

Updated version of the publication:

**“Indicators for Monitoring the Millennium Development Goals
Definitions, Rationale, Concepts and Sources”**

DRAFT

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Indicator 1.1: Proportion of population below \$1 (PPP) per day

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.A Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day

DEFINITION AND METHOD OF COMPUTATION

Definition

This indicator is defined as the percentage of the population living in households below the international *poverty line* where the average daily consumption (or income) per person is less than \$1.25 a day measured at 2005 international prices adjusted for *purchasing power parity (PPP)*.

Concepts

The *poverty line* is a marker used to measure poverty based on income or consumption levels. A person is considered poor if his or her consumption or income level falls below the minimum level necessary to meet basic needs. This minimum level is referred to as the *poverty line*. The *poverty line* for the calculation of this indicator is the \$1.25 a day international line, transformed into national currency units using *PPP* exchange rates for consumption. The \$1.25 a day poverty line measured in 2005 prices replaces the \$1.08 a day poverty line measured in 1993 prices. Often described as “\$1 a day” this poverty line has been widely accepted as the international standard for extreme poverty. The new poverty line was estimated using *PPP* estimates from the 2005 International Comparison Program and the most recent household surveys available for developing countries. National consumer price indices were used to calculate the international poverty line in local currency to prices prevailing at the time of the surveys. The time series back to 1990 have been recalculated using this new line which measures extreme poverty in 2005 prices.

The *purchasing power parity (PPP)* conversion factor for private consumption represents the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as one United States dollar would buy in the United States. It is based on the System of National Accounts' concept of actual individual consumption.

The percentage of people living below the poverty line is also known as the *headcount index*.

Method of computation

The percentage of people living below the poverty line is calculated using either per capita consumption or income data, gathered from nationally representative household surveys.

Consumption is preferred to income for measuring poverty, because income is more difficult to measure accurately and can vary over time even if the standard of living does not. However, in practice the two methods yield similar results.

Consumption, including consumption from own production (or income when consumption is unavailable), is calculated for the entire household and then divided by the number of persons living in the household to derive a per capita measure. Households are then ranked by either consumption (or income) per person and compared to the poverty line to determine the number of people living above and below the poverty line.

The sample distributions are weighted by household size and sample expansion factors so that they are representative of the population of each country. This generates an estimate of the number of people living in households with levels of per capita consumption or income below the poverty line. The total number below the poverty line is divided by the total population to estimate the proportion of the population that is poor. This number is multiplied by 100 to derive a percentage.

The formula for calculating this indicator is as follows:

$$P_0 = \frac{1}{N} \sum_{i=1}^N I(y_i \leq z) = \frac{N_p}{N}$$

where P_0 represents the headcount ratio, $I(.)$ is an indicator function that takes on a value of 1 if the bracketed expression is true, and 0 otherwise. If individual consumption or income (y_i) is less than the poverty line (z), then $I(.)$ is equal to 1 and the individual is counted as poor. N_p is the total number of the poor and N is the total population.

RATIONALE AND INTERPRETATION

The \$1.25 a day poverty line—the critical threshold value below which an individual or household is determined to be poor—corresponds to the value of the poverty lines in the poorest countries (the poorest countries are determined by international rank of Gross National Income per capita in PPP terms). This threshold is a measure of extreme poverty that allows for comparisons across countries when converted using PPP exchange rates for consumption. In addition, poverty measures based on an international poverty line attempt to hold the real value of the poverty line constant over time allowing for accurate assessments of progress toward meeting the goal of eradicating extreme poverty and hunger.

The indicator values range from 0 (no population in extreme poverty) to 100 (all the population in a country living below the international poverty line). To attain MDG target 1.A, the percentage of poor people in a country must be half or less than it was in 1990 by 2015.

SOURCES AND DATA COLLECTION

The indicator is ideally produced using data on household income or consumption expenditures from nationally representative household surveys. Only nationally representative surveys that contain sufficient information to produce a comprehensive consumption or income aggregate (including consumption or income from own production) and allow for the construction of a correctly weighted distribution of per capita consumption or income should be used. Nationally representative household surveys are usually conducted by the national statistical office. In some cases surveys are conducted by the ministry of economic planning, central banks, or by private agencies under the supervision of government or international agencies.

