit healthcare workers with HIV from undertaking procedures which were exposure-prone. Dentistry was placed in the same category as orthopaedic surgery because, during treatment, the tips of the fingers were not always in full view of the clinician to whom they were attached.

**20 years' later**

Apart from the case of Dr Acer, no other transmissions of HIV in the dental setting have been demonstrated.

The data available from patient notification exercises supports the conclusion that the overall risk of transmission of HIV from infected healthcare workers to patients is extremely low. Between 1988 and 2003 in the UK, there were 28 patient notification exercises. However, there was no detectable transmission of HIV from an infected healthcare worker to a patient, despite more than 7,000 patients having been tested.

**Two major developments**

Since the Acer case back in 1990, there have been two developments that would suggest that the precautionary response that had been adopted in the UK should now be reviewed:

- The advances in the medical management of HIV disease
- Significant improvements in infection control standards.

Combination antiretroviral therapy (HAART) introduced in 1995 successfully diminishes viral replication and can lead to undetectable levels of HIV in plasma. Indeed, studies have shown that HAART is sufficiently effective to protect (at least 96% of the time) an uninfected partner when having unprotected sex with a person who has been taking anti-retroviral medication to treat their underlying HIV status. As you will have probably realised, unprotected sex is a fairly efficient way of transmitting HIV (as is sharing needles) while dentistry is not effective.

Just recently, infection control standards in UK dental surgeries have been upgraded again with the universal adoption of HTM 01-05. In addition, the introduction of bodies like CQC – and its equivalent in Wales, Scotland and Northern Ireland – will provide a regular audit of those newly elevated infection control standards, thereby assuring the track record that has already been proven to successfully prevent transmission of blood-borne pathogens (in both directions, from patient to dentist and dentist to patient).

**What next?**

Any OHCP+ who withdrew from practice and is now interested in returning to work would be well advised to contact their defence organisation regarding registration with the GDC (if that has lapsed) and for support while organising a programme of skills development in conjunction with their local deanery.

In this way, the necessary CPD requirements can also be achieved. Dental students who are currently required to take an HIV test before starting their training can progress through their course without the fear that they might suddenly be forced to discard the time and money invested in tuition because of a momentary indiscretion.

Dentists can at last join the rest of mankind in seeing a diagnosis of HIV as a signal to concentrate on their health and the available treatment, rather than being confronted with the immediate end to their career, combined with an immediate loss of income that can only compound the stress produced by that same diagnosis.

So all together now, ‘Why are we waiting…?’

The following extract from Hansard during May 2011 confirms that the current regulations are set to change.

Lord Colwyn: ‘To ask Her Majesty's Government whether they have received the report of the Tripartite Working Group established to review the current guidance on HIV-infected healthcare workers; whether they propose to publish it; and what steps they propose to take in relation to the guidance.’ [HL9369]

The parliamentary under-secretary of state, Department of Health (Earl Howe): ‘Professor Dame Sally Davies, the government's chief medical officer, received the Tripartite Working Group’s report on the management of HIV-infected healthcare workers on 20 April 2011. Officials are currently considering the report and will be providing advice to Ministers in due course.’

Even though the answer from Earl Howe is lacking in detail, it is likely we will see an announcement from the Department of Health on this subject in the near future, prior to a public consultation on the proposed changes in the management of the treatment provided by HIV-infected oral healthcare professionals (OHCP+).
Portland, Oregon (CNN) – As he puts a straw in his fruit smoothie, Michael Lee Howard accidentally knocks over the cup, spilling the seaweed-colored liquid. "Well, it happens," he says. As he collects the smoothie overflow in the plastic lid, he exposes the tattoos on his wrists: a biohazard symbol on the right and a radiation symbol on the left.

Howard might not have come across as such a calm person in late 2005, when he found out he was HIV-positive. After his diagnosis, he felt "dirty" in his own skin, and feared infecting others if he so much as cut his hand. Getting the wrist tattoos helped him in his journey toward self-acceptance.

"It's a branding of who I am, and it's a branding of being comfortable with that, being comfortable with who I am," said Howard, 37, who lives in Portland, Oregon.

Howard is one of many people living with HIV who have chosen to get tattoos to represent living with the disease. They say these tattoos help start conversations, reduce stigma and serve as reminders of how living with HIV has changed their lives.

Tattoos like Howard's biohazard symbol are especially common in men who have sex with men, the subpopulation that bears the highest burden of new HIV infections in the United States. Men who have sex with men accounted for 61%, or 29,300, new HIV infections in 2009, federal health officials said last week. And although the number of new HIV cases has remained stable in the general population, new infections rose among young, black gay and bisexual men from 2006 to 2009.

It was also among men having sex with men that U.S. doctors first realized, in 1981, that there was a never-before-seen disease that could destroy the immune system. That disease came to be known as human immunodeficiency virus.

"In the gay male community, we think about it (HIV) a lot more because it attacked our community first. It's wiped out a number of us," said William Conley of Pollock Pines, California. His tattoo, a biohazard symbol with the Celtic motif of a crown of thorns circling around it, means he's winning the fight against this disease.

"You're not a victim. You're a champion, you are a survivor, and that's the biggest part of the tattoo," Conley said.

Identification and awareness
The origins of HIV-related tattoos are murky, but the biohazard symbol is recognized in connection with HIV among many gay men, said David Dempsey, clinical director at the Alexian Brothers Bonaventure House in Chicago and The Harbor in Waukegan, Illinois, both transitional living facilities for HIV-positive individuals recovering from alcohol and substance dependence.

"It's to let other men know that they're HIV-positive so that they don't have to come out and say it," he said. In situations of anonymous sex, it can signal status to potential partners and, in that sense, may help with prevention, because unprotected sex with an HIV-infected individual can spread the disease, he said.

For those with HIV, seeing someone else with a biohazard symbol is a sign this is another person living with the disease who might provide support, Conley said, like a "secret identification code."

There are less cryptic HIV tattoos, too. Dempsey has a red AIDS ribbon tattoo on his chest, which he chose even before he became HIV-positive. The organization Visual AIDS created the ribbon symbol in
1991). Dempsey has been a social worker in the HIV community for 11 years, and wanted to show solidarity with people living with the disease, as well as raise awareness.

In 1986, when AIDS was just starting to be recognized as a deadly illness transmitted through sex and intravenous drug use, conservative author William F. Buckley Jr. suggested HIV-positive people get tattoos to protect others. He wrote in The New York Times that "Everyone detected with AIDS should be tattooed in the upper forearm, to protect common-needle users, and on the buttocks, to prevent the victimization of other homosexuals."

Some HIV-positive individuals may have gotten tattoos in resistance to Buckley's article, said Richard Sawdon Smith, professor of photography and AIDS cultures at London South Bank University in the United Kingdom, who has been HIV-positive since 1994. This is not an oft-cited reason among people with tattoos today, although many of the people who got HIV in the '80s and may have gotten tattoos then have since died.

Another theory is that certain ACT UP activists sported biohazard tattoos in their massive demonstrations in the late '80s and early '90s, but founder Larry Kramer said he hasn't heard of these tattoos or of the organization's participation in the practice. Tattooing HIV-related symbols has been going on at least since Nick Colella started at Chicago Tattooing and Piercing Company in 1994.

Colella used to tattoo more memorial motifs honoring people who had died of AIDS when he was starting out—less so now, since modern antiretroviral medications effectively let patients live long lives with HIV as a chronic illness. Colella, like other tattoo artists, sterilizes his equipment and throws used needles away in biohazard-labeled containers so diseases transmitted through blood, including HIV, do not spread from person to person.

Showing the world his HIV-positive status through tattoos was like a second coming out for Michael Lee Howard.

Biohazard symbols and ribbons are just some of the representations of HIV-positive status that Colella has tattooed, he said. He sees this business pick up annually during Chicago Pride Fest. "People symbolize happiness, sadness, sexuality, everything with tattoos. It's all the good, all the bad, all the everything," he said.

Some people get HIV-related tattoos immediately after getting a positive test result. Conley waited three days after his diagnosis in 2009 to get his tattoo.

Conley, a sociologist by training, knows of 45 to 60 others in online forums who have tattoos involving a biohazard symbol or a scorpion, another sign of having HIV in the gay community. The stinging tail of the scorpion alludes to the virus, he said.

"Basically saying, 'I'm positive and you need to know that, especially if we're going to engage in any intimate relation'—it has that meaning," he said.

**Coming to terms with diagnosis**

Howard found out about the biohazard sign as a symbol for the HIV-positive gay community through the Internet. The radiation design, though, was his own idea. He chose it because in comic books, when superheroes get radiated, life "starts from scratch," he said.

That's what Howard felt like he needed: A rebirth. Getting HIV had been a total shock. He had briefly dated a man who said he didn't have sexually transmitted diseases, but later Howard found out the man was HIV-positive and had given him the virus. Before then, Howard didn't know anyone who was HIV-positive.

His diagnosis was a wake-up call to better his life. Deep down, he said, he wasn't a happy person and wasn't being his true self on his blog, which felt like "a Hello Kitty commercial"—too perky for what he actually felt. He went into three years of intense therapy in an effort to find his "authentic self."

"I just got tired of being what everybody else wanted me to be," he said. "I think that's part of where the tattoos came in: I didn't get tattoos or as many piercings, because that's not what you do. You do what everyone tells you to do."

"After my diagnosis I'm like, 'Well hey, I have nothing left to lose.'"

Showing the world his status through the tattoos was like a second coming out for Howard. And the responses from others about the tattoos have been overwhelmingly positive. Since his tattoos are so prominent, Howard gets asked about them all the time. They give Howard opportunities for dialogue about living with HIV, with everyone from fellow light-rail commuters to his boss.
Talking about it
Opening up those kinds of conversations is why Chad Hendry, 32, got a bold tattoo from Colella in July. On his neck is a red AIDS ribbon with the words "On this day my new life began" and the date of his diagnosis: 12-30-09.

He's not sure whether he got HIV through sex or drugs; he knew his behavior was risky, but he never thought he'd get the disease. After about a year, though, his health declined, and a test showed he had HIV. Rehab helped him curb his crystal meth addiction, and his grandparents helped him get back on his feet. He lives in an HIV recovery home near Chicago.

A red HIV T-shirt campaign gave him the idea that he wanted a tattoo related to his status. People would see the shirt and ask questions about living with the virus; with a tattoo, Hendry could have that level of engagement all the time.

"It's the same reason I'm very vocal about it: because I believe that will make the path just a little bit easier for somebody else," he said.

But the tattoo hasn't entirely brought him comfort. Hendry fears he might not find a partner who is comfortable with the statement of the tattoo. His family members weren't entirely welcoming of it—they wondered why it had to be so prominent on his neck. People on trains seem to stare at it, too.

Still, Hendry loves his tattoo. He's not ashamed of having HIV; in fact, he feels it's one of the best things that has happened to him, because he's off drugs and has a better outlook on life.

"Today I live every day with gratitude. You become grateful for what you have in being alive," he said.

The ribbon motif also appealed to Howard of Portland. To commemorate his five-year "posiversary" in November, he got a red ribbon tattoo on his shoulder with his diagnosis date.

"I think that I'm the most comfortable and happy in my own skin that I've ever been in my entire life," Howard said.

Pakistan battles against hidden HIV-Aids menace
Asim Ashraf is now an HIV-Aids coordinator at a family planning association

For a long time perceptions of Pakistan as a conservative Muslim country encouraged a belief that HIV-Aids incidence would be non-existent or very low. With the number of HIV cases rising the government finally included it in its 2009 national health policy, but as the BBC's Nosheen Abbas reports, its full extent is still not widely acknowledged.

A report on HIV by the UN last year said that 2003 was a key date in the battle against the disease in Pakistan.

At that time there was an outbreak of the epidemic when it was discovered that 10% of people among a random sample tested in the city of Larkana city in the province of Sindh were infected.

The findings moved Pakistan up from "low prevalence—high risk" category to a "concentrated epidemic".

The epidemic is concentrated in pockets of high risk groups—including injecting drug users (IDUs), and male, female and hijra (transvestite) sex workers.

'Attitude of apartheid'
A large number of HIV and Aids cases are also detected among migrants returning from Gulf states.

Drug addicts are a group especially at risk from HIV

The UN report says that while the prevalence of HIV is low—only 0.1% among the general population—the growing commercial sex industry's overlap with high risk groups is likely to cause the epidemic to spread to the general population.

But experts say the epidemic is not being properly tackled.

Asim Ashraf found out that he was infected with HIV when he was 18.

The mandatory medical test for Haj pilgrimage applicants showed his medical status, but he recalls the doctor being hesitant to break the news.

"I didn't know anything about it, all the ads used to state that Aids was not curable and it's a death sentence—I thought I would die in a couple of days or hours," he says.

After a couple of tests Asim was lucky finally to find a doctor who explained HIV to him and helped him focus on living life as normally as possible.

But when Asim returned to his day job he was ostracised by his fellow workers, who would not sit and eat with him in what he describes as an "attitude of apartheid".

He says his isolation worsened his health.
'Strong stigma'
After studying the illness he is now the HIV-Aids co-ordinator at Rehnuma Family Planning Association. He is married and has a baby daughter—neither she nor his wife is infected with the virus. Awareness campaigns regarding the epidemic are almost non-existent in Pakistan.

Patients are made to sit outside on the lawn far away from the office itself—the reason is the fear of suicide attacks

Palvasha HIV counselor

Jamshed is HIV-positive and a UNAIDS employee. He argues that "people avoid going to HIV and Aids clinics because there is such a strong stigma around the epidemic".

"They don't get themselves registered, least of all get themselves tested for HIV because many argue that we are an Islamic country and we do not have this problem," he says.

The belief that HIV and Aids is an epidemic caused by "immoral activities" remains a popular misconception among the general public.

The efforts of those fighting against the illness have been hampered by the deteriorating security situation in many parts of the country and by this cultural mindset.

'Walking on eggshells'
Non-governmental organisations (NGOs) working to fight HIV and Aids in the region have received threats and have either changed the location of their offices or only function by telephone.

Palvasha, a 30-year-old Pashtun woman who is HIV-positive, counsels others with the illness in the country's tribal areas where militants have a strong presence.

"Patients are made to sit outside on the lawn far away from the office itself—the reason is the fear of suicide attacks," Palvasha says.

She describes the difficulties of providing counselling to HIV-positive people in the region as "akin to walking on eggshells".

"You need to imply a lot and not talk about things in a direct manner—using one wrong word could send you out of people's houses.

"We are afraid to hold awareness campaigns because we get accused of spreading wrong and sinful things—so we have to be very tactful."

The UN says that the country's anti-Aids programme is short of cash and bedevilled by bureaucracy—especially when it comes to the release of funds that have been committed.

But female Pakistani parliamentarian Donya Aziz argues that the government has been forward-thinking about the crisis, handling it in a pragmatic way.

"Despite being an Islamic republic, many programmes have been designed for high risk groups," she says.

"The penal code states sodomy as a crime for example, yet we have programmes geared towards male partners... But we do need to spend the money in a cost-effective way."

Study Shows Vaccine Against Effects of Heroin Works, at Least in Rats


An experimental vaccine successfully blocked heroin's pain-killing effects and addiction behavior in rats, researchers reported in a new study. The vaccine did not block the effects of other opiates, suggesting it narrowly targeted heroin and related compounds.

In the body, heroin quickly metabolizes into two additional addictive compounds, 6-acetylmorphine (6AM) and morphine, and an effective vaccine would need to target all three.

The vaccine works by stimulating immune system antigens against these addictive compounds. The product is based on a carrier protein attached to a heroin molecule on the side opposite that metabolized, study leader Kim D. Janda, a chemist at Scripps Research Institute in La Jolla, Calif., and colleagues reported. A salt-like substance is used to slow down metabolism of the vaccine. The antibodies bind the heroin compounds in the bloodstream, preventing them from entering the brain.

"Our vaccine goes through a dynamic process where it slowly changes in form from heroin to 6AM to morphine," Janda said. "The immune system recognizes each of those molecules," he said, forming "three columns of troops."

Vaccinated rats did not experience the pain-relieving effects of heroin when their paws were exposed to a hot surface or sharp object. They also did not learn to press a lever to dose themselves with heroin through a permanent IV line. However, they did get relief from pain with another opiate, oxycodone, suggesting the vaccine is specific to heroin, 6AM, and morphine.
Such a vaccine could support drug rehabilitation, but it would require a booster several times a year. A determined drug user could probably overpower it by taking higher doses.

“Most cocaine and heroin addicts aren’t CEOs, and insurance companies don’t cover them,” said Janda, who has spent 25 years in the field. “But there’s clearly a need for this. The billions of dollars spent on wasted lives, theft, destruction, AIDS—it’s hard to measure.”


HIV-2 Remains Rare in the U.S., Says CDC Report

Published on Tuesday, 09 August 2011 00:00
Written by Liz Highleyman

Fewer than 200 cases meeting the CDC’s definition of HIV-2 infection were reported between 1988 and 2010, accounting for only 0.01% of all HIV cases, according to a study described in the July 29, 2011, issue of Morbidity and Mortality Weekly Report. About half these cases were in New York City, mostly among people from West Africa.

There are 2 types of human immunodeficiency virus, HIV-1 and HIV-2. Though transmitted by similar routes, HIV-2 causes less aggressive disease with slower deterioration of immune function. HIV-2 is also much less common, mostly occurring in West Africa.

Over the course of the epidemic, the U.S. Centers for Disease Control and Prevention (CDC) HIV surveillance case definition has applied to both types. In 2009, the CDC convened a working group to develop a working case definition to distinguish between HIV-1 and HIV-2.

To meet the definition of HIV-2, cases had to satisfy at least 1 of the following criteria:

- HIV-1/HIV-2 type-differentiating antibody test (e.g., Bio-Rad Multispot HIV1/HIV-2 Rapid Test) positive for HIV-2 but negative for HIV-1;
- Positive HIV-2 nucleic acid test (DNA or RNA);
- Positive HIV-2 immunoblot and negative or indeterminate HIV-1 immunoblot test.

Results

- Between 1988 and June 2010, a total of 242 suspected cases of HIV-2 were reported to the CDC.
- 166 of these met the new working definition of HIV-2.
- 47 reported cases were excluded due to insufficient identifying information and 29 did not meet the working definition criteria.
- These 166 HIV-2 cases represent just 0.01% of the more than 1.4 million U.S. HIV infections diagnosed during 1987-2009.
- HIV-2 cases were concentrated in the Northeast (66%), including 46% in New York City.
- Most HIV-2 infections (81%) occurred among people born in West Africa.
- 89% of people with HIV-2 were black, 58% were men, and the median age at diagnosis was 39 years.
- Infection risk factors were heterosexual contact (23%), male-to-male sex (2%), injection drug use (2%), and unidentified (72%).
- The number of HIV-2 cases increased significantly between 1987 and 2009, but this could have been due to changes in surveillance; there were no significant trends during 1990-1999 or 2000-2009.
- Almost all people with HIV-2 also tested positive for HIV-1 on Western blot antibody tests typically used to confirm positive HIV screening tests (e.g., ELISA).

"Immunoblot antibody tests currently used to confirm HIV reactive screening tests do not contain reagents specific to HIV-2 and thus are not reliable for identification of HIV-2 infections," the report authors wrote. More specialized tests such as the Bio-Rad Multispot HIV-1/HIV-2 rapid test can distinguish between them, however.

"Additional specific testing for HIV-2 should be considered if test results for HIV-1 are inconsistent with one another, inconclusive, or imply the absence of HIV infection despite clinical evidence suggesting its presence, particularly if the patient was born in or had other associations with areas such as West Africa, where HIV-2 infection is prevalent," they recommended. "Suspected HIV-2 cases should be reported to state or local health departments, which can conduct supplemental diagnostic tests for HIV-2 or arrange for them to be done at the CDC laboratory."

Reference

Fluconazole (Diflucan) for Fungal Infections Can Cause Birth Defects, FDA Warns

Published on Friday, 05 August 2011 00:00
Written by FDA

Fluconazole (brand name Diflucan and generic versions) may increase the risk of birth defects when taken by pregnant women at higher doses and for prolonged periods to manage yeast infections (candidiasis) or other fungal infections. People with suppressed immune function—including those with HIV/AIDS—may experience recurrent or persistent yeast infections and are sometimes treated with long-term fluconazole.

Below is an edited excerpt from a U.S. Food and Drug Administration (FDA) safety announcement regarding prolonged fluconazole during pregnancy. The complete announcement, including references, is available on the FDA website.

FDA Drug Safety Communication: Use of Long-Term, High-Dose Diflucan (Fluconazole) during Pregnancy May Be Associated with Birth Defects in Infants

Safety Announcement

August 3, 2011—The U.S. Food and Drug Administration (FDA) is informing the public that chronic, high doses (400-800 mg/day) of the antifungal drug Diflucan (fluconazole) may be associated with a rare and distinct set of birth defects in infants whose mothers were treated with the drug during the first trimester of pregnancy. This risk does not appear to be associated with a single, low dose of fluconazole 150 mg to treat vaginal yeast infection (candidiasis).

There are several published case reports of birth defects in infants whose mothers were treated with high-dose fluconazole (400-800 mg/day) for serious and life-threatening fungal infections during most or all of the first trimester (see Data Summary below). The features seen in these infants are listed in Table 1.

Based on this information, the pregnancy category for fluconazole indications (other than vaginal candidiasis) has been changed from category C to category D. The pregnancy category for a single dose of fluconazole 150 mg to treat vaginal candidiasis has not changed and remains category C.

Pregnancy category D means there is positive evidence of human fetal risk based on human data but the potential benefits from use of the drug in pregnant women with serious or life-threatening conditions may be acceptable despite its risks.

Healthcare professionals should be aware of the potential risks with long-term, high-dose use of fluconazole and counsel patients if the drug is used during pregnancy or if a patient becomes pregnant while taking the drug.

Additional Information for Patients

- Use of long-term, high-dose (400-800 mg/day) fluconazole during the first three months of pregnancy (first trimester) may be associated with a rare and distinct set of birth defects in infants.
- A single dose of fluconazole 150 mg to treat vaginal yeast infection during pregnancy does not appear to be associated with the birth defects.
- Patients should notify their healthcare professional if they are pregnant or become pregnant while taking fluconazole.
- Side effects from the use of fluconazole should be reported to the FDA MedWatch program, using the information in the "Contact Us" box at the bottom of the page.

Additional Information for Healthcare Professionals

- The pregnancy category for a single 150 mg dose of fluconazole for vaginal candidiasis is category C based on data from animal studies that showed an adverse effect on the fetus. There are no adequate and well-controlled studies of fluconazole in pregnant women. Available human data do not suggest an increased risk of congenital anomalies following a single maternal dose of 150 mg.
- The pregnancy category for fluconazole use for indications other than vaginal candidiasis is now category D. A few published case reports describe a rare pattern of distinct congenital anomalies in infants exposed in utero to high-dose maternal fluconazole (400-800 mg/day) during most or all of the first trimester.
- The features seen in these infants include brachycephaly, abnormal facies, abnormal calvarial development, cleft palate, femoral bowing, thin ribs and long bones, arthrogryposis, and congenital heart disease. These effects are similar to those seen in animal studies.
- If fluconazole is used during pregnancy, or if a patient becomes pregnant while taking fluconazole, the patient should be informed of the potential risk to the fetus.
Adverse events involving fluconazole should be reported to the FDA MedWatch program using the information in the "Contact Us" box at the bottom of this page.

Data Summary
There are several case reports published in the medical literature that describe rare and distinct congenital anomalies in infants whose mothers were treated with chronic high-dose (400-800 mg/day) fluconazole for fungal infections in the first trimester of pregnancy. Four reports involved maternal use of chronic high-dose intravenous fluconazole for coccidioidal meningitis and one report involved a human immunodeficiency virus (HIV)-positive mother who received chronic high-dose oral fluconazole for vaginal candidiasis. Cases associated with high-dose fluconazole use all shared some characteristics with the autosomal recessive genetic disorder known as Antley-Bixler syndrome. This combination of congenital anomalies occurs rarely in the general population, and is similar to anomalies seen in animals following in utero fluconazole exposure.

Chronic high-dose fluconazole may be teratogenic in humans when used in the first trimester of pregnancy; however, the magnitude of this potential human teratogenic risk is unknown. The five reports of distinct and rare congenital anomalies following chronic, high-dose in utero exposure to fluconazole suggest a possible drug threshold effect for a fluconazole embryopathy.

The available data in the medical literature do not suggest an association between low-dose oral fluconazole use in the first trimester of pregnancy and congenital anomalies. The few published epidemiological studies of in utero exposure to low doses of fluconazole (most patients received a single oral dose of 150 mg) showed no consistent pattern of anomalies among affected infants; however, most of these studies were too small to accurately detect an increased risk for major birth defects overall. In addition, none of these studies were large enough to accurately detect an increased risk for a rare or unique birth defect or syndrome.

Pakistan Faces HIV/AIDS Spreading From High-Risk Groups To General Population
"For a long time, perceptions of Pakistan as a conservative Muslim country encouraged a belief that HIV/AIDS incidence would be non-existent or very low," but "with the number of HIV cases rising, the government finally included it in its 2009 national health policy," BBC News reports. However, the full extent of the disease "is still not widely acknowledged," and "experts say the epidemic is not being properly tackled," the article states.

A recent U.N. report warned that the country's "growing commercial sex industry's overlap with high-risk groups is likely to cause the epidemic to spread to the general population," the news service writes. But HIV/AIDS awareness campaigns "are almost non-existent in Pakistan" and non-governmental organizations working on the disease "have been hampered by the deteriorating security situation in many parts of the country and by this cultural mindset," according to the article. In addition, the U.N. "says that the country's anti-AIDS program is short of cash and bedevilled by bureaucracy – especially when it comes to the release of funds that have been committed," BBC notes (8/9).

Genetically modified 'serial killer' T cells obliterate tumors in leukemia patients
Gene therapy approach provides tumor-attack roadmap for other cancers
(PHILADELPHIA)—In a cancer treatment breakthrough 20 years in the making, researchers from the University of Pennsylvania’s Abramson Cancer Center and Perelman School of Medicine have shown sustained remissions of up to a year among a small group of advanced chronic lymphocytic leukemia (CLL) patients treated with genetically engineered versions of their own T cells. The protocol, which involves removing patients’ cells and modifying them in Penn’s vaccine production facility, then infusing the new cells back into the patient’s body following chemotherapy, provides a tumor-attack roadmap for the treatment of other cancers including those of the lung and ovaries and myeloma and melanoma. The findings, published simultaneously today in the New England Journal of Medicine and Science Translational Medicine, are the first demonstration of the use of gene transfer therapy to create "serial killer" T cells aimed at cancerous tumors.

"Within three weeks, the tumors had been blown away, in a way that was much more violent than we ever expected," said senior author Carl June, MD, director of Translational Research and a professor of Pathology and Laboratory Medicine in the Abramson Cancer Center, who led the work. "It worked much better than we thought it would."

The results of the pilot trial of three patients are a stark contrast to existing therapies for CLL. The patients involved in the new study had few other treatment options. The only potential curative therapy
would have involved a bone marrow transplant, a procedure which requires a lengthy hospitalization and carries at least a 20 percent mortality risk—and even then offers only about a 50 percent chance of a cure, at best.

"Most of what I do is treat patients with no other options, with a very, very risky therapy with the intent to cure them," says co-principal investigator David Porter, MD, professor of Medicine and director of Blood and Marrow Transplantation. "This approach has the potential to do the same thing, but in a safer manner."

**Secret Ingredients**

June thinks there were several "secret ingredients" that made the difference between the lackluster results that have been seen in previous trials with modified T cells and the remarkable responses seen in the current trial. The details of the new cancer immunotherapy are detailed in *Science Translational Medicine*.

After removing the patients' cells, the team reprogrammed them to attack tumor cells by genetically modifying them using a lentivirus vector. The vector encodes an antibody-like protein, called a chimeric antigen receptor (CAR), which is expressed on the surface of the T cells and designed to bind to a protein called CD19.

Once the T cells start expressing the CAR, they focus all of their killing activity on cells that express CD19, which includes CLL tumor cells and normal B cells. All of the other cells in the patient that do not express CD19 are ignored by the modified T cells, which limits side effects typically experienced during standard therapies.

The team engineered a signaling molecule into the part of the CAR that resides inside the cell. When it binds to CD19, initiating the cancer-cell death, it also tells the cell to produce cytokines that trigger other T cells to multiply—building a bigger and bigger army until all the target cells in the tumor are destroyed.

**Serial Killers**

"We saw at least a 1000-fold increase in the number of modified T cells in each of the patients. Drugs don't do that," June says. "In addition to an extensive capacity for self-replication, the infused T cells are serial killers. On average, each infused T cell led to the killing of thousands of tumor cells—and overall, destroyed at least two pounds of tumor in each patient."

The importance of the T cell self-replication is illustrated in the *New England Journal of Medicine* paper, which describes the response of one patient, a 64-year old man. Prior to his T cell treatment, his blood and marrow were replete with tumor cells. For the first two weeks after treatment, nothing seemed to change. Then on day 14, the patient began experiencing chills, nausea, and increasing fever, among other symptoms. Tests during that time showed an enormous increase in the number of T cells in his blood that led to a tumor lysis syndrome, which occurs when a large number of cancer cells die all at once.

By day 28, the patient had recovered from the tumor lysis syndrome—and his blood and marrow showed no evidence of leukemia.

"This massive killing of tumor is a direct proof of principle of the concept," Porter says.

The Penn team pioneered the use of the HIV-derived vector in a clinical trial in 2003 in which they treated HIV patients with an antisense version of the virus. That trial demonstrated the safety of the lentiviral vector used in the present work.

The cell culture methods used in this trial reawaken T cells that have been suppressed by the leukemia and stimulate the generation of so-called "memory" T cells, which the team hopes will provide ongoing protection against recurrence. Although long-term viability of the treatment is unknown, the doctors have found evidence that months after infusion, the new cells had multiplied and were capable of continuing their seek-and-destroy mission against cancerous cells throughout the patients’ bodies.

Moving forward, the team plans to test the same CD19 CAR construct in patients with other types of CD19-positive tumors, including non-Hodgkin’s lymphoma and acute lymphocytic leukemia. They also plan to study the approach in pediatric leukemia patients who have failed standard therapy. Additionally, the team has engineered a CAR vector that binds to mesothelin, a protein expressed on the surface of mesothelioma cancer cells, as well as on ovarian and pancreatic cancer cells.

**New Insights Into the How the Powerhouse of the Cell Works**

ScienceDaily (Aug. 10, 2011) — Mitochondria are the powerhouse of the cell. They are thought to have evolved more than a billion years ago from primitive bacterium which was engulfed by an early eukaryotic cell resulting in endosymbiotic relationships between the host cell and the newly formed organelle. During evolution the vast majority of the mitochondrial genetic material left the organelle and got
integrated into the nucleus of the host cell. Hence, most of the mitochondrial proteins are synthesized outside of the organelle and have to be imported into the various internal mitochondrial compartments.

Researchers from the Interfaculty Institute of Biochemistry (IFIB) of the University of Tübingen characterized recently a novel import pathway into the mitochondria. The group of Doron Rapaport employs a wide variety of genetic, biochemical and molecular cell biology methods in their studies. In the current project they used radiolabeled proteins and mitochondria isolated from yeast cells. Using this approach they discovered an unknown import route that is taken by a sub-group of proteins that span the mitochondrial outer membrane with multiple domains. The group could identify the components involved in this import pathway and to characterize their contribution to the process. These findings are reported in the current issue of the Journal of Cell Biology.

This work contributes to our understanding of the formation of the organelle and its maintenance within the cell. As mitochondrial defects are playing an important role in many human sicknesses, these findings can add to our perception of these diseases.

**Journal Reference:**

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**US approval for new three-drug combination pill**

Keith Alcorn
Published: 11 August 2011

The US Food and Drug Administration has approved Complera, a combination pill containing three drugs, including the new non-nucleoside reverse transcriptase inhibitor rilpivirine.

Complera combines tenofovir and emtricitabine (FTC) (also available as the combination pill Truvada) with rilpivirine (recently approved in the United States as Edurant). Complera is taken once daily, and is suitable only for patients who have not taken HIV drugs before.

Complera is marketed by Gilead Sciences, but is a joint venture with Johnson & Johnson, which developed rilpivirine. Gilead already markets another once-daily three drug combination, Atripla, which is currently the most commonly prescribed first-line HIV treatment. However, according to Reuters, Gilead will earn more from Complera due to a royalties deal which allows it to retain 30% of the royalty it would otherwise pay to Johnson & Johnson.

Marketing approval in Europe is likely to follow by the first quarter of 2012.

**Other recent approvals**

Boehringer-Ingelheim received a recommendation for approval of the once-daily, delayed release version of nevirapine (Viramune) from the European Medicines Agency in late July, while Merck received European Union marketing approval for its hepatitis C protease inhibitor boceprevir (Victrelis) earlier this month.

**US FDA Approves Gilead’s Once-Daily HIV Pill Complera**

* Reuters Health Medical News, (08.10.2011)

The Food and Drug Administration (FDA) on Wednesday approved the once-daily pill Complera for patients not previously treated for HIV.

Complera, made by Gilead Sciences Inc., combines tenofovir/emtricitabine (Truvada) with rilpivirine (Edurant), a Johnson & Johnson drug that received FDA approval in May. The combination treatment will cost approximately $1,705 a month.

A statement by Gilead said the approval of Complera was supported by data from two 48-week, Phase III studies—ECHO and THRIVE—that compared rilpivirine to efavirenz (Sustiva), made by Bristol-Myers Squibb Co., in treatment-naïve adults with HIV-1 infection. Most patients in the rilpivirine study arm received Truvada as well.

Gilead stressed consideration of the following before starting patients on Complera:

- Complera is not recommended for use in patients under age 18.
- Virologic failure was more common in subjects in the rilpivirine arm who had a baseline HIV-1 RNA of greater than 100,000 copies/mL.
- Compared to those in the efavirenz arm, virologic failure rate in rilpivirine-treated subjects conferred a higher overall rate of treatment resistance and cross-resistance to the non-nucleoside reverse transcriptase inhibitor class.
More subjects treated with rilpivirine developed lamivudine/emtricitabine-associated resistance compared to efavirenz.

Further, Complera has boxed warnings concerning lactic acidosis/severe hepatomegaly with steatosis and post-treatment acute exacerbation of hepatitis B.

For more information, visit http://www.fda.gov/ForConsumers/ByAudience/ForPatientAdvocates/HIVandAIDSActivities/ucm267592.htm.

Ambulatory blood pressure monitoring shows that 15% of HIV patients had undiagnosed high blood pressure

Michael Carter
Published: 11 August 2011

Approximately 15% of HIV-positive patients had undiagnosed hypertension, Spanish investigators report in the online edition of the Journal of Acquired Immune Deficiency Syndromes.

However the study also found that 39% of patients diagnosed with high blood pressure during a normal clinic appointment had what is called “office hypertension”—raised blood pressure due to stress—rather than persistently elevated blood pressure.

Researchers at Madrid’s La Paz hospital used 24-hour blood pressure monitoring to assess the true prevalence of hypertension in patients who had raised blood pressure during clinical monitoring.

“A major strength of our study is the strict methodology used for BP [blood pressure] measurement and the use of ABPM [ambulatory blood pressure monitoring] for diagnosis of HTN [hypertension].”

Family history, older age, and greater exposure to HIV therapy with risk factors for elevated blood pressure.

Cardiovascular disease is now a major cause of illness and death in patients with HIV. Hypertension— or high blood pressure—is a risk factor for cardiovascular disease, but its prevalence and risk factors in HIV-positive patients are poorly understood.

Therefore investigators designed a prospective study involving 310 patients attending routine care.

They were concerned that the stressful environment of HIV clinics could mean that their patients’ blood pressure measurements obtained during routine care are not always accurate. Indeed, an acknowledged clinical syndrome is called isolated office blood pressure.

Consequently, all the investigators’ patients’ had their blood pressure monitored during routine clinic visits. This involved both seated and standing tests.

Patients with hypertension (blood pressure above 140/90 mmHG) were offered 24-hour ambulatory blood pressure monitoring. This test allows blood pressure and cardiac function to be monitored outside the clinical environment, during the performance of routine, day-to-day activities.

Most of the patients were white males, and their average duration of HIV infection was ten years. The majority (71%) were taking antiretroviral therapy.

Overall, 20 patients (7%) had a prior diagnosis of hypertension. Monitoring in the clinic showed that an additional 44 patients (14%) had blood pressure above 140/90 mHG. When these figures were added together, the prevalence of hypertension in the study population was 21%.

Ambulatory monitoring confirmed the diagnosis of hypertension in 26 of the patients who had isolated office hypertension. The investigators therefore calculated that the true prevalence of hypertension in their patients was 15%.

Patients with hypertension were older than those with healthy blood pressure (48 vs. 41 years, p < 0.001), had longer duration of HIV infection (13 vs. 9 years, p = 0.001), and had a lower nadir CD4 cell count (149 vs. 203 cells/mm3, p = 0.008). Patients with high blood pressure were also more likely to have lipoatrophy (46% vs. 26%, p = 0.008), and to be taking HIV therapy (87% vs. 68%, p = 0.008).

Analysis that controlled for potentially confounding factors showed three independent risk factors for hypertension:

- Older age (each additional year increased the risk by 8%; OR = 1.08; 95% CI, 1.03-1.12; p < 0.001).
- Family history of hypertension (OR = 2.24; 95% CI, 1.09-4.59; p = 0.027).
- Number of antiretroviral regimens (OR = 1.2; 95% CI, 1.07-1.34; p = 0.001).

“The number of antiretroviral regimens could be an indirect measurement of ART duration and cumulative drug-related toxicity,” comment the investigators.

Female sex was associated with a significantly lower risk of hypertension (OR = 0.27; 95% CI, 0.09-0.81; p = 0.02).
Further analysis showed that 60% of patients who underwent 24-hour monitoring had abnormal cardiac patterns, and in 17% of patients these were extreme. CD4 cell counts were significantly higher in patients with normal cardiac rhythms than those with altered patterns (612 vs. 425 cells/mm³, p = 0.017).

The investigators acknowledge that their study has a number of limitations, including the small sample size. Nevertheless, they conclude, “using ABPM, HTN prevalence in HIV-infected patients is lower than previously reported...non-invasive BP monitoring could be useful to confirm HTN diagnosis and help make better decisions regarding treatment in hypertensive subjects.”

Reference

Sugar-Binding Protein May Play a Role in HIV Infection
ScienceDaily (June 16, 2011) — Researchers report that a sugar-binding protein called galectin-9 traps PDI on T-cells' surface, making them more susceptible to HIV infection.

Specific types of "helper" T cells that are crucial to maintaining functioning immune systems contain an enzyme called PDI (protein disulfide isomerase). This enzyme affects how proteins fold into specific shapes, which in turn influences how the T cells behave. PDI also plays a role in HIV infection by helping to change the shape of the surface envelope protein of the virus, enabling the virus to interact optimally with receptors on the T cells, such as the CD4 molecule.

Though it is known that PDI inhibitors can prevent HIV infection, just how this happens has remained a mystery. And though it has been known that PDI, which normally lives inside the cell, can become entrapped on the cell's surface, it has not been understood how this happens.

Now, in a new study, UCLA researchers report that a sugar-binding protein called galectin-9 traps PDI on T-cells' surface, making them more susceptible to HIV infection.

IMPACT: The findings could lead researchers to a potential new target for anti-HIV therapeutics, such as therapies to inhibit PDI or galectin-9.

Journal Reference:
S. Bi, P. W. Hong, B. Lee, L. G. Baum. Galectin-9 binding to cell surface protein disulfide isomerase regulates the redox environment to enhance T-cell migration and HIV entry. Proceedings of the National Academy of Sciences, 2011; DOI: 10.1073/pnas.1017954108

08/08/2011

Empowering women to protect themselves: Successes in female condom programming
“Girls and women remain vulnerable to HIV and we have to summon the courage and political will to empower and protect them.”

Ensuring that high quality condoms are widely available, either free or at an affordable price, is fundamental to a pragmatic and effective AIDS response. In a recently published report, the United Nations Population Fund (UNFPA) focuses on the increasing use of female condoms and highlights how millions of women around the world are now using this method to protect themselves against HIV.

HIV prevention that women can control
Titled HIV prevention gains momentum: Successes in female condom programming, the report looks at the issue through the prism of national case studies. These pinpoint how a variety of partners have come together, pooling ideas, expertise and resources, to empower women to access female condoms. This is crucial as HIV is the leading cause of death among women of reproductive age worldwide, and in sub-Saharan Africa 60 percent of all people living with HIV are female.

“Girls and women remain vulnerable to HIV and we have to summon the courage and political will to empower and protect them,” said Dr Babatunde Osotimehin, UNFPA’s Executive Director, quoted in the report’s foreword. “We have to invest in practical tools that women can use to protect themselves, such as the female condom,” he added.

