Part 2

WORLD HEALTH INDICATORS

1. Health Status Indicators
### Life expectancy at birth

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>Life expectancy at birth reflects the overall mortality level of a population. It summarizes the mortality pattern that prevails across all age groups – children and adolescents, adults and the elderly.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Average number of years that a newborn is expected to live if current mortality rates continue to apply</td>
</tr>
<tr>
<td>Associated terms</td>
<td>A life table presents a set of tabulations that describe the probability of dying, the death rate and the number of survivors for each age or age group. Accordingly, life expectancy at birth is an output of a life table.</td>
</tr>
<tr>
<td>Data sources</td>
<td>Vital registration, census and surveys: Age-specific mortality rates required to compute life expectancy at birth.</td>
</tr>
<tr>
<td>Methods of estimation</td>
<td>WHO has developed a model life table based on about 1800 life tables from vital registration judged to be of good quality. For countries with vital registration, the level of completeness of recorded mortality data in the population is assessed and mortality rates are adjusted accordingly. Where vital registration data for 2003 are available, these are used directly to construct the life table. For countries where the information system provides a time series of annual life tables, parameters from the life table are projected using a weighted regression model, giving more weight to recent years. Projected values of the two life table parameters are then applied to the modified logit life table model (see references), where the most recent national data provide an age pattern, to predict the full life table for 2003. In case of inadequate sources of age-specific mortality rates, the life table is derived from estimated under-5 mortality rates and adult mortality rates that are applied to a global standard (defined as the average of all the 1800 life tables) using a modified logit model.</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>By age and sex.</td>
</tr>
<tr>
<td>Database</td>
<td>WHO Mortality Database (vital registration data): (<a href="http://www3.who.int/whosis">http://www3.who.int/whosis</a>)</td>
</tr>
<tr>
<td>Comments</td>
<td>The lack of complete and reliable mortality data, especially for low income countries and particularly on mortality among adults and the elderly, necessitates the application of modelling (based on data from other populations) to estimate life expectancy.</td>
</tr>
</tbody>
</table>
## Healthy life expectancy (HALE)

### Rationale for use
Substantial resources are devoted to reducing the incidence, duration and severity of major diseases that cause morbidity but not mortality and to reducing their impact on people’s lives. It is important to capture both fatal and non-fatal health outcomes in a summary measure of average levels of population health. Healthy life expectancy (HALE) at birth adds up expectation of life for different health states, adjusted for severity distribution making it sensitive to changes over time or differences between countries in the severity distribution of health states.

### Definition
Average number of years that a person can expect to live in “full health” by taking into account years lived in less than full health due to disease and/or injury.

### Associated terms
None.

### Data sources
- Death registration data reported annually to WHO: Mortality data for calculation of life tables. For countries without such data, available survey and census sources of information on child and adult mortality are analysed and used to estimate life tables.
- WHO Global Burden of Disease (GBD) study, WHO Multi-Country Survey Study (MCSS) and World Health Survey (WHS): Estimation of prevalence data. The GBD study draws on a wide range of data sources to develop internally consistent estimates for the incidence, prevalence, duration and years lived with disability for 135 major causes. The World Health Survey, carried out by WHO in more than 70 countries, uses anchoring vignettes to maximize comparability of self-report capacities for a set of core health domains. It also includes a health state valuation module for assessing the severity of reported health states.

### Methods of estimation
Since comparable data on health state prevalence are not available for all countries, a four-stage strategy is used:
1. Data from the WHO-GBD study are used to estimate severity-adjusted prevalence by age and sex for all countries.
2. Data from the WHO-MCSS and WHS are used to make independent estimates of severity-adjusted prevalence by age and sex for survey countries.
3. Prevalence for all countries is calculated based on GBD, MCSS and WHS estimates.
4. Life tables constructed by WHO are used with Sullivan’s method to compute HALE for countries.

### Disaggregation
By age and sex.

### References

### Database
WHOSIS BOD WebPages: (http://www.who.int/evidence/bod)

### Comments
The first challenge is the lack of reliable data on mortality and morbidity, especially from low income countries. Other issues include lack of comparability of self-reported data from health interviews and the measurement of health-state preferences for such self-reporting.
### Probability of dying (per 1,000) between ages 15 and 60 years (adult mortality rate)

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>Adult mortality is an important indicator of Burden of Disease (BOD) during the most economically productive age span.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Probability that a 15 year old will die before reaching his/her 60th birthday.</td>
</tr>
<tr>
<td>Associated terms</td>
<td>The <em>probability of dying</em> between the ages of 15 and 60 years (per 1,000 population) per year among a hypothetical cohort of 100,000 people that would experience the age-specific mortality rate of the reporting year. <strong>Life table</strong> <em>(see Life expectancy at birth)</em>.</td>
</tr>
<tr>
<td>Data sources</td>
<td>Vital or sample registration: Mortality by age and sex are used to calculate age specific rates. Census: Mortality by age and sex tabulated from questions on recent deaths that occurred in the household during a given period preceding the census (usually 12 months). Census or surveys: Indirect methods provide adult mortality rates based on information on survival of parents or siblings.</td>
</tr>
<tr>
<td>Methods of estimation</td>
<td>Empirical data from different sources are consolidated to obtain estimates of the level and trend in adult mortality by fitting a curve to the observed mortality points. However, to obtain the best possible estimates, judgement needs to be made on data quality and how representative it is of the population. Recent statistics based on data availability in most countries are point estimates dated by at least 3-4 years which need to be projected forward in order to obtain estimates of adult mortality for the current year. When no adequate source of age-specific mortality exists, the life table is derived as described in the life expectancy indicator.</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>By sex, location (urban/rural, major regions/provinces) and socio-economic characteristics (e.g. education, wealth quintile). Censuses and surveys provide such detail; vital registration data usually does not include socio-economic variables but can provide the other disaggregations.</td>
</tr>
<tr>
<td>Database</td>
<td>WHO Mortality Database (vital registration data): (<a href="http://www3.who.int/whosis">http://www3.who.int/whosis</a>)</td>
</tr>
<tr>
<td>Comments</td>
<td>There is a dearth of data on adult mortality, notably in low income countries. Methods to estimate adult mortality from censuses and surveys are retrospective and possibly subject to considerable measurement error.</td>
</tr>
</tbody>
</table>
Probability of dying (per 1 000) under age five years (under-5 mortality rate)

### Rationale for use
Under-5 mortality rate is a leading indicator of the level of child health and overall development in countries. It is also an MDG indicator.

### Definition
Probability of a child born in a specific year or period dying before reaching the age of five, if subject to age-specific mortality rates of that period.

### Associated terms
- **Under-5 mortality rate**, is strictly speaking, not a rate (i.e. the number of deaths divided by the number of population at risk during a certain period of time) but a probability of death derived from a life table and expressed as rate per 1 000 live births.
- **Live birth** refers to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life - e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles - whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.

### Data sources
Age-specific mortality rates among children and infants are calculated from birth and death data derived from vital registration, census, and/or household surveys:
- **Vital registration**: Number of deaths by age and numbers of births and children in each age group are used to calculate age specific rates. This systems provides annual data.
- **Census and surveys**: An indirect method is used based on questions to each woman of reproductive age as to how many children she has ever born and how many are still alive. The Brass method and model life tables are then used to obtain an estimate of under-5 mortality.
- **Surveys**: A direct method is used based on birth history - a series of detailed questions on each child a woman has given birth to during her lifetime. To reduce sampling errors, the estimates are generally presented as period rates, for five or 10 years preceding the survey.

