

Chapter 6: Impact Indicators

Overview

The best measure of the long-term impact of all HIV prevention activities is the HIV incidence rate, namely the number of new cases of HIV infection per year divided by the number of HIV-negative individuals in the population at the start of the year. Data on HIV incidence are scarce, however, and usually from small groups, not nationally representative samples. It is easier to measure the prevalence of HIV infection — the proportion of the total population that is infected with HIV.

The goal of HIV prevention programmes is to reduce the transmission of HIV. Since people aged under 25 have had a relatively short time in which to become infected, most prevalent infections in this age-group will have been recently acquired. Prevalence in this group can therefore be a good measure of the rate at which the epidemic is progressing and can show where prevention programmes are making a difference. The number of new HIV infections that occur among young people may reflect behaviour change occurring amongst all age groups because young people can be infected by older partners. It is important to be able to construct a good measure of both the proportion of young people infected with HIV and the trends in the prevalence of HIV infection over time. Changes in HIV prevalence among a particular group can occur for many reasons. It is almost as important to be able to explain changes in prevalence as to be able to detect these changes as they occur.

This section defines indicators that describe levels of HIV infection among young people.

Indicator	Tools for Measurement	Priority Generalized Epidemic	Priority Concentrated/ Low level
1. HIV prevalence among young pregnant women	<ul style="list-style-type: none"> ○ Sentinel surveillance 	C	A
2. HIV prevalence among young people in community based surveys	<ul style="list-style-type: none"> ○ Nationally representative general population survey 	C	A
3. HIV prevalence in sub-populations of young people with high-risk behaviour	<ul style="list-style-type: none"> ○ UNAIDS/WHO Second Generation Surveillance Guidelines ○ FHI guidelines on sampling in sub-populations 	A	C
4. Young people who have a sexually transmitted infection	<ul style="list-style-type: none"> ○ Surveys among clinic-based groups (ANC attendees, gynaecology patients, blood donors, etc.) ○ Community-based surveys 	A	A

1. HIV prevalence among young pregnant women

Priority: Core in generalised epidemics, additional in others

Definition

Proportion of young pregnant women that test positive for HIV during 'unlinked anonymous sentinel surveillance' at selected antenatal clinics

Target Population

Pregnant young women, aged 15-24 years

Numerator

Number of pregnant young women who test positive for HIV infection using an unlinked anonymous testing protocol, while attending antenatal clinics (ANC)

Denominator

All young pregnant women who are tested for HIV infection using an unlinked anonymous testing protocol, while attending antenatal clinics

Measurement tools

UNAIDS/WHO Second Generation Surveillance guidelines

What it measures

In most countries, young women who attend antenatal clinics are a reasonably representative sample of young women in the general population. Young women who are pregnant have, by definition, had unprotected sex sometime in the last ten months and have therefore potentially been sexually exposed to HIV infection. They will not be, on average, a group characterized by other high-risk behaviour. Participation bias is relatively low in this sample because HIV testing is carried out anonymously with blood that is routinely taken from all pregnant women for other routine tests. Most HIV infections among young women will have been recently acquired. Trends in HIV prevalence in this group may therefore reflect trends in the incidence of new HIV infections.

How to measure it

HIV prevalence is estimated from the unlinked anonymous testing of blood samples that are routinely taken from pregnant women of all ages at sentinel antenatal clinics. The quality of these data depends on the structure of the surveillance system. An ideal sentinel surveillance system would include clinics chosen to reflect a country's urban, rural, ethnic and other socio-geographic divisions. The methods used for surveillance should be the same in all sites.

The indicator should be reported as a percentage and presented separately for age in three groups: 15–19, 20–24 and 15–24. It should also be reported by parity in two groups — primigravidae and multigravidae. If the sample is large enough the results can be presented

disaggregated by both age and parity. Parity is important because prevalence among women having their first pregnancy provides a better estimate of incidence.

