

Written Testimony on HIV/AIDS Incidence and Prevention  
For  
Hearing to be held September 16, 2008

Submitted to:  
Chairman Henry A. Waxman  
Committee on Oversight and Government Reform  
Congress of the United States  
House of Representatives

Submitted by:  
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**Introductory Remarks.** Chairman Waxman, Representative Davis, and distinguished members of the Committee on Oversight and Government Reform: thank you sincerely for the opportunity to speak with you today on the critical topic of HIV prevention in the United States. My name is David Holtgrave, and I am Professor and Chair of the Department of Health, Behavior & Society in the Johns Hopkins Bloomberg School of Public Health. From 1991-1995, and from 1997-2001, I worked at the US Centers for Disease Control and Prevention (CDC). In the later time period, I served as Director of the Division of HIV/AIDS Prevention – Intervention Research and Support at CDC.

**Public Health Urgency.** The topic of the hearing today is truly urgent. CDC's new HIV incidence estimates would suggest that there is, on average, a new HIV infection every 9.5 minutes in the US.<sup>1</sup> Further, there is also an AIDS-related death roughly every 33 minutes in the nation. The racial/ethnic disparities in HIV/AIDS are indeed staggering with African-American and Latino communities bearing disproportionate burdens.<sup>1</sup> Sadly, incidence appears to be again rising among gay and bisexual men. There are also important fiscal consequences of the epidemic. HIV care and treatment costs are approximately \$22,500 per year (depending on the client's health status), and lifetime treatment costs can easily total over \$275,000.<sup>2,3,4</sup>

**Evidence Base of National Prevention Efforts.** Because CDC's new base-case estimate of HIV incidence is higher than previously thought (55,000 or 56,000 instead of 40,000 infections per year), we might ask if HIV prevention services are without merit and should be discontinued.<sup>1</sup> I will argue today that actually HIV prevention services have been very successful at keeping the HIV transmission rate relatively low in the US, but as a nation, we have failed to scale up the implementation of evidence-based prevention programs to the level of coverage necessary to further impact the epidemic.

The HIV transmission rate is simply the number of new HIV infections in a year divided by the number of people living with HIV in that year. This statistic provides a sense of the speed of spread of the epidemic in a population. While a very simple statistic, only since 2004 has it garnered any attention in the US.<sup>5,6</sup> Along with collaborators from CDC, I have just updated in the past month the HIV transmission rate estimates for the US.<sup>7</sup> As can be seen in Figures 1 and 2, the HIV transmission rate dropped from 92.3 in 1980, to 31.2 in 1985, to 6.6 in 1991. It stayed at roughly this level until 1997 when, after the advent of highly active antiretroviral therapy (HAART), the transmission rate went up temporarily to almost 7.5. Thereafter, it continued once again on a downward trend. In 2006, we estimate the transmission rate to be approximately just under 5.0 (4.98). This means that for every 100 persons living with HIV in the US, there are just under five new infections on average in a year. That also means that over 95% of persons living with HIV in the US are not transmitting the virus to someone else in a given year. Because the transmission rate is rather low in the US, it will be very challenging for the nation to push that transmission rate number down even further.

The declines in the HIV transmission rate are not the only measure of HIV prevention success in the US. Perinatal infection in the US is near elimination,<sup>8</sup> the blood supply is

extremely safe,<sup>9</sup> and transmissions among injection drug users have noticeably declined over the course of the epidemic.<sup>1</sup> Many persons living with HIV came to access life saving care and treatment because they learned of their HIV serostatus via counseling and testing services provided by prevention programs.<sup>10</sup>