### Methods of estimation
Empirical data from different sources are consolidated to obtain estimates of the level and trend in under-5 mortality by fitting a curve to the observed mortality points. However, to obtain the best possible estimates, judgement needs to be made on data quality and how representative it is of the population. Recent statistics based on data availability in most countries are point estimates dated by at least 3-4 years which need to be projected forward in order to obtain estimates of under-5 mortality for the current year.

### Disaggregation
By sex, location (urban/rural, major regions/provinces) and socio-economic characteristics (e.g. mother’s education, wealth quintile). Often disaggregated under-5 mortality rates are presented for 10-year periods because of the rapid increase in sampling error if multiple categories are used. Censuses and surveys provide such detail; vital registration data usually does not include socio-economic variables but can provide the other disaggregations.

### References

### Database
- Demographic and Health Surveys (DHS): (http://www.measuredhs.com/)
- WHOSIS Mortality Database (Vital registration data): (http://www3.who.int/whosis)
- UNICEF (statistics and MICS): www.childinfo.org/

### Comments
Even though many countries have collected information on child mortality in recent years, the high demand for very recent child mortality trend information is difficult to meet through household surveys. High quality of vital registration systems (completeness of registration) and high quality of survey or census data collection are crucial - WHO does estimate the level of underestimation of vital registration systems and there clearly is substantial variation in data quality and consistency across countries.
# Neonatal mortality rate (per 1 000 live births)

## Rationale for use
Neonatal deaths account for a large proportion of child deaths. Mortality during neonatal period is considered a good indicator of both maternal and newborn health and care.

## Definition
Number of deaths during the first 28 completed days* of life per 1 000 live births in a given year or period.

* Neonatal deaths may be subdivided into early neonatal deaths, occurring during the first seven days of life, and late neonatal deaths, occurring after the seventh day but before the 28 completed days of life.

## Associated terms
The neonatal period commences at birth and ends 28 completed days after birth.

Live birth (see Probability of dying under age 5 years).

## Data sources
Vital registration: The number of live births and number of neonatal deaths are used to calculate age specific rates.

Surveys: Calculations are based on birth history - a series of detailed questions on each child a woman has given birth to during her lifetime. The estimates are generally presented as period rates for the five-year periods preceding the survey. The total number of births in the survey provides the denominator.

## Methods of estimation
Empirical data are used. When no survey or registration data point is available, the neonatal mortality rate is estimated from the under-5 mortality using a regression adjusted for AIDS.

## Disaggregation
By sex, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. mother's education level, wealth quintile).

## References


## Database
Demographic and Health Surveys (DHS): (http://www.measuredhs.com)


WHO, European Office. HFA database: (http://www.who.dk/hfadb)

## Comments
The reliability of the neonatal mortality estimates depends on accuracy and completeness of reporting and recording of births and deaths. Underreporting and misclassification are common, especially for deaths occurring early on in life.

Perinatal mortality, defined as number of stillbirths and deaths in the first week of life per 1 000 live births, is a useful additional indicator, and work is ongoing to improve estimates of stillbirth rates, a major component of perinatal mortality.
### Maternal mortality ratio (per 100,000 live births)

| **Rationale for use** | Complications during pregnancy and childbirth are a leading cause of death and disability among women of reproductive age in developing countries. The maternal mortality ratio represents the risk associated with each pregnancy, i.e. the obstetric risk. It is also a MDG indicator. |
| **Definition** | Number of maternal deaths per 100,000 live births during a specified time period, usually one year. |
| **Associated terms** | Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. To facilitate the identification of maternal deaths in circumstances in which cause of death attribution is inadequate, ICD 10 introduced an additional category: Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death. Live birth (see Probability of dying under age 5 years). |
| **Data sources** | Vital registration, household surveys, census, health service records. |
| **Methods of estimation** | Measuring maternal mortality accurately is difficult except where comprehensive registration of deaths and of causes of death exists. Elsewhere, censuses or surveys can be used to measure levels of maternal mortality. Data derived from health services records are problematic where not all births take place in health facilities because of biases whose dimensions and direction cannot be determined. Reproductive-age mortality studies (RAMOS) use triangulation of different sources of data on deaths of women of reproductive age coupled with record review and/or verbal autopsy to accurately identify maternal deaths. Based on multiple sources of information, RAMOS are considered the best way to estimate levels of maternal mortality. Estimates derived from household surveys are subject to wide confidence intervals and long period rates (often for 10 year periods). For countries without any reliable data on maternal mortality, statistical models are applied. Global and regional estimates of maternal mortality are developed every five years, using a regression model. |
| **Disaggregation** | By age and parity, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. education level, wealth quintile). |
| **Database** | None. |
| **Comments** | Maternal death is, from an epidemiological perspective, a relatively rare event and mortality is difficult to measure accurately. Many low-income countries have no or very little data and modelling is used to obtain a national estimate. |
### HIV prevalence among the population aged 15-49 years

#### Rationale for use
HIV and AIDS has become a major public health problem in almost every country and monitoring the course of the epidemic is crucial. Both the MDGs and the United Nations General Assembly Special Session (UNGASS) on HIV and AIDS have set goals of reducing HIV prevalence.

#### Definition
Percent of people with HIV infection among all people aged 15-49 years.

#### Associated terms
For surveillance purposes, *HIV infection* is diagnosed through the HIV antibody test, according to, as a minimum, the WHO/UNAIDS surveillance guidelines.

#### Data sources
HIV surveillance: in generalized epidemics, antenatal clinic attendees as primary sources of information. In concentrated and low level epidemics (where estimated HIV prevalence in the general population is below 1%), surveillance among risk populations, e.g. injecting drug users, men who have sex with men and sex workers, should be the focus of surveillance. Household surveys: Inclusion of HIV testing is being increasingly adopted by countries e.g. Demographic and Health Surveys (DHS).

#### Methods of estimation
HIV prevalence data from surveillance systems, which may include national surveys with HIV testing, are used to estimate HIV prevalence using standardized methods of estimation developed by UNAIDS and WHO in collaboration with the UNAIDS Reference Group on Estimation, Modelling and Projections. For generalized epidemics, a software package called Epidemic Projection Package (EPP) is used to fit a curve to empirical data points. For concentrated and low level epidemics a spreadsheet method is used that requires inputs on estimated size and HIV prevalence in risk populations.

