PEPFAR and Maximizing the Effects of Global Health Assistance

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Between 1995 and 2008, worldwide global investment in improving health in developing countries increased from $8 billion to nearly $25 billion. A main reason for this substantial increase was the creation of new institutions including the Gates Foundation; the Global Fund to Fight AIDS, Tuberculosis and Malaria; the GAVI Alliance; and, most importantly, the President’s Emergency Plan for AIDS Relief (PEPFAR) program.

Created by President George W. Bush in 2003, PEPFAR was, as its website says, “launched to combat HIV/AIDS.” The program targeted 15 “focus” countries, mostly chosen for their high rates of human immunodeficiency virus (HIV) and AIDS but also for their government’s willingness to address the problems of HIV/AIDS as well as larger US geopolitical strategic reasons. PEPFAR has been the largest financial commitment of any country to global health and to treatment of any specific disease worldwide.

PEPFAR is widely considered President Bush’s greatest achievement. PEPFAR has shown that it is possible to deliver advanced care that includes massive screening programs, prevention education, combination drug therapies, CD4 counts, and the rest of modern AIDS care to millions of people in very poor countries. PEPFAR has built and significantly improved health facilities, trained tens of thousands of health care workers, and developed reliable supply chains of HIV drugs in numerous countries. In addition, as shown by the report by Bendavid et al1 in this issue of JAMA, PEPFAR demonstrates that global health programs can have substantial effects on health—significantly associated with lower mortality rates among adults.

Building on the success of PEPFAR, President Obama launched the Global Health Initiative (GHI). Overall, the GHI was intended to broaden the focus of US health assistance and to emphasize getting the maximum “bang for the buck” rather than just spending more. Two of the core principles guiding the GHI constituted important shifts of emphasis: from emergency programs to sustainable programs and from measuring the success of global health aid based on inputs to substantive and meaningful health outcomes.4

See also p 2060.

Measuring PEPFAR’s Success

Since PEPFAR’s creation, advocates and others have largely measured its success on 2 metrics: the size of its budget and the number of infected individuals receiving antiretroviral therapy (ART). By those measures, PEPFAR has been successful. Under President Bush, the budget increased exponentially. Cumulatively from 2003 to 2008, $20.4 billion was spent on PEPFAR. By the end of 2008, 2 million people were receiving ART because of PEPFAR funding. Because of this initial success, Congress in 2008, through the Hydelantos Amendment, authorized—that is, it permitted the spending of but did not actually appropriate the money—up to $48 billion for PEPFAR over the next 5 years (ie, by 2014). Thus far, spending on PEPFAR has remained robust and ART goals have been substantially exceeded: cumulatively between 2009 and 2011 in excess of $20 billion has been given to PEPFAR, and by the end of 2011—in just 3 years—PEPFAR has doubled the number of people receiving ART to more than 4 million—reaching the goal to be achieved by 2014, more than 2 years ahead of schedule.5

But in the end, how much is spent and how many pills PEPFAR distributes are largely irrelevant. These measures assume a fixed relationship between inputs and outputs but are not what are important. What is of most interest is whether PEPFAR is prolonging life; giving people higher quality of life; and allowing people to lead economically, socially, culturally, and personally productive lives—and doing so for the maximal number of people possible. These are the metrics that really matter.6 The article by Bendavid et al1 addressed one of these substantive outcomes: has the PEPFAR program actually decreased mortality and therefore prolonged lives?

