

[STD Update] FYI 4-22: HIV infection prematurely ages humans by an average of 5 years, HIV spreads through the body much faster than previously thought, Using social media to drive gay men to HIV testing, 5 papers, 2 webinars, more.

National Stories

HIV infection prematurely ages humans by an average of 5 years

HIV Spreads Through the Body Much Faster Than Previously Thought

Model suggests there are fewer people with HIV in the US than thought, and more of them on therapy

To Drive Gay Men to HIV Testing, Use Social Media

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National Stories

HIV infection prematurely ages humans by an average of 5 years

As reported by Science Daily | 4.21

Thanks to combination antiretroviral therapy, many people with HIV can be expected to live decades after being infected. Yet doctors have observed that these patients often show signs of premature aging. Now a study published April 21 in *Molecular Cell* has applied a highly accurate biomarker to measure just how much HIV infection ages people at the biological level--an average of almost 5 years.

"The medical issues in treating people with HIV have changed," says Howard Fox, a Professor in the Department of Pharmacology and Experimental Neuroscience at the University of Nebraska Medical Center and one of the authors of the new study. "We're no longer as worried about infections that come from being immunocompromised. Now we worry about diseases related to aging, like cardiovascular disease, neurocognitive impairment, and liver problems."

The tool used in the new study looks at epigenetic changes in people's cells. Epigenetic changes affect the DNA, but not the DNA sequence. Once they occur, they are passed down from one generation of cell to the next, influencing how genes are expressed. The particular epigenetic change used as a biomarker in this research was methylation, the process by which small chemical groups are attached to DNA. Methylation of DNA can impact how genes get translated into proteins.

"What we've seen in previous studies is that as we age, methylation across the entire genome changes," says Trey Ideker, a Professor of Genetics in the Department of Medicine at the University of California San Diego and the study's other corresponding author. "Some people call it entropy or genetic drift. Although we're not sure of the exact mechanism by which these epigenetic changes lead to symptoms of aging, it's a trend that we can measure inside people's cells."

The 137 patients included in the analysis were enrolled in CHARTER (the CNS Antiretroviral Therapy Effects Research study), a long-term study aimed at monitoring HIV-infected individuals who are being treated with combination antiretroviral therapy. Subjects who were chosen didn't have other health conditions that could skew the results. 44 HIV-negative control subjects were also included in the initial analysis. An independent group of 48 subjects, both HIV positive and negative, was used to confirm the findings.

In addition to the discovery that HIV infection led to an average advance in biological aging of 4.9 years, the researchers note that such a change correlates with an increased risk of mortality of 19%.

"We set out to look at the effects of HIV infection on methylation, and I was surprised that we found such a strong aging effect," Ideker says.

"Another thing that was surprising was that there was no difference between the methylation patterns in those people who were recently infected [less than five years] and those with chronic infection [more than 12 years]," Fox adds.

The investigators say it's possible drugs could eventually be developed to target the kinds of epigenetic changes observed in the study. But the more immediate implications are much simpler: they note that people infected with HIV should be aware that they're of greater risk for age-related diseases and work to diminish those risks by making healthy lifestyle choices regarding exercise, diet, and drug, alcohol, and tobacco use.

This study was supported by the National Institute of Mental Health, the National Cancer Institute, and the California Institute for Regenerative Medicine.

Journal Reference:

Gross et al. **Methylome-wide analysis of chronic HIV infection reveals five-year increase in biological age and epigenetic targeting of HLA.** *Molecular Cell*, 2016 DOI: [10.1016/j.molcel.2016.03.019](https://doi.org/10.1016/j.molcel.2016.03.019)

View the story online: [Click here](#)

HIV Spreads Through the Body Much Faster Than Previously Thought

As reported by POZ | 4.18

HIV spreads much more rapidly through the body after initial infection than previously believed, apparently causing immediate immune reactions that enable its replication. Publishing their findings in the journal *Cell*, researchers vaginally exposed 44 rhesus monkeys to SIV, HIV's simian cousin, and analyzed the animals during the first few days post-infection.