#### Disaggregation
By sex, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. education level, wealth quintile).

#### References
- Sexually Transmitted Infections, Special Issue, British Medical Journal, 2004. ([http://www.sti.bmjournals.com/content/vol80/suppl_1](http://www.sti.bmjournals.com/content/vol80/suppl_1))

#### Database

#### Comments
The main indicator proposed for monitoring progress towards achieving the international goals is HIV prevalence among young people aged 15-24 years which is a better proxy for monitoring HIV incidence than prevalence among ages 15-49 years. Although countries are moving towards collecting better data on young people, mainly by capturing data on young pregnant women attending antenatal clinics, comparable data availability is still limited.
## Number of poliomyelitis cases

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>The 1988 World Health Assembly (WHA) called for the global eradication of poliomyelitis. The number of poliomyelitis cases is used to monitor progress towards this goal and to inform eradication strategies. Countries implement strategies supplementing routine immunization - e.g. national immunization days and sub-national campaigns - or more targeted mop-up activities, depending on the levels of poliomyelitis cases.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Suspected polio cases (acute-flaccid paralysis - AFP, other paralytic diseases, and contacts with polio cases) that are confirmed by laboratory examination or are consistent with polio infection.</td>
</tr>
<tr>
<td>Associated terms</td>
<td>None.</td>
</tr>
<tr>
<td>Data sources</td>
<td>Active case finding and reporting of AFP, communicable disease surveillance systems, national and regional laboratory reports*.</td>
</tr>
</tbody>
</table>
* Most countries conduct active case search for cases of acute flaccid paralysis among children less than 15 years of age. When possible (approximately 80% of cases) a stool specimen is obtained for laboratory investigation. A regional reference laboratory verifies cases with evidence of polio infection. The principle indicator for the quality of AFP/polio surveillance data is the use of the non-polio AFP rate. Studies have shown that the expected non-polio AFP rate is approximately 1 per 100,000 population under 15 years of age and an effective polio surveillance system should detect and report approximately one AFP case per 100,000 population under 15. |
| Methods of estimation | Estimates of polio cases are based exclusively on unadjusted surveillance data. |
| Disaggregation   | By location (urban/rural, major regions/provinces). |
| References       | Information on Vaccines, Immunization and Biologicals:  
|                  | (http://www.who.int/vaccines-surveillance/diseasedesc/DES_polio.htm) and  
|                  | (http://www.who.int/vaccines-surveillance/diseasedesc/RSS_polio.htm) |
| Database         | Information on Vaccines, Immunization and Biologicals:  
|                  | (http://www.who.int/vaccines/casecount/case_count.cfm)  
|                  | WHO Vaccines preventable diseases monitoring system:  
|                  | (http://www.who.int/vaccines/globalsummary/immunization/countryprofileselect.cfm) |
| Comments         | Many countries have eliminated indigenous polio and in some instances more than ten years have passed since the last reported case of polio. Intensive, high quality surveillance is difficult to maintain when effective interventions have eliminated the disease locally. |
# Incidence of smear positive tuberculosis per 100 000 population

## Rationale for use

The incidence of tuberculosis is an important measure to monitor the progression of the disease at country level and around the world. The indicator is also formulated in Target 8 of the Millennium Development Goals (MDGs) that is to “have halted by 2015 and begun to reverse the incidence of malaria and other major diseases (including TB)”. TB incidence, together with TB prevalence and deaths are measuring the impact of the DOTS strategy. Impact measures complement what DOTS implementation indicators (case detection and treatment success) provide in term of programme outcomes.

## Definition

Estimated number of smear positive new TB cases (including HIV sero-positive) per 100 000 population per year.

## Associated terms

None.

## Data sources

Estimates of incidence are derived from notifications to WHO (coupled with assumptions about the proportion of incident cases which is notified); from disease prevalence surveys (coupled with assumptions about the duration of disease); or from surveys of the prevalence of infection in children, used to calculate the annual risk of TB infection (ARTI) (coupled with assumptions about the relationship between ARTI and the incidence of disease).

Estimates of incidence, prevalence and deaths are based on a consultative and analytical process in WHO and are published annually in the global TB report.

## Methods of estimation

To estimate the incidence of all TB cases, first, a reference year is selected for which a best estimate of incidence is available; this may be the year in which a survey was carried out or the year in which incidence was first estimated using one the following methods:

1. incidence = case notifications / proportion of cases detected
2. incidence = prevalence / duration of condition
3. incidence = annual risk of infection x Styblo coefficient
4. incidence = deaths / proportion of incident cases that die

Then the series of case notification are used to determine how incidence changed before and after that reference year. The time series of estimated incidence rates is constructed from the notification series in two ways: if the rate of change of incidence is roughly constant through time, the exponential trends is fit to the notifications; if the rate of change varies (eastern Europe, central Europe and high-HIV Africa), a three-year moving average of the notification rates is used. If the notifications for any country are considered to be an unreliable guide to trend (e.g. because reporting effort is known to have changed), the aggregated trend for all other countries with reliable data from the same epidemiological region is applied.

## Disaggregation

None

## References


## Database


WHO Tuberculosis Programme: [www.who.int/tb](http://www.who.int/tb)

## Comments

Direct measures of incidence are expensive and time consuming and can only be done from time to time in some countries. On the other hand, disease surveys measure prevalence and not incidence, although surveys may provide some valuable information about the duration of infectiousness which can be used to estimate the incidence. The tuberculin surveys are feasible where annual risk of infection is high and BCG coverage is low which may not be applicable in many countries. A reliable vital registration system is in place only in small number of countries and needs to be improved in most countries with high TB burden. Finally, the routine surveillance system is the tool for evaluating TB epidemiology and control which needs to be improved in many countries.
<table>
<thead>
<tr>
<th><strong>Rationale for use</strong></th>
<th>The low birth weight rate in a population is a good indicator of a public health problem that includes long-term maternal malnutrition, ill health and poor health care. On an individual basis, low birth weight is an important predictor of newborn health and survival.</th>
</tr>
</thead>
</table>
| **Definition**       | Percentage of live born infants with birth weight less than 2,500 g* in a given time period.  
*Low birth weight may be subdivided into very low birth weight (less than 1500 g) and extremely low birth weight (less than 1 000 g).|
| **Associated terms** | Birth weight is the first weight of the foetus or newborn obtained after birth. For live births, birth weight should ideally be measured within the first hour of life before significant postnatal weight loss has occurred and actual weight should be recorded to the degree of accuracy to which it is measured.  
Low birth weight is defined as less than 2500 g (up to and including 2499 g).  
Live birth (see Probability of dying under age 5 years). |
| **Data sources**     | Health services statistics: Proportion of live births with low birth weight among births in health institutions.  
Household Surveys: Demographic and Health Surveys (DHS) include questions on birth weight as well as the mothers’ subjective assessment of the infant’s size at birth (i.e. very large, larger than average, average, smaller than average, very small), for births in the last 3-5 years. |
| **Methods of estimation** | “Percentage of low birth weight” births from routine service statistics provides the rate. Survey indicators are analysed to apply a consistent methodology for adjusting numerical birth weight data for underreporting and heaping at 2500g. To estimate the low birth weight rate, a weighting procedure is used in which the proportion low birth weight in each category of size is multiplied by the total proportion of births in the corresponding category and summed to obtain overall estimates of the low birth weight incidence. When numerical birth weight is available for more than 95% of births, no adjustment is made.  
For those countries where it is not possible to obtain the original data files, published estimates are adjusted using methods to suit the nature of the published figures. |
| **Disaggregation**   | By location (urban/rural, major regions/provinces) and socio-economic characteristics (e.g. mother’s education level, wealth quintile). |
(http://www.who.int/reproductive-health/publications/low_birthweight/low_birthweight_estimates.pdf)  
| **Database**         | Demographic and Health Surveys (DHS): (http://www.measuredhs.com)  
WHO, European Office. HFA database: (http://www.who.dk/hfadb) |
| **Comments**         | The large proportion of infants not weighed at birth constitutes a significant impediment to accurate monitoring of low birth weight. |
# Children under five years of age

- **stunted for age (%)**
- **underweight for age (%)**

## Rationale for use

Both indicators measure growth in young children. Child growth is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations. In addition, children who suffer from growth retardation as a result of poor diets and/or recurrent infections tend to have greater risks of illness and death.

