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Assessment: A Core Function for Implementing Effective Interventions in Sexually Transmitted Disease Control Programs

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Abstract

Assessment is a core function in sexually transmitted disease (STD) prevention and control programs. Assessment is more than reviewing case report data; it includes taking into consideration an array of data of various sources and types to be able to respond to emerging disease threats, align human and financial resources, and plan for the future. In this article, we outline key assessment domains, data sources, activities, and methods for STD programs. We present an illustrative case study of how assessment can be used to identify effective interventions for STD control.

Assessment is 1 of 3 core public health functions, along with assurance and policy development. In 1988, the Institute of Medicine defined assessment as including “all the activities involved in the concept of community diagnosis, such as surveillance, identifying needs, analyzing the causes of problems, collecting and interpreting data, case-finding, monitoring and forecasting trends, research and evaluation of outcomes.”¹ In short, assessment is an understanding of the current situation—strengths, threats, and capacity to respond—used to inform the direction of future planning.

For sexually transmitted disease (STD) prevention and control programs, assessment means collecting and reviewing data on the incidence and prevalence of disease, determining which populations are most affected and where these populations are found, and understanding behavioral risk factors that contribute to STD acquisition and transmission. Assessment also includes collecting data on services for STD prevention, care, and treatment—which screening, diagnostic, and treatment services are being offered and where, which populations are using these services, and how well the current configuration, scope, and scale of services² meet current STD control needs.

Assessment also includes taking into consideration policy, community, or other environmental factors that have an impact on STD control. For example, local or state jurisdictions often have regulations and statutes that affect screening, data sharing, insurance

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coverage, or the content of health information. At a community level, cultural, social, or other contextual factors affect whether a program will be well received or can be feasibly implemented. Environmental factors include the availability of infrastructure for the intervention, such as laboratories and trained staff, and whether appropriate partners can be identified. Cost data need to be considered to determine whether the intervention will be sustainable.

Although case reports and other surveillance data comprise the core of STD program assessment activity, reviewing and considering an array of data sources results in a more robust understanding of STD trends and potential responses. Facility or program level data may need to be triangulated with data from national-level behavioral surveys or health services assessments. Data that characterize social and sexual networks may be important for understanding transmission patterns, whereas visual displays of data will help programs understand the geographic distribution of STDs.

Quantitative data help programs determine the frequency or magnitude of a problem, whereas qualitative data provide insight into motivations, practices, values, and processes that affect disease transmission, and the success or failure of interventions. Programs that use complementary methods of data collection and take into account different sources and types of data will develop a more holistic view of a program and a better understanding of its relation to the broader health system and community.

Assessment is part of a cycle of continuous program management and improvement, the goal of which is more efficient alignment and use of resources. The scope and scale of assessment depends on the size of the program, the assessment questions, and the available capacity and resources to conduct assessment. Regardless of these factors, programs need to think of assessment holistically, considering all of the available data and filling in data gaps whenever possible. Once interventions are in place, continued monitoring and evaluation are necessary to ensure that timely program adjustments are made and that interventions are achieving the desired goals.

Here we use a case study approach to review activities that are particularly relevant for STD programs, including assessment of morbidity, geographical, behavioral, health services, policy, and community-level data. By taking this approach, we aim to provide an overview of data sources and methods for assessment and to illustrate how conducting assessment activities can help identify effective interventions for STD control.

Case study:

State X's STD program recently received additional resources to augment its current program. To identify which effective interventions they should consider implementing, the state reviewed their available assessment data.

Morbidity

Disease morbidity data can be used to monitor trends in infection and identify outbreaks rapidly. Case report data for notifiable conditions, such as chlamydia, gonorrhea, and

syphilis, can be reviewed to determine which populations are diagnosed as having STDs and if there have been changes over time. However, case report data are limited as not all infections and sequelae are reportable conditions; not all important demographic, clinical, and behavioral factors are routinely reported (e.g., most gonorrhea case reports do not contain data on gender of sex partners); and trends in identified infections can be biased by screening coverage (as screening coverage increases the number of reported infections increases even if incidence is flat). Data from sentinel surveillance, such as positivity data from selected clinics³ and enhanced data collection from a random selection of cases,⁴ can be used to supplement case report data. In addition, review of administrative data, such as billing or pharmacy data, can further describe disease morbidity, particularly for those STDs that are not reported.⁵ Although state or local data are needed to describe morbidity trends in the community, national STD surveillance data help programs understand how local data relate to national trends.