Concerted efforts appear to have an impact: the report states that access to female condoms has increased dramatically over the last few years, with 50 million used in 2009. Today condoms are available in more than 90 countries through public health programmes. However, availability and price remain issues as the female condom can cost as much as one US dollar per unit and, despite considerable progress made, in 2009 only one female condom was available for every 36 women worldwide.

Stories highlighted in Successes in female condom programming range from coffee ceremonies in Ethiopia where married women help each other break taboos surrounding condoms, to networks of
hairdressers and small businesspeople in Guyana, Malawi and Zimbabwe encouraging their clients to use them.

**Innovative distribution outlets**

For example, Langton Ziromba owns a small barbershop in Zimbabwe’s capital, Harare, and in addition to giving haircuts and shaves he also promotes and sells female condoms to his male customers. Mr Ziromba is one of around 70 barbers and 2000 hairdressers in the country trained by Population Services International (PSI), a UNFPA partner. Such activity, the report outlines, has contributed towards the growth in sales of female condoms through social marketing and public sector programmes from one million in 2005 to more than five million in 2009.

Other countries, such as Myanmar, have focused on key populations like sex workers and men who have sex with men. In 2006 UNFPA entered into an agreement with the Myanmar government and PSI to provide 700,000 female condoms to these groups over a three year period. According to the report, progress was “remarkable” and in the first year of the initiative use of female condoms among sex workers nearly doubled from 20 percent in 2004 to 36 percent in 2006.

**Building national capacity for programming**

The publication also draws attention to the push to increase the capacity of national governments and their partners to implement comprehensive condom programming, of which female condoms are an integral part, with a view to outside assistance eventually being phased out.

Since 2002 UNFPA has been the lead agency for the UN Inter-Agency Task Team on Comprehensive Condom Programming and plays a key role in discussions on funding, technical assistance and regional and global support. It also works with governments and partners to stimulate demand and facilitate the design and implementation of culturally appropriate condom programming so that individuals around the world are empowered to protect themselves against HIV.

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**10/08/2011**

**HIV treatment outcomes poorer in adolescents and young adults**

Adolescents and young adults appear less likely to benefit from antiretroviral therapy compared with adults.

Adolescents and young adults appear less likely to benefit from antiretroviral therapy compared with adults, according to a [small Northwestern University Feinberg School of Medicine study](#) published ahead of print by the Journal of Acquired Immune Deficiency Syndromes. Future studies will be needed to better understand this disparity and define support programs for young people, many of whom are being treated in adult clinics and potentially not receiving services addressing the needs of adolescents.

According to the U.S. Centers for Disease Control and prevention, about 68,000 people living with HIV in the United States are adolescents or young adults between ages 13 and 24. In fact, the highest number of new HIV diagnoses now occurs in those 13 to 29 years old.

Much of what is known about treatment outcomes in this population comes from studies conducted at clinics intended for adolescents and young adults, which offer tailored services—such as social support and trained medical providers—to maximize care. However, many clinics in the United States do not have adolescent HIV programs and therefore typically treat young people in adult programs. Little is known about treatment outcomes in this particular circumstance.

Patrick Ryscavage, MD, and his Northwestern colleagues conducted a retrospective study comparing the treatment outcomes of adolescents and young adults (17 to 24 years old) and older adults (25 to 40 years old) at the university’s outpatient HIV clinic. The clinic, Ryscavage reports, provides comprehensive HIV-related care to more than 1,500 patients in the Chicago metropolitan area. About 5 percent of the clinic population is adolescent or young adult. There are no structured on-site programs targeting HIV-positive youth.

Forty-six adolescents and young adults, averaging 21 years old, were included in the analysis. They were compared with 46 older adults, averaging 31 years old. Roughly 61 percent were women, and 54 percent were African American. CD4 cells, upon entry in the study, averaged 353 and 312, respectively. Nearly half had a mental health disorder, and about 52 percent and 39 percent, respectively, reported using illicit substances (including tobacco, alcohol, marijuana or intravenously administered drugs).

About 15 percent of the adolescents/young adults acquired HIV around the time of birth, and roughly 17 percent had been referred to the Northwestern adult clinic from a pediatric/adolescent clinic.

Compared with older adults, the adolescents and young adults were less likely to have undetectable viral loads within six months of entering the study (78 percent versus 59 percent, respectively). And while
fewer adolescents had undetectable viral loads at any time point in the study, compared with older adults (70 versus 83 percent, respectively), this difference was not statistically significant, meaning it could have been due to chance.

Viral load rebounds were more likely to occur among adolescents/young adults (56 percent) compared with older adults (13 percent) during the follow-up period. What’s more, many more adolescents/young adults were lost to follow-up—they failed to return to the clinic for care—compared with older adults (44 versus 11 percent).

In an analysis conducted by the researchers, African-American adolescents and young adults had the lowest rates of undetectable viral loads after six months: 44 percent compared with 71 percent of older African-American adults, and 77 percent for non-African-American adolescents/young adults compared with 91 percent for non-African-American older adults. African-American adolescents and young adults were also much more likely to experience virologic rebounds in the study.

According to Ryscavage, these sobering results are similar to those of other studies, showing relatively poor outcomes in HIV-positive youths.

Though this particular study didn’t evaluate the factors associated with poor outcomes, the authors note that “adolescents often experience feelings of invulnerability which can increase their risk of HIV acquisition, reduce rates of HIV testing, and reinforce negative health care behaviors after diagnosis. In addition many of these patients are burdened with socioeconomic stressors and mental health comorbidities. Other potential barriers to optimal outcomes among adolescents and young adults include HIV-associated stigma, reluctance to disclose HIV diagnosis to family and friends, housing instability, lack of insurance, physical and sexual abuse, fractured family support and poor organizational skills.

“Though differing age-related [metabolism of ARVs] has been suggested as an explanation for poor virologic outcomes in HIV-infected youth, poor antiretroviral and clinic adherence are likely more important factors.” According to studies cited by Ryscavage’s group, ARV adherence rates among youth, predominantly those who were infected as a result of risky behavior and not perinatally, have been between 26 and 78 percent, with a majority of the studies reporting rates under 50 percent.

“The poor rates of clinical retention among adolescents/young adults in our study suggest that barriers exist to full engagement in adult HIV care,” the authors conclude. “Because many adolescents/young adults will receive care in adult-oriented HIV clinics, these patients will benefit from careful study and additional resources directed to improve outcomes. Potential strategies to improve outcomes may include improved social support, provider training, and systems-based quality improvements. Future studies should also aim to determine specific barriers to successful HIV treatment success among African-American adolescents/young adults.”

05/08/2011

Statins greatly reduce risk of death in HIV cohort study

Taking a cholesterol-lowering statin, combined with antiretroviral therapy, further reduced the risk of death by 67 percent in a cohort of people living with HIV.

Taking a cholesterol-lowering statin, combined with antiretroviral (ARV) therapy, further reduced the risk of death by 67 percent in a cohort of people living with HIV, according to a new report published by PLoS One. Though the data are from an observational cohort study and need to be confirmed in a prospective clinical trial, the results add to a growing body of evidence supporting therapeutic strategies aimed at minimizing inflammation in people living with HIV.

HIV is associated with chronic inflammation and immune activation. Though ARV therapy reduces inflammation, it often fails to reduce markers of inflammation to levels seen in people not living with HIV or other chronic infections.

Statins, technically called HMG-coenzyme A reductase inhibitors, are typically used to lower harmful cholesterol levels, thereby reducing the risk of cardiovascular disease (CVD). But research suggests that their lipid-lowering activity in the body doesn’t fully explain their effect on CVD risk—statins also appear to reduce inflammation, which has also been shown to be a CVD risk factor.

Based on these observations, along with the fact that many people living with HIV require cholesterol-lowering drugs to manage the lipid gains that often accompany ARV treatment, statins remain a logical therapy to assess for disease-reducing and life-saving effects in HIV-positive people.

Richard Moore, John Bartlett and Joel Gallant, all of Johns Hopkins University School of Medicine in Baltimore, explored this possibility by evaluating patients enrolled in the Johns Hopkins HIV Clinical
Cohort who achieved undetectable viral loads within six months of starting ARV treatment after January 1, 1998. Assessment was continued until death in patients who maintained undetectable viral loads, or until their viral loads became detectable again and went above 500.

Roughly 15 percent of the 1,538 individuals who qualified for the analysis took a statin. Two thirds of study participants were men. Those who took a statin tended to be somewhat older (46 versus 42 years old) and to have started ARV treatment with a higher CD4 cell count (270 versus 200 cells).

Of the 85 people who died during the average 1.5-year follow-up period, seven used statins, whereas 78 did not. Cancers, non-AIDS-defining infections, liver failure and CVD were the main causes of death.

After adjusting for a variety of factors—CD4 cell count, viral load, hemoglobin, cholesterol levels when ARV therapy was started, age, race, hepatitis coinfection, the length of ARV therapy and the different types of ARVs used—the risk of death among those using statins was a third of that seen among those who didn’t use a statin. This was highly statistically significant, meaning it wasn’t due to chance, and translated into a 67 percent reduction in the risk of death among those who used statins in combination with HIV-suppressive ARV treatment.

"In summary," the researchers write, “we found that patients who maintained virologic suppression on effective [ARV treatment] appeared to derive additional survival benefit from the use of a statin. If additional observational data support this finding, a randomized clinical trial would be warranted to confirm this association."

Some Catholic Officials Urge Parents to Opt Out of Mandated Sex Education

The Roman Catholic Archdiocese of New York on Wednesday called a new city policy requiring sex education in all public middle and high schools “troubling.” Few other constituencies had immediate objections to the mandatory sex education lessons, which will cover abstinence, birth control, condom use, and other means of preventing STDs and pregnancy.

“Parents have the right and responsibility to be the first and primary educators of their children,” Joseph Zwilling, communications director for the archdiocese, said in a statement. “This mandate by the city usurps that role, and allows the public school system to substitute its beliefs and values for those of the parents.”

A lawyer for the archdiocese, Edward Mechmann, encouraged parents to use the opt-out clause exempting their children from contraception lessons. “I’d also insist that parents inspect the materials to make sure there’s nothing really offensive or inaccurate being put in there.”

The bishop of Brooklyn, Nicholas A. DiMarzio, said he plans to mobilize Catholic parents citywide to “assert their parent rights on this issue.” Some public schools that rent church space could have to find new sites at which to teach the courses.

Some parents suggested that high teen pregnancy rates and the number of youths with HIV make it harder to oppose the lessons on moral grounds.

In the 1990s, a Queens school district excised a number of sex-related topics from health classes. Under mayoral control, however, boards no longer have that prerogative.

“I think it is a good idea,” Souleimane Konate, head imam of the Masjid Aqsa mosque in Harlem, said of the mandate. “I do talk about it sometimes, but people look at me like I’m crazy because the imams aren’t supposed to talk about it. It’s taboo in my community. But if somebody is doing it for me, I would support them 100 percent.”

Spread Of Polio In Pakistan Threatening Goal Of Eradication

With 63 cases of polio diagnosed in Pakistan this year, nearly double the number recorded in the same time period 2010, the U.N. "says that these findings suggest Pakistan could be the 'last polio reservoir worldwide' – the country standing in the way of eliminating only the second global epidemic disease after smallpox," the Atlantic Wire reports.

"What’s particularly troubling now is that while the number of cases is dropping in India, Nigeria, and Afghanistan – which, along with Pakistan account for over 90 percent of cases – the disease is spreading in Pakistan (in fact Pakistani President Asif Ali Zardari has declared polio a national emergency)," the news source writes. According to a recent report, the goal of eradicating polio is threatened by a lack of funding and a reappearance of the disease in Chad, Angola, Democratic Republic of Congo and South Sudan, as well as an outbreak in the Nigerian state of Kano, the Atlantic Wire notes (Friedman, 8/10).
**Experts Troubled By Global Rise In C-Section Rates**

Almost one-third of infants in the U.S. are delivered by caesarean section (c-section), a trend that is now growing globally. PRI's The World/PBS NewsHour reports. "The c-section rate in Thailand has reached 34 percent, in Vietnam, it is 36 percent, and in China, nearly half of all births are by c-section," the article states.

Some experts, including Joao Paulo Souza, an obstetrician for the WHO who has studied the rising number of c-sections in developing countries, are troubled by the trend, according to the article. "In settings where surgery is not safe, what we have been seeing is increased risk of hysterectomy and other severe complications," Souza said. Sister Gillian Rose, who runs Bollobhpur Hospital in West Bangladesh, "said one of the reasons more women are having caesareans is that private doctors at private clinics are telling women they need the surgery when they do not," the article reports. "In Bangladesh, many women who choose c-sections say they do so for convenience and to avoid the pain of childbirth," according to the article (Anderson, 8/9).

**Researchers Fight Cholera With Computer Forecasting**

AUSTIN, Texas – Just as the rainy season is driving a new surge of cholera cases in Haiti, a new computational model could forecast where outbreaks are likely to occur.

Researchers at Ohio State University are working with the Centers for Disease Control and Prevention (CDC) on the project, in the hopes of targeting anti-cholera efforts where they are most needed in the earthquake-ravaged country.

Just back from a 10-day trip to the Artibonite Valley in Haiti, Ohio State researcher Marisa Eisenberg described the model’s early results at the Ecological Society of America annual meeting in Austin.

One question was whether the deadly disease is spreading primarily through contaminated environmental water or through human contact – for example, through contaminated food. That knowledge would enable the CDC and relief agencies to focus limited resources on counteracting one means of transmission or the other.

“According to our preliminary findings, it’s both,” said Eisenberg, who is a postdoctoral fellow in the Mathematical Biosciences Institute at Ohio State. “We can’t neglect either source of transmission.”

As they continue to process the data, the researchers hope to identify typical patterns of cholera outbreaks, and identify “hotspots” – regions that are key to controlling the spread of the disease.

The CDC approached computer modelers about the problem in November 2010. Among them was Eisenberg’s collaborator, Joseph Tien, professor of mathematics at Ohio State, who had previously identified patterns in data from the 19th Century cholera epidemics in London.

The resulting study, which he and Eisenberg published with Canadian collaborators in the Annals of Internal Medicine in May 2011, revealed the disease’s cyclical nature: When a new strain of cholera invades a country, the epidemic typically starts with an initial wave of cases in the fall, then erupts into much larger outbreaks the following summer.

That pattern has thus far held true for Haiti.

“Before the earthquake, cholera hadn’t been reported in Haiti in decades, so we’re in new territory as far as what the disease will do there in the coming months and years,” Tien said. “There are lots of different factors to consider—environmental conditions affecting the ability of the cholera bacteria to persist in water bodies, variation in water quality and sanitation in different locales, infection-derived immunity, seasonal drivers such as rainfall. We’re hoping to use mathematics to help piece the puzzle together.”

Cholera is a bacterial infection of the intestines that causes vomiting and severe diarrhea. Without help, victims die of dehydration. According to the CDC, an estimated 3-5 million cases and 100,000 deaths occur around the world every year due to cholera.

The disease is primarily spread through fecal contamination of water and food. In much of Haiti, where large portions of the population still remain homeless since the 2010 earthquake, sanitation simply doesn’t exist.

Tien, Eisenberg, and the Ohio State team traveled to Haiti to make connections with local health officials and to begin to gather cholera data from hospitals – in particular, the Hôpital Albert Schweitzer, the main hospital for a population of nearly 350,000 in the island’s central valley.

Several trips to Haiti will follow, but Eisenberg describes the first one as intense and eye-opening.
“Part of the difficulty in getting accurate data, particularly during the first wave of the outbreak, is that the hospitals fill up and not everyone reaches a treatment center. Treatment center staff keep as detailed records as they can, though different agencies use different reporting methods. But cholera treatment centers are often short on funds and space, and even hospitals have many people staying in tents outside, because there isn’t enough space,” she said.

Other facts make tracking the disease more difficult. One village may get its water from multiple sources – a nearby river, spring on the hillside, or well dug along a road. Families travel many times a day to gather water in buckets and carry it home.

“Two neighbors may both get cholera, but they didn’t necessarily get it from the same source,” Eisenberg explained.

Modeling the Haiti outbreak on computer presents its own unique challenge, as hospitals, the United Nations, and UNICEF are all providing data at different spatial scales. Some have data at only the village level, or the department (state) level, or the country level. The telecommunications company Digicel is providing customers’ location data, so the researchers can track where populations are moving within the country.

Eisenberg is busy constructing algorithms to fit all this diverse data together. It may take time before the researchers have a complete model for the CDC and other agencies to use, but she hopes to get more initial results soon.

Non-Government Organizations (NGOs) have aided Haiti since the earthquake. They distribute chlorine tablets, and educate people on how to decontaminate their water. They build latrines to encourage people not to defecate in the river or in a field of crops.

But, as the Ohio State researchers learned on their trip, those same NGOs are running out of money, and preparing to leave the country. Yet the current rainy season, which began in June, has brought a surge of new cases.

According to the Haitian government, the population experienced 1,000 new cases of cholera per day in June.

To make the best use of aid that remains, the researchers would like to be able to know where exactly on the island new outbreaks are going to occur. They are assembling maps of cholera transmission, and creating software that will forecast the likelihood of new cases based on many factors such as population, water sources, travel, and weather.

They hope to have more results in the fall. What they learn could be of use not just in Haiti, but in Southeast Asia and in the Democratic Republic of the Congo, where the disease is common today.

Tien’s collaborators on the study of cholera in 19th Century London were David Earn and Hendrik Poinar of McMaster University and David Fisman of the University of Toronto. Earn and Fisman also coauthored the Annals of Internal Medicine paper, along with Ashleigh Tuite of the University of Toronto and Junling Ma of the University of Victoria.

NIH-led team maps route for eliciting HIV-neutralizing antibodies
New technique can be used widely to develop vaccines

Researchers have traced in detail how certain powerful HIV neutralizing antibodies evolve, a finding that generates vital clues to guide the design of a preventive HIV vaccine, according to a study appearing in Science Express this week. The discoveries were made by a team led by the Vaccine Research Center (VRC) at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health.

“This elegant research brings us another step closer to an HIV vaccine and establishes a potent new technique for evaluating the human immune response to experimental vaccines, not only for HIV, but for pathogens generally,” said NIAID Director Anthony S. Fauci, M.D.

The new findings build on last year’s discovery reported by VRC scientists of three HIV antibodies, two of which could stop more than 90 percent of known global HIV strains from infecting human cells in the laboratory. Called VRC01, VRC02 and VRC03, these antibodies were found in blood donated for NIAID studies by an HIV-infected North American known as donor 45. In the new paper, scientists report discovering antibodies similar to VRC01 in the blood of two HIV-infected Africans known as donor 74 and donor 0219.

The researchers further discovered that these VRC01-like antibodies all bind to the same spot on HIV in the same way. This suggests that an HIV vaccine should contain a protein replica of this spot, known as the CD4 binding site, to elicit antibodies as powerful as VRC01, according to the researchers. The CD4
Scientists explain unique activity of TB drug pyrazinamide

WHAT: Pyrazinamide has been used in combination with other drugs as a first-line treatment for people with tuberculosis (TB) since the 1950s, but exactly how the drug works has not been well understood. Now, researchers have discovered a key reason why the drug effectively shortens the required duration of TB therapy. The finding potentially paves the way for the development of new drugs that can help eliminate TB in an infected individual even more rapidly. The study was supported by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, and published online on August 11 in Science Express.

Unlike most first-line TB drugs, pyrazinamide does not directly kill Mycobacterium tuberculosis, the bacterium that causes TB, grown in a test tube; rather, the drug acts only on latent TB bacteria that exist in an acidic environment in the body. From previous studies, the investigators knew that shortly after pyrazinamide enters latent M. tuberculosis in the body, the drug converts to its active form, pyrazinoic acid (POA). But they did not know how POA then killed the bacteria, thereby shortening the normal 9- to 12-month course of therapy by several months.

In this study, the researchers learned that once formed, POA binds to a vital bacterial cell protein, ribosomal protein S1 (RpsA), blocking RpsA from decoding M. tuberculosis DNA to create other proteins that keep the bacteria alive in the body. The investigators note that their results explain the mechanism of this enigmatic TB drug, which could assist researchers attempting to develop improved TB drug treatment regimens.
Outbreak C. difficile strain common in Chicago hospitals, investigation finds

An outbreak strain of Clostridium difficile, a bacterium that causes diarrhea and sometimes life-threatening inflammation of the colon, is common in Chicago-area acute care hospitals, an investigation published in the September issue of Infection Control and Hospital Epidemiology suggests.

In response to Illinois Department of Public Health reports of rising rates of C. difficile infection as a hospital discharge diagnosis, the Chicago and Cook County health departments surveyed 25 Chicago-area hospitals over one month in 2009. They identified 263 total cases of C. difficile illness. Of 129 C. difficile isolates cultured from these patients, 61 percent were the outbreak C. difficile strain known as BI/NAP1.

The BI strain, which is known to cause more serious illness, is usually associated with large acute outbreaks of C. difficile. However this investigation suggests that BI is endemic in the Chicago area and patients could be at risk for severe disease even in the absence of a large acute outbreak.

"Our findings highlight the need for effective interventions aimed at reducing the risk of C. difficile infection," said Stephanie Black, MD with the Chicago Department of Public Health and the investigation’s lead author.

The investigation suggests that the transfer of patients from one facility to another has helped to spread the BI strain. Dr. Black and her team found that half of the patients with the BI strain were transferred from one healthcare facility to another. "Inter-facility transfer of recently infected patients is a plausible mechanism for the spread of the BI group and may explain in part how BI became the dominant [strain] in this region," the authors write.

C. difficile is most common in elderly patients and those receiving treatment with antibiotics. It is considered to be one of the most important health care-related infections in the U.S.

The Society for Healthcare Epidemiology of America recommends that patients take the following steps to reduce the spread of C. difficile:

- Make sure that all doctors, nurses, and other healthcare providers clean their hands with soap and water.
- Only take antibiotics as prescribed by your doctor.
- Be sure to clean your own hands often, especially after using the bathroom and before eating.


Genetically Modified 'Serial Killer' T-Cells Obliterate Tumors in Leukemia Patients

ScienceDaily (Aug. 10, 2011) — In a cancer treatment breakthrough 20 years in the making, researchers from the University of Pennsylvania’s Abramson Cancer Center and Perelman School of Medicine have shown sustained remissions of up to a year among a small group of advanced chronic lymphocytic leukemia (CLL) patients treated with genetically engineered versions of their own T cells. The protocol, which involves removing patients’ cells and modifying them in Penn’s vaccine production facility, then infusing the new cells back into the patient’s body following chemotherapy, provides a tumor-attack roadmap for the treatment of other cancers including those of the lung and ovaries and myeloma and melanoma.

The findings, published simultaneously in the New England Journal of Medicine and Science Translational Medicine on August 10, are the first demonstration of the use of gene transfer therapy to create "serial killer" T cells aimed at cancerous tumors.

"Within three weeks, the tumors had been blown away, in a way that was much more violent than we ever expected," said senior author Carl June, MD, director of Translational Research and a professor of Pathology and Laboratory Medicine in the Abramson Cancer Center, who led the work. "It worked much better than we thought it would."

The results of the pilot trial of three patients are a stark contrast to existing therapies for CLL. The patients involved in the new study had few other treatment options. The only potential curative therapy would have involved a bone marrow transplant, a procedure which requires a lengthy hospitalization and carries at least a 20 percent mortality risk—and even then offers only about a 50 percent chance of a cure, at best.
"Most of what I do is treat patients with no other options, with a very, very risky therapy with the intent to cure them," says co-principal investigator David Porter, MD, professor of Medicine and director of Blood and Marrow Transplantation. "This approach has the potential to do the same thing, but in a safer manner."

**Secret Ingredients**

June thinks there were several "secret ingredients" that made the difference between the lackluster results that have been seen in previous trials with modified T cells and the remarkable responses seen in the current trial. The details of the new cancer immunotherapy are detailed in *Science Translational Medicine*.

After removing the patients' cells, the team reprogrammed them to attack tumor cells by genetically modifying them using a lentivirus vector. The vector encodes an antibody-like protein, called a chimeric antigen receptor (CAR), which is expressed on the surface of the T cells and designed to bind to a protein called CD19.

Once the T cells start expressing the CAR, they focus all of their killing activity on cells that express CD19, which includes CLL tumor cells and normal B cells. All of the other cells in the patient that do not express CD19 are ignored by the modified T cells, which limits side effects typically experienced during standard therapies.

The team engineered a signaling molecule into the part of the CAR that resides inside the cell. When it binds to CD19, initiating the cancer-cell death, it also tells the cell to produce cytokines that trigger other T cells to multiply—building a bigger and bigger army until all the target cells in the tumor are destroyed.

**Serial Killers**

"We saw at least a 1000-fold increase in the number of modified T cells in each of the patients. Drugs don't do that," June says. "In addition to an extensive capacity for self-replication, the infused T cells are serial killers. On average, each infused T cell led to the killing of thousands of tumor cells—and overall, destroyed at least two pounds of tumor in each patient."

The importance of the T cell self-replication is illustrated in the *New England Journal of Medicine* paper, which describes the response of one patient, a 64-year-old man. Prior to his T cell treatment, his blood and marrow were replete with tumor cells. For the first two weeks after treatment, nothing seemed to change. Then on day 14, the patient began experiencing chills, nausea, and increasing fever, among other symptoms. Tests during that time showed an enormous increase in the number of T cells in his blood that led to a tumor lysis syndrome, which occurs when a large number of cancer cells die all at once.

By day 28, the patient had recovered from the tumor lysis syndrome—and his blood and marrow showed no evidence of leukemia.

"This massive killing of tumor is a direct proof of principle of the concept," Porter says.

The Penn team pioneered the use of the HIV-derived vector in a clinical trial in 2003 in which they treated HIV patients with an antisense version of the virus. That trial demonstrated the safety of the lentiviral vector used in the present work.

The cell culture methods used in this trial reawaken T cells that have been suppressed by the leukemia and stimulate the generation of so-called "memory" T cells, which the team hopes will provide ongoing protection against recurrence. Although long-term viability of the treatment is unknown, the doctors have found evidence that months after infusion, the new cells had multiplied and were capable of continuing their seek-and-destroy mission against cancerous cells throughout the patients' bodies.

Moving forward, the team plans to test the same CD19 CAR construct in patients with other types of CD19-positive tumors, including non-Hodgkin's lymphoma and acute lymphocytic leukemia. They also plan to study the approach in pediatric leukemia patients who have failed standard therapy. Additionally, the team has engineered a CAR vector that binds to mesothelin, a protein expressed on the surface of mesothelioma cancer cells, as well as on ovarian and pancreatic cancer cells.

**Journal References:**

New Discovery in Battle Against Infections
ScienceDaily (Aug. 10, 2011) — Researchers from Dr. Woodland's lab at the Trudeau Institute have now identified a previously unknown link between the migration of white blood cells to infected tissues and the ability of these cells to survive and become long-lived memory cells after the infection has been cleared. The new data is featured on the cover of this month's The Journal of Experimental Medicine.

"Defining the factors that regulate the generation of these long-lived memory cells is crucial, as these are the cells that provide protection from re-infection," said Dr. David Woodland. "Our study focuses on influenza and tuberculosis infections, but a similar study from our colleagues in Japan that was published simultaneously in The Journal of Experimental Medicine shows this observation is relevant to other pathogens, suggesting these findings may be applicable to many infectious diseases. Hopefully, we can use this information to design vaccines that generate larger numbers of memory cells and can therefore provide better protective immunity."

The lab envisions the findings will lead to the development of additives that act to boost vaccine efficacy. This would be especially important for the elderly population that tends to be difficult to effectively vaccinate.

**Journal Reference:**

**New antiviral drug could destroy nearly any viral infection**
Antibiotics, such as penicillin, can treat most bacterial infections. But when it comes to viral infections, including influenza, the common cold, and deadly hemorrhagic fevers such as Ebola, antibiotics are useless.

Now, in a development that could transform how viral infections are treated, a team of researchers at MIT’s Lincoln Laboratory has designed a drug that can identify cells that have been infected by any type of virus, then kill those cells to terminate the infection.

In a paper published July 27 in the journal PLoS One, the researchers tested their drug against 15 viruses, and found it was effective against all of them — including rhinoviruses that cause the common cold, H1N1 influenza, a stomach virus, a polio virus, dengue fever and several other types of hemorrhagic fever.

The drug works by targeting a type of RNA produced only in cells that have been infected by viruses. “In theory, it should work against all viruses,” says Todd Rider, a senior staff scientist in Lincoln Laboratory’s Chemical, Biological, and Nanoscale Technologies Group who invented the new technology. Because the technology is so broad-spectrum, it could potentially also be used to combat outbreaks of new viruses, such as the 2003 SARS (severe acute respiratory syndrome) outbreak, Rider says.

Other members of the research team are Lincoln Lab staff members Scott Wick, Christina Zook, Tara Boettcher, Jennifer Pancoast and Benjamin Zusman.

**Few antivirals available**
Rider had the idea to try developing a broad-spectrum antiviral therapy about 11 years ago, after inventing CANARY (Cellular Analysis and Notification of Antigen Risks and Yields), a biosensor that can rapidly identify pathogens. “If you detect a pathogenic bacterium in the environment, there is probably an antibiotic that could be used to treat someone exposed to that, but I realized there are very few treatments out there for viruses,” he says.

There are a handful of drugs that combat specific viruses, such as the protease inhibitors used to control HIV infection, but these are relatively few in number and susceptible to viral resistance.

Rider drew inspiration for his therapeutic agents, dubbed DRACOs (Double-stranded RNA Activated Caspase Oligomerizers), from living cells’ own defense systems.

When viruses infect a cell, they take over its cellular machinery for their own purpose — that is, creating more copies of the virus. During this process, the viruses create long strings of double-stranded RNA (dsRNA), which is not found in human or other animal cells.

As part of their natural defenses against viral infection, human cells have proteins that latch onto dsRNA, setting off a cascade of reactions that prevents the virus from replicating itself. However, many viruses can outsmart that system by blocking one of the steps further down the cascade.

Rider had the idea to combine a dsRNA-binding protein with another protein that induces cells to undergo apoptosis (programmed cell suicide) — launched, for example, when a cell determines it is en
route to becoming cancerous. Therefore, when one end of the DRACO binds to dsRNA, it signals the other end of the DRACO to initiate cell suicide.

Combining those two elements is a “great idea” and a very novel approach, says Karla Kirkegaard, professor of microbiology and immunology at Stanford University. “Viruses are pretty good at developing resistance to things we try against them, but in this case, it’s hard to think of a simple pathway to drug resistance,” she says.

Each DRACO also includes a “delivery tag,” taken from naturally occurring proteins, that allows it to cross cell membranes and enter any human or animal cell. However, if no dsRNA is present, DRACO leaves the cell unharmed.

Most of the tests reported in this study were done in human and animal cells cultured in the lab, but the researchers also tested DRACO in mice infected with the H1N1 influenza virus. When mice were treated with DRACO, they were completely cured of the infection. The tests also showed that DRACO itself is not toxic to mice.

The researchers are now testing DRACO against more viruses in mice and beginning to get promising results. Rider says he hopes to license the technology for trials in larger animals and for eventual human clinical trials.

CMV infection may increase risk of mother-to-child HIV transmission
Carole Leach-Lemens
Published: 12 August 2011
Cytomegalovirus infection during pregnancy or delivery may greatly increase the subsequent risk of foetal or infant HIV infection, Thai researchers report.

Among formula-fed infants of HIV-infected mothers receiving zidovudine prophylaxis, HIV infections were more frequent in infants with congenital or acquired cytomegalovirus (CMV) infection, Woottichai Khamduang and colleagues reported in a retrospective case-control study from a Thai clinical trial cohort published in the advance online edition of the Journal of Acquired Immune Deficiency Syndromes.

Among independent risk factors maternal viral load is acknowledged as being the most important predictor of mother–child HIV transmission. While the presence of infant CMV infection has been looked at within the context of HIV infection of mothers and infants, the authors note it has never been subject to multivariate analysis.

In non-HIV-infected populations between 0.1% and 2% of infants become infected with CMV during pregnancy, and 5%–10% become infected during birth. CMV is a common virus from the family of herpes viruses that may eventually infect the majority of otherwise healthy adults, and in most cases causes no more than a mild viral infection.

However in a minority of infants infected with CMV during pregnancy, infection can lead to more serious health problems such as hearing loss and learning difficulties.

In people with HIV infection who suffer serious immune system damage, including infants, CMV can cause serious AIDS-defining disease in the gastrointestinal tract or in the eye (retinitis).

Among HIV-infected infants rates of infection ranging from 0–26% during pregnancy have been recorded; the two largest studies have shown a 10% transmission rate. Among formula-fed infants a number of studies have shown high overall rates of CMV in HIV-infected infants, the authors of the Thai study note.

In a retrospective case-control study using data and frozen specimens from a non-breastfeeding cohort the authors looked at predictors, including infant CMV infection, of HIV transmission during pregnancy and birth to see whether CMV was independently associated with HIV transmission.

The study population came from a clinical trial that took place in Thailand from 1997 to 2001 to look at the effects of long- and short-term zidovudine monotherapy in the prevention of mother-to-child HIV transmission.

The parent study included 1409 live births of which 97 were HIV-infected.

HIV-infected infants were matched with HIV-uninfected infants according to maternal viral load; so ensuring the elimination of the strongest known risk factor for MTCT. A total of 194 control mothers and 196 control HIV-uninfected infants were included (one HIV uninfected infant had an infected twin and one matched mother had two uninfected infants).

Mothers were not tested for CMV since studies have shown CMV prevalence among pregnant women in Thailand to be close to 100%. Infants were formula-fed from birth. Infant blood samples were tested at birth, six weeks and at four, six, 12 and 18 months of age.
Infants were screened by testing 18-month plasma or serum for CMV antibodies. All earlier samples were tested to time the start of CMV infection.

Maternal baseline CD4 cell counts, length of zidovudine prophylaxis, mode of delivery, sex of infant, prematurity and birth weight were all tested for HIV transmission risk.

Median length of zidovudine prophylaxis was lower among mothers with infant HIV transmission compared to no transmission, 5.4 weeks and 6.8 weeks, (p=0.04) respectively.

Close to 90% (84) of the 97 HIV-infected infants had samples to time the infection. 40% were infected during pregnancy and 58% during delivery.

Neither zidovudine prophylaxis nor CD4 cell count were significantly associated with HIV transmission, whereas prematurity and low birth weight were (p=0.02 and p=0.003, respectively). The authors note this may be explained by the matching of case-controls according to the strongest and most consistent risk factor—maternal viral load.

Other mother/infant characteristics were similar in both sets of mother-infant pairs.

Among HIV-infected infants congenital and overall CMV infections were more common than in HIV-uninfected infants, 14% (as in other studies) compared to 3%; and 84% compared to 63%, respectively. Acquired CMV infection was common to all infants in the study. CMV infection during delivery and the period immediately following birth accounted mostly for the higher percentage found in HIV-infected infants. The authors believe this can be attributed to cervical shedding.

Congenital (OR: 4.9, p=0.009) and overall CMV (OR: 3.0, p<0.001) infection were strongly associated with overall HIV infection.

The timing of both HIV and CMV infections are of importance. Congenital CMV was linked to both HIV infection during pregnancy (OR:8.1, p=0.01) and HIV infection acquired during birth (p=0.03). However, CMV infection acquired after birth was not associated with HIV infection during pregnancy (OR: 0.9, p=1.00) but was significantly associated with HIV infection acquired during delivery (OR: 2.5, p=0.04).

The order of the timing and linking of infections, the authors note, suggests that foetal or infant CMV infection predisposes to HIV infection and not the other way around. There is no evidence to support this and it may be because of some unknown confounding factor, they add.

The authors note that it is probable that the two infections are linked in some way, adding it is likely that one viral infection facilitates the other.

The authors note that 85% of HIV-infected infants were co-infected with CMV by 18 months of age and suggest their impaired immune functioning may make them more susceptible to horizontally acquired infections.

The authors conclude that in an analysis of multiple risk factors for mother-to-child transmission in a formula-fed population of HIV-infected mothers “congenital and acquired CMV infections are strong independent predictors of mother-to-child transmission.”

Reference
ScienceDaily (Aug. 12, 2011) — Researchers have traced in detail how certain powerful HIV neutralizing antibodies evolve, a finding that generates vital clues to guide the design of a preventive HIV vaccine, according to a study appearing in Science Express this week. The discoveries were made by a team led by the Vaccine Research Center (VRC) at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health.

"This elegant research brings us another step closer to an HIV vaccine and establishes a potent new technique for evaluating the human immune response to experimental vaccines, not only for HIV, but for pathogens generally," said NIAID Director Anthony S. Fauci, M.D.

The new findings build on last year's discovery reported by VRC scientists of three HIV antibodies, two of which could stop more than 90 percent of known global HIV strains from infecting human cells in the laboratory. Called VRC01, VRC02 and VRC03, these antibodies were found in blood donated for NIAID studies by an HIV-infected North American known as donor 45. In the new paper, scientists report discovering antibodies similar to VRC01 in the blood of two HIV-infected Africans known as donor 74 and donor 0219.

The researchers further discovered that these VRC01-like antibodies all bind to the same spot on HIV in the same way. This suggests that an HIV vaccine should contain a protein replica of this spot, known as
the CD4 binding site, to elicit antibodies as powerful as VRC01, according to the researchers. The CD4 binding site is one of the few parts of the continuously mutating virus that stays the same across HIV variants worldwide, and the virus uses this site to attach to the cells it infects.

The scientists previously found that the genes for VRC01-like antibodies undergo an unusually high number of mutations—70 to 90—between the first draft that codes for a weak antibody and the final version that codes for an antibody that can neutralize HIV. These genes lie in the DNA of immune cells called B cells.

"To make a vaccine that elicits VRC01-like antibodies, we will need to coach B cells to evolve their antibody genes along one of several pathways, which we have now identified, from infancy to a mature, HIV-fighting form," said VRC Director Gary J. Nabel, M.D., Ph.D.

To guide B cells along this extended evolutionary pathway, the scientists first needed to map the route. They began by turning to an existing technology to sequence the collection of B-cell genes that code for all the antibodies created by a person’s immune system. This study marks the first time this technology, called deep sequencing, has been used to track the evolution of the antibody response to HIV at the genetic level. The NIH researchers then devised sophisticated bioinformatics techniques to decipher the large library of genetic data produced by deep sequencing.

"We found a way to read the books, or genes, in this library by defining unique characteristics of VRC01-like antibodies,” said Peter Kwong, Ph.D., chief of the VRC’s structural biology section and co-principal investigator of the study.

Based on their discovery of the common structure and genetic origin of the VRC01-like antibodies, the scientists devised strategies for scanning the B-cell DNA libraries of donor 45 and donor 74. From hundreds of thousands of antibody genes, the scientists first identified thousands that code for VRC01-like antibodies and then sorted these genes into family trees showing their evolution from their earliest stage into mature forms. The genes that coded for HIV neutralizing antibodies grouped together on the same branches of the trees.

Next, the researchers focused on the gene segment that codes for the part of the VRC01-like antibody that attaches to and neutralizes HIV. Examining this sequence in the genes of the newfound relatives of VRC01 revealed how the sequence changed step by step along one of a few clear paths from its original state into a mature form. A vaccine that elicits VRC01-like antibodies would need to coax the B-cell DNA of immature antibodies to evolve along one of these pathways.

The scientists now aim to create proteins they can deliver through a vaccine to serve as signposts that direct the development of B-cell DNA to produce VRC01-like antibodies.

The new research has far-reaching implications for vaccine development. "As we develop and test new HIV vaccines, it will be possible to analyze not just antibodies in the blood, but also the specific B-cell genes that are responsible for producing antibodies against HIV," said John R. Mascola, M.D., deputy director of the VRC and co-principal investigator of the study. "This information will indicate whether an investigational HIV vaccine in a preclinical or clinical trial is heading in the right direction."

Journal Reference:
Judge throws HIV law into question
11/08/2011 00:00:00

COURTS cannot compel individuals to undergo HIV tests in cases where they are accused of deliberately infecting their partners with the virus, the High Court ruled on Thursday.

The ruling by Justice Maphios Cheda, sitting at the Bulawayo High Court, threw the attempted prosecution of Insiza South MP Siyabonga Ncube [MDC] into disarray.

Ncube was arrested in June after a journalist from the state-run B-Metro newspaper alleged that he had infected her with HIV during their romance from August 2009 to July 2010.

But Ncube’s trial has exposed deficiencies in the drafting of Section 79 of the Criminal Law and Codification and Reform Act which, while criminalising “deliberate transmission of HIV”, does not provide the courts with tools to enforce the law.

By contrast, Section 80 provides for an “appropriate test” to be conducted in cases of rape; aggravated indecent assault; and having sexual intercourse or performing an indecent act with a young person.

The MP’s trial magistrate Mark Dzira ordered him to undergo an HIV test in July, and he immediately appealed to the High Court.