## Definition

- “Percentage of children stunted” is the percentage of children under five years who have a height-for-age below minus two standard deviations of the National Center for Health Statistics (NCHS)/WHO reference median.
- “Percentage of children underweight” is the percentage of children under five years who have a weight-for-age below minus two standard deviations of the NCHS/WHO reference median.

## Associated terms

Severely underweight or stunting is defined as below minus three standard deviations from median weight-for-age or height-for-age of NCHS/WHO reference population.

## Data sources

National household surveys, sub-national nutritional surveys and national nutrition surveillance systems.

## Methods of estimation

Empirical values are used. Several countries have limited data for recent years and current estimations are made using models that make projections based on past trends.

## Disaggregation

By sex, age, and location (urban/rural, major regions/provinces)

## References


## Database

WHO Global Database on Child Growth and Malnutrition: (http://www.who.int/nutgrowthdb)

## Comments

Anthropometric values are compared across individuals or populations in relation to a set of reference values. The choice of the reference population has a significant impact on the proportion of children identified as being under-nourished and/or over-nourished. Since the late 1970s, WHO has recommended the NCHS/WHO international reference population, for the comparison of child growth data. An improved international growth reference for young children is expected to be available by the end of 2005.
### Prevalence of adults (15 years and older) who are obese (%)

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>The prevalence of overweight and obesity in adults has been increasing globally. Obese adults (BMI ≥30.0) are at increased risk of adverse metabolic outcomes including increased blood pressure, cholesterol, triglycerides, and insulin resistance. Subsequently, an increase in BMI exponentially increases the risk of noncommunicable diseases (NCDs) like coronary heart disease, ischaemic stroke and type-2 diabetes mellitus. Raised BMI is also associated with an increased risk of cancer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Percentage of adults classified as obese (BMI ≥30.0 kg/m²) among total adult population (15 years and older).</td>
</tr>
</tbody>
</table>
| Associated terms | Adult overweight (BMI ≥ 25.0 kg/m²)  
Pre-obese (BMI 25.00-29.99 kg/m²)  
Obesity (BMI ≥ 30.00 kg/m²) |
| Data sources | Nationally representative household surveys, including Demographic and Health Survey (DHS). |
| Methods of estimation | Estimates are still under development and will be published later in 2005. Only national representative surveys with either anthropometric data collection or self-reported weight and height (mostly in high income countries) are included in the 2005 World Health Statistics. |
| Disaggregation | By sex, age, location (urban/rural, major regions/provinces) |
| Database | Demographic and Health Surveys (DHS): (http://www.measuredhs.com)  
WHO Global Database on Body Mass Index (BMI): (http://www.who.int/bmi) |
| Comments | The household surveys focus on different age ranges and sometimes on select samples (such as women of reproductive ages who a child under five years of age), which affects comparability. Also, self-reported height and weight information is likely to have more problems than measured adult BMI. The existing data are under review and estimation methods developed. It is expected that a new set of data and metadata and eventually estimates will replace the currently available information. |
# Mean systolic blood pressure among population aged 15 years and older

**Rationale for use**
High blood pressure is an important, preventable cause of premature death from heart diseases and stroke. Even though clinical guidelines define high blood pressure as systolic blood pressure $≥140$ mmHg or diastolic blood pressure $≥90$ mmHg, the risk of chronic diseases increases continuously even below this recommended criteria. Therefore, to measure the population level of risk, “mean systolic blood pressure” with standard deviation(s) is used to provide the distribution of this risk factor in the population.

**Definition**
Mean blood pressure of population (age-adjusted to WHO Standard population, age 15 years and older) expressed in mmHg (millimetres of mercury which is a unit of pressure).

**Associated terms**
None.

**Data sources**
National and sub-national health examination surveys, research publications.

**Methods of estimation**
Estimates are made for 113 countries using existing country level data held in WHO Global InfoBase (see database). Adjustments (definitions, year, standard age group, and age-adjustment) are made to make data comparable between countries.

**Disaggregation**
By sex and age.

**References**
None.

**Database**

**Comments**
Efforts are being made to make systolic blood pressure estimates comparable. However, a number of countries, particularly in Africa, do not have published data in Global Info-base and for these countries it is not possible to estimate this indicator.
Part 2

WORLD HEALTH INDICATORS

2. Health Services Coverage Indicators
<table>
<thead>
<tr>
<th><strong>Rationale for use</strong></th>
<th>Immunization coverage estimates are used to monitor immunization services, to guide disease eradication and elimination efforts, and are a good indicator of health system performance.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Measles immunization coverage is the percentage of one-year-olds who have received at least one dose of measles containing vaccine in a given year. For countries recommending the first dose of measles among children older than 12 months of age, the indicator is calculated as the proportion of children less than 24 months of age receiving one dose of measles containing vaccine. DTP3 immunization coverage is the percentage of one-year-olds who have received three doses of, the combined diphtheria and tetanus toxoid and pertussis vaccine in a given year. HepB3 immunization coverage is the percentage of one-year-olds who have received three doses of Hepatitis B vaccine in a given year.</td>
</tr>
<tr>
<td><strong>Associated terms</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Data sources</strong></td>
<td>Administrative data: Reports of vaccinations performed by service providers are used for estimates based on administrative data service providers (e.g. district health centres, vaccination teams, physicians). The estimate of immunization coverage is derived by dividing the total number of vaccinations given by the number of children in the target population, often based on census projections. Household surveys: Survey items correspond to children’s history in coverage surveys. The principle types of surveys are the Expanded Programme on Immunization (EPI) 30-cluster survey, the UNICEF Multiple Indicator Cluster Survey (MICS), and the Demographic and Health Survey (DHS).</td>
</tr>
<tr>
<td><strong>Methods of estimation</strong></td>
<td>WHO and UNICEF rely on reports from countries, household surveys and other sources such as research studies. Both organizations have developed common review process and estimation methodologies. Draft estimates are made, reviewed by country and external experts and then finalized.</td>
</tr>
<tr>
<td><strong>Disaggregation</strong></td>
<td>By sex, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. mother’s education level, wealth quintile).</td>
</tr>
<tr>
<td><strong>Database</strong></td>
<td>Information on Vaccines, Immunization and Biologicals: (<a href="http://www.who.int/vaccines-surveillance">http://www.who.int/vaccines-surveillance</a>) Estimates on Immunization Coverage: (<a href="http://www.childinfo.org/eddb/immuni/database.htm">http://www.childinfo.org/eddb/immuni/database.htm</a>)</td>
</tr>
<tr>
<td><strong>Comments</strong></td>
<td>The principle challenges are to improve the quality (accuracy, validity, completeness and timeliness) of the data. Also, interpretation of available data needs to be improved by adjusting for possible biases for the most accurate estimate of immunization coverage possible.</td>
</tr>
</tbody>
</table>
Antenatal care coverage (%)