In developing countries, household surveys on income or expenditure typically take place every three to five years, although intervals vary across countries. A common problem with household consumption data is comparability across surveys: household survey questionnaires can differ widely and similar surveys may not be strictly comparable because of differences in survey methods. These problems have become less prevalent as survey methods improve and become more standardized, but achieving strict comparability is still difficult.

- For other possible problems that can be encountered in data collection for this indicator see Indicator 1.1a on national poverty lines.

DISAGGREGATION

See Indicator 1.1a on national poverty lines.

COMMENTS AND LIMITATIONS

The poverty rate is a useful tool for policy makers and donors to target development policies to the poor. Yet it has the drawback that it does not capture the depth of poverty; failing to account for the fact that some people may be living just below the poverty line while others live far below the poverty line (see Indicator 1.2). Policymakers seeking to make the largest possible impact on reducing poverty rates might be tempted to direct their poverty alleviation resources to those closest to the poverty line (and therefore least poor).

In making international comparisons of poverty estimates, there are conceptual and practical problems to address. Possible problems include the following:

- Internationally comparable lines are useful for producing global aggregates of poverty. However, such a universal line is generally not suitable for the analysis of poverty within a country. For that purpose, a country-specific poverty line needs to be constructed which reflects the country's economic and social circumstances (see Indicator 1.1a on national poverty lines). Similarly, the

poverty line may need to be adjusted for different locations (such as urban and rural areas) within the country, if prices or access to goods and services differ.

- PPPs are based on prices of goods and services that may not be representative of the consumption patterns of the poor. As a result, there is no certainty that an international poverty line measures the same degree of need or deprivation across countries.
- The reliability of poverty estimates may be affected by the quality of the PPPs and price indexes used, due to differences in sampling procedures, measurement errors, assumptions and approximations made to survey data for price estimation.
- The quality of consumer price indexes around the world varies widely, which may affect the reliability of extrapolations over long periods and comparisons across countries. Furthermore, product definitions may differ from one part of a country to another.
- Differences in the relative importance of consumption of non-market goods may affect poverty rate estimates. The local market value of all consumption in kind (including own production) should be included in total consumption expenditure. Similarly, imputed profit from the production of non-market goods should be included in income.
- This indicator measures poverty based on household per capita income/consumption, ignoring intra-household inequality in the distribution of resources, and does not take into account other dimensions of poverty such as vulnerability, people's feeling about relative deprivation and lack of voice and power of the poor.

GENDER EQUALITY ISSUES

In many settings, households headed by women tend to have lower incomes and members of those households are therefore more likely to live below the poverty line. However, this relationship should be examined taking into account national circumstances and the definition of head of household, which is not always defined as the chief source of economic support. Gender relations, including whether households are headed by women or men, may also affect intra-household resource allocation and use.

DATA FOR GLOBAL AND REGIONAL MONITORING

Estimates on poverty for global and regional monitoring are calculated by the World Bank. International poverty estimates are usually not calculated for high-income countries, where the \$1.25 a day poverty line is not relevant.

The first global poverty estimates for developing countries produced by the World Bank were published in the *World Development Report 1990* using household survey data for

22 countries. Since then there has been considerable expansion in the number of countries that field household income and expenditure surveys. The World Bank's poverty monitoring database maintained by the Development Research Group now includes more than 675 surveys representing 116 developing countries collected between 1979 and 2007. Not all of these surveys are comparable in design and sampling methods. Non-representative surveys, though useful for some purposes, are excluded from the calculation of international poverty rates. As of 2009 there are 508 surveys for 115 countries available for deriving poverty estimates. More than 1.2 million randomly sampled households were interviewed in these surveys, representing 96 percent of the population of developing countries. Data coverage is improving in all regions, but the Middle East and North Africa and Sub-Saharan Africa continue to lag. The database is updated annually as new survey data become available, and a major reassessment of progress against poverty is made about every three years.

