Kenya AIDS Indicator Survey 2012

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Surveillance—the routine, systematic collection of data about disease frequency and distribution; the analysis of those data; and the dissemination of that information to those who need to know—is a cornerstone of public health action.[1] Surveillance has played an important historical role in the global response to HIV/AIDS, alerting the world to the gravity of the pandemic, providing data on which major funding decisions were based, allowing appropriate targeting of intervention efforts, and evaluating and monitoring the response. Despite the complexity of measuring HIV infection, morbidity, and mortality, data on the global distribution of HIV/AIDS are among the most robust in all of global health.

Traditionally, estimates of national and global burdens of HIV infection have been derived from mathematical modeling applied to sentinel HIV prevalence data among pregnant women.[2] Early on, sentinel studies among persons with sexually transmitted infections and blood donors contributed additional information. So-called "second generation surveillance" introduced in the early 2000s emphasized adapting approaches to local country contexts, addressing the surveillance needs of key populations at high risk of exposure to HIV infection, collecting information to monitor and measure the impact of HIV services, and incorporating appropriate behavioral measurements to give integrated insight into biomedical data.[2] Despite these improvements, increasing experience with population-based surveys showed that extrapolations from sentinel surveillance data frequently yielded excessively high estimates of population HIV prevalence, and the role and utility of these national HIV prevalence surveys quickly became recognized.[3] The substantial downsizing of global estimates of HIV infection that the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) undertook in 2007 can largely be ascribed to the insights provided by population-based surveys in different countries.[4]

Over 30 countries, most in sub-Saharan Africa, have conducted population-based surveys of HIV infection, with Botswana, South Africa and Kenya standing out by having supported 4 such studies this century. In Kenya, 2 surveys incorporated HIV testing into routine Demographic and Health Surveys, and 2 were special AIDS Indicator Surveys.[5–8] These surveys have yielded nationally representative data on HIV prevalence in men, women, and for the first time in 2012 in Kenya, in children. Clear insights have been provided into the complex age-specific, urban–rural, and regional differences within the country; the impact of male circumcision; behavioral and other factors associated with HIV infection; HIV testing behaviors and knowledge of HIV serostatus, including within stable relationships; blood and injection safety; and the association at a population level of HIV with previous tuberculosis and sexually transmitted infection syndromes. The 2012 Kenya AIDS Indicator Survey (KAIS 2012) also examined orphans and vulnerable children as well as key populations. These surveys have given representative insights into the trends in national epidemics.

KAIS 2012 was innovative in several ways. Data were collected by trained field staff using robust tablet devices that allowed real-time data entry and transmission to a central location on a daily basis, thus facilitating data quality enhancement and oversight, and shortening the time required for survey completion. Blood was collected from study participants for later testing for HIV, CD4 counts, and viral load at the central reference laboratory, but participants who wished to know their HIV and CD4 status were offered point-of-care testing with immediate return of results, and if necessary, referral for care.

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The study assessed coverage of the HIV-infected population with essential interventions, including voluntary medical male circumcision, prevention of mother-to-child transmission of HIV services, and antiretroviral therapy (ART), allowing direct comparison of results with programmatic data. Viral load testing allowed assessment of suppression of viral load at the population level, as well as clarifying the state of the HIV/AIDS treatment cascade. Assessment of treatment coverage also allowed estimation of additional numbers requiring ART if Kenya were to adopt WHO's latest recommendations concerning initiation of ART at a CD4 threshold of 500 cells per microliter. Applying tests recognizing recent HIV infections allowed estimation of national HIV incidence. Finally, because the sampling framework was similar to that used in the 2007 KAIS, comparisons could be made across time.

Despite the rich data provided, population-based surveys also suffer from potential weaknesses and no single surveillance approach provides all relevant information. Sources of bias in population-based surveys include participation bias from nonacceptance or absence from the household for reasons potentially associated with HIV such as illness, migration, or high-risk activities away from home. Cross-sectional studies cannot measure true overall burden such as orphanhood if children have died along with their parents. Almost half of all HIV-infected children die before the age of 2 years without ART and may not be captured in surveys. Key populations such as men who have sex with men and female sex workers will likely be under-represented, and special studies are required for better characterizing these special groups. These surveys also rely on self-reported information, which may not necessarily be accurate. Finally, population-based surveys are complex to conduct, time-consuming, and expensive, and the estimates of HIV prevalence obtained remain necessarily incompletely precise and subject to the influence of biases and chance.

Costing about 7.5 million US dollars, KAIS 2012 has provided essential and representative data on HIV/AIDS and Kenya's response, which provide a yardstick against which to monitor future progress. While this sum seems high, countries generally invest considerably less than 10% of their HIV/AIDS budgets in strategic information, despite widespread commitments to base action on evidence. We believe a study of this cost and complexity to be well justified every few years, with continuous application of other surveillance approaches during the years in between. As ART coverage increases and reduces mortality and HIV incidence, HIV prevalence trends will become increasingly difficult to interpret, necessitating diverse approaches and use of modeling techniques, as well as estimation of HIV incidence from tests of recent infection.

We are pleased to present this special supplement highlighting the key findings of KAIS 2012, which coincides with the release of the Kenya Ministry of Health's definitive report for the survey. The results of KAIS 2012 show substantial progress and impact from Kenya's HIV/AIDS programs. Kenya is on track to achieve universal access, virtual elimination of pediatric HIV disease, and a society where male circumcision is the norm. Population-based surveys will remain key to monitoring progress, as will efforts to assure unique identifiers, enhanced national vital registration capacity and electronic medical records that allow cohort analysis of all citizens receiving ART. The essentials of an AIDS-free generation[9]—greatly reduced HIV incidence in adults, virtual elimination of HIV infection in children, and essentially normal life span for HIV-infected persons through ART—should be achievable, and surveillance must track that achievement.

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