



Clinical Education Initiative

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HIV EPIDEMIOLOGY IN THE UNITED STATES: WHERE IS THE EPIDEMIC GOING?

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HIV Epidemiology

[Video Transcript]

[00:00:06] So I'm going to be talking today about where we think the epidemic is going. There's been a lot of change in the last 30 or so years since it was first identified in the United States. I have no financial disclosures. I work for you and learning objectives or characterize patients at greatest risk for HIV in the U.S. today. And then to also apply knowledge about the emerging epidemiology of HIV to address preventable and treatable co-morbidities, morbidity to reduce new HIV infection. So let's go back first to this curve which gives a quick brief history is the only real history's sliding going to show the history of HIV in the United States shown here are actually AIDS diagnoses not HIV infection diagnoses because when they this when the disease due to this infection first emerged in the United States we didn't know what caused it, we didn't know how to test for it, and we didn't really understand how it was transmitted. So, starting in the early 80s, we recognized a syndrome characterized by diagnosis with a cluster of opportunistic infections which weren't normally seen in people with a healthy immune system. And the number of these cases rose steadily until sometime in the early to middle 1990s. I just note that the first drug that was approved to treat HIV; AZT was approved in 1985-1986 and the test for HIV infection came out right around that time. Infections really continue to climb until as I mentioned the middle 1990s and then with the advent of a multi drug at the time, triple drug antiretroviral therapy highly effective combination therapy we saw began to see a decline in cases. I'll just note that the decline actually preceded the availability of the so-called triple drug cocktail and this is due in part because we were doing a better job managing AIDS we were better at identify the opportunistic infections and treating them so they didn't threaten life, and also immunizing patients, and giving them prophylaxis to prevent developing opportunistic infections. Since that time HIV infected AIDS cases but also HIV infections have continued to decline up until the present time. I just note that in the more in the middle right in middle 2000s I need to take my glasses off I can't see that in the middle 2000s integrase inhibitors were improved and these are the latest class of antiretroviral drugs you'll be hearing about later very potent and have also made a real change in how we treat the disease. As a result of these improvements, two important factors: death due to AIDS has declined dramatically in the United States and the age at which people die who have HIV infection has steadily risen. So, we've had a decline in deaths from 382 per 100,000 to 20 that's over a tenfold decline. And the age at which people die most recently was 51 years in 2013 up from 36 in 1987. So really remarkable progress and the age of death due to HIV infection is continuing to go away. I need to turn this off, sorry about that there we go are continuing to increase. In fact, our progress with treating HIV has been so dramatic that if you look at the leading causes of death for people who are most affected by the disease and continue to be young people aged 25 to 44 whereas in the early 90s it was the leading cause of death. It is now below five other major causes of death unintentional injury, cancer, heart disease, suicide, homicide. So really amazing progress. As I mentioned before this is due in great part to the availability of really effective treatment of the infection. So, let's hone in now on the more recent time period from 2008 forward and I'm going to begin talking now about HIV infections which we've been able to diagnose and have followed in the United States since around the 1997-98. So looking at persons aged 13 years or older and limiting it just to the United States top the U.S. and its six dependent areas new diagnoses have declined from about 48,000 to about thirty nine thousand six hundred over the roughly nine year period shown here and that's an 18 percent decline over this time period. So, we continue to see really great progress. But I want to point out that since 2003 this curb is beginning to flatten. And I'm not going to have a chance to go into this in great detail, but we have reason to believe that a lot of this is due to a national increase in the number of people who are injecting drugs again in part related to the opioid epidemic and we're very concerned that a resurgence in injection drug use could actually turn the curve on some of our progress to date.

