

The Changing Epidemic: Some Considerations for Integrating Acquisition -Transmission, and Progression Models

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Drinking by the Bucket



Global summary of the AIDS epidemic |

2009

Number of people living with HIV

Total	33.3 million [31.4 million–35.3 million]
Adults	30.8 million [29.2 million–32.6 million]
Women	15.9 million [14.8 million–17.2 million]
Children (<15 years)	2.5 million [1.6 million–3.4 million]

People newly infected with HIV in 2009

Total	2.6 million [2.3 million–2.8 million]
Adults	2.2 million [2.0 million–2.4 million]
Children (<15 years)	370 000 [230 000–510 000]

AIDS deaths in 2009

Total	1.8 million [1.6 million–2.1 million]
Adults	1.6 million [1.4 million–1.8 million]
Children (<15 years)	260 000 [150 000–360 000]

NYC HIV/AIDS Statistics

History of the HIV/AIDS Epidemic in New York City, 1981 – 2009

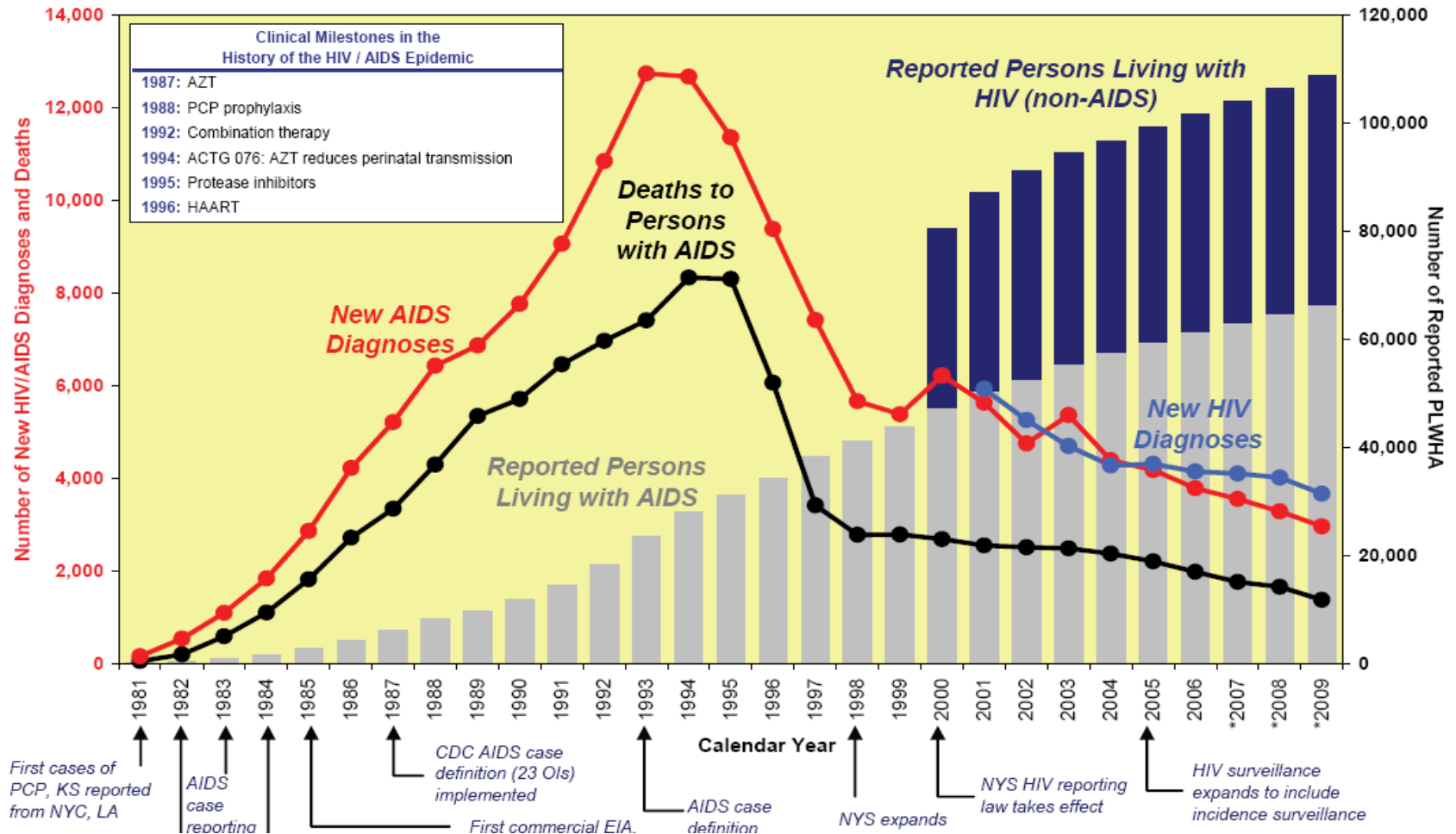
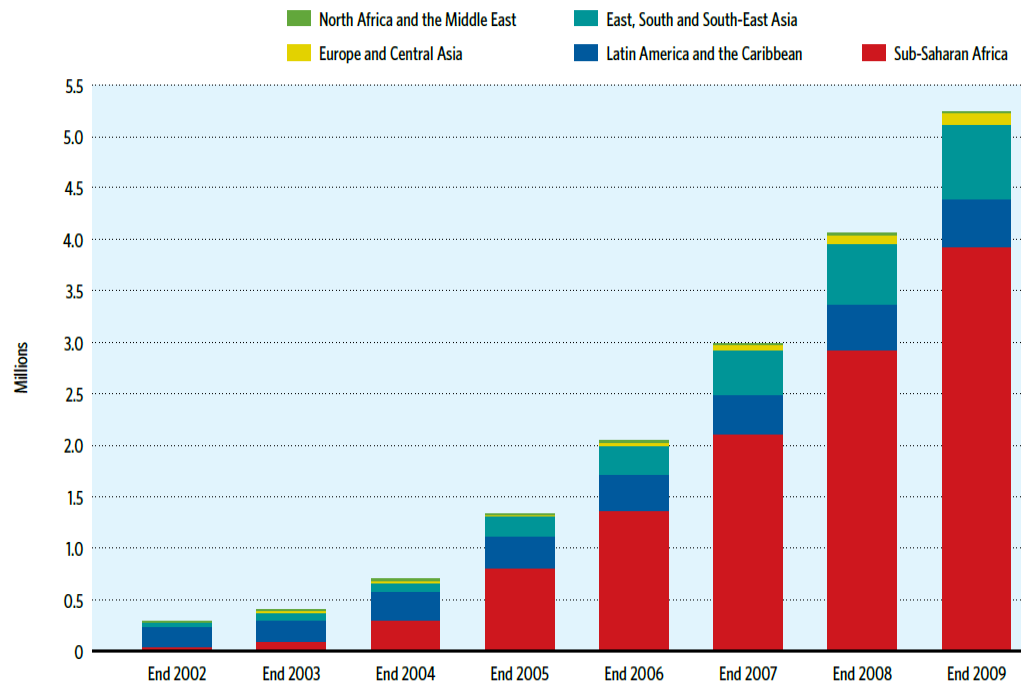