At a High Court hearing two weeks ago, prosecutor Nonhlanhla Ndlovu conceded the magistrate’s order was “incompetent” and without legal foundation, but she asked for directions from Justice Cheda.

Granting Ncube’s appeal on Thursday, Justice Cheda said: “It is ordered that the ruling of the magistrate be and hereby set aside.”

Ncube returns to the Magistrates’ Court on July 18 with a discharge now likely as prosecutors will not be able to prove the charge against him.

Under Section 79, for the prosecution to succeed, the state must prove that Ncube, knowing he had HIV or realising that there was a real risk or possibility that he is infected with HIV “intentionally did anything ... which he knew would infect” his partner.

It is a defence under the law if the accused can prove that the alleged victim knew that he was HIV, or where she gave consent to sex “appreciating the nature of HIV and the possibility of becoming infected with it”.

If convicted, the MP faces 20 years in jail.

Ncube has not been formally asked to plead, although his lawyers have indicated he will enter a not guilty plea, but concede on a second charge of sending his accuser, Simiso Mlevu, abusive text messages.

State OKs Rules to Foil Spread of Chlamydia

*Boston Globe*, (08.11.2011) Kay Lazar

New rules approved by state health regulators will allow Massachusetts care providers to prescribe or dispense antibiotics for chlamydia to the sex partners of infected patients, without examining the partners.

“Right now, if you treat someone and cure them, they could literally be re-infected within hours or days from an untreated sexual partner,” said Kevin Cranston, director of the state Public Health Department (DPH)’s infectious-disease bureau.

The Public Health Council, an appointed panel of physicians, consumer advocates, and professors, approved the regulation on Wednesday in the hope of reducing the rapid spread of chlamydia, particularly among young people. Cases of the STD have more than doubled over the last decade, from approximately 8,700 in 1999 to more than 21,200 in 2010, DPH data show.

Last year, chlamydia infection rates in people ages 15-19 were quadruple Boston’s overall rate, records indicate. The highest rates were among black women ages 15-24. The neighborhoods hardest-hit were Dorchester, Mattapan, and Roxbury.

Chlamydia is often symptomless, but left untreated can lead to female infertility. Treatment for most patients is one dose (two pills) of azithromycin.

Patients diagnosed with chlamydia will now be given a prescription and a fact sheet for each sex partner. Cranston said the consumer-friendly fact sheets will be available in Spanish, Portuguese, French,
and Haitian Creole. If funds allow, the information also will be published in Vietnamese and Khmer, he said.

**China Finds (Another) HIV-Positive Septuagenarian**

*Wall Street Journal*, (08.08.2011) Laurie Burkitt

An elderly man in the city of Wuhan in central China was recently diagnosed with HIV, more evidence that the senior population is underserved by the nation’s AIDS prevention efforts.

According to the state-run Xinhua News Agency, the widower approaching 80 had no recent history of blood transfusion and likely contracted the virus through unprotected sex. Last year, a Guangzhou health official said a 94-year-old was found to be HIV-positive. Xinhua said China’s senior population is becoming more sexually active as overall health in the country improves.

In China, HIV/AIDS prevention efforts have typically focused on young people, men who have sex with men, sex workers, and migrants, Xinhua said. Older men report seeking out commercial sex because their wives either died or lacked interest in sex, according to China Daily. The newspaper cited the case of one 70-year-old HIV-positive man who said he thought he contracted the virus by having unprotected sex with women at a “sauna.”

China has an estimated 4 million to 10 million female sex workers, China Daily said, citing a study by the Chinese University of Hong Kong. Some 6 percent of Chinese males ages 20-64 report paying for sex from these women, according to the report.

**Researchers create new experimental vaccine against chikungunya virus**

NIH awards $3 million to prepare for clinical trials; developers hope vaccine will alleviate suffering caused by mosquito-borne virus in Asia and Africa and limit its spread

GALVESTON — Researchers have developed a new candidate vaccine to protect against chikungunya virus, a mosquito-borne pathogen that produces an intensely painful and often chronic arthritic disease that has stricken millions of people in India, Southeast Asia and Africa.

A single dose of the experimental vaccine protected lab mice from infection with the virus, according to a paper published online in the journal *PLoS Pathogens* by researchers from the University of Texas Medical Branch at Galveston, Inviragen, Inc., of Ft. Collins, Colorado, the University of Wisconsin, the Centers for Disease Control and Prevention and the University of Alabama.

"Currently, we have no approved treatment or vaccine for chikungunya, and there’s a real need for an effective vaccine to protect against this debilitating and economically devastating infection," said Scott Weaver, director of UTMB’s Institute for Human Infections and Immunity, scientific director of the Galveston National Laboratory and senior author of the paper. "Everything we’ve seen so far suggests this vaccine candidate could fill that need."

The experimental vaccine is a "recombinant live-attenuated vaccine" created by genetically modifying the chikungunya virus using techniques developed with the initial support from the Western Regional Center of Excellence in Biodefense and Emerging Infectious Diseases, headquartered at UTMB. The resulting vaccine strain differs from wild-type chikungunya virus in two ways: it doesn’t cause disease, and it’s incapable of infecting mosquitoes; the latter trait is an important safety feature to ensure that the vaccine strain cannot initiate transmission in nonendemic locations where travelers might be immunized before a trip to Africa or Asia. But it still provokes an immune response to protect against future chikungunya infections.

Such a live virus vaccine would also be relatively economical to produce in large quantities — an important factor given the limited resources available in the areas hit hardest by chikungunya.

"We need to slow this virus down in India and Southeast Asia, not just to protect the people there but to reduce the very real risk that it might become endemic here after an infected traveler arrives," Weaver said. "The best way to do that is with a vaccine, and if you’re going to make a vaccine you have to look at where it’s going to be used and what they can afford."

UTMB has signed a license agreement with Inviragen for commercialization of the new vaccine candidate. In addition, the two partners have been chosen to receive a four-year, $3 million grant from the National Institutes of Health to complete the preclinical development work needed submit an investigational new drug application to the Food and Drug Administration, opening the door to human trials.
Software Predicted Risk in California West Nile Virus Epidemic

A computer model of the spread of West Nile virus was able to predict areas where human cases would be concentrated, especially around Sacramento in 2005. The success of the model, say researchers, depended on its focus on biological factors and on a high volume of reports from members of the public.

A computerized epidemiological model of the spread of the mosquito-borne West Nile virus in 17 counties of California in 2005 successfully predicted where 81.6 percent of human cases of the disease would arise and defined high-risk areas where the risk of infection turned out to be 39 times higher than in low-risk areas, according to newly published research. The DYCAST software used in those predictions is now open-source and is being applied to other diseases.

"One of the things that really differentiates DYCAST from other approaches is that it's based on biological parameters," said Ryan Carney, a Brown University graduate student who is the lead author on a paper about DYCAST's performance that appears in the current issue of the journal *Emerging Infectious Diseases*, published by the Centers for Disease Control. "All of the parameters in the model are based on experimental data related to the biology and ecology of the virus, mosquito vector, and bird host."

It's not just tracking the geography of actual cases. DYCAST "is based on biological parameters." For example, the spatial parameters of the model include how far mosquitoes and infected birds are likely to fly. Key time parameters include how long the virus needs to incubate in mosquitoes before they become infectious and the lifespan of infected birds. Carney said that by using biology to define the geographic and temporal attributes of the model rather than county or census tract borders, which are convenient for humans but irrelevant to birds and mosquitoes, the model allowed the California Department of Public Health to provide early warnings to an area stretching from the Bay Area through Sacramento to the Nevada line, as well as regions in southern California.

Carney implemented the software when he worked for the California department in 2005. (The software was created by Constandinos Theophilides at the City University of New York.) Feeding the model in 2005 were 109,358 dead bird reports phoned in or entered by members of the public via a state hotline and website.

As more dead birds were reported in close proximity, the software would generate daily maps of areas at high risk for human infection, providing an early warning to local public health officials. The software, for example, predicted areas as high-risk more than a month before the first human cases arose, on average.

In Sacramento County, location of the largest West Nile virus epidemic in the United States that year, DYCAST helped mosquito control officials target their testing and spraying resources—actions that ultimately reduced human illness, Carney said.

After 2005, the department implemented the model throughout the state, although the number of human cases and reported dead birds, along with the model's prediction rates, dropped sharply.

In 2007 Carney enrolled as a master's student at Yale and adapted the DYCAST model to track dengue fever in Brazil, using a version of the software that his CUNY collaborators had converted to an open-source platform. With the specific parameters of that disease, DYCAST was able to predict its spread in the city of Ribeirão Preto in Brazil, Carney said, citing unpublished data.
Carney has continued his analysis and development of DYCAST and dengue at Brown, where he is a doctoral student of ecology and evolutionary biology. He said the software at its core has potential to be adapted as an early warning system for other infectious diseases or even bioterrorism attacks.

**Journal Reference:**
Ryan Carney et al. *Early Warning System for West Nile Virus Risk Areas, California, USA.* Emerging Infectious Diseases, 2011; DOI: 10.3201/eid1708.100411

**Salmonella stays deadly with a 'beta' version of cell behavior**

COLUMBUS, Ohio – *Salmonella* cells have hijacked the protein-building process to maintain their ability to cause illness, new research suggests.

Scientists say that these bacteria have modified what has long been considered typical cell behavior by using a beta form of an amino acid – as opposed to an alpha form – during the act of making proteins.

Beta versions of amino acids occur in nature under rare and specific circumstances, but have never been observed as part of protein synthesis. Before this finding, in fact, researchers had determined that virtually all proteins were constructed with the alpha forms of amino acids.

This work has shown that when researchers delete any one of three genes from the process that makes use of the beta form of the amino acid, or if they insert the alpha form in the beta version’s place, *Salmonella* cells are no longer able to cause disease. The amino acid in question is lysine, one of 22 genetically encoded amino acids that are strung together in cells to make proteins.

"When these genes were knocked out, the cells became sensitive to antibiotics. And if we put beta lysine into the medium where cells were growing, they became resistant to antibiotics," said Michael Ibba, professor of microbiology at Ohio State University and a senior author of the study. "So we could see the beta amino acid being taken up and used. The cells really do need the beta amino acid to be resistant to antibiotics, and for other aspects of their virulence."

This finding suggests that the process using this specific beta amino acid could be an attractive antibiotic target for this common pathogen, the researchers say.

The Centers for Disease Control and Prevention estimates that about 1.4 million people in the United States are infected with *Salmonella* each year, though only 40,000 cases are reported. Most people infected with *Salmonella* develop diarrhea, fever and abdominal cramps. Though recovery can occur within a week without treatment, some severe cases require antibiotic treatment and hospitalization.

The study is published in the Aug. 14 online edition of the journal *Nature Chemical Biology.* This work began when University of Toronto scientists exploring the origins of *Salmonella*’s virulence identified three genes that were clear players in the process. These three genes – called YjeK, PoxA and EF-P – were unusual in this context.

Genes that confer virulence in bacteria typically have a specific job, such as producing toxins or transporters. But these three virulence genes all looked like they should have a role in the protein synthesis machinery – which is Ibba’s expertise.

Under normal circumstances in cells, an enzyme will select amino acids in the cell and place them on a molecule called transfer RNA, or tRNA, which leads to translation of the genetic code into proteins.

In *Salmonella* cells, these steps are similar, but with a few surprising twists, Ibba said. He and colleagues confirmed that the YjeK gene makes beta lysine, and showed that the PoxA gene takes that beta lysine and attaches it to EF-P – a protein that partially mimics the shape and function of tRNA.

"It’s a really unexpected pathway," said Ibba, also an investigator in Ohio State’s Center for RNA Biology. "It is a mimic of what normally makes protein in a cell. Where a cell would normally be expected to use an alpha amino acid, *Salmonella* puts on a beta amino acid. And it ends up making molecules that lead to the cells being virulent."

The research team first reconstructed this unusual protein synthesis process in test tube experiments, and then followed with studies in cell cultures. Even before they took on studying the mechanism, however, they knew that the effects of these virulence genes were powerful: In earlier animal studies, deleting any one of the three genes and then infecting mice with these altered *Salmonella* cells had no effect on the animals. When the genes were left intact and cells were injected into mice, the resulting *Salmonella* infection killed the animals.

In addition, when the researchers tricked *Salmonella* cells into using alpha lysine for this pathway instead of beta lysine, the cells lost their ability to cause illness.

"This tells us the cell is not going to be able to easily replace the beta amino acid," Ibba said. "It is essential for virulence in *Salmonella.*"
And that, he said, is why that amino acid might be such an effective drug target, especially as humans don’t seem to make beta amino acids at all. “You have to make an antibiotic look like something natural, only different. If you have something that’s already different like a beta amino acid, you’ve potentially got a much better drug target because it involves chemistry that’s comparatively rare in the cell. It’s harder for the cell to try to alter its own chemistry to develop resistance,” Ibba said.

From here, the researchers are observing cell behavior later in the protein-building process to figure out how this hijacked system actually gives Salmonella its virulence.

August 9, 2011: Health, July-August 2011

How the Conservatives killed a law providing cheap AIDS drugs to Africa

By Stephanie Law

In March, Canada came improbably close to establishing a system to deliver drugs cheaply and quickly to poorer countries. In a vote of 172 to 111, the House of Commons passed Bill C-393, which would have streamlined Canada’s Access to Medicine Regime, a program to provide low-cost generic drugs to the global south. It wasn’t to be: the senate stalled, waiting for the vote of non-confidence that precipitated a spring election. That vote came four days later, effectively trashing the bill.

CAMR allows generic drugmakers to export cheaper versions of brand-name drugs to developing countries, without needing the permission of the patent-holders. “We have tremendous capacity to help address a particular need,” says Richard Elliott, executive director at the Canadian HIV/AIDS Legal Network. But CAMR’s cumbersome red tape kept manufacturers away. Says Elliott: “To leave in place a regime that is not working would be harming millions of people who need access to medicines.”

The program had only been used once since it was introduced in 2005. In 2007, Apotex, the largest Canadian-owned generic drug company, shipped enough HIV medication, Apo-TriAvir, to treat 21,000 patients in Rwanda. Apotex says the final shipment went out in 2008. “We’re not likely to repeat the process under the current regime,” says Bruce Clark, Apotex’s senior vice-president of scientific and regulatory affairs. “It’s not just our decision, it’s a practical reality that no second country has made a request under the regime because it’s so complicated.” Bill C-393 would have simplified that process, but its future looks doubtful.

When C-393 passed in the House of Commons, it was supported by 26 Conservative MPs; 25 of those were re-elected, but the bill’s prospects in the new Conservative-dominated parliament look dim. “We saw what Harper did in the senate with the bill,” Elliott says.

On May 5, Elliott discussed CAMR’s future with other major advocacy groups. They’ve decided it’s not time to give up, but it will take time to re-assess the political climate before drafting some next steps. “The legal landscape is more challenging now than before,” he says. “But it’s worth trying to gather some intelligence and make a more informed assessment as to what the prospects might be before moving forward.”

Even with such slight optimism, Elliott expects the earliest the bill could be re-introduced—if at all—would be this fall.

Blue Cross Says It Will Cover HPV Vaccine for Males

Boston Globe, (08.13.2011) Deborah Katz

Blue Cross Blue Shield of Massachusetts (BCBSM) will begin covering Gardasil human papillomavirus for males, the company said Friday. Other major health insurers in the state already cover HPV vaccine for boys and young men.

The three-shot series, which can cost nearly $400, is approved for males ages 9-26 to prevent genital warts, anal cancer, and associated precancerous lesions caused by vaccine-targeted HPV types. Although CDC recommends routine HPV vaccination of girls ages 11-12 to prevent cervical cancer, it says that males “may get HPV vaccine.” CDC has not recommended routine HPV vaccination for boys.

“It is our understanding that the CDC is expected to recommend the use of this vaccine in males at its October meeting,” said Jay McQuaide, a BCBSM spokesperson. “In anticipation of the CDC taking this expected step in October, we are beginning the process to cover the vaccine in males.”

To obtain HPV vaccine coverage for males, BCBSM members must get their doctors to submit a “request for individual consideration” to the insurer. BCBSM said the requests will be routinely reviewed and granted, unless the member has a serious health issue or falls outside the indicated age range for males.
If CDC adopts a policy recommending HPV vaccine for males, BCBSM will provide coverage without requiring formal requests, the insurer said. However, if CDC “does not recommend the use of the vaccine in males in October, then we will need to take a hard look at our decision to provide coverage and may reconsider,” McQuaid said.

Men who have sex with men are at increased risk for HPV-related anal cancers, and gay rights advocates were quick to praise BCBSM’s revised policy.

**Cell-to-cell spread of HIV keeps viral reservoir going despite ART**
Keith Alcorn
Published: 17 August 2011

The presence of very low levels of HIV in the blood despite treatment with highly potent antiretroviral regimens could be explained by cell-to-cell spread of the virus that overwhelms drug concentrations within cells, according to new research from the laboratory of US Nobel prize winner David Baltimore.

Journal *Nature*, is an attempt to explain why, despite reducing HIV replication to very low levels, highly potent regimens that target several different steps in the HIV life cycle cannot shut down HIV replication altogether.

Development of drug delivery methods that can raise drug concentrations within cells vulnerable to HIV infection could stop this process – and gradually shrink the reservoir of HIV-infected cells that maintain infection within the body. This would aid efforts to cure HIV infection, although it is unlikely to cure HIV infection alone.

Researchers at the California Institute of Technology compared the effects of the drugs in one of the most potent antiretroviral combinations (tenofovir, emtricitabine and efavirenz) on suppressing HIV spread in cell cultures.

They found that cell-free infection – where cells become infected by virions that have been released from other cells – was efficiently prevented by tenofovir and efavirenz. In the presence of tenofovir cell-free infection declined thirty-fold.

However, infections that occurred by the transfer of virus through direct contact between cells were much less affected by the presence of drug. At the highest drug concentrations, the transmission rate due to cell-to-cell infection was six times higher than the rate of cell-free infection.

“We saw that with cell-to-cell infection, you wind up with a lot more virus infecting a single cell,” explained Alex Sigal, a postdoctoral scholar in Baltimore’s laboratory and lead author of the study. “When this happens, the chance of at least a single virus getting past the drugs is much larger.”

In fact, they found that whereas cell-free infection might transmit one virus, in the presence of tenofovir or efavirenz respectively, an average of 75 and 175 viruses were being transferred from one cell to another when direct transfer took place.

“And you only need one virus to infect a cell and keep the cycle going, forming a reservoir of infection,” said Sigal.

Furthermore, once infection became established as a result of cell-to-cell transfer, the number of infected cells in the test tube kept growing despite tenofovir concentrations similar to those achieved by...
normal dosing. It was only when tenofovir concentrations were at their peak that the number of infected cells began to decline slightly with each cycle of virus replication.

This finding implies that getting more drug into cells, and keeping it there, would limit replication as a result of cell-to-cell spread, but it’s unclear at this stage whether higher drug levels would stop it in the first place.

Determining the location of viral reservoirs in the body, as well as mechanisms that maintain it, are important parts of the search for an HIV cure. Eliminating the reservoir, or at least finding ways of keeping it from spurring new rounds of HIV replication, will be essential because, at the moment, the reservoir of infected cells is enough to cause a huge rebound in viral load within weeks of stopping antiretroviral treatment.

"It's important to determine whether or not cell-to-cell replication is causing a reservoir, particularly in terms of finding a cure," said Sigal. "You can't treat it the same way as you would a latent reservoir."

Strategies to 'wake up' virus in resting cells so that it could be cleared by antiretroviral drugs would not address cell-to-cell spread of the virus.

"For us, the next step is to look at the process on a more physiological level by looking at how HIV infects in organs such as lymph nodes where cell-to-cell transmission actually happens," said Sigal.

"We're really looking for a cure, but to get to a cure, you have to fully understand the disease first," he said.

Reference

Charity hits out at jail sentence for Northampton man who gave partner herpes

By Rob Middleton
Published on Tuesday 16 August 2011 02:18

A CHARITY and leading doctors have criticised the jailing of a Braunston man who passed on genital herpes to his partner.

David Golding, 28, was jailed for 14 months at Northampton Crown Court last week after he kept quiet about having the sexually transmitted infection.

The traffic officer with the Highways Agency, who pleaded guilty to inflicting grievous bodily harm, had caught it from a previous partner.

He claimed to have been given the all-clear before passing it onto a new partner towards the end of 2009, without ever disclosing he had it.

Nigel Scott, of the Herpes Viruses Association, said: “This is outrageous. Will children also now be prosecuted for giving their friends chicken pox? For passing on a cold sore?

“Most people who have genital herpes don’t know it because even if they do get recurrences, it is such a trivial infection that they don’t notice it. It has exactly the same medical implications and consequences as an ordinary facial cold sore so in no way can it be construed as serious.

“It is an extraordinarily ill-informed comment to compare it to HIV. This case sets back the normalisation of this trivial infection by years. I had thought such a farcical scenario could only happen in America . . . never in Northampton”.

Dr Colm O’Mahony, who is a sexual health consultant, said: “Being sent to prison for passing on herpes simplex is like being sent down for 10 years for a parking offence. I’m appalled. There is no way of proving who gave herpes to whom and with so many of the population already unknowingly infected it is irrelevant to blame someone specific. It is a cold sore in an awkward place.”

Marian Nicholson, director of the Herpes Viruses Association said, “It is unfortunate genital herpes is being dragged in to court like this. While we sympathise with the woman, she is one of nearly 75,000 new cases each year.

“This is a very common virus – herpes simplex – that most of us carry without even noticing. We know that many of those who are diagnosed are reluctant to disclose their status but this is because of the unnecessary stigma, not because it is serious . . . emphatically it is not.”

HIV in America: Studies Zero In on Trouble Spots

Reuters, (08.17.2011) Julie Steenhuysen

Sophisticated mapping and medical record technologies can help target AIDS-related resources to those who need it most, according to several studies presented at the 2011 National HIV Prevention Conference in Atlanta. Dr. Jonathan Mermin, director of the Division of HIV/AIDS Prevention at CDC, which
sponsored the gathering, said the research will help inform implementation of the National HIV/AIDS Strategy.

Dr. Alexandra Oster of CDC and colleagues presented data on a study of nearly 30,000 people in 21 US cities. They noted HIV infection rates well above the national average among three at-risk groups: men who have sex with men (19 percent); injection drug users (9 percent); and heterosexuals in low socioeconomic groups (2 percent). Nearly half of those with HIV did not know they were infected, the team said. The infection rate for the general US population is 0.47 percent.

A study of residents of Los Angeles County used disease mapping software to track HIV infection and treatment rates. Dr. Jennifer Sayles, director of the county’s Office of AIDS Programs and Policy, looked at treatment coverage among the roughly 12,000 HIV-positive residents whose care is paid for through the Ryan White program. While 90 percent of these patients reported antiretroviral treatment, a cross-check of ZIP codes found significant variations in treatment by neighborhood. Blacks, people under age 24, recent substance abusers, recent prisoners, and the poor were more likely to have poorly controlled disease.

Dr. Ann Avery of the Cleveland Department of Public Health presented a study on the impact of an HIV testing prompt added to the electronic medical records at MetroHealth, a city-based hospital system. At the study’s start just 4 percent of patients were screened for HIV. Six months after implementation, testing at the hospital’s outpatient clinics increased by almost two-thirds. First-time testing among men increased from 2.9 percent to 6.1 percent.

**US Scientists Expand Scope of HIV Vaccine Study**

*Voice of America News*, (08.11.2011) Joe DeCapua

A US-based HIV vaccine trial is expanding the number of participants it will enroll as well as the scientific questions it will probe.

Conducted in 12 US cities, the HIV Vaccine Trials Network 505 (HVTN 505) study will assess a dual vaccine candidate for safety and whether it can prevent infection, not just curb the virus in a person already infected. Enrollment is increasing from about 1,300 men who have sex with men, and transgender women who have sex with men, to 2,200.

The trial’s scientific scope changed in response to the RV-144 trial in Thailand in 2009, which proved it was possible to for a vaccine to prevent HIV infection. Though the vaccine’s efficacy was too low, the research offered the first-ever evidence that an HIV/AIDS vaccine candidate conferred even modest protection against infection.

“Because of the Thai trial, what we saw in that vaccine actually preventing infection was, wow, we really need to then look differently at HVTN 505 and expand its ability to look at the question: could this vaccine actually also prevent infection, prevent acquisition of HIV?” said Mitchell Warren, head of the AIDS Vaccine Advocacy Coalition (AVAC). Previously, a main outcome was whether a candidate lowered viral load in vaccinated persons who later became infected.

The HVTN 505 trial will assess whether the vaccine candidate stimulates both an antibody response to prevent HIV infection and a cell-mediated immune response to mitigate infection, said Warren.

“It uses a prime-boost combination of two different vaccines,” Warren said. “One is a DNA vaccine that has snippets of HIV that can’t cause HIV at all, but is meant to kind of prime the immune system. And then it has an Adeno 5 (adenovirus type 5, a common cold virus) vaccine boost.”

For more information about the trial, sponsored and funded by the National Institute of Allergy and Infectious Diseases, visit: http://www.hvtn.org/media/news.html. Volunteers should visit: http://www.hopetakesaction.org/volunteering/index.html.

**Popular Herbal Supplements May Adversely Affect Chemotherapy Treatment**

*Doctors urge cancer patients to discuss supplements with their doctors before beginning treatment*

July 13, 2011; Chicago

Acai berry, cumin, herbal tea, turmeric and long-term use of garlic – all herbal supplements commonly believed to be beneficial to your health – may negatively impact chemotherapy treatment according to a new report presented at the recent American Society of Clinical Oncology (ASCO) meeting in Chicago. Researchers from Northwestern Memorial hospital say there is growing evidence that these popular supplements may intensify or weaken the effect of chemotherapy drugs and in some cases, may cause a toxic, even lethal reaction.

“With the growth of the Internet, patients have better access to information about alternative products and often turn to dietary and herbal supplements to treat their illness because they think they’re
natural and safe,” said June M. McKoy, MD, geriatrician at Northwestern Memorial Hospital and lead investigator on the ASCO presentation. "What people don’t realize is that supplements are more than just vitamins and can counteract medical therapies if not taken appropriately”.

McKoy, who is also director of geriatric oncology at the Robert H. Lurie Comprehensive Cancer Center of Northwestern University, says more research is needed to understand which supplements interact with chemotherapy drugs and the extent of those interactions and encourages patients to openly communicate with their physicians about the use of supplements.

“Patients need to tell their doctors what medications they are taking – including vitamins and supplements – to avoid any possible interaction,” said McKoy who is also an assistant professor of medicine and preventive medicine at Northwestern University Feinberg School of Medicine. Herbal supplements, defined as plant or plant parts used for therapeutic purposes, can interact with chemotherapy drugs through different mechanisms. Some herbs can interfere with the metabolism of the drugs, making them less effective while other herbs such as long-term use of garlic may increase the risk of bleeding during surgery. While culinary herbs used in small quantities for flavoring are generally safe, consuming large amounts for prolonged periods of time may have a negative effect on the body when going through chemotherapy.

Recent research shows that 50 percent of patients undergoing chemotherapy did not tell their doctor they were taking alternative therapies. “Some believe it’s not important, while others are uncomfortable admitting they are pursuing alternative therapies,” said McKoy. “The truth is, integrative approaches can be beneficial for cancer patients, but it’s important to take these approaches at the right time and under the supervision of your doctor.”

McKoy urges patients to stop taking herbal supplements while receiving chemotherapy until more is known about possible interactions, but encourages those who are interested in complementary approaches to have a conversation with their doctor about other approaches that may be beneficial.

“Integrative therapies such as massage, acupuncture and meditation can address important patient needs by alleviating stress, addressing pain and helping patients cope,” said Melinda Ring, MD, medical director for the Northwestern Memorial Physicians Group’s Center for Integrative Medicine and Wellness.

No matter the course of treatment, McKoy stresses the importance of physicians and patients being more cognizant of this potential interaction and encourages communication about all herbal supplement intakes. “Patients should bring in labels and bottles to their appointments. This can help the doctor calibrate drug dosage with other supplements in mind in order to prevent toxicities,” stated McKoy.

McKoy plans to launch a pilot study this summer to examine how frequently conversations about supplements come up between cancer patients and their doctors.

“By identifying communication barriers, we can take steps to improve doctor patient communication in order to prevent potentially dangerous drug interactions,” said McKoy.

AIDS researchers isolate new potent and broadly effective antibodies against HIV
Discovery provides new directions for AIDS vaccine design
NEW YORK, NY, LA JOLLA and SOUTH SAN FRANCISCO, CA, SEATTLE, WA, August 17, 2011 — A team of researchers at and associated with the International AIDS Vaccine Initiative (IAVI), The Scripps Research Institute, the biotechnology company Theraclone Sciences and Monogram Biosciences Inc., a LabCorp company, report in the current issue of Nature the isolation of 17 novel antibodies capable of neutralizing a broad spectrum of variants of HIV, the virus that causes AIDS.

The new antibodies, large protein molecules that bind to pathogens and flag them for destruction, were isolated from blood serum samples collected in a continuing global search for broadly neutralizing antibodies (bNAb) launched by IAVI. They should provide researchers with a new set of targets for the design of vaccine candidates that can elicit similar antibodies to protect people from contracting HIV. Some of the bNAb blocked HIV infection of cells as much as 10 to 100 times as potently as previously discovered bNAb.

"Most antiviral vaccines depend on stimulating the antibody response to work effectively," said Dennis Burton, a professor of immunology and microbial science and director of the IAVI Neutralizing Antibody Center at The Scripps Research Institute in La Jolla, Calif. Professor Burton, one of the senior authors of the study, is also a member of the Ragon Institute, in Cambridge, Mass. "Because of HIV's remarkable variability, an effective HIV vaccine will probably have to elicit broadly neutralizing antibodies. This is why we expect that these new antibodies will prove to be valuable assets to the field of AIDS vaccine research."
Only a minority of people who are HIV-positive begin to produce bNAbs after several years of infection. Animal studies suggest that such antibodies could block HIV infection if they were elicited by a preventive vaccine. Researchers prize bNAbs because their structural and biochemical analysis can reveal how to achieve a preventive vaccine. Specifically, scientists expect that they can use information about how bNAbs bind to HIV to construct immunogens—the active ingredients of vaccines—that elicit similar antibodies. The potency of bNAbs matter because a highly potent antibody could confer such protection at relatively low levels.

"Solving the neutralizing antibody problem is perhaps the greatest challenge facing the field today," said IAVI’s chief scientific officer, Wayne Koff. "IAVI concluded many years ago that unlocking the information stored in bNAbs was going to be essential to the fulfillment of our mission—ensuring the design and development of broadly effective AIDS vaccines. This is why we support several laboratories around the world that are designing novel vaccine candidates on the basis of what we’re learning from such antibodies. We have no doubt that these new bNAbs will contribute a great deal to our own immunogen design efforts and, we hope, those of other researchers working on AIDS vaccines."

In that regard, the new bNAbs are encouraging. Many of them bind hitherto unknown molecular structures, or epitopes, on the surface of HIV. This means that they could significantly broaden the target options researchers have in designing vaccines to elicit similar antibodies.

How the antibodies were discovered

The 17 new bNAbs described in the current Nature report were isolated from four HIV-positive individuals. The effort, sponsored by IAVI, is unprecedented in scale and distinguished by its emphasis on identifying antibodies that neutralize subtypes of HIV circulating primarily in developing countries. It had previously yielded three potent bNAbs, two of which, PG9 and PG16, were isolated by this research team in 2009 and described in the journal Science. Another bNAb was subsequently isolated from these samples by researchers at the Vaccine Research Center of the National Institutes of Health, who have also discovered a set of bNAbs from separate blood samples using an entirely different approach.

Both the previous and current studies used Theraclost Science’s highly sensitive I-STAR™ technology to isolate the antibodies. The new crop of bNAbs, like PG9 and PG16, was rescued from cell cultures derived from single antibody-producing B cells used for antibody discovery and development. Theraclost Sciences Executive Chair and Interim CEO, Steven Gillis commented, "We’re delighted that I-STAR has provided essential support in identifying bNAbs that will contribute to advancing AIDS vaccine development. In this project, and in our own infectious disease and cancer programs, the I-STAR platform continues to demonstrate a remarkably powerful ability to isolate rare antibodies with unique properties. Theraclost values these collaborative opportunities in which I-STAR can be used to help improve treatment for critical diseases."

Monogram Biosciences, which also participated in the discovery of PG9 and PG16, conducted the neutralization assays essential to isolating the new bNAbs. The serum samples from which they were isolated represent the top 1% of all such samples gathered by IAVI and its partners, in terms of the number of HIV variants they neutralize and the potency with which they do so.

"Monogram has developed a highly skilled scientific team capable of taking on a variety of biomedical challenges," said Chris Petropoulos, Vice President, Laboratory Corporation of America Holdings, Research and Development, Monogram Biosciences. "Their expertise and innovation has been invaluable to the discovery of these new antibodies. This research illustrates the important role different sectors of the research and health care community can play in supporting global health initiatives."

The analysis of the new antibodies also hints at how future vaccines ought to be formulated to maximize their effectiveness. On the basis of their analyses, the authors of the report conclude that AIDS vaccine candidates that seek to effectively harness the antibody response should probably attempt to elicit certain combinations of bNAbs if they are to provide truly comprehensive protection from HIV.

Further evidence that `breast is best` for children of mothers with HIV in sub-Saharan Africa

Carole Leach-Lemens
Published: 19 August 2011
Early weaning resulted in almost twice as many acute illnesses and hospitalisations among HIV-exposed uninfected infants when compared to infants who continued to be breastfed beyond six months of age, long-term follow-up of the PEPI-Malawi study of extended infant antiretroviral prophylaxis has shown.
However, the difference only became apparent after 12 months of age, suggesting that both breastfeeding and antiretroviral prophylaxis beyond 12 months of age—the currently recommended milestone for HIV-positive mothers to begin weaning uninfected infants—ought to be evaluated by studies of longer breastfeeding and prophylactic regimens.

The findings are published in the August 15 edition of Clinical Infectious Diseases.

At 15 months of age 6.4% of infants weaned early had died compared to 3.5% of those still breastfeeding (p= 0.03).

Improving the survival of infants born to mothers with HIV who remain uninfected is a serious challenge in sub-Saharan Africa.

Studies in Malawi, Uganda and Botswana have shown how early weaning (at 4–6 months of age) to prevent HIV transmission compared to breastfeeding for longer periods has resulted in severe diarrhoea and death, acute malnutrition and/or stunted growth. Additionally, stopping breastfeeding has not improved HIV-free survival (remaining alive and being free of HIV infection).

Balancing the risks and benefits of breastfeeding in resource-poor settings where safe alternatives are rare has been the subject of lengthy debate.

Breastfeeding provides many protective factors including complete nutritional requirements and is vital to survival in resource-poor settings especially in the first few months of life. The World Health Organization (WHO) recommends breastfeeding for 12 months or longer.

The authors note that while evidence from resource-poor setting shows the increased risk of death and disease from not breastfeeding, the timing of these events is poorly understood.

In the interests of programme planning and clinical management the authors stress the importance of knowing the immediate and long-term effects of early weaning.

They hypothesise that stopping breastfeeding to prevent HIV transmission “leads to early acute morbidity that occurs during the process of weaning or immediately after weaning.” They recognise that death linked to weaning happens late and after the process of weaning is completed.

The authors chose to look at rates of illness and/or hospitalisation among HIV-exposed, uninfected Malawian infants in follow-up periods of three months after weaning took place and to determine the cumulative death rates over time. The infants were part of the PEPI-Malawi trial.

The PEPI-Malawi trial took place from 2004 to 2009 to determine the efficacy of extended infant antiretroviral prophylaxis for up to 14 weeks after birth to reduce HIV transmission after birth. The study showed that 14 weeks of infant antiretroviral prophylaxis had a greater protective effect than single dose nevirapine plus one week of AZT.

The infants and their mothers were seen at birth and at 1, 3, 6, 9 and 14 weeks of age. After 14 weeks follow-up visits were at six months of age and then every three months until 2 years of age.

Mothers in the trial were advised to stop breastfeeding by six months. The characteristics of the mothers in the groups were similar and remained constant over time. However, more women in the NBF group had CD4 cell counts at baseline under 250 cells/mm³ than in the BF group.

This analysis included HIV-uninfected infants at six months of age. Breastfeeding and illness and or hospital admission and malnutrition (defined as weight for age Z score of or less than two) were compared during the age intervals of 6–9 months, 9–12 months and 12–15 months.

Breastfeeding (BF) was defined as any breastfeeding at the start and end of the interval, and no breastfeeding was defined as no breastfeeding (NBF) at any time during the interval.

Among 1761 infants, after controlling for extended antiretroviral infant prophylaxis, infant cotrimoxazole prophylaxis and maternal HIV disease stage, the rate ratios for illnesses and/or hospital admissions for NBF compared to BF at 6–9 months, 9–12 months and 12–15 months were 1.7, p<0.0001, 1.66, p=0.0001 and 1.75, p=0.0008, respectively.

No breastfeeding was consistently and significantly associated with a higher risk of illness and/or hospitalisation.

The authors note these findings support their hypothesis and suggest “that the adverse effects of weaning occur quickly and manifest as acute events resulting in clinic visit or hospital admission.”

While death rates were similar between the BF and NBF groups during the 6–12 month age interval the risk of death was significantly higher in the NBF group during 12–15 months of age. This finding, the authors note, reinforces that of another study, which showed that stopping BF early was associated with increased mortality that continued into the second year of life in HIV-exposed, uninfected African children.

The authors also note the apparent association of cotrimoxazole prophylaxis (CTXP) with lower frequency of illnesses and/or admissions at each age interval for these infants. Evidence has shown the
benefits of CTX in HIV-infected infants and adults, while studies in HIV-exposed, uninfected infants are lacking.

A clinical trial (the PROMISE study) will begin soon that will determine if extended CTXP can reduce death and disease after stopping breastfeeding among HIV-exposed, uninfected infants. The authors suggest a potential bias of excluding infants who became HIV-infected during the follow-up period, as most of these were in the BF group.

They also note the issue of reverse causality that is common to breastfeeding studies. Illness, for example, may lead mothers to stop breastfeeding and as such is the cause of not breastfeeding rather than the result.

The authors conclude “with the introduction of maternal antiretrovirals for both prophylaxis and treatment, breastfeeding duration could be extended. The impact of these changes on child health needs to be evaluated. In settings similar to Malawi, where the background rates of illness and death are high, inexpensive preventive strategies such as cotrimoxazole prophylaxis of HIV-exposed, uninfected children during and after weaning, should be considered.”

Reference

Cameroon: Free Men Charged Under ‘Sodomy’ Law
Two Men Detained for Feminine Appearance Say Police Tortured Them
August 17, 2011
Cameroon’s law criminalizing homosexual conduct is a tool of persecution that is used freely by the police and judiciary against innocent people. A conviction against Jonas and Franky will send a frightening message that people in Cameroon can be tortured and jailed just because of the way they look.

Dipika Nath, researcher of the Lesbian, Gay, Bisexual and Transgender Rights Program (Johannesburg) – Three men returning from a bar last month in Yaoundé, the capital of Cameroon, were detained by police because two of them appeared feminine, Association pour la Défense de l’Homosexualité (ADEFHO) and Human Rights Watch said today. The three were jailed on July 25, 2011, for one week and were tortured and otherwise abused by police during this time, according to a Cameroonian civil society group that has been working on their behalf.

One man was released a week later, while the two who appeared feminine were charged with “homosexuality” under Section 347 bis of Cameroon’s penal code, which criminalizes consensual same-sex sexual conduct. They will be tried at the Court of First Instance in Ekounou, Yaoundé, today, August 18.

“Police in Cameroon are arresting people for supposedly looking homosexual, which is absurd and also violates Cameroon’s constitution as well as international law,” said Alice Nkom, Director, ADEFHO. “They are relying on a discriminatory statute to punish people simply for the way they look.”

Jonas, 19, and Franky, 20, were in the company of an older man on the night of July 25 and were returning from a bar when they were stopped by police officers of the Mobile Intervention Group of the first subdivision of Yaoundé. According to the two detainees, the police at first assumed that Jonas and Franky were women because of their feminine appearance. However, upon checking their identification documents, in which Jonas and Franky were identified as male, the police took all three to the offices of the Regional Directorate of the Judicial Police of the first subdivision of Yaoundé, where they were held until August 1.

Cameroonian law declares that a detainee may be held for only up to 48 hours before being brought before a magistrate or judge. However, all three individuals were held for seven days before being charged. During this time, Jonas and Franky refused to make a statement to the police in the absence of legal representation. Members of ADEFHO, who are representing them, informed Human Rights Watch that police personnel tortured and harassed them in custody. The third man was not harassed or beaten.