[00:04:49] In conjunction with decreasing diagnoses deaths have also declined from about eighteen thousand nine hundred to fifteen thousand five hundred roughly and that's also about an 18 percent decline. So, we are continuing to see a lot of progress and that decline in death has not flattened out and that's reassuring. So, I want to show you now the age distribution and this includes all persons diagnosed with HIV including the six dependent areas Puerto Rico, Guam those sorts of places a total of 40000 in the year 2016 roughly. And you'll note that the peak age of persons recently diagnosed is between 20 and 40. So peaking at 25 to 29 but most persons are in their young adult years. But I don't I want to make sure that you also recognize that we still see new infections in people over the age of 50, 17 percent in the year 2016. And I'll talk more about this later because this and what the curve of people living with HIV looks like now have a lot of implications for what you're here for today. Many of you are probably well aware that this disease disproportionately affects different groups of Americans. 44 percent of new diagnoses were among African-Americans and if you look at the other pie chart over on the right which shows the distribution of these race ethnicities in the general population, only 13 percent of the U.S. population are African-American. Likewise, the grey part of the pie. Hispanic and Latinos represent 26 percent of new diagnoses but only 18 percent of the U.S. population. And in terms of transmission route the leading route of transmission remains in the United States male to male sexual contact almost 70 percent of new diagnoses of a 67 percent in 2016 injection drug use also represents still continues to represent about 6 percent of new infections. And I'll note having said before that we're concerned about a resurgence in injection drug use that in the middle 1990s over 30 percent of new AIDS cases were due to injection drug use and that we've gotten it down so far to 6 percent of HIV diagnoses is really again remarkable progress but we're concerned about a turnaround in that. So, the group most affected this is a diagram showing the number of new infections kind of combining race, ethnicity and transmission group and the group who account again for the largest number of diagnoses are men who have sex with men black, Latino, and white.

[00:07:16] However, we've seen some progress you know among white MSM over the last eight years has been a 10 percent decline in new infections among black women due to heterosexual contact. Also, about a 10 percent decline. But at the same time, we've seen 5 percent increase among African-American MSM and worrisome for us in particular a 16 percent increase among Hispanic Latino MSM. So, although we're seeing some declines in certain groups there are still groups where new infections are increasing. Translating this to a person's lifetime risk for HIV infection; I just find this to be very startling statistic. If you look at the estimated lifetime risk of HIV infection among MSM for white men, there's a 1 in 11 chance you'll develop HIV infection. Hispanic Latino men one in five. But if you're a black man living in the United States and you have sex with men there's a 1 in 2 chance over the course of your lifetime that you may develop HIV infection. We've seen a general decline in men although we said there's been an increase in most groups of MSM by age. The rates have been pretty steady although some of these appear to decline. There are actually no statistically significant differences in the trend over time with one exception this age group 25 to 34 even in the last year we've seen a 23 percent increase. So again, the groups were really concerned about in terms of race ethnicity and transmission risk or MSM and in particular young MSM of color in the United States. HIV also affects the country geographically in different ways. In 2014 five states shown here in red accounted for over 50 percent of all diagnoses or half of persons I'm sorry fifty percent of people living with HIV. Those were Texas, California, New York, Florida, and my home state Georgia. In 2014 also states located in the southern tier of the United States shown here in red accounted for 45 percent of persons living with HIV, 50 percent of undiagnosed infections, 51 percent of new infections. Yet this part of the country only represents 38 percent of the United States. There's a disproportionality in terms of geography as well.

[00:09:28] So we're going to go to the first question. So, I'm going to just wait a few seconds and let this continue to grow. And it looks like the answer that's emerging is 50 percent. And yes, that's correct, over 50 percent of deaths due to HIV infection occur in the southern United States.