The analysis compared 9 of 15 PEPFAR focus countries, most of the ones in Africa, with 18 nonfocus African countries. The important finding was that implementation of PEPFAR was associated with a significant decrease in mortality among adults in the focus countries, from 8.3 to 4.1 per 1000 population, compared to a more modest 20% decline in nonfocus countries. Importantly, this decline involved all-cause mortality, not just a...
mortality decrease due to fewer HIV/AIDS deaths, which had been shown before.\(^7\)

These data are plausible because World Health Organization data demonstrate important increases in overall life expectancy in these African countries between 2003 and 2009—greater increases in focus than nonfocus countries. For instance, in Kenya, life expectancy increased from 50 to 60 years between 2003 and 2009, in Namibia from 51 to 57 years, in Tanzania from 45 to 55 years, in Uganda from 49 to 52 years, and in Rwanda from 45 to 59 years. In nonfocus countries, the life span increases were more modest. In Burkina Faso, life expectancy increased from 45 to 52 years, in Gabon from 58 to 62 years, in Congo from 54 to 55 years, and in Liberia from 41 to 56 years.\(^8\) The study by Bendavid et al\(^3\) will be cited to counter criticism that PEPFAR has been, as economists say, “crowding out” funding as well as scarce health care workers from other health priorities and therefore causing adverse effects on overall health in countries.

Any study such as the report by Bendavid et al has major methodological challenges that need to be carefully considered. First, not all the PEPFAR focus countries had data that could be used for the analysis. In particular, 3 African countries—Côte d’Ivoire, Botswana, and South Africa—including 2 with very large HIV/AIDS burdens and better development indices, did not have available data and were not included in the analysis. As the authors acknowledge, the size of the HIV/AIDS disease burden in these countries could have changed the results from positive to negative.

More importantly, because the countries included in the analysis by Bendavid et al\(^3\) were not chosen at random and a difference-in-difference analysis was used, the study can demonstrate association but cannot establish causality. When dealing with large and complex countries such as Nigeria, Ethiopia, and Congo, over years many other unobserved factors could change outcomes. Potentially important differences include the political climate and administrative competence of the countries—which was a factor in initially selecting the focus countries. In a volatile continent, the 9 focus countries are significantly more politically stable compared with the nonfocus countries. During the analysis period, 2004 to 2008, the nonfocus countries were more likely to be subject to ongoing political violence, civil wars, and government overthrows. Even if not democratic, the focus countries have more effective governments that are generally more committed to improvement of their population’s well-being rather than enrichment of the rulers. For instance, some of the nonfocus countries included Zimbabwe, Congo, Madagascar, Gabon, Guinea, Niger, and Chad.

Bendavid et al\(^3\) attempted to address such unobserved differences. For example, in their analyses they used the government effectiveness index to control for political and economic stability. The average government effectiveness index in the focus countries was 36.4 on a scale of 0 to 100 while the average for the 18 nonfocus countries was 21.9. In addition, in Rwanda and Tanzania, they conducted in-country comparisons between regions with intense PEPFAR interventions and those with less intense interventions, as a check, assuming that some of the unobserved differences between countries are not operative within countries. Although the statistical analysis shows some difference in mortality based on intensity, Figure 3 in the article makes it difficult to be convinced; for instance, in 2008, the last year of their analysis, adult mortality rates appear to be almost identical in intensive and nonintensive regions in Tanzania. Moreover, different regions within African countries can have very different situations; some regions have ethnic groups favored by the government or have other advantages that are likely to track intensity of PEPFAR involvement and therefore not be effective in serving as controls. Overall, the significant differences in political stability and effectiveness are important and likely to affect adult mortality and effectiveness in converting assistance to improvements in health and well-being.

Is PEPFAR Worth It?

Even if PEPFAR was effective in reducing overall adult mortality in PEPFAR focus countries, there is a further essential policy question. Is the investment in PEPFAR worth it? This is not a popular question; advocates in the development community avoid asking it, much less answering it.

