

# Experiences and Lessons from Modeling HIV Vaccines

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Understanding Microbicide Introduction in Africa and India  
Toronto, August 13, 2006



## Why model HIV vaccines?

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- Support resource mobilization
- Inform vaccine design
- Support vaccine trials



## Key Challenges

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- Modes of action not certain
  - Reduce susceptibility
    - take or degree action
  - Reduce infectiousness
  - Slow disease progression
- Complexity of delivery is unknown
  - Single dose
  - Multiple doses



## Key Challenges

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- Demand/acceptability uncertain
  - Related to efficacy, price, epidemic severity?
- Effects on behaviors unknown



## Key Questions Models Can Address

- Will a low efficacy vaccine have a public health benefit?
- Can HIV vaccines extinguish the epidemic?
  - At what levels of efficacy and coverage?
- Will a vaccine still be useful if it is not ready until 2015?



## There is a Rich Vaccine Modeling Literature



## Key Findings

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- Low efficacy vaccines can have important public health impact
- Eradication through vaccines alone is unlikely
- Behavioral reversals a concern
- Important effects in all epidemic types



## WHO-UNAIDS *HIV VaccSim*

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- Focus on evaluating alternative strategies for implementation
  - Allocation of scarce supplies
  - Costs and cost-effectiveness
- Working with five country teams
  - Kenya, China, Brazil, Peru, Thailand



## IAVI Impact Model: Spectrum

- Focus on demonstrating impact
  - Global impact
  - National impact
- Priority on ease of use by national experts
- Started with global focus, now moving to county focus
  
- More details at Skills Building Session, Wednesday, August 16, 2:15pm



## Two Approaches to Addressing Uncertainty

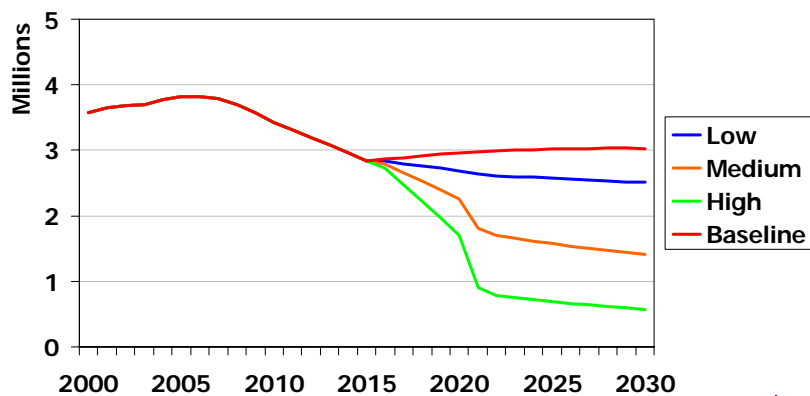
- *HIV VaccSim*
  - Generate a large number of scenarios by sampling parameter values from distributions of possible values
  - Test vaccine impacts in all plausible scenarios
- Spectrum
  - Easy to run different scenario to test effects of different assumptions



## Scenarios

- Coverage
- Effects on susceptibility, infectiousness, progression
- Type of action
- Duration of effectiveness
- Effectiveness of other prevention interventions
- Effect of ART expansion
- Target populations
- Number of doses
- Costs

## New HIV Infections: Low and Middle Income Countries



## Next Steps

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- Country teams will apply models to investigate impacts in their epidemics
- Demonstrate benefits to national leaders and global funders
- Continuous effort
  - New information on vaccine effects
  - Changing environment for prevention and treatment
  - Changing epidemics



## Lessons for Microbicides?

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- Need for both global and national results
- Include uncertainty explicitly
- Include impact of other prevention programs and potential new interventions (e.g., male circumcision)
- Work with national teams