The investigators found that, in most of the animals, viral RNA was present in at least one tissue outside the reproductive tract just one day after infection. As early as this same point, SIV had also apparently prompted an inflammatory immune response in tissues infected with the virus. There was a connection between increasing amounts of viral RNA and greater amounts of a protein that suppresses the immune response to viruses. The researchers also saw that the early workings of a mechanism by which certain cells are instructed correlated with a lower level of antiviral T-cell responses, as well as with higher levels of replication of SIV.

These research findings suggest a much shorter time than previously believed when HIV only remains in the mucosal tissues where it was first deposited. Such knowledge may contribute to the research into vaccines, microbicides and pre-exposure prophylaxis (PrEP) methods.

To read a press release about the study, [click here](#).

View the story online: [Click here](#)

Model suggests there are fewer people with HIV in the US than thought, and more of them on therapy

Gus Cairns, *aidsmap* | 4.20

A study comparing recorded diagnoses of HIV with subsequent records of viral load and CD4 tests suggests that the number of people with HIV in the US could have been overestimated by as much as 45% – and the proportion who are on antiretroviral therapy (ART) with undetectable viral loads could have been underestimated by as much as 50%. There could be a few as 820,000 people with HIV in the US compared with the normally accepted figure of 1.2 million – and up to 55% of those could be on ART and virally suppressed, compared with the most commonly quoted figure of 30%.

Background

The 30% figure comes from a 2011 study (reported here on *aidsmap.com*). However, it is not just because it is five years out of date that the 30% figure has been questioned. It is also puzzling because with such a low rate of viral suppression, one would have expected a continuing increase in the number of new diagnoses – but this does not seem to be the case, with decreases in diagnoses reported for nearly every group in the last few years. In contrast, in the UK, with roughly two-thirds of people with HIV on ART and virally suppressed – more than twice the supposed US figure – the number of new infections, at least in gay men, continues to slowly increase.

The 30% viral suppression figure in the US has been blamed on a healthcare system that excludes a lot of people from care, and a recent model based on the usually accepted figures has calculated that as many as 45% of people diagnosed with HIV are not in current medical care and that 60% of new infections come from these people.

Figures from individual US cities with high HIV prevalence, however, suggest much higher rates of care and viral suppression. Studies from Seattle and New York presented three years ago at the Conference on Retroviruses and Opportunistic Infections (CROI) suggested that 57% and 44% of people with HIV in those cities, respectively, had an undetectable viral load even then; and a more recent study from San Francisco suggested a figure of 60% there – close to the UK figure and one which, with the addition of a sizeable number of HIV-negative people taking pre-exposure prophylaxis (PrEP), seems to be leading to considerable falls in new HIV infections.

The Seattle researchers found that, in their city at least, 20% of people with HIV reported not to be in care actually were in care – partly because they had moved to another area and were getting care there, but also because the way of calculating who was in care was to count the number of people who had had at least one CD4 count or viral load test during a specific four-month period.

This measure is the same as the one used to make the original countrywide estimate of the proportion of people in care. This comes from the Centers for Disease Control and Prevention's (CDC) Medical Monitoring Project (MMP), which receives data from a selection of states and cities. The period used in the original 2011 estimate was January to April in that year. However, this may considerably underestimate the number of people actually in care if their CD4 or viral load tests are not reported or if they happen not to attend during that period.

Conversely, deriving the number of people with HIV from positive test results may overestimate the number of people with HIV if they are duplicated for some reason – for instance, under single and married surnames – or if, as is not uncommon, people who say they did not know they had HIV have, in fact, already been tested. A UK survey found that 27% of people reported (from anonymised blood samples) as having HIV but not being tested for it during a sexual health screen were, in fact, already taking ART – they just preferred not to tell their sexual health clinic. Deaths may also be under-recorded, especially if people move abroad, thus overestimating the number of people still alive.

This study

Suspecting that some of these conditions might bias the US statistics, the researchers in this study first directly compared the number of new HIV diagnoses reported in New York City both with the number of reported CD4 or viral load tests in a four-month period, and also the number of people for whom at least two HIV care appointments at least three months apart were recorded in one year.

They found that by HIV test data, 97,128 people were recorded as being diagnosed in New York City and still living there up to the end of 2012. However, by using laboratory test records, they only found 77,334 people diagnosed with HIV living in New York at the same date. This implies that test data could be overestimating the number of people with HIV in New York by 25.6% – or, alternatively, that 25.6% of people diagnosed with HIV in New York are not attending care.