PEPFAR assistance to focus countries consumes the vast majority of US global health assistance. Between 2003 and 2008, from its founding until this analysis, PEPFAR—separate from malaria funding—accounted for 75% of all US global health assistance. During these years, PEPFAR received $20.4 billion, malaria $1.7 billion, maternal and child health $2.2 billion, and family planning $2.4 billion. Neglected tropical diseases, such as schistosomiasis and soil-transmitted helminths, which affect approximately 1 billion people worldwide—and the very poorest of the world’s population—received a paltry $45 million cumulatively in US global assistance over the 6 years.\(^9\) To this day, PEPFAR continues to receive 75% of all US global health funding.\(^1\)

Advocates commonly argue that in matters of global health assistance one disease should not be pitted against other diseases. Ideally, sufficient money to fund all global health needs would be available. In actuality, to fully fund essential global health assistance to a level that would ensure the world’s poor live a complete life is relatively inexpensive. Various groups, such as the Commission on Macroeconomics and Health and the World Bank, suggest that to provide essential interventions to people throughout the world would cost in the range of $30 to $40 per person, or a cumulative $40 to $60 billion depending on how many people and what interventions are included.\(^12,13\) The cumulative gross domestic product (GDP) of the 20 largest economies in the world (the G20) is nearly $60 trillion (nominal US$ in 2011). Therefore, it would cost approximately 0.1% of the GDP of the
G20 countries—one penny out of every $10 of GDP—to provide for the essential health needs of the entire world’s poor. This is certainly doable and something even people in the United States who think their country spends too much on foreign aid are likely to support.

However, this ideal world does not exist. Total global health assistance remains less than $28 billion per year. The United States, under President Obama, continues to increase funding for global health assistance, but that has not been true of all other countries. Indeed, since 2009 the worldwide recession and the European financial crisis has meant that some countries, such as France and Italy, have substantially reduced their aid, and the overall rate of increase in global health assistance has declined and is unlikely to increase in the near future.¹

Unless global health assistance will support essential care for all the world’s poor, it is critical to confront the question about which investment of global health assistance dollars produces the greatest improvement in health. In A Theory of Justice, Rawls¹⁴ has noted that principles of justice are necessary precisely because there is scarcity and all human needs and wants cannot be satisfied. Precisely because health assistance will not, in any plausible scenario, meet the essential health needs of the world’s poorest 2 billion people, it is unethical and irresponsible not to ask how global health assistance should be directed to produce the most good. Indeed, according to Ord, president of Giving What We Can (written communication; T. Ord, PhD; April 25, 2012), the effects of assistance can be increased in terms of saving lives and improving quality of life by focusing more of the assistance on more high-value interventions instead of increasing the amount of money spent.

Improving the comparative effectiveness of global health assistance is ethically and economically imperative. Otherwise, people die by favoring less effective programs. In other words, it is unethical—an abdication of global moral responsibility—not to ask what are the most effective programs that should be funded because they do more good for the money.

Even if PEPFAR implementation has been associated with decreased overall adult mortality in 9 focus countries, a vitally important question is whether other investments of global health aid might have increased life span or quality of life more. As Figure 1 in the article by Bendavid et al³ shows, the improvement in adult mortality literally came at a high price. By 2008 the mean assistance per person with HIV in the focus countries was $171 compared with $77 in non-focus countries—a nearly 2.5 fold difference that was markedly accelerating over time.

In the low-income countries of the world, HIV/AIDS is not the number-one health problem, whether considered by overall mortality or by disability-adjusted life-years (DALYs) lost. Respiratory diseases—mainly pneumococcal pneumonia—and diarrheal diseases cause significantly more deaths and DALYs lost than HIV/AIDS. Malaria causes more than 50% the number of deaths and DALYs lost as HIV/AIDS, although funding for malaria prevention, treatment, and eradication from the US government is just 10% that of HIV/AIDS. Similarly, in the lowest-income countries deaths at birth from infections and asphyxia also cause more than 50% of the number of deaths and approximately the same DALYs lost as HIV/AIDS, although US government funding for reducing these conditions is about 10% that of HIV/AIDS.¹⁵,¹⁶