[00:09:48] And that's an increase from 1987 from 28 percent to 53 percent. And again, this only represents 38 percent of the nation's population. So, it's not just a problem of new infections and people living with HIV, but this also implies that there may be problems with access to care in the quality of the care people are receiving in the south. I'm not that's not to say that it's the clinician's fault or the providers fault or the patient's fault. It's just a nature of many many things that are taking place in the south that come together to create a problem for folks there. So, I want to talk now more about some of the aspects of HIV as a manageable chronic disease which today in 2018 I believe that it really is. We know that if you start treatment for HIV with antiretroviral therapy abbreviated as A.R.T. this is lifelong treatment that requires lifelong care to keep the virus suppressed, you'll hear a lot more about that today but we had some really tremendous progress in getting people suppressed in great part due to the availability of multiple, single tablet, once daily regimens that have fewer and fewer side effects. So, to give you a sense of what survival looks like back in 1995 and 96 when triple therapy was first introduced, we expected people who were diagnosed age 20 to live about another eight years. And it's increased in most recently in 2010 from the analysis done here to an additional 55 years or living to around age 75 and that's compared to persons who are HIV uninfected with an average lifespan of about 80. So today people who are able to be diagnosed early and initiated into ongoing regular care and treated effectively with antiretroviral therapy can pretty much expect to live as long as persons who don't have HIV infection. These are the now seven singled tablet once daily formulations just to show you that there's really a lot of options to choose from. These are very simple this aren't these are not handfuls of pills like many of our patients if you took care of people back in the 80s and 90s had to take these drugs are increasingly potent and remarkably have fewer and fewer side effects. I've listed here two references that I find very handy that summarize what all the different antiretroviral drugs, are what their acronyms are, the year they were approved and manufactured, and how they work. There's one on AIDS info dot net that's an NIH supported Web site and AIDS info net that's supported by I think it's in Arizona and you go to fact sheet number 42. For our statisticians who have to do research, and you know they're going through databases and it says this patient received D4T and they don't know what that is that fact sheets a great cheat sheet. We also know that effective therapy prevents sexual transmission of HIV and this although it is it may have seemed like common sense because we know that treating any infectious disease reduces its transmissibility. This was really a home run in terms of the three studies that I've shown here which demonstrated this effect. HPTN 052 partner in opposites attract were studies that enrolled heterosexual couples where there was a mixed HIV status. So, one partner had HIV but was being treated the other did not have HIV and was not being treated. And in the partner in opposites attract studies the uninfected person also did not take PEP PrEP and they did not use condoms during anal or vaginal sex. And in these studies, they observed despite large numbers of people and many many condom less sexual contacts no genetically linked infections. In fact, based on the last two studies which actually quantified these exposures, in more than 75,000 condomless acts of vaginal or anal intercourse. Over 1,500 couple of years of observation no genetically linked infections were observed. It's pretty remarkable. At some point we may be able to talk more about what that means in practice because not everybody is perfect and not everybody is able to get their viral load suppressed and keep it there. But for those people who can reach this nirvana this is incredibly potent information because it's in very destigmatizing. I know a lot of people with HIV sometimes carry this yoke of feeling less than anybody else. Feeling very stigmatized about their infection and this is potent information to help patients maintain their treatment because they can protect those, they love from HIV

infection. Now we don't know its effectiveness for preventing HIV in other routes like injection drug use, breastfeeding, but we have no reason to believe that the biological plausibility doesn't also apply there. We expect that it would be decreased, but we don't know by how much.

[00:14:29] So as a result of these findings there's been a movement that you'll hear about if you haven't already called U=U where they are promoting to patients as well as providers the importance of getting suppressed because this means that you're untransmittable. And the Department of Health and Human Services of which my agency is part has had a working group where we've pulled together we've looked at these studies very carefully, and we've concluded now that people who take A.R.T daily as prescribed and who achieve and maintain an undetectable viral load have effectively no risk of sexually transmitting to negative partners. As a result of this and other studies therefore since 2015 all major guidelines for treatment of HIV in this country and abroad recommending offering A.R.T. as close to diagnosis is feasible both because of its benefit to the patient, but also because of its benefit to public health by reducing HIV transmission.