The mean prevalence should be reported, together with the number of clinics contributing data, the total number of women tested, and the total number of women who tested positive for HIV infection. The data should be presented for the capital city, other urban areas, and rural areas.

Strengths and limitations

In countries where the epidemic is heterosexually driven, this indicator gives a fairly good idea of relatively recent trends in HIV infection nationwide. It is less reliable as an indicator of overall epidemic trends in areas where the bulk of HIV infection remains confined to sub-populations with especially high-risk behaviour. In these circumstances it is a useful way of monitoring whether HIV infection is spreading beyond these sub-populations.

To interpret changes in ANC prevalence it is important to isolate real changes in the proportion of young women who are infected with HIV from artefacts of the surveillance system. The HIV prevalence observed among young women attending ante-natal clinics may change for a number of reasons not directly connected with the true prevalence of HIV infection among young women in the general population. Changes that affect the number of young women who become pregnant, the proportion of those who seek antenatal care, and the stage of the pregnancy at which a woman first visits an antenatal clinic could all affect the HIV prevalence observed at ANC. Some of these changes, such as an increase in the age at first sex, may also affect the incidence of new HIV infections among young women. As a result, trends in the prevalence of HIV infection among young pregnant women should be interpreted carefully.

When monitoring trends, the sample composition is very important. The representativeness of the clinic sample is only as good as the data on which the sampling frame was based. Accurate information about the size and location of the clinics means that this can be treated with more confidence.

Interpretation will be easier if the same sample of clinics is used in several rounds of surveillance. The size of the clinics has to change considerably before the sample will cease to be representative. If prevalence appears to be changing, it may make sense to retain the same sample long enough to establish whether a trend is emerging.

HIV prevalence among young pregnant women can also be used to estimate HIV prevalence among young women in the general population. Software is available (at www.UNAIDS.org) to develop the adjustments necessary to make these data representative of the population. However, estimation is beyond the scope of this guide.

2. HIV prevalence among young people in community-based surveys

Priority: Core in generalised epidemics, additional in others

Definition

Proportion of young people who test positive for HIV in a general population survey

Target Population

15-24 year olds

Numerator

Number of young people who test positive for HIV infection

Denominator

All young people tested

Measurement tools

Nationally, or regionally, representative community based surveys, which include collection of suitable biological specimens.

What it measures

Data from community-based surveys are potentially the best source of data on HIV prevalence among young people in the general population. However, they may not provide good estimates for subgroups of the youth population (e.g., IDUs) whose behaviour would place them in a group at high risk of HIV infection, because a community-based survey is unlikely to find sufficient people in these categories to make a representative sample.

Data for this indicator is not as feasible to collect as ANC surveillance data is, for two main reasons. The first is that because very few such surveys have been carried out, there is not enough evidence to recommend that these data be used as an essential part of the HIV/AIDS monitoring among young people. The second is that surveys of this sort are expensive and time-consuming. To provide robust estimates of prevalence trends, they must be repeated at regular intervals in a comparable manner. If such a survey can only be carried out at infrequent intervals, the findings can be compared with the results from ANC surveillance

How to measure it

This indicator should be reported as a percentage broken down by sex and by age in three groups: 15-19, 20-24, and 15-24. The unweighted sample sizes and response rates should be given for each category. The HIV testing protocol should also be given.

Strengths and limitations

The findings of a general population survey can be taken at face value, provided the survey is truly representative of the population in which it was carried out.

General population surveys approach participants, while most other methods of data collection rely on participants presenting themselves at the place where HIV testing is being carried out. This means that the selection and participation bias should be less important in these surveys. If the survey's sampling frame is inaccurate, however, or if the survey is badly implemented, there may still be some selection bias. Participation bias is potentially a greater problem. The extent of participation bias will be influenced by the topic of the survey and the protocol under which the HIV testing is carried out. The factors of particular concern are those that may relate to the HIV status of the potential respondent (e.g., high-risk sexual behaviour). If the individuals who chose not to participate differ markedly from those who do participate on such characteristics, the accuracy of the HIV-prevalence estimates may be affected.