Figure courtesy of NYC Dept. of Health

Increased utilization of cART in the developing world

Fig. 4.1. Number of people receiving antiretroviral therapy in low- and middle-income countries, by region, 2002–2009

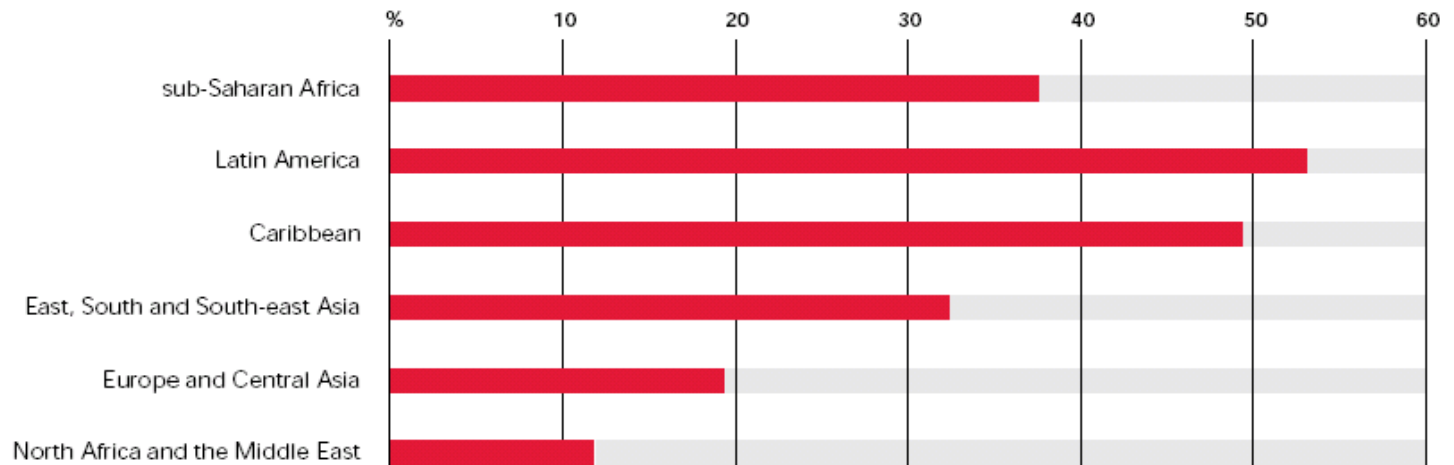


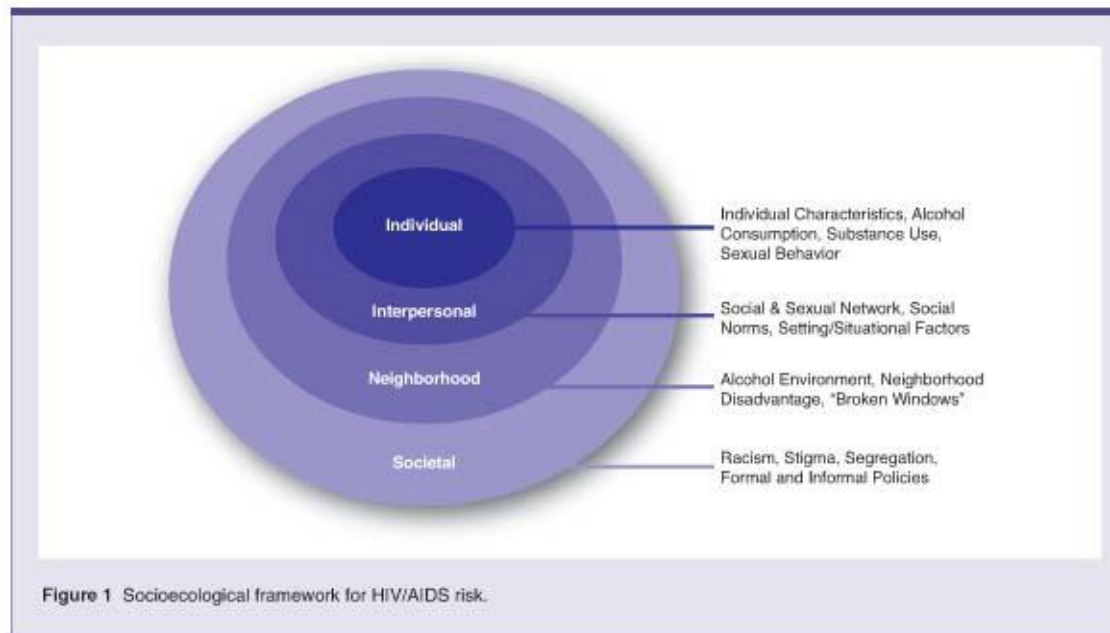
- Rapid scale up of HIV/ART treatment programs across the developing world
- Implications for HIV death rates and perhaps transmission
- Results threatened by several challenges most notably issues with retention in care

WHO Library; *Towards universal access: scaling up priority HIV/AIDS interventions in the health sector: progress report 2010.*

Coverage is low in Africa

Source: WHO Towards Universal Access 2010.