Case study:

State X reviewed their case report data and found that over the past 3 years, rates of reported chlamydia had increased steadily, particularly in young women, whereas positivity data from family planning clinics remained flat. Gonorrhea case rates remained level and primary and secondary (P&S) syphilis rates increased 45%, with increases primarily among young men of color. In addition, 38% of young men with syphilis were HIV infected. The state reviewed national surveillance data and found that coinfection with HIV is common among men with syphilis and that, nationally, syphilis rates among men are increasing.

Geography

Mapping and spatial analysis can powerfully illustrate which communities bear the highest burden and risk of STDs and where to target interventions. Sexually transmitted disease morbidity data can be used alone or combined with community-level socioeconomic and service coverage data to describe areas with high burden of disease, identify groups at risk, and provide contextual insight to help target interventions.⁶⁻¹⁰ Local and state health departments regularly collect detailed patient address information for STD case management and reporting. Detailed demographic, social, and economic data at the census tract level and above are available from the US Census. Other potentially useful sources of data include crime statistics from local law enforcement, service coverage from area health departments, and information from local housing authorities.¹¹

Although the capacity to geocode case address information and conduct spatial analysis of these data varies widely, the last 2 decades have seen several instances of the innovative use of spatial data to support STD program activities. Many health departments use SAS, ArcGIS, and other commercially available tools to create sophisticated maps and charts. Powerful and low-cost open source software, such as R, make spatial analysis and map generation more accessible than ever. These tools can be used to create publication-ready maps and graphs for such diverse uses as epidemiologic profiles, surveillance reports, and press releases.

Many health departments regularly use GIS to analyze data at the census block, tract, or zip code levels. Two large cities, Chicago and New York City, make spatial data available online.^{12,13} Other jurisdictions lack sufficient resources to analyze spatial data internally, let alone publish to the Web. The National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention. Atlas allows for county-level analysis of total cases and rates for notifiable STDs.¹⁴ Tools like the National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention. Atlas, AIDSVu, and the Census Bureau's American Fact Finder enable programs to use location data for assessment, even in the absence of the ideal local GIS capacity.

Case study:

State X's review of county-level maps indicated that the increase in reported cases of P&S syphilis among young men of color primarily occurred in County Y, which has a midsized city isolated from the state's most urbanized areas. Further mapping of the data at the census tract level showed that cases were largely confined to the 2 census tracts with the highest poverty levels in the county.

Behaviors

Understanding risk behaviors associated with STDs in the community can help identify intervention opportunities by determining the populations most at risk for acquiring STDs, as well as modifiable risk factors for infection. Behavioral data can be collected and reviewed among the general population (e.g., data from population surveys such as the Youth Risk Behavior Survey), among persons diagnosed as having STDs (e.g., partner services data), and among populations at high risk (e.g., surveys of STD clinic patients).

Understanding where behaviors take place can also inform intervention opportunities. For example, after an increase in HIV diagnoses among young black gay, bisexual, and other men who have sex with men (MSM) in Mississippi, researchers conducted a series of structured interviews with young, HIV-infected MSM to identify where they met their partners and identified a number of public venues (e.g., bars and cruising areas) that could be targeted for testing and prevention interventions.¹⁵

Individual behaviors do not fully explain sexual risk for STDs.¹⁶ The context of a person's behavior, in particular their sexual network, has implications for STD transmission. A person may have multiple partners (a "high-risk" behavior), but if there is no disease in their sexual network, their chance of getting an STD is low. Conversely, a person may have only 1 sex partner (a "low-risk" behavior), but if the prevalence of infection is high in their sexual network, the probability of acquiring an infection may be high. In addition, a person's behaviors are influenced by their social and economic context. For example, persons who cannot afford quality health care may delay seeking care for an STD, increasing the risk that their partners will be exposed to untreated infection.

Case study:

State X reviewed national surveillance data and found that across the United States, most P&S syphilis cases are among young MSM. The state reviewed the literature and found that in some areas, methamphetamine use and using the Internet to find sex partners may be

contributing to the syphilis epidemic among MSM. The state reviewed County Y's partner services data and found that the 77% of the P&S syphilis cases in young men were among MSM and few cases reported using recreational drugs other than marijuana. Disease Intervention Specialist (DIS) case notes revealed that most of young MSM with syphilis in County Y found their partners on the Internet; however, DISs were not capturing the specific Internet Web site or application, nor were they using the Internet to conduct partner services.

