Issues and Priorities in Program Science

Susan DeLisle, ARNP, MPH
A (slightly) deranged program implementer
Why the Concept of Program Science Is A Step Forward

- Promises to bring science and program closer together for the benefit of each
- Promise of better integration across scientific disciplines
- Views program components as a system
- Includes policy, structural, social marketing, in addition to bio-medical interventions
- Identifies population level effects of a package of interventions, not just one intervention at a time
More Things to Like About Program Science

- Recognizes that the cost of an intervention is relevant
- Recognizes that both efficacy and efficiency are important
- Recognizes that just adding more tools won’t get the job done any faster or better
- Recognizes that program implementation is a series of trade-offs... “biggest bang for the buck”
Questions Posed to Panelists

- Identify Top Issues/Priorities for Program Science
- Why these are the most important priorities
- Initial Steps to start dealing with these priorities
Top Issues and Priorities for Program Science

The Many “C’s”
Complexity

- Of the Health Care system
  - STI/HIV programs operate within a larger health system
    - But they are a system unto themselves
STD Prevention System

Critical Partners for all Components

- Schools
- Health
- Depts
- NGOs/CBOs
- HIV-related orgs
- Media
- Drug & Alcohol
- PTCs
- DIS
- HIV Rx providers
- Detention/corrections
- Community sites
- PNC clinics
- Regional Infertility
- Labs
- Others

Public and Private Health Care Providers

- STD Awareness Building
- STD Awareness Building
- Client counseling, facilitation, and other behavioral change intervention
- Partner Services
- Risk Assessment
- Diagnosis/Tx
- Screening
- Surveillance
- Condoms provided
- Clients counseled
- Partners, associates, and social networks identified, contacted
- Infected clients treated
- Infected persons identified
- Individuals status assessed
- Individuals screened
- Cases reported/Outbreaks identified

Outputs

Immediate Outcomes

- Seminars
  - Conducted
  - Media hits
  - Info dissemnated
  - School curricula offered
  - Clients informed

- Increased Awareness/Knowledge
  - STD consequences
  - Safe behaviors
  - Self assessment of risk

Intermediate Outcomes

- Increased healthcare seeking
- Increased awareness of opportunities and indications for testing and Rx
- Increased self-protective skills and attitudes
- Increased availability of condoms
- Increased use of condoms
- Increased protective attitudes
- Increased partner protective attitudes
- Increased Durability
- Increased infectivity
- Reduced prevalence
- Reduced sequelae
- Reduced exposure between infecteds and susceptibles
- Decreased infectivity
- Decreased Duration
- Reduced incidence (Syphilis Chlamydia Gonorrhea HIV/AIDS)
- Increased self-awareness of STD consequences
- Increased safe behaviors
- Increased self-assessment of risk
- Increased healthcare seeking
- Increased awareness of opportunities and indications for testing and Rx
- Increased self-protective skills and attitudes
- Increased availability of condoms
- Increased use of condoms
- Increased protective attitudes
- Increased partner protective attitudes
- Increased Durability
- Increased infectivity
- Reduced prevalence
- Reduced sequelae
- Reduced exposure between infecteds and susceptibles
- Decreased infectivity
- Decreased Duration
- Reduced incidence (Syphilis Chlamydia Gonorrhea HIV/AIDS)

Public and Private Health Care Providers

- STD Awareness Building
- STD Awareness Building
- Client counseling, facilitation, and other behavioral change intervention
- Partner Services
- Risk Assessment
- Diagnosis/Tx
- Screening
- Surveillance
- Condoms provided
- Clients counseled
- Partners, associates, and social networks identified, contacted
- Infected clients treated
- Infected persons identified
- Individuals status assessed
- Individuals screened
- Cases reported/Outbreaks identified

Outputs

Immediate Outcomes

- Seminars
  - Conducted
  - Media hits
  - Info dissemnated
  - School curricula offered
  - Clients informed

- Increased Awareness/Knowledge
  - STD consequences
  - Safe behaviors
  - Self assessment of risk