[00:15:26] The second point I wanted to make about HIV is a chronic disease is that getting suppressed is not necessarily as easy as you might think. It requires getting diagnosed first of all and then getting into ongoing care. And so, there's a thing called the HIV Care continuum, I'll show you in just a minute which talks about this pathway from knowing you have HIV to getting to where you're suppressed. And it's a it can be a long and winding road for some people. What percentage of Americans diagnosed with HIV today among those diagnosed have an effectively suppressed viral load?

[00:15:59] 25, 50, 75 percent or 90 percent Why this is so much fun to see in real time moving around it's like I could throw the numbers if I kind of punch in my own. Yeah. OK. So, it looks like two answers are emerging somewhere between 50 and 75 percent. Almost neck and neck but a little bit ahead for 50. So, let me move ahead then and you see on the right it's about 49 percent so approximately 50 percent.

[00:16:31] What we know in the United States today is despite the availability of potent therapy of an infrastructure that can deliver the medical care that people need, the social services, the availability of pharmacy, and that support, all the mental health services that are available for people to help them be able to stay engaged and care not everybody is benefiting from this care. Only 85 we estimate and it's true for today as well this was a figure from 2014 but it's the same number in 2016 that only 85 percent of persons with HIV in the United States know their diagnosis. That means of the approximately one point one million people living with the disease, 15 percent or about 150000 individuals don't yet know they have the infection. Only about 62 percent are two thirds of those persons are engaging are actually receiving some kind of care and only half of all the persons diagnosed are actually being retained in care.

[00:17:26] So we've got a challenge. And one of the reasons that a large number of people remain undiagnosed we believe that many people are not many people who are at highest risk are not tested annually as recommended by our guidelines. The three groups at highest risk for HIV are heterosexuals who are sexually active with more than one partner, people who inject drugs, and men who have sex with men. And the bar graph on the left shows the fraction of persons who on a number of surveys we've done were not tested in the last year despite a recommendation they should be tested annually. So almost a

third of gay and bisexual men were not tested in the last year. Concerning to me in particular is this middle figure that of people who encountered a health care provider who were diagnosed with HIV, and then during the prior year encountered a health care provider seven of 10 people who were in those risk categories were not tested by that provider. So what this is is a lost opportunity in that if we look at how late diagnoses are occurring this is the figure over on the right of the roughly 40,000 persons diagnosed in 2015 we estimate that the median time about one out of every two persons had had the infection for three years before they'd been diagnosed. And at the bottom one in five actually had progressed to the most advanced stage of HIV infection or AIDS prior to diagnosis. And this is looking by year since 2010 the fraction of persons who were diagnosed with late stage infection.

[00:18:54] And you can see we really haven't made a lot of progress has remained to about 25 percent. There's no statistically significant difference in the trend in this curve and that's a real challenge for us. We're now with people should not have to experience severe damage their immune system before they have the opportunity to get into care. So, let's talk now about a different question, what percentage of new infections are attributed to people who are either undiagnosed or not linked to care? OK so 25, 50, 75 percent or 90 percent? OK. So, it looks like people are coalescing around 75 percent. Not many people think 25 percent. Some are at 50 some are at 90 percent. OK so 75 percent is though the leading figure. Well this shows you analysis done by our agency looking to answer this question and the two bars on the left are the number of transmissions attributable to either people who were undiagnosed in the dark blue bar or people who were diagnosed but not yet retained in care. They may have made a first visit, but they didn't continue in care. And putting this now in a table showing the population that they represent and the number of transmissions so undiagnosed in people not retained represent in total only 62 percent of people living with HIV in the United States. But we believe that there they are the source for about 92 percent of people who have who report 92 percent of new transmissions rather. And this again speaks to the really important issue of diagnosing people and getting them into care because it's not only good for their own health it's good for the public health as well. This is really going to be a critical step in ending new HIV infections in the United States. The third thing I want to talk about is this concept of near normal life expectancy. We do hear a lot about how people who are diagnosed early and treated today can expect to live a near normal life and I believe that's true if they're effectively treated. But there are some things we need to talk about that are a little different for folk's HIV I'm not going to go into that at length because that's what most of this conference is going to focus on. But I did want to bring up two points for your attention. The first is that people should be initiated as soon as feasible on HIV treatment. I mentioned that all current guidelines recommend that and despite the fact that people do achieve a suppressed viral load and are doing well there is some predisposition on people currently living with HIV who are doing well for so-called non-HIV related conditions. But most of these can be effectively managed with good preventive care and early diagnosis which is what you all are going to be learning about over the next few days. So, this is a really interesting study that was done at San Francisco General Hospital. And they were looking at how long does it take someone to become virologically suppressed based on when you initiate therapy. The bottom line here is when we used to say you should start treatment when your CD4 cell count is 350 or 200, the middle line is when we said we should just start everybody on antiretroviral therapy as soon as possible. And you can see there is some improvement from 220 days so that's what is that about two or three months three months until the person's virologically suppressed to 130 days, a major improvement. But then San Francisco did a really remarkable thing they said what if we offer people treatment at the time they're diagnosed? What if we just say OK you've been diagnosed today; I'm going to give you some medication. We'll draw your labs. We'll follow up those labs in a day or two. And if there's a problem then we'll change your medication and that includes if there's a problem with resistance. But let's get started right away. And I want you to consider you go to the doctor