To compare the number of poor across countries and compute regional aggregates, country estimates must first be "lined up" to a common reference year. This involves estimating figures through interpolation for countries that do not provide survey data for the reference year, but do provide data for years before or after the reference year. The process requires adjusting the mean income or expenditure observed in the survey year by a growth factor to infer the unobserved level in the reference year. Thus, two assumptions are required to implement this process: distribution-neutral growth and a conjectured real rate of growth between the survey and reference year.

Distribution-neutral growth implies that income or expenditure levels are adjusted for growth assuming that the underlying distribution of income or expenditure observed in survey years remains unchanged. Under this assumption, it is straightforward to interpolate the poverty estimate in a given reference year using a given rate of growth in income or expenditure.

Rate of change in real consumption per capita should be based on the change in real consumption measured by comparing country survey data across different years. In practice, however, survey data in most countries are not available on an annual basis. Therefore, the change in private consumption per capita as measured in the national accounts is used instead. While, there can be no guarantee that the survey-based measure of income or consumption changes at exactly the same rate as private consumption in the national accounts, under certain circumstances and over short periods of time it can provide a reasonable approximation.

When the reference year falls between two survey years, an estimate of mean consumption at the reference year is constructed by extrapolating the mean consumption obtained from the surveys forward and backward to the reference year.

The second step for constructing comparable poverty rates is to compute the headcount poverty rate for the reference year after normalizing the distributions observed in the two survey years by the reference year mean consumption. This yields two estimates of the headcount poverty rates in the reference year. The final reported poverty headcount rate

for the reference years is the average of the two. For example, let's suppose the reference year is 1993 and there are two surveys available, for 1989 and 1995. There are two means at the reference year based on two surveys, M93(89) and M93(95) where M93(t) is the estimated mean for 1993 using the survey for year t. Based on the 1989 distribution and M93(89), the headcount index obtained using the 1993 mean and the 1989 distribution H93(89) can be estimated. Similarly, based on the 1995 distribution and M93, H93(95) is estimated. The poverty headcount for 1993 is estimated as the weighted average of H93(89) and H93(95) according to the following formula:

$$H93 = \left[\frac{1995 - 1993}{1995 - 1989} \right] \times H93(89) + \left[\frac{1993 - 1989}{1995 - 1989} \right] \times H93(95)$$

When data from only one survey year are available, the reference year mean is based on the survey mean by applying the growth rate in private consumption per capita from the national accounts. The reference year poverty estimate is then based on this mean and on the distribution observed in the one survey year.

The better the data coverage is in terms of number and frequency of available surveys, the more accurate this lining-up process is and the more reliable the regional estimates will be.

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Indicator 1.1a: Proportion of population below national poverty line

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.A Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day

DEFINITION AND METHOD OF COMPUTATION

Definition

This indicator is defined as the percentage of the total population living below the *national poverty line*.

Concepts

National poverty lines are thresholds defined at the country level below which a person is deemed to be poor. *National poverty lines* are commonly set as the consumption expenditure or income level at which food energy intake is just sufficient to meet basic requirements; or they are set by stipulating a consumption bundle (incorporating both food and non-food items) deemed to be adequate for basic consumption needs, and then

estimating the cost of the consumption bundle for each of the subgroups being compared in the poverty profile.

Method of computation

The formula for calculating the proportion of the population living below the national poverty line, also known as the headcount index, is as follows:

$$P_0 = \frac{1}{N} \sum_{i=1}^N I(y_i \leq z) = \frac{N_p}{N}$$

where P_0 is the headcount index, $I(.)$ is an indicator function that takes on a value of 1 if the bracketed expression is true, and 0 otherwise. If individual consumption or income (y_i) is less than the poverty line (z), then $I(.)$ is equal to 1 and the individual is counted as poor. N_p is the number of poor and N is the total population.

Poverty lines can be calculated using different methods. Some of these methods are based on objective information and define poverty lines in terms of absolute standards of minimum material capabilities (such as food-energy intake or cost of basic needs). Other methods consider subjective information on perceptions of welfare. In practice, the use of subjective methods to determine poverty lines has been more evident in developed countries.

