

# Reflections on 40 Years of AIDS

*[Announcer] This program is presented by the Centers for Disease Control and Prevention.*

[Sarah Gregory] Hello, I'm Sarah Gregory, and today I'm talking with Dr. Kevin De Cock. He has had a long and distinguished career, including director for CDC's HIV/AIDS Prevention, Surveillance, and Epidemiology; director of CDC Kenya; director of WHO HIV/AIDS; and director of CDC's Center for Global Health prior to his retirement in December of 2020. And I'm talking to Dr. Peter Drotman. He's the Editor-in-Chief of *Emerging Infectious Diseases* since 2001, and he was among the last physicians to see patients with smallpox when working for the WHO Smallpox Eradication Programme in Bangladesh, and he was one of the first physicians to see patients with AIDS when it was newly discovered in 1981. Starting in 1982, he worked on HIV/AIDS for the next 14 years. We'll be discussing the history of HIV/AIDS, and what we've learned along the 40 years.

Welcome, Dr. De Cock and Dr. Drotman.

[Peter Drotman] Hi. In the interest of full disclosure, Kevin and I go back quite a few years to the late 20th century when we both had training at the Los Angeles County—University of Southern California immense public hospital and medical center. And as was common in that time, when we were still learning the epidemiology of bloodborne pathogens, we encountered healthcare workers who sustained needlestick injuries and suffered dire consequences. Kevin actually (being a liver Fellow at the time) reviewed some of those cases. Please tell us what you learned and how that prompted your interest in preventing needlestick injuries, bloodborne pathogens.

[Kevin De Cock] Thank you Peter, it's good to talk with you. Yes, I remember this. In fact, I had to give grand rounds at LA county hospital. I was a fellow and then an assistant professor of medicine, and I gave grand rounds on the, you know, recently introduced hepatitis B vaccine, which was an enormous advance and very important for healthcare workers. I started my presentation by presenting very quickly three cases of hepatitis B: one who had fulminant hepatitis with fulminant liver failure and actually died; another one had sort of typical unpleasant viral hepatitis with jaundice; and the third one went on to have chronic hepatitis B infection, which of course is very dangerous because it can progress to cirrhosis and liver cancer. And I made the point, I just presented these as I said, you know, there's nothing unusual about any of these three cases except for the fact all of them had been members of staff (members of the medical staff) of LA county hospital over the previous 10 years. And actually, one of them I looked after myself as a patient. So that, you know, was a pretty impressive experience. And of course, the vaccine was a very important advance for healthcare workers who had to prevent becoming infected from bloodborne exposure. It was as we say, of course, HIV that really in subsequent years later in the mid-80s, later in the 80s, really pushed the agenda of improving, enhancing safety in healthcare settings and prevention of needlesticks—tremendous advances and much attention, much investment. And really it was HIV that pushed all of that. Ever since, I think you and I and others have remained interested in the issue of healthcare worker exposure to bloodborne pathogens.

In fact, if I could just finish quickly by saying this whole thing of exposure in healthcare workers to pathogens remains immensely important, and in the article that we've just published that we're talking about, you know, my co-authors and I talk about Ebola and COVID-19. And of course, many healthcare workers have died of Ebola and of COVID-19. And this whole issue of the

infection prevention and control in healthcare settings remains neglected and very important issue in global health. So, thank you for asking that.

[Peter Drotman] And it has even diverse [derivative] implications and issues, impinging as it does on injectable immunization programs and disposal of medical waste in parts of the world where it's difficult to dispose of things. You've must encountered these issues in your present posting in sub-Saharan Africa. Anything you want to say about developments in that field?

[Kevin De Cock] Well, it's a very important point. There has been progress—inadequate progress—but there has been progress largely funded (again, because of HIV), largely funded through PEPFAR (the President's Emergency Plan for AIDS Relief), the big AIDS money that came in in the early 2000s. And here in Kenya, we did invest (CDC invested quite heavily) in injection safety programs and laboratory safety and as we connected that [corrected points] as to safe management of medical waste, all of which had sort of almost forgotten. We talk about blood safety, but a lot of people don't think about the issue of waste management. It's very important and I'm very pleased that, again, it was the AIDS agenda and some of the AIDS money that led to some of these improvements. But there's an awful lot to do still, and the whole issue of nosocomial transmission of different pathogens remains very, very important.

[Peter Drotman] Now, at the beginning of the essay that's in the journal, you have a leading quotation by the late Jonathan Mann. And we both knew him, we both worked with him, but a lot of our younger listeners will not recall his pioneering efforts when he took the first CDC international AIDS research and investigation posting in central Africa when he founded Project SIDA in Zaire, and he had been recruited from his previous post in North America, being the state epidemiologist of New Mexico. But he kicked off the international AIDS research, particularly in the Africa region, and eventually took up a post founding the AIDS program at the WHO in Geneva, a program that you eventually took over. But please tell us a little bit about Jonathan Mann, his work, his legacy, and the developments at WHO and UNAIDS.

[Kevin De Cock] Yes. Jonathan was a pivotal figure in the early history of the AIDS pandemic, and has had lasting, lasting influence. And I should add that, you know, one of the co-authors of the paper we're just publishing (Jim Curran) was Jon Mann's supervisor and a very good friend of his. I discussed this with Jim extensively, including in recent time actually, and the thing that Jim always comes back to is Jon Mann's qualities of leadership. He really was quite unique in how he galvanized people and led them, sometimes rather authoritatively—now sometimes with a pretty strong, noncompromising authority—and much of the time by sheer eloquence and brilliance. But yeah, he's an ex-EIS officer, he was assigned to the state of New Mexico, as you said he was the state epidemiologist for 10 years. And he was getting restless and wanted another job or was looking for another job, and just at that time Jim Curran and helped by others (such as Joe McCormick who worked in viral hemorrhagic fevers) learned about Jon, recruited him and Joe McCormick who knew Africa in particular (including Zaire) quite well, went with Jonathan to visit. And anyway, long story short, Jon set up this research site in Kinshasa, was there for only two years (which is a very short time, really), but the research they did and the attention they brought to the issue was utterly remarkable.

He went from there; he was recruited to set up the first program on AIDS in 1986 at WHO. And again, in a very short space of time—because he was only there for about four years (or just under four years)—it is just astonishing what he achieved, how he brought the world's attention to this new disease, and it's, again, his ability to capture the world's imagination and persuade

people what needed to be done was quite unique. I'm glad you mentioned also that a lot of younger people don't even know who he is. If you give a talk on AIDS and say, "Who is Jonathan Mann?" many people don't know. Most people may not know, and it's one of the sobering illustrations of how history passes and contributions that individuals have made can easily get forgotten. But he was a unique figure. He left WHO, he resigned because of conflict with a new Director General, he went on to do other important things, and then tragically died in a plane crash in 1998 along with his second wife, Mary Lou Clements, who herself was a distinguished vaccine researcher at Johns Hopkins. We have many warm memories of Jon, he had an enormous impact on the world of AIDS, and a lasting impact, particularly for linking health and human rights—for exposing the issues of vulnerability, fighting against exclusion and stigma and discrimination—and really changing how we view health problems globally. Let me stop there. We could talk about Jon for a long time. He was a remarkable individual.

[Peter Drotman] Indeed. In that recounting, you mentioned your co-author Jim Curran hiring Jonathan back in the early 1980s, and it was at that time that Jim Curran (director of the AIDS response out of the Centers for Disease Control and Prevention) was giving a great many talks, presentations, congressional testimonies, and others, and he would use the analogy of once you see AIDS patients in a community, there has already been HIV circulating in that community for a long period of time. And then follows on that by the time a person becomes clinically ill with AIDS, the virus has been in their body for a very long time. Thus, there is first an epidemic of HIV often silent and unrecognized, then an epidemic of disease, and then an epidemic of death, and then an epidemic of basically terror and panic among the population as they witness people suffering and dying. And Jim was trying to promote the epidemic of response, the research, and the addressing of the problem. And fortunately, that research and response effort has proven remarkably successful. It's just that it's taken decades to develop truly effective fruits. Do you think this analogy and story holds up and is useful for us to learn and apply to the future?

[Kevin De Cock] Yeah, I think it is, I think it is. Again, in this article that Jim is a co-author on and of course, the third author is Harold Jaffe, who was a leading epidemiologist working for Jim in the early 1980s and contributed a lot to CDC's work in HIV, enormous amount. I think it is a useful analogy. And I think it also is useful then to apply it to different infectious diseases (epidemic prone diseases). Of course, in the paper we discuss a little bit the similarities and differences between HIV, Ebola, and SARS coronavirus, which clearly have been the most serious [important] epidemics in the, you know, last 40 years. I mean, there's been other important ones, but those three really do stick out. And, of course, we're struggling with a pandemic right now. HIV is rather special because of this long, asymptomatic period which allows for silent spread so that by the time those, you know, five iconic cases are described in Los Angeles in 1981, there were already hundreds of thousands of people infected (probably millions) around the world, especially in Africa where it could have been present for longer. But also, in the United States there must have been tens of thousands, if not hundreds of thousands of men who have sex with men infected, and then later the disease, and then we have the response. And actually, Jonathan Mann made a similar comment, and he talked about the silent epidemic of HIV, then the epidemic of disease and death, and then thirdly the social and political consequences of all of this. So, I think that is a framework—those are two frameworks—that are worth thinking about and actually can even be applied to how we're dealing with this, you know, very difficult pandemic today.

[Peter Drotman] One of the areas where, unfortunately, we have not made the kind of progress we had been hoping for (and even anticipating) is the development of an HIV vaccine, which contrasts sharply with the amazing progress made in the SARS-coronavirus-2 vaccine development. I think Sarah may have a question or two about this.

[Sarah Gregory] Is there a vaccine on the horizon for HIV? Are the new mRNA vaccines for COVID a game changer that could lead the way to vaccines for these more difficult diseases?

[Kevin De Cock] Yeah, let me...it's a question that's often raised, of course. I've come across this so frequently, people asking why don't we have an HIV vaccine, you have been talking about it for so long and yet in a year we have a vaccine for SARS-coronavirus-type-2. And I've been talking a little bit about this with UNAIDS (who I'm doing some consulting for) in relation to their science work. For HIV, unfortunately it's the virus. There's a joke the WAGs will say, "You'll have an HIV vaccine in 10 years, just as has been the case for the last three decades." Because that's been the prediction since the beginning. But the reason we don't have one is really to do with the virus. It's a very difficult virus. And as you know, somebody who is exposed to HIV becomes infected, it turns into a chronic infection. There is an immune response, but the immune response does not eliminate the infection. And there are people who produce so-called broadly neutralizing antibodies, there are some people who do that, but it takes a couple of years. And again, it doesn't eliminate the infection.

So, what we're asking from an HIV vaccine is to be better than nature. That's really difficult. And if you look at other infectious diseases which are chronic and where the immune response does not eliminate or completely control the infection, again, we are finding it difficult to get effective vaccines. You can think of tuberculosis, malaria (there is progress in malaria, but not necessarily a homerun yet), and some other parasitic diseases and so on. And without going into technical details, there's just really difficult things about the HIV virus in relation to protective antibodies and an effective vaccine. So, in a way SARS-coronavirus is easier because it's sort of a more typical infection—you get infected, you can get very sick, some people will die. But on the whole, those who survive have immunity and that's the type of immunity we're initiating with new vaccines. Now, there are lots of questions of course—the issue of long COVID, some people seem to remain unwell for a very long time and we don't know the natural course of that, and we don't completely understand it. But in general, it's sort of an easier immunological situation for vaccine development. Of course, I think a lot of people would say that the science that went into delivering a vaccine for COVID-19 (or for SARS-coronavirus) benefitted greatly from the enormous investments that have gone into HIV vaccine research, and research has now gone on for several decades and it remains a leading topic (a leading priority) in research. If you look at the NIH website, the two primary areas to which they attach the greatest importance are vaccine research for HIV and the quest for the elusive cure of HIV.

[Sarah Gregory] Isn't there something about the way HIV hides in cells that makes it hard to treat or vaccinate?

[Kevin De Cock] Yes, you're right, Sarah. It is one of the difficulties—it's not the only difficulty, but it is one of them—and that is the fact that when HIV infects someone, it actually integrates its genetic material into the host's genetic material (into the host's genome). And even when people are on suppressive therapy (full suppressive therapy) with antiretroviral drugs, these cells carrying virus in latent form are still there. And if you take the drugs away, the virus tends to

come back. So, yes it hides in so-called reservoirs, and that's one of the technically very difficult issues to deal with.

[Sarah Gregory] Dr. De Cock, how have you remained involved in HIV/AIDS work over the last 40 years?

[Kevin De Cock] Well, my interest started (as we were discussing with Peter), my interest started when I was at—or my involvement started when I was working in Los Angeles starting in 1983, and of course I was working in liver disease and my research interest was in viral hepatitis. But of course, the populations affected by hepatitis viruses overlapped tremendously with the groups infected with or at risk for HIV. So, I became interested then. And really by the time I left Los Angeles, I was really more interested in HIV. And I was particularly interested in researching HIV in Africa because so little was known about it and I had worked in Africa. I worked at the University of Nairobi in Kenya from 1979–82 before I went to LA, and the overlap between these different issues was just fascinating to me. So I went to CDC, I worked—my boss was Joe McCormick, who as I said earlier was head of the hemorrhagic fever group dealing with Ebola, Lassa, Marburg, and those kinds of viruses. But he was also interested in HIV in Africa, and we collaborated with Jim Curran and folks that Jim supervised, and it really went from there. And so, I've been involved in it since then, and really the main part of my work over all those years.

[Peter Drotman] Perhaps you might want to say something if you were involved with the San Francisco hepatitis B vaccine cohort. When the first hepatitis B vaccines were being developed, a large cohort of gay men were the initial population being investigated for the development of that vaccine, and of course it was because of the overlapping epidemiology of hepatitis B virus and HIV that a great many men in that vaccine cohort were diagnosed with AIDS. And there was immense concern and worry that... (before we knew about HIV) that it might be that vaccine that was somehow linked to the development of AIDS. Were you involved in that research?

[Kevin De Cock] So I wasn't involved directly in the San Francisco cohort work because it was before I joined CDC. But I followed all that stuff, and the study with hepatitis B (the science of hepatitis B) was immensely important for understanding AIDS and proposing a model for how, you know, the putative—the still theoretical—infectious cause of AIDS was being transmitted. And I think CDC (particularly Harold Jaffe and Jim Curran) played an important role in proposing that model, making the argument for this being an infection when initially that wasn't proven, and some people didn't believe it. But obviously it stood the test of time. And then the French group were the first to isolate HIV in late 1983.

[Peter Drotman] For which they received a Nobel Prize.

[Kevin De Cock] Yes, that's right. The concern you're talking about was that the first vaccine for hepatitis B was derived from plasma collected from gay men and chronically infected with hepatitis B. The surface antigen of the virus was extracted, and that was the basis of the vaccine. I mean, it was the surface antigen which elicits an immune response (a protective immune response) and it had derived from the plasma of gay men, who of course had a (at that time, unknown but probably high) rate of prevalence of HIV infection. So, there was a lot of concern about that and fortunately it was not dangerous, because of the ways that the vaccine preparation was being, you know, sterilized and all the rest of it. But very rapidly, advances in molecular biology led to other ways of getting surface antigens produced for vaccine delivery (advances in cloning and so on). So, that was only the case for a certain period of time. However, we did do

some interesting studies in Los Angeles—rates of HIV infections in different groups with different types of hepatitis over time—and we were able to show retrospectively that the first documented infection that we had with HIV was back in, actually in 1978 [1979]. Now remember, the first AIDS cases were described in '81. There were already gay men in LA infected back in '78 ['79], and there was a very, very strong overlap of coinfection later in men who had hepatitis delta virus (another type of hepatitis) which was, when I was there, there was obviously an outbreak going on in gay men. And we later showed that actually 80–85% of gay men with delta (hepatitis delta virus) were actually also infected with HIV. So, a very strong overlap in certain populations in these different infections.

[Peter Drotman] I think we might be remiss if we don't give some credit to the gay community and the collective willingness to support medical research. Even as people were suffering and dying, some of them on their deathbeds even would willingly provide information and blood and other samples to promote research into these viruses, despite there being widespread stigmatization and prejudice far different than our current way that society (at least in North America) treats the gay community. I'm sure you ran into that issue, and I'm sure you're impressed by the progress that has been made.

[Kevin De Cock] I think you're right; I think you're absolutely right. And I think Jim Curran and Harold talk about that quite a lot.

[Peter Drotman] And does their colleague, Bill Darrow, the sociologist who worked with them. Yes.

[Kevin De Cock] Yeah, not only were men who were ill prepared to collaborate, but of course activism sprung up and activists pushed for research. And Tony Fauci speaks very eloquently about (Fauci, from NIH) speaks very eloquently about just the community and how they pushed NIH and then the Food and Drug Administration to do things differently. In a way, this also takes us back to Jonathan Mann, who when he was at WHO in '86–'87 (in those early years), he pushed for involvement of communities and representation of people with HIV in all of these discussions. And that was completely new. That hasn't happened at WHO before and was pretty revolutionary. The whole issue of community involvement has changed because of HIV and AIDS. So let me just finish this comment by also saying, you know, stigma and discrimination are still major issues, and in Africa, homophobia is a very, very potent force. And, you know, the advances we've seen, the progressive ideas and acceptance of different...of sexual minorities and so on, this is not worldwide at all (and Africa, particularly). Of course, there are gay men everywhere, of course there are people with same sex preference everywhere in the world. But it's a difficult issue in Africa and remains so.

[Peter Drotman] I have a bit of an anecdote involving Jonathan. When he was in WHO Geneva, they're addressing the panic and fear and prejudice extended to sports. And I was the CDC sports medicine consultant to Jonathan as he gathered the International Olympic Committee, the medical foundation, and others to address HIV-infected athletes and their participation in the Olympic Games. And we devised a rational set of guidelines for the '88 and '92 Olympics. You may or may not recall that was the first Olympics that had the United States basketball dream team that included Magic Johnson, an all-star NBA player who disclosed that he had HIV. Once he made that disclosure, he never played another game in the NBA. But he did play in the Barcelona Olympic Games, and did so safely, I might add. But those guidelines that Jonathan helped organized became accepted across a great many sports...professional, collegiate,

community levels. He was a leader in a great many ways, and he addressed the fear of AIDS and rational reaction to AIDS in a great many venues for which we respect him.

[Sarah Gregory] Dr. De Cock, I understand you are living in Nairobi. Why there, and what are you doing with your days now that you've retired?

[Kevin De Cock] Well firstly, I've been living in Nairobi since late 2012. I've been living here the last eight years because CDC assigned me here and extended me, and my family is Kenyan. So, this is one of my homes. And as you know, I retired from CDC at the end of December 2020. I'm doing some consulting work on COVID-19 as well as on HIV. So, my days are not that different from last year when we were also working from home. So, that's why I'm here and unfortunately, international travel is not easy and probably best avoided right now. So, I do feel a bit—it's not that I'm stuck—but I feel a bit frustrated at the lack of mobility. But, yeah, so I'm consulting and doing some of this and that, and doing some writing and so on. It doesn't feel that different except I don't get a CDC salary anymore.

[Sarah Gregory] How has the COVID-19 pandemic impacted Nairobi and the rest of Africa, for that matter?

[Kevin De Cock] It's very complicated. I think this pandemic is increasingly settling on poorer parts of the world and is having (and going to have) its greatest impact in low- and middle-income countries. The saving grace for Africa is the age of the population. As we all know, the major risk factors for adverse outcome (and some risk for severe disease or death) from SARS-CoV-2, the major risk factors are firstly age and then secondly other comorbidities. Now, the median age in many African countries is about 20 or even less. I think in Kenya, it's 20 and Uganda, I think it's 18 or 19. So, I mean, it's a very young population—50% of the population under the age of 20. And that, of course, is protective across the continent. That said, there is gross undertesting, underrecognition, underdiagnosis of infection, an infection I think has spread quite widely (is spreading widely). And we have seen waves of (we've now seen three waves) in Kenya (Nairobi most heavily affected). We're just coming out of one (the last one, the third one), and it was severe. The hospitals were full, the intensive care beds were full, a lot of people died. If you look at the cases that are reported, they behave the same as everywhere else—very strong age association with bad outcomes and so forth, and overall case fatality rates and reported cases about 1.8%. Not very different from elsewhere. But it's this issue of underreporting, underdiagnosis, and very poor mortality statistics (population-level mortality statistics). So, it's very difficult to get insight into excess mortalities, but unquestionably it's there. So, there's a real urgency to get vaccines out into the world, and they're woefully behind. And it's very painful, I think, to see the necessary, understandable, but still the discussions of vaccinating children and young adolescents in high-income countries, and here even healthcare workers are not getting access to vaccines. So, it's a very troubling situation.

[Sarah Gregory] Dr. De Cock, if you could have one wish for the future of public health, what would it be?

[Kevin De Cock] I guess I would ask for two wishes, actually. One is science. Public health policy, it must be driven by science. Science must drive public health policy. And I think by and large we've seen that with HIV, and that's why—again, to go back to the article—I think we make the point that the AIDS experience wasn't always perfect by any means. There certainly have been major issues and flaws, but I think we can be proud of a lot of work been achieved. And it is sort of a benchmark against which to compare other responses or other public health

challenges. So, you know, you've got to keep the science going and make sure that drives the policy. But secondly, public health is not just about interventions, it is about social determinants. It's about people's socioeconomic standards and politics. It's about commitment. And so, I guess my second wish would be that we increase global equity. I think it was Bill Foege who said that the philosophic basis of public health is social justice. So, I guess the second thing I would plead for is greater equity and social justice. Which by itself—which those things alone—do so much for public health. Look at the history of tuberculosis, where deaths from TB began to decline long before we had drugs to cure this, and that's because of social issues. So, that would be my double answer to your single question.

[Sarah Gregory] Thank you for taking the time to talk with me today, Dr. De Cock and Dr. Drotman.

[Peter Drotman] Well thank you, we appreciate the support, and we appreciate your sticking with this topic and writing us with updates from time to time. All the best.

[Kevin De Cock] Yes, and I've texted my co-authors and I'll hold you to it. Maybe we should meet again in 10 years.

[Peter Drotman] It's a date.

[Sarah Gregory] And thanks for joining me out there. You can read the June 2021 article, Reflections on 40 Years of AIDS, online at [cdc.gov/eid](https://www.cdc.gov/eid). You can also find the Reflections on 30 Years of AIDS podcast there, which we recorded 10 years ago also with Dr. De Cock.

I'm Sarah Gregory for *Emerging Infectious Diseases*.

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