If basic information is collected from those who do not take part in the survey (or in part of the survey) ,participation bias can be detected, although not corrected, at the analysis stage. Response rates for the survey should always be reviewed and presented where possible.

A potentially serious limitation of community- based survey data is lack of continuity. Because surveys are expensive and time-consuming, the scope and format of successive surveys may vary. This introduces an unquantifiable error into the estimates. Reliable data on HIV prevalence over time requires a series of comparable surveys to be carried out periodically in the same population.



3. HIV prevalence in sub-populations of young people with high-risk behaviour

Priority: Core in concentrated epidemics, additional in others

Definition

Proportion of young members of defined sub-population at higher risk of contracting or transmitting HIV infection who test HIV positive

Target Population

Members of a high-risk group, aged 15-24 year olds

Numerator

Number of young people in a high-risk group who test positive for HIV infection

Denominator

Young people at high risk of contracting or transmitting HIV

Measurement tools

UNAIDS/WHO Second Generation Surveillance guidelines; FHI guidelines on sampling in sub-populations.

What it measures

This indicator is most useful in countries where HIV infection has not spread to the general population but remains concentrated in certain groups. The prevalence of HIV infection among members of these groups identifies important areas/groups for intervention. Trends in prevalence can indicate whether interventions are having an impact or whether some other factors are driving prevalence up or down.

In a concentrated epidemic, the groups of interest generally include one or more of the following: injecting drug users, men who have sex with other men, sex workers and frequent clients of sex workers, and street children.

How to measure it

This indicator should be reported as a percentage broken down by sex and by age in three groups: 15–19, 20–24 and 15–24. Any data available on young people of 10 to 14 years can also be given. The sample sizes should be given for each category. The HIV testing protocol used should be given. It may be appropriate to give estimates disaggregated by the duration of risk-group membership.

Surveys conducted among high-risk groups should not sample only young people; instead, this indicator should be based on the data from a subset of respondents. It is important that surveys among high-risk groups cover a sufficiently large sample to provide reliable estimates for young people.

If sample sizes are small and such subdivisions would prejudice anonymity, or if the information is not available in relation to HIV status, it is not necessary to provide the prevalence data subdivided by age or duration of group membership. Instead, the age distribution of whole group should be reported, regardless of HIV status. The group can be described in three age groups: <15, 15–19, 20–24. Where available, the median duration of risk-group membership should be reported for each age-group.

Tracking HIV in sub-populations can be logistically and ethically difficult, especially if the groups are marginalized or their activities are illegal. Sampling and estimation of total population sizes are key issues. An understanding of how the sampled population relates to any larger population sharing similar risk behaviour is critical to the interpretation of the indicator. For some groups, population-based sampling strategies will be necessary. In other cases, sentinel sites are available. Sentinel sites for these populations tend to be linked to the provision of health services – for example, a men’s health clinic in an area with a high concentration of gay sex bars, or a drug rehabilitation centre.

Strengths and limitations

A limitation of surveys among high-risk groups is that it is not usually possible to find a representative probability sample. This indicator will, at best, represent the members of the sub-group with high-risk behaviour from which the sample was drawn, and may not represent all persons displaying that behaviour. This means that it is difficult to estimate the extent to which an indicator based on these data will describe prevalence among all members of the group. Information on the size of the high-risk groups is necessary to put this prevalence data into a national (or regional) context.

Because of the difficulties in access to sub-populations, the biases in sub-population sero-surveillance data are likely to be far greater (and much less predictable) than those in data from a more generalized population, such as women at antenatal clinics. Where sentinel sites provide health services to the sub-population in question – for example, the use of the facility may be associated with problems that are themselves related to HIV infection.

It is especially difficult to minimize biases associated with age, since the age of participation in especially high-risk behaviour may be very variable. Chronological age is less important in a high-risk group than duration of membership of the group when it comes to explaining observed patterns. It is essential, however, to collect and present data by age because it is this information which allows the targeting of interventions and policies.