RATIONALE AND INTERPRETATION

National poverty lines reflect local perceptions of the level of consumption or income needed to avoid poverty. The perceived boundary between poor and not poor rises as the average income of a country rises, so national poverty lines do not provide a uniform measure for comparing poverty rates across countries. Nevertheless, national poverty estimates are clearly the appropriate measure for setting national policies for poverty reduction and for monitoring their results. International poverty measurements, on the other hand, provide a uniform standard for comparing poverty rates and the number of people living in poverty across countries.

National poverty rates may range from 0 (no population living below the national poverty line) to 100 (the entire population of a country living below the national poverty line).

SOURCES AND DATA COLLECTION

Data on household income, consumption and expenditure, including income in kind, are generally collected through household budget surveys or other surveys covering income and expenditure. Household budget or income surveys are undertaken at different intervals in different countries. In developing countries they typically take place every three to five years.

To be useful for poverty estimates, surveys must be nationally representative. They must also include enough information to compute a comprehensive estimate of total household

consumption or income (including consumption or income from own production) and to construct a correctly weighted distribution of consumption or income per person. Despite these quality standards, there are numerous potential problems associated with household survey data.

First, consumption is measured by using household surveys questions on food and nonfood expenditures as well as food consumed from the household's own production, which is particularly important in the poorest developing countries. This information is collected either through recall questions using lists of consumption items or through diaries in which respondents record all expenditures on a daily basis. However, difficulties emerge because these methods do not always provide equivalent information, and depending on the approach used, consumption can be underestimated or overestimated. Different surveys use different recall or reference periods. Depending on the true flow of expenditures, the rate of spending reported is sensitive to the length of the reporting period. The longer the reference period, the more likely respondents are to fail to recall certain expenses—especially food items—thus resulting in an underestimation of true expenditure.

Secondly, best-practice surveys administer detailed lists of specific consumption items. These individual items collected through the questionnaires are then aggregated afterwards. But many surveys use questionnaires in which respondents are asked to report expenditures for broad categories of goods. In other words, specific consumption items are implicitly aggregated by virtue of the questionnaire design. This shortens the interview, reducing the cost of the survey. A shorter questionnaire is also thought to reduce the likelihood of fatigue for both respondents and interviewers, which can lead to reporting errors. However, there is also evidence that less detailed coverage of specific items in the questionnaire can lead to underestimation of actual household consumption. The reuse of questionnaires may result in the omission of new consumption goods, leading to further underreporting.

Thirdly, invariably some sampled households do not participate in surveys because they refuse to do so or because nobody is at home. This is often referred to as “unit non-response” and is distinct from “item non-response,” which occurs when some of the sampled respondents participate but refuse to answer certain questions, such as those pertaining to consumption or income. To the extent that survey non-response is random, there is no concern regarding biases in survey-based inferences; the sample will still be representative of the population. However, households with different incomes are not equally likely to respond. Relatively rich households may be less likely to participate because of the high opportunity cost of their time or because of concerns about intrusion in their affairs. It is conceivable that the poorest can likewise be underrepresented; some are homeless and hard to reach in standard household survey designs, and some may be physically or socially isolated and thus less easily interviewed. If non-response systematically increases with income, surveys will tend to overestimate poverty. But if compliance tends to be lower for both the very poor and the very rich, there will be potentially offsetting effects on the measured incidence of poverty.

DISAGGREGATION

It is sometimes possible to disaggregate this indicator by urban-rural location. In some cases, the national poverty line can be adjusted for different areas (such as urban and rural) within the country to account for distinct economic and social circumstances and differences in prices or the availability of goods and services. Typically the urban poverty line is set higher than the rural poverty line; reflecting the relatively higher costs of living in urban areas. In such cases, a clear definition of urban and rural areas needs to be established and included in the metadata.