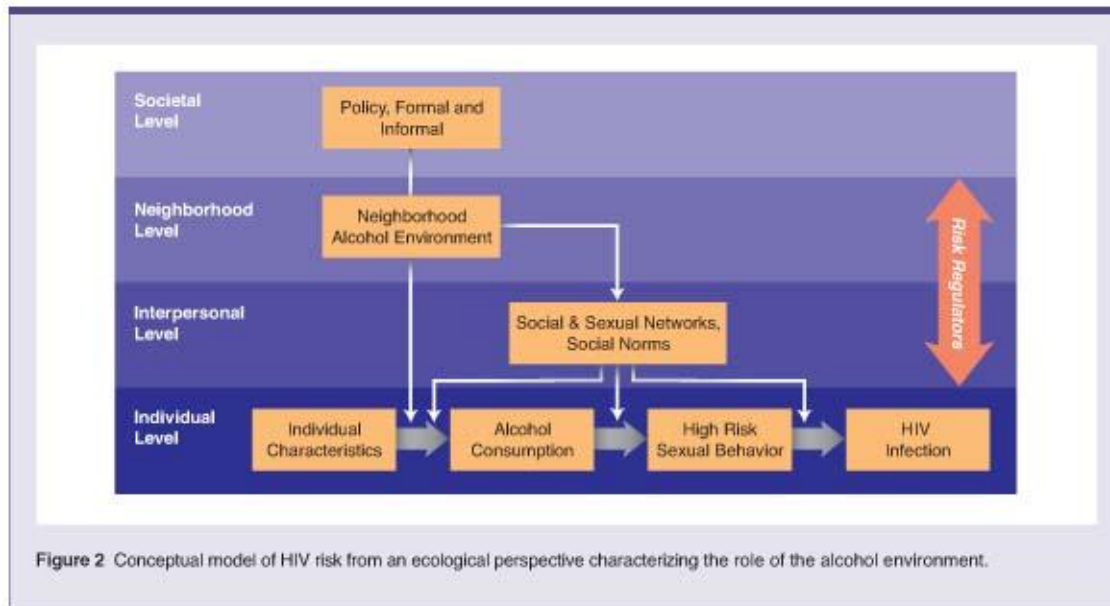
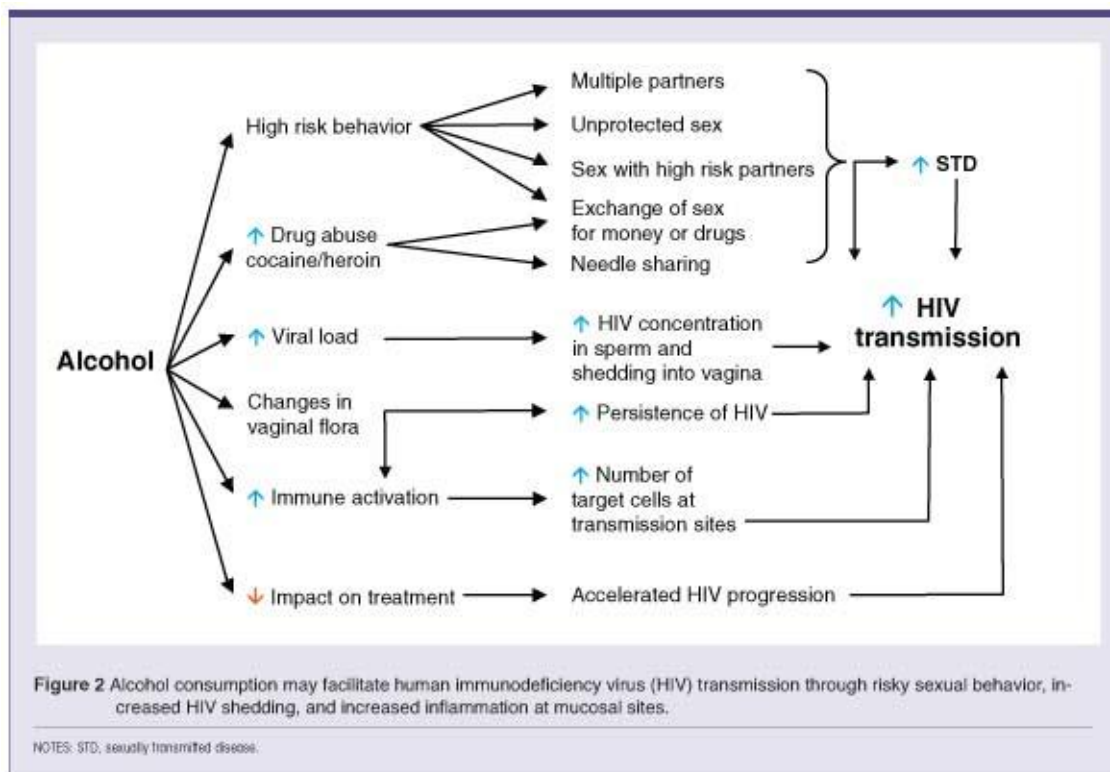
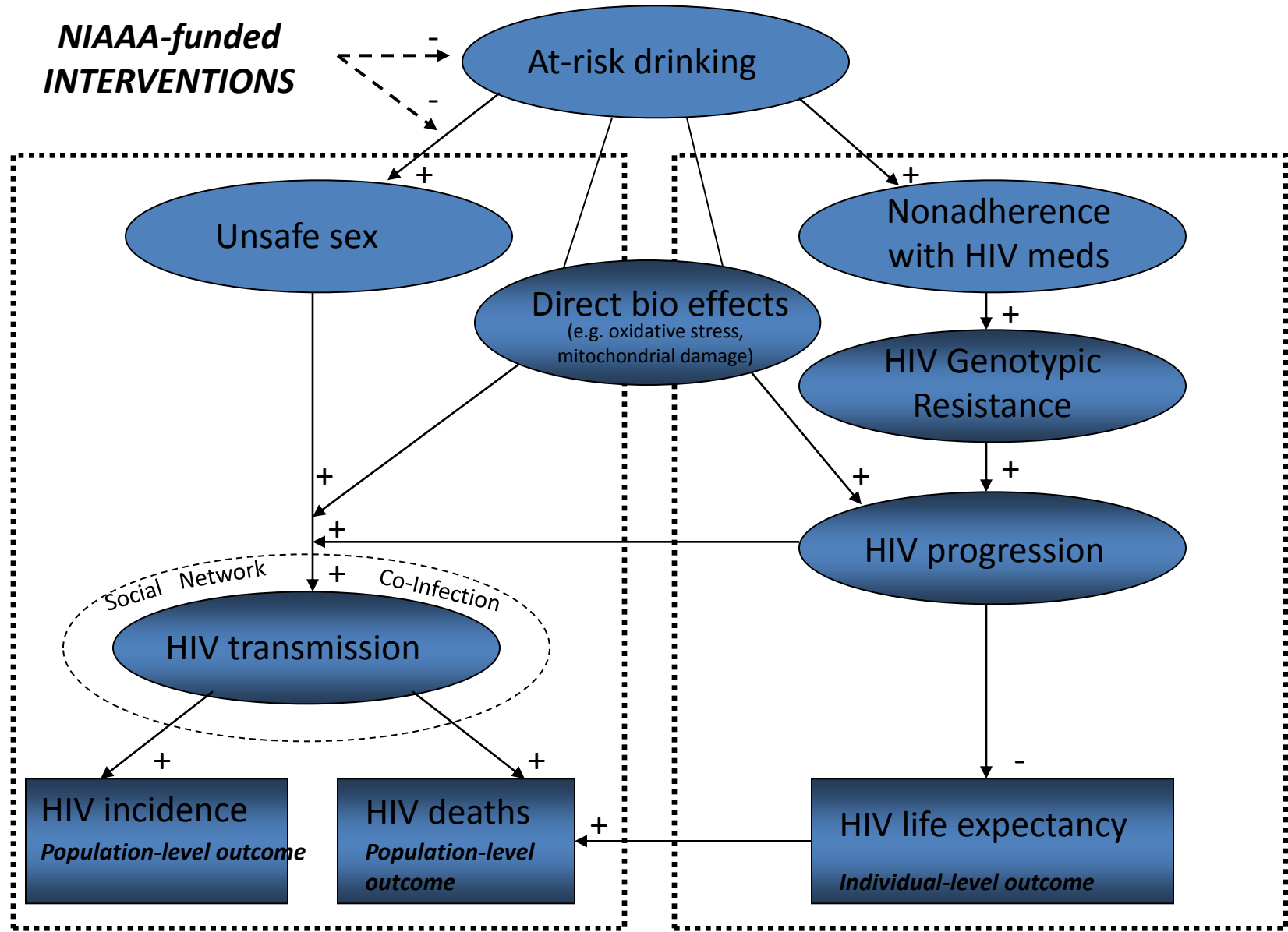


