Overview of STD Prevention, Control, and Program Management

Key Concepts: Public Health/STD Program Essential Functions, Core Components of STD Programs, STD Transmission Dynamics, Targets of STD Interventions

STD Program Management

Overview of STD Prevention, Control, and Program Management - Part 1

Leadership Pyramid

Why am I here?


Session Topics and Objectives - 1

Participants will be able to:

- Describe how the essential functions of public health relate to STD prevention & control
- Describe the federal, state, and local roles in STD prevention & control
- Discuss the similarities and differences between the CDC and NCSD frameworks for STD Programs
- List at least 5 factors to consider when prioritizing the STDs a program will address
Session Topics and Objectives - 2

Participants will be able to:

- Describe the critical factors in STD transmission
- Describe two tools or concepts that can be used to determine the focus/priorities of your program
- Explain how levels of prevention, selected interventions, targeted STDs, and priority populations are essential components of STD prevention & control

What is Public Health?

- One of the efforts of organized society to protect, promote, and restore the people’s health – the population as a whole.

How does the focus of public health practitioners differ from health care providers?
Legal Responsibility for Public Health

- **Federal**
  - Interstate Commerce
  - Defense – National Security
- **State**
  - Primary Responsibility for Public Health
- **Local**
  - Responsibilities Delegated or Permitted by State

What are Roles of Federal, State a Local Health Departments in STD Prevention?

**Federal**
- Funding
- Technical Assistance, Training and Research
- Policy Development including Guidelines
- Surveillance (Primarily National)

**State**
- Policy Development
- Assure Compliance With PH Laws
- Surveillance
- Funding
- Technical Assistance, Training and Research
- Assure Access to Diagnosis and Treatment
- Disease Intervention

**Local**
- Surveillance
- Disease Intervention
- Assure Access to Diagnosis and Treatment
- Assure Compliance With PH Laws
- Funding
- Technical Assistance, Training and Research

**Federal, State and Local Government Relationships in STD Prevention**

- CDC Funded City/County Project Areas
- CDC Funded State Project Areas
CDC Comprehensive STD Prevention Systems (CSPS)
- CDC grant program to support the coordinated and comprehensive provision of essential program functions to prevent and control STDs within states, communities and special populations.

CDC Program Operation Guidelines (POGs)
- Purpose – Further STD prevention by providing a resource to assist in the design, implementation, and evaluation of Comprehensive STD Prevention and Control Programs
- Framework
  - 8 Essential Services with Related Activities
  - 6 Areas (Populations) of Special Emphasis
  - Extensive Explanations and Tools in Individualized Guidelines
  - [http://www.cdc.gov/std/Program/](http://www.cdc.gov/std/Program/)

CDC Essential Functions 2009-2013
- **Surveillance**
  - Surveillance and Data Management
  - Outbreak Response Plan
- **Interventions**
  - Medical and Laboratory Services
  - Partner Services
  - Community and Individual Level Behavioral Change Services
CDC Essential Functions 2009-13

- **Evaluation**
  - Program Evaluation
  - Performance Measures (PM)
  - Program Improvement Plans (PIP)
  - Evidence-Based Action Plans (EBAP)

- **Program Support Systems**
  - Leadership and Program Management
  - Training and Professional Development

NCSD Core Components and Strategies for State and Local STD Programs

- **Purpose**
  - Provide STD Directors and Managers with action-based STD specific program components and strategies linked to the 3 Public Health Core Functions and 10 Essential Services

- **Development**
  - NCSD Workgroup developed framework in 2004, ratified by membership and reviewed and updated annually

- **Framework**
  - 25 Core Components
  - 72 Strategies (34 Essential & 38 Optional)
  - 4-Page Grid for Easy Reference and Portability
Overview of STD Prevention, Control, and Program Management

Example: NCSD Core Component and Program Strategy – EPHS 7*

Ensure Availability and Access to Adequate STD Clinical Services for People at Risk for STDs
- Assess STD clinics by analyzing wait times, accessibility and other barriers. (Essential)
- Annually, conduct STD clinic patient satisfaction surveys. (Optional)
- Provide or actively refer STD clinic clients for family planning, HIV services. (Optional)

