CLINICAL SURVEILLANCE: BRINGING ROUTINE CLIENT-LEVEL HIV DATA TOGETHER TO CONTROL HIV

OVERVIEW

The accurate capture, analysis and interpretation of high-quality data is essential to developing public health policies for achieving HIV epidemic control. HIV programs generate large amounts of potentially useful data while providing services to people living with HIV (PLHIV). In fact, some of the most important information needed to understand the HIV epidemic as well as the impact of HIV programs, such as HIV diagnosis, viral load suppression, retention on treatment, and mortality, exist in the clinical records at the point of HIV-related service delivery; however, these data frequently exist in medical and laboratory records that are not easily accessible nor used in decision-making.

Clinical surveillance systems capture data from programs, such as antenatal care/prevention of mother-to-child transmission (ANC/PMTCT), HIV testing and counseling, laboratory, and treatment programs, and organize them for analysis and use. In HIV programs supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), surveillance systems include ANC surveillance, HIV case-based surveillance (CBS) systems, HIV recent-infection surveillance among newly diagnosed PLHIV, HIV drug-resistance surveillance, mortality surveillance, and laboratory-based HIV surveillance. Clinical surveillance systems also link to data from other public health data sources, such as vital registration systems and tuberculosis control programs, to track data collected outside of HIV programs that are critical to measuring the impact of HIV interventions. Clinical surveillance systems capture and analyze data to estimate the burden and distribution of HIV; monitor the uptake of key HIV prevention, treatment, and laboratory services; and measure key clinical and public health HIV-related outcomes.

CDC'S ROLE

The U.S. Centers for Disease Control and Prevention (CDC) has supported host-country governments in strengthening routine patient-level health information systems (HIS) for effective implementation of HIV prevention and treatment programs since the inception of PEPFAR. CDC subject matter experts assist countries in developing HIS and automated health information exchanges to report longitudinal information on persons diagnosed with HIV infection through the cascade of care, including linkage to treatment, viral suppression, HIV drug resistance, adverse events, and death. By linking routinely collected patient data from HIV testing services, treatment patient monitoring, pharmacies, laboratory information systems, and vital statistics systems, HIV CBS allows countries to monitor epidemic trends and programmatic impact to direct a targeted public health and programmatic response.

New rapid tests for recent infection detection developed by CDC scientists are now being used to detect recently acquired HIV infection (infection occurring, on average, in the past six months) among newly diagnosed PLHIV. In combination with demographic and behavioral indicators, these results enable countries to establish a real-time public health surveillance and response system where data are immediately used to identify potential clusters associated with recent and ongoing transmission and investigated to deliver interventions to those that need it the most. At the program level, these data are used to enhance prevention interventions to improve case detection strategies and prevent transmission to HIV-negative contacts, without altering routine services.

CDC has also supported the establishment of routine, sustainable ANC/PMTCT sentinel surveillance in PEPFAR-supported countries. CDC has worked with the World Health Organization (WHO), UNAIDS, and other partners to develop guidelines for assessing the utility of PMTCT program data for surveillance,[1] as well as guidelines on using PMTCT program data for HIV surveillance among pregnant women.[2] These two documents established global standards and technical guidance for conducting HIV surveillance among pregnant women. Additionally, CDC developed a strategy document[3]that translates and adapts these global guidance documents for use by PEPFAR-supported countries. Data from these systems are one of the key sources of information for models generating global and national HIV estimates.

[1] WHO. Guidelines for assessing the utility of data from prevention of mother-to-child transmission (PMTCT) programmes for HIV sentinel surveillance among pregnant women, http://apps.who.int/iris/bitstream/10665/85512/1/9789241505611_eng.pdf

[2] WHO. Guidelines for conducting HIV surveillance among pregnant women attending antenatal clinics based on routine programme data, http://www.unaids.org/sites/default/files/media_asset/SurveillanceRoutineProgrammeData_en.pdf

[3] CDC Division of Global HIV and Tuberculosis. Strategy for ANC surveillance based on routine program data: prospective sentinel surveillance design in a quality monitoring and strengthening framework.