Figure 2 Conceptual model of HIV risk from an ecological perspective characterizing the role of the alcohol environment.



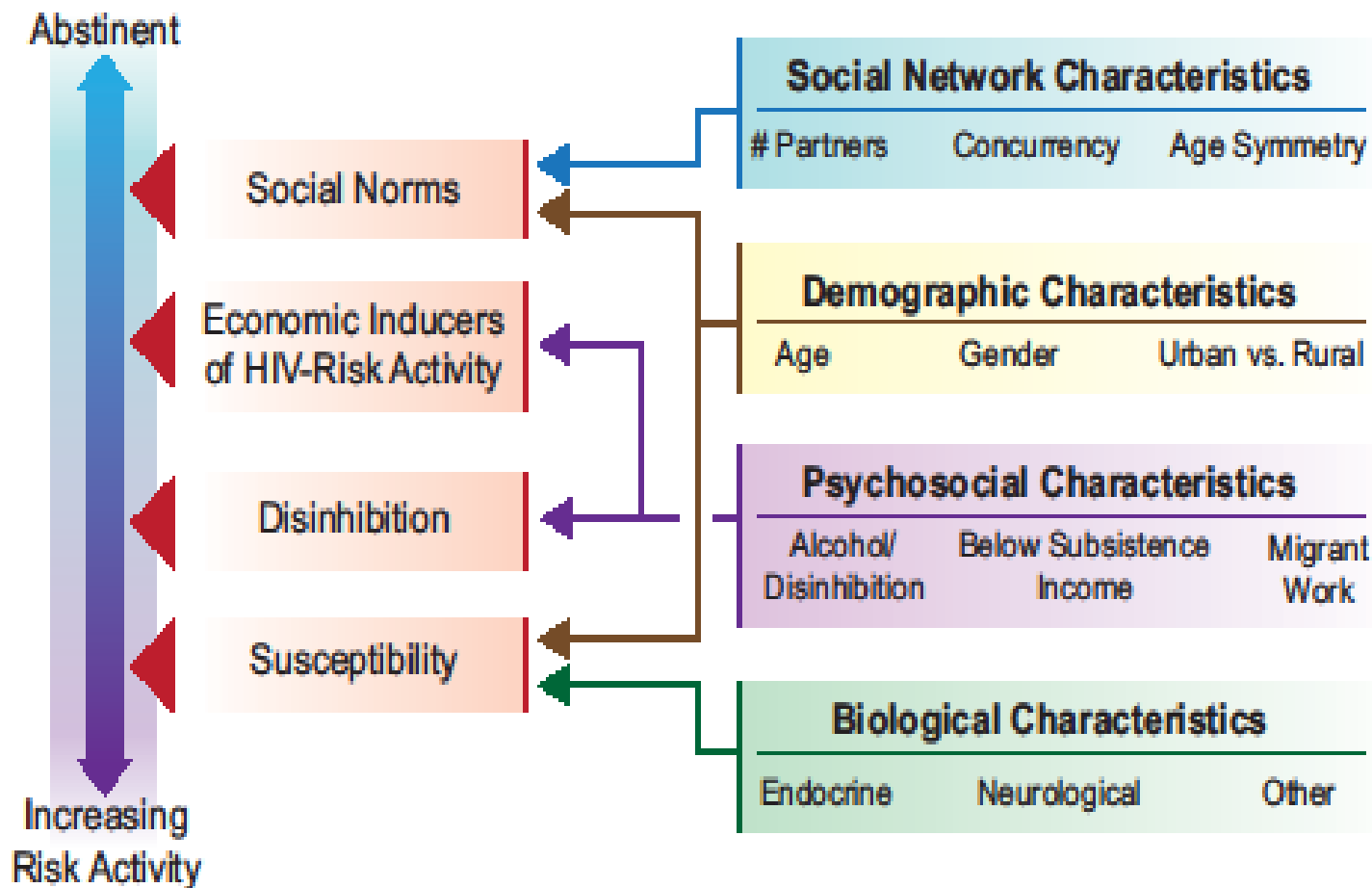
Social/behavioral constructs
 Biological "core" constructs