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>Antenatal care coverage is an indicator of access and utilization of care during pregnancy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Percentage of women who utilized antenatal care provided by skilled birth attendants for reasons related to pregnancy at least once during pregnancy as a percentage of live births in a given time period.</td>
</tr>
</tbody>
</table>
| Associated terms  | **Antenatal care** includes recording medical history, assessment of individual needs, advice and guidance on pregnancy and delivery, screening tests, education on self-care during pregnancy, identification of conditions detrimental to health during pregnancy, first-line management and referral if necessary.  
**Skilled birth attendant** (see Proportion of births attended by skilled health personnel).  
**Live birth** (see Probability of dying under age 5 years). |
| Data sources      | Household surveys: Birth history - detailed questions on the last child or all children a woman has given birth to during a given period preceding the survey (usually 3 to 5 years), and women are asked about the use of antenatal care. The number of births in the survey provides the denominator.  
Routine health service statistics: Number of women receiving antenatal care (numerator).  
Census projections or in some cases vital registration data are used to provide the denominator (numbers of live births). Problems can arise with both numerators and denominators (incorrect and biased or out-of-date data). |
| Methods of estimation | Empirical data from household surveys are used. At global level, facility data are not used. |
| Disaggregation    | By location (urban/rural, major regions/provinces) and socio-economic characteristics (e.g. women's education level, wealth quintile). |
| Database          | Demographic and Health Surveys (DHS): (http://www.measuredhs.com) |
| Comments          | A single antenatal visit is not really the best indicator of the quality of care. Additional indicators may include the number of visits (at least four per pregnancy are recommended) and the timing of the first visit. |
### Rationale for use
All women should have access to skilled care during pregnancy and at delivery to ensure detection and management of complications. Moreover, because the indicator Maternal Mortality Ratio cannot be used for monitoring short-term trends, the proportion of births attended by skilled health personnel can serve as a proxy for monitoring progress.

### Definition
Percentage of live births attended by skilled health personnel in a given period of time.

### Associated terms
A skilled birth attendant is an accredited health professional – such as a midwife, doctor or nurse – who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. Traditional birth attendants, trained or not, are excluded from the category of skilled attendant at delivery. In developed countries and in many urban areas in developing countries, skilled care at delivery is usually provided in a health facility. However, birth can take place in a range of appropriate places, from home to tertiary referral centre, depending on availability and need, and WHO does not recommend any particular setting. Home delivery may be appropriate for a normal delivery, provided that the person attending the delivery is suitably trained and equipped and that referral to a higher level of care is an option.

Live births (see Probability of dying under age 5 years).

### Data sources
Household surveys: They constitute an important source of information on maternity care on ad hoc basis and, for many countries, they are the main source of information on skilled birth attendants. When using survey data, absolute numbers and confidence intervals should be reported to indicate the reliability of the data and facilitate interpretation of trends and differentials.

Health services statistics: As the point of contact with women, this is the main and most obvious routine source of information for the numerator. Nevertheless, health service information used on its own constitutes a poor source of statistics on coverage of care as it is often incomplete because of inadequate reporting or exclusion of private sector information. Census projections or in some cases vital registration data are used to provide the denominator (numbers of live births).

### Methods of estimation
Empirical data from household surveys are used. At global level, facility data are not used.

### Disaggregation
By place of delivery, type of skilled health personnel, location (urban/rural, major regions/provinces) and socio-economic characteristics (e.g. education level, wealth quintile)

### References

### Database
Under development.

### Comments
While efforts are made to standardize definitions of skilled birth attendants, there is doubt about the comparability of some of the results across countries and within countries at different time periods.
### Contraceptive prevalence rate (%)

<table>
<thead>
<tr>
<th><strong>Rationale for use</strong></th>
<th>The indicator is useful in tracking progress towards health, sex and poverty goals. It also serves as a proxy measure of access to reproductive health services that are essential for meeting many of the MDGs, especially the child and maternal mortality and HIV/AIDS goals.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Contraceptive prevalence rate is the percentage of women between 15-49 years who are practising, or whose sexual partners are practising, any form of contraception.</td>
</tr>
<tr>
<td><strong>Associated terms</strong></td>
<td><strong>Contraceptive methods</strong> include condoms, female and male sterilization, injectable and oral hormones, intrauterine devices, diaphragms, spermicides and natural family planning, as well as lactational amenorrhoea (lack of menstruation during breastfeeding) where it is cited as a method.</td>
</tr>
<tr>
<td><strong>Data sources</strong></td>
<td>Household surveys, Demographic and Health Surveys (DHS), Multiple Indicators Cluster Surveys (MICS), contraceptive prevalence surveys. Estimates can also be made from service statistics using census projections as a denominator. Such estimates however are often expressed in terms of couple years of protection.</td>
</tr>
<tr>
<td><strong>Methods of estimation</strong></td>
<td>Empirical data only.</td>
</tr>
<tr>
<td><strong>Disaggregation</strong></td>
<td>By age (adolescence), marital status, method of contraception, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. education level, wealth quintile)</td>
</tr>
</tbody>
</table>
| **Database**          | Demographic and Health Survey (DHS): [http://www.measuredhs.com](http://www.measuredhs.com)  
| **Comments**          | Statistics on contraception prevalence rates are based primarily on data reported by women, mainly because contraception is more easily measured in this way. In some countries the denominator is married women only, as (reported) sexual activity outside of marriage is considered rare. |
### Children under five years of age using insecticide-treated nets (%)

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>The use of Insecticide Treated Nets (ITN) by a population in malaria risk areas is one of the most effective malaria prevention measures. Malaria prevention programmes using ITN constitute one of the four interventions of the Roll Back Malaria Initiative. It is also listed as an MDG indicator.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Percentage of population under five years of age in malaria-risk areas reported as sleeping under ITN.</td>
</tr>
<tr>
<td>Associated terms</td>
<td><strong>Malaria-risk areas</strong> include areas of endemic malaria (stable transmission allowing the development of some level of immunity) and epidemic malaria (seasonal and less predictable transmission impeding the development of effective immunity).</td>
</tr>
<tr>
<td>Data sources</td>
<td>Household surveys such as Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and malaria stand-alone surveys, that include questions on whether children under five years of age slept under an ITN the previous night.</td>
</tr>
<tr>
<td>Methods of estimation</td>
<td>Empirical data only.</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>By age, location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. education level, wealth quintile)</td>
</tr>
</tbody>
</table>
| References         | WHO/Roll Back Malaria site. (http://www.rbm.who.int)  
| Comments           | The accuracy of reporting in household surveys may vary. Also, seasonal influences related to fluctuations in vector and parasite prevalence may affect level of coverage.                                    |
### Tuberculosis cases detected under DOTS (%)