Jonas told ADEFHO that police slapped him and beat him on the soles of his feet to make him confess to being homosexual – both Jonas and Franky confessed. They also intimated that they did not receive food while in custody.

On August 1, the three individuals were taken to the Attorney of the Republic at the Court of First Instance, who issued warrants against Jonas and Franky, whose trial is scheduled to begin on August 18; the older man was released. Jonas and Franky remain in custody at the Central Prison in Kondengui, Yaoundé, awaiting trial.
In March 2011, another individual, Roger Jean-Claude Mbede, was sentenced to three years in prison because he admitted to the police that he was homosexual. In that instance, as in this more recent one, there was no evidence to prove criminal conduct. Mbede’s health has declined in prison and he is at risk of violence because of his sexual orientation. If convicted and sentenced, Jonas and Franky could be similarly vulnerable to abuse.

In 2010, the United Nations Human Rights Committee recommended that Cameroon should decriminalize consensual homosexual conduct. Cameroon’s constitution grants equal rights, freedom, and security to all persons and ensures the protection of minorities.

“Cameroon’s law criminalizing homosexual conduct is a tool of persecution that is used freely by the police and judiciary against innocent people,” said Nath. “A conviction against Jonas and Franky will send a frightening message that people in Cameroon can be tortured and jailed just because of the way they look.”

**HIV Risk After Release from Prison: A Qualitative Study of Former Inmates**

*Journal of Acquired Immune Deficiency Syndromes Vol. 57; No. 5: P. 429-434.* (08.15.2011) Jennifer Adams, MD; Carolyn Nowels, MSPH; Karen Corsi, ScD, MPH; Jeremy Long, MD, MPH; John F. Steiner, MD, MPH; Ingrid A. Binswanger, MD, MPH

Noting that “former prison inmates are at risk of HIV and hepatitis C (HCV) infection,” the researchers designed the current study to understand how such individuals perceived their risk for these diseases after prison, the behaviors and environmental factors that put patients at risk for new infection, and the barriers to accessing health care.

The qualitative study used individual, face-to-face, semi-structured interviews to explore participants’ perceptions, risk behaviors and barriers to accessing regular medical care post-incarceration. A team-based general inductive approach was used to code and analyze transcripts of the interviews.

The racially and ethnically diverse participants — 20 men and nine women, ages 22 to 57 — were interviewed within two months of their release from prison to the Denver, Colo., community.

The four principal themes that emerged from these interviews were:

- Risk factors — including unprotected sex, transactional sex and drug use — were prevalent in the post-release period.
- There was disproportionate engagement in risky behavior in the first few days post-release.
- Former inmates needed to know more about HIV and HCV.
- Former inmates faced major challenges in accessing health care and medications.

“Risk factors for HIV and HCV infection were prevalent among former inmates immediately after release,” the authors concluded. “Prevention efforts should focus on education, promotion of safe sex and needle practices, substance abuse treatment, and drug-free transitional housing. Improved coordination between correctional staff, parole officers and community health care providers may improve continuity of care.”

**Gene Therapy Using Modified HIV Hailed as Potential Cancer Cure**

Published on Friday, 12 August 2011 00:00
Written by Liz Highleyman

Image courtesy of University of Pennsylvania School of Medicine

Genetically engineered T-cells altered with a viral vector derived from HIV were able to destroy tumors and induce sustained remission in patients with leukemia—a technique related to gene therapy currently being tested to protect T-cells from HIV infection.

As described in the August 10, 2011, issues of both *Science Translational Medicine* and the *New England Journal of Medicine*, Carl June from the University of Pennsylvania and colleagues removed a small number of T-cells from 3 patients with chronic lymphocytic leukemia (CLL) that did not respond to chemotherapy; their only remaining treatment option would have been a risky bone marrow transplant.

In the laboratory, the researchers used a lentivirus derived from HIV to insert a gene for a chimeric antigen receptor into the T-cells.
When this receptor was expressed on the surface of these cells, they could recognize and destroy CLL tumor cells and B-cells carrying a specific marker (CD19).

The altered T-cells proliferated by 1000-fold and persisted at high levels for 6 months in the blood and bone marrow, continuing to express the chimeric antigen receptor, the researchers reported. The 3 patients experienced sustained, ongoing remission that started 3 weeks after infusion of the altered T-cells and had lasted 10 months at the time of the report.

Participants experienced tumor lysis syndrome—a set of metabolic disturbances that occurs when a large number of tumor cells are killed and release toxic substances—indicating that the treatment was working. The other main adverse event was that the treatment knocked out normal B-cells as well as CLL tumor cells, leading to B-cell aplasia and impaired antibody production.

June is also working with Jay Lalezari of Quest Clinical Research, Ronald Mitsuyasu of the University of California at Los Angeles, and others to test a gene therapy technique that uses zinc finger nucleases to alter CD4 T-cells in people with HIV.

While the newly reported leukemia treatment essentially adds a receptor to T-cells, the HIV treatment deletes a receptor. Zinc finger nucleases cut out the gene that encodes the CCR5 coreceptor used by many types of HIV to enter cells (along with the CD4 receptor). Because the altered CD4 cells no longer express CCR5, HIV is unable to infect them.

Interim results from an ongoing pilot study of participants who reached undetectable HIV viral load but had poor immunological recovery on antiretroviral therapy showed sustained CD4 cell gains out to 8 months so far.

The technique described in the present reports could possibly be used to target other types of cancer, including myeloma, lung cancer, and ovarian cancer. Gene therapy of this sort has the potential to be a mainstay of future medical treatment for a variety of diseases if it can be scaled up to allow for widespread, cost-effective use.

Researchers Turn Their Attention To Chagas Disease As Developed Countries See Rise In Infection Rates

Chagas disease, a historically neglected tropical disease that the WHO estimates affects about 10 million people worldwide, is drawing increased attention as infection by the parasite spreads from Latin America to developed countries, such as Spain and the United States, Science reports. "The main reason for this rise isn't the spread of insects carrying Trypanosoma cruzi but rather emigration from Latin America of large numbers of people who are already infected," the magazine writes.

"[T]he number of infected people living in the United States remains unknown, says medical epidemiologist Caryn Bern of the U.S. Centers for Disease Control and Prevention in Atlanta," but "the rising incidence of Chagas disease has already required action by health officials in the United States and other developed nations," Science notes (Leslie, 8/19). In a related article, the magazine reports that "after years of stagnation, research into new treatments for Chagas disease has picked up" as researchers at the University of California "have received permission from the U.S. Food and Drug Administration (FDA) to launch a phase I safety trial of" a new compound, "dubbed K777, in the United States next year" (Leslie, 8/19).

Outbreak Of Hand, Foot And Mouth Disease Kills 81 Children In Vietnam

"Vietnam's prime minister has put the country on alert as an outbreak of hand, foot and mouth disease continues to surge, killing 81 children and sickening more than 32,000 people nationwide so far this year, officials said Friday," the Associated Press reports. "It has spread nationwide but is raging hardest in the country's south, where nearly 80 percent of the cases have been reported. About 65 percent of the deaths have occurred in children younger than three," AP writes.

While "the number of patients has decreased compared to a month ago," Graham Harrison, WHO's acting country representative for Vietnam, "urged greater awareness at clinics and hospitals outside cities in detecting and treating new cases" as well as "enhanced hygiene, including frequent hand washing and regularly cleaning floors, tables and counters with disinfectant," AP reports (Mason, 8/19).

PBS NewsHour Examines Polio Eradication Efforts In India's Uttar Pradesh And Bihar States

PBS NewsHour reports on polio eradication efforts underway in India's Uttar Pradesh and Bihar states, which "have been the source of all the polio viruses that have crippled children in India, ... one of four
countries in the world where polio is still endemic, though it appears it may be on the cusp of finally halting transmission," according to the news service.

"Nearly every month the effort is mounted" as "[a]n army of vaccinators tries to find every child five and younger," the news service writes. The teams, consisting primarily of women, "visit each house, shanty and tent on their routes, dripping orange polio vaccine into grimacing mouths," PBS notes (Branswell, 8/16).

2011-08-19

**Researchers on the trail of a treatment for cancer of the immune system**

Danish researchers from the University of Copenhagen have become the first in the world to regulate a special receptor or bio-antenna that plays a vital part when the Epstein Barr herpes virus infects us and when this infection appears to be mutating into cancer of the immune system. Using a biochemical blueprint and a tiny bio-molecule the Danish researchers have succeeded in blocking the receptor concerned. This will make it possible to adjust and regulate the memory cells of the immune system.

Infection with Epstein Barr means that the B cells, which are the primary memory cells of the immune system, are hi-jacked.

When the virus has penetrated, researchers observe an excess of a special bio-antenna, a receptor known as EB12, suddenly sprouting from the surface of the B cells. But why they do so remains a mystery.

The receptors are a vital component of the way cells communicate with their surroundings via hormones and other bio-molecules, for example, but in a body consisting of millions of cells and transmitters it can be hard to determine the part each molecule plays.

"It is possible that the large numbers of EB12 receptors could actually be the B cells response to the virus and an attempt to combat the infection. Another possibility is that the EB virus reprogrammes the cell for this explosive growth in the number of EB12 receptors. What we know for certain is that more EB12 receptors assist the B cell infected by the EB virus to multiply more rapidly thus spreading the infection faster," says postdoc Tau Benned-Jensen from the Faculty of Health Sciences, University of Copenhagen.

**The Epstein Barr virus can cause cancer**

No fewer than 95 per cent of us carry the Epstein Barr Herpes virus.

"We often encounter it as kids and it is normally harmless. Are we infected later in life EB virus may cause mononucleosis, and it seems to play a part in some forms of cancer, just as HPV affects the risk of cervical cancer. But we have no drugs to combat the Epstein Barr virus, and no vaccines for it.

"Under normal circumstances our immune systems can keep the EB virus infection in a latent state and a truce or stand-off may arise between the immune system and the virus," explains Mette Rosenkilde, professor of pharmacology at the Department of Neuroscience and Pharmacology, University of Copenhagen.

"We cannot dispense with the infection and we carry it all life long, but to most of us it is harmless. For people whose immune systems do not function due to disease or because they are suppressed by drugs in conjunction with organ transplants it is a very different matter. Now the Epstein Barr virus is suddenly free to reproduce so uninhibitedly and dramatically that it may lead to cancer," says Mette Rosenkilde.

**The first step on the road to solving the EB12-puzzle**

While researchers know that the B cell EB12 receptors play a part when the cell visits the lymph glands, the immune system's Central Station, we have not yet explained the exact role of the receptor.

So the Danish researchers started by mapping the bio-antenna molecule by molecule and then, as the first in the world, they made a blueprint of a tiny molecule they thought could bind to the B cell EB12 receptor.

"When we know what receptors react to, it tells us more about the part they play," Mette Rosenkilde explains, "and our tiny molecule, a ligand, blocks the EB12 receptor, preventing it from doing its job."

"In time this block may be able to help transplant patients. If we can restrain EB virus reproduction when the immune system is being medically suppressed, we may well be able to avoid cancer," Tau Benned-Jensen says.

"On the other hand the EP virus also appears to play a part in other immune diseases such as autoimmune disease, where the ability to adjust the immune system would be beneficial," says Mette Rosenkilde.
And shortly after the Danish researchers published their article on their ligand, the first articles appeared about natural substances in the body, which activate the EB12 receptor and direct the B cell to specific areas in the lymph glands.

"Our molecule can inhibit the activation of the new substances, and the next step in our research will be experiments to identify even more biochemical dials to twiddle and to help us develop new drugs," Tau-Benned says.

The discovery has just been published in the Journal of Biological Chemistry.

**Virus Uses 'Swiss Army Knife' Protein to Cause Infection**

ScienceDaily (Aug. 18, 2011) — In an advance in understanding Mother Nature's copy machines, motors, assembly lines and other biological nano-machines, scientists are describing how a multipurpose protein on the tail of a virus bores into bacteria like a drill bit, clears the shavings out of the hole and enlarges the hole.

They report on the "Swiss Army knife" protein, which enables the virus to pump its genetic material into and thus infect bacteria, in the Journal of the American Chemical Society.

Akio Kitao and colleagues focus on a group of viruses termed "bacteriophages," which literally means "bacteria eaters." These viruses infect bacteria like E. coli and usually make the bacteria dissolve. Infection involves injecting their own DNA or RNA into the bacteria, so that the viral genetic material takes over control of the bacteria. The tools for doing so are among numerous invisible nanomachines—so small that 50,000 would fit across the width of a human hair—that work unnoticed in organisms ranging from microbes to people.

The scientists recreated intricate details of the protein's work as it helps the tail of the virus infect E. coli bacteria. Their computer models show that the protein performs tasks in a regular sequence, starting with a screw-like motion as it begins to penetrate the outer membrane of E. coli. The protein acts as a cell-puncturing bit, a pipe to draw away membrane debris and a tool to enlarge the puncture hole, among other functions. The infection process demonstrates "a case where a single-function protein acquired multiple chemical functions" as different parts of its structure come in contact with bacterial membrane proteins.

**Journal Reference:**

Wataru Nishima, Shuji Kanamaru, Fumio Arisaka, Akio Kitao. Screw Motion Regulates Multiple Functions of T4 Phage Protein Gene Product 5 during Cell Puncturing. *Journal of the American Chemical Society*, 2011; 133: 11080516 DOI: 10.1021/ja204451g

**Micro-Organisms Are 'Invisible' to the Immune System**

ScienceDaily (Aug. 19, 2011) — That micro-organisms have a great capacity to vary their surface structure is well known. It is one of the reasons why it is so difficult to develop vaccines against HIV and malaria, and why new influenza vaccines have to be produced every year. But it seems that these micro-organisms are also able to completely avoid activating a strong immune response in the person attacked.

This is what Professor Gunnar Lindahl from Lund University and his research group show in an article in *Cell Host & Microbe*.

"If we get a serious streptococcus infection, we want our immune defences to create antibodies aimed at certain parts of the micro-organisms' surface protein. But that mechanism does not work particularly well, which is a disadvantage for us and an advantage for the bacteria," he says.

Gunnar Lindahl's group has studied group A streptococci. These are one of the world's most important disease bacteria, causing ordinary tonsillitis, fatal toxic shock syndrome and a very serious autoimmune disease.

The part of the bacteria that has been studied is a surface protein called the M protein, more precisely the part of this protein (the "hypervariable region") which has the ability to vary extensively, in order to escape attack. The research showed that the relevant part of the protein was not just variable, but also managed to avoid eliciting any strong antibody response from the immune system.

"This may be what actually constitutes the micro-organisms' primary weapon: that they avoid antagonizing the immune system. In the case of a long-lasting infection, the immune system does indeed start to produce antibodies eventually, but by then the micro-organisms can have established a firm footing," says Gunnar Lindahl.

The micro-organisms' ability to sneak under the immune system's radar, as it were, was already suggested in certain scientific articles in the 1950s. But this ability was then overshadowed by their other defensive mechanism, i.e. the ability to vary their surface structure. And since a strong variation was
considered to be obviously connected to strong antibody pressure—that the micro-organisms were simply forced to vary in order to evade the antibodies—no one has paid any attention to investigating whether there really was any strong antibody pressure.

The findings of the Lund researchers are part of basic research in molecular biology, but have consequences for the development of new vaccines. The vaccine developers must in future take account not only of the capacity for variation in bacteria, viruses and other micro-organisms, but also of their ability to avoid activating the immune defence system.

**Journal Reference:**

**Heritability of Intelligence**
A new study of thousands of people in Europe quantifies the genetic underpinnings of intelligence, finding that some 50 percent of smarts stems from genes.

**By Tia Ghose | August 9, 2011**

Human fetal neural stem cellsFlickr, GE Healthcare

In at least one population, **about half of intelligence differences between individuals can be attributed to genetics**—specifically, the sum of many small effects from hundreds or even thousands of genes. The study, published today (August 9) in *Molecular Psychiatry*, is the first to pin down the genetic influence on cognitive abilities.

“The value of this paper is that it is the first clear and empirical demonstration that part of intelligence comes down to something which is writ in DNA,” said **Patrick Sullivan**, a psychiatric geneticist at University of North Carolina Chapel Hill, who was not involved in the study.

For decades, scientists have fiercely debated how much of the variation in individual intelligence can be attributed to genes. Studies of identical twins have suggested that 60-80 percent of intelligence comes down to genes, but “the controversy in the past has been, ‘well, maybe there’s just no separating out nature and nurture,’” said study co-author **Peter Visscher**, a quantitative geneticist at the Queensland Institute of Medical Research in Australia.

In addition, aside from the Alzheimer’s-linked APOE4 gene, researchers who went looking for “intelligence genes” have been unable to find them. Furthermore, many studies purporting to look at the heritability of intelligence have been accused of using faulty methodology or tweaking the data to justify racist beliefs.

To tease out the genetic differences directly, Visscher and his colleagues analyzed roughly 500,000 single nucleotide polymorphisms (SNPs) in about 3,500 adults aged 18 to 90 from the United Kingdom and Norway. The subjects took an array of vocabulary, speed of processing, and reasoning tests designed to measure intelligence.

Not surprisingly, they didn’t find any specific genes that were associated with higher cognitive abilities. Given the complexity of the trait, a single gene is unlikely to have a large effect on intelligence, meaning researchers would need a much larger sample size to detect those minute effects.

Instead, they were able to use a statistical technique to analyze the overall effect of genetics on smarts. Specifically, they used all 500,000 SNP locations to determine how genetically similar each subject was to every other individual in the study. They found that people who tested higher on intelligence were more genetically similar to each other than to those who scored lower in intelligence, and that roughly half of the variation in intelligence between individuals could be attributed to underlying genes. The results suggest that hundreds or even thousands of genes may each contribute a small amount to intelligence. But what those genes are remains a mystery.

One way to find those genes would be to increase the sample size by pooling genetic data from all studies on intelligence, Visscher said.

The findings also have a number of other limitations, researchers said. First, the study participants were mostly older adults, born as early as 1921, and thus represented a biased population—those healthy enough to still be alive, said geneticist **Dorret Boomsma**, who leads the Netherlands Twins Register at the VU University in Amsterdam, and was not involved in the study. The study population is also inherently biased because the selection criteria make it a nonrandom sample.

In addition, some researchers have questioned the statistical methods used, said **Greg Gibson**, director of the Center for Integrative Genomics at Georgia Institute of Technology who was not involved in the study. Because the researchers sampled only a small subset of the SNPs in the human genome, most
of which are not in the actual genes that may affect intelligence, its quantitative estimate is not predictive of the larger population, he said. So even though genetics predicted about half of the variation in intelligence within their sample population, what they found would only predict about 1 percent of the variance in intelligence across the wider population in Northern Europe, Gibson said.

Finally, the study is only applicable to intelligence in populations they studied, Gibson added. “This study says absolutely nothing about differences between groups,” such as people of different ethnicities. Davies, G., et. al, “Genome-wide association studies establish that human intelligence is highly heritable and polygenic,” Molecular Psychiatry, doi: 10.1038/mp.2011.85, 2011.

Sharing the Bounty
Gut bacteria may be the missing piece that explains the connection between diet and cancer risk.

By Michelle G. Rooks and Wendy S. Garrett | August 1, 2011

Like many great political alliances, symbiotic relationships in biology may have started with antagonism, before the two parties reached mutual understanding—at least according to some evolutionary biologists. The often cited example is the mitochondrion, the eukaryotic cell’s energy-supplying organelle, which may have first existed as a prokaryote. As the story goes, this prokaryote was engulfed by a second cell, and the two eventually formed such a close symbiotic alliance that one could not live without the other. This mutual dependence, however, formed over many millennia.

Our own symbionts, the microbes that reside throughout our bodies, primarily in our guts, have a more independent—some might say downright rocky—relationship with us, their hosts.

Although gut bacteria have long been called commensals (in which only one party derives benefit, but neither is harmed), it is now clear that we draw many benefits from their colonization of our body, some of them essential to our health. Our relationship with gut bacteria is complicated, however. While involved in metabolizing food into energy, producing micronutrients, and shaping our immune systems, gut microbes are also increasingly being linked to medical conditions including obesity, inflammatory bowel disease, and diabetes. And our understanding of their influence continues to widen: these bacteria may play a critical role in cancer, either protecting us from it, or in some cases, promoting its initiation and progression.

Bacteria, inflammation, and cancer

One example of a dangerous gut microbe is Helicobacter pylori—a bacterium that resides in the GI tract of almost two-thirds of the world’s population, and is responsible for stomach ulcers in many people. Gastric MALT (mucosa-associated lymphoid tissue) lymphoma, a cancer that occurs in the stomach, is frequently associated with H. pylori. Not surprisingly, then, the antibiotics that kill this bacterium cause this particular cancer to regress in upwards of 80 percent of these patients, and half are cured. However, this infection is also an important risk factor for gastric cancer, which is much more difficult to treat, as antibiotics provide no cure. But harboring this bacterium does not automatically lead to cancer: the guts of some 4.5 billion people are home to H. pylori, yet stomach cancer occurs in only a fraction of individuals.

Gut microbes are increasingly being linked to medical conditions including obesity, inflammatory bowel disease, diabetes, and cancer.

Another example is a toxin-producing Bacteroides fragilis strain, which has been shown to initiate colon cancer in mice and may also do so in humans. This bacterium’s toxin is a metalloprotease that can drive cleavage of the adhesion molecule E-cadherin, leading to the activation of the Wnt/β-catenin pathway, an overactive pathway in almost all colon cancers. The toxin also activates the transcription factor NF-κB, which plays an important role in the initiation and promotion of epithelial tumorigenesis and is best known as a master regulator of inflammatory response pathways. In this and other ways, this bacterial strain drives inflammation, which creates conditions that promote cancer formation and progression. Much of the current thinking about how bacteria may contribute to cancers, particularly those of the gastrointestinal tract, involves chronic inflammation. (See “An Aspirin for your Cancer?”, The Scientist, April 2011.)

While many species of bacteria activate inflammation, it is when bacteria initiate chronic inflammation that cancer risk increases significantly. Inflammatory mediators, such as reactive oxygen and nitrogen species, are part of our defenses against bacterial pathogens, but persistent exposure to these mediators directly damages host DNA and contributes to genomic instability—a common feature of cancer cells. Certain cytokines and chemokines produced by immune cells function as growth factors or promoters of angiogenesis. NF-κB and STATs (signal transducers and activators of transcription), STAT3
in particular, are transcription factors vital to physiologic inflammatory responses, and are key molecular links connecting inflammation to cancer.\textsuperscript{2}

The innate immune system’s microbial sensors, which recognize patterns shared across many microbes, have recently been shown to intersect with tumor growth pathways. Several studies in mouse models suggest that Toll-like receptors (a major family of receptors that bind these microbe-associated patterns) and their adaptor proteins, such as MyD88, can promote tumorigenesis by affecting both tumor size and number.

Additionally, the laboratory of Maria Abreu at University of Miami Miller School of Medicine, found that mice deficient in Toll-like receptor-4 were protected from colon cancers that usually arise in the setting of chronic inflammation.\textsuperscript{3} Conversely, when overexpressed, this receptor was associated with an increased susceptibility to colon cancer. Patients with colitis-associated cancer also had elevated Toll-like receptor-4 levels, raising the possibility of a novel therapeutic target.

To truly understand how gut bacteria might contribute to the initiation of diseases such as cancer, it is vital to clarify, at the molecular level, the beneficial role these microbes play in digestion and metabolism, and the ways that changes in the human diet affect the microbial residents in the gut.

**Eating for two**
Successful adaptation to the ever-changing human diet is central to the survival of gut microbes. The laboratory of Jeffrey Gordon at Washington University in St. Louis is answering key questions about how diet influences gut bacteria and what has made certain bacteria such successful symbionts. Several other laboratories, such as Andy Goodman’s at Yale, Ruth Ley’s at Cornell, Justin Sonnenburg’s at Stanford, and Peter Turnbaugh’s at Harvard, are now actively investigating the genetic features that allow these bacterial species to rapidly respond to dietary changes. The ‘Western diet,’ a dietary pattern high in fats and simple sugars, can reshape gut microbial ecology and predispose both mice and humans to obesity—a risk factor for cancers of the colon, endometrium (lining of the uterus), breast, esophagus, and kidney. Changing to a plant polysaccharide–rich, low-fat diet reduces weight and shrinks fat stores in humans and mice, and causes marked shifts in gut microbiota. Researchers observed that after these dietary changes had been adopted for long enough to reduce the weight of human subjects and mice, the gut microbiota profiles looked more similar to those of lean control subjects.\textsuperscript{4}

In a normal gut of a lean individual, bacteria generally do more good than harm. Gut bacteria actively supplement our metabolism. The indigestible leftovers of our diet serve as the major food source for these resident bacteria, the greatest numbers of which reside in the distal gut, or large intestine. They metabolize many dietary fibers that escape host digestion, generating short-chain fatty acids such as acetic, propionic, and butyric acids, which contribute an estimated 10 percent of our daily energy supply.\textsuperscript{3} The amount and variety produced are determined by the types of food ingested, how long the food stays in the gut, and which microbial species are present. While humans have the capacity to synthesize some short-chain fatty acids, the vast majority are produced by gut microbes.

These metabolites do more than just provide us with extra energy. Approximately 95 percent of gut short-chain fatty acids are absorbed and metabolized by the host for a wide range of physiological functions. Microbe-generated acetate, for example, has been shown to bind a G-protein-coupled receptor, GPR43, expressed on immune cells. Deletion of this receptor in mice exacerbated arthritis, asthma, and colitis—diseases characterized by an overactive immune system—suggesting that the microbially produced acetate may help guide the resolution of inflammatory responses.\textsuperscript{5} Acetate also appears to protect the host against infection by pathogenic bacteria, like the intestinal hemorrhage-causing *Escherichia coli* 0157:H7, by strengthening epithelial barrier function.\textsuperscript{2}

While acetate’s connection to health benefits is clearest, propionic and butyric acids may also be beneficial. Propionic acid appears to modulate T-helper cell immune responses by promoting the adaptive immune response. Butyrate’s role as an important energy source for certain epithelial cell types is well established, as is its inhibition of histone deacetylase enzymes. Some of butyrate’s anticancer effects may involve its ability to alter microRNA expression. A recent study from the laboratory of Eugene Chang at
the University of Chicago suggests that butyrate slowed the proliferation of a cancer cell line by reducing miR106b levels. This family of microRNAs plays important roles in regulating cell cycle progression and is often overexpressed in cancers.

**From food to cancer**

Researchers are beginning to realize that we can’t think of the food we ingest without thinking of the gut bacteria that also ingest our food. One oft-cited example is the polyphenol family of chemicals, predominantly found in coffee, tea, wine, fruits, and vegetables, which have been linked to reducing the risk of cancer. The three main classes of dietary polyphenols include flavonoids, phenolic acids, and lignans. Polyphenols are not digested and absorbed in the upper gastrointestinal tract, but they are readily metabolized in the colon by microbial enzymes. While several members of the *Bacteroides* genus have been shown to metabolize polyphenols, determining which members of the colonic microbial community play a role in the metabolism of polyphenols will require both metabolomic and metagenomic approaches, as well as carefully crafted animal studies and human trials. Investigations headed by Tom van de Wiele’s group in the Laboratory of Microbial Ecology and Technology at Ghent University have shown that the type and quantity of polyphenols consumed by healthy human subjects results in distinct metabolic profiles that are unique to each individual and his or her microbiota. The metabolism of polyphenols changes how they will be absorbed and utilized; therefore, the variability of health benefits observed in epidemiological studies may be attributable to the composition and relative abundance of the gut microbiota. In addition, food isn’t our only source of polyphenols: clinical studies have shown that when human subjects are given a measured quantity of polyphenols, the amount of polyphenols excreted can exceed what was consumed.8

A number of polyphenols, produced by microbes or ingested directly, are being actively investigated for their anticancer properties. Ellagic acid, which is found in berries and nuts, is one of many plant polyphenol compounds thought to have anti-inflammatory and anticancer effects. Gut microbiota are essential for metabolizing ellagic acid into urolithins—compounds believed to be responsible for reducing inflammation and thereby protecting against cancer. The laboratory of Juan Carlos Espín de Gea at the Spanish National Research Council has investigated the anti-inflammatory effects of urolithins in chocolate. In cell culture, urolithin-A was found to downregulate mRNA expression and protein levels of cyclooxygenase-2—a prostaglandin synthase and a key inflammatory mediator that is inhibited by aspirin and other nonsteroidal anti-inflammatory drugs. They also showed that urolithin-A inhibited the activation of transcription factors like NF-κB and signaling pathways that drive inflammation.9 Investigators from this lab have also observed similar results in vivo using a rodent model of intestinal inflammation.

Although it is known that a substantial portion of polyphenol metabolites are generated by bacteria in the gut, just how microbiota interact with polyphenols is still not fully understood. In some cases, polyphenols are toxic to microbes. Numerous flavonoid compounds have been able to kill both Gram-positive and Gram-negative organisms in vitro.10 In addition, it is not known how dietary phenols may alter microbial composition.

In other cases, polyphenols such as the isoflavones produced by soy and other plants act as antioxidants that mitigate oxidative stress, which is often linked to cancer. Just how soy may modify cancer risk is far from clear. Like other antioxidants, isoflavones are thought to reduce the inflammation that predisposes tissues to cancer. The soy isoflavone daidzein is metabolized by certain gut microbes into equol, a plant estrogen. Because of their hormone-like properties, soy isoflavones have been reported to have protective effects against prostate cancer; however, these findings are not consistent across studies. One reason for these inconsistencies could be individual differences in how gut microbes metabolize isoflavones. According to epidemiological studies, only 30–50 percent of the human population is capable of producing equol. Studies of populations that consume a high level of soy, mostly of Asian descent, have found that equol producers may have a greater reduction in cancer risk than those who do not produce equol.11 Generally, interpretation of the soy–cancer prevention literature is challenging. Although more
research is needed to understand the role of our gut microbiota in mediating cancer risk, metabolites like urolithins, polyphenols and equol, show promise against cancer.

Our group is studying the effects of dietary interventions that are thought to be beneficial—such as fermented dairy products—and of risk-associated foods like red meat on the microbiota and on colon cancer. We use mouse models of inflammatory bowel disease and colon cancer to understand how diet can impact these diseases. By using mice, we can control many genetic and environmental factors that complicate human studies of the microbiota and diet. In addition, we make use of germ-free mice, in which we can design the microbial communities from scratch by adding back select bacteria. Also, we can transplant human fecal samples into such mice and thus, to some extent, make them better models of human physiology. Our research suggests that one way fermented milk products may confer a health benefit is by indirectly driving shifts in short chain fatty acids; bacteria in the fermented milk actually influence the resident gut microbes to drive these changes.

**An incomplete symbiosis**

Our gut microbiota, when fed certain foods, can also produce detrimental metabolites that promote cellular proliferation and inhibit apoptosis—circumstances conducive to cancer development. Heterocyclic amines (HCAs)—compounds found in the char that coats any well-done steak—are considered carcinogenic. HCAs are not digested in the small intestine but remain available for fermentation by bacteria in the colon. Once metabolized by gut bacteria, HCAs are converted to electrophilic derivatives that damage DNA, placing people at increased risk for colon cancer.\(^\text{12}\)

It will be years before a fecal sample will reveal risk of cancer or the foods that could change it.

Hydrogen sulfide is another metabolite produced by gut bacteria that can damage DNA. Consumption of high-protein foods, particularly red meat, may fuel hydrogen sulfide production by sulfate-reducing gut microbes. Some studies suggest that patients with colon cancer and inflammatory bowel disease may harbor higher levels of such bacteria. Studies by Rex Gaskins’s lab at the University of Illinois at Urbana-Champaign suggest that hydrogen sulfide can contribute to cancer progression when DNA repair mechanisms are impaired. Whether a greater abundance of sulfate-reducing bacteria precedes or is a result of these health conditions, and which host factors contribute, requires further investigation. In high-risk individuals, these metabolites may offer targets for cancer prevention.

**“It takes a village”: the power of community**

Although the link between gut microbes and cancer risk is becoming clearer, it will probably be years before dropping off a fecal sample at the doctor’s office will generate a report of your cancer risk and a list of foods you should or shouldn’t eat to modify that risk. Further experimentation is needed to understand the metabolic potential and function of the human microbiota. Some of the current bottlenecks are in data processing and analysis.

Indeed, because only a very few gastrointestinal-associated bacterial species, like *Helicobacter pylori*, have been convincingly linked to cancer, the focus is shifting from single-organism studies to bacterial communities as a factor influencing cancer risk. Worldwide consortia such as the Human Microbiome Project and the Metagenomics of the Human Intestinal Tract project (MetaHIT) are applying sequence-based approaches to study the microbiota of healthy and disease-affected individuals. The emerging field of microbial “omics,” which encompasses metagenomics and metabolomics, is rapidly advancing. Cancer genomics has offered the potential to understand how cancers operate at the molecular level.

Microbial metagenomics may have the potential to improve many aspects of cancer prevention and treatment. Current studies like the esophageal cancer microbiome project, a joint venture spearheaded by Karen Nelson from the J. Craig Venter Institute and New York University’s Zhiheng Pei, aim to identify microbiota-based biomarkers that can identify patients at high risk for developing cancer. Successful microbiota biomarker identification could be used as a prognostic, diagnostic, and management tool, allowing gut microbe testing to become part of the evolving personalized-medicine tool kit.

In cancer care, cancer genomics and pharmacogenomics are increasingly employed to identify which patients will respond to which treatments and whether particular patients are at risk for experiencing dangerous drug toxicities. Enzymes produced by gut microbes can often interact with drug regimens, contributing to side effects or changing how the drug is metabolized by the body. A recent study showed that gut bacterial enzymes called β-glucuronidases can contribute to the severe diarrhea sometimes associated with a commonly used colon-cancer chemotherapy drug called irinotecan.\(^\text{13}\) Selectively targeting these bacterial enzymes reduced a potentially life-threatening side effect of this drug.

The day may not be so far off when fecal samples are biobanked for future transplant, and microbiota associated with a high risk of cancer can be replaced with lower-risk microbiota. Foods or bacterial-directed therapies may be used to re-engineer the microbial communities in the gut by introducing...
functions that reduce cancer risk. As we come to understand what features constitute a healthy microbiota and how the microbiota changes across the human life cycle, the plasticity and genomic potential of our gut microbes may be tapped as a fountain of youth and health. As far as symbiotic relationships go, ours appears to be continually influenced by dietary patterns that may be altering this relationship in significant ways. A deeper understanding of the effects of dietary intake on our microbiota will hopefully lead us toward a more perfect union.

Michelle Rooks and Wendy Garrett are at Harvard School of Public Health.

References

Bacteria Kamikazes

Researchers design a synthetic bacterium that kills the infectious microbe Pseudomonas aeruginosa, sacrificing itself in the process.

By Kelly Rae Chi | August 16, 2011

Researchers have constructed a new synthetic bacterium that detects Pseudomonas aeruginosa, a common microbe and a leading cause of hospital-acquired infections, and explodes, releasing antimicrobials that kill the invaders. The results, published today (August 16) in Molecular Systems Biology, suggest that the engineered bacteria might eventually be used to prevent or treat infection with P. aeruginosa in humans.

“The paper sets up innovative use of synthetic biology for engineering microbes to carry out functions that they normally wouldn’t do”—namely, kill other bacteria, said William Bentley, chair of the Fischell Department of Bioengineering at the University of Maryland in College Park, who was not involved with the research.

P. aeruginosa is an infectious bacterium that colonizes human respiratory and gastrointestinal tracts and rapidly develops resistance to antibiotics. The bacteria cause about 10 percent of all hospital-acquired infections, and are especially common in immunocompromised patients. Infections are treated using a combination of antibiotics, but this approach also eliminates symbiotic bacteria, which may make the body more susceptible to colonization by harmful bacteria. Phage therapy, the use of specific viruses to destroy the bacteria, is another potential treatment, although it is complicated by the fact that hosts may eventually make antibodies against the virus, preventing it from killing the bacteria.

So Chueh Loo Poh and Matthew Wook Chang at Nanyang Technological University in Singapore decided to devise a new way to fight the microbe—with another bacterium. Specifically, their teams engineered Escherichia coli bacteria to detect molecules involved in P. aeruginosa quorum sensing, called acyl homoserine lactones. The release of these molecules by P. aeruginosa triggered the engineered E. coli to produce pyocin S5, a protein antibiotic that is not normally produced by E. coli and that has been shown to kill P. aeruginosa. In the process of releasing pyocin S5, the engineered bacteria burst, killing themselves.

“That was a very clever aspect of this work, to design a delivery system that would grow and replicate until it found its target, and then would kill itself and its target at the same time,” said microbiologist Beth Lazazzera at the University of California, Los Angeles, who was not involved with the study.
Poh and Chang’s teams tested the effectiveness of the engineered bacteria against *P. aeruginosa* cultured either free floating in media or in a biofilm assay, and found that the engineered bacteria inhibited growth of *P. aeruginosa* and prevented biofilm formation.

The fact that the scientists engineered the killer bacteria to sense *P. aeruginosa*’s unique quorum-sensing molecules—which allow bacteria to monitor population cell density, and in turn regulate development, virulence and other processes—suggests a similar strategy may prove successful for other quorum-sensing microbes, such as *Vibrio cholerae* and *Helicobacter pylori*. John March’s lab at Cornell University in Ithaca, New York, for example, has already created engineered bacteria that target *V. cholerae* through its quorum sensing molecules, and the group has shown that the approach can protect against *cholera* in a mouse model.

“We can easily develop another type of engineered bacteria to target other infectious pathogens,” said Chang, a chemical and biomolecular engineer. First, however, the group plans to test their new system in mice that have been infected with *P. aeruginosa*, and they expect to have results within the next few years.

If the engineered *E. coli* prove successful in mouse models and other future studies, Poh and Chang envision that they could be administered in a probiotic drink that immunocompromised patients could take to prevent infection. Because the bacteria are not known to be harmful, they could live in the intestinal tract, where *E. coli* are naturally plentiful, until they encountered infection. Furthermore, pyocin S5 does not kill *E. coli* or other microbes, meaning the treatment wouldn’t affect the body’s symbiotic inhabitants, Chang and Poh said.

But some questions remain as the group moves into in vivo experiments. For example, it is unclear whether the engineered bacteria will be able to locate *P. aeruginosa* within infected organisms. “It’s not obvious that it would necessarily find them,” Bentley noted. “There’s nothing that drives the *E. coli* to the *Pseudomonas*.” Other types of quorum sensing molecules that act as homing mechanisms could be added to Chang and Poh’s system to ensure that the engineered bacteria more easily target the infection, Bentley added.


**Biologists’ Discovery May Force Revision of Biology Textbooks: Novel Chromatin Particle Halfway Between DNA and a Nucleosome**

![Diagram of chromatin assembly](image-url)

**Mechanism of Chromatin Assembly**

1. DNA
2. Newly-Discovered Particles ("prinucleosomes")
3. ADP
4. ATP
5. Formation of Nucleosomes (building blocks of chromatin)
6. Motor Enzyme (uses ATP as fuel)
7. Chromatin Proteins

*Biologists have discovered a novel chromatin particle halfway between DNA and a nucleosome. While it looks like a nucleosome, it is in fact a distinct particle of its own, researchers say.*
ScienceDaily (Aug. 18, 2011) — Basic biology textbooks may need a bit of revising now that biologists at UC San Diego have discovered a never-before-noticed component of our basic genetic material.

According to the textbooks, chromatin, the natural state of DNA in the cell, is made up of nucleosomes. And nucleosomes are the basic repeating unit of chromatin.

When viewed by a high powered microscope, nucleosomes look like beads on a string. But in the Aug. 19 issue of the journal Molecular Cell, UC San Diego biologists report their discovery of a novel chromatin particle halfway between DNA and a nucleosome. While it looks like a nucleosome, they say, it is in fact a distinct particle of its own.

"This novel particle was found as a precursor to a nucleosome," said James Kadonaga, a professor of biology at UC San Diego who headed the research team and calls the particle a "pre-nucleosome." "These findings suggest that it is necessary to reconsider what chromatin is. The pre-nucleosome is likely to be an important player in how our genetic material is duplicated and used."

The biologists say that while the pre-nucleosome may look something like a nucleosome under the microscope, biochemical tests have shown that it is in reality halfway between DNA and a nucleosome.

These pre-nucleosomes, the researchers say, are converted into nucleosomes by a motor protein that uses the energy molecule ATP.

"The discovery of pre-nucleosomes suggests that much of chromatin, which has been generally presumed to consist only of nucleosomes, may be a mixture of nucleosomes and pre-nucleosomes," said Kadonaga. "So, this discovery may be the beginning of a revolution in our understanding of what chromatin is."

"The packaging of DNA with histone proteins to form chromatin helps stabilize chromosomes and plays an important role in regulating gene activities and DNA replication," said Anthony Carter, who oversees chromatin grants at the National Institute of General Medical Sciences of the National Institutes of Health, which funded the research. "The discovery of a novel intermediate DNA-histone complex offers intriguing insights into the nature of chromatin and may help us better understand how it impacts these key cellular processes."

