

# Estimating the Impact of an AIDS Vaccine

*A 50% effective vaccine given to just 30% of the population could cut the number of new HIV infections in the developing world by more than half over 15 years.*

## The world needs an AIDS Vaccine

- There are over 39 million people living with HIV worldwide, with 2.9 million deaths and over four million new cases every year.<sup>1</sup> Current prevention efforts are not sufficient to turn the tide of the pandemic.
- The AIDS crisis requires a comprehensive response that balances expansion of existing prevention, treatment, and care programs with investments in new prevention technologies, particularly vaccines, which historically are among the best tools for fighting infectious diseases.

## The impact of an AIDS Vaccine

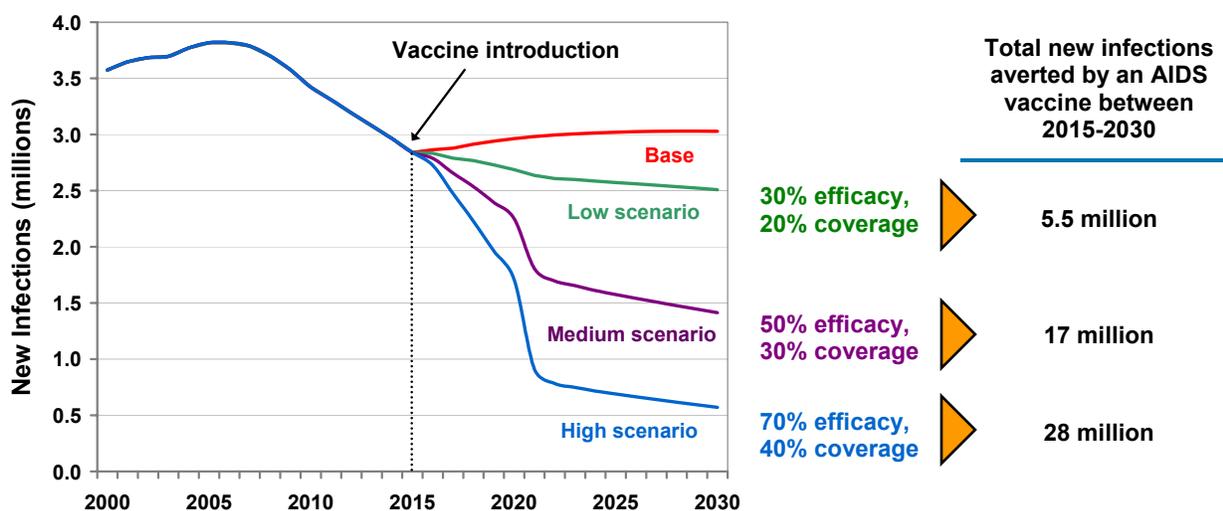
Though no one knows exactly what levels of protection the first generation of vaccines will have, scientists believe that vaccines will become increasingly more effective as they are improved over time.<sup>2</sup>

First generation vaccines could work by:

- protecting some vaccinated individuals against HIV infection;
- reducing the probability that a vaccinated individual who later becomes infected will transmit the infection to others; or
- slowing the rate of progression to AIDS for those who later become infected with HIV.

IAVI estimates that an AIDS vaccine could substantially alter the course of the AIDS pandemic and reduce the number of new infections, even if vaccine efficacy and population coverage levels are relatively low and other programs for treatment and prevention have been scaled up.

**Figure 1:** New adult HIV infections in low- and middle-income countries by year and vaccine scenario



<sup>1</sup>UNAIDS. 2006. AIDS Epidemic Update. [http://data.unaids.org/pub/EpiReport/2006/2006\\_EpiUpdate\\_en.pdf](http://data.unaids.org/pub/EpiReport/2006/2006_EpiUpdate_en.pdf)

<sup>2</sup>IAVI. 2006. *AIDS Vaccine Blueprint 2006: Actions to Strengthen Global Research and Development*.

### ***Modeling the impact of an AIDS vaccine***

- IAVI's impact model was created to explore the impact of a vaccine at the national level, but it can also be used to generate regional or global estimates. IAVI plans to do additional work on modeling the effects of a vaccine at the country level, in collaboration with teams of national researchers and policy makers.
- This model represents a significant improvement over previous models because it is easy to use; relies on readily available data; incorporates improvements in existing prevention and treatment and introduction of other new prevention technologies; and is capable of modeling a range of vaccine delivery strategies.
- The baseline epidemic trajectory for this analysis assumes that UN goals for expanded prevention and treatment in countries will be met by 2015. If efforts fall short of these goals, the potential benefits of a vaccine are even greater.

*(The introduction of a vaccine at 2015 was chosen for illustrative purposes. A vaccine is not guaranteed by 2015.)*

### ***An AIDS vaccine could have an enormous effect***

The world has committed to providing universal access to AIDS prevention, treatment, and care; but, unless the number of people who become infected is reduced, the costs of treatment and care will mount into tens of billions of dollars every year for the foreseeable future. This annual cost does not take into account the challenges associated with rising drug resistance and the associated need for ever-more expensive alternative drugs.

IAVI's modeling work shows that even a partially effective vaccine provided to a modest proportion of the population could lead to a major decrease in new HIV infections. If a vaccine is first introduced a number of years from now in a world where other prevention and treatment activities have expanded, an AIDS vaccine will still make a significant impact. This impact is likely to be particularly beneficial for marginalized and vulnerable populations who are the least served by today's programs, even as they expand. The need to reach these underserved populations underscores the importance of making investments in AIDS vaccine research and development today.

The negative effects of the AIDS pandemic are substantial, in terms of lost lives, human suffering, shattered families and communities, lower economic productivity, and health care costs. A vaccine that could reduce the number of new infections by 20% to 80% would produce enormous health and economic benefits and could help to dramatically curtail the pandemic.