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>This indicator measures the National Tuberculosis Programme’s (NTP) ability to diagnose and collect data on tuberculosis (TB) cases. It is also an MDG indicator.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Percentage of the total number of smear-positive TB cases estimated to occur countrywide in a given year that are diagnosed (correctly or incorrectly) and reported under DOTS to the national health authority.</td>
</tr>
<tr>
<td>Associated terms</td>
<td>Detection under DOTS implies that all components of the internationally recommended approach to TB control are in place where patients are detected – political commitment; uninterrupted drug supply; use of smear microscopy in diagnosing TB cases; standardized short-course treatment regimens; direct observation of treatment; monitoring of treatment outcomes for 100% of patients with TB.</td>
</tr>
<tr>
<td>Data sources</td>
<td>For the numerator, aggregated quarterly reports on TB case registration, which should be available at national TB programme or equivalent central office. For the denominator, WHO estimate based on a statistical model that takes into account all available data (which may differ from country to country) and includes case notifications and death records (from routine surveillance and vital registration) as well as measures of the prevalence of infection and disease (from population-based surveys). These estimates are reported every year by WHO in the annual report on global TB control.</td>
</tr>
<tr>
<td>Methods of estimation</td>
<td>To estimate the incidence of all TB cases, first a reference year for which a best estimate of incidence is available is selected. Then, the series of case notifications (all forms of TB) is used to determine how incidence changed before and after that reference year. The time series of estimated incidence rates is constructed from the notification series in two ways: if the rate of change of incidence is roughly constant through time, the exponential trends is fit to the notifications; if the rate of change varies, a three-year moving average of the notification rates is used. If the notifications for any country are considered to be an unreliable guide to trend (e.g., because reporting effort is known to have changed), the aggregated trend for all other countries with reliable data from the same epidemiological region is applied. The estimate of smear-positive TB is derived from the estimate of all TB cases considering the HIV prevalence in TB cases and assuming that smear-positive cases represent 45% of all HIV negative and 35% of HIV positive TB cases.</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>None</td>
</tr>
<tr>
<td>Comments</td>
<td>The case detection numerator may be affected by a number of factors: these are potential problems that are “indicated” by the analysis, rather than limitations of the indicator itself (e.g., under-reporting of cases to the NTP). Limitations of the indicator are that it can only be used at the national level and that it can only be used on an “annualized” basis. In addition, there are certain limitations inherent in the calculation of DOTS coverage and in WHO’s estimate of incidence. The limitation of use only at the national level (countrywide analysis) is related to the accuracy and appropriateness of the denominator, WHO’s estimated incidence for the country as a whole. There may be real differences in TB epidemiology in urban/rural areas and/or at sub-national levels, which means that the national estimate should not be used at sub-national levels.</td>
</tr>
</tbody>
</table>
### Tuberculosis cases successfully treated under DOTS (%)

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>This indicator measures a programme’s capacity to retain patients through a complete course of chemotherapy with a favourable clinical result. It is also an MDG indicator.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Percentage of a group of tuberculosis (TB) cases registered under DOTS in a specified period that successfully completed treatment, whether with bacteriologic evidence of success (&quot;cured&quot;) or without (&quot;treatment completed&quot;). For new smear-positive cases, there is a target of 85% treatment success, based on the assumption of what can be reasonably achieved assuming the baseline proportion of unfavourable outcomes (death and failure and default) to be about 15%.</td>
</tr>
<tr>
<td>Associated terms</td>
<td>Treatment under DOTS means that all components of the internationally recommended approach to TB control are in place where patients are treated. (See Tuberculosis cases detected under DOTS)</td>
</tr>
<tr>
<td>Data sources</td>
<td>Numerator and denominator can be derived from aggregated quarterly reports on TB case treatment outcomes, which should be available at the National Tuberculosis Programme’s (NTP) or equivalent central office. The country specific treatment outcomes are documented by WHO in the annual report on global TB control. At the end of the treatment course, one of six treatment outcomes is recorded in the TB register for each sputum smear-positive TB case: cured, treatment completed, died, failed, defaulted, or transferred out. The treatment outcomes should be available in the NTP office or equivalent in the country and is compiled by aggregation of the “quarterly reports on treatment outcomes”. The quarterly reports are compiled from TB registers in basic management units and sent to the NTP office either directly or indirectly through the mid levels. Due to the applicability of this indicator to the lowest level, measurement has always been based on 100% of TB cases.</td>
</tr>
<tr>
<td>Methods of estimation</td>
<td>Empirical data only.</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>In a national programme data should be disaggregated and analysed at the level of basic management unit (typically district health office).</td>
</tr>
<tr>
<td>Comments</td>
<td>This indicator relies on accuracy and effort in the determination of treatment outcomes at the facility level including the follow-up of transferred patients. At higher levels, this indicator is affected by completeness of reporting. For example, if reporting on cases registered is more complete than reporting (1 year later) on treatment outcomes, then the outcome of some cases in the denominator will be unaccounted for. For pulmonary smear-positive cases, the cure rate is more trustworthy—or more valuable—than the success rate because patients who completed treatment but who do not have bacteriological confirmation of cure could conceivably still have smear positive TB disease. The large majority of successfully treated cases should have bacteriological confirmation of cure. Another important limitation is that success (and other treatment outcomes monitored routinely in TB programmes) is an outcome of treatment regimens, not patient results. Although it might be useful to analyse a cohort of TB patients in terms of survival or TB-free status at a given point in time (e.g. 12 months, 24 months), the routine TB monitoring system was not designed to facilitate such an analysis.</td>
</tr>
</tbody>
</table>
### People with advanced HIV infection receiving antiretroviral (ARV) combination therapy (%)

**Rationale for use**
As the HIV epidemic matures, increasing numbers of people are reaching advanced stages of HIV infection. ARV combination therapy has been shown to reduce mortality among those infected and efforts are being made to make it more affordable even in less developed countries. This indicator assesses the progress in providing ARV combination therapy to everyone with advanced HIV infection.

**Definition**
Percentage of people with advanced HIV infection receiving ARV therapy according to nationally approved treatment protocol (or WHO/Joint UN Programme on HIV and AIDS standards) among the estimated number of people with advanced HIV infection.

**Associated terms**
None

**Data sources**
Health facility reports are used to obtain the number of people on ARV therapy i.e. drugs received during the last month. External validation of country reported figures is carried out with data from pharmaceutical industry (if available).

**Methods of estimation**
The denominator of the coverage estimate is obtained from models that also generate the HIV prevalence, incidence and mortality estimates. The number of adults with advanced HIV infection who need to start treatment is estimated as the number of AIDS cases in the current year times two.
The total number of adults needing ARV therapy is calculated by adding the number of adults that need to start ARV therapy to the number of adults who are being treated in the previous year and have survived into the current year.

**Disaggregation**
By sex, age (children/adults), location (urban/rural, major regions/provinces), and socio-economic characteristics (e.g. education level, wealth quintile)

**References**

**Database**
Under development

**Comments**
The accuracy of the reported number of people on ARV therapy needs improvement as programme monitoring systems are still developing.
Although this indicator allows trends to be monitored over time, it does not attempt to distinguish between the different types of therapy available nor does it measure the cost, quality or effectiveness of such treatment.
Therapies for preventing the mother to child transmission of HIV and post exposure prophylaxis are not included in this indicator.
PART 2

WORLD HEALTH INDICATORS

3. Behavioural and Environmental Risk Factors Indicators
Population with

- sustainable access to an improved water source (%)
- access to improved sanitation (%)

| Rationale for use | Access to drinking water and improved sanitation is a fundamental need and a human right vital for the dignity and health of all people. The health and economic benefits of improved water supply to households and individuals (especially children) are well documented. Both indicators are used to monitor progress towards the MDGs. |
| Definition | Access to improved water source is the percentage of population with access to an improved drinking water source in a given year. Access to improved sanitation is the percentage of population with access to improved sanitation in a given year. |
| Associated terms | **Improved drinking water sources** are defined in terms of the types of technology and levels of services that are more likely to provide safe water than unimproved technologies. Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections. Unimproved water sources are unprotected wells, unprotected springs, vendor-provided water, bottled water and tanker truck-provided water. **Reasonable access** is broadly defined as the availability of at least 20 liters per person per day from a source within one kilometer of the user’s dwelling. **Sustainable access** has two components with respect to water: one stands for environmental sustainability, the other for functional sustainability. The former insists on environmental protection through limiting extraction of water to a capacity below what is actually available. The latter reflects programme sustainability in terms of supply and management. **Improved sanitation** facilities are defined in terms of the types of technology and levels of services that are more likely to be sanitary than unimproved technologies. Improved sanitation includes connection to a public sewers, connection to septic systems, pour-flush latrines, simple pit latrines and ventilated improved pit latrines. Not considered as improved sanitation are service or bucket latrines (where excreta is manually removed), public latrines and open latrines. |
| Data sources | Household surveys and assessment questionnaires to complement survey data or to provide estimates where survey data are not available. The latter also captures information related to usage and breakdown of self-built water facilities of which service providers may be unaware. |
| Methods of estimation | ‘Estimates are generated through analysis of survey data and linear regression of data points. Coverage estimates are updated every two years. |
| Disaggregation | By location (urban/rural). |
| Database | WHO/UNICEF Joint Monitoring Programme web site: (http://www.wssinfo.org) |
| Comments | Information is missing from many developed countries. More needs to be done to address the issues of sustainability and safety in drinking water provision. |
Population using solid fuels (%)