**Journal Reference:**

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**Big increase in HIV and syphilis diagnoses in US among young black gay men**

Michael Carter  
Published: 22 August 2011

HIV and syphilis diagnoses among young gay and other men who have sex with men (MSM) increased in most metropolitan areas of the US between 2004 and 2008, investigators report in the online edition of the *Journal of Acquired Immune Deficiency Syndromes*.

The increase in diagnoses was especially marked in young (13-24) black men, among whom HIV diagnoses increased by 85% and syphilis diagnoses by 203%.

"Young black MSM have disproportionately high rates of HIV diagnoses...highlighting the need for prevention efforts which address the behavioral and structural factors that place these men at risk," write the investigators.

A recent study using data from the Centers for Disease Control and Surveillance showed that although rates of new HIV diagnoses in the US are steady, they are increasing in young gay men and black men. Diagnoses of HIV and syphilis are especially high in younger black MSM.

However, it is possible that recent increases in reported rates of both infections have been skewed by large numbers of diagnoses in a few large cities. In 2008, two cities accounted for 20% of all cases of syphilis in gay men and a fifth of all HIV diagnoses in gay and other MSM were located in three cities.

Therefore, investigators analysed reported HIV and syphilis diagnoses in gay and other MSM from 73 metropolitan areas across the US. All had a population of at least 500,000, and to be included in the analysis the areas had to have a population of at least 500 black individuals aged between 13 and 14.

Rates of HIV and syphilis diagnoses between 2004 and 2008 were monitored. The results were stratified according to age and race.

The total number of HIV diagnoses in gay and other MSM increased between 2004 and 2008 in all 73 areas by an average of 11%. Over the same period syphilis diagnoses almost doubled (88%).
However, the largest percentage increase in HIV diagnoses was among black men aged 13 to 24. HIV diagnoses in all other age and race groups remained relatively stable.

A comparison of the 2004 and 2008 data showed that increases in HIV diagnoses in black MSM aged 13 to 24 occurred in 85% of the areas included in the study. Increases were observed in more areas for black men in this age group than for Hispanic (62%) or white (58%) MSM of a similar age.

The number of HIV diagnoses among young black MSM was 69% higher in 2008 compared to 2004. Similar patterns were present for syphilis diagnoses. These increased in 70% of areas among black men aged 13 to 24. Overall, the number of syphilis diagnoses in young black gay men increased by 203% between 2004 and 2008.

The majority of areas (79%) had increases in both HIV and syphilis diagnoses in black men aged 13 to 24. Concurrent increases in HIV and syphilis diagnoses among Hispanic MSM in the same age group were recorded in 73% of areas, but concurrent increases in both infections among young white men occurred in only 50% of areas.

“These findings document that increases in HIV and syphilis diagnoses among young black men are not limited to a few large areas, but are widespread among areas with different population sizes,” comment the investigators.

They believe that some of the increase could be due to changes in US testing guidelines. In 2006, opt-out HIV testing was introduced and all individuals at high risk of HIV were recommended to have an annual HIV test. Moreover, in 2007 a major programme commenced designed to increase testing among African Americans.

However, the investigators also suggest: “increases in transmission may also explain the observed increases in diagnoses of HIV and syphilis.” They add: “the observed increase in HIV diagnoses among MSM aged 13-24 years suggests an increase in transmission.”

The investigators further argue that the massive increases in syphilis diagnoses point to high rates of risky sexual behaviour, commenting: “syphilis diagnoses can serve as a ‘real-time’ marker of unprotected sexual intercourse that may result in the transmission of syphilis or HIV.”

The authors were especially concerned about the especially large increase in new HIV diagnoses among younger gay men. They write: “young MSM report being unprepared for their first sexual encounter, such as being ill-equipped to negotiate safer sex or not knowing how to use lubricant to reduce tearing and bleeding during anal sex.”

Separate research has shown that sexual risk behaviour in among US is similar across racial groups. The investigators suggest that the especially large increase in new diagnoses among young black men in their study could be due to “social factors, such as sexual network configurations (e.g. sex with black and older partners).” They also note that rates of undiagnosed HIV are especially high among African Americans.

“Infections among young MSM are unacceptably high,” conclude the investigators, “as the underlying causes of the epidemic are likely to be multifactorial, combining multiple strategies may prove most beneficial in improving the sexual health of this increasingly vulnerable population.”

Reference

Glaxo HPV Vaccine Protects Women from Anal Cancer
Reuters, (08.22.2011)  Julie Steenhuysen

A large study by a team from the US National Institutes of Health (NIH) finds the Cervarix human papillomavirus vaccine, which protects against cervical cancer caused by HPV, also offers strong protection against HPV-related anal cancer.

Cervarix targets HPV types 16 and 18, the strains most responsible for cervical cancer. These also “cause the bulk of anal cancers,” explained study leader Dr. Aimee Kreimer of NIH’s National Cancer Institute.

Researchers analyzed anal tissue specimens in a group of 4,210 healthy women ages 18-25 in Costa Rica. About half the women received Cervarix in three doses, and the other half received a placebo vaccine. After four years, the women were tested for anal and cervical HPV 16 and 18 infections.

The results indicated Cervarix prevented 62 percent of anal cancers and 77 percent of cervical cancers linked to HPV infection compared with rates in the general population. “There was strong protection with the vaccine against anal infection,” said Kreimer. In participants with no likely previous HPV infection exposure, the vaccine prevented 84 percent of anal HPV, a rate comparable to that for cervical HPV
infection (89 percent). Furthermore, Cervarix was found to be cross-protective against HPV types 31, 33, and 45, which also cause cancer.

“We’re getting more bang for our buck than we realized with this vaccine,” Kreimer said.

Approximately 5,300 new cases of anal cancer are diagnosed annually in the United States, with women comprising the majority of patients. Anal intercourse can increase the risk for anal cancers caused by HPV infections, making men who have sex with men especially vulnerable.

The study, “Efficacy of a Bivalent HPV 16/18 Vaccine Against Anal HPV 16/18 Infection Among Young Women: A Nested Analysis Within the Costa Rica Vaccine Trial,” was published early online in the Lancet Oncology (2011; doi:10.1016/S1470-2045(11)70213-3).

**Correlates of HIV Testing History Among Urban Youth Recruited Through Venue-Based Testing in 15 US Cities**

*Sexually Transmitted Diseases Vol. 38; No. 8: P. 691-696,* (08..2011)  Diane M. Straub, and others

Adolescents and young adults are disproportionately represented among both those living with HIV and individuals who are infected but do not know it. The team undertook the current study to determine factors associated with a history of HIV testing and receiving test results among a sample of urban, high-risk, sexually active adolescents in 15 US cities.

Twenty to 30 sexually active youths ages 12-24 were recruited to take part in an anonymous survey and HIV antibody testing at two to three venues per city identified by young men who have sex with men, young women or color, or IV drug users. The sample was diverse in terms of gender, race/ethnicity, and sexual orientation.

Having been tested for HIV was reported by 72 percent of the 1,457 participants. Among those who had tested, 89 percent were aware of their results. “Factors found to be predictive of testing typically reflect high risk for HIV, except for some high-risk partner characteristics, including having had a partner that made the youth have sex without a condom or had a partner with unknown HIV status. Factors associated with knowledge of serostatus are reported,” the authors wrote.

“HIV testing seems to be more associated with sexually transmitted infection testing services than with primary care,” the team concluded. “More strategies are needed that increase testing, including targeting partners of high-risk individuals, ensuring receipt of test results, and increasing testing in primary care settings.”

**Canadian study finds criminalisation confusion "chills" open and honest discussion of HIV risk-taking**

Edwin J. Bernard
Published: 23 August 2011

The lack of clarity over when a person with HIV has a legal obligation to disclose their HIV-positive status to a sexual partner is resulting in “anxiety, confusion and contradictory HIV counselling advice,” according to a new study on the impact of HIV criminalisation in Canada.

**Vague "significant risk" decision**

A 1998 Supreme Court decision created Canada's current law, which obligates people with HIV to disclose their HIV-positive status before engaging in conduct that poses a “significant risk” of transmitting the virus. Non-disclosure prior to sex that poses a "significant risk" renders the sex non-consensual, so that HIV exposure is considered to be a sexual assault.

Since the Supreme Court was not explicit regarding what constitutes a “significant risk" this has led to inconsistent and overly-broad interpretations by Canada's police and lower courts.

Some people have been charged and/or convicted for **having sex with a condom and/or oral sex alone** while others have been acquitted for **unprotected anal sex**. Although the Courts of Appeal of Manitoba and Quebec have recently ruled that when a condom is used or when a person has an undetectable viral load there is no significant risk of transmission and, therefore, there is no duty to disclose, these decisions may yet be reversed. The Supreme Court is scheduled to hear the prosecution’s appeal in at least one of these cases in 2012.

As part of a **criminal law reform project** to encourage a more evidence-informed application of the criminal law, Eric Mykhalovskiy, an Associate Professor in the Department of Sociology at York University in Toronto interviewed 28 healthcare and HIV service providers, and a further 26 people with HIV participated in four focus group interviews. The interviews took place in three cities in the province of Ontario – Toronto, Ottawa and Hamilton – between January and September, 2010.
Anger, fear and confusion for people with HIV
A consistent theme in the focus group interviews with HIV-positive individuals was that there was a disconnect between what science (and public health) knew to be epidemiologically important risks and the lack of consistent legal recognition of these risks and how to reduce them, such as by using condoms.

The legal uncertainty over which sexual acts pose a "significant risk", thus triggering the obligation to disclose, left many study participants "angry, confused and frightened" notes Professor Mykhalovskiy. Although some participants with HIV claimed to disclose in all sexual circumstances, others said they were less open about their HIV-positive status as a result of the law. A few participants admitted that they have responded to the situation by withdrawing from sex altogether.

Inconsistent and contradictory counselling
Healthcare providers also admitted to struggling with the tension between unclear legal concepts of "significant risk" and public health-focused safer sex counselling. This has resulted in people with HIV being provided with inconsistent and contradictory information about their legal obligation to disclose.

Some healthcare providers have responded to the vagueness of the law by advising patients to disclose to all sexual partners, regardless of the transmission risks they pose.

Professor Mykhalovskiy notes that "a troubling consequence" is that detaching disclosure from scientific assessments of "significant risk" can result in a "blanket moral obligation" to disclose, which was not the intention of the Supreme Court.

Don't ask, don't tell
Healthcare providers emphasised how HIV criminalisation has impeded their ability to establish trust with their HIV-positive clients and patients, creating a chill in their counselling relationships. Mindful that medical and counselling records could be used in criminal proceedings, healthcare workers are cautioning their patients about the limits of client confidentiality, resulting in a 'don't ask, don't tell' approach. Professor Mykhalovskiy notes a perverse circularity of public health/criminal law relations as counselling and record keeping are done with an "eye to the law" in anticipation of their potential use in criminal proceedings.

Fears of false allegations of non-disclosure
People with HIV and healthcare providers also voiced concerns over the difficulties of proving (non)disclosure in court. Some people with HIV – notably female migrants of African origin – voiced concerns that they were vulnerable to arrest and prosecution following false allegations of non-disclosure. Professor Mykhalovskiy notes that "in the context of unequal relationships, the legal requirement to disclose can be subject to manipulation...partners can use false claims of non-disclosure to control and threaten" people with HIV.

Prosecutorial guidelines may establish clarity
Professor Mykhalovskiy notes that "while the use of the criminal law may be warranted in some circumstances, the expansive use of a vague legal concept of significant risk does little good either for preventing HIV transmission or for the credibility of the criminal justice system." He concludes that the establishment of prosecutorial guidelines may create some clarity regarding disclosure obligations, potentially mitigating some of the problems described in this study.

Reference

88% Ghanaians despise HIV/AIDS patients
Communications Manager for the AIDS Commission, Eric Pwadura has revealed that a demographic survey conducted by the Commission in 2008 revealed that 88% of Ghanaians are uncomfortable associating with HIV positive persons. This, he says, is making efforts at tackling HIV/AIDS counterproductive.

Speaking on Multi TV’s current affairs programme pm:EXPRESS, Mr. Pwadura noted that persons living with HIV/AIDS [PLWHA] face stigma at two different levels; one from the society, and then from the PLWHAs.

Societal stigma he said, was borne out of ignorance leading to discrimination and subsequently the violation of the rights of persons living with HIV/AIDS.

He explained that apart from societal stigma, PLWHAs also indulge in self stigma which effectively perpetuates the cycle of stigma against the sufferers of the disease.
He said “let’s tackle stigma head-on, let’s think about the bigger picture, let’s think of Ghana without HIV/AIDS but let’s start small, wherever we are, let’s spread the message but let’s act now, it’s very important”.

UN Secretary General Ban Ki Moon has indicated “stigma remains the single most important barrier to public action. It is the main reason why too many people are afraid to see a doctor, to determine whether they have the disease or to seek treatment if so. It helps make AIDS the silent killer because people fear the social disgrace of speaking about it or taking easily available precautions. Stigma is a chief reason why the AIDS epidemic continues to devastate societies around the world.”

The Ghana Health Service has developed an HIV/AIDS strategic plan for 2011-2015 to direct the implementation of the national response to HIV/AIDS in the next five years.

Commenting on the national strategic plan, Mr. Pwadura said the Commission will work hard in the upcoming years to reduce new infections by 50%, eliminate mother to child transmission, strengthen community response and health institutions and also tackle treatment as a very important component of the national response.

An HIV positive patient who was on the show shared his experience with living with the disease.

He said his wife was first diagnosed of the disease after several complaints of feeling weak. He was 37 years old then. He has no idea how the family contracted the disease.

Kwabena Adu [not his real name] said he contemplated suicide but encouraged himself that his life was worth something once he kept taking the anti retroviral drugs.

“When my wife died and people asked for the reason, I said she died of typhoid fever. I don’t know why I did not disclose our status but I knew if I told them my wife died of AIDS, they would point fingers at me”, Kwabena Adu revealed sadly.

He said he became very emaciated at a point that people started to suspect he had AIDS, a disease that had killed his wife some seven years ago.

According to him, even though he faces stigmatization, it is not so terrible because he has not declared his status openly.

He said he left his job because the disease makes him weak and is now finding it difficult to cater for his two kids who have also contracted the disease. He was however quick to commend health professionals at the Korle-Bu Teaching Hospital who still dish out the anti-retroviral drugs to him though he has no money to pay.

Kwabena Adu encouraged patients to continue with their medication since it is the only way to ensure continuous strength.

Since HIV/AIDS was discovered in Ghana in 1986 with an initial 42 recorded cases, a lot of efforts have gone into tackling the spread of the disease but the prevalence rate however peaked in 2003 to a high of 3.6%. The situation has however been on the decline prompting the United Nations to delist the country from the list of endemic countries.

Statistics indicate that adult prevalence reduced to 1.6% in 2010 from 1.9% in 2009. Prevalence among women who sought anti natal care was 2.9% in 2009 but came down to 2.0% in 2010.

An area of interest to the Commission is the critical age group of between 15 and 24 whose prevalence reduced from a high of 2.1% in 2009, to 1.5% in 2010.

On a regional basis, the Eastern region still has a higher than national average prevalence rate of 3.2%.

Currently there are 230,000 people between the ages of 15 and 39 living with AIDS in the country with women constituting more than 60%.

30% of all babies born to HIV mothers in Ghana are positive.

Globally the call is to have a zero transmission of the HIV virus from mother-to-child but Ghana is targeting a reduction of 25% from the current figure of 30%.

According to Mr. Pwadura, out of 315,000 women who have been screened so far, 9000 of them tested positive.

He said the Commission is doing all it can to end the stigmatization. To this end, the Commission is sending out two forms of messages, one to empower persons with HIV/AIDS to stand up for themselves and the second to educate society on the mode of transmission of the disease.

The Communications Manager added that 80% of all infections are through the exchange of bodily fluids, 15% of infections are also through mother-to-child transmissions and the remaining 5% is through contact with infected blood products such as blood transfusions.

It is estimated that globally, 6.6 million AIDS patients are on anti-retroviral drugs but 9.4 million still lack access to the drugs.
Health experts say 30,000 new infections are recorded daily among the youth between 15 and 24 years. They contend that access to the ARV's must be scaled up in Ghana if the goal of eliminating the disease by 2020 can be achieved.

**Polio Eradication 'At Risk' As Chad And Pakistan Face Continued Outbreaks, GPEI Report Says**

"According to the latest report from the Independent Monitoring Board (IMB) of the Global Polio Eradication Initiative (GPEI), continued transmission of polio is a 'global health emergency,' and plans to interrupt transmission by the end of 2012 are 'at risk,'" the *Lancet Infectious Diseases* reports, adding, "With a US$590 million funding gap and weak political leadership in some countries, the engagement of communities to plan and implement local approaches is paramount."

"Notable progress has been made in India and Afghanistan, but the situation in Chad is 'particularly alarming,' says the IMB, while 'Pakistan risks becoming the last global outpost of this vicious disease,'" the journal writes (Morris, September 2011). According to IRIN, "Pakistan has seen a rising number of polio cases since 2007, with 69 reported so far this year as against 37 in the same period of 2010." The article says insecurity is a major cause because it hinders the movement of vaccination teams (8/22).

**Haitian Women Crossing The Border To Give Birth Overwhelm Dominican Health Care System**

"Dominican hospitals and clinics are being overwhelmed by Haitian women ... who make up roughly half of the patients giving birth in Dominican hospitals, officials here say," the *Washington Post* reports. "They come because they don't have access to health care in Haiti, especially since last year's earthquake. They come because they can get free health care in the Dominican Republic each year, and so that they can have their babies in hospitals instead of on the floors of their homes," the newspaper writes.

"In Haiti, 27 of every 1,000 newborns in 2009 died, according to the latest numbers from UNICEF, nearly seven times the U.S. rate," and, before the January 2010 earthquake, "[t]he lifetime odds of a woman dying while giving birth in Haiti [were] one in 93," according to the *Washington Post* (Gilger, 8/23).

**Coriander oil could tackle food poisoning and drug-resistant infections**

Coriander oil has been shown to be toxic to a broad range of harmful bacteria. Its use in foods and in clinical agents could prevent food-borne illnesses and even treat antibiotic-resistant infections, according to the authors of a study published in the *Journal of Medical Microbiology.*

The researchers from the University of Beira Interior in Portugal tested coriander oil against 12 bacterial strains, including *Escherichia coli, Salmonella enterica, Bacillus cereus* and meticillin-resistant *Staphylococcus aureus* (MRSA). Of the tested strains, all showed reduced growth, and most were killed, by solutions containing 1.6% coriander oil or less.

Coriander is an aromatic plant widely used in Mediterranean cuisine. Coriander oil is one of the 20 most-used essential oils in the world and is already used as a food additive. Coriander oil is produced from the seeds of the coriander plant and numerous health benefits have been associated with using this herb over the centuries. These include pain relief, ease of cramps and convulsions, cure of nausea, aid of digestion and treatment of fungal infections.

This study not only shows that coriander oil also has an antibacterial effect, but provides an explanation for how it works, which was not previously understood. "The results indicate that coriander oil damages the membrane surrounding the bacterial cell. This disrupts the barrier between the cell and its environment and inhibits essential processes including respiration, which ultimately leads to death of the bacterial cell," explained Dr Fernanda Domingues who led the study.

The researchers suggest that coriander oil could have important applications in the food and medical industries. "In developed countries, up to 30% of the population suffers from food-borne illness each year. This research encourages the design of new food additives containing coriander oil that would combat food-borne pathogens and prevent bacterial spoilage," said Dr Domingues. "Coriander oil could also become a natural alternative to common antibiotics. We envisage the use of coriander in clinical drugs in the form of lotions, mouth rinses and even pills; to fight multidrug-resistant bacterial infections that otherwise could not be treated. This would significantly improve people's quality of life."
Trudeau Institute announces a discovery in how FluMist elicits protection

Saranac Lake, N.Y. – New research from the Trudeau Institute may help to explain why live attenuated influenza vaccine (LAIV), commonly known as FluMist, elicits protection. The research is published in this month’s issue of Vaccine. The journal article is entitled "Live attenuated influenza vaccine (LAIV) impacts innate and adaptive immune responses” and was authored by Trudeau Institute scientist Dr. Laura Haynes and her colleagues.

"Our research specifically examines how the vaccine, which is commonly known as FluMist, elicits protection," said Dr. Laura Haynes. "Influenza infection normally induces a massive inflammatory response in the lungs that leads to significant illness and increases the susceptibility to secondary bacterial infections. The most efficient way to prevent influenza infection is through vaccination. To date, the mechanism of how FluMist induces protection has been unclear. Our study demonstrates that this vaccine works by inducing a very early non-specific immune response in the lungs in a mouse model of influenza infection."

The very early non-specific immune response sets the stage for the early influx of virus-specific immune cells, which are necessary for viral clearance. Importantly, this immune response is protective against both matching and non-matching influenza strains, therefore it could provide a level of protection in the case of a newly emergent influenza strain.

In addition, this very early immune response also serves to limit lung inflammation by significantly reducing the levels of inflammatory cytokines and chemokines produced following influenza infection. This novel finding provides insight into how this influenza vaccine functions and is important because inflammation is a major cause of damage in the lungs and this can set the stage for secondary bacterial infections, which are quite common following influenza infection.

The study goes on to show that the LAIV vaccine also induces a robust immune response in healthy adult volunteers. These translational experiments were carried out in collaboration with the Respiratory Diseases Research Department at the Naval Health Research Center (NHRC) in San Diego, CA and were the result of a joint Trudeau/Department of Defense contract.

Subjects were recruited by NHRC and were administered the commercially available FluMist vaccine. At specific time points following vaccination, the immune response to the vaccine was examined. Following LAIV vaccination, chemokines and cytokines involved in virus-specific lymphocyte recruitment were produced. This is indicative of a protective immune response and would lead to the early recruitment of immune cells to the lung should influenza infection occur. Importantly, early recruitment of immune cells to the lung is highly desirable since this then leads to accelerated viral clearance and reduced levels of inflammation.

Newfound hijacked proteins linked to salmonella virulence

Scientists have discovered that bacteria like E. coli and Salmonella have a sneaky way of making minor alterations to their genes to boost their chances for infection.

It’s a fascinating discovery made at Ohio State University, which is featured in the Aug. 14 issue of Nature Chemical Biology. This discovery shows how bacteria make tweaks in their genes, and their proteins to gain strength.

The team includes research scientist Herve Roy, who joined the University of Central Florida faculty at the College of Medicine this month. He co-authored the paper after conducting research in OSU Professor Michael Ibba’s lab.

"Mother Nature tinkers a lot," Roy said from his new lab in Orlando. "Our recent findings illustrate that new proteins in living organisms often evolve from older pre-existing ones, and that evolution updates biochemical mechanisms of living cells by tweaking them a little by applying molecular patches."

The precise role of one protein in bacteria, EF-P, remains a mystery, but this team found that it plays an essential role in the virulence of Salmonella enterica typhimurium, a common foodborne pathogen causing diarrhea, fever, and abdominal cramps, and occasionally lifetime chronic arthritis. Salmonella also accounts for about 400 deaths each year in the United States.

EF-P is known to play a role in protein biosynthesis, which is a keystone mechanism present in all organisms. This process is the chain assembly line that decodes the blue prints stored in the genomes of living organisms, to make all the proteins necessary to sustain life.

The team’s research identified a modification born by EF-P that acts as a molecular patch on protein synthesis. The patch seems to increase the bacteria's prowess. Interestingly, the modification on EF-P is made by a hijacked protein, normally involved in the protein synthesis machinery itself.
In the Aug. 14 issue of Nature Chemical Biology, Roy and co-authors identified the chemical nature of the modification that occurs on EF-P. This is critical because in the team’s experiments, when the modified version of EF-P is absent, Salmonella doesn't spread.

Because the mechanism by which the modification occurs is unique to bacteria and this system is involved in virulence it could be a potential drug target, Ibba said.

Roy’s experience and interest in this area is what drew him to UCF. His lab in the Burnett School of Biomedical Sciences at UCF will use National Institutes of Health funding to explore how some other components of the protein synthesis machinery have been hijacked to accomplish alternate cellular processes. For instance, one process utilizes parts of the protein synthesis machinery to modify components of the bacterial membrane. This mechanism increases bacterial resistance to a large spectrum of antibiotics and presents a good avenue for new drugs that could potentially alleviate or cure many infectious diseases.

"That’s why I came to UCF," Roy said. "There is a good team of scientists here working in infectious diseases. There is a good opportunity to collaborate and make a difference."

When Well-Known Flu Strains 'Hook Up' Dangerous Progeny Can Result
ScienceDaily (July 13, 2011) — A new University of Maryland-led study finds that 'sex' between the virus responsible for the 2009 flu pandemic (H1N1) and a common type of avian flu virus (H9N2) can produce offspring — new combined flu viruses — with the potential for creating a new influenza pandemic.

Of course, viruses don’t actually have sex, but University of Maryland Virologist Daniel Perez, who directed the new study, says new pandemic viruses are formed mainly through a process called reassortment, which can best be described as viral sexual reproduction. "In reassortment, two viruses enter the same cell; their genetic material is mixed; and new genetically distinct viruses emerge," explains Perez, an associate professor in the VA-MD Regional College of Veterinary Medicine, Maryland Campus. According to Perez and his colleagues many factors are involved in the viability of new viruses that result from reassortment, but the most important is the compatibility of their two sets of viral genes to work together to form functional offspring. The importance of reassortment in the generation of viruses with pandemic potential, the scientists say, was demonstrated in 2009 when a novel H1N1 influenza (pH1N1) virus caused the first influenza pandemic in 40 years. That virus was identified as the product of a three way reassortment, between avian, swine, and human influenza viruses.

In their current study, the researchers looked at the compatibility of the 2009 pandemic pH1N1 virus—which has some genetic characteristics that may allow it to reassort more easily than other influenza viruses—with an influenza strain known as H9N2.

Published in the Proceedings of the National Academy of Sciences (PNAS) the week of July 4-8, this new research builds on earlier findings by Perez and his team of the heightened communicability of the H1N1 virus as well as their work on the airborne communicability of H9N2. And it adds knowledge that may advance modern medicine’s longstanding effort to learn how to predict when pandemic flu viruses will arise. An effort that in recent years has focused on study of H5, H7, and H9 subtypes of flu viruses because these all occasionally infect humans and, in the case of H5 viruses, can cause significant disease and death.

For their PNAS study, the researchers created four reassortant viruses with one or two genes from the H9N2 virus and the rest of the genes from pH1N1. They used two different H9N2 viruses to provide the genes. One was a typical H9N2 isolated from a bird in Asia. The other was an avian isolate that had been adapted to infect and transmit in mammals.

Perez and colleagues looked at the growth characteristics of these four viruses and also their infectivity and transmissibility in ferrets. Ferrets are used as a model for human infections as they are susceptible to the same viruses and show similar signs of infection. All four viruses were able to grow to relatively high levels in cell culture. Similarly all four viruses infected ferrets and showed similar signs of disease and levels of replication. Additionally, they were all able to transmit to ferrets housed in the same cage and allowed physical contact. Finally, three of the four viruses were able to transmit to ferrets that were physically separated but shared the same air.

The new results are important for several reasons according to Perez. "Ours is the first study to show respiratory transmission of an H9 reassortant virus in mammals without prior adaptation. This is important because a new virus must be able to transmit via the respiratory route to impact the human population significantly. Secondly, adapting some of the genes to mammalian hosts allows for more efficient infection and transmission. Finally, these studies indicate that the pH1N1 and H9N2 influenza
Subtypes are highly compatible for reassortment with each other. And this compatibility means there is potential for the emergence of an H9 influenza pandemic."

**Journal Reference:**

**Researchers identify protein essential in transmission of Ebola virus**
Researchers identified a novel small molecule that inhibits EboV entry into cells by more than 99 percent; they found that the target of the inhibitor is the cell protein Niemann-Pick C1

Boston, MA – Ebola virus (EboV) is the cause of sporadic outbreaks of highly fatal infections in Africa that are unpredictable in onset and rapid in progression. There is no effective vaccine or therapy for EboV infection. To address this problem, researchers at Brigham and Women’s Hospital (BWH) used a robotic method developed by their colleagues at the National Small Molecule Screening Laboratory at Harvard Medical School to screen tens of thousands of compounds and identified a novel small molecule derived from benzylpiperazine adamantyl diamide that inhibits EboV entry into cells by more than 99 percent.

Further studies at the United States Army Research Institute for Infectious Disease at Fort Detrick, MD verified that the newly identified entry inhibitor blocked cell-cell transmission of the virus. They used the inhibitor as a probe to investigate the EboV infection pathway and found that the target of the inhibitor is the cell protein Niemann-Pick C1 (NPC1). This research is published in the August 25, 2011 issue of *Nature*.

"In 2005, we showed that digestion of the glycoprotein on the surface of EboV particles by the host cell protease cathepsin B is a critical step in infection, but we knew that there was something else at play. Identifying the EboV inhibitor led us to the discovery that NPC1 is the conduit through which the virus is able to breakthrough cell membranes and infect host cells," said James Cunningham, MD, senior author of the paper and researcher in the Division of Hematology at BWH.

Combined with the results of previous studies of the virus glycoprotein structure and function, these findings indicate that EboV infection proceeds by sequential steps in which cathepsin B removes the protective top of the EboV glycoprotein and exposes the critical region that binds to NPC1 and triggers entry of EboV particles into cells.

"Our findings show that EboV infection has features in common with other pathogenic viruses including HIV and SARS that also utilize two host proteins to breakthrough cell membranes and infect host cells," said Cunningham. "It is interesting that NPC1 is critical for the uptake of cholesterol into cells, which is an indication of how the virus exploits normal cell processes to grow and spread. Small molecules that target NPC1 and inhibit EboV infection have the potential to be developed into anti-viral drugs."

**Cholera pandemic’s source discovered**
Researchers have tracked the spread of antibiotic resistant strains back to the Bay of Bengal

Researchers have used next generation sequencing to trace the source and explain the spread of the latest (seventh) cholera pandemic. They have also highlighted the impact of the acquisition of resistance to antibiotics on shaping outbreaks and show resistance was first acquired around 1982.

Whole genome sequencing reveals that the particular cholera type responsible for the current pandemic can be traced back to an ancestor that first appeared 40 years ago in the Bay of Bengal. From this ancestor, cholera has spread repeatedly to different parts of the world in multiple waves.

These findings offer much better understanding of the mechanisms behind the spread of cholera—a diarrhoeal infection which is usually linked to unhygienic conditions and poor sanitation systems often found in disaster areas, such as the Haitian earthquake in October 2010. It is estimated that cholera affects 3 million to 5 million people each year, with 100,000-120,000 deaths.

The team tracked the spread of the organism by analysing the genomes of the causative bacterium Vibrio cholerae taken from 154 patients across the world over the last 40 years. Using the ability to track single DNA changes in the genome of this strain, they were able to map the transmission routes of the bacteria, aiding future health planning and enabling ‘backtracking’ of the disease to its origin.
They discovered that the current strain of the bacterium—known as the El Tor strain—first became resistant to antibiotics in 1982 by acquiring the genetic region SXT, which entered the bacterium's genome at that time, triggering renewed global transmission from the original source.

"Through comparing the genomes of 154 cases of cholera, we have made important discoveries as to how the pandemic has developed" says Dr Julian Parkhill, a senior group leader at the Wellcome Trust Sanger Institute and a senior author of the study. "Our research shows the importance of global transmission events in the spread of cholera. This goes against previous beliefs that cholera always arises from local strains, and provides useful information in understanding cholera outbreaks."

The study crucially identified the origins of the pandemic strain to its roots 40 years ago in the Bay of Bengal. From this base, it has since infected people around the world, including Africa, South Asia and South America.

"Looking at the past 40 years of transmissions from continent to continent, we found that the Bay of Bengal acts as a reservoir for cholera, where it can thrive and spread," explains Nicholas Thomson from the Sanger Institute and one of the first authors of the study. "By tracking how the disease is spread, our maps of transmission could influence future decisions on how to tackle this disease."

The analysis shows that there was not a simple single spread of a strain of V. cholerae out from the Bay of Bengal. The evidence suggests that there have been at least three independent overlapping waves of intercontinental spread with a common ancestor in the 1950s, representing the original El Tor strain. These movements are strongly correlated with human activity, suggesting that the strain has been carried by human travel.

"These findings are opening up new pathways for researchers studying all fields of bacterial infection: from investigating how genetic changes enable strains to build up resistance to antibiotics, to being able to track a disease's transmission and trace it back to its roots," says Ankur Mutreja, first author from the Sanger Institute. "These first initial discoveries could be the key to unlocking many other bacterial pandemics."

"This is among the first study that merges evolutionary information with emergence of contemporary new variants of Vibrio cholerae and then uses the phylogenetic signatures to track the intercontinental spread of cholera," explains Professor G Balakrish Nair, Director of the National Institute of Cholera and Enteric Diseases in Beliaghata, India. "These findings in due course will lead us to understand why cholera pandemics begin in Asia and then spread as a wave across the world."

**Publication Details**


**Novel control of Dengue fever**

The spread of Dengue fever in northern Australia may be controlled by a bacterium that infects mosquitoes that harbor the virus, Australian and U.S. researchers report Aug. 25 in two papers published in the journal *Nature*.

The result grew out of work more than 20 years ago by population biologist Michael Turelli, professor of evolution and ecology at UC Davis, and Ary Hoffmann, now at the University of Melbourne, Australia, who are among the coauthors of one of the new *Nature* papers.

Turelli and Nick Barton of the Institute of Science and Technology, Austria, also describe the mathematical basis of the dengue elimination project in a paper to be published in the journal *American Naturalist* in September.

Dengue fever is caused by four virus strains spread by the mosquito *Aedes aegypti*. The disease causes high fever and has been called "breakbone fever" because of the joint aches and muscle pains it causes. Dengue viruses can also cause a potentially fatal disease, dengue hemorrhagic fever, in people who have previously been infected with a different strain of the virus.

Dengue viruses are found throughout the tropics and subtropics and appear annually in northern Australia. The researchers released mosquitoes infected with the bacterial parasite *Wolbachia*, which suppresses the virus, and now report that the *Wolbachia* parasite spreads rapidly through the wild mosquito population.

"The results show we can completely transform local populations in a few months," Turelli said. *Wolbachia* is transmitted by female mosquitoes to their offspring. A pair of infected mosquitoes produce slightly fewer eggs than an uninfected couple, but when an infected male mosquito mates with an uninfected female, she produces no eggs at all. That provides a big reproductive advantage to the spread of *Wolbachia*-infected mosquitoes, generation by generation.
"It's natural selection on steroids," Turelli said.

It turns out that Wolbachia also suppresses various other microbes living in the same mosquito – including the dengue virus. As these virus-resistant mosquitoes spread through the wild population, dengue transmission should dry up.

Turelli and Hoffmann first described what turned out to be Wolbachia spreading among Drosophila flies in California's Central Valley in 1991, and Barton developed much of the relevant mathematics in the late 1970s while trying to understand the genetics of grasshoppers in the French Alps. That basic research by Turelli, Hoffman and Barton provides the biological and mathematical basis for the dengue control strategy.

"At the time, none of us expected that this original research might contribute to human health. This is very exciting, once-in-a-lifetime opportunity," Turelli said. "We never thought this would turn into an eradication project."

The mathematics is complicated because when Wolbachia is rare, its spread through an insect population is disadvantaged because infected couples lay fewer eggs than uninfected. However, once the frequency of the infection crosses a certain threshold, there is a strong advantage to its spread.

Originally, Turelli and other researchers lead by Scott O'Neill at the University of Queensland, funded by the Bill & Melinda Gates Foundation, tried to use Wolbachia to shorten the lifespan of Aedes so that the virus would not have the 12 days necessary to develop. However, that approach seems unlikely to work, based on the mathematics of the spread of that type of Wolbachia.

Instead, the team found that Wolbachia itself suppresses certain viruses. The Gates Foundation is providing further funding to support release of infected mosquitoes in Australia, Vietnam and Thailand.

**Eradicating dangerous bacteria may cause permanent harm**

**Researcher urges immediate investigation of widespread antibiotic use and overuse**

New York, August 25, 2011 – In the zeal to eliminate dangerous bacteria, it is possible that we are also permanently killing off beneficial bacteria as well, posits Martin Blaser, MD, Frederick H. King Professor of Medicine, professor of Microbiology and chair of the Department of Medicine at NYU Langone Medical Center. His commentary is published in the August 25 edition of the journal *Nature*.

Dr. Blaser sounded the alarm to the medical community and to the general public, that the widespread use of antibiotics may be having unintended consequences causing permanent changes in the body’s protective, friendly flora and causing harm to the body's natural defense system. This may be even more dangerous to health than the creation of resistant "superbugs," which have garnered much attention over the last few years.

By the time a child in the US or other developed countries reaches the age of 18, s/he has already had on average 10-20 doses of antibiotics. These are in addition to the antibiotics that may be given to women while they are pregnant, and which may affect the normal bacteria that mothers transmit to their children.

The discovery and use of antibiotics has helped to increase life expectancy. However they are non-discriminatory and destroy even friendly bacteria, not just harmful ones. Scientists have found that some of the beneficial bacteria may never recover and that these extinctions may lead to increased susceptibility to infections and disease. As a result, antibiotic use could be contributing to the increases in obesity, allergies and asthma, inflammatory bowel disease, and type 1 diabetes that are occurring throughout the developed world.

Dr. Blaser urges physicians to curtail the use of these drugs immediately, and recommends that narrow spectrum, and more targeted drugs be used in their place. To be successful, this shift will require a significant effort to develop new antibacterials and new diagnostic tests that will permit the use of targeted agents.

"I believe that doctors of the future will be replacing "lost" members of our normal flora in young children to diminish the risk of development of these important and chronic diseases," said Dr. Blaser.

**George Mason Research Team Uncovers New Factor in HIV Infection**

Aug. 24, 2011

**Media Contact:** Leah Fogarty, lfogart1@gmu.edu 703-993-8781

Building off previous findings, HIV researchers hope discovery will aid new therapies

A George Mason University researcher team has revealed the specific process by which the HIV virus infects healthy T cells—a process previously unknown. The principal investigator, HIV researcher Yuntao
Wu, says he hopes this breakthrough will start a new line on inquiry into how researchers can use this knowledge to create drugs that could limit or halt HIV infection.

Wu, a professor of molecular and microbiology at Mason, published these findings in an April 2011 edition of the Journal of Biological Chemistry, along with researchers Paul J. Vorster, Jia Guo, Alyson Yoder, Weifeng Wang, Yanfang Zheng, Dongyang Yu and Mark Spear from Mason's National Center for Biodefense and Infectious Diseases and the Department of Molecular and Microbiology and Xuehua Xu from Georgetown University School of Medicine's Department of Oncology.

This paper outlined a new understanding on how T cells—which are the target cells that the HIV virus infects—move and migrate when hijacked by the virus.

"The discovery adds to our understanding of how HIV initiates the infection of human T cells, which leads to their eventual destruction and the development of AIDS," Wu says.

Researchers and doctors have known for some time that the HIV virus, rather than directly killing healthy T cells, actually hijacks them. This eventually leads to their destruction. So the virus essentially turns the infected T cells (also known as CD4T cells or helper T cells) into a factory for creating even more HIV. Learning more about how the cells are infected could be a key step toward figuring out how to stop infection altogether.

Wu's latest discovery builds upon his previous work, published in the journal Cell in 2008, which described the basic process of how HIV infects T cells. After discovering that cofilin—a protein used to cut through a cell's outer layer, or cytoskeleton—is involved in HIV infection, Wu's new research provides the detailed framework for this process.

This new factor is called LIM domain kinase, or LIMK. The researchers discovered that LIMK triggers a cell to move, almost acting like a propeller. This cell movement is essential for HIV infection. This discovery marks the first time that a research team has uncovered the involvement of LIMK in HIV infection.

Building upon these results, the researchers then used a drug to trigger similar LIMK activation and found that it increased infection of T cells. Of course, the researchers ultimately want to decrease the infection of T cells—so they worked backwards and found something very promising.

"When we engineered the cell to inhibit LIMK activity, the cell became relatively resistant to HIV infection," says Wu. In other words, the researchers engineered human T cells that were not easily infected by HIV. This finding suggests that, in the future, drugs could be developed based on LIMK inhibition.

And while there are currently no medical drugs available to inhibit LIMK, Wu hopes this is a developing area in potential new therapeutic targets. One advantage of using this kind of therapy over the current medication available to those with HIV is that it's more difficult for the HIV virus to generate resistance to treatment, Wu explains.

Wu's team continues its work on decoding this complicated process, and he stresses that there is still much to be done.

"These findings are certainly exciting, and are an emerging research field that we are proud to have established three years ago with the publication of our Cell paper," he says. "We will continue to study the molecular details and to use those discoveries to develop new diagnostic and therapeutic tools to monitor and treat HIV-mediated CD4 T cell dysfunction and depletion."