Disaggregation by sex of the indicator would also be very useful. Unfortunately, with the proposed method of computation based on household income or consumption, this is not yet possible. In order to measure sex-disaggregated poverty rates, consumption or income of individuals, rather than of households, needs to be recorded and analyzed.

Alternatives to determine sex disaggregated measures include calculating poverty rates of household members according to the household head's gender, measuring the age and gender composition of households at or below the poverty line, or measuring outcomes of welfare indicators other than consumption or income.

COMMENTS AND LIMITATIONS

National poverty lines are used to make poverty estimates consistent with a country's specific economic and social circumstances, and are not intended for international comparisons of poverty levels. National poverty lines tend to increase as the average level of income in a country increases.

Issues arise when comparing poverty measures within countries when urban and rural poverty lines represent different purchasing powers. For example, the cost of living is typically higher in urban than in rural areas. One reason is that food staples tend to be more expensive in urban areas. So the urban monetary poverty line should be higher than the rural poverty line. However, the difference between urban and rural poverty lines sometimes reflects more than the difference in the cost of living. In some countries the urban poverty has a higher real value—meaning that it allows the purchase of more commodities for consumption—than does the rural poverty line. Sometimes the difference has been so large as to imply that the incidence of poverty is greater in urban than in rural areas, even though the reverse is found when adjustments are made only for differences in the cost of living. As with international comparisons, when the real value of the poverty line varies it is not clear how meaningful such urban-rural comparisons are.

Consumption is the preferred welfare indicator for measuring poverty for a number of reasons. For one thing, income is generally more difficult to measure accurately and can vary over time even if the standard of living does not. For example, the poor who work in the informal sector may not receive or report monetary wages; self-employed workers often experience irregular income flows; and many people in rural areas depend on idiosyncratic, agricultural incomes. Moreover, consumption accords better with the idea

of the standard of living than income, which can vary over time even if the actual standard of living does not. Thus, whenever possible, consumption-based welfare indicators are used to estimate the poverty measures reported here. But consumption data are not always available; for instance, in Latin America and the Caribbean the vast majority of countries primarily collect income data. In such cases there is little choice but to use income data.

Even if survey data were entirely accurate and comprehensive, the measure of poverty obtained could still fail to capture important aspects of individual welfare. For example, using household consumption measures ignores potential inequalities within households. Thus, consumption- or income-based poverty measures are informative but should not be interpreted as a sufficient statistic for assessing the quality of people's lives. The national poverty rate, a "headcount" measure, is one of the most commonly calculated measures of poverty. Yet it does not capture income inequality among the poor or the depth of poverty. For instance, it fails to account for the fact that some people may be living just below the poverty line, while others experience far greater shortfalls. Policymakers seeking to make the largest possible impact on the headcount measure might be tempted to direct their poverty alleviation resources to those closest to the poverty line (and therefore least poor).

Lastly, this income/consumption based poverty indicator does not fully reflect the other dimensions of poverty such as inequality, vulnerability, and the lack of voice and power of the poor.

GENDER EQUALITY ISSUES

See indicator 1.1.

DATA FOR GLOBAL AND REGIONAL MONITORING

In principle, poverty indicators derived using national poverty lines are intended to reflect a specific country's economic and social circumstances and the data are not adjusted for international comparability. Therefore regional or global data based on national poverty figures are not produced.

The World Bank publishes data on the proportion of the population living below the national poverty line for developing countries in its World Development Indicators (WDI) Online database. These data come mainly from the World Bank's Poverty Assessments. The World Bank periodically prepares poverty assessments of countries in which it has an active program, in close collaboration with national institutions, other development agencies, and civil society groups, including poor people's organizations. Poverty assessments report the extent and causes of poverty and propose strategies to reduce it. They often include separate assessments of urban and rural poverty. Data are derived from nationally representative household surveys conducted by national statistical offices or by private agencies under the supervision of government or international agencies and obtained from government statistical offices and World Bank Group country departments.

Data for developed countries are typically gathered from national poverty reports. These data are not adjusted for international comparability.