For these other causes of death, there are effective and inexpensive interventions. For pneumonia and diarrhea, 2 new vaccines are available—conjugate pneumococcal and rotavirus vaccines—that cost approximately $3.80 and $2.50, respectively. (These prices are for the course of treatment, not for each dose.)¹⁷ These vaccines are currently under-utilized. It is estimated that, when fully deployed, these vaccines could reduce childhood mortality by more than 1 million deaths per year.¹⁸ Similarly, malaria interventions are remarkably cost-effective. A recent review showed that insecticide-treated bed nets cost $27 per DALY averted, indoor insecticide treatment cost an average of $143 per DALY averted, and intermittent treatment cost $24 per DALY averted.¹⁸ The list of other highly effective and cost-effective interventions for developing countries includes nutrition programs for underweight children, treatment for soil-transmitted worms, and treatments for other neglected tropical diseases.

Conclusions

PEPFAR is a remarkable program that has brought tremendous health improvement and hope to many people with HIV/AIDS in many developing countries. The article by Bendavid et al³ is welcome news in helping to document the even greater benefits of PEPFAR not only on HIV/AIDS but on overall mortality in countries.

However, the further question that must be asked by ethically responsible people and policy makers becomes: Is PEPFAR worth it? Many other global health programs are improving the health of poor people worldwide but are not funded anywhere near the level of PEPFAR. The fundamental ethical, economic, and policy question is not whether PEPFAR is doing good, but rather whether other programs would do even more good in terms of saving life and improving health. Clearly, besides treatment for HIV/AIDS, there are other highly effective and lower-cost interventions for the world’s poor.

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REFERENCES

China’s Air Quality Dilemma
Reconciling Economic Growth With Environmental Protection

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Before 2008, concentrations of air pollutants in the city of Beijing, China, site of the 2008 Olympic Games, far exceeded acceptable standards, which caused serious concerns in the international community about the health and performance of Olympic athletes. To ensure acceptable air quality during the Olympics (held from August 8-24) and the Paralympics (held from September 6-16), the Chinese government launched a series of aggressive measures to reduce pollutant emissions. To reduce industrial emissions, the operations of combustion facilities were restricted in smelters, cement plants, power plants, nonattainment boilers, and construction and petro-chemical industries. To reduce traffic emissions, certain vehicles and trucks were banned, 70% of government-owned vehicles were kept off the streets, and other vehicles could travel through the city only on alternating days.

In this issue of JAMA, in a study of the relationship between air pollutants and biomarkers of inflammation and thrombosis in 125 medical students, before, during, and after the Olympics, Rich et al report substantial reductions in the mean concentration of sulfur dioxide (−60%), carbon monoxide (−48%), nitrogen dioxide (−43%), elemental carbon (−36%), fine particles (particulate matter ≤2.5 µm in aerodynamic diameter [PM2.5]; −27%), ozone (−22%), and sulfate (−13%). These changes in air quality were accompanied by statistically significant improvements in biomarkers related to platelet adhesion and activation including a 34.0% decrease in P-selectin (sCD62P) and a 13.1% decrease in von Willebrand factor during the period of the Olympics that returned toward baseline after the air pollution controls were removed.

The study by Rich et al is compelling for the following reasons. First, confounding by long-term trends in air pollution and health, one of the main threats to validity in evaluating the public health consequences of long-term public health actions (eg, smoking bans, lowering national ambient air quality standards), is unlikely to bias the results of this study. This is because the air pollution levels were substantially reduced only for the 2 months that the 2008 Olympic games were taking place but then returned to their original levels. Second, these multiple actions to reduce air pollution provided a unique opportunity for investigating the health consequences of drastic and immediate changes in the air pollution mixture "as a whole" in addition to estimating health risks associated with exposure to individual pollutants. Third, in addition to better understanding the toxic effects of the air pollution mixture, short-term intervention studies like this one can advance the understanding of potential biological mechanisms of adverse effects of air pollution.

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See also p 2068.