<table>
<thead>
<tr>
<th><strong>Rationale for use</strong></th>
<th>The use of solid fuels in households is associated with increased child mortality, mainly from respiratory diseases, and is an indicator of socio-economic status. It is also an MDG indicator.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Percentage of population using solid fuels as the main cooking fuel.</td>
</tr>
<tr>
<td><strong>Associated terms</strong></td>
<td><strong>Solid fuels</strong> include coal, charcoal, wood, crops or other agricultural waste, dung, shrubs, grass, straw etc.</td>
</tr>
<tr>
<td><strong>Data sources</strong></td>
<td>Household surveys and national census. National energy statistics on the proportion of population using solid fuels are based either on data from surveys or censuses, or on statistical models where no survey or census data are available.</td>
</tr>
<tr>
<td><strong>Methods of estimation</strong></td>
<td>The data from surveys and censuses are used as reported in the surveys and censuses. A regression model based on gross national income, per capita petroleum consumption and rural population is being used. All countries with a GNP per capita above US$ 5,000 are assumed to have made a complete transition to cooking with non-solid fuels.</td>
</tr>
<tr>
<td><strong>Disaggregation</strong></td>
<td>By location (urban/rural, major regions/provinces) and socio-economic characteristics (e.g. education level, wealth quintile)</td>
</tr>
<tr>
<td><strong>Database</strong></td>
<td>Databases related to indoor air pollution: (<a href="http://www.who.int/indoorair/health_impact/databases/en">http://www.who.int/indoorair/health_impact/databases/en</a>)</td>
</tr>
<tr>
<td><strong>Comments</strong></td>
<td>Data from surveys or censuses are now available for 94 countries but are modelled for the remaining developing countries.</td>
</tr>
</tbody>
</table>
### Prevalence of current tobacco use in adolescents (13-15 years of age) by males and females

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>‘Early onset of tobacco use is an important risk factor for chronic diseases associated with tobacco later in life. Tobacco is an addictive substance and smoking often starts in adolescence, before the development of risk perception. By the time the risk to health is recognized, the addicted individuals find it difficult to stop tobacco use.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Prevalence of tobacco use (including smoking, oral tobacco and snuff) on more than one occasion in the 30 days preceding the survey, among adolescents aged 13-15 years.</td>
</tr>
<tr>
<td>Associated terms</td>
<td>None.</td>
</tr>
<tr>
<td>Data sources</td>
<td>Global Youth Tobacco Survey (GYTS) and Global School Health Survey (GSHS). GYTS started in 1998 and is ongoing. Few countries have repeated surveys. This is a school based self-administered questionnaire.</td>
</tr>
<tr>
<td>Methods of estimation</td>
<td>Adjustments and standardizations are made as necessary.</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>By sex.</td>
</tr>
</tbody>
</table>
| References | GYTS: (http://www.who.int/tobacco/surveillance/gyts/en)  
GSHS: (http://www.who.int/school_youth_health/assessment/gshs/en) |
| Comments | Some of the surveys were conducted in small sub-national populations and therefore may not accurately reflect the national picture. |
### Rationale for use
Over-consumption of alcohol is related to many diseases and health conditions, including chronic diseases such as alcohol dependence and liver cirrhosis, and acute health problems such as injuries. Estimation of per capita consumption of alcohol across the entire population aged 15 years or older can provide policy makers with some sense of the magnitude and trends likely to be found in alcohol-related problems.

### Definition
Liters of pure alcohol per capita, computed as the sum of alcohol production and imports, less alcohol exports, divided by the adult population (aged 15 years or older).

### Associated terms
None

### Data sources
- Food and Agriculture Organization’s Statistical Database (FAOSTAT), World Drink Trends, regularly published by Produktchap voor Gedistilleerde Dranken (Netherlands)
- Direct government data.

### Methods of estimation
Estimated amount of pure ethanol in litres of total alcohol, and separately, beer, wine and spirits consumed per adult (15 years and older) in the country during a calendar year, is calculated from official statistics on production, sales, import and export, taking into account stocks whenever possible. Conversion factors are used to estimate the amount of pure alcohol in various alcoholic beverages. In beer (barley) the factor represents 5% of alcohol, in wine it is 12% and in spirits 40%. Other conversion factors are used for some types of beer and other beverages.

### Disaggregation
None.

### References

### Database
Global Alcohol Database: (http://www.who.int/alcohol)

### Comments
It is important to note that these figures comprise, in most cases, the recorded alcohol consumption only and have some inherent problems. Factors that influence the accuracy of per capita data are: informal production, tourist and overseas consumption, stockpiling, waste and spillage, smuggling, duty-free sales, variation in beverage strength and the quality of the data on which it is based. In some countries there exists a significant unrecorded alcohol consumption that needs be taken into account for a comprehensive picture of total alcohol consumption. Several African countries (Uganda, Nigeria, Swaziland and Burundi) appear in the list in the top 30 positions of adult per capita consumption. This is because the calculations were based on FAO data which include fermented beverages and estimates of beer produced locally from sorghum, millet and other agricultural products.
### Condom use at higher risk sex among young people aged 15-24 years (%)

**Rationale for use**
Consistent correct use of condoms within non-regular sexual partnerships substantially reduces the risk of sexual HIV transmission. This is especially important for young people who often experience the highest rates of HIV infection. Condom use is one measure of protection against sexual transmission of HIV; others include delaying age at first sex, reducing the number of non-regular sexual partners, being faithful to one uninfected partner, avoidance of concurrent sexual partnerships and high-risk sexual practices such as unprotected anal sex.

**Definition**
Percentage of young people aged 15–24 years reporting the use of a condom during the last sexual intercourse with a non-regular partner among those who had sex with a non-regular partner in the last 12 months.

**Associated terms**
A non-regular sexual partner is a non-marital and non-cohabiting partner.

**Data sources**
Household surveys such as Demographic and Health Surveys (DHS), Multiple Indicators Cluster Survey (MICS), ‘Behavioural Surveillance Surveys (BSS).

**Methods of estimation**
Empirical data only. Survey respondents aged 15–24 years are asked whether they have commenced sexual activity. Those who report sexual activity and have had sexual intercourse with a non-regular partner in the last 12 months, are further asked about the number of non-regular partners and whether they used condom protection the last time they had sex with a non-regular partner.

**Disaggregation**
By sex, location (urban/rural, major regions/provinces), and socio-economic characteristics (education level).