Of course, the ultimate measure of prevention success is the difference between what we observed in the HIV epidemic in the US, and what would have occurred had prevention programs not been in place.<sup>11</sup> One can never directly measure what would have happened had prevention programs not been in place in the US, but one can make careful and reasonable estimates based on the natural history of HIV disease and what we see occurring in other nations.<sup>11</sup> If we assume (very conservatively), that without our prevention programs, the HIV transmission rate in the US would have never dropped below 8.18 (this is the current global HIV transmission rate across all nations<sup>12</sup>), then we are led to the following conclusions. I believe that from the beginning of the epidemic through 2006, there were roughly 362,000 HIV infections prevented in the US (Figure 3). Over 3.3 million quality-adjusted years of life were saved. The prevention programs in the US over this time frame cost approximately \$18.6 billion (including federal, state and private contributions). Therefore, the cost per infection prevented was about \$52,000 which is the less than the cost of HIV care and treatment for one person over a lifetime; indeed, prevention programs appear to have actually saved money. If an intervention is cost-saving, then it is clearly a good investment even when compared to other medical and public health interventions in infectious and chronic diseases.

**Prevention Funding Trends and Implications.** Of course, one might ask if there is some demonstrable relationship between spending on HIV prevention programs and HIV incidence. Ms. Jen Kates of the Kaiser Family Foundation and I examined this correlational relationship between incidence and spending in a paper published in 2007.<sup>13</sup> We found a strong relationship as depicted in Figure 4. Using advanced statistical methods, we found two distinct periods in the epidemic. From the beginning of the epidemic until 1985, incidence tends to predict future investment (as if society is responding to the exploding epidemic by making larger investments). Here we measure investment as CDC's HIV prevention budget, adjusted for inflation. From 1986 onward, it appears that investment predicts future incidence, leading me to the conclusion that post -1985, the nation "gets what it pays for" in terms of HIV prevention investments.

Given this correlation between investment and incidence, one must be concerned that when adjusted for inflation, CDC's HIV prevention budget has fallen by over 19% since fiscal year 2002, and in real dollar terms the investment in the Minority AIDS Initiative is also in decline.<sup>14</sup> If there is a relationship between investment and incidence, and investment is in decline, then the potential for further growth of the epidemic seems to be increasing not lessening.

**Scaling Up HIV Prevention in the U.S: Tools, Investments & Accountability.** So, what can we do to actually make further reductions in HIV transmission rates, and also to reduce HIV incidence to a substantial degree? I believe that we must scale up the use of

evidence-based HIV prevention tools already at our disposal even as we all hope for the development of new interventions such as microbicides and a vaccine.

Many evidence based prevention tools are now at the ready. Dr. Ronald Valdiserri of the Veterans Administration (formerly of CDC) and others have reviewed the scientific literature and identified a number of types of evidence-based prevention interventions.<sup>15-19</sup> Some of these are listed in Figure 5. We possess the technology to be able to influence HIV-related risk behaviors, and the scientific literature leaves very little question on that point.

However, we have not scaled-up sufficiently to provide such services to everyone who needs them in the US. For instance, CDC's MMWR on behavioral surveillance of men attending gay-identified venues, only 15% had received an individual-level behavioral HIV prevention intervention in the past year, and only 8% had received a group-level prevention intervention.<sup>20</sup> Clearly, there is much work to be done.

By my calculations, I believe that with the right level of investment, utilization of evidence-based interventions, and strong accountability, we can achieve a 50% reduction in both transmission rate and incidence in a few years time. I have previously published an estimate that CDC's HIV prevention budget would need to increase from its current level to about \$1.321 billion per year and remain at that higher level (for at least 4 years) so as to undo the inflationary and other damage done since FY02, and also to address unmet HIV prevention needs in the US.<sup>14</sup>

What would this higher level of investment support in terms of service delivery (over and above current HIV prevention efforts)? Over a four year time frame (Figure 6), I believe it would provide sufficient resources to field a new, truly large-scale, targeted HIV counseling and testing campaign; a nationwide public information and anti-stigma campaign; intensive, client-centered prevention services for all of the roughly 16% of persons living with HIV (and aware of their serostatus) who engage in any risk behavior that could result in transmission; and brief but evidence-based interventions for 15 million (of the roughly 26 million<sup>21</sup>) HIV negative persons in the US at risk of infection. To most effectively deliver these services, it would be desirable to load more of this investment into earlier years of the scale up (Figure 6) so as to most quickly get the level of HIV serostatus awareness among persons living with HIV as high as possible (this has additional benefits in downstream years).