Intermediate Outcomes

- Increased healthcare seeking
- Increased awareness of opportunities and indications for testing and Rx
- Increased self-protective skills and attitudes
- Increased availability of condoms
- Increased use of condoms
- Increased protective attitudes
- Increased partner protective attitudes
- Increased Durability
- Increased infectivity
- Reduced prevalence
- Reduced sequelae
- Reduced exposure between infecteds and susceptibles
- Decreased infectivity
- Decreased Duration
- Reduced incidence (Syphilis Chlamydia Gonorrhea HIV/AIDS)
- Increased self-awareness of STD consequences
- Increased safe behaviors
- Increased self-assessment of risk
- Increased healthcare seeking
- Increased awareness of opportunities and indications for testing and Rx
- Increased self-protective skills and attitudes
- Increased availability of condoms
- Increased use of condoms
- Increased protective attitudes
- Increased partner protective attitudes
- Increased Durability
- Increased infectivity
- Reduced prevalence
- Reduced sequelae
- Reduced exposure between infecteds and susceptibles
- Decreased infectivity
- Decreased Duration
- Reduced incidence (Syphilis Chlamydia Gonorrhea HIV/AIDS)
Complexity

- Of the Health Care system
  - STI/HIV programs operate within a larger health system
    - But they are a system unto themselves

- Of defining communities
  - By risk group?, by geography?, by demographics?

- Of combining intervention packages for populations rather than by organism

- Of choosing from among the existing tools
Competing points of view, priorities, and biases based on disciplinary background

Competition for resources

Coordination and integration of health messaging, education, communications, and funding across disease lines

Integration of the best science across silos
“Silo” Approach To Science and Programs

Approach to Communities
Health Disparities
Social Marketing
Surveillance
Training
Research
Program
Science

HIV

STI
Capitalizing on Changes in the Health Care System

- In the U.S., the biggest gains in STI/HIV prevention are to be made in the private sector

- If the PPACA proceeds as planned, 32 million additional people will be insured
  - One-half through Medicaid/CHIP programs
  - One-half through insurance exchanges
  - Dependent coverage through age 26

- These changes must be considered when designing intervention packages
Health Care System Changes

- Significant expansion of primary care networks
- Many STI and HIV services will be covered by insurance, but many will not
- Public health’s role will change
  - More policy, quality assurance
  - Less clinical
- Intervention packages need to be geared for primary care setting
Capacity, Constraints, Consensus

- Capacity of Public Health Infrastructure
- Capacity to influence primary care, private sector
  - Evidence-based guidelines
- Capacity to work across disciplines to answer cross-cutting questions
- Constraints on funding
- Constraints of the traditional scientific process
- Consensus of scientists and programs
  - Inexperienced with systems thinking and management of programs
Where to Start?

- Develop consensus to move forward

- Develop end point(s) – goal
  - Is it a community? Geographic location?

- Form a core group of interdisciplinary scientists and program leaders
  - Recruit talent from schools that teach systems science

- Identify willing programs, communities to develop key research questions, gather data

- Identify inputs, and first use modeling to determine most effective strategies to address chosen “target”
Resource Allocation Modeling

- Resource Allocation—the process of distributing resources among competing programs, priorities, populations, or regions.
- Healthcare resource allocation decisions may rely on a combination of—
  - Last year’s allocation (historical spending patterns) or some other allocation
  - Influential players (communities, advocacy groups, NGOs, press/media, government, …)
  - Input data (surveillance, prevalence, incidence, …)
  - Program efficacy, best practice guidelines
  - Target setting
  - Priority setting
  - Formal resource allocation modeling
The allocation problem can be defined using two components that interact

1- **Epidemic model**—determines the epidemic outcome given a defined allocation

2- **Optimization model**—generates different allocation scenarios, which feed into the epidemic model; stops when the best outcome is reached
Required Data Needed

1. **Budget**
   - Current allocation breakdown
   - Current budget
   - Additional funds

2. **Subpopulation level data**
   - Total size of subpopulation (denominators)
   - Number of positives (numerator)
   - % unaware

3. **Rates of movement in and out of each subpopulation**
   - Entry into susceptible
   - Exit rate from susceptible and undiagnosed
   - Exit rate from diagnosed + (death and disease)

4. **Transmission**
   - Mixing %
   - Incidence by subpopulation
   - Effective contact rate for diagnosed and undiagnosed

5. **Intervention cost and outcome**
   - Interventions by target level
   - Cost of testing by target level and subpopulation
   - Background testing level
   - Cost of testing by target level and subpopulation
   - Testing yield
   - Cost of behavior change by target level and subpopulation
   - Effect of behavior change intervention by target level and subpopulation

6. **Constraints**
   - Max reach (%) by intervention category by subpopulation
   - Min reach (%) or investment ($) by intervention category by subpopulation
   - Max/Min $ or % for higher levels than subpopulation?
The Important Thing is...

- To Start

- To Carefully Plan Approach

- To develop the knowledge base and experience with Systems Science
And Remember
In the Words of a famous “C”

- Real knowledge is to know the extent of one’s ignorance....Confucius