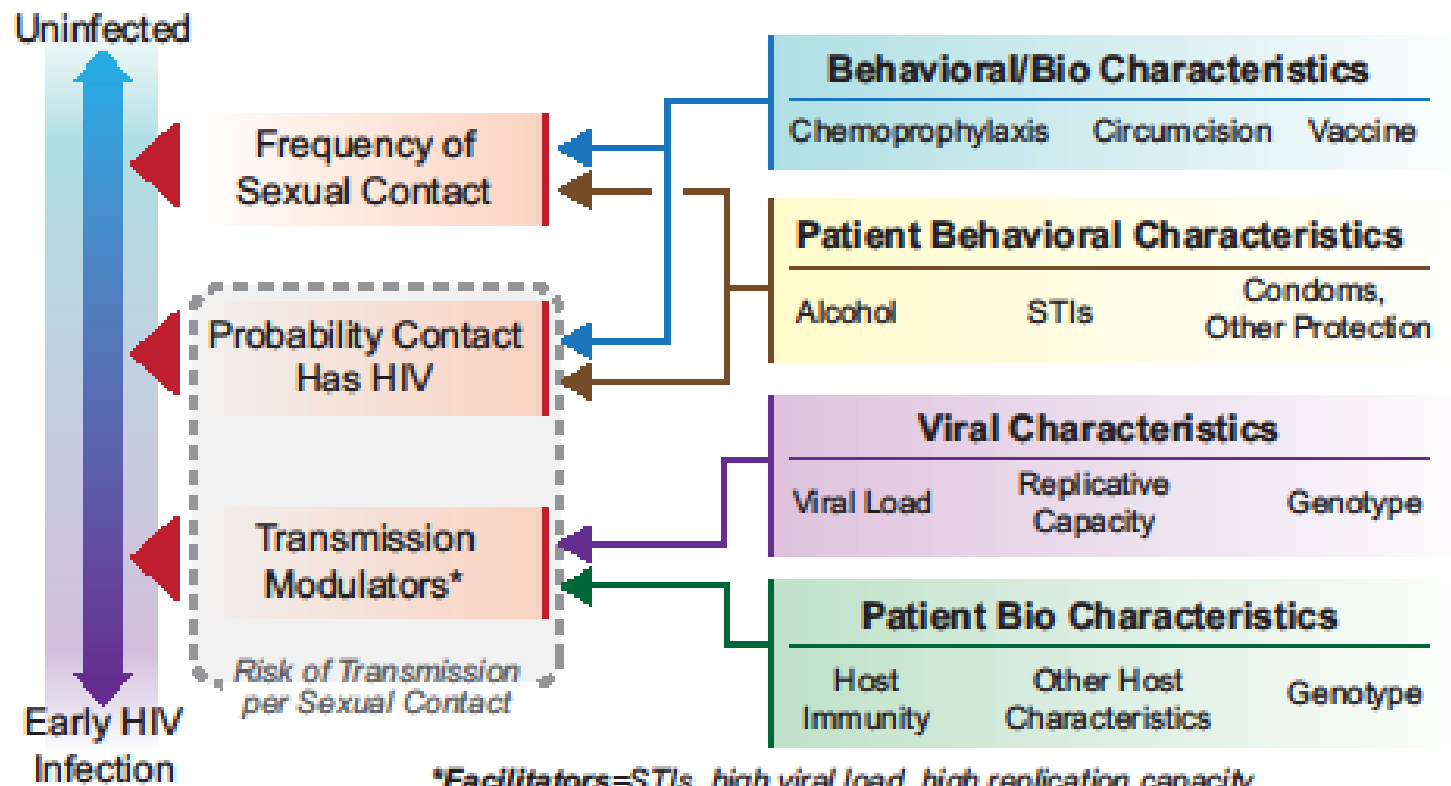
Epidemic module of proposed simulation model

