STD PCHD

Strengthening STD Prevention and Control for Health Departments

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Technical Assistance Note #16 | Epidemiologic analysis

From Strategy Area V: Analyze and Use Data for Program Improvement

16. Conduct epidemiologic analysis, translation, and dissemination
    a. Conduct regular analyses of trends in, geographic distribution of, and factors associated with reported cases using core epidemiologic variables
    b. Disseminate, interpret, and discuss data and findings with internal and external stakeholders
    c. Assist local jurisdictions with analyzing their data on a regular basis, including analyses of trends, epidemiologic factors, and geographic distribution of cases, and help local areas identify outbreaks, gaps in services, or inequalities in the burden of disease that should drive resource allocation

Why DSTDP included this strategy

In STD PCHD, the analysis of STD surveillance data was elevated as its own strategy because of both the importance of this aspect of public health surveillance and need for STD PCHD recipients to ensure that staff have the skills and time required to analyze, interpret, and disseminate surveillance data effectively. Resources dedicated to collection and management of surveillance data may be wasted if the data are not analyzed and translated to public health action.

Public health surveillance – the systematic ongoing collection, management, analysis, interpretation, and dissemination of data to stimulate public health action — is a cornerstone of public health practice. While resources are often invested into collection and management of STD surveillance data, sufficient investment into analysis, interpretation, and dissemination is less common. Yet without these crucial steps, STD PCHD recipients may make programmatic decisions in the absence of information that could help target resources. Additionally, routine, timely, and frequent data analyses are critical for identifying possible outbreaks and emerging disease trends that may require rapid redirection of resources. Effective, timely, and targeted dissemination of data, such as sharing data with both internal and external stakeholders, can raise awareness of changing epidemiology, inform resource allocation decisions, and galvanize providers, affected population, and other stakeholders to take action.

In some jurisdictions, substantial public health authority and decision-making resides at the local level. State health departments have opportunities to assist local jurisdictions with improved data analysis, interpretation, and use for public health decision-making.

Key definitions

Stratification: The data analysis approach of splitting data into groups to uncover patterns and control for confounding. A simple example is to display male gonorrhea rates and female gonorrhea rates separately, thus stratifying gonorrhea rates by gender. Stratifying data by multiple variables (such as county and gender) can be useful for exploring patterns in the data.

Measure of association: A measure of association quantifies the relationship between two groups, such as comparing disease occurrence among one group with disease occurrence in another group. For example, a rate ratio is the ratio of rates of two groups.

Example: If the rate of reported gonorrhea among men is 120 per 100,000 males and the rate among women is 80 per 100,000 females, the rate ratio is 1.5 (120/80). This means that the rate of reported gonorrhea among men is 1.5 times the rate reported among women.

There are multiple measures of association, such as rate ratios, odds ratios, and prevalence ratios. The measure of association that should be calculated depends on the analytic study design. An association is not the same as causation and associations may be confounded.

Confounding: The distortion of a measure of association between an exposure and an outcome by a third variable related to both the exposure and the outcome.
Example: The association between county (exposure) and reported chlamydia rates (outcome) may be distorted by age (confounder) as chlamydia is most common among young women and age distribution may differ by county. For example, overall rates of reported chlamydia in County A are 2.5 times the rates of chlamydia in county B (rate ratio = 2.5). However, County A has a much younger population than County B. When stratified by age and gender, rates of chlamydia among women aged 15-24 years were similar in County A and County B (rate ratio = 1.1 in each county). In this scenario, age confounded the association between county and reported chlamydia rates. As shown here, stratifying can help determine if confounding is occurring.

Considerations for implementation
Conduct regular analysis of epidemiologic and surveillance data