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Indicator 1.2: Poverty gap ratio

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.A: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day

DEFINITION AND METHOD OF COMPUTATION

Definition

The poverty gap is the mean shortfall of the total population from the *poverty line* (counting the non-poor as having zero shortfall), expressed as a percentage of the *poverty line*.

Concepts

The *poverty line* is a common method used to measure poverty based on income or consumption levels. A person is considered poor if his or her consumption or income level falls below some minimum level necessary to meet basic needs. This minimum level is referred to as the "poverty line."

The international poverty line for the calculation of this indicator is the \$1.25 a day international line, converted to national currency units using the latest *purchasing power parity (PPP)* exchange rates for consumption (See Indicator 1.1).

National poverty lines are defined differently across countries based on different calculation methods (See Indicator 1.1a).

The *purchasing power parity (PPP)* conversion factor for private consumption represents the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as one United States dollar would buy in the United States. It is based on the System of National Accounts concept of actual individual consumption.

Method of computation

The poverty gap ratio is measured as follows:

$$P_1 = \frac{1}{N} \sum_{i=1}^N I(y_i \leq z) * (1 - \frac{y_i}{z})$$

where P_1 represents the poverty gap and is calculated as the sum of relative distance between the poverty line (z) and income or consumption for those who are poor (the non-poor have a poverty gap of zero). $I(\cdot)$ is an indicator function that equals 1 if the bracketed expression is true, and 0 otherwise. N is the total population.

This formula is calculated based on data on individuals (y_i as individual income or consumption). If household-level data are used, the formula has to be adjusted by the weight w_i , which is the household size times sampling expansion factor for every household i .

The poverty line used for this calculation can be either the international poverty line of \$1.25 a day converted into respective national currency units at the latest PPP exchange rates for consumption, or the national poverty line.

RATIONALE AND INTERPRETATION

The indicator measures the “poverty deficit” of the entire population, where the poverty deficit is the per capita amount of resources that would be needed to bring all poor people above the poverty line through perfectly targeted cash transfers. Hence, the indicator is often described as a tool for measuring the per capita amount of resources needed to eliminate poverty, identifying the poverty depth in population groups which makes it a very useful indicator for policy makers and donors.

The poverty gap indicator supplements the poverty headcount indicator in describing the poverty situation. The indicator values may range between 0 (no one is poor) and 100 (everyone is poor and has zero income). The larger the poverty gap, the poorer on average the poor are and the more resources are needed to lift everyone out of poverty. If two countries have about the same poverty headcounts, but the poverty gap estimate is much higher in the first than the second country, then the first country can be regarded as “poorer” than the second country.

Poverty measures based on an international poverty line attempt to hold the real value of the poverty line constant across countries, as is done when making comparisons over time. Therefore, poverty gaps are comparable between countries.

SOURCES AND DATA COLLECTION

The indicator should be produced using nationally representative household surveys that are of good quality, contain sufficient information to produce a comprehensive consumption or income aggregate, and allow for the construction of a correctly weighted distribution of per capita consumption or income.

For data sources, see Indicator 1.1.

DISAGGREGATION

It is sometimes possible to disaggregate this indicator by urban-rural location. In such cases, a clear definition of urban and rural areas needs to be established and included in the metadata.

COMMENTS AND LIMITATIONS

Limitations of this indicator include the following:

- National poverty lines are the most precise determinants of the number of poor in a country according to national standards of living. However, they are set at different thresholds and hence are not comparable internationally. In order to compare poverty across countries, this indicator uses the international poverty line.
- The international poverty line reflects for the ability to purchase a basket of commodities that is roughly similar across the world. However, the international poverty line is not suitable for the analysis of poverty within a country. For that purpose, a country-specific national poverty line needs to be constructed.
- PPP exchange rates are used in the conversion of the \$1.25 a day international poverty line into respective national currency units. PPPs are based on prices of commodities that may not be representative of the consumption patterns of the poor. As a result, there is no certainty that an international poverty line measures the same degree of need or deprivation across countries.
- The reliability of the poverty estimates may be affected by the quality of the PPPs and price indexes used, which are subject to differences in survey sampling procedures, measurement errors, assumptions and approximations.