Conversely, the figure for the number of people with at least two recorded medical visits (more than three months apart) in 2012 was 61,159 – implying that using recorded medical appointments as the definition of 'being in care' would underestimate the number actually in care by 21%.

Taken together, these two figures could underestimate the proportion of people diagnosed who are in care in New York by as much as 37%.

The researchers were able to do a similar exercise for 19 other jurisdictions in the US ranging from populous and high-prevalence areas (such as the state of Illinois) to rural and low-prevalence areas (such as North Dakota). However, while they had diagnosis and laboratory test reports for these 19 areas (which were chosen because they had the most complete data), they did not have appointment attendance figures.

They therefore provided two estimates: in one, the under-reporting of 'being in care' was assumed to be the same as in New York; in the other, they assumed that both lab test results and appointment records were under-reported by 15% each. This would increase the number actually in care, and would mean the difference between this figure and the number diagnosed with HIV from HIV test records would be lower.

They found that if CD4 and viral load results and appointments were recorded as reliably in New York, then the number of people diagnosed with HIV derived from HIV test results would in all cases overestimate the true figure – and in some cases, by a huge margin. For instance, it would mean that the number of people actually diagnosed with HIV living in West Virginia, Minnesota, Hawaii and Washington DC was actually less than half of that derived from HIV test results – and in Illinois, less than one third.

Or – and this is the alternative reading – that in these five areas, an unusually high proportion of people with HIV is not currently in care.

If CD4 and viral load results and appointments were regarded as being recorded 15% less reliably than in New York City, then in some states – Delaware, Iowa, Nebraska, North Dakota and South Carolina – the number of people diagnosed with HIV derived from HIV tests and from CD4 and viral load tests would match. In short, nearly everyone diagnosed with HIV in those states would actually be in care.

In Washington DC and Illinois, however, the true number of people diagnosed with HIV would still be overestimated by 100% if CD4 and viral load test results were a better guide to true HIV diagnosis figures than HIV test results, and by 50% in West Virginia, Minnesota and Hawaii.

Impact on the HIV care cascade

If viral load and CD4 count results are a better guide to the number of diagnosed people living with HIV, then this would have a huge impact on the so-called HIV care continuum or cascade.

The CDC estimates that there are 1.2 million people living with HIV in the US of whom just over a million (86%) are diagnosed. However, it estimates that only 46.5% of the diagnosed, or 40% of the total, are retained in care, and this means only 30% of the total have a suppressed viral load.

If the researchers' assumptions are correct, then the true total of people living with HIV in the US is only 819,000 – a third lower than the CDC estimate. But the proportion retained in care would be 84% of the diagnosed and 72% of the total. This in turn would imply that 55% of all people with HIV in the US are on ART and have a suppressed viral load – not that much lower than the UK figure.

In making this new cascade, the researchers used a method of estimating the proportion of people out of care by noting that patients return to care at a fairly constant rate and that this can be used to

estimate the number out of care. They used the case of Seattle – a city with excellent records – to estimate the proportion of diagnosed people with HIV who are retained in care. This is 84%, which may seem high, but actually includes people who have not had a CD4 or viral load test result for over four years. When these are removed, the proportion rises to 88% and in New York using the same method, to 91%.

The 55% viral suppression rate may be higher than this in some cities if the same methods are used to weed out ‘false’ records of people living with HIV. It would be 67% in Seattle (about the same as the UK), 70-72% in New York, and as much as 78% in San Francisco, which could explain most of its fall in HIV diagnoses.

Conclusions

The truth is likely to lie somewhere in between, as some areas may have a high proportion of diagnosed people out of care while in others there may be a lot of people recorded as living with HIV who are not actually in that area, alive, or even actual people. In particular, the true number of people living with HIV in the US is likely to lie somewhere between the CDC’s 1.2 million and this study’s 819,000.