**Impossible? Outlawing State Safety Laws for Generic Drugs**
Leonard H. Glantz, J.D., and George J. Annas, J.D., M.P.H.

In the 2009 case Wyeth v. Levine, the Supreme Court ruled that manufacturers of brand-name drugs could be sued under state law for failing to adequately warn of new risks discovered after the drug was approved for marketing by the Food and Drug Administration (FDA).1 The Court rejected Wyeth’s argument that state lawsuits were preempted because federal law prohibited the manufacturer from changing the label without FDA approval. The Court held, first, that Congress did not expressly forbid states from requiring additional safety warnings on drug labels. Second, the FDA had promulgated a “changes being effected” regulation, which explicitly permitted the drug manufacturer to make labeling changes to strengthen a warning without preapproval by the FDA. Finally, the Court noted, “it has remained a central premise of federal drug regulation that the manufacturer bears responsibility for the content of its label at all times [including] . . . ensuring that its warnings remain adequate as long as the drug is on the market.”2

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The question in *Pliva v. Mensing*, which the Supreme Court decided on June 23, 2011, was whether the safety standards for brand-name drug labeling also apply to generic-drug manufacturers. The patients in the *Pliva* case took generic metoclopramide for several years and developed tardive dyskinesia. The label warned of a risk of tardive dyskinesia, but the injured patients argued that the warning was not adequate. The defendant manufacturer responded that the “changes being effected” process was not available to generic-drug manufacturers because the FDA requires labels for generic versions of drugs to be identical to those of the brand-name drugs. In its brief to the Court, the FDA agreed with the manufacturer’s interpretation of the law. The Court, in an opinion written by Justice Clarence Thomas, accepted the FDA’s interpretation and held that state courts were preempted from making any finding of liability based on a generic-drug manufacturer’s failure to change its label. The FDA also asserted, however, that generic-drug manufacturers have a duty to propose stronger warning labels to the FDA if they know that stronger warnings are needed to safely market a drug. If the FDA agreed that a label change was necessary, it would work with the brand-name manufacturer to create a new label.

The Court ruled that even if such a duty existed, federal law still preempted injured patients from bringing lawsuits in state courts, because the state laws in question require a safer label, not communication with the FDA about the possibility of creating a safer label. The Court concluded that FDA regulations made it “impossible” for the manufacturer to change the label on its own and therefore impossible to comply with both federal and state laws; given this impossibility, federal law preempted state law under the Supremacy Clause, so the injured patients could not bring a state lawsuit.

The four dissenting justices, in an opinion written by Justice Sonia Sotomayor, argued that state lawsuits were not preempted because compliance with both federal and state laws had not been proven to be impossible. FDA regulations provide generic-drug makers with a way to comply with their state-law duty to adequately warn purchasers of the drugs about the newly recognized side effects. Specifically, the generic manufacturer could notify the FDA that the label used by the brand-name drug manufacturers was inadequate and request that the labeling be amended. The dissenters would require a manufacturer to prove that the FDA would not have adopted its proposed labeling change as a condition of showing that compliance with both federal and state law was impossible. Second, since state law requires adequate labeling of drugs as a condition of sale, the drug companies could have complied with both federal and state laws by stopping the sale of the drugs it knew were inadequately labeled. And with that, the Court reversed the rulings of two circuit courts of appeals that had found the lawsuits were not preempted by federal law.

The four dissenting justices, in an opinion written by Justice Sonia Sotomayor, argued that state lawsuits were not preempted because compliance with both federal and state laws had not been proven to be impossible. FDA regulations provide generic-drug makers with a way to comply with their state-law duty to adequately warn purchasers of the drugs about the newly recognized side effects. Specifically, the generic manufacturer could notify the FDA that the label used by the brand-name drug manufacturers was inadequate and request that the labeling be amended. The dissenters would require a manufacturer to prove that the FDA would not have adopted its proposed labeling change as a condition of showing that compliance with both federal and state law was impossible. Second, since state law requires adequate labeling of drugs as a condition of sale, the drug companies could have complied with both federal and state laws by stopping the sale of the drugs it knew were inadequately labeled. But as with many five-to-four decisions, there are important ideological divisions between the majority and the dissenters.

The majority opinion leaves injured patients with no legal recourse even if they were victims of inadequate labeling, a result that doesn’t seem to trouble the majority. The justices in the majority blame this unfair and arbitrary result on what they see as incompetent federal regulation and make no attempt to reconcile the federal law with state law as the lower courts did. The dissenters argue that this nonsensical outcome could not have been intended. Both Congress and the FDA meant to strengthen drug safety (a point the majority entirely ignores), not to empower generic-drug makers to inadequately label their products.

It is also worth noting the ideological paradox inherent in the majority opinion. The majority, made up of four conservative justices joined by Justice Anthony Kennedy, usually claim to deplore excessive federal authority and to favor state authority. But they decided the case in a way that denies the states any role at all in generic-drug safety. Given their judicial philosophies, as well as what the minority noted has been the Court’s “assumption that the historic police powers of the States were not to be superseded by the Federal Act unless that was the clear and manifest purpose of Congress,” one would expect them to go out of their way to interpret federal laws so as to avoid depriving states of their historical “police power” authority. The liberal justices in the dissent are less enamored of federalism but were able to reconcile the laws so that both federal and state governments would play important roles in drug safety and the compensation of victims of inadequate drug labeling.

As the American Medical Association argued in its brief, “It should be the responsibility of all drug makers to conduct reasonable and affirmative safety surveillance and to take appropriate action when significant safety concerns arise.” Such surveillance and follow-up are especially important when it comes
Proportion of All U.S. Prescriptions Accounted for by Generic Drugs (Panel A) and Proportion of Prescription-Drug Market in which Generic Drugs May Be Substituted for Brand-Name Drugs (Panel B)., and “in many cases, once generic versions of a drug enter the market, the brand-name manufacturer stops selling the brand-name drug altogether.” These facts, as well as the inadequacy of FDA postapproval drug surveillance, demonstrate the public policy problems inherent in relying on brand-name drug manufacturers to ensure proper labeling.

Congress or the FDA can change the Supreme Court's conclusion. Better postmarketing surveillance should be combined with a more proactive FDA to ensure adequate labeling of all the drugs available for physicians to prescribe. Finding the political will to make these changes should not be impossible.

**HIV Surveillance, Public Health, and Clinical Medicine — Will the Walls Come Tumbling Down?**

Amy L. Fairchild, Ph.D., M.P.H., and Ronald Bayer, Ph.D.

The centrality of antiretroviral therapy for people with human immunodeficiency virus (HIV) infection is an established feature of the clinical response to HIV–AIDS. Now there is compelling evidence that such treatment can have a profound impact at the population level by reducing viral loads and hence infectivity. As a consequence, important ethical and operational questions about the relationship between clinical medicine and public health are surfacing. Perhaps the most fundamental of these centers on the uses of surveillance.

More than two decades of battles over HIV surveillance yielded a comprehensive public health surveillance system — along with robust firewalls to protect confidentiality. Many surveillance personnel and advocates for people with HIV asserted that such registries should be used for epidemiologic purposes only — that data should go in but not come out.

Despite such deep resistance, pressure began to mount to ensure that surveillance data were used to serve public health ends. In 2007, a report from the Centers for Disease Control and Prevention (CDC) bluntly stated that “once the data are in hand it is the failure to use those data for public health purposes that must be justified.”

New York City sought to pioneer new uses of its HIV registry. In 2005, city health commissioner Thomas Frieden proposed extending surveillance to the monitoring of viral loads and drug resistance, arguing that the data should provide a foundation for public health interventions targeting both patients and providers. “We know people are dying,” he told the New York Times, “and we are prohibited by law from lifting a finger to try and help.” He unsuccessfully sought to determine when people dropped out of care (indicated by a lack of regular tests for CD4 counts and viral loads) and then to reach out either to their health care providers or the patients themselves to help them regain access.

Strikingly, analyses of the debate over using surveillance data for clinical purposes focused heavily on social resistance grounded in classic arguments about violations of privacy and the protection of professional autonomy. Hardly noticed was the opposition from within the public health community. In New York, for example, it was state health officials who most ardently opposed new uses of data, even as they endorsed expanded surveillance for epidemiologic purposes. The reluctance was surprising, given the long history of using surveillance registries as a bridge between patients, medical providers, and health departments in the control of sexually transmitted diseases (STDs) and tuberculosis.

Advances in HIV treatment, however, began shifting the terms of the discussion, and in March 2011 the CDC convened a “Consultation on Monitoring the Use of Laboratory Data Reported to HIV Surveillance” to help craft recommendations for legitimate uses of confidential surveillance data. Central to this shift was the mounting evidence regarding the key role of linkage to care in controlling the epidemic’s spread. It had long been established that, nationwide, approximately 25% of people with HIV infection don’t know their HIV status. Moreover, of those who are aware that they’re infected, 50% are not receiving regular HIV care. Even in New York City, which provides an unusually strong package of benefits and treatment, less than half of the 76% of patients who continued to show evidence of care after
an initial diagnosis managed to receive regular care (i.e., laboratory monitoring at least every 6 months) over the long term.\textsuperscript{3}

All states but one now require laboratory-based reporting of CD4 cell counts to health departments, and all but four require reporting of viral loads. Nevertheless, only one state has begun to push information back out in ways intended to affect care.

The innovating state, Louisiana, could hardly boast about its record of STD control. In 2008–2009, it led the nation in rates of primary, secondary, and congenital syphilis and reported 17,000 people living with HIV, approximately 40\% of whom were not in care.\textsuperscript{4} But not all were lost to care entirely. Some 2500 persons with either untreated HIV or syphilis received other, unrelated medical services in the public hospital system in 2007. Yet their health care providers were unaware of their HIV or STD status.

To remedy this situation, the state Office of Public Health (OPH) created the Louisiana Public Health Information Exchange (LaPHIE). Today, when an “authorized medical provider” opens a patient’s electronic medical record in the state hospital system, it triggers an automatic data query to OPH. LaPHIE determines whether the patient is an HIV-exposed infant or someone who tested positive for HIV but either was not informed of the results or hasn’t received a CD4 test within the past 12 months.\textsuperscript{5} In these instances, it returns an eye-catching “point-of-care message,” alerting the caregiver that the patient is HIV-positive and not receiving care and providing an opportunity to offer appropriate services. At the March 2011 CDC consultation, Jane Herwehe of Louisiana State University presented data showing that this simple message, which merely triggers a conversation with the patient, resulted in approximately 75\% of HIV-positive people returning to care during the pilot phase.

Characteristically, the state consulted extensively with members of the community, health care providers, and federal health officials on ethical matters before launching LaPHIE. Ironically, all this discussion masked the most substantial initial barrier the initiative faced: resistance from staff members of the Louisiana Office of HIV Surveillance. Their antagonism was grounded in both social and practical considerations. To build an HIV registry, the staff had become skilled at mining clinical records and other data registries. But though they regarded no data source as off-limits, officials resisted bringing those sensitive data together into a single, identified HIV record. Stigma remained a major reason for opposing measures that might put confidentiality at risk.

Technical considerations about when the data were “good enough” for clinical purposes have also been paramount. As one New York City official explained, “Matching is the single most dangerous part. It all falls down to how careful surveillance programs are with their ‘fuzzies’” — laboratory reports that don’t definitively belong to an individual in the registry.

Significantly, staff members who have long defended the walls around the HIV registry are reconsidering policies of containment and now believe it’s time to open up HIV registries.\textsuperscript{1} What pushed the matter to the tipping point were the data on retention in care. An analysis identifying “major gaps in continuity of care among persons newly diagnosed with HIV” convinced New York City’s surveillance staff that the registry had the “capacity to monitor utilization of care, identify deficits, and evaluate progress in programs designed to facilitate retention in care.”\textsuperscript{3} Combining these data with the new understanding about the ways in which treatment reduces infectivity led innovators to conclude that “The most important thing we can do is to actively link [those with HIV] into care.” They have begun reconceiving of the registry as a kind of “universal” electronic medical record, a critical “resource for physicians” analogous to immunization registries or childhood wellness databases.\textsuperscript{2}

At this point in the HIV epidemic — given the social context, the therapeutic prospects for individual patients, and the potential for interrupting transmission in the population — we must ask what is the greater mistake: opening up the registries, potentially giving infected people and clinicians more choice, or leaving those walls intact, recognizing that the data are imperfect and that some people don’t want their information shared even with their own health care providers? We believe it is time to affirm that there is a public health duty to use surveillance data in new ways, for the sake of both populations and individuals — and then to begin the harder business of deciding when the data are adequate for us to start dismantling the Jericho-like walls from the inside out.

\textbf{Study shows ’remarkable’ effectiveness of modern HIV treatment}

\textit{Michael Carter}

Published: 24 August 2011

US investigators have found evidence of the “remarkable” success of antiretroviral therapy in disadvantaged urban minority populations. In the online edition of \textit{Clinical Infectious Diseases},
researchers from Johns Hopkins’ University, Baltimore, report that in 2010 their patients’ average viral load was below 200 copies/ml.

“This is a remarkable accomplishment that is probably due to improved antiretroviral drugs and changes in management, including the starting of therapy at less advanced immunosuppression,” comment the authors.

They add that the levels of HIV suppression achieved by their patients could have important implications for the prevention of further HIV transmissions.

Triple-drug antiretroviral therapy first became available in 1995-96. However, it was based on unboosted protease inhibitors that lacked potency. Treatment also had other limitations. It often involved unpleasant side-effects, adherence was difficult, and many patients had pre-existing resistance due to a history of previous therapy involving only one or two anti-HIV drugs.

Since then there have been major improvements in HIV treatment and care. These have included the introduction of boosted protease inhibitors and potent NNRTIs, as well as the development of drugs in new classes. Indeed, the goal for HIV treatment for most patients is an undetectable viral load. Moreover, there have also been changes in treatment guidelines, which now recommend the early initiation of antiretroviral therapy.

Johns Hopkins’ HIV clinic serves a large socially disadvantaged urban population. Between 1996 and 1998 only 44% of the clinic’s patients taking HIV therapy achieved an undetectable viral load, but by 2001 to 2002 this had increased to 79%.

Investigators from the clinic wanted to see how changes in HIV treatment and care had impacted on their patients’ viral load between 1996 and 2010.

A total of 5290 individuals were included in the investigators’ analysis.

There were important changes in the demographics and clinical characteristics of the patients over the period of the study.

Their median age increased from 38 years in 1996 to 49 years in 2010. There was also a marked fall in the proportion of patients who were infected with HIV via injecting drug use, from 46% in 1996 to 36% in 2010. At the same time, there was an increase in the percentage of patients who acquired HIV through heterosexual intercourse (43% to 51%).

The proportion of patients taking triple-drug antiretroviral therapy increased from 22% in 1996 to 85% in 2010, and overall CD4 cell count increased from a median of 239 cells/mm³ to 444 cells/mm³.

Median viral load fell from 10,000 copies/ml in 1996 to below 200 copies/ml in 2010. Moreover, by 2010, only 17% of patients had a viral load above 500 copies/ml.

Rates of retention in care improved from 86% in the period 1996 to 2002 to 94% by 2010.

“We believe that our results emphasize that even an inner urban HIV-infected population with a relatively high proportion of patients who were infected as a consequence of injecting drug use, HAART [highly active antiretroviral therapy] can be highly efficacious,” write the authors.

They add: “These results...reflect the increasing use of HAART and are a testament to the remarkable effectiveness of HAART in our patient population.”

There is considerable interest in the use of HIV treatment as prevention, and the investigators believe that the viral suppression achieved by their patients “may...have implications for transmission of HIV in the urban community which the Johns Hopkins HIV clinic draws its patients.”

An editorial accompanying the study is equally enthusiastic about its findings, the author commenting, “the results of the study are highly relevant for clinicians, because they show an extremely high treatment success rates, even in the context of challenging sociodemographic circumstances. Providers faced with potentially difficult cases can be reassured that most of these cases are in patients who will achieve virologic suppression with the effective and well-tolerated regimens now available.”

Reference

AIDS Stalks Gay and Transgender Indians
Agence France Presse, (08.24.2011)
HIV prevalence among men who have sex with men (MSM) and among transgender women in India is estimated at 7.3 percent, much higher than the 0.31 percent rate in the general adult population,
according to the National AIDS Control Organization. This disparity persists despite India’s 50 percent reduction in its overall HIV infection rate during the past decade.

“We don’t have a proper denominator for the number of MSM, and that number is much higher than what we are willing to accept,” said Ashok Row Kavi, gay rights activist and UNAIDS technical adviser for sexual minorities. “It’s very worrying because hardly 4 percent of the [government] money for fighting HIV is coming to MSM groups.”

Most gay men feel pressured to hide their sexuality, and some have no idea about the particular risks of unprotected sex, said Maksoom Ali, project manager at the Pahal Foundation, which offers condoms, counseling, and HIV testing to MSM and transgender persons. UNAIDS estimates about one-third of MSM in India are not accessing HIV testing, sex education, and free condoms.

“Many people think that [MSM] cannot get HIV, and that’s one reason why people have a lot of unsafe sex,” said Ali.

Sanam, a 25-year-old transgender sex worker, knew nothing about STDs in the beginning: “I never used to take it seriously; we used to do it without condoms. [Pahal Foundation] first conducted a blood test on me, then they told me about HIV, what it is, how it spreads. Because of that I always use condoms.”

Sometimes customers use force to have unprotected sex, said Rupali, a 24-year-old transgender sex worker. Police also abuse her, she added: “They force us to have sex, they take our money, and then they beat us up.”

Many nongovernmental organizations say funding for HIV prevention among MSM and transgender women falls short. For instance, the Pahal Foundation serves 50 percent more people than it can cover with its budget.

**Human Rights Watch: Maternal Deaths Quadruple in South Africa**

Associated Press, (08.08.2011) Michelle Faul

Poor governance, corruption, and abuse in South Africa’s health care system contribute to its high maternal death total of some 4,500 women annually, according to Human Rights Watch. A new HRW report documents care failures, abuse of maternity patients by health workers, and inferior services in Eastern Cape Province that put lives at risk.

South Africa’s maternal death rate more than quadrupled over the past decade, from 150 deaths per 100,000 live births in 1998 to 650 deaths per 100,000 in 2007, putting the UN Millennium Development Goal of no more than 38 maternal deaths per 100,000 by 2015 completely out of reach.

Better reporting and the country’s 18 percent HIV infection rate could both be factors in the increase, HRW said. The government claims nearly half of maternal deaths between 2005 and 2007 were related to HIV/AIDS. However, just 9 percent of maternal deaths in sub-Saharan Africa overall are HIV/AIDS-related. The report quotes witnesses who say HIV-positive women in South Africa are denied care or given it too late.

“The basic issue is lack of oversight and accountability in terms of monitoring what is happening, and acting on it,” said Agnes Odhiambo, the HRW project’s lead researcher. “If nurses are abusive, they need to be accountable; if people are corrupt, they need to be made accountable.”

Most of the witnesses interviewed, who were not identified for fear of repercussions, did not file complaints. There were no responses in the few cases where complaints were lodged, HRW said. Several women said they avoided government facilities because of widely known stories of patient abuse.

“We are very, very much aware ... painfully aware,” said Aaron Motsoaledi, South Africa’s health minister. He agreed with “some” of the findings, but added that he has been working several years to reduce the maternal death rate.


**The Effect of Peer-Driven Intervention on Rates of Screening for AIDS Clinical Trials Among African Americans and Hispanics**

American Journal of Public Health Vol. 101; No. 6: P. 1096-1102, (06.2011) Marya Viorst Gwadz, PhD; Noelle R. Leonard, PhD; Charles M. Cleland, PhD; Marion Riedel, PhD; Angela Banfield, MPH; Donna Mildvan, MD; the ACT2 Project Collaborative Research Team

The study authors examined the efficacy of a peer-driven intervention to increase screening rates for AIDS clinical trials among African Americans and Hispanics with HIV/AIDS.
The intervention (six hours of structured sessions and the opportunity to educate three peers) was compared with a time-matched control arm using a randomized controlled design to examine efficacy. Participants were recruited using respondent-driven sampling (n=342; 43.9 percent female; 64.9 percent African-American; 26.6 percent Hispanic). Most participants (93.9 percent) completed intervention sessions, and 64.9 percent recruited or educated peers. Completion rate for baseline and post-baseline computer-assisted interviews was 94.4 percent. Intervention effects on screening were examined via a mixed model.

Compared to the control group, screening was much more likely in the peer-driven intervention (adjusted odds ratio=55.0; z=5.49, P<.001); 46.0 percent of intervention participants were screened compared with 1.6 percent of controls. The experience of recruiting and educating each peer also increased screening odds among those who themselves were peer-recruited and –educated (AOR=1.4; z=2.06, P<.05).

"Peer-driven intervention was highly efficacious in increasing AIDS clinical trial screening rates among African Americans and Hispanics living with HIV/AIDS," the authors concluded.

New Antiretrovirals Factory to Operate in Mozambique in 2013
Xinhua News Agency, (08.24.2011)
Construction is underway in Mozambique on a new pharmaceutical factory that will manufacture antiretrovirals and other products, the Mozambican News Agency reported Wednesday. The facility is set for completion early next year, with manufacturing to begin in 2013, Jose Luis Telles, head of Brazil’s Oswaldo Cruz Foundation, was quoted as saying. “The factory, which will employ 88 Mozambicans, will manufacture 20 different medicines for the treatment of a number of diseases, especially antiretroviral drugs,” Telles said. Promoted by Brazil’s former President Luis Inacio Lula da Silva, the project has been in planning since 2003, but Brazil’s Senate only green-lighted it in 2009.

Older Women Shunning Safe Sex: Survey
Australian Associated Press, (08.25.2011) Stephen Johnson
A Family Planning New South Wales study of adult women with a profile on the Australian dating website RSVP found those over age 40 were less likely to use a condom with a new partner. Of the 1,788 women surveyed in 2009 about safer sex and Internet dating, 62 percent were over 40. Older women were open to discussing STDs but less likely to refuse unprotected sex, the report found. “It is possible that older women are simply not part of the ‘condom generation,’” said report co-author Deborah Bateson. “This may explain why our Family Planning NSW clinics are seeing more women aged 40 and above requesting information and testing for sexually transmitted infections.” In addition to mistakenly assuming infection risk declines with age, “Women who have reached menopause also don’t have the added incentive of using condoms to prevent pregnancy,” Bateson said. New strategies to encourage condom use should be investigated, suggests the report.

Researchers find wide gap in immune responses of people exposed to the flu
ANN ARBOR, Mich.—Why do some folks who take every precaution still get the flu, while others never even get the sniffles?

It comes down to a person’s immune system response to the flu virus, says Alfred Hero, professor at the University of Michigan College of Engineering. In one of the first known studies of its kind, Hero and colleagues from Duke University Medical Center and the Duke Institute for Genome Sciences & Policy, used genomics to begin to unravel what in our complex genomic data accounts for why some get sick while others don’t. The study findings will appear in PLoS Genetics Aug. 25.

Hero’s analysis group used several methods, including a pattern recognition algorithm previously developed for satellite imaging of the environment to discover the genomic signatures associated with immune response and flu symptoms. Using these genomic signatures, researchers compared the responses of previously healthy participants inoculated with the flu, and found significant and complex immune responses in both people who got sick and those who did not.

The gene expression data gets to the heart of how the immune system reacts and orchestrates its response to the flu virus, which dictates whether people get sick.

"We looked at over 22,000 genes in 267 blood samples,” said Hero, who is also affiliated with the U-M College of Literature, Science & Arts and the U-M Medical School. "No study of this magnitude has ever been done on human immune response."
Geoff Ginsburg, study co-author and director of the Center for Genomic Medicine at the Duke Institute for Genome Sciences & Policy, said the study reveals what happens after virus exposure.

"It also points out, importantly, that remaining asymptomatic in the face of an exposure to a virus is an active process in the immune system, and we can now begin to probe the underlying biology to resisting infection," Ginsburg said.

The team inoculated 17 healthy individuals with the flu virus and about half of them got sick. They then collected gene expression data from each individual at 16 time points over 132 hours. These data provided a clear picture of the gene expression over time in those who developed flu symptoms and those who did not.

Eventually, if scientists can understand what happens at the level of the genome that makes people more or less susceptible to viral illness, they could potentially develop therapies to prevent the illness. Hero said the inflammatory genomic signature that differentiated the well group from the sick group was measurable up to about 36 hours before peak flu symptoms developed. It may, therefore, be possible to detect illness early, allowing people to take precautions and perhaps even prevent the worst symptoms.

Mathematical methods for finding hidden correlations within large quantities of data were a key component of the analysis performed by Hero and his former doctoral student Yongsheng Huang, who is lead author on the study. One of the principal analysis methods was a pattern-recognition tool previously developed for processing hyperspectral satellite images of the earth. Called Bayes Linear Unmixing, Hero applied it with virtually no modification to image the patterns of gene expression.


**Vitamin A supplements for children could save 600,000 lives a year**

Children in low and middle income countries should be given vitamin A supplements to prevent death and illness, concludes a study published on bmj.com today.

The researchers argue that the effectiveness of vitamin A supplementation is now so well-established that further trials would be unethical, and they urge policymakers to provide supplements for all children at risk of deficiency.

Vitamin A is an essential nutrient that must be obtained through diet. Vitamin A deficiency in children increases vulnerability to infections like diarrhoea and measles and may also lead to blindness. Globally, the World Health Organisation estimates that 190 million children under the age of 5 may be vitamin A deficient. But, despite widespread efforts, vitamin A programmes do not reach all children who could benefit.

So a team of researchers based in the UK and Pakistan analysed the results of 43 trials of vitamin A supplementation involving over 200,000 children aged 6 months to 5 years. Differences in study design and quality were taken into account to minimise bias.

They found vitamin A supplements reduced child mortality by 24% in low and middle income countries. It may also reduce mortality and disability by preventing measles, diarrhoea and vision problems, including night blindness.

The authors say that, if the risk of death for 190 million vitamin A deficient children were reduced by 24%, over 600,000 lives would be saved each year and 20 million disability-adjusted life years (a measure of quantity and quality of life) would be gained.

Based on these results, the authors strongly recommend supplementation for children under 5 in areas at risk of vitamin A deficiency. They conclude: "The evidence for vitamin A is compelling and clear. Further trials comparing vitamin A with placebo would be unethical."

This view is supported in an accompanying editorial by two experts at Harvard School of Public Health, who say "effort should now focus on finding ways to sustain this important child survival initiative and fine tune it to maximise the number of lives saved."

**Why HIV Virus Infection Rates Are on the Rise**

**Thursday, August 25, 2011**

**TAU researcher finds already-medicated patients are passing on the virus**

Since HIV infection rates began to rise again around 2000, researchers have been grasping for answers on what could be causing this change, especially in the homosexual community. The rising numbers are a stark contrast to the 1990’s, when infection rates dropped due to increased awareness of the virus. A new study in Israel reveals that the number of new HIV cases diagnosed each year in the last decade saw a
startling increase of almost 500% compared to the previous decade, and similar trends have been reported in a number of other developed nations, including the U.S.

According to Prof. Zehava Grossman of Tel Aviv University’s School of Public Health at the Sackler Faculty of Medicine and the Central Virology Laboratory of the Ministry of Health, a new approach to studying HIV transmission within a community has yielded a disturbing result. By cross-referencing several databases and performing a molecular analysis of the virus found in patients, an astonishingly high number of newly-diagnosed men with male sexual partners were found to have contracted the virus from infected, medicated partners who are already aware of their HIV-positive status.

Reported in the journal Clinical Infectious Diseases, these findings indicate that the public health approach towards HIV counselling and education needs to be reconsidered, Prof. Grossman says.

Bypassing the questionnaires
Researchers had begun to suspect that the rise in infection rates was due to a change in social behavior, but hard evidence was lacking. The answers, Prof. Grossman says, were not easy to find by asking the patients themselves. Questionnaires and similar methods to gather information are hard to interpret because, in addition to the difficulty of recruiting an accurate cross-section of the population, people are often unwilling to be frank about risky sexual behavior.

To unravel the mystery, Prof. Grossman and her colleagues at the Central Virology Laboratory directed by Prof. Ella Mendelson and Israel’s leading AIDS clinicians turned to the virus itself. Working with senior epidemiologists of the Public Health Services of Israel’s Ministry of Health, they conducted a comprehensive analysis of laboratory, clinical, and epidemiological data, including information about patients’ diagnosis and treatment, sexually transmitted diseases contracted along with HIV, and the molecular characteristics of the virus in different patients.

Prof. Grossman and her colleagues found that an overwhelming number of new cases were infected with HIV strains that had already developed resistance to existing HIV drug therapies. Because the virus can only become resistant if previously exposed to medication, this result indicates that new patients are often infected by an HIV-positive partner already receiving the therapies. More often than in the past, HIV found in different patients could be traced back to a common source.

Changing the educational approach
While people are now more knowledgeable about the virus and aware of the risks of unprotected sex, it appears that an increasing number of homosexual men, including those who are infected and treated for HIV, are likely to engage in risky sexual behaviour. Public health authorities, educators, and activists should be encouraged to find new ways of changing this attitude and of better imprinting the message about the risk and consequences of HIV transmission, particularly within the gay community.

Clearly, Prof. Grossman warns, the need to establish the values of safe sex within at-risk populations is as imperative as it has ever been.

Discovery Explains Why Influenza B Virus Exclusively Infects Humans; Opens Door for Drugs to Fight Seasonal Epidemics Caused by Virus

Rutgers, University of Texas at Austin researchers determine three-dimensional structure of site on influenza B virus protein that suppresses human defenses to infection
August 25, 2011
Professor Montelione may be contacted at 732-986-8775 or guy@cabm.rutgers.edu. Professor Krug may be contacted at 512-232-5563 or rkrug@mail.utexas.edu.

NEW BRUNSWICK, N.J. – Researchers at Rutgers University and the University of Texas at Austin have reported a discovery that could help scientists develop drugs to fight seasonal influenza epidemics caused by the common influenza B strain.

Their discovery also helps explain how influenza B is limited to humans, and why it cannot be as virulent as A strains that incorporate new genes from influenza viruses that infect other species. The devastating flu pandemic of 1918, the pandemics of 1968 and 1977, and the avian influenza that emerged in the middle of the last decade were caused by influenza A viruses. Understanding features of influenza B virus that limit it to humans will help scientists better understand how influenza A strains are able to cross species.
Three-dimensional structure of a complex between influenza B virus protein, NS1B, represented as the solid form, and the human protein that fights infections, ISG15, represented as pink and magenta ribbons and strands. The sequence of the ISG15 protein found only in humans and non-human primates, represented as a short dark blue strand, binds to the NS1B protein, immobilizing ISG15 and preventing it from fighting the virus. Researchers determined the structure using X-ray crystallography.

The researchers have determined the three-dimensional structure of a complex between an influenza B virus protein and one of its human protein targets, resulting in suppression of the cell’s natural defenses to the infection and paving the way for the virus to replicate efficiently.

Their findings are detailed in a paper published in the most recent issue of PNAS (Proceedings of the US National Academy of Sciences).

“Our study shows the basis by which non-structural protein 1 of influenza B, or NS1B, binds to a human host protein, immobilizing it to prevent it from fighting the virus,” said Gaetano Montelione, a lead author and professor of biochemistry and molecular biology, School of Arts and Sciences, at Rutgers. That human protein, known as interferon-stimulated gene 15 protein or ISG15, is an essential part of the defense mechanism that human cells use to protect themselves from viral infections. Chemicals that block the binding of NS1B to ISG15 may have antiviral potential against influenza B virus.

The study, led by professors Montelione and Robert Krug at the University of Texas at Austin, also reveals why NS1B cannot bind ISG15 molecules in other species, such as dogs or mice. Only human and non-human primate ISG15 proteins have a unique molecular sequence in a small part of the protein that makes it possible to bind to the NS1B protein. So far, influenza B virus has been found only in humans.

“The three-dimensional structure of the NS1B-ISG15 complex, which we determined using X-ray crystallography, has given us a clear understanding of the molecular basis for this species specificity,” said Krug, professor and chair of molecular genetics and microbiology.

“Flu infections continue to be a major health problem, with more effective drugs critically needed to treat infected individuals and control potential pandemics,” said Aaron Shatkin, director of the Center for Advanced Biotechnology and Medicine (CABM) at Rutgers and an eminent virologist. “This discovery opens new possibilities for achieving these very important goals.”

**Few Health Problems Are Caused by Vaccines, Review of Studies Suggests**

ScienceDaily (Aug. 25, 2011) — An analysis of more than 1,000 research articles concluded that few health problems are caused by or clearly associated with vaccines. A committee of experts convened by the Institute of Medicine to review the scientific literature on possible adverse effects of vaccines found convincing evidence of 14 health outcomes—including seizures, inflammation of the brain, and fainting—that can be caused by certain vaccines, although these outcomes occur rarely. It also found indicative though less clear data on associations between specific vaccines and four other effects, such as allergic reactions and temporary joint pain.

In addition, the evidence shows there are no links between immunization and some serious conditions that have raised concerns, including Type 1 diabetes and autism. The data were inadequate to reach conclusions about other suggested adverse effects.

The review will help the U.S. Department of Health and Human Services (HHS) administer the Vaccine Injury Compensation Program (VICP). VICP is committed to using science-based evidence to inform its decisions about vaccine-related adverse effects, and HHS turned to IOM to provide a comprehensive review of study results on eight vaccines covered by the program. The report’s findings will be useful to all stakeholders involved in vaccine compensation decisions, including VICP staff, people filing claims, special masters that rule on vaccine cases, and others.
Convincing evidence shows that the measles-mumps-rubella (MMR) vaccine can lead to fever-triggered seizures in some individuals, although these effects are almost always without long-term consequences, the report says. The MMR vaccine also can produce a rare form of brain inflammation in some people with severe immune system deficiencies. In a minority of patients, the varicella vaccine against chickenpox can induce brain swelling, pneumonia, hepatitis, meningitis, shingles, and chickenpox in immunocompromised patients as well as some who apparently have competent immune function, the committee found. The majority of these problems have occurred in individuals with immunodeficiencies, which increase individuals' susceptibility to the live viruses used in MMR and varicella. Six vaccines—MMR, varicella, influenza, hepatitis B, meningococcal, and the tetanus-containing vaccines—can trigger anaphylaxis, an allergic reaction that appears shortly after injection. And, in general, the injection of vaccines can trigger fainting and inflammation of the shoulder, the committee noted.

The evidence suggests that certain vaccines can lead to four other adverse effects, although the data on these links are not as convincing, the report says. The MMR vaccine appears to trigger short-term joint pain in some women and children. Some people can experience anaphylaxis after receiving the HPV vaccine. And certain influenza vaccines used abroad have resulted in a mild, temporary oculo-respiratory syndrome characterized by conjunctivitis, facial swelling, and mild respiratory symptoms.

The committee’s review also concluded that certain vaccines are not linked to four specific conditions. The MMR vaccine and diphtheria-tetanus-acellular pertussis (DTaP) do not cause Type 1 diabetes, and the MMR vaccine does not cause autism, according to the results of several studies. The evidence shows that the flu shot does not cause Bell’s palsy or exacerbate asthma. Suggestions that vaccines can lead to these serious health problems have contributed to parental concerns about immunization for their children.

Establishing a cause-and-effect relationship between an agent and a health outcome requires solid evidence. The committee's conclusions are based on the strengths and weaknesses of several types of evidence, including biological, clinical, and epidemiological research. In many cases of suggested vaccine-related adverse outcomes, there is too little evidence, or the available evidence offers conflicting results or is otherwise inadequate to draw conclusions.

"With the start of the new school year, it’s time to ensure that children are up to date on their immunizations, making this report’s findings about the safety of these eight vaccines particularly timely," said committee chair Ellen Wright Clayton, professor of pediatrics and law, and director, Center for Biomedical Ethics and Society, Vanderbilt University, Nashville, Tenn. "The findings should be reassuring to parents that few health problems are clearly connected to immunizations, and these effects occur relatively rarely. And repeated study has made clear that some health problems are not caused by vaccines."

In accordance with its charge, the committee focused solely on findings about potential risks of immunizations. It did not examine information that would have allowed it to draw conclusions about the ratio of benefits to risks. However, the committee members noted that deaths and disability due to infectious diseases have been dramatically reduced over the last century since the majority of vaccines were developed and brought into widespread use.

**DNA Cages 'Can Survive Inside Living Cells'**

ScienceDaily (Aug. 25, 2011) — Scientists at Oxford University have shown for the first time that molecular cages made from DNA can enter and survive inside living cells.

The work, a collaboration between physicists and molecular neuroscientists at Oxford, shows that artificial DNA cages that could be used to carry cargoes of drugs can enter living cells, potentially leading to new methods of drug delivery.

A report of the research is published online in the journal ACS Nano.

The cages developed by the researchers are made from four short strands of synthetic DNA. These strands are designed so that they naturally

Human embryonic kidney cells were used to test the DNA cages. (Credit: Image courtesy of University of Oxford)
assemble themselves into a tetrahedron (a pyramid with four triangular faces) around 7 nanometres tall.

The Oxford researchers have previously shown that it is possible to assemble these cages around protein molecules, so that the protein is trapped inside, and that DNA cages can be programmed to open when they encounter specific 'trigger' molecules that are found inside cells.

In the new experiment they introduced fluorescently-labelled DNA tetrahedrons into human kidney cells grown in the laboratory. They then examined the cells under the microscope and found that the cages remained substantially intact, surviving attack by cellular enzymes, for at least 48 hours. This is a crucial advance: to be useful as a drug delivery vehicle, a DNA cage must enter cells efficiently and survive until it can release its cargo where and when it is needed.

'At the moment we are only testing our ability to create and control cages made of DNA,' said Professor Andrew Turberfield of Oxford University's Department of Physics, who led the work. 'However, these results are an important first step towards proving that DNA cages could be used to deliver cargoes, such as drugs, inside living cells.'

Professor Turberfield said: 'Previous studies have shown that the size of particles is an important factor in whether or not they can easily enter cells, with particles with a radius less than 50 nanometres proving much more successful at gaining entry than larger particles. At 7 nanometres across our DNA tetrahedrons are compact enough to easily enter cells but still large enough to carry a useful cargo. More work is now needed to understand exactly how these DNA cages manage to find their way inside living cells.'

Journal Reference:

Unprotected sex eight times more common in serious relationships than casual ones, US gay youth study finds
 Gus Cairns
Published: 26 August 2011
The strongest single predictor of not using condoms in anal sex in a group of young US gay men was that the relationship was regarded as 'serious', a study has found. Unprotected sex was eight times more likely in serious relationships than in casual encounters.

This study, conducted by Northwestern University in Illinois, USA (Mustanski) reinforces previous findings that over two-thirds of HIV transmissions between US gay men happen between primary sex partners and only a third between casual partners (Sullivan). In this study, the researchers comment, “there was almost no unprotected sex occurring in relationships classified as casual”. This suggests that HIV prevention strategies amongst US gay men may need to focus more on HIV risk and safer-sex negotiation within couples than on individual risk-taking decisions.

The study
The current study included 122 young men (aged 16-20) who had sex with men (MSM). Two-thirds classed themselves as gay and nearly a quarter bisexual while the remaining 11% used other categories (queer, questioning etc.) They were a subset of Project Q2, a longstanding longitudinal study of gay youth that has already uncovered high levels of mental ill-health and suicidal behaviour.

The group was recruited by means of ‘snowball sampling’ whereby a number of participants were initially identified by outreach and then encouraged to recruit others (and given $10 for each recruit). Participants were not recruited according to whether they had risky sex or not.

The researchers conducted three surveys of sexual partnerships, risk behaviour and other factors during the previous six months. These occurred at the start of the study and then six and twelve months later. Participants were paid $40 for each interview, and the retention rate was about 90%. Data was available for 117 participants who between them reported a total of 416 sexual partners (3.5 each on average).

The participants’ mean age was 18.5 years and 23% were under 18.

Half of the group described themselves as African-American, just under one in five as white, one in eight as Hispanic and one in nine as multiracial. Six per cent (seven individuals) reported knowing they had HIV; 81% had ever tested for it and 60% said they had taken a test in the last six months.

Only two participants reported knowingly having had sex with an HIV positive partner – this was so uncommon that whether status knowledge influenced safer-sex decisions could not be established.
**Findings**

Half (49%) of participants reported being in a serious relationship at the time of asking, defined as having “someone you feel committed to above all others”, and 80% reported having had at least one over the study period. Twelve per cent had had a female partner (serious or otherwise) during this time.

Despite commitment being reported frequently, truly long-term relationships were not common: only 8% of participants reported having the same partner six months later. During the 18-month study period 20% of participants reported no ‘serious’ relationship, 23% one, 27% two, and 28% three or more, to a maximum of five.