- Identify data that could be used for epidemiological analyses of STDs in your jurisdiction, including, but not limited to, data from case reports, data collected during partner services or enhanced investigations, STD clinic data, data from other surveillance systems (such as eHARS or the National HIV Behavioral Survey [NHBS]), and Medicaid or other administrative claims data on healthcare services (such as chlamydia screening)
- Establish data sharing agreements with related programs, as needed, to ensure timely access to HIV, viral hepatitis, or other surveillance systems that contain important variables for analysis
- Conduct descriptive analyses to describe trends in STDs in your jurisdiction
  - Stratify rates by key variables (such as gender, race/ethnicity, age categories, and geography [county]) and investigate how rates differ by these variables and how rates may have changed over time
- Conduct analyses to understand which factors are associated with STDs in your jurisdiction.
  - Consider quantifying the measure of association between STDs and behaviors (such as use of geo-locating apps), clinical history (such as previous STDsor HIV co-infection), and other factors. These analyses can focus on identifying factors or populations that can be targeted for public health action
  - When interpreting measures of association, do consider possible confounders
- Consider creating and presenting maps of disease by geographic area (such as at the county or census tract level) to identify patterns. Overlaying additional data on the maps of disease, such as healthcare provider locations and socioeconomic indicators, may provide additional insight into the STD epidemic in your jurisdiction
- To go above and beyond, link available STD data with additional data sources, such as data on social determinants of health
- To go above and beyond, consider partnering with faculty and/or students at a local college/university to conduct more advanced epidemiologic analyses. Data sharing agreements can help ensure shared data adhere to your health department's and the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention's confidentiality and data security policies

Disseminate findings to internal and external stakeholders

- Identify key internal and external stakeholders for your jurisdiction
  - Internal stakeholders may include staff in the STD program (such as DIS), other health department sections (such as reproductive health or school health), and health department leadership
  - External stakeholders may include medical providers, laboratories (public and private), policy makers, and school officials
- Hold routine (perhaps quarterly) meetings between data management, epidemiologic, and programmatic staff to review data, identify additional analyses that would inform decision-making, and discuss contextual factors that may be contributing to findings
- On at least an annual basis, generate a summary report that provides the most current data on STDs in your jurisdiction, as well as important trends over time. Disseminate the report and other data summaries to key internal and external stakeholders
  - Do keep tables and figures simple and uncluttered
  - Don't share multiple tables or figures without any summarization or interpretation
  - Do consider creating and disseminating power point slides to accompany summary reports
- Consider creating additional materials that are tailored to the needs of specific audiences (such as healthcare providers)
  - Consider asking stakeholders what kinds of data and in what format are most useful
  - Novel presentations of data, such as infographics, may be an effective way to communicate information.
- Consider presenting the findings from your epidemiological analyses at local and national scientific conferences, as well as publishing your findings in peer-reviewed journals and *Morbidity and Mortality Weekly Reports* (*MMWRs*)
- To go above and beyond, develop an online query system for stakeholders to access data

 Do not spend time creating complicated data reports that are run frequently and never reviewed! To ensure data are translated into public action, ensure that findings are discussed and meet the needs of stakeholders.

Assist local jurisdictions to analyze and use data

- Identify a point of contact in your health department who will provide technical assistance to local jurisdictions on ways to analyze and use their local data
- Don't assume that local jurisdictions have the capacity to analyze and interpret their local data
- Consider periodically providing a brief summary report to local jurisdictions that highlights key trends in the STD epidemic in their area. This could be an automated report that is run and disseminated quarterly
- Consider creating and sharing a template for a report that a local jurisdiction could complete independently using their own data
- To go above and beyond, have local jurisdictions present their analyses of their local data at a jurisdiction-wide conference or webinar

 This strategy is closely related to routine surveillance (see TA Notes #1 - #5). Those efforts describe the methodology for collecting and managing surveillance data, including reviewing data quality.

 Additionally this strategy is related to outbreak response (see TA Note #6) which provides more detailed information on how to detect and respond to an increase in disease in your jurisdiction.

Other resources

- 2017 STD Surveillance Report: https://www.cdc.gov/std/stats17/default.htm
- NCHHSTP Atlas Plus: https://www.cdc.gov/nchhstp/atlas/index.htm
- Principles of Epidemiology in Public Health Practice, Third Edition. An Introduction to Applied Epidemiology and Biostatistics. Available at: https://www.cdc.gov/ophss/csels/dsepd/ss1978/
- Sources for data on social determinants of health: https://www.cdc.gov/socialdeterminants/data/index.htm
- Data visualization resources for presenting data effectively:
    - http://stephanieevergreen.com/wp-content/uploads/2016/10/DataVizChecklist_May2016.pdf
    - https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/STD-Data-Infographic-Resources-for-STD-Prevention.aspx
    - https://www.cdc.gov/std/products/infographics.htm