* EPHS = Essential Public Health Service
# 7 - Link People to Needed Health Services and Assure Provision of Health Care When Otherwise Unavailable

Example: NCSD Core Component and Program Strategies – EPHS 7*

Maintain and Support STD Screening Programs in High-Risk Settings Based on Assessment of Local Prevalence Trends
- Assure routine STD screening in family planning clinics, correctional facilities, and youth detention centers. (Essential)
- Support STD screening in adolescent and HIV testing and treatment sites. (Optional)
- Support STD treatment at primary health care sites where appropriate. (Optional)

* EPHS = Essential Public Health Service
# 7 - Link People to Needed Health Services and Assure Provision of Health Care When Otherwise Unavailable
### Which STDs to Prevent and Control?

- [Image of different STDs]

### Factors Influencing STD Transmission

- **Agent**
  - Genetic
  - Antibiotic Susceptibility and Resistance
  - Virulence
  - Infectiousness
  - Prevalence

- **Host**
  - Vaginal PH
  - Other STDs
  - Cervical Ectopy
  - Cervical Mucus
  - Menses
  - HIV Infection
  - Pregnancy
  - Anatomic Site of Exposure

- **Environment**
  - Sexual Behaviors
  - Substance Abuse
  - Health Behaviors
  - Socioeconomic
  - Sociobehavioral
  - Sociodemographic
  - Political
  - Technologic
  - Epidemiologic
Sexually Transmitted Pathogens-1

Transmitted in Adults Predominantly By Sexual Intercourse

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Viruses</th>
<th>Other*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neisseria gonorrhoeae</td>
<td>HIV-1 and HIV-2</td>
<td>Trichomonas vaginalis</td>
</tr>
<tr>
<td>Chlamydia trachomatis</td>
<td>HTLV-1</td>
<td>Phthirius pubis</td>
</tr>
<tr>
<td>Treponema pallidium</td>
<td>Herpes simplex virus type 2</td>
<td></td>
</tr>
<tr>
<td>Calymmatobacterium granulomatis</td>
<td>Human papillomavirus</td>
<td></td>
</tr>
<tr>
<td>Ureaplasma urealyticum</td>
<td>Hepatitis B virus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cytomegalovirus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Molluscum contagiosum virus</td>
<td></td>
</tr>
</tbody>
</table>

* Includes protozoa, ectoparasites, and fungi

Source: Control of STDs: A Handbook for the Design and Management of Programs: FHI

Sexually Transmitted Pathogens-2

Transmitted Sexually But Not Well Defined or Not Predominant Mode

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Viruses</th>
<th>Other*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mycoplasma hominis</td>
<td>HTLV-II</td>
<td>Candida albicans</td>
</tr>
<tr>
<td>Gardnerella vaginalis and other vaginal bacteria</td>
<td>? Hepatitis C virus</td>
<td>Sarcoptes scabiei</td>
</tr>
<tr>
<td>Group B streptococcus</td>
<td>Herpes Simplex virus type 1</td>
<td></td>
</tr>
<tr>
<td>Transmitted By Sexual Contact Involving Oral-Fecal Exposure</td>
<td>Human herpes virus type B Kaposi's sarcoma, Epstein Bar</td>
<td></td>
</tr>
<tr>
<td>Shigella spp.</td>
<td>Hepatitis A</td>
<td>Giardia lamblia</td>
</tr>
<tr>
<td>Campylobacter spp.</td>
<td>Entamoeba histolytica</td>
<td></td>
</tr>
</tbody>
</table>

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Factors to Consider When Determining What STDs to Prevent and Control

- Frequency
- Severity
- Cost
- Identifiability
- Preventability
- Communicability
- Public Interest
- Health Equity
STD Transmission Dynamics

Transmission Characteristics That Distinguish STDs from Other Infectious Diseases - 1

- Populations at risk are a fraction of the total population rather than entire population.
- The intensity of transmission is related to the distribution of sexual activities that facilitate transmission rather than the population density.
- Carrier phenomenon where persons are often asymptomatic for long periods of time is important in determining net rate of transmission.

Source: Anderson. STDs, Holmes et. al., 3rd Ed.