One factor that may be important for HIV transmission was that, in this gay youth group, the majority of participants’ partners were older than they were – on average two years older.

Violence within relationships was not uncommon – 11% reported being ‘hit, slapped, punched or hurt’ by their partner – but non-consensual sex less so – only two individuals reported forced sex.

The study found an average of 5.74 episodes of unprotected sex within each sexual partnership they had.

Being in a relationship regarded as serious was, by a long way, the strongest predictor of having unprotected sex. This was 7.82 times more likely to happen within a serious relationship than in a casual one (a 682% increase), and was highly statistically significant (p=<0.001).

This association became even more significant when the 12% of partnerships that were with women were eliminated: unprotected sex was ten times more likely within male/male relationships regarded as serious than in ones not thought so.

Two other factors were associated with more than twice the risk of unprotected sex but were less significant. Participants reporting sex with a woman were 2.9 times more likely to report unprotected sex, but this finding was not statistically significant and could have been due to chance (p=0.25). Forced sex was associated with a 5.5 times greater risk of reporting unprotected sex but, while this was statistically significant, as reported above, forced sex was uncommon.

Having a relationship that lasted more than six months increased the risk of unprotected sex by 62%, drug use prior to sex by 45%, and violence within the relationship by 88%.

Unprotected sex was related to the age of partners. There was a 20% increased likelihood of unprotected sex per one-year increase in a partner’s age, relative to the participant, and unprotected sex was six times more common with partners who were five or more years older. A recent US study (Hurt) found that having a partner five or more years older than themselves doubled their risk of HIV infection. Given that HIV prevalence in gay men increases sharply during the early 20s and especially in African men, this may be a major contributing factor in HIV acquisition.

The researchers in their introduction note that relationships can be ‘serious’ for negative as well as positive reasons: people can feel trapped in a relationship because they feel dominated or because they perceive no-one else is available, as well as because they want the relationship to last.

They tested the influence of these emotional factors and found that while “wanting the relationship to last” was associated with unprotected sex (twice the risk), feeling trapped within a relationship was not. If the relationship was known to be open (partner having sex with others), unprotected sex was 32% less likely.

There was a hint that power dynamics might influence safer sex choices in that unprotected sex was 32% more likely if participants reported that their partner “usually got his/her way” in disputes, though this was only marginally significant (p=0.05).

**Comments**

The researchers comment that “Our findings suggest that serious relationships are the context in which most unprotected sex is occurring in our sample of urban, primarily racial-minority, young MSM...This points to serious relationships as being a potentially powerful context for prevention.”

However, they add, “Before such interventions can be developed, more formative research will be required to understand how to address the relatively frequent turnover in serious relationships at this age.”

And they warn that while serious relationships may be an HIV risk factor, there are many “other emotional and health benefits that can come with being in a close and positive romantic relationship.”

**References**


**S.Africa's HIV infections fall to 5.4 million: government**

The number of people living with HIV in South Africa has dropped slightly to 5.38 million, and the number of AIDS deaths is finally starting to fall, Deputy President Kgalema Motlanthe said Thursday.

South Africa has more HIV infections than any country in the world, previously estimated at 5.6 million by the United Nations in its global report on HIV in 2009, released late last year.

"South Africa has invested a large amount of resources into its HIV response," Motlanthe said in a written reply to a question from parliament, where lawmakers had asked for an update on the success of the anti-AIDS fight.

"The number of deaths due to HIV-related causes is beginning to show a decline due to the intensification of anti-retroviral treatment."

He said government statistics place South Africa’s HIV infection rate at 10.6 percent of the overall population of 50 million people, with 16.6 percent of 15- to 29-year-olds infected.

Among pregnant women, the infection rate stands at just below 30 percent, Motlanthe said. But he added that transmission of the infection from expecting mothers to their babies has fallen from 10 percent to 3.5 percent in the last three years.

Motlanthe said the government is still struggling to reduce the number of new infections.

"The rate of new infections continues to outpace our prevention efforts, and thus prevention programmes will be prioritised in the new national strategic plan which is being developed for the term 2012 to 2016," he said.

Motlanthe’s response came several weeks after the end of a massive testing campaign that reached nearly 14 million people, two million of whom tested positive.

It also came on the heels of an announcement by the government that it will provide potentially life-saving anti-retroviral (ARV) drugs to all HIV patients whose CD4 count, a measure of white blood cells, falls below 350 cells per microlitre.

Previously the drugs were only handed out when the count hit 200 cells per microlitre, but studies have found earlier treatment can save people’s lives.

South Africa has the largest ARV drug programme in the world, with some 1.3 million people receiving treatment.

**California Lawmakers OK Statewide Rules on Circumcision**

*Associated Press*, (08.23.2011) Adam Weintraub

On Tuesday, the California Senate Judiciary Committee unanimously approved a measure that will block local jurisdictions from banning male circumcision. AB 768 is in part a response to a San Francisco ballot measure that sought to outlaw the procedure on boys under age 18.

Nationally, efforts are underway to limit male circumcision. Critics say it is an unnecessary surgery on a healthy and defenseless child that can have lasting sexual and mental health problems. Supporters, including researchers, say male circumcision can reduce the risk of STDs and cancer. Jews and Muslims consider the practice an important religious rite.

Backed by two Democratic lawmakers, the measure declares that the surgical removal of the foreskin has health, cultural, and other benefits. “It’s a medical procedure, and it has value,” said Assembly member Mike Gatto of Los Angeles, a co-author of AB 768.

Supporters say the bill is needed to prevent a patchwork of laws throughout the state governing the practice. “The decision to perform male circumcision should be left up to the parents in consultation with their physician, wherever they reside,” said Ryan Spencer, a spokesperson for the California Medical Association.

The San Francisco ballot measure drew national attention. In June of this year, a group including Jewish and Muslim city residents sued to block it. On July 28, San Francisco Superior Court Judge Loretta Giorgi ordered it struck from the November ballot, saying California law specifies that only the state, not cities, can regulate medical procedures, and that it violated protections of religious freedoms under the US Constitution.

Gatto said AB 768 is necessary in case Giorgi’s ruling is overturned on appeal. Further, the Jewish specialists who perform circumcisions, mohels, might not be covered by state law on medical procedures.
New HIV Infections Drop 20 Percent in Asia-Pacific

 Deutsche Presse-Agentur, (08.26.2011)
The latest UNAIDS report on Asia-Pacific shows that annual new HIV infections there dropped from about 450,000 in 2001 to 360,000 in 2009, a decline of 20 percent.

“I think it is very important to make the world understand that we are at the crossroads today in Asia and the Pacific, because efforts have been made,” UNAIDS Executive Director Michel Sidibe said at the report’s release in Pusan, South Korea. Governments have invested in prevention programs and increased access to antiretroviral drugs, said the agency.

The region has some 4.7 million people living with HIV/AIDS, most of them in Burma, Cambodia, China, India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, Thailand, and Vietnam. In particular, Burma, Cambodia, India, and Thailand have significantly reduced their infection rates by initiating programs for sex workers and their clients, UNAIDS noted.

However, “We cannot be complacent,” Sidibe cautioned. “In Asia particularly we are seeing a growing number of infections among most-at-risk populations.”

Though access to antiretroviral therapy increased three-fold from 2006 to 2009, the treatment remains unavailable to approximately 60 percent of people in need across the region. And while countries such as China, Malaysia, Pakistan, Samoa, and Thailand largely fund their own HIV/AIDS programs, many less-developed Asian nations continue to rely on outside aid, said UNAIDS.

More Gender Equality Leads to More Sex, Global Study Shows

 USA Today, (08.08.2011) Sharon Jayson
A new study finds that countries that had higher gender equality rankings also generally reported more casual sex, more sex partners per capita, younger ages for sexual debut, and greater tolerance/approval of premarital sex. Roy Baumeister of Florida State University presented his research on worldwide “sexual economics” at the recent American Psychological Association meeting in Tallahassee, Fla.

Baumeister’s research used two data sets on 37 countries, including an international online sex survey of 317,000 people and data specific to gender equity and related topics.

“Women’s sexuality has a kind of value that men’s sexuality does not,” explained Baumeister. “Men will basically exchange other resources with women to have sex, but the reverse doesn’t work. Women ... can trade sex for attention, for grades, for a promotion, for money, as in prostitution or sex with a celebrity.”

Supply and demand dictates that whichever sex is more scarce has more power, said Baumeister, with the caveat that this theory applies only to heterosexual interactions.

“In countries where women are at a big disadvantage, they restrain sex, so the price is high and men make a lifetime commitment to support them to get sex,” Baumeister said. “Men will do whatever is required for sex.”

Mark Regnerus, an associate professor of sociology at the University of Texas-Austin, said Baumeister’s theory is a “perspective through which to understand sexual relationships and sexual behavior.” Regnerus’ research on the subject attributes the rise of the “hook-up” culture in colleges to the fact that so many more women are getting a higher education.


37 Percent of Teens Say They Tried Sex, 7 Percent Say They Were Raped: Poll

 Chicago Sun-Times, (08.26.2011) Stefano Esposito
In a fall 2010 survey of about 1,700 suburban Cook County students from 20 public high schools, 37 percent reported they were sexually experienced. Among those reporting intercourse within the preceding three months, about 62 percent said they used a condom.

By race/ethnicity, 61 percent of African Americans, 49 percent of Hispanics and 24 percent of Caucasians reported sexual activity. About 6 percent said they had sex for the first time before age 13. About 7 percent of all teens said they had been physically coerced to have sex.

During the preceding year, 13 percent said they had seriously considered suicide, and 9 percent actually attempted it. Among all students, 40 percent had tried cigarettes and 33 percent marijuana at least once. About 29 percent reported being offered, sold or given illegal drugs on school grounds in the preceding year.
“In general, there are so many things that we need to tackle, it’s kind of like, where do we start?” said Amy Poore, a spokesperson for the Cook County Department of Public Health (CCDPH).

One starting point would be better sex education in schools, Poore said. Data like these could help in applying for grants or passing state legislation, she said.

“Most schools don’t have comprehensive sex education and are teaching abstinence only, but clearly we have a high amount of students who are engaging in sexual activity,” said Poore.

The suburban area’s first Youth Risk Behavior Survey was conducted with local help from CCDPH, the Children’s Memorial Hospital Child Data Lab and school administrators.

**Condoms for Victoria Prisoners**

*Australian Associated Press*, (08.26.2011)

Starting next week, authorities will begin distributing safe-sex kits to inmates in two men’s prisons and two women’s prisons in Victoria. “Condoms and dental dams can significantly reduce transmission of sexually transmitted infections and some blood-borne viruses,” said Andrew McIntosh, corrections minister. “There are more than 5,000 prisoners who leave prison every year, so it is important to take steps to protect both prisoners and the community from infectious disease.” The policy change comes five years after an ombudsman recommended it. “Evidence from other jurisdictions shows that condoms and dental dams have had no negative impacts to prison security and safety,” McIntosh said. The products will be available at prison health centers, and inmates will be given information about safe-sex practices.

**Global Obesity Rates Doubled Over Last 30 Years, Researchers Say**

"Obesity rates worldwide have doubled in the last three decades, even as blood pressure and cholesterol levels have dropped," according to a series of papers published Friday in the Lancet, the Associated Press/New York Times reports (8/25). According to the researchers, "1.5 billion adults are overweight and another half-a-billion are obese," and "the rise in obesity is likely to lead to an increase in the number of people afflicted by diabetes, heart disease, cancer and other illnesses, adding to the cost of healthcare," VOA News' "Breaking News" blog writes (8/25).

"The international group of researchers ... said no country had yet got to grips with the problem" and that "[t]ougher action—including taxing junk food—is needed by all governments if the obesity crisis is going to be tackled," according to BBC News. "They predicted obesity rates would rise from a quarter in the U.K. to about 40 percent by 2030" and that in the U.S. "obesity rates would rise from one in three to about one in two," BBC notes (Triggle, 8/25).
Rare immune cell is asset and liability in fighting infection

August 26, 2011
By Michael C. Purdy

Immune cells in the spleen have brought in stowaways: Listeria bacteria, which appear green in the image. Researchers at Washington University School of Medicine in St. Louis have found that the immune cells the bacteria have exploited can be both helpful and harmful in fighting infection. The cells could be particularly useful in efforts to turn the immune system against cancers using vaccines.

The same trait that makes a rare immune cell invaluable in fighting some infections also can be exploited by other diseases to cause harm, two new studies show.

In papers published online in Immunity, scientists at Washington University School of Medicine in St. Louis reveal that the cells, known as CD8 alpha+ dendritic cells (CD8a+ DCs), can help the body beat back infection by a common parasite, but the same cells can be hijacked by a bacterium to decimate the body’s defenses.

The trait that makes the cells both an asset and a liability is the way they alert other immune cells, causing them to attack invaders. CD8a+ DCs can sound the alarm in a manner that is particularly helpful for stripping away invaders’ disguises. But this process takes time, and Listeria bacteria can take advantage of that delay to wreak havoc inside the spleen.

“As we’ve discovered how useful these cells can be in fighting different kinds of infections, researchers have wondered why they’re so rare,” says Kenneth Murphy, MD, PhD, the Eugene L. Opie First Centennial Professor of Pathology and Immunology. “This may be why — overcommitting to any one defensive strategy opens up opportunities for counterstrategies that exploit it.”

CD8a+ DCs make up about 10 percent of all dendritic cells in the body. By studying the basic functions of these cells, scientists are laying the groundwork to use them to fight infections. The cells also appear to be essential for some cancer vaccines, which enlist the power of the immune system to help fight tumors.

Murphy, who is a Howard Hughes Medical Institute Investigator, previously created genetically altered mice where CD8a+ DCs could be selectively eliminated. By comparing these mice with normal mice, Murphy and his collaborators have shown that CD8a+ DCs are essential to priming the body’s defenses against viral infections.

Viruses often try to disguise themselves to evade defenders, but CD8a+ DCs can extract characteristic parts of a virus and display them on their surface. Other cells also can make these displays, but CD8a+ DCs do it in a way that helps peel back disguises, causing other immune cells to seek out additional copies of the virus and kill them.

In one of the new studies, doctoral student Mona Mashayekhi showed that CD8a+ DCs are early responders to infection with the Toxoplasma gondii parasite, which causes serious disease in patients with weakened or suppressed immune systems. She found only CD8a+ DCs produce a signal that causes other immune cells to fight the parasite.

In the second paper, Brian Edelson, MD, PhD, assistant professor of pathology and immunology, tested the cells against the bacteria Listeria, which can cause food poisoning. He discovered that CD8a+ DCs could make Listeria infection worse.

“Listeria likes to get into immune cells using a pathway that typically leads to the bacteria’s death in garbage disposals inside the cell,” Murphy explains. “But that pathway is slowed down in CD8a+ DCs to ensure that they can retain part of the invader to display to other immune cells.”
Researchers watched Listeria use this delay to ride inside CD8a+ DCs as they entered the spleen, where immune cells not yet activated for attacking invaders are kept. These cells are easy targets for the bacteria, and infection worsens.

According to Murphy, CD8a+ DCs’ specialized ability to initiate immune attacks makes them essential for efforts to create cancer vaccines based on DNA from tumors. He and collaborator William Gillanders, MD, professor of surgery, are working to use these vaccines to make immune cells attack cancers.

“What we’re learning from basic studies, for example, has already enabled us to increase the number of CD8a+ DCs in mice until they’re about 30 to 40 percent of dendritic cells,” Murphy says. “Learning more about how this cell interacts with other immune cells will allow us to create effective cancer vaccines.”

**Could New Drug Cure Nearly Any Viral Infection? Technology Shows Promise Against Common Cold, Influenza and Other Ailments, Researchers Say**

The microscope images above show that DRACO successfully treats viral infections. In the left set of four photos, rhinovirus (the common cold virus) kills untreated human cells (lower left), whereas DRACO has no toxicity in uninfected cells (upper right) and cures an infected cell population (lower right). Similarly, in the right set of four photos, dengue hemorrhagic fever virus kills untreated monkey cells (lower left), whereas DRACO has no toxicity in uninfected cells (upper right) and cures an infected cell population (lower right). (Credit: Image courtesy of Massachusetts Institute of Technology)

ScienceDaily (Aug. 26, 2011) — Most bacterial infections can be treated with antibiotics such as penicillin, discovered decades ago. However, such drugs are useless against viral infections, including influenza, the common cold, and deadly hemorrhagic fevers such as Ebola.

Now, in a development that could transform how viral infections are treated, a team of researchers at MIT’s Lincoln Laboratory has designed a drug that can identify cells that have been infected by any type of virus, then kill those cells to terminate the infection.

In a paper published July 27 in the journal PLoS ONE, the researchers tested their drug against 15 viruses, and found it was effective against all of them—including rhinoviruses that cause the common cold, H1N1 influenza, a stomach virus, a polio virus, dengue fever and several other types of hemorrhagic fever.
The drug works by targeting a type of RNA produced only in cells that have been infected by viruses. "In theory, it should work against all viruses," says Todd Rider, a senior staff scientist in Lincoln Laboratory's Chemical, Biological, and Nanoscale Technologies Group who invented the new technology.

Because the technology is so broad-spectrum, it could potentially also be used to combat outbreaks of new viruses, such as the 2003 SARS (severe acute respiratory syndrome) outbreak, Rider says.

Other members of the research team are Lincoln Lab staff members Scott Wick, Christina Zook, Tara Boettcher, Jennifer Pancoast and Benjamin Zusman.

**Few antivirals available**

Rider had the idea to try developing a broad-spectrum antiviral therapy about 11 years ago, after inventing CANARY (Cellular Analysis and Notification of Antigen Risks and Yields), a biosensor that can rapidly identify pathogens. "If you detect a pathogenic bacterium in the environment, there is probably an antibiotic that could be used to treat someone exposed to that, but I realized there are very few treatments out there for viruses," he says.

There are a handful of drugs that combat specific viruses, such as the protease inhibitors used to control HIV infection, but these are relatively few in number and susceptible to viral resistance.

Rider drew inspiration for his therapeutic agents, dubbed DRACOs (Double-stranded RNA Activated Caspase Oligomerizers), from living cells' own defense systems.

When viruses infect a cell, they take over its cellular machinery for their own purpose—that is, creating more copies of the virus. During this process, the viruses create long strings of double-stranded RNA (dsRNA), which is not found in human or other animal cells.

As part of their natural defenses against viral infection, human cells have proteins that latch onto dsRNA, setting off a cascade of reactions that prevents the virus from replicating itself. However, many viruses can outsmart that system by blocking one of the steps further down the cascade.

Rider had the idea to combine a dsRNA-binding protein with another protein that induces cells to undergo apoptosis (programmed cell suicide)—launched, for example, when a cell determines it is en route to becoming cancerous. Therefore, when one end of the DRACO binds to dsRNA, it signals the other end of the DRACO to initiate cell suicide.

Combining those two elements is a "great idea" and a very novel approach, says Karla Kirkegaard, professor of microbiology and immunology at Stanford University. "Viruses are pretty good at developing resistance to things we try against them, but in this case, it's hard to think of a simple pathway to drug resistance," she says.

Each DRACO also includes a "delivery tag," taken from naturally occurring proteins, that allows it to cross cell membranes and enter any human or animal cell. However, if no dsRNA is present, DRACO leaves the cell unharmed.

Most of the tests reported in this study were done in human and animal cells cultured in the lab, but the researchers also tested DRACO in mice infected with the H1N1 influenza virus. When mice were treated with DRACO, they were completely cured of the infection. The tests also showed that DRACO itself is not toxic to mice.

The researchers are now testing DRACO against more viruses in mice and beginning to get promising results. Rider says he hopes to license the technology for trials in larger animals and for eventual human clinical trials.

**Journal Reference:**


**Could the Spanish Flu Devastate Us Again?**

ScienceDaily (Aug. 26, 2011) — The last century has seen two major pandemics caused by the H1N1 virus—the Spanish Flu in 1918 and 2009's Swine Flu scare, which had thousands travelling with surgical masks and clamoring for vaccination. But scientists did not know what distinguished the Swine Flu from ordinary influenza in pigs or seasonal outbreaks in humans, giving it the power to travel extensively and infect large populations.

Until now. Prof. Nir Ben-Tal of Tel Aviv University's Department of Biochemistry and Molecular Biology and his graduate student Daphna Meroz, in collaboration with Dr. Tomer Hertz of Seattle's Fred Hutchinson Cancer Research Center, have developed a unique computational method to address this question. Published in the journal *PNAS*, the research presents a valuable tool for identifying viral mutation strategies, tracking various virus strains and developing vaccinations and anti-virals which can...
protect the population. It may also lead to more precisely designed vaccines to combat these viral mutations.

Their method reveals that mutations in the virus' amino acids in specific positions, such as antigenic receptor sites, may explain how the new strain successfully spread throughout the population in 2009. These alterations allowed the strain to evade both existing vaccines and the immune system’s defenses.

**Playing a game of cat and mouse**

Viruses and our immune systems are constantly at war. A virus constantly mutates to escape notice, and our immune system strives to play catch-up—to recognize the virus and mobilize the body’s defense system.

To determine the spread of the 2009 human pandemic flu, Prof. Ben-Tal and his fellow researchers analyzed the hemagglutinin protein, which controls the virus' ability to fuse to a host cell in the body and transfer the genome which contains the information needed to make more virus. Eventually, he says, our immune system is able to recognize a virus' hemagglutinin, which triggers its reaction to fight against the virus.

Using a statistical learning algorithm, the researchers compared amino acid positions in the 2009 strain of H1N1 against the common flu and the strain of H1N1 found in Swine Flu, and discovered that major sequence changes that had occurred, altering antigenic sites and severely compromising the immune system’s ability to recognize and react to the virus.

"Our new computation method showed that the main differences between the pandemic strain and the common seasonal H1N1 strain are in some 10 amino acid positions," Prof. Ben-Tal and Meroz report. "That's all it takes."

Experiments conducted by Sun-Woo Yoon, Dr. Mariette F. Ducatez and, Thomas P. Fabrizio from Prof. Richard J. Webby’s lab at St. Jude Children’s Research Hospital in Memphis, TN, confirmed some of the theoretical predictions.

**Predicting pandemic**

Like its 1918 predecessor the Spanish Flu, the 2009 pandemic flu will likely go into "hibernation"—now that this particular strain has been recognized by the immune system, its power to infect has been compromised. But we were lucky: despite the relatively low death toll of the pandemic in 2009, similar to the number of deaths attributable to common seasonal flu, we might be facing more dangerous future outbreaks of mutated H1N1 varieties.

Because of the enormous mutation rate, says Prof. Ben-Tal, viruses can spread widely and rapidly, and vaccines are fairly inefficient. In the future, a refined version of this computational method may ultimately be used to generically compare various strains of viruses. This in-depth analysis might lead to the ability to predict how a strain will morph and determine if a pandemic could strike.

This is an important step towards revealing the amino acid determinants of the emergence of flu pandemics, but there is more work to be done, the researchers say.

**Journal Reference:**

**Single Vaccines to Protect Against Both Rabies and Ebola**

ScienceDaily (Aug. 25, 2011) — Researchers from Thomas Jefferson University, among other institutions, including the National Institute of Allergy and Infectious Diseases, have developed single vaccines to protest against both rabies and the Ebola virus.

Successfully tested in mice, these bivalent vaccines have several advantages over other Ebola candidates that could help speed up development for use in humans and primates. It’s built on the same platform as the already approved and financially viable rabies vaccine, and it protects at-risk populations against two viruses, not just one, making it an effective and ideal public health tool.

"Many Ebola vaccine candidates have been proven effective, but none are close to licensure," said Matthias Schnell, Ph.D., director of the Jefferson Vaccine Center. "One of the challenges is the market: There’s rather limited incentive in creating a vaccine for Ebola. But these vaccines could change that."

The findings were published ahead of print online August 17 in the *Journal of Virology.*

The Ebola virus belongs to the *Filoviridae* family and is composed of five distinct species. The Zaïre, Sudan and Bundibugyo species have been associated with large Ebola hemorrhagic fever outbreaks in Africa. According to the World Health Organization, more than a thousand people have died from the virus since it was discovered in 1976.
"Rabies still poses a health threat for people worldwide, and is especially devastating in developing nations where a post exposure treatment is often not available. And Ebola still exists in parts of Central Africa and is also a chief bioterrorism concern worldwide," said Dr. Schnell, who is also a Professor in the Department of Microbiology and Immunology at Thomas Jefferson University. "You can protect these people from two very lethal diseases in an area where they don't have the best access to medical care."

The purpose of this study was to identify novel vaccine candidates for Ebola with a maximum potential of licensure and utilization.

Researchers generated a chemically inactivated and live rabies virus expressing the Ebola Zaïre species glycoprotein using a reverse genetics system based on the commonly-used rabies vaccine. Immunizations with those vaccines, the researchers found, induced immunity against each virus and conferred protection from both viruses in mice. Piggy backing, in a sense, on the rabies vaccine could accelerate development of vaccines that protects against Ebola because of the advanced state of the rabies vaccine's safety, production and distribution, according to Schnell.

"After the vaccine has been tested in primates and eventually humans, this new vaccine could kill the proverbially two birds with one stone," he said.

There are implications for non-humans, too—gorillas, in particular. The Ebola virus has eradicated thousands of gorillas, prompting the World Conservation Union to raise their status to "critically endangered" in 2007, the first time a mammal has become critically endangered as a direct result of disease. Vaccinations, though challenging, could stall those deaths.

What's more, several human outbreaks have been attributed to primate interaction or handling, so providing a vaccine for our closest relative could minimize that risk.

**Journal Reference:**

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**Uncovering the Spread of Deadly Cancer: New Imaging Device Enables Scientists to See Tumor Cells Traveling in the Brain**

ScienceDaily (Aug. 25, 2011) — For the first time, scientists can see pathways to stop a deadly brain cancer in its tracks. Researchers at Case Western Reserve University School of Medicine have imaged individual cancer cells and the routes they travel as the tumor spreads.

The researchers used a novel cryo-imaging technique to obtain the unprecedented look at a mouse model of glioblastoma multiforme, a particularly aggressive cancer that has no treatments to stop it from spreading.

A description of their work, and images, is being published Sept. 1 in the journal Cancer Research.

"We're able to see things we couldn't before, and we can use these images to understand how tumor cells invade and disperse," said Susann M. Brady-Kalnay, a professor of molecular biology and microbiology at the Case Western Reserve University School of Medicine. The main tumor is green, blood vessels feeding the tumor are red and migrating cells, yellow. (Credit: Case Western Reserve University School of Medicine)
Western Reserve School of Medicine, and senior author of the paper.

That information, in turn, can be used to help develop and test the effectiveness of drugs and other therapies used to treat the cancer, she said.

To obtain the view, the scientists used a model that included four different cell lines of brain cancers at various stages of tumor development and dispersion. The cancer cells were modified with fluorescent markers and implanted in the model's brain in collaboration with Biomedical Engineering Professor James Basilion’s lab.

The cryo-imaging system, developed by David Wilson, also a professor of biomedical engineering at Case Western Reserve, disassembles the brain layer by layer and reassembles the model into a color three-dimensional digital image.

Using software and algorithms designed by the researchers, they are able to differentiate the main tumor mass, the blood vessels that feed the cancer and dispersing cells. The imaging system enables them to peer at single cells and see exactly where they are in the brain.

The lead researchers, Susan Burden-Gulley, Mohammed Qutaish and Kristin Sullivant, found that two cell lines, a human brain cancer LN229, and a rodent cancer CNS-1, best resemble the actions of glioblastoma multiforme in human patients.

Reconstructions of models of those two lines enabled the researchers to analyze the extent and patterns of cancer cell migration and dispersal from tumors along blood vessels and white matter tracts within the brain.

The ability to produce such clear and detailed images, the researchers say, will be invaluable when evaluating the potency of drugs and other therapies designed to block dispersal of glioblastoma multiforme cells.

**Journal Reference:**

**More Teens Getting HPV Vaccines, but Not Enough, CDC Reports**


In a new report using data from its National Immunization Survey-Teen, CDC found coverage with routine adolescent vaccines is rising, but “the increase in [human papillomavirus] coverage among adolescent females is lagging, with only one-third having received the full three-dose series.”

The proportion of female teens who had received at least one dose of HPV vaccine grew from 44.3 percent to 48.7 percent from 2009 to 2010, while the proportion who had received all three doses rose from 26.7 percent to 32 percent. The survey collected information on more than 19,000 youths ages 13 to 17.

“As in previous years, coverage with ≥1 dose of HPV was higher among older compared with younger adolescent females,” the authors wrote. “Among females with adequate time to complete the series, 30.4 percent had not done so. HPV completion rates were lower among certain populations (i.e., blacks, Hispanics and those living below poverty) known to have higher cervical cancer rates.

“Although HPV vaccination is only universally recommended for females aged nine through 26 years, 2009 [Advisory Committee on Immunization Practices] guidance states that HPV vaccination may be administered to males aged nine through 26 years. Only 1.4 percent of males aged 13 through 17 years received the vaccine in 2010,” according to the report, which also detailed increased uptake of the vaccines MenACWY (meningococcal conjugate) and Tdap (tetanus, diphtheria, acellular pertussis).

“Although adolescent vaccination is increasing, additional strategies are needed to meet ‘Healthy People 2020’ vaccination objectives for adolescents, particularly for HPV vaccination, because the increase in HPV coverage significantly lags behind other adolescent vaccines,” the authors wrote. “A new 2012 Healthcare Effectiveness Data and Information Set measure requiring health plans to track the number of females who receive three HPV doses by age 13 years is expected to lead to increased HPV vaccination rates.”

“Stronger provider recommendations for HPV vaccination, implementing reminder-recall systems, eliminating missed opportunities, and educating parents of adolescents regarding the risk for HPV infection and the benefits of vaccination, are needed to effectively protect adolescent girls against cervical cancer,” the team concluded.

Taiwan Hospital Transplants Five HIV-Infected Organs

Associated Press, (08.29.2011) Annie Huang

Last week in Taiwan, five transplant recipients received organs from a deceased HIV-infected donor due to a lapse in operating procedures, the Taipei-based National Taiwan University Hospital (NTUH) announced on its website over the weekend.

NTUH said a transplant staff member believed he had heard the English word “non-reactive” during a briefing given over the telephone about the organ donor’s HIV test. But “reactive,” or HIV-positive, was in fact said. Information about the result was not double-checked as standard operating procedures require, NTUH said. “We deeply apologize for the mistake,” said the hospital.

A Health Department team will investigate the transplants and decide on any penalties against NTUH, where four of the operations occurred, said Shih Chung-liang, a department official. One surgery, a heart transplant, was performed at the National Chengkung University Hospital (NCUH).

All the organ recipients are now receiving AIDS drugs, said an NTUH official, who spoke anonymously, lacking authorization to talk with the media. However, the recipients will probably contract HIV, and their treatment will be further complicated by the anti-rejection medications, said Yao Ke-wu, head of the health department in Hsinchu city, where the donor lived. The mistake could have been avoided had Taiwan mandated that NTUH ask his department for the donor’s medical history, Yao said.

Some surgical staff who performed the transplants are worried about their own infection risk. Team members who transplanted the man’s heart “were depressed, and on the verge of panic,” said Lee Nan-yao, an NCUH physician.

FAO Warns Mutant Form Of H5N1 Bird Flu Poses Threat To Asia

“The U.N. Food and Agriculture Organization (FAO) on Monday warned about a new mutant strain of the deadly bird flu H5N1 virus in China and Vietnam, saying there could be a 'major resurgence' of the disease,” Agence France-Presse reports. In a statement, FAO “said it was concerned about ‘the appearance in China and Vietnam of a variant virus able to sidestep the defenses provided by existing vaccines,’ adding that the new strain was known as H5N1–2.3.2.1,” the news agency notes. The organization said the virus, which can be spread by wild bird migration, "poses a direct threat to Cambodia, Thailand and Malaysia as well as endangering the Korean peninsula and Japan" (8/29).

"The FAO urged increased preparedness and surveillance against the variant strain of H5N1, the virus that has infected 565 people since it first appeared in 2003, killing 331 of them. The latest death was reported in Cambodia earlier this month," according to Deutsche Presse-Agentur/M&C (8/29). The Associated Press/FoxNews.com notes that the "virus was eliminated from most of the 63 countries infected at its peak in 2006, but it remained endemic in six countries: Bangladesh, China, Egypt, India, Indonesia and Vietnam" (8/29).

Disappearance Of Mosquitoes From Some Parts Of Africa Puzzles Researchers

"Malaria-carrying mosquitoes are disappearing in some parts of Africa, ... indicat[ing] controls such as anti-mosquito bed nets are having a significant impact on the incidence of malaria in some sub-Saharan countries," researchers report in a paper published in Malaria Journal, according to BBC News. But the team of Danish and Tanzanian "researchers say mosquitoes are also disappearing from areas with few controls," and "[t]hey are uncertain if mosquitoes are being eradicated or whether they will return with renewed vigor," the news agency writes (McGrath, 8/26).

"Many of our fellow malaria researchers think that the fall in countries such as Tanzania, Eritrea, Rwanda, Kenya and Zambia shows that all the control programs are working, particularly the use of mosquito nets, says Associate Professor Dan Meyrowitsch from the Department of Health Services Research at the University of Copenhagen, and continues: That just isn’t the whole story," according to Health Canal. "[T]he question is whether the mosquitoes have succumbed to disease, or communities have been using pesticides, or whether the fall is due to the chaotic new precipitation patterns," Health Canal writes (8/25).
Money Alone Cannot Fix Russia’s ’Demographic Crisis’
Russia “is in a demographic crisis, shedding 2.2 million people (or 1.6 percent of the population) since 2002, and the government is trying to encourage more women to bring Russian citizens into the world,” journalist Natalia Antonova writes in a Foreign Policy opinion piece, in which she describes her experience with the Russian medical system after “unexpectedly” becoming pregnant shortly after receiving her visa to work in Moscow.

"The prime minister has ... pledged to spend 1.5 trillion rubles (about $54 billion) over the next four years on demographics-related projects such as raising life expectancy and increasing the birth rate by 30 percent," she writes, adding that “[w]hile pumping money into maternal care is well and good, what these women most need is a change in the mainstream medical attitudes toward pregnancy and childbirth in Russia. ... If the staff is not motivated to treat pregnant women like regular human beings, as opposed to mere prisoners to their condition, all the money in the world won’t improve Russia’s maternal care system” (8/26).

From mild-mannered to killer plague
Study explains plague’s rapid evolution and sheds light on fighting deadly diseases
CHICAGO – In the evolutionary blink of an eye, a bacterium that causes mild stomach irritation evolved into a deadly assassin responsible for the most devastating pandemics in human history. How did the mild-mannered Yersinia pseudotuberculosis become Yersinia pestis, more commonly known as the Plague?

Now, scientists from Northwestern University Feinberg School of Medicine, with the use of new DNA sequencing techniques, offer long sought after evidence of how these two pathogens with virtually identical genetic matter could produce two such vastly different diseases. The Feinberg School team used the new DNA sequencing techniques to identify an unexpected source for these differences, which may help explain the Plague’s rapid evolution.

The findings, to be published Aug. 29 in the journal Proceedings of the National Academy of Sciences, offer a glimpse into how the new technology might aid in the development of therapeutics to fight deadly diseases, including the Plague.

"Most people think of the Plague as a historic disease, but it’s still a public health issue today, both in the human population and in animals,” said Wyndham Lathem, lead author of the study and assistant professor of microbiology-immunology at Northwestern’s Feinberg School. "It’s extremely dangerous and highly virulent. Without treatment, it can take as little as three to five days from infection to death."

Globally, the World Health Organization reports 1,000 to 3,000 cases of Plague every year, and Y. pestis exists on every continent except Antarctica. The United States Department of Homeland Security classifies Y. pestis as a Category A biological agent, a group that also includes anthrax, smallpox and Ebola.

The Plague’s ancestor, Y. pseudotuberculosis, still exists and infects humans, but it causes a mild gastrointestinal disease and most people don’t show symptoms.

Lathem and colleagues have discovered the differences in disease severity between these two subspecies may have arisen from changes in small, non-coding RNAs (sRNAs), complex molecules involved in controlling many cellular processes.

The Northwestern team is the first to show that sRNAs in Yersinia affect virulence, a finding that suggests the evolution of pathogens may also occur at the level of changes in RNA and in the way protein-coding genes are regulated.

Lathem used advanced DNA sequencing technology — called high-throughput sequencing — to identify the complete set of sRNAs produced by Y. pseudotuberculosis. The technology enabled his team to study the diseases for the first time at a deeper genetic level.

"This technique enables us to really pick apart how pathogens evolve and how different species of bacteria are able to cause different types of disease," Lathem said. "It goes beyond looking at what proteins are produced by the bacteria. It’s an additional layer of evolutionary analysis."

This detective work is important because if researchers can identify unique characteristics among deadly species such as Y. pestis, they may be able to generate new therapeutics or adapt current ones.

Unlike traditional "messenger" RNA, which is copied from DNA to create proteins and is well understood by scientists, these non-coding sRNA molecules are never translated into proteins. Hundreds of noncoding RNA molecules exist inside bacterial cells, but, until recently, scientists had not determined the function of many.
"Once we identified the complete set of sRNAs for *Y. pseudotuberculosis*, further analysis unlocked a number of surprising discoveries about their function," Lathem said.

Among these surprising discoveries, Lathem's team identified 150 sRNAs, a majority of which are specific to the Yersinia species, and six sRNAs unique to *Y. pseudotuberculosis*. Those six sRNAs are missing in *Y. pestis*, likely lost during its rapid evolution (somewhere between 1,500 and 20,000 years ago), and thereby potentially responsible for the Plague's virulence. Lathem's team developed this explanation because they could specify exactly which genes the sRNAs control.

First author Jovanka Koo, a postdoctoral fellow in Lathem's lab at Feinberg, noted, "An important lesson is that small changes can have big effects on sRNA functions. They can affect when an RNA is expressed or produced, the way that RNA folds, and the ability of that RNA to affect the regulated protein coding RNA." Over time, those small changes can become the difference between mild and deadly diseases.

**Abuse by partner may be common in HIV-positive gay men**
Michael Carter
Published: 30 August 2011

The majority of a sample of HIV-positive gay men had recently been abused by a partner, US investigators report in the online edition of *AIDS and Behavior*.

Half the men participating in the study had experienced some form of psychological abuse from a partner in the previous twelve months. Physical, sexual, and HIV-specific abuse were also common.

“The high prevalence of partner abuse we discovered...is alarming, and indicates the importance of systematic screening for all patients in HIV care settings – including men – despite common perceptions that only women are victims and men are perpetrators,” comment the investigators. However, they acknowledge that their study only looked at a small sample of men, and that further research is needed.

A total of 168 HIV-positive men attending two specialist HIV out-patient clinics were recruited to the study. All identified as men who have sex with men.

The investigators noted that little research has examined the prevalence and consequences of partner abuse in HIV-positive men. The few studies that have looked at this issue were conducted in the 1990s and found that abuse was widespread and had a damaging impact on both mental and physical health.

Therefore, the men participating in the current study were asked to complete a validated questionnaire enquiring about experiences of physical, psychological, sexual, and HIV-specific abuse which was perpetrated by a partner.

Further questions enquired about the possible impact of abuse, and assessed anxiety, depression, thoughts of suicide, social support mechanisms, stigma, substance abuse, and health-related quality of life.

The investigators expected that, “compared with non-abused participants, HIV-positive MSM who experience each type of partner abuse will have poorer mental and physical health across various measures.”

Most (63%) of the men were white and their mean age was 44 years. The majority (75%) were unemployed and 46% were living in poverty with an income below $738 per month.

Over a third (37%) were presently partnered and 69% of these men reported that they had been in a relationship for over a year.

Overall, almost two-thirds (61%) reported having had sex with both men and women during their lifetime.

Approximately half (54%) reported some form of partner abuse in the previous twelve months, 66% in the past five years, and 78% ever being abused.

Psychological abuse was the most common, with 51% saying they had experienced this in the previous year (73% ever).

Physical abuse in the past twelve months was reported by a fifth of participants (38% ever) and 17% said they had recently experienced sexual abuse such as forced intercourse or rape (30% ever). HIV-specific abuse in the past year was reported by 10% of men (16% ever).

Individuals reporting physical abuse by a partner were significantly more likely than men not reported this abuse to be younger (39 vs. 45; p < 0.001), of non-white race (52% vs. 26%; p = 0.02), on a low income 78% vs. 40%; p < 0.001), live with someone else (48% vs. 24%; p < 0.01), and have a history of sex with both men and women (78% vs. 59%; p = 0.04).
Methamphetamine use was more common among physically abused men (47% vs. 25%; p = 0.02) as was use of cocaine (p < 0.01).

Anxiety scores were significantly higher for the men reporting recent physical abuse (p < 0.01). These men were also more likely to have symptoms of depression (p < 0.01), and report thoughts of suicide (p = 0.01).