What would this higher level of investment achieve in terms of public health outcomes? Based on my unpublished analysis, I estimate that after four years of service delivery at such a heightened intensity, the US could achieve a reduction of 50% in the HIV transmission rate, a reduction of 50% in incidence, and a high level of awareness of serostatus such that nearly 90% of persons living with HIV would at any point in time know their serostatus. Once such goals were achieved, it would be time once again to take stock of the necessary level of investment and types of services needed in the US.

The proposed massive intensification of HIV prevention programs must be preceded (or accompanied) by a quick but careful review of current HIV prevention resources at CDC and across the federal government to ensure that any and all existing HIV prevention resources are well spent. This is most especially true for federal HIV prevention resources outside of the National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention. Also during this time, there would ideally be the rapid completion of a national AIDS strategy that spanned HIV prevention, care, treatment and housing (with a specific component of that plan focused on the logistical details of well-utilizing new prevention resources). It is important to emphasize that strong prevention, care, treatment and housing programs all go hand in hand; weakness in any of these programs directly undermines the others.

Further, the performance of all HIV prevention resources, be they extant or new, should be summarized in a national HIV prevention report card issued every year.<sup>22</sup> Such a report card should summarize HIV prevention investment levels; details on clients served and interventions delivered; summaries of evidence of short-term outcomes; and evidence of steps towards achievement of long-term impacts.<sup>22</sup> Such report cards must be issued frequently so that if the HIV prevention efforts in the US stray off course, they can be corrected mid-stream. Accountability is key to the responsible use of both existing and expanded HIV prevention resources.

My analysis also assumes that evidence-based programs could actually be delivered. Hence, there must exist a policy and societal environment that is favorable to allowing such interventions to be put in the field without interference (e.g., that homophobia would not block the delivery of evidence-based interventions for gay men).

**Closing Remarks.** I am the first to recognize that my comments may seem idealistic and overly ambitious. However, my statements here are backed up by careful analyses (some already in the peer-reviewed literature) that I would be most happy to share and discuss with the Committee. My comments are also based on 17 years of professional work on this epidemic. So, I stand behind the technical aspects of my assertions even if they appear grandiose.

Further, I believe that we are at a historic crossroads in the HIV epidemic in the US.<sup>23</sup> We can do more of the same, and get more of the same results; or we can find the national will to scale up HIV prevention sufficiently to change the course of the epidemic in the US once and for all. With the terrible human and fiscal consequences of HIV disease, a new HIV infection by 9.5 minutes is just not acceptable to me, and I hope not acceptable to the US.

Again, may I please thank you sincerely for your interest in HIV prevention as evidenced by your holding of this important hearing today.

Respectfully submitted by,  
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Figure 1