diagnosed with strep throat. Have they ever told you come back in a week and I'll give you antibiotics? No! And we've treated HIV differently for a very long time; And I think that this is a really nice move in the right direction. You can see that it had a really profound effect on getting people undetected quickly. Now you might ask well how acceptable this is to people. I mean really are they ready to start lifelong therapy with these drugs that they may have heard or toxic for the rest of their life. Well this is a graph looking at the acceptability of the intervention in red are the people who were offered treatment the same day, in gray or people who were offered treatment in this sort of routine run of things. And there's very high acceptability among people who have HIV; and I personally think part of that is because people want to do something when they find out they've got the diagnosis. This is very empowering to know that I've been given this diagnosis, but I can do something about it right now. And this is not a solitary finding. This finding has been repeated in a recent study done in New Orleans shown here a rapid start is a different kind of way of presenting the data. This is a Kaplan Meier curve. So is the percent who achieve less than 200 viral load time is along the bottom axis the fraction who achieve it is on the left. And for people in their rapid start program the median time to viral suppression was 50 days versus 68 days in standard of care. And then on the other side of the graph is another side effect of doing this. People who start immediately also tend to be retained and care better. These are data from Haiti a little different than our country but certainly no worse. And people who had a same day start if you look at the bottom here retained overall standard of care sorry same day 79 percent standard of care 72 percent. And it also included those who had a viral load less than 1000. It was higher percentage there as well, 61 versus 52 percent. So same day start is close to a possible early start. Not only get your viral load suppressed more rapidly but appears to also help people remain engaged in care longer. Let's talk a little bit now about people who are living with HIV infection. So, I've shown you the number of new diagnoses over the age of 50 is 17 percent. But in terms of the fraction of persons living with HIV by age as is shown here in this histogram 47 percent in 2015 were over the age of 50. And we estimate that by 2020 over 50 percent of people living with HIV are going to be over the age of 50.

[00:25:02] Now I know that 50 is the new 30 but 50 is still and trust me it's the new 20. As far as I'm concerned but you know a lot we're we have a population of people living with HIV who are aging and if any of you all are interested in geriatric care or looking to do a Ph.D. in geriatric care of HIV I'm telling you you have a big future at least for the next 10 to 15, 20 years.