The researchers say that their study, “is not an attempt to precisely quantify the number of HIV-infected persons in the US but rather to examine the extent to which the current estimates change when derived from evidence available at the state and local level.” They note that as the CDC received more accurate figures, they revised their own estimate down from 1.178 million in 2008 to 1.145 million in 2010. However, they suggest that this figure is still an overestimate due to duplicate records and undercounting of deaths, and that CD4 and viral load test and appointment records should be used to make more accurate local estimates.

Reference

Xia Q et al. Persons living with HIV in the United States: fewer than we thought. *J Acquir Immune Defic Syndr*, early online publication. doi: 10.1097/QAI.0000000000001008. See abstract here. March 2016.

View the story online: [Click here](#)

To Drive Gay Men to HIV Testing, Use Social Media

As reported by POZ | 4.20

A program to encourage HIV testing among men who have sex with men (MSM) apparently succeeded by engaging them on gay-focused social media sites, Reuters Health reports. Publishing their findings in *Clinical Infectious Diseases*, researchers created public profiles, situating them to target different geographic locations, on Adam4Adam, BlackGayChat, Craigslist and Gay.com.

Health educators used the profiles to post about the importance of HIV testing and indicated that they were available to provide information through instant messaging about testing services.

On Craigslist in particular, the health educator posted about HIV testing periodically between 9 a.m. and 5 p.m., Monday through Friday, during 2013 and 2014.

The researchers offered men on the sites \$10 to complete an assessment, which looked at their substance use, age, race, sexual orientation, HIV status and their HIV testing history during the previous 12 months.

The study included more than 1,000 participants, who were 40 years old on average. About 35 percent of both those who received the intervention encouraging testing and those in the control group said they had been tested for HIV during the previous year. After the intervention, 64 percent of those who received it said they had been tested during the previous 12 months, compared with 40 percent of the control group.

To read the Reuters Health article, [click here](#).

To read the study abstract, [click here](#).

View the story online: [Click here](#)

Scientific Papers/Conference Abstracts

National- and state-level impact and cost-effectiveness of nonavalent HPV vaccination in the United States

Durham DP, Ndeffo-Mbah ML, Skrip LA, et al. *PNAS* 2016; [Epub ahead of print]

Abstract:

Every year in the United States more than 12,000 women are diagnosed with cervical cancer, a disease principally caused by human papillomavirus (HPV). Bivalent and quadrivalent HPV vaccines protect against 66% of HPV-associated cervical cancers, and a new nonavalent vaccine protects against an additional 15% of cervical cancers. However, vaccination policy varies across states, and migration between states interdependently dilutes state-specific vaccination policies. To quantify the economic and epidemiological impacts of switching to the nonavalent vaccine both for individual states and for the nation as a whole, we developed a model of HPV transmission and cervical cancer incidence that incorporates state-specific demographic dynamics, sexual behavior, and migratory patterns. At the national level, the nonavalent vaccine was shown to be cost-effective compared with the bivalent and quadrivalent vaccines at any coverage despite the greater per-dose cost of the new vaccine. Furthermore, the nonavalent vaccine remains cost-effective with up to an additional 40% coverage of the adolescent population, representing 80% of girls and 62% of boys. We find that expansion of coverage would have the greatest health impact in states with the lowest coverage because of the decreasing marginal returns of herd immunity. Our results show that if policies promoting nonavalent vaccine implementation and expansion of coverage are coordinated across multiple states, all states benefit both in health and in economic terms.

View the paper online: [Abstract](#)

The use of mobile phone apps by Australian gay and bisexual men to meet sex partners: an analysis of sex-seeking repertoires and risks for HIV and STIs using behavioural surveillance data

Hull P, Mao L, Prestage G, et al. *STI* 2016; [Epub ahead of print]

Background

Mobile phone apps are now the most popular method that Australian gay men use to find sex partners. Partner-seeking mobile phone apps use location functions to identify like-minded men and display their proximity. This study examines whether meeting partners via mobile apps is associated with a greater risk of HIV and sexually transmitted infections (STIs) than with other ways of meeting partners.

Methods

Data were analysed from the Gay Community Periodic Surveys, community-based, cross-sectional surveys conducted in Australian state capital cities between 2010 and 2014. χ^2 tests and multinomial logistic regression were used to analyse differences in risk profiles of men who used different methods to meet partners.