**References**

**Database**
Measure Demographic and Health Surveys (DHS): HIV/AIDS database: (http://www.measuredhs.com/hivdata)

**Comments**
Data quality is affected by self-reporting biases. There is often substantial reluctance to report non-regular sexual activity, especially among young women. Furthermore, if condoms are promoted in AIDS campaigns, there may be a strong desirability bias: respondents say they used condoms, even if they have not.
Part 2

WORLD HEALTH INDICATORS

4. Health Systems Indicators
### Health System Indicators

#### Number of physicians per 10 000 population

- **Rationale for use**: The availability and composition of human resources for health is an important indicator of the strength of the health system, even though there is no consensus about the optimal level of health workers for a population and the higher levels of density are not necessarily better. The nurse-physician ratio is an indicator of the health worker skills mix.

#### Definition

- Physicians’ density is the number of physicians per 10,000 population.
- Nurse density is the number of nurses per 10,000 population.
- Total number of health workers per 10,000 population is the total number of physicians, nurses, and midwives.
- Nurse-physician ratio is the ratio of the number of nurses to physicians.

#### Associated terms

Physicians, nurses, and midwives are defined on the basis of education, regulation, activities, and task-based criteria (combined WHO and ILO classification system). This does not include auxiliary nurses. In some countries, statistics on midwives are included in the reported numbers, in others they are not.

The 2004 Joint Learning Initiative report on human resources for health used three categories to identify low, medium, and high density of health workers: less than 25, 25-50, and 50 or more health workers per 10,000 population.

#### Data sources

Country reports forwarded to WHO regional offices or headquarters, based on administrative records such as databases of registered physicians/nurses in the country. In some countries, data are obtained from the census, labour force or other surveys that include questions about occupations of the household members. Data on physicians and nurses constitute generally the best information available on human resources for health.

In the WHO Region of the Americas, the indicator “Number of nurses and midwives per 10,000” refers to nurses and nurses-midwives per 10,000. It does not include midwives.

#### Methods of estimation

No methods of estimation have been developed.

#### Disaggregation

By sex, age, and location (urban/rural) in some countries.

#### References


#### Database

- ([http://www.wpro.who.int/chips/default.asp](http://www.wpro.who.int/chips/default.asp))
- Regional Core Health Data Initiative: ([http://www.paho.org/English/SHA/coredata/tabulator/newTabulator.htm](http://www.paho.org/English/SHA/coredata/tabulator/newTabulator.htm))
- European Health for all database (HFA-DB): ([http://www.data.euro.who.int/hfadb](http://www.data.euro.who.int/hfadb))

#### Comments

The accuracy and completeness of data on human resources for health in countries can be a problem because databases are not updated frequently, private sector data is often not included and definitions of workers vary.

Many low-income countries have trained cadres of health workers that have received extensive clinical training and perform many clinical functions of doctors. These are “assistant medical officers”, clinical officers, etc. and they are not included in the database. Another challenge is the definition of “nurses” and “midwife”.
## Number of hospital beds per 10,000 population

| **Rationale for use** | Service delivery is an important component of health systems. To capture availability, access and distribution of health services delivery, a range of indicators or a composite indicator are needed. Currently, there is no such data for the majority of countries. “In-patient beds” density is one of the few available indicators that relate to “level of health service delivery”. |
| **Definition** | Number of in-patient beds per 10,000 population. |
| **Associated terms** | Hospital beds include in-patient and maternity beds. Maternity beds are included while cots and delivery beds are excluded. |
| **Data sources** | Administrative records, based on reported data by in-patient facilities; censuses of health facilities. |
| **Methods of estimation** | Empirical data only with possible adjustment for underreporting (e.g. missing private facilities). |
| **Disaggregation** | By location (urban/rural) although the availability of data is limited in many instances. |
| **Comments** | There is a need for further work to better capture the level and distribution of health services in a country. This would be the first step towards assessing inequity in access to health services. |
### Health System Indicators

#### Total expenditure on health as percentage of GDP
- **Rationale for use**: Health financing is a critical component of health systems. There is a wide range of indicators that need to be monitored. The selected indicators summarize national expenditure on health.
- **Definition**: Total health expenditure as percentage of Gross Domestic Product (GDP)
  - Percentage of total general government expenditure that is spent on health.

#### General government expenditure on health as percentage of total general government expenditure

#### Per capita total expenditure on health at international dollar rate

#### Associated terms
- **Total health expenditure**: is the sum of general government expenditure on health and private expenditure on health in a given year (in international dollars).
- **GDP**: is the value of goods and services provided in a country by residents and non-residents without regard to their allocation among domestic and foreign claims. This corresponds to the total sum of expenditure (consumption and investment) of the private and government agents of the economy during the reference year.
- **General government expenditure**: includes consolidated direct outlays and indirect outlays, including capital of all levels of government. Social security institutions, autonomous bodies, and other extra-budgetary funds.
- **International dollars**: are derived by dividing local currency units by an estimate of their Purchasing Power Parity (PPP) compared to US dollar, i.e. a measure that minimizes the consequences of differences in price levels existing between countries.

#### Data sources
- Health expenditure data are based on National Health Accounts (NHA), which synthesize financing and spending flows recorded in the operation of a health system. However, only a limited number of countries produce full NHA.
- Other national sources include public expenditure reports, statistical yearbooks and other periodicals, budgetary documents, national account reports, statistical data on official web sites, nongovernmental organization reports, academic studies and reports and data provided by government ministries and offices.
- The United Nations National Account Statistics are the main source for GDP for most countries. General government expenditure obtained from national accounts of Organization for Economic Cooperation and Development (OECD) countries and International Monetary Fund (IMF) government finance statistics.

#### Methods of estimation
- Estimates for total health expenditure per capita are based on NHA or multiple other sources provided to WHO and partners by the countries or publicly available sources. Ratios are represented in per capita terms by dividing the expenditure figures by population figures. These per capita figures are expressed first in US dollars at an average exchange rate which is the observed annual average number of units at which a currency is traded in the banking system. It is then also presented in international dollar estimates which, as noted above, minimizes the impact of price differentials between countries.

#### Disaggregation
- None.

#### References

#### Database

#### Comments
- The lack of availability and the lack of standardization of NHA limit estimation and comparison.
### Coverage of vital registration of deaths

<table>
<thead>
<tr>
<th>Rationale for use</th>
<th>Health information is an essential component of health systems. The registration of births and deaths with causes of death, called &quot;vital registration system&quot;, is an important component of a country health information system.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Percentage of estimated total deaths that are ‘counted’ through vital registration system.</td>
</tr>
<tr>
<td>Associated terms</td>
<td>None.</td>
</tr>
<tr>
<td>Data sources</td>
<td>Country reports of coverage and WHO assessment of coverage.</td>
</tr>
<tr>
<td>Methods of estimation</td>
<td>Expected numbers of deaths by age and sex are estimated from current life tables, based on multiple sources. Reported numbers are compared with expected numbers by age and sex to obtain an estimate of coverage of the vital registration system.</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>None.</td>
</tr>
<tr>
<td>Database</td>
<td>WHO mortality database website: (<a href="http://www3.who.int/whosis/menu.cfm?path=whosis,search,mort&amp;language=english">http://www3.who.int/whosis/menu.cfm?path=whosis,search,mort&amp;language=english</a>)</td>
</tr>
<tr>
<td>Comments</td>
<td>Though sample registration systems only partially cover deaths in a country, they can be an important intermediate solution to obtain mortality and causes of death information about the country.</td>
</tr>
</tbody>
</table>