[00:25:29] So as a result of this we're seeing a real shift in the burden of disease in the aging population of people living with HIV. This is a really nice study from the Netherlands where they had a cohort of people with HIV and they were matched to a cohort of people like them in every other way except for HIV infection. And on the left are the number of non-AIDS diseases that people had the darker the bar the higher the numbers of the dark black bars is three or more diagnoses. Comparing HIV infected person on the left with uninfected on the right. That you can appreciate that across all three of these age groups sorry all five of these age groups excuse me that people with HIV had more diagnoses of chronic disease not HIV related chronic disease and HIV uninfected people. Now you might ask yourself, well maybe this is just a bias of the fact that people engaged in care come in more regularly and therefore have more opportunity for the diagnosis to be made but they actually matched and corrected for that in this analysis. So, it isn't a bias of observation as we say. And the diseases that these folks with HIV tend to be predisposed to as a result of their infection even when well treated fall to a cluster of different areas.

First are cardiovascular diseases, heart disease, and cerebral vascular disease than diabetes, chronic obstructive pulmonary disease, or COPD, renal impairment, non-AIDS cancers, and bone loss.

[00:26:54] And I think all of these are going to be discussed at some length over the next couple of days. I'll just note that all of these are also diseases that you can diagnose early, and that are preventable or treatable. So, it's incumbent on us who are taking care of folk's HIV to be aware of these things look for them and to address them aggressively. As a result of living longer with HIV and the increased burden of non-AIDS chronic disease in that population the number of drugs that people with HIV are prescribed has is also greater than people in the general population. The bars on the left are males and the bars on the right are females. And what I've highlighted in green are the fraction of uninfected in black versus general population and white. The number of drugs they've been prescribed over 180 days, the number the fraction they've had more than five drugs prescribed where that prescription is more than 180 days and is significantly greater in people with HIV than not. So, I've shown you now that people with HIV can be treated with one pill, once a day and most of the medication that folks over the age of 50 in particular are getting are from other pills. It's not antiretroviral therapy so much anymore.

[00:28:06] So last question I'm showing you here for preventable conditions, tobacco smoking, increasing BMI, inactivity or lack of exercise, and alcohol consumption in which one of these preventable conditions is both associated with most of the outcomes and is the cause of most of the condition and is a leading cause of the conditions? I showed you before and you all know the agency that I work for don't you because we really hate tobacco. The only the only FDA approved product in the United States which only hurts people. And yeah well 88 percent excellent. Yes, you can you change your answer 100 percent is going to make me really happy. Okay that's absolutely right! It's cigarette smoking or tobacco smoking that includes cigars sorry and chewing tobacco as well.

[00:28:57] What I'm showing you here are the number of people in a large cohort of people in care for HIV that we follow at the CDC the medical monitoring project or MMP that's the dark blue line. And the percent of smokers active smokers in that cohort is shown to the dark blue line starting around 40 percent and has decreased in the last few years to 2014 percent. That's a small decline. That's compared to the national average from what's called the National Health Interview Survey and that dotted green line at the bottom. And in 2015 and 16 we've gotten down to 15 percent of Americans are active smokers so a lot more people with HIV are smoking than the average. And they're a lot less likely to quit. What I'm showing you here also now quit ratios. So, the light blue line is HIV infected persons in care, that dotted, or the slashed light green line is the general population. The quit ratio is the fraction of all persons who ever smoked with the numerator being the fraction who are now not smokers. Okay. And that's a lot lower for people with HIV infection than those who are not. So, people with HIV not only smoke more but they're significantly less likely to quit. So, in summary where are we going in 2018 new diagnoses continue to decline but are disproportionately and increasingly affecting certain populations that we really need to prioritize for prevention. MSM of color that's Latino or black and people in the southern United States. Some old threats may be becoming new again. I'm thinking particularly about injection drug use people who inject drugs and we're paying a lot of attention to that near you should as well. With antiretroviral the possibility of true HIV control is within our grasp. And what I mean by that, is we have the tools today to stop HIV infection in the United States with the political will and the resources there's no reason why we should continue to see infections in this country. But we need there's a lot we need to do to get there.

And now for folks who are treating the current cohort of people with HIV the focus of treatment is increasingly on managing and preventing co-morbidities.

[00:31:02] So I think I'll stop there and thank you.

[Video End]