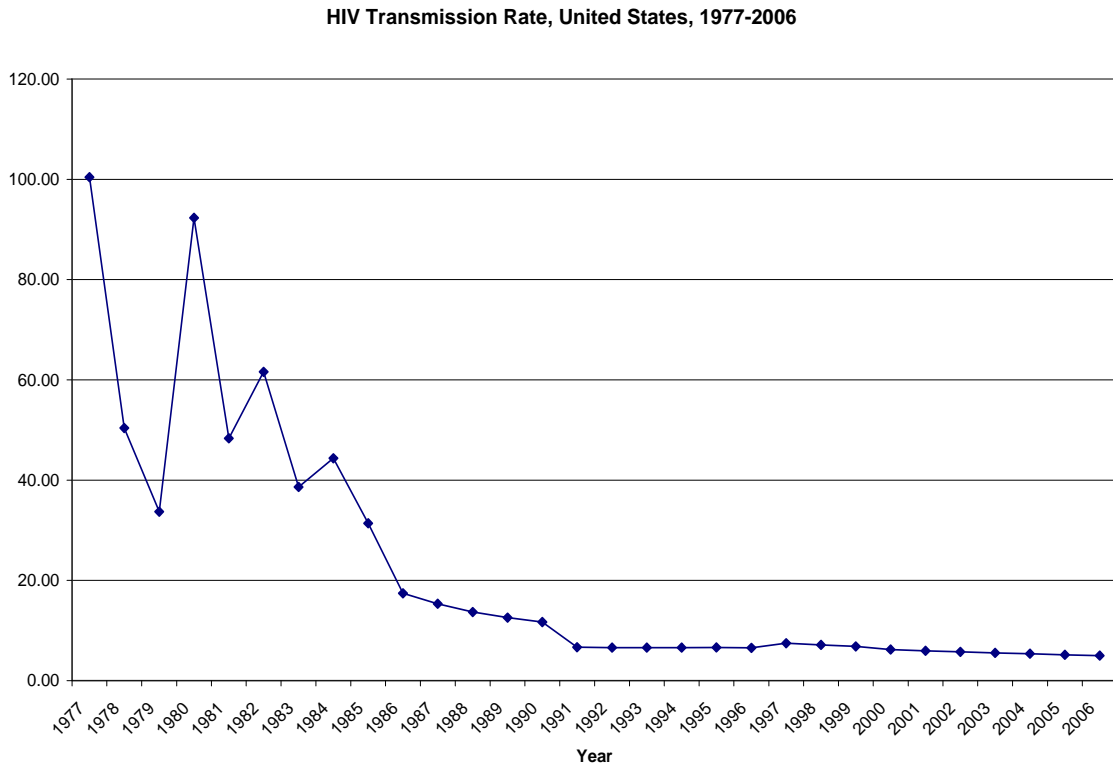




Figure 2

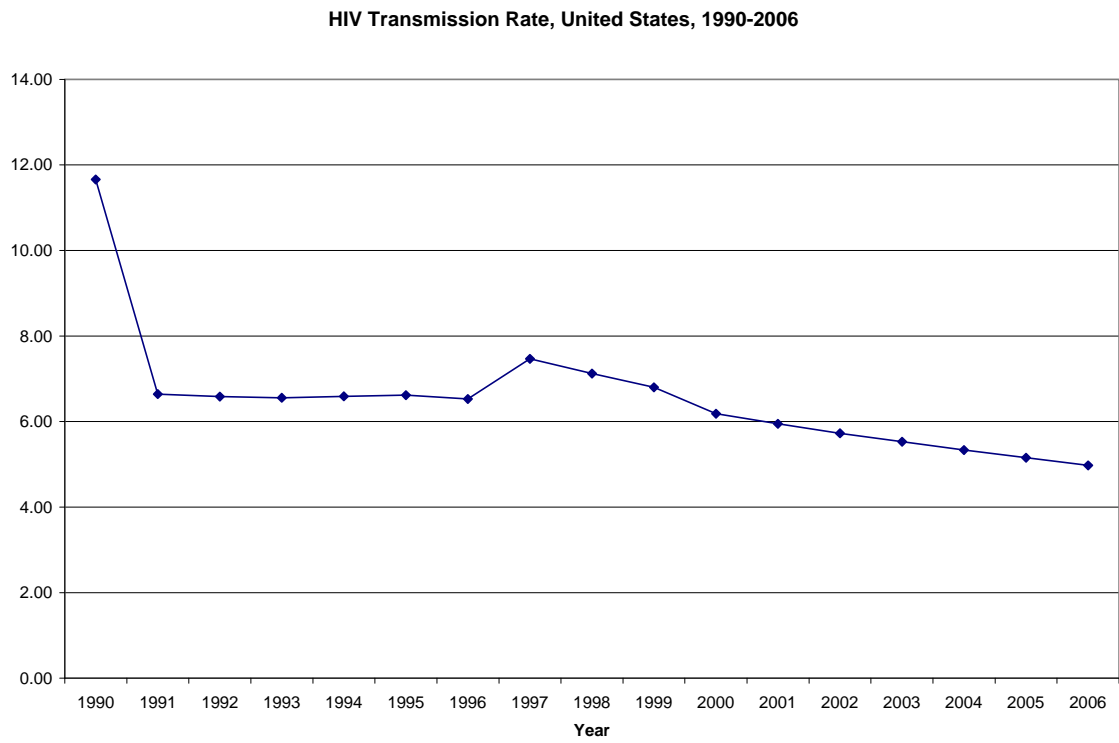
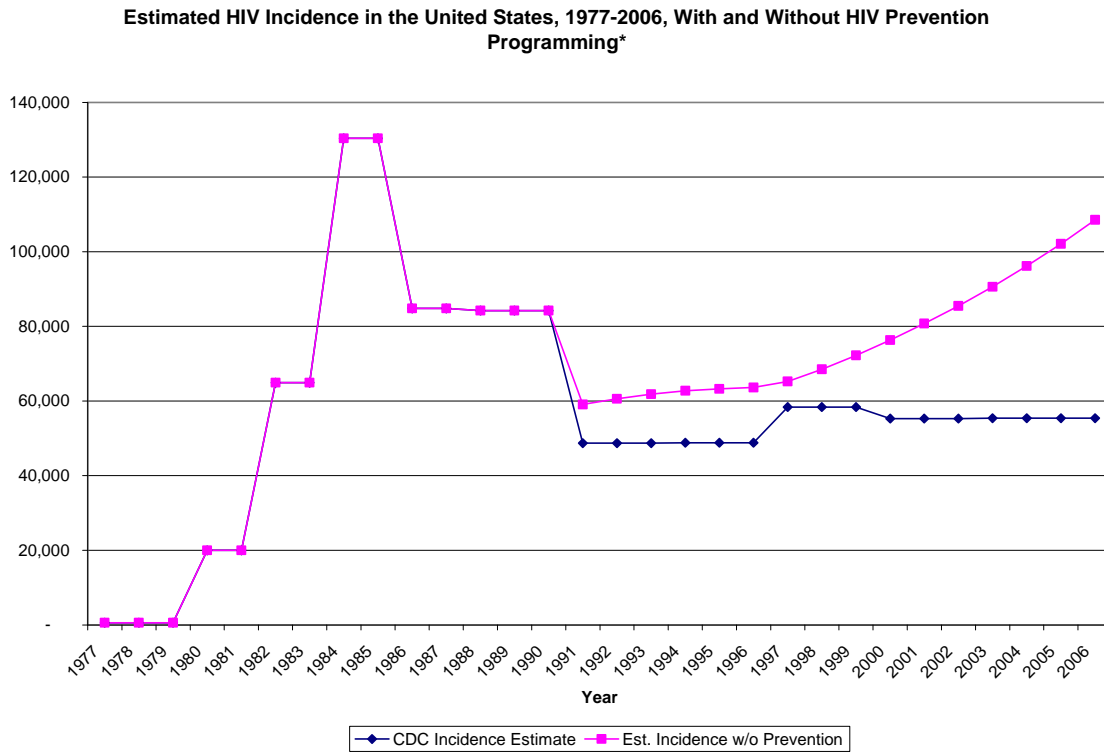


Figure 3



\*Analysis assumes that without HIV prevention programs in place, annual HIV transmission rate would never drop below current global transmission rate of approx. 8.18.

Figure 4

HIV Incidence and CDC HIV Prevention Budget (Adjusted for Inflation), United States, 1977-2006