Results

Data were analysed from 36 428 men who participated in the Gay Community Periodic Surveys between 2010 and 2014. In 2014, 4116 men reported meeting sex partners with the use of mobile apps, increasing from 23.9% in 2011 to 42.5% in 2014. Men who used a combination of online and offline methods reported a greater number of sex partners and were more likely to report a recent STI than men who used online methods only or offline methods only.

Conclusions

There has been a steep increase in the use of mobile phone apps by gay men in Australia to meet male partners. However, men who use a combination of mobile phone apps, internet websites and offline places to meet partners appear to be at increased risk of STIs or HIV compared with men who use a narrower range of online and offline methods.

View the paper online: [Abstract](#)

Practice-Based Quality Improvement Collaborative to Increase Chlamydia Screening in Young Women

DiVasta AD, Trudell EK, Francisc M, et al. *Pediatrics* 2016; DOI: 10.1542/peds.2015-1082

BACKGROUND AND OBJECTIVE:

Chlamydia trachomatis infections are common among sexually active young women. We developed a practice-based quality improvement (QI) collaborative to increase Chlamydia screening in at-risk young women.

METHODS:

Structured data fields were integrated into the electronic record for practices affiliated with Boston Children's Hospital. A learning community (LC) was developed. Content included the adolescent well visit, assessment of sexual/risk behaviors, epidemiology of sexually transmitted diseases, and screening methods. The QI initiative effectiveness was assessed by comparing preintervention and

postintervention rates of Chlamydia screening by using statistical process control analyses and logistic regressions.

RESULTS:

LC participants demonstrated significant increases in recommended Chlamydia screening, as illustrated by using Healthcare Effectiveness Data and Information Set (HEDIS) screening rates (LC1: 52.8% preintervention vs 66.7% postintervention [$P < .0001$]; LC2: 57.8% preintervention vs 69.3% postintervention [$P < .0001$]). Participating practices reported total improvements larger than nonparticipating practices (13.9% LC1, 11.5% LC2, and 7.8% nonparticipants). QI and LC efforts also led to increased documentation of sexual activity status in the record (LC1: 61.2% preintervention to 91.2% postintervention [$P < .0001$]; LC2: 43.3% preintervention to 61.2% postintervention [$P < .0001$]). Nonparticipating practices were more likely to perform indiscriminate screening.

CONCLUSIONS:

Through our QI and LC efforts, statistically and clinically meaningful improvements in Chlamydia screening rates were attained. Differences in rates of improvement indicate that LC participation likely had effects beyond electronic medical record changes alone. During the project time frame, national HEDIS screening rates remained unchanged, suggesting that the observed improvements were related to the interventions and not to a national trend. As a result of QI tools provided through the LCs, HEDIS screening goals were achieved in a primary care setting.

View the paper online: [Abstract](#)

First case of pancreas transplant alone in patient with diabetes and HIV infection

Mittal S, Choudhary P, Callaghan C, et al. *International Journal of STD & AIDS* 2016; [Epub ahead of print]

Abstract:

Chronic conditions have largely replaced opportunistic infections as the leading causes of mortality in human immunodeficiency virus (HIV) infection. Pancreas transplantation alone can be performed for people with difficult to manage diabetes associated with severe hypoglycaemic unawareness. For carefully selected patients, pancreas transplantation alone has the potential to dramatically improve quality and quantity of life. Historically, HIV was considered a contraindication to transplantation; however, today renal transplantation for people with end-stage kidney disease and HIV infection is increasingly common. We describe the use of a standard immunosuppression regimen in combination with effective antiretroviral control using a stable highly active antiretroviral therapy regimen with minimal interaction with immunosuppressants. We describe what is to our knowledge the first case of pancreas transplantation alone performed for this particularly challenging group, resulting in complete resolution of hypoglycaemic symptoms. We suggest that this group of patients should receive optimal diabetes management, including access to transplantation where appropriate, and demonstrate that pancreas transplantation alone is feasible for people with HIV infection.