Services

Clinic data can inform programs about what services are being provided in the community, as well as service uptake, to help identify intervention opportunities. In New York City, the health department reviewed medical record data from public STD clinics and found a high rate of STDs among women accessing emergency contraception (EC) services; however, few women were tested for STDs during the EC visit. Based on this assessment, the health department instituted a policy to offer STD screening during all EC visits at public STD clinics, resulting in higher screening rates and more infections identified and treated.¹⁷ Clinic data from publicly funded clinics, such as STD clinics, may be readily available, but it is also important to reach out to private providers to fully characterize services available in the community. In addition, assessment of laboratory testing and practices can help a program understand laboratory capacity in the community.¹⁸ Partner services data can also inform assessment of service delivery and acceptability. Indicators such as the number of patients located and the number of partners brought to treatment can help monitor service uptake,¹⁹ whereas interviews with DIS can help provide context to the indicators.

Service assessments also can provide information on geographic distribution of services. Are clinics located in areas of highest prevalence? How accessible are the services to public transportation? These questions can be answered through service mapping (e.g., geocoding cases and services) or through interviews with users of services.

Case study:

State X overlaid a map of clinics on a map of their syphilis cases and found that the only MSM-targeted clinic is 2 counties over from County Y. State X found that most syphilis cases in County Y are reported from the county STD clinic, with few cases reported by the community health center (CHC) that provides HIV care. The state contacted the CHC and found that only 40% of HIV-infected MSM were tested for syphilis last year. A review of partner services data showed that partner services acceptance is low among cases identified in the CHC.

Policy

Policies, defined as “laws, regulations, procedures, administrative actions, incentives, or voluntary practices of governments and other institutions,”²⁰ can significantly impact the success or failure of interventions. Many states have legal requirements that address STD screening, testing, and treatment among specific populations such as pregnant women, adolescents, or inmates.²¹⁻²³ State statutes can specify the content of health information, how and to whom vaccines or treatments are delivered, the way DIS interact with individuals

diagnosed as having STDs, and how confidential information should be protected. Sexually transmitted disease program managers need to assess whether and how existing or proposed legislation will affect interventions.

Program managers also need to assess and evaluate the impact of policy as an intervention. In states where expedited partner therapy for gonorrhea is explicitly authorized, more patients report receiving this intervention than in states where expedited partner therapy is not explicitly authorized, but where it may still be permissible.²⁴ Whether a state mandates opt-in or opt-out HIV testing can affect uptake of the HIV test.²⁵

Organizations responsible for maintaining public health and safety routinely establish rules and protocols that pertain to STDs. Statements issued by state medical and nonmedical boards (e.g., pharmacy) or other professional associations or institutions can have considerable influence.²⁴ Insurance regulations and reimbursement policies affect STD programs; for example, the Patient Protection and Affordable Care Act greatly expanded access to STD-related services. Management and operating policies that govern Internet use and security and data sharing within organizations also affect the way in which delivery of interventions such as partner services for persons diagnosed as having STDs and HIV is carried out.

Case study:

Although young MSM of color in county Yare using the Internet to find sex partners, DISs are not using the Internet for partner notification. A focus group with DIS indicated that the protocol for using the Internet to deliver partner services was never fully implemented. A review of County Health Department operational policies indicated that DISs have limited access to commonly used social media sites, and that Web sites with explicit sexual content, such as Adam4Adam.com, are completely blocked.

Disease Intervention Specialists reported delays in determining whether a syphilis case is coinfecting with HIV because they do not have direct access to the HIV database. Review of state statutes regarding confidentiality of HIV data showed that there are no legal barriers to allowing the STD program to have timely access to these data.

Community

Sexually transmitted disease program managers also need to consider the community context when planning for interventions. Qualitative and participatory methods that engage directly with stakeholders and community members are particularly useful for understanding perceptions about STDs, identifying barriers and facilitators to service uptake, and assessing receptivity to new interventions.^{26,27} Rapid assessment approaches can provide real-time, practical feedback to program managers and policy makers.²⁸ For example, assessments carried out in Detroit, Miami, and Philadelphia identified patterns in the time of day and week that risk activities, such as trading sex for drugs, were taking place. This information helped programs better structure service hours to reach vulnerable populations.²⁹ Rapid assessments have helped programs make adjustments to better serve MSM with syphilis and understand the organization of sex work in rural areas.³⁰

Case study:

To better understand the context of the epidemic in young MSM in County Y, the STD program carried out in-depth interviews and focus groups with MSM. Findings indicated that some MSM feel uncomfortable using the CHC after having had negative experiences with providers. Other MSM are reluctant to use partner services because of concerns about confidentiality. Many young MSM of color are unstably housed or homeless and out-of-school and spend a lot of time hanging out in a known cruising area. Men who have sex with men identified a small community-based organization (CBO) that provides social support and primary care services to unstably housed young men.