Progression module of proposed simulation model

Prevention Issue: Reducing Exposure Risk

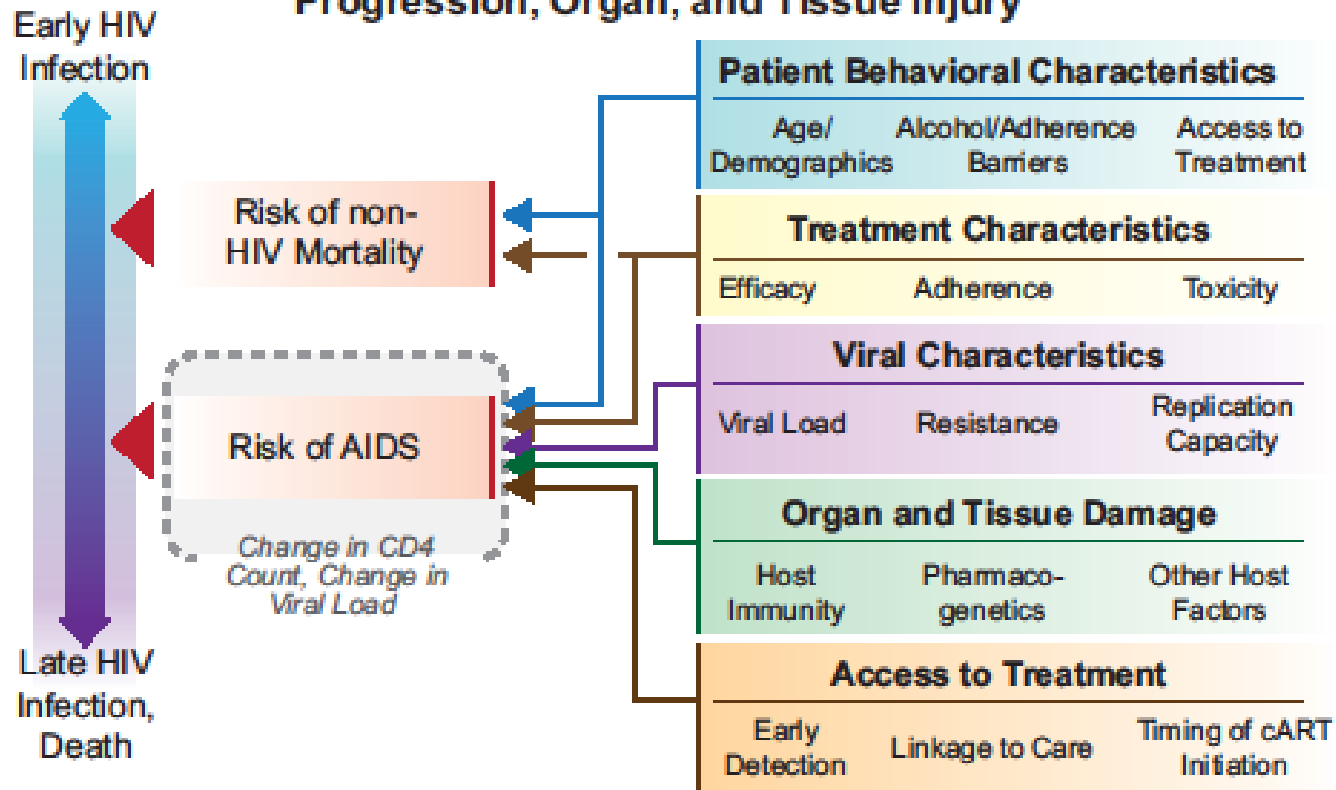


Prevention Issue: Reducing Transmission Risk After Exposure

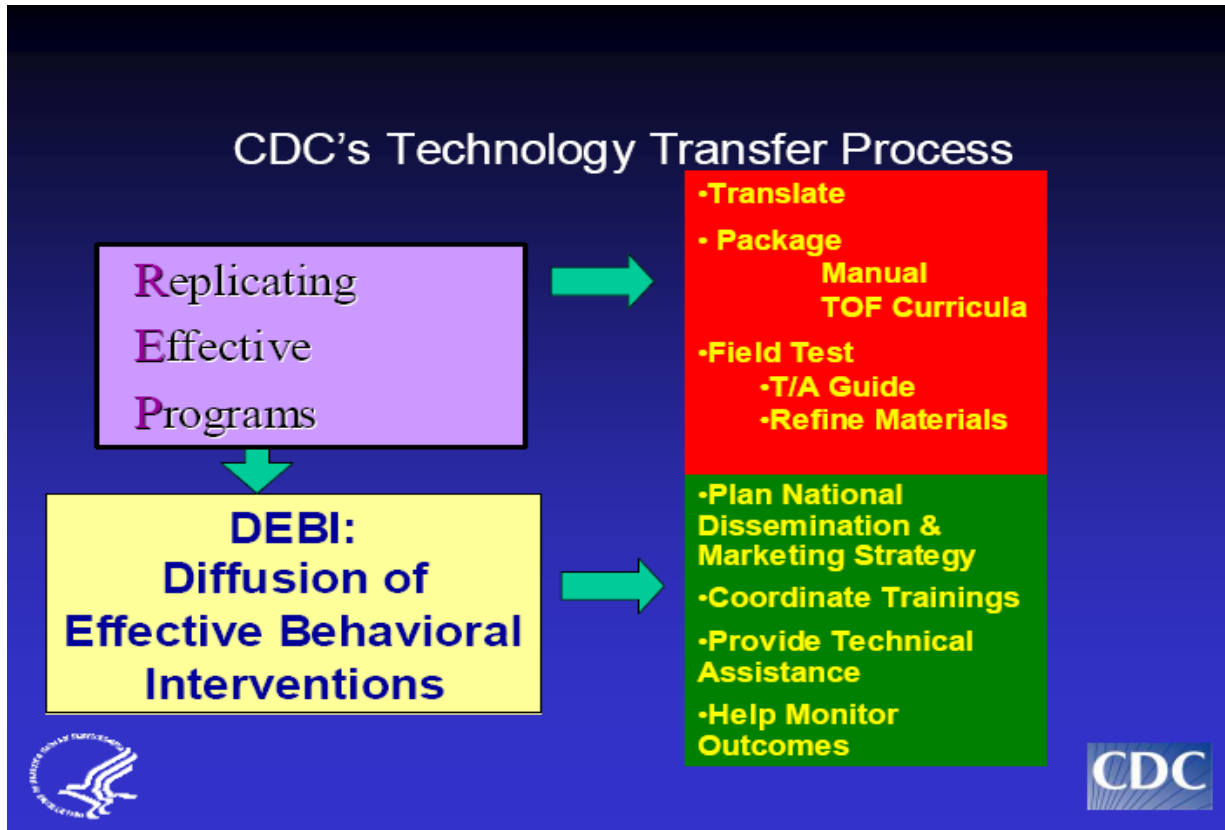


**Facilitators=STIs, high viral load, high replication capacity.
 Attenuators=Viral load, low replication capacity, condoms, and protection.*

Prevention Issue: Reducing Risk of HIV Progression, Organ, and Tissue Injury



CDC EBIs (Sharpe, Collins & Glassman, 2007)

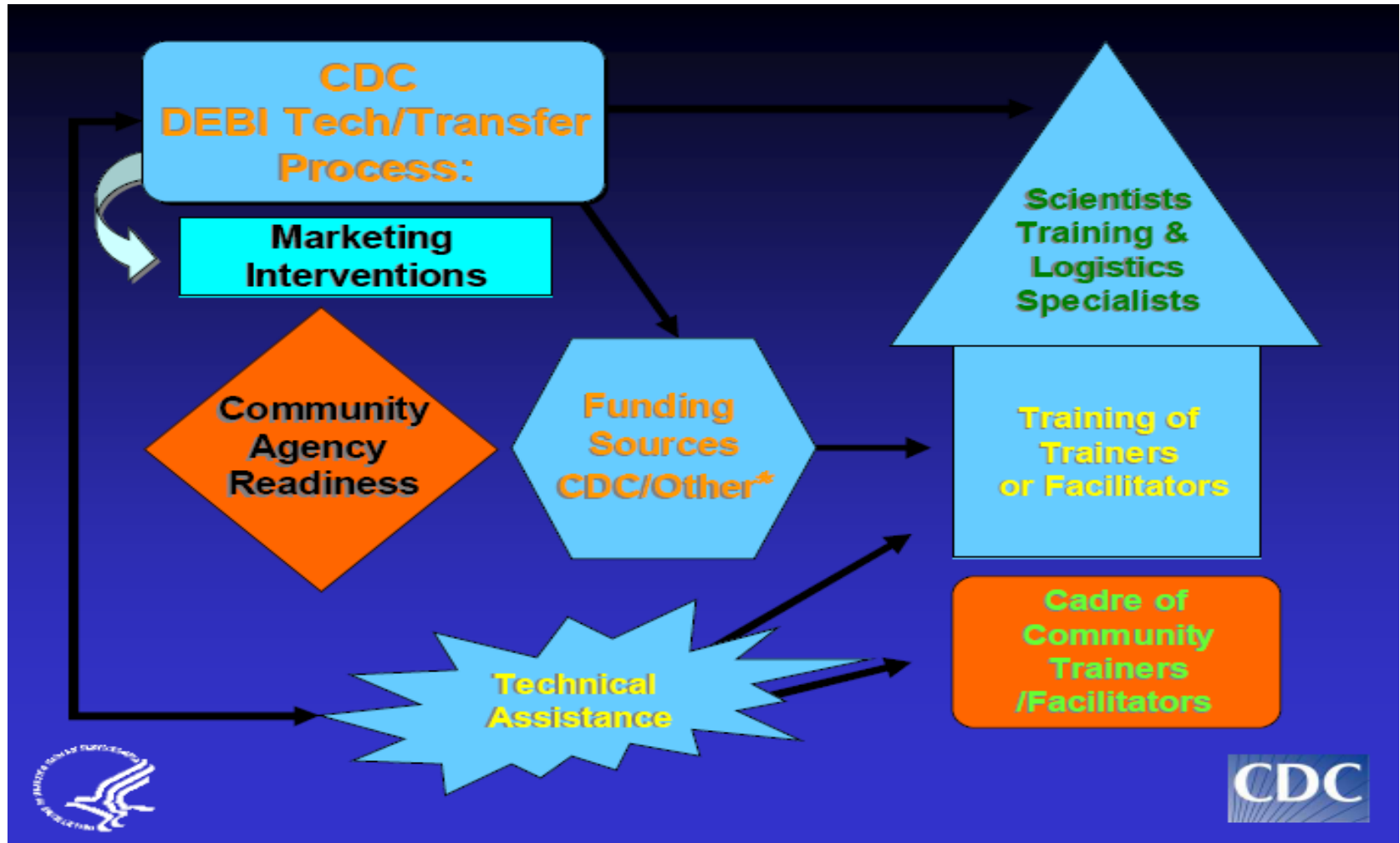


Best-Evidence

Promising-Evidence

ADAPT

CDC EBIs (Sharpe, Collins & Glassman, 2007)



Operations Research (OR): A science of implementation

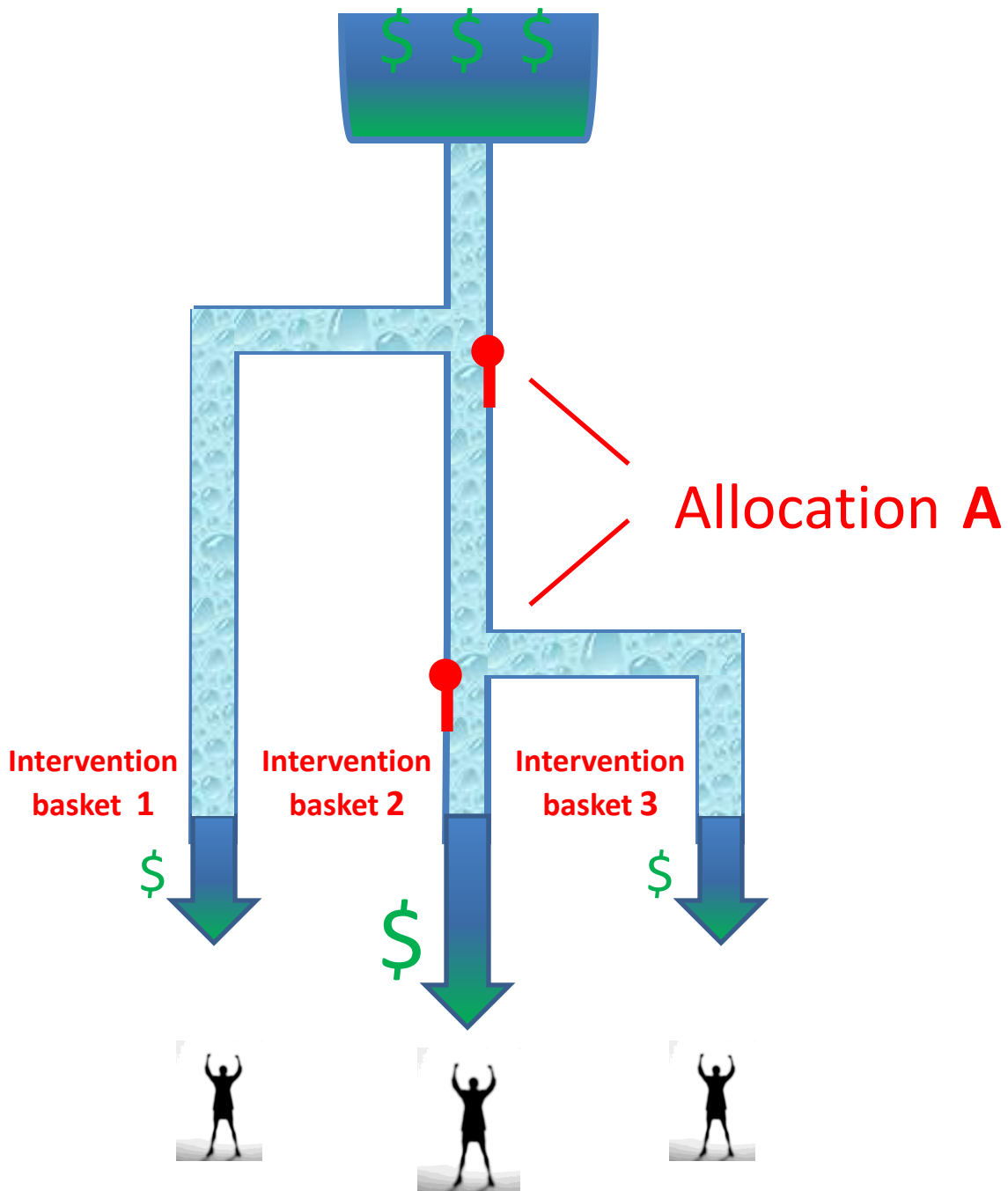
- OR is a systematic approach to prioritize interventions for:
 - Patient risk factors and demographics
 - Would it generalize to patients in this setting?
 - Feasibility
 - Would it be feasible in this setting?
 - Budget
 - Would it be more beneficial than alternative uses ?

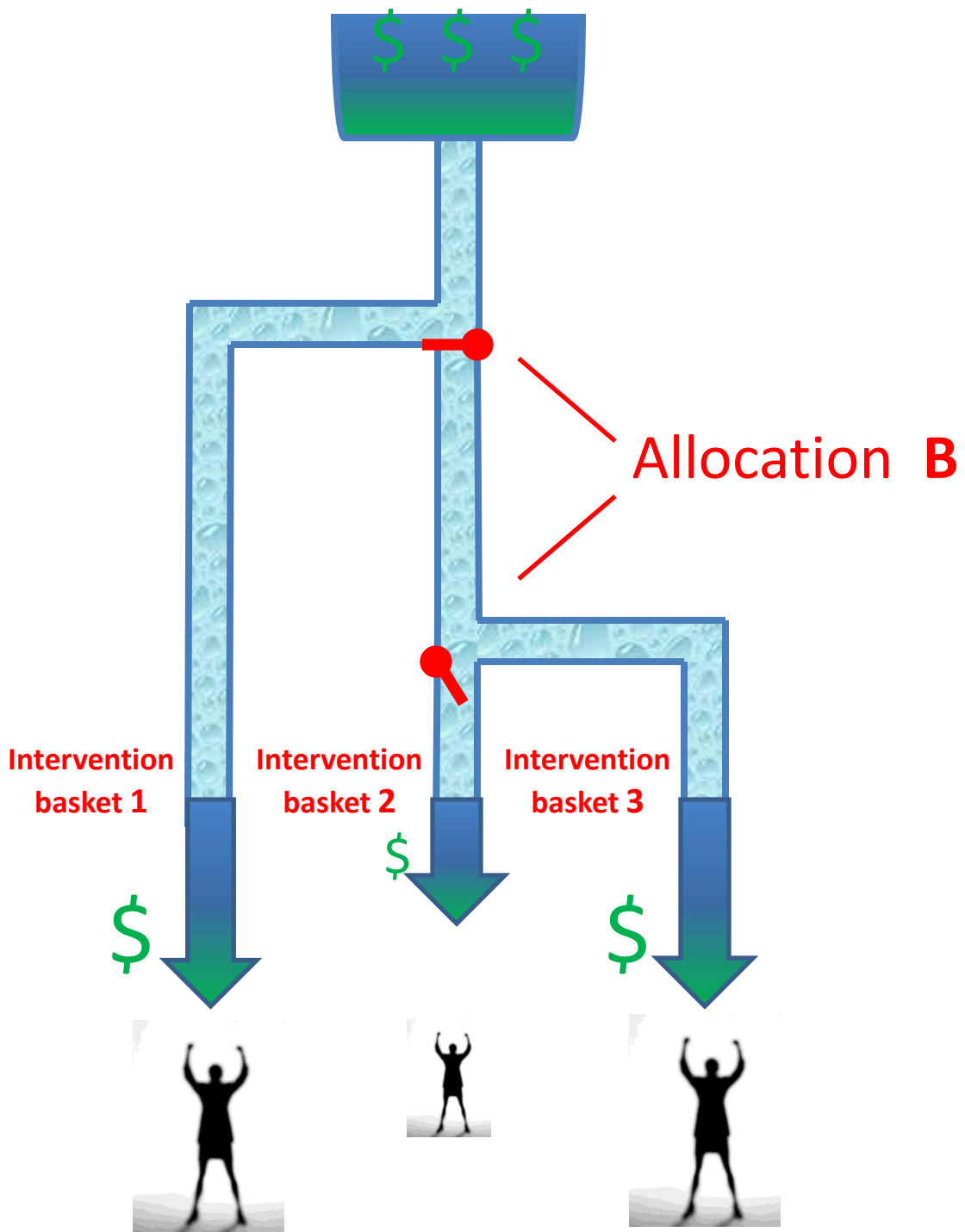
Operations Research (OR): A Science of Implementation

- Uses computer simulation and decision modeling to arrive at optimal solutions to complex problems.
- Particularly useful when decision maker must allocate resources among different “baskets” of interventions

Objective

- To develop an operations research model to inform HIV resource allocation in East Africa
 - How to get the most “bang for the buck”
- Model considers alternative portfolios of interventions and program options
 - You give the simulation a budget
 - It tells you how to spend that budget to get
 - Most HIV cases averted
 - Greatest increase in LE or quality-adjusted LE





Alcohol Alert

Number 80

Alcohol and HIV/AIDS: Intertwining Stories

Human immunodeficiency virus (HIV)—the pathogen responsible for the current pandemic of acquired immune deficiency syndrome (AIDS)—targets the body’s immune system. HIV infection puts a person at risk for a multitude of diseases that someone with a healthy immune system generally would fight off. When HIV was recognized in the 1980s, testing positive for HIV infection was, in fact, a death sentence. Now, however, the availability of anti-HIV medications has made living with the virus a reality. Patients who stick to a careful medication regimen (i.e., taking several medicines at specific times throughout the day) may live from 20 and 40 years with HIV and do not always die of AIDS-related illnesses.