Changes in HIV prevalence in these groups could reflect the success or failure of prevention attempts but they may also reflect change in recruitment and exposure, which are unrelated to prevention efforts. This indicator should be considered in conjunction with the behavioural indicators that refer to membership and activity of high-risk groups, because changes in recruitment to, or exit from, the group could be responsible for change in observed prevalence. Prevalence will also be affected by changes in the number of new infections and in mortality.

Despite these difficulties, it is essential to track HIV infection in those with higher-risk behaviour in concentrated epidemics. The information will not be perfect, but some measure of progress or of lack of progress will be essential to maintain support for prevention programmes in critical sub-populations

4. Young people who have a sexually transmitted infection

Priority: Additional

Definition

Proportion of diagnostic tests for an STI conducted in young people that confirm the presence of an STI

Target Population

15-24 years

Numerator

Number of diagnostic tests carried out for patients aged 15-24 years which confirm the existence of an STI

Denominator

Total number of diagnostic tests carried out for patients aged 15-24 years *

*NOTE: The type(s) of STI should be dependent on what is locally important. If more than one infection is considered, the results should be given separately.

What it measures

In countries where HIV infection has yet to take hold, this indicator gives some idea of the potential for HIV to spread.

In populations where HIV infection is established, STI prevalence can be used as an additional way to monitor the levels of risky sexual behaviour. Once HIV infection is established in a population it is more difficult to generalize about the interpretation of this indicator. This is primarily because the epidemiology of STIs do not necessarily follow that of HIV, since most STIs have a shorter duration of infection, many are transmitted more easily than HIV, and most can be treated and cured.¹ If STIs are to be used as a marker for risk behaviour, additional information is needed on the incidence of new infections and on treatment.

In countries where health facilities are universally available, the number of new STI diagnoses in a defined region can be used as a proxy measure of incidence. This is most useful for monitoring trends, because the absolute number depends on the number of undetected infections in the population, but trends in new diagnoses could reflect changing rates of infection.

How to measure it

¹ <http://www.doh.gov.za/docs/reports/2000/hivreport.html>

This indicator should be given as a percentage and presented separately by sex in three age groups: 15–19, 20–24 and 15–24. If data are available for young people aged 10 to 14 years, these should also be presented.

The prevalence of an STI must be determined from laboratory diagnoses of infection, because many STIs are asymptomatic and many STIs have similar symptoms, which makes an accurate clinical diagnosis difficult. It is recognized that in many countries, the availability of suitable laboratory facilities is limited and that this may restrict the sources of data for this indicator.

This indicator places one limit on the source of the data. Data should not be collected from STI-clinic patients, or from any other group for which a test is being carried out because the person has STI symptoms. This is because this group is very highly selected and the prevalence of infection amongst the group does not provide information on the prevalence of infection amongst young people in the general population. Suitable groups or sources of groups include young women attending ANC, gynaecology patients, family-planning-clinic screening programmes, occupational screening programmes, blood donors or from community-based surveys. The interpretation of this indicator will depend on the source of the data, and the source must therefore be reported with the indicator estimates.

Strengths and limitations

This indicator does not necessarily give information on how many people are infected with STI. Using the number of requests for diagnostic tests in the denominator, instead of people, means that the results will be difficult to generalize to the population, if the source is routine clinic-based data. If the data are from screening programmes or community surveys it will be easier to relate this indicator to STI prevalence because each test will correspond to one person.

Selection and participation bias are likely to be problems if the indicator is based on data from health services: those attending are likely to be systematically different from those who do not attend and those who consent to an STI test are also likely to be different from those who do not consent. It is impractical to limit this indicator to those STI that can be diagnosed from samples taken for other purposes, as some of the more important STI cannot be diagnosed in this way.

If the data are derived from a screening programme or survey, for which people are sought for testing rather than vice versa, selection bias is less of a problem. If the survey uses unlinked anonymous testing, participation bias will be minimized. As a screening programme cannot by its nature be anonymous, participation bias must be considered.