Examples of specific clinical surveillance activities include:

1. Development of technical guidance and tools for CBS. Working with PEPFAR-supported countries in planning, implementation, and/or data use of HIV case reporting and CBS activities.
2. Development of technical guidance and tools for HIV recent-infection surveillance among persons with newly diagnosed HIV infection. Working with PEPFAR-supported countries in planning, implementation, and data use of recent-infection surveillance activities.
3. Monitoring trends in mortality in PLHIV. Working on bio-marker based mortality surveillance in two PEPFAR countries and civil registration and vital statistics strengthening in three PEPFAR countries to understand the causes of death for PLHIV in order to improve care.
4. Working with PEPFAR-supported countries in the planning and implementation of HIV Drug Resistance surveys and surveillance
5. Monitoring viral load and early infant diagnosis access and performance. Monitoring and surveillance is needed to ensure validity, accuracy, and utility of these data.
6. Conducting complex analyses using laboratory monitoring data, including CD4 depletion models to estimate HIV incidence and measurement of durable viral suppression among patients on antiretroviral therapy (ART).
7. Conducting analysis of PEPFAR monitoring and evaluation program data to monitor HIV prevalence trends among pregnant women.

ACCOMPLISHMENTS / RESULTS

CDC supported development of the 2017 WHO Consolidated Guidelines on Person-centered HIV Patient Monitoring and Case Surveillance.[4] As an addendum to these guidelines, CDC, in partnership with the National Association of State and Territorial AIDS Directors and WHO, has developed a technical "how-to" guide for countries building and strengthening CBS systems. Utilizing these strategies, CDC is currently supporting the development of HIV case reporting and CBS in over 20 PEPFAR-supported countries. Staff have also supported a landscape assessment of CBS in 40 PEPFAR-supported countries in 2017 and 2018.

CDC supported the development of PEPFAR 2018 Country Operational Plan guidance on CBS and recent-infection surveillance. Between 2017 and 2018, CDC also supported field evaluations of programs including the rapid test for recent infection in Central America (routine HIV testing services); adolescent girls and young women attending ANC in Malawi; and key populations and HIV testing clients in Vietnam, and found acceptable performance in all instances. CDC is supporting the expansion of rapid recent-infection testing among newly diagnosed PLHIV, with linkages to case reporting and index testing programs in 15 countries in sub-Saharan Africa and Haiti. Data will be used to identify potential clusters of transmission, improve case detection, and interrupt transmission.

Finally, CDC has developed resource documents for clinical surveillance priorities including protocol guidance for antenatal clinic surveillance and HIV CBS; a toolkit for planning, implementing, and using data from CBS; a toolkit for planning, implementing, and using data from recent infection surveillance; template protocols for recent infection surveillance, newly diagnosed HIV case reporting, surveillance of acquired HIV drug resistance, and bio-marker based mortality surveillance; and PEPFAR guidance on establishing CBS and HIV recent-infection surveillance.

FUTURE EFFORTS

A barrier to the implementation of clinical surveillance system is the lack of highly developed and integrated laboratory, clinical, and reporting systems that can ensure unique, secure, and confidential use of routine patient-level HIV information for surveillance purposes. CDC is working with WHO, UNAIDS, and others to develop guidance for patient monitoring, as well as standards for unique identifiers, data security, and interoperability. CDC is also working with PEPFAR-supported countries to develop surveillance strategic plans. These plans aim to support surveillance as well as monitoring and evaluation systems that collect and provide the data necessary to guide both PEPFAR and partner governments' HIV control activities.

BENEFITS OF OUR WORK

As a key PEPFAR implementing partner, CDC relies on scientific evidence to create efficient methods and programs, including clinical surveillance systems, which accelerate progress towards HIV epidemic control. Clinical surveillance systems assist PEPFAR-supported countries' efforts to control HIV and support achievement of global epidemic control targets. CDC efforts further PEPFAR's impact and progress towards achieving global HIV goals.

[4] World Health Organization. Consolidated guidelines on person-centered HIV patient monitoring and case surveillance, 2017. https://www.who.int/hiv/pub/guidelines/person-centred-hiv-monitoring-guidelines/en/