Characteristics That Distinguish STDs from Other Infectious Diseases - 2

- Many STDs induce little or no acquired immunity resulting in susceptibility to re-infection.
- Great variability in the course of infection, between first infection and the diagnosis of symptomatic disease.
- Patterns of STD infections in communities are characterized by great heterogeneity in transmission rates within and between different populations.
Who’s at risk for Acquiring/Transmitting STDs?

Persons who are:

- Ready to be sexually active (teens)
- Uninfected but susceptible to infection because of their behaviors or exposures
- Infected but not yet infectious to their sexual partners
- Infected and infectious to their sexual partners

Anderson–May Equation:
Foundation of STD Prevention & Control

\[ R_0 = \beta \times D \times c \]

- **R**\(_0\) Reproductive rate of infection - average number of secondary cases generated in a population by a primary case
- **\(\beta\)** Transmission efficiency - average probability of transmission per sexual contact
- **D** Duration of infection – differs by STD
- **c** Number of sexual partners per unit time – varies by sexual network


Interventions that Reduce or Prevent STD Transmission

Disease interventions should reduce or prevent transmission efficiency, duration of infection, and/or # of sexual partners.

\[ R_0 = \beta \times D \times c \]

- Sexual decision-making, abstinence, monogamy
- Screening, timely diagnosis & effective treatment, partner care
- Condoms, microbicides, minimize exposure
What are Core Groups and Their Role in STD Transmission?


What are Sexual Networks and Their Role in STD Transmission?


What are sexual networks and their role in STD Transmission?

Serial Monogamy - after A is exposed to infected partner D, the next partners E and F are potentially infected.
What are sexual networks and their role in STD Transmission?

**Concurrency** - given the same time period, after A is exposed to infected partner D, all four other partners (B, C, F and E) are potentially infected. **Concurrency facilitates more transmission than serial monogamy.**

Levels and Targets of Intervention

- **Primary Prevention**: Activities conducted prior to STD exposure to prevent transmission. **Upstream**
- **Secondary Prevention**: Activities conducted to enable early detection and treatment of an STD to prevent complications. **Midstream**
- **Tertiary Prevention**: Activities conducted to treat and reduce the severity of complications. **Downstream**
Targets of STD Interventions

- Individuals and Partnerships
  - Behavioral change, condom use
- Families & Communities
  - Schools, community-based organizations
  - Social marketing
- Structures
  - Healthcare systems
  - Educational systems
  - Mass media
  - Social and physical environment
  - Public policy

What Intervention Questions Should You Ask?

- **Why** – What’s The Need, What’s the Data Indicate?
- **Who** – General Population or Which Target Group?
- **What** – What Intervention, What Disease?
- **When** – Change the Intervention at What Stage of the Epidemic?
- **Where** – What Community and Venue for Which Disease?
- **How** – Collaborations, Staffing, Resources, Protocols, Political Support, Evaluation?

Sample Question: Which population should be targeted and why?

- Infected persons with high risk behaviors
  - High Priority
  - High Cost per Person
- Infected persons with low risk behaviors
- Uninfected persons with high risk behaviors
- Uninfected persons with low risk behaviors
  - Low Priority
  - Low Cost per Person

Source: Adapted, Sevgi Aral, CDC, DSTDP 2008
How Interventions, Core Groups and Networks Affect STD Transmission – G1

Indicate the Anderson May Variable for Each STD Prevention Activity Below and if the Intervention Would be Effective in Core Groups and Sexual Networks

<table>
<thead>
<tr>
<th>Program Activity</th>
<th>B</th>
<th>D</th>
<th>c</th>
<th>CG</th>
<th>SN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribute Condoms to Sex Workers</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Provide Treatment for GC Positive Test</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct Sex Partner Referral</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Promote Use of Oral Contraceptives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Anderson – May Variable
B = Transmission efficiency
D = Duration of infection
c = Number of sexual partners per unit time

Core Groups and Networks
CG = Core Group
SN = Sexual Network

 STD Prevention, Control and Management Overview Module: Key Take Home Messages

- Be able to use common public health concepts when explaining your program priorities, activities and operations.
  - IOM Core Functions – CDC Essential Elements – NCSD Core Components – 3 Levels of Prevention
- Be knowledgeable about the relationship between STD transmission dynamics and STD program interventions.
  - Anderson-May – Core Groups – Sexual Networks - Concurrency