In addition, physically abused men also had poorer coping strategies (p < 0.001), were more likely to report feeling stigmatised (p = 0.02) and to have poorer health-related quality of life (p = 0.05).

Recent sexual abuse was associated with stigma (p < 0.02). Men who reported sexual abuse were younger than men who did not experience this type of abuse (p < 0.05), were more likely to be non-white (p = 0.01) and to have a low income (p = 0.03).

Psychologically abused men were more likely to be living with someone else than men who did not experience this form of abuse (52% vs. 36%; p = 0.04), and were also younger (42 vs. 45 years; p < 0.01) and to be on a low income. Surprisingly, psychological abuse was not associated with poorer mental health outcomes.

Abuse was not associated with poorer adherence to HIV therapy. The investigators speculate that abused men may have focused on adherence as a control mechanism.

“We believe that our work both makes a contribution and highlights the need for additional, ongoing work in this area,” comment the authors.

They conclude, “collaborative efforts with clients, providers, and public health officials will be needed to address partner abuse in a comprehensive manner. Given the extent of partner abuse and its deleterious effects, work on such interventions cannot begin too soon.”

Reference

U.S. scientists knew 1940s Guatemalan STD studies were unethical, panel finds

By Rob Stein, Published: August 29

U.S. government researchers who purposely infected unwitting subjects with sexually transmitted diseases in Guatemala in the 1940s had obtained consent a few years earlier before conducting similar experiments in Indiana, investigators reported Monday.

The stark contrast between how the U.S. Public Health Service scientists experimented with Americans and Guatemalans clearly shows that researchers knew their conduct was unethical, according to members of the Presidential Commission for the Study of Bioethical Issues, which is investigating the experiments.

“These researchers knew these were unethical experiments, and they conducted them anyway,” said Raju Kucherlapati of Harvard Medical School, a commission member. “That is what is reprehensible.”

At least 5,500 prisoners, mental patients, soldiers and children were drafted into the experiments, including at least 1,300 who were exposed to the sexually transmitted diseases syphilis, gonorrhea and chancroid, the commission reported. At least 83 subjects died, although the commission could not determine how many of the deaths were directly caused by the experiments, they said.

“This is a dark chapter in our history. It is important to shine the light of day on it. We owe it to the people of Guatemala who were experimented on, and we owe it to ourselves to recognize what a dark chapter it was,” said Amy Gutmann of the University of Pennsylvania, the commission’s chairwoman.

The revelations came on the opening day of a two-day hearing the commission convened to review the findings of its investigation. President Obama ordered the probe when the experiments were revealed in October. Investigators reviewed more than 125,000 documents from public and private archives around the country and conducted a fact-finding trip to the Central American nation.

The Guatemalan government is conducting its own investigation. The experiments were approved by some Guatemalan officials.

“Actually cruel and inhuman conduct took place,” said Anita L. Allen of the University of Pennsylvania. “These are very grave human rights violations.”

In one case described during Monday’s two-hour hearing, a woman who was infected with syphilis was clearly dying from the disease. Instead of treating her, the researchers poured gonorrhea-infected pus into her eyes and other orifices and infected her again with syphilis. She died six months later.

The ultimate goal of the Guatemalan research was to determine whether taking penicillin after sex would protect against syphilis, gonorrhea and chancroid. The question was a medical priority at the time,
especially in the military. The Guatemalan experiments, carried out between 1946 and 1948, aimed to find a reliable way of infecting subjects for future studies.

The research included infecting prisoners by bringing them prostitutes who were either already carrying the diseases or were purposely infected by the researchers. Doctors also poured bacteria onto wounds they had opened with needles on prisoners’ penises, faces and arms. In some cases, infectious material was injected into their spines, the commission reported.

The researchers conducted similar experiments on soldiers in an army barracks and on men and women in the National Mental Health Hospital. The researchers took blood samples from children at the National Orphanage, although they did not purposely infect them.

In the studies conducted in Indiana, researchers exposed 241 inmates in Terre Haute to gonorrhea in 1943 and 1944. But there, the researchers explained the experiments in advance in detail and experimented only on the prisoners who volunteered. In contrast, many of the same researchers who began experimenting on Guatemalans a few years later actively hid what they were doing and never tried to obtain permission, the commission found.

About 700 of the Guatemalan subjects were treated for the sexually transmitted diseases, but it remains unclear whether they were treated adequately or what became of them. Gonorrhea can cause a variety of complications, including infertility. Chancroid can cause painful ulcers. Syphilis can cause blindness, major organ damage, paralysis, dementia and death.

Susan M. Reverby, a historian at Wellesley College in Massachusetts, discovered the Guatemalan experiments while doing research for a book on the infamous Tuskegee studies in Alabama. Reverby found papers from John C. Cutler, a doctor with the federal government’s Public Health Service. Cutler had participated in the Tuskegee experiment, in which hundreds of African American men with late-stage syphilis were left untreated to study the disease between 1932 and 1972. Cutler died in 2003.

After sending Obama a report in September, the commission will meet again in November to discuss whether current protections are adequate for research subjects internationally and in the United States and will issue a final report in December.

Panel Reveals New Details of 1940s Experiment
Associated Press, (08.30.2011) Mike Stobbe

A panel tasked with conducting a review of US medical experiments in Guatemala in the 1940s said Monday the history of the research is even more disturbing than previously known.

From 1946 to 1948, the US Public Health Service and the Pan American Sanitary Bureau worked with government agencies in Guatemala on studies involving people deliberately exposed to syphilis, gonorrhea or chancroid. The goal was to see if a relatively new treatment, penicillin, could prevent infection.

The experiments were already considered a stain on US medical research, even given the historical context of a different era. Panel members said the new findings show the researchers were unusually unethical. “The researchers put their own medical advancements first and human decency a far second,” said Anita Allen, a member of the Presidential Commission for the Study of Bioethical Issues.

Of 1,300 Guatemalans infected—including soldiers, prostitutes, prisoners, and mental patients—only around 700 received some sort of treatment. Eighty-three patients died, though it is not clear these deaths were directly linked to the experiments.

One female syphilis patient with an undisclosed terminal illness was infected with gonorrhea in her eyes and elsewhere as a way to see the impact of an additional STD. She died six months later. Commission leader Dr. Amy Gutmann called this case “chillingly egregious.”

The experiments were hidden for decades but became public last year after a Wellesley College historian found records among the papers of Dr. John Cutler, who led the research. President Obama ordered a full review of the studies; the commission’s final report is due next month. Guatemala also is conducting an investigation into the experiments, which should be completed by November, said a spokesperson for Vice President Rafael Espada.

For more information, visit http://www.bioethics.gov/.
Zimbabwean Activists Urge Tightening of Statute on Knowing HIV Transmission

Activists fought for years for a law that would allow prosecution of knowing transmission of HIV but the absence or scarcity of cutting-edge technology in the country makes it difficult for the state to obtain convictions.

Sandra Nyaira | Washington

The Zimbabwean courts have seen an increasing number of cases in which former lovers bring charges against each other charging that the ex-partner knowingly and willfully transmitted the virus that causes AIDS, a crime under Zimbabwean law punishable by 20 years in prison.

The most prominent case in recent memory involves Insiza South Member of Parliament Siyabonga Malandu Ncube, who was accused by Bulawayo-based journalist Simiso Mlevu of passing on HIV when they were on intimate terms. The state's case recently received a setback when a High Court judge said Malandu could not be compelled to be tested for HIV.

Malandu has denied transmitting the virus and has said he is HIV-negative.

Activists fought for years for a law that would allow prosecution of willful transmission but the absence or scarcity of cutting-edge technology in the country makes it difficult for the state to prove willful transmission, so there have been no convictions based on the 2007 statute.

Human rights lawyer Kucaca Phulu says Section 79 of the Criminal Law Codification and Reform Act criminalizes deliberate or negligent transmission of HIV – but the legislation needs to be fine-tuned to better protect victims.

US-based HIV/AIDS and public health consultant Frenk Guni, a Zimbabwean, said people must not be complacent hoping their partners will not infect them for fear of the law.

Advocates Support Overturning Iowa's Criminal HIV Law

The Gazette (Cedar Rapids), (07.31.2011)  Cindy Hadish

CHAIN—For Community HIV & Hepatitis Advocates of Iowa Network—is working to repeal the state’s criminal statute relating to HIV transmission. The activists want HIV to be addressed under a state law that already deals with the intentional spread of infectious diseases. CHAIN’s repeal bill died in a legislative subcommittee this year, but members vow to bring it up again.

The law works against public health goals by making people less likely to test, according to CHAIN, since it applies only to sex acts by a person who knows he or she is HIV-positive. Actual transmission does not have to occur for the law to be broken. The law carries a maximum penalty of 25 years in prison, and those convicted must register as sex offenders for the rest of their lives. Nine Iowans are currently jailed under the law; two are on probation; and one is on parole.

HIV testing at public sites in Iowa has declined from a high of almost 24,000 in 1992, following NBA great Magic Johnson’s disclosure that he was HIV-positive, to less than 6,000 last year. Randy Mayer, chief of the Iowa Department of Public Health’s HIV, STD and Hepatitis Bureau, acknowledged the drop but does not necessarily blame the law, which took effect in 1998.

About 60 percent of HIV tests are now conducted in private medical settings, Mayer said. CDC funding targets high-risk populations for testing, leaving less funding for public testing sites in Iowa, he added.

Mayer noted that the National HIV/AIDS Strategy encourages state legislatures to revisit the question of whether HIV-specific laws benefit public health. “In many instances, the continued existence and enforcement of these types of laws run counter to scientific evidence about routes of HIV transmission and may undermine the public health goals of promoting HIV screening and treatment,” the strategy says.

Porn Filmmaking Shut Down After Performer Tests HIV-Positive

Los Angeles Times, (08.29.2011) Molly Hennessy-Fiske

Another adult-film performer has tested HIV-positive, and the industry is temporarily shutting down productions in the Los Angeles area to allow for further testing, a trade group said Monday.

“Until we know for sure, we’ve asked the industry to have a moratorium on production,” said Diane Duke, executive director of Canoga Park-based Free Speech Coalition, which is setting up a database to coordinate STD testing of performers on a routine basis. The pornography industry’s voluntary standards require that performers get tested every 30 days and show producers proof of a negative test. Duke said the adult-film companies she contacted have agreed to the suspension.
“Retesting and confirmation is underway, as is the process of identifying and testing first- and second-generation partners,” said Duke. The further testing will likely take another week, she said.

The performer tested HIV-positive at an out-of-state facility, so the new HIV diagnosis has not directly involved Los Angeles County health officials, Duke said. A county health spokesperson did not respond to requests for a comment. The out-of-state provider who tested the infected performer “does not appear to have protocols or procedures in place for medical follow-up (including generational testing),” according to a statement by Duke.

“How many performers must become infected with HIV and other serious STDs before the industry will clean up its act and government will do the right thing?” asked Michael Weinstein, president of Los Angeles-based AIDS Healthcare Foundation (AHF), referring to previous reports of porn industry-related infections.

AHF is collecting voter signatures for a June ballot initiative that would mandate condom use for films produced under permits issued by Los Angeles. The foundation has until Dec. 23 to collect at least 41,138 eligible signatures.

**Chagas Parasite Infects 18M Worldwide, Often Without Detection**

Chagas, which is caused by the parasite Trypanosoma cruzi, affects 18 million people worldwide, but is particularly prevalent in Latin American countries, "where a bug called the vinchuga, sometimes known as the kissing bug (because it bites people on their faces while they sleep), transmits the disease," the *Atlantic* reports. The parasite "remains dormant in peoples' bodies for up to 30 years, until it kills them suddenly by stopping their hearts or rupturing their intestines," the magazine writes.

In Bolivia, nearly 10 percent of the population—or one million people—are infected with Chagas, and "[b]ecause of immigration, more and more cases are being reported" in the U.S., according to the *Atlantic*. The article discusses the efforts of a Los Angeles clinic and the Bolivian government to fight the disease by identifying and treating people, as well as fumigating homes to rid them of the vinchuga. The article also highlights the limited availability and effectiveness of treatment for the infection (Coster, 8/29).

**Many Women Give Birth In Haiti's Tent Camps Without Medical Services**

In the refugee camps in the Haitian capital of Port-au-Prince nearly two years after a devastating earthquake, "health and human rights officials warn of another crisis: an explosion of tent babies," the *Miami Herald* reports. "Haiti's tent baby phenomenon comes as the country continues to struggle to rebuild, and as the nearly 600,000 Haitians still living in hundreds of squalid camps in quake-ravaged communities see the avalanche of medical assistance from foreign doctors and nongovernmental organizations disappear," primarily because of a lack of funding, the newspaper writes.

"Population explosions after a disaster are nothing new. But in a country already rattled by a collapsed health system, cholera epidemic and now sordid conditions in congested camps, experts say they are worried about the impact. Adding to the concerns are conditions under which the pregnancies are occurring: insecurity and rapes in the camps despite increased U.N. peacekeeper patrols, lack of education and medical services, and desperation among girls, some as young as 13," according to the newspaper (Charles, 8/29).

**Viruses in the human gut show dynamic response to diet**

August 31, 2011 – The digestive system is home to a myriad of viruses, but how they are involved in health and disease is poorly understood. In a study published online today in *Genome Research* (www.genome.org), researchers have investigated the dynamics of virus populations in the human gut, shedding new light on the gut "virome" and how it differs between people and responds to changes in diet.

"Our bodies are like coral reefs," said Dr. Frederic Bushman of the Perelman School of Medicine at the University of Pennsylvania, senior author of the study, “inhabited by many diverse creatures interacting with each other and with us.” The interactions between viruses, bacteria, and the human host likely have significant consequences for human health and disease, especially in the delicate ecosystem of the gut microbiome.

In this work, lead author Sam Minot, Bushman, and colleagues investigated the dynamics of the gut virome during perturbations to diet. The group studied six healthy volunteers—some received a high fat and low fiber diet, others a low fat and high fiber diet, and one an ad-lib diet.

By analyzing DNA sequences from viruses and bacteria present in stool of the volunteers over the course of eight days, they found that although the largest variation in virus diversity observed occurred
between individuals, over time dietary intervention significantly changed the proportions of virus populations in individuals on the same diet, so that the viral populations became more similar.

"The study provides a new window on the vast viral populations that live in the human gut, demonstrates that they vary radically between individuals, and shows that dietary changes can affect not just bacterial populations but also viral populations," Bushman said.

**New Roles Emerge for Non-Coding RNAs in Directing Embryonic Development**

**ScienceDaily (Aug. 29, 2011) —** Scientists at the Broad Institute of MIT and Harvard have discovered that a mysterious class of large RNAs plays a central role in embryonic development, contrary to the dogma that proteins alone are the master regulators of this process. The research, published online August 28 in the journal *Nature*, reveals that these RNAs orchestrate the fate of embryonic stem (ES) cells by keeping them in their fledgling state or directing them along the path to cell specialization.

Broad scientists discovered several years ago that the human and mouse genomes encode thousands of unusual RNAs—termed large, intergenic non-coding RNAs (lincRNAs)—but their role was almost entirely unknown. By studying more than 100 lincRNAs in ES cells, the researchers now show that these RNAs help regulate development by physically interacting with proteins to coordinate gene expression and suggest that lincRNAs may play similar roles in most cells.

"There's been a lot of debate about what lincRNAs are doing," said Eric Lander, director of the Broad Institute and the senior author of the paper. "It's now clear that they play critical roles in regulating developmental decisions—that is, cell fate. This was a big surprise, because specific types of proteins have been thought to be the master controls of development."

"This is the first global study of lincRNAs," said Mitchell Guttman, first author of the paper and a graduate student at MIT and the Broad Institute. "We picked embryonic stem cells in particular because they are so important to development and so well understood. This allowed us to dissect the role of lincRNAs within the circuitry of a cell."

The researchers used genetic tools to inhibit more than 100 lincRNAs and found that the vast majority—more than 90 percent—had a significant impact on embryonic stem cells, indicating that the RNAs play a key role in the cells' circuitry.

Embryonic stem cells can follow one of two main routes. They can either differentiate, becoming cells of a specific lineage such as blood cells or neurons, or they can stay in a pluripotent state, duplicating themselves without losing the ability to become any cell in the body. When the researchers turned off each lincRNA in turn, they found dozens that suppress genes that are important only in specific kinds of cells. They also found dozens of lincRNAs that cause the stem cells to exit the pluripotent state.

"It's a balancing act," said Guttman. "To maintain the pluripotent state, you need to repress differentiation genes."

The researchers also uncovered a critical clue about how lincRNAs carry out their important job. Through biochemical analysis, they found that lincRNAs physically interact with key proteins involved in influencing cell fate to coordinate their responses.

"The lincRNAs appear to play an organizing role, acting as a scaffold to assemble a diverse group of proteins into functional units," said John Rinn, an author on the paper, an assistant professor at Harvard University and Medical School, and a senior associate member of the Broad Institute. "lincRNAs are like team captains, bringing together the right players to get a job done."

"By understanding how these interactions form, we may be able to engineer these RNAs to do what we want them to do," said Guttman. "This could make it possible to target key genes that are improperly regulated in disease."

Aviv Regev, an author on the paper, a core member of the Broad Institute, and associate professor at MIT, sees the team's approach to studying the lincRNAs as important for the field. "Many people are interested in lincRNAs, but they need a comprehensive view of the whole collection of lincRNAs," said Regev. "The large-scale data and technology from this study will be useful for scientists worldwide in studying both lincRNAs as well as many other RNAs in the cell."

This project marks a collaborative effort involving experts in embryonic stem cells and lincRNAs as well as computational biologists and researchers in the Broad's RNAi Platform, which developed the tools needed to systematically silence lincRNAs. Other researchers who contributed to this work include Julie Donaghey, Bryce W. Carey, Manuel Garber, Jennifer K. Grenier, Glen Munson, Geneva Young, Anne Bergstrom Lucas, Robert Ach, Xiaoping Yang, Ido Amit, Alexander Meissner, and David E. Root. This
work was funded by the National Human Genome Research Institute, the Richard Merkin Foundation for Stem Cell Research at the Broad Institute, and funds from the Broad Institute of MIT and Harvard.

**Journal Reference:**

**Older Partner Selection, Sexual Risk Behavior and Unrecognized HIV Infection Among Black and Latino Men Who Have Sex with Men**
*Sexually Transmitted Infections Vol. 87: P. 442-447*, (08..2011)  Heather A. Joseph; Gary Marks; Lisa Belcher; Gregorio A. Millett; Ann Stueve; Trista A. Bingham; Jennifer Lauby
The authors conducted this study to assess whether young black and Latino men who have sex with men who have older sex partners are more likely than MSM who do not have older partners to have unrecognized HIV infection. The team examined whether the association is due to increased sexual risk behavior with male partners of any age, heightened risk of being exposed to HIV by older partners, or a combination of these two factors.

Included in the analytical sample were 723 black and Latino MSM ages 18-35. At study entry, all were HIV-negative or of unknown serostatus. Participants underwent HIV testing and completed a self-administered questionnaire. MSM who reported a male sex partner at least four years older were compared with those who did not. Study outcomes included unprotected receptive anal intercourse (URAI) with male partners of any age during the past three months, and having unrecognized HIV infection.

A higher prevalence of URAI was reported by men with older partners (adjusted odds ratio=1.50, 95 percent confidence interval 1.02 to 2.21.) A second model showed men with older partners had increased odds of having unrecognized HIV infection (AOR=2.51, 95 percent CI 1.18 to 5.34), after controlling for the number of URAI partners of any age, which remained an independent predictor.

“Young black and Latino MSM who had older male sex partners were at increased risk of having unrecognized HIV infection,” the authors concluded. “This heightened risk was associated with sexual risk behavior with partners of any age as well as possible increased exposure to HIV infection from older partners.”

**Aging with AIDS: An Epidemic's Changing Face**
*Baltimore Sun*, (08.25.2011)
“... This month, the Greater Baltimore HIV Health Services Planning Council released the results of a survey that found two-thirds of the region’s HIV victims were age 45 to 64. The last time the group conducted this study, just seven years ago, the majority of HIV cases were among those who were 25 to 44.

“The aging of the AIDS population has presented new challenges to physicians and public health officials. Not nearly enough is known about the long-term effects of the highly active antiretroviral drugs that allow people with AIDS to live for decades or longer, nor are the physical and social effects of aging on people with AIDS well understood. Meanwhile, the problems associated with providing elder care for people with AIDS and the training of their caregivers and social service professionals are becoming even more urgent.

“Moreover, health professionals must find ways to reduce the growing racial and class disparities among older AIDS victims .... African-American women, who make up just 11 percent of women over 50, comprise 65 percent of HIV infections and half of all AIDS cases among older women .... Nationally, nearly one-fifth of people 55 or older who were living with HIV in 2009 did not know they were infected.

“The rapidly changing dynamic of the epidemic due to the aging of the AIDS population requires an equally dynamic change in the way older people think about the disease. Until recently, people in their 50s and 60s believed they were at little risk of contracting the virus. But that’s no longer a safe assumption.

“That’s why the National Institutes of Health are recommending that everyone, regardless of age, get tested at least once in their lifetime, and that people who have multiple partners or engage in risky behaviors get tested every year. The new drug therapies have allowed people with HIV to live much longer, healthier and more productive lives, but the corollary to that is that everyone must also be much more vigilant.”
Performance of PMTCT in routine programme matches clinical trials, Botswana reports

Carole Leach-Lemens
Published: 31 August 2011

Formula-fed infants born to women who started ART during pregnancy under routine programme conditions in Botswana, without frequent viral load monitoring or specialised care, were fourteen times less likely to become infected with HIV compared to infants born to mothers who got zidovudine and/or single-dose nevirapine.

Scott Dryden-Peterson and colleagues report the findings in a prospective observational study published in the advance online edition of the *Journal of Acquired Immune Deficiency Syndromes.*

The observed transmission rate in mothers on ART (0.4% 95% CI: 0-2.2%) is among the lowest reported to date, “supporting the effectiveness of ART for PMTCT outside the context of a clinical trial.” And, in accordance with Botswana’s treatment guidelines the women on ART had lower CD4 cell counts than those getting zidovudine and/or single-dose nevirapine. Yet, lower CD4 cell counts are strongly associated with vertical transmission.

The 2010 World Health Organization (WHO) guidelines for prevention of mother-to-child transmission recommend that pregnant women who need treatment for their own health (those with CD4 cell counts under 350 cells/mm$^3$ or WHO clinical stage 3 or 4), start ART.

For those pregnant women not yet in need of treatment, WHO recommends either ART or zidovudine with single-dose nevirapine if zidovudine has been used for under four weeks, followed by infant prophylaxis.

Observational evidence suggests that maternal ART may lead to greater reductions in MTCT in women at all CD4 cell counts. However, a recent randomised trial, the Kesho Bora study, did not find a significant difference between ART and zidovudine among women with CD4 cell counts over 350 cells/mm$^3$.

The authors note that few studies have looked at comparing the effectiveness of these strategies within a resource-poor programme setting.

Given that government and programme managers are having to decide which strategy to use for PMTCT the authors chose to compare rates of HIV infection among infants born to mothers taking ART or zidovudine in the Botswana national programme.

Between February 2009 and April 2010 the authors enrolled consenting HIV-infected women who had delivered live-born infants on the maternity wards of Scottish Livingstone (a district referral hospital) and the Princess Marina Hospital (the largest national hospital). They prospectively followed the infants (93% of whom were formula-fed), 60% of whose mothers took ART (258 infants) and 40% of whom took zidovudine (170 infants) during pregnancy.

The Botswana national programme provides free HIV treatment including PMTCT interventions to all its citizens. The programme also provides free infant formula. In 2009 93% of the 32% of pregnant women who were HIV-infected took part in the PMTCT programme.

Botswana national guidelines at the time of the study recommended three-drug antiretroviral therapy when the CD4 count fell below 250 cells/mm$^3$. Pregnant women with CD4 counts above this level received AZT prophylaxis during pregnancy and single-dose nevirapine at the time of delivery.

Infants were followed from birth until six months of age. HIV infant testing was done at one month and repeated at six months in breast-fed infants. Positive results were confirmed by repeat testing. Infants who did not return for testing were followed-up in their homes.

Among the 415 (97%) infants for whom final HIV status could be determined, ten infants (2.5%) became HIV-infected; nine (5.5%, 95% CI: 2.6-10.2%) in the zidovudine group and one (0.4%, 95% CI: 0-2.2%) in the ART group.

HIV transmission in the zidovudine group was also analysed according to the new WHO-recommended threshold for maternal antiretroviral treatment, in order to assess the programmatic performance of giving zidovudine prophylaxis according to current WHO guidelines.

This analysis found that the relative risk of transmission in women with CD4 counts at or above 350 was similar to the overall rate (RR: 13.3, 95% CI: 1.6-112, p=0.007), indicating that even in women with CD4 counts above the recommended level for treatment, zidovudine prophylaxis was associated with a much higher rate of vertical transmission than was seen in women with CD4 counts below 250 treated with triple-drug ART.
Infant free survival until six months of age was greater in the ART group than in the zidovudine group, 95.7% and 90.4%, p=0.040, respectively.

The authors note their findings “do not support the equivalence of zidovudine and ART for prevention of MTCT”. Five of the nine infant infections in the zidovudine group happened in mothers with CD4 cell counts equal to or greater than 350 cell/mm³.

While late start of ART was associated with an increased risk of MTCT, it did not differ significantly between the two groups.

The authors highlight that providing zidovudine beyond four to six weeks did not lead to further reductions in viral load or to a greater proportion of women with an undetectable viral load at delivery. Both of which, they note, are important predictors of MTCT risk.

The study raises operational challenges, note the authors. Delays in CD4 testing and getting women onto ART resulted in nine women (8.3%) not getting ART before delivery; one subsequently transmitted HIV to her infant. Only 22.7% (5) of women who had been on zidovudine for under four weeks got single-dose nevirapine.

However, the authors note the primary reason in both groups for a shortened time on ART during pregnancy was prematurity rather than a delay in starting ART. They add “nearly one third of the newborns in this cohort were premature or low birthweight, emphasizing the importance of improving access to neonatal services in parallel with PMTCT programmes.”

The authors acknowledge the non-randomised design and earlier start of ART “limits a conclusive assessment of ART versus zidovudine.”

However, the authors conclude “the findings of this study indicate that a strategy to provide ART for all HIV-infected women, as is currently being piloted in Botswana, could nearly eliminate infant HIV infection.”

Reference

Only four US state AIDS Drug Assistance Programmes cover all recommended cardiovascular risk-reduction therapies
Michael Carter
Published: 31 August 2011
The provision of medication to reduce the risk of cardiovascular disease by AIDS Drug Assistance Programs in the US is patchy and inconsistent, research published in the Journal of General Internal Medicine shows.

Only four state AIDS Drug Assistance Programs (ADAPs) provided medication that was consistent with national guidelines for the treatment of type-2 diabetes, hypertension, hyperlipidaemia and smoking cessation. Most states provided treatment that was at least partially compliant with guidelines for at least one of the risk factors, but a quarter of ADAPs provided no coverage at all.

“Our findings indicate that most ADAPs do not provide guideline-consistent prescription drug coverage for type-2 diabetes, hypertension, hyperlipidemia, or smoking cessation,” comment the investigators.

Cardiovascular disease is an increasingly important cause of serious illness and death in patients with HIV. Routine HIV care should include screening for cardiovascular risks so that appropriate medication can be offered to reduce the risk of disease and mortality.

Approximately a third of HIV-positive individuals in the US rely on their state ADAPs for their antiretroviral therapy. ADAPs are legally obliged to provide at least one drug in each antiretroviral class, but do not have to provide access to any additional therapies.

Many ADAPs provide neither treatment for hepatitis C nor HIV-related opportunistic infections. Investigators therefore wished to see if ADAP provision of therapies to reduce the risk of cardiovascular disease was consistent with national guidelines.

Their analysis was conducted in 2010 and included all 50 states as well as Washington DC, Puerto Rico and the US Virgin Islands.

Provision of cardiovascular therapies was categorised as consistent, partially consistent, or “no coverage” when compared to national guidelines.

Only four state ADAPs – Massachusetts, New Jersey, New York and Pennsylvania – provided prescription drug coverage consistent with guidelines for all four cardiovascular risk factors.
However, 68% of states and territories provided therapy that was at least partially consistent with guidance for one risk factor. No coverage was provided by 25% of ADAPs.

Analysis by risk factor showed that 28% of states provided therapy that was consistent with guidelines for type-2 diabetes, with a fifth of ADAPs giving access to treatment that was at least partially consistent with guidance. However, 51% of ADAPs provided no therapy for type-2 diabetes.

A quarter of ADAPs offered treatment for hypertension according to guidelines. A further 15% provided access to therapy that was at least partially compliant with guidance, but 60% did not provide risk-reduction therapy for high blood pressure.

In all 15% of ADAPs had treatment formularies that were consistent with national guidelines for hyperlipidaemia. The majority (53%) provided therapy that was partially consistent, but almost a third had no coverage.

ADAPs in only four states (8%) provided smoking-cessation therapy that was consistent with national guidance. Approximately half (47%) offered treatment that was partially compliant guideline, and 45% provided no access to this type of treatment.

"In our systematic survey of ADAP formularies, we identified only four states that provided prescription drug coverage consistent with clinical practice guidelines for all four modifiable cardiovascular risk factors," write the investigators.

They believe that financial pressures and cost cutting could mean that some ADAPs are restricting their access to non-HIV medications. However, they note non-HIV drugs account for “less than 10% of the prescription drug budget.”

The researchers conclude that policymakers should address the “root causes” for the variations in coverage and “provide a comprehensive ADAP formulary informed by clinical guidelines.”

Reference

Why Nigerian Women Shun Female Condom
Winifred Ogbebo
29 August 2011

For Nora Nzeribe, an Abuja- based lawyer, female condom is a new phenomenon and one she had never been aware of.

Expressing surprise, she said enough awareness has not been created enough for it. "Am even surprised that it exists," she says. If they advertise it like they do male condoms, everyone, including me would have been aware. Instead, they are doing it hush, hush."

Unlike Nzeribe though, Linda Nwadioha says she is aware that female condom does exists. A banker at Intercontinental Bank, Abuja, she disclosed that she got enlightened through the help of health officials whom the bank management usually engage to educate the staff.

In 2005, United Nations Fund for Population Activities (UNFPA) launched the Female Condom Initiative in 24 countries to ensure that female condom programming was integral to national AIDS policies and reproductive health programmes.

According to a report by the organisation, in a number of countries, governments were applying highly creative approaches to educating the public about condoms and to overcome the stigma and taboos associated with it.

"In the process, they are discovering that the female condom is a tool for women’s empowerment, enabling women and adolescent girls to take the initiative to protect their own and their partners' health," the report said.

The female condom is a 17cm-long polyurethane sheath with a flexible ring at each end. It provides about the same protection from sexually transmitted infections—including HIV—and unwanted pregnancy as the male condom, but unlike the male condom, can be used with oil- and water-based lubricants without the risk of breakage.

The UNFPA also stated that female condoms which were once rejected are now gradually gaining acceptance.

The executive director, UNFPA, Dr Babatunde Osotimehin was quoted in the report, saying, "For the fourth consecutive year, access to female condoms has increased dramatically, reaching a record number of 50 million in 2009."

He called for the courage and political will to protect and empower girls and women who have remained vulnerable to HIV.
"We have to invest in practical tools that women can use to protect themselves, such as the female condom," he added.

Few years ago, the Society for Family Health (SFH) launched the Universal Access to female condoms (UAFC) Programme and unveiled the Elegance brand Condom which is funded by Oxfam Novib.

The Universal Access to Female Condom programme (UAFC) seeks to reposition the female condom to prevent STIs including HIV and as a contraceptive of choice among couples and women of reproductive age.

SFH commenced implementation of the UAFC programme in Nigeria in 2008, and has sold over 300,000 female condoms over the past two years.

According to the deputy director, Partnership and Programme Management, SFH, Mr Ifeanyi Okekearu, SFH and her partners decided to launch the Universal Access to Female Condoms (UAFC) programme to formerly introduce the programme at national level. While female condoms programming has been on in Nigeria for some time by the UNFPA through FMoH, UAFC was to complement these efforts as well as sustain ongoing female condoms programming.

He said the project was intended to create awareness and increase demand for female condom, to integrate female condom into existing reproductive health programmes, making female condom more acceptable and also creating an enabling environment for female condom programming. It was to be implemented in three states, Lagos, Delta and Edo and its for two years. The target groups are men and women of reproductive age.

But in the views of the president, Association for Reproductive and Family Health (ARFH) Prof Oladapo A. Ladipo, the contraceptive use rate is very low in Nigeria.

He stated, "It's barely 10 per cent which is very low. We find that the unmet need for contraception is about 20 per cent of women who want to delay conception or who want to stop producing babies don't have access to it and we are aware of the importance of family planning in reducing maternal and child mortality. We are also aware of the importance of family planning method in particular; barrier methods from preventing sexually transmitted infections with inflammatory diseases. Recently, of course, the barrier methods have dual protection of prevention of unwanted pregnancies and prevention of infections, particularly, HIV/AIDS."

On what is responsible for low condom use in the country, Ladipo said, "there are many people who still use barrier method of contraception who are not using the condom. Partly because as they often say, it reduces sensitivity, but I believe its because they are not sufficiently motivated. Such people take risks and the ultimate effect of that is that they are the ones who will fall victim to HIV/AIDS infection. Certainly, one would encourage every male or female to have one on one sexual relationship, or if they are young or are not in marriage to abstain from illicit sexual activities but if they cannot restrain themselves, one would encourage them to use the barrier method of contraception using male or female condom."

LEADERSHIP's random check on some pharmacists in Abuja, revealed that the female condoms were much in stock even though there were variations in the cost price. While some pharmacists sell the pack of two for N40, some sell as low as N25. It's only in government hospitals that they are given out free of charge.

However, a sales girl at Amen Green pharmacist and Stores, Gwarinpa, disclosed that the volume of sale was very low especially when compared to the male condoms. She observed that women were buying them in trickles as stock could last for long on the counters before they are disposed of.

The reason for this is not farfetched. The president, Association for Reproductive and Family Health (ARFH), Prof Oladapo A. Ladipo, says there is need to give more publicity to family planning method; particularly the condoms. "There is not enough notice spot showing the importance of these methods. There are not enough television or radio announcements. My position always is that we must evangelize family planning to show that it's not just for prevention of unplanned or unwanted pregnancies but there are other health benefits from the use of family planning."

On what should be done in the issue of cultural barrier to family planning, he said, "One of the reasons adduced for the low contraceptive use has been our inability to break through the cultural barriers. We believe that the evidence that we are having now shows that there is considerable improvement, change of attitude and behaviours of Nigerians, especially the young ones. People are better informed now than ever before. We have 20 per cent unmet needs as an example; if only government can make provision to have commodities to meet the need of those 20 per cent, we would have achieved a great deal."

According to him, "Access to methods is a major issue of concern; availability of commodities too is another major concern."
The federal government, until recently, had no budget for commodity purchase. We relied solely on the donors especially UNFPA and some other organisations like US government and DFID. So government needs to ensure contraceptives security in Nigeria to meet the needs of those who need it because it makes sense. If you plan your family, you will be successful in anything that you want to do. A nation that does not plan will plan to fail. There's wisdom in moderating our population growth. The quality of life is more important than quantity. It's better to have highly educated, healthy population that will be very productive than to have a very large population where the masses are in abject poverty and cannot contribute much to national development. To compound that of course, is the potential risk of threats to security when you have large population of disgruntled, unemployed individuals."

According to a report published in Momentum, a UNFPA in-house publication, currently, there are 33.3 million people living with HIV and for every two receiving treatment, five are newly infected.

"The widening scope of the epidemic, which is affecting more and more women, calls for an urgent increase in combination HIV prevention strategies, of which condom are an essential part," Purnima Mane, UNFPA deputy executive director programme said in the report.

According to reports, in Zimbabwe, billboards, radio spots and TV adverts helped boost female condom distribution by the public sector from about 400,000 in 2005 to more than two million in 2008, while the sales of female condoms went up from 900,000 in 2005 to more than three million in 2008.

In Zimbabwe, Guyana and Malawi, hairdressers were used to market the female condom, which proved highly successful while in Ethiopia, coffee ceremonies, an age-old social custom were used to reach married women because condoms—perceived to be used by promiscuous people and sex workers—are highly stigmatised in Ethiopian society.

Based on the SFH report, findings have shown that a lot of misconceptions exist on the female condom and it recommended among others that there was need to increase demand for the female condom, as this is currently not a well known product, with only 13% of persons having heard of the female condom, and much fewer having ever used one.

**Resistance to antibiotics is ancient, McMaster study finds**

Hamilton, ON (August 31, 2011) – Scientists were surprised at how fast bacteria developed resistance to the miracle antibiotic drugs when they were developed less than a century ago. Now scientists at McMaster University have found that resistance has been around for at least 30,000 years.

Research findings published today in the science journal *Nature* show antibiotic resistance is a natural phenomenon that predates the modern clinical antibiotic use. Principal investigators for the study are Gerry Wright, scientific director of the Michael G. DeGroote Institute for Infectious Disease Research and Hendrik Poinar, McMaster evolutionary geneticist.

"Antibiotic resistance is seen as a current problem and the fact that antibiotics are becoming less effective because of resistance spreading in hospitals is a known fact," said Wright. "The big question is where does all of this resistance come from?"

After years of studying bacterial DNA extracted from soil frozen in 30,000-year-old permafrost from the Yukon Territories, the researchers were able to develop methods to isolate DNA within McMaster's Ancient DNA Centre. Using state-of-the-art molecular biological techniques, methods were developed to tease out small stretches of ancient DNA.

Researchers discovered antibiotic resistant genes existed beside genes that encoded DNA for ancient life, such as mammoths, horse and bison as well as plants only found in that locality during the last interglacial period in the Pleistocene era, at least 30,000 years ago. They focused on a specific area of antibiotic resistance to the drug vancomycin, a significant clinical problem that emerged in 1980s and continues to be associated with outbreaks of hospital-acquired infections worldwide.

"We identified that these genes were present in the permafrost at depths consistent with the age of the other DNAs, such as the mammoth. Brian Golding of McMaster's Department of Biology showed that these were not contemporary, but formed part of the same family tree. We then recreated the gene product in the lab, purified its protein and showed that it had the same activity and structure then as it does now."

This is only the second time an ancient protein has been 'revived' in a laboratory setting.

Wright said the breakthrough will have important impact on the understanding of antibiotic resistance: "Antibiotics are part of the natural ecology of the planet so when we think that we have developed some drug that won't be susceptible to resistance or some new thing to use in medicine, we are completely kidding ourselves. These things are part of our natural world and therefore we need to be
incredibly careful in how we use them. Microorganisms have figured out a way of how to get around them well before we even figured out how to use them.”

Poinar says this discovery has opened doors for ancient antibiotic resistance research. "We can go back a million years in the permafrost, which is our next goal."

**Black Death Bacterium Identified: Genetic Analysis of Medieval Plague Skeletons Shows Presence of Yersinia Pestis Bacteria**

ScienceDaily (Aug. 29, 2011) — A team of German and Canadian scientists has shown that today’s plague pathogen has been around at least 600 years.

The Black Death claimed the lives of one-third of Europeans in just five years from 1348 to 1353. Until recently, it was not certain whether the bacterium *Yersinia pestis*—known to cause the plague today—was responsible for that most deadly outbreak of disease ever. Now, the University of Tübingen’s Institute of Scientific Archaeology and McMaster University in Canada have been able to confirm that *Yersinia pestis* was behind the great plague.

The results of the research are published in the *Proceedings of the National Academy of Sciences*.

Previous genetic tests indicating that the bacterium was present in medieval samples had previously been dismissed as contaminated by modern DNA or the DNA of bacteria in the soil. Above all, there was doubt because the modern plague pathogen spreads much more slowly and is less deadly than the medieval plague—even allowing for modern medicine.

The international team of researchers has for the first time been able to decode a circular genome important for explaining the virulence of *Y. pestis*. It is called pPCP1 plasmid and comprises about 10,000 positions in the bacterium’s DNA. The sample was taken from skeletons from a London plague cemetery. The working group in Tübingen, led by Dr. Johannes Krause used a new technique of "molecular fishing"—enriching plague DNA fragments from tooth enamel and sequencing them using the latest technology. In this way, the fragments were connected up into a long genome sequence—which turned out to be identical to modern-day plague pathogens. "That indicates that at least this part of the genetic information has barely changed in the past 600 years," says Krause.

The researchers were also able to show that the plague DNA from the London cemetery was indeed medieval. To do that, they examined damage to the DNA which only occurs in old DNA—therefore excluding the possibility of modern contamination. "Without a doubt, the plague pathogen known today as *Y. pestis* was also the cause of the plague in the Middle Ages,” says Krause, who is well known for his DNA sequencing of ancient hominin finds, which help trace relationships between types of prehistoric man and modern humans.

**Journal Reference:**