View the paper online: [Abstract](#)

UK guideline for the use of HIV Post-Exposure Prophylaxis Following Sexual Exposure, 2015

Cresswell F, Waters L, Briggs E, et al. *International Journal of STD & AIDS* 2016; [Epub ahead of print]

Abstract:

We present the updated British Association for Sexual Health and HIV guidelines for HIV post-exposure prophylaxis following sexual exposure (PEPSE). This document includes a review of the current data to support the use of PEPSE, considers how to calculate the risks of infection after a potential exposure, and provides recommendations on when PEPSE should and should not be considered. We also review which medications to use for PEPSE, provide a checklist for initial assessment, and make recommendations for monitoring individuals receiving PEPSE. Special scenarios, cost-effectiveness of PEPSE, and issues relating to service provision are also discussed. Throughout the document, the place of PEPSE within the broader context of other HIV prevention strategies is considered.

View the paper online: [Abstract](#)

Resources, Webinars, & Announcements

Dapivirine Ring—Past, Present and Future

AVAC

AVAC's new issue of *Px Wire* is an advocate's guide to the past, present and future of the dapivirine ring for HIV prevention.

It features a timeline of key milestones that could lead to licensure, a simple comprehensive Q & A, and a closer look at where sub-Saharan African women will have access to daily oral PrEP and/or the Ring via open-label extension studies.

We hope this resource will be used to spark discussion and guide plans for further engagement.

Download the latest issue of *Px Wire*

- Full Issue: [PDF](#), [HTML](#)

For more information: [Click here](#)

Virtual Hill Day for STD Prevention: April 26th

[National Coalition of STD Directors \(NCSD\)](#) invites you to participate in a Virtual Hill day for STD by sending one of two prepared letters to your federal policymakers to educate them on the importance of STD control programs today. Learn more [HERE!](#)

For more information: [Click here](#)

Online Learning Opportunities: Webinars Highlight ACA and Those at Risk for and Living with HIV

Blog.aids.gov

The Affordable Care Act (ACA) has brought access to quality, affordable health care for millions of Americans. Now is a great time to learn more about how the law affects those at risk for and living with HIV, and how to engage and enroll individuals in the health care coverage they need—or use the new coverage they have. Be sure to check out these webinars:

Practices to Engage, Enroll, and Retain Ryan White HIV/AIDS Program Clients in Health Coverage

April 27, 3:00 – 4:00pm, ET

This webinar looks at best and promising practices—including real experiences from Ryan White HIV/AIDS Program recipients—on how to engage, enroll and retain Ryan White clients in health coverage. Speakers will highlight how they have implemented best practices at their organizations and lessons learned. The webinar will also provide suggestions for implementation and resources available to assist in the process. Hosted by: HRSA's HIV/AIDS Bureau, ACE TA Center.

[Register to Participate](#)

How the ACA Helps Transgender and Gender Nonconforming Patients

[Archive online](#).

This week, we observe National Transgender HIV Testing Day, is a great time to revisit a webinar that originally aired in October 2015. This webinar highlights how the ACA has improved access to health care for transgender and gender nonconforming patients, best practices for navigating issues with insurance coverage, and challenges that still face the transgender community. Hosted by: HRSA.

[View webinar archive online](#).

For more webinars on the ACA and other topics of interest to the AIDS.gov community, [visit our webinars page](#).

WEBINAR: Meeting the Sexual + Reproductive Health Needs of Patients with Developmental Disabilities

CFHC

DATE: May 11

TIME: 11:00 AM – 12:00 PM PST

Presenter:

Katherine McLaughlin, M.Ed, Sexual Health Education + Training Consultant

Overview:

People with physical, cognitive, or emotional disabilities have a right to sexuality education and sexual health care. Medical providers understand the need to address sexuality and provide sexual and reproductive health care for patients with developmental disabilities, but many are unsure how to work

with this population. This webinar will explore tools and resources to provide high quality, patient-centered care to developmentally disabled patients.

For more information: [Click here](#)

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Archives of previous STD Updates can be found [here](#). To unsubscribe or add colleagues' names, email aaron.kavanaugh@cdphc.a.gov. If you have an item related to STD/HIV prevention which you would like included, please send. No bibliographic questions please; all materials are compiled from outside sources and links are provided. No endorsement should be implied! Note: Some words may have been palced in [brackets] or replaced with blanks (___) or asterisks (*) in order to avoid filtering by email inboxes.

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