Moving From Data to Action

Sexually transmitted disease programs can consider findings across multiple sources and types of data, and across key assessment domains—morbidity, geography, behavior, services, policy, and community—to determine where, for whom, and what form interventions should take. Applying multiple approaches to a question and reviewing data from diverse and dissimilar data sets can help programs identify areas of convergence and divergence and obtain a more robust understanding of program needs. Assessment activities may lead to long-term planning and commitment of resources for major activities, such as opening a new clinic, or mounting a screening program targeted at a specific population. In other instances, assessments will indicate that smaller, more immediate program adjustments are needed to tailor services so they are used by those who most need them. Often, a combination of short- and long-term intervention planning is needed.

Case study:

State X outlined short- and long-term interventions to address increases in syphilis among MSM of color in County Y (Table 1). Short-term interventions include conducting provider visitation and ensuring standing orders and protocols are in place for screening HIV-positive MSM at the CHC, and ensuring that DISs are trained to use the Internet for partner services within current policies. The program also will work with the DIS and the local CBO to conduct outreach screening and distribution of condoms in the cruising area. State X also developed a long-term plan to implement clinical decision-making tools at the CHC to prompt providers to screen MSM for syphilis, to embed a DIS at the CHC, and to work within its own institution to remove barriers that prevent DIS from accessing Internet sites needed to maximize IPS. They also plan to work with the regional prevention training center to train local providers in MSM care principles.

In conclusion, assessment is an understanding of where the STD program stands in relation to potential threats to community health.³¹ Assessment, however, is more than tracking incidence and prevalence of disease; it includes knowing how well the program will be able to respond to future demands and aligning the human and financial resources to meet those demands. Planning for effective interventions requires, at a minimum, taking into consideration diverse sources of data from across several domains and using the findings to set direction and move toward program goals.

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TABLE 1.

Summary of Case Study of Assessment Activities to Prevent Syphilis Among MSM

Assessment Domain	Assessment Data Source	Key Findings	Short-Term Interventions	Long-Term Intervention	Desired Outcomes
<ul style="list-style-type: none"> Morbidity Geography Behavioral 	<ul style="list-style-type: none"> Case reports National surveillance data Data visualization and mapping 	<ul style="list-style-type: none"> High rates of syphilis among MSM of color Cases occurring within 2 census tracts in County Y 			
<ul style="list-style-type: none"> Morbidity Services 	<ul style="list-style-type: none"> Case reports Clinic data 	<ul style="list-style-type: none"> Most syphilis cases reported from STD clinic, with few reported by the CHC 40% of HIV-infected MSM seeking care at the CHC had an annual syphilis test. 	<ul style="list-style-type: none"> Provider visitation to increase awareness of syphilis increases and screening recommendations among priority providers Standing orders and protocols to ensure HIV-positive MSM are appropriately screened for syphilis 	<ul style="list-style-type: none"> Implementation of clinical decision support tools that prompt for syphilis testing at CHC 	<ul style="list-style-type: none"> More HIV-positive MSM screened for syphilis More HIV-negative MSM tested and know their HIV status
<ul style="list-style-type: none"> Services Policy 	<ul style="list-style-type: none"> DIS case notes Interviews with DIS Health department operational policies State statutes and HIV data sharing policies 	<ul style="list-style-type: none"> MSM finding partners on the Internet DIS not using Internet to find and notify contacts DISs do not know if a case is coinfecting with HIV. 	<ul style="list-style-type: none"> Ensure protocol is in place and DIS are appropriately trained to use the Internet for partner services 	<ul style="list-style-type: none"> Amend and update operational policies to facilitate DIS access to needed social media sites and technology Modify data-sharing policies to facilitate DIS timely access to HIV data 	<ul style="list-style-type: none"> More contacts to MSM syphilis cases are identified and receive timely treatment
<ul style="list-style-type: none"> Services Community Geography 	<ul style="list-style-type: none"> Service mapping Ethnographic mapping Interviews/ focus groups with MSM of color and key 	<ul style="list-style-type: none"> Some MSM have had negative experiences with the CHC, and do not feel comfortable using partner services. 	<ul style="list-style-type: none"> Work with DIS and the CBO to conduct outreach screening and distribute condoms in identified cruising area. 	<ul style="list-style-type: none"> Embed a DIS at the CHC to facilitate identification of partners Train local providers in 	<ul style="list-style-type: none"> Improved acceptability and quality of care results in more MSM seeking testing and treatment of STD/HIV

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Assessment Domain	Assessment Data Source	Key Findings	Short-Term Interventions	Long-Term Intervention	Desired Outcomes
	informants from the community	<ul style="list-style-type: none">• "Hot spots," and potential partners identified for enhanced outreach efforts		LGBT care principles	