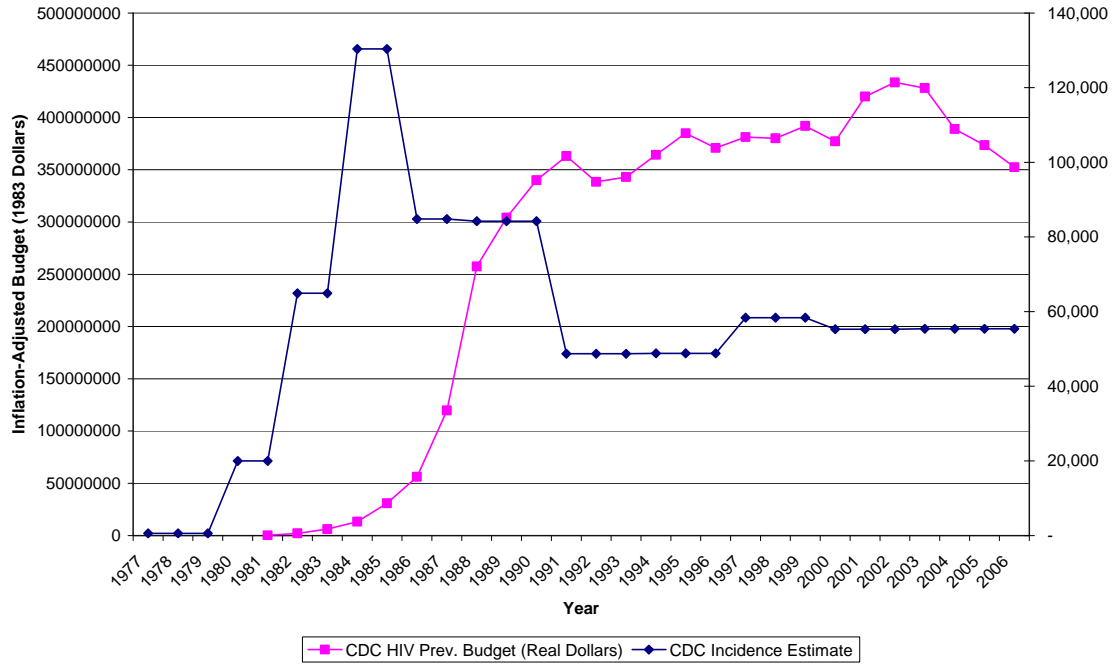


Figure 5

Overview of Evidence-based HIV Prevention Interventions.  
Adapted from: Valdiserri et al. *Nature Medicine* 2003;9(7):881-886.

Sexual Transmission Prevention

- Small group behavioral interventions
- Counseling and testing
- Community-level interventions
- Structural interventions
- STI diagnosis and treatment

Perinatal Transmission Prevention

- Pharmaceutical intervention (e.g., AZT; nevirapine)
- Breast-milk supplementation (depending on local circumstances)

Parenteral Transmission Prevention

- Blood safety
- Occupation setting precautions
- Injection drug use programs
  - Behavioral change interventions
  - Drug treatment
  - Access to sterile injection equipment

Figure 6

Cost, Inputs, and Expected Consequences of Large Scale-Up of HIV Prevention Interventions, United States

Year	CDC Budget	Major New Program Elements*	Expected Awareness Level of HIV Seropositivity	Expected HIV Transmission Rate	Expected HIV Incidence (Infections Averted)
0	Current Level	Review of Current Resources; Strategic Planning	75% Current	4.98 Current	55,400 Current
1	\$1.637B	Public Information & Anti-Stigma Campaign; Massive, Targeted Counseling & Testing Effort	90%	3.57	40,600 (14,800 infections averted)
2	\$1.239B	Substantial, Targeted Counseling & Testing Effort; Prevention for PLWH At Risk of Transmission; Prevention for Additional 5 Million At-Risk HIV Seronegative Persons	90%	3.03	34,500 (20,900 infections averted)
3	\$1.210B	Substantial, Targeted Counseling & Testing Effort; Prevention for PLWH At Risk of Transmission; Prevention for Additional 5 Million At-Risk HIV Seronegative Persons	90%	2.58	29,700 (25,700 infections averted)
4	\$1.192B	Substantial, Targeted Counseling & Testing Effort; Prevention for PLWH At Risk of Transmission; Prevention for Additional 5 Million At-Risk HIV Seronegative Persons	90%	2.32	27,000 (28,400 infections averted)

\* It is assumed that all administrative and supporting program activities (such as necessary surveillance efforts) are also included in each year but are not separately listed. Note: Additional investment divided by additional infections averted (across all years) is approx. \$26,900 indicating cost-savings when compared to HIV medical care costs. Note: Measurement of epidemiologic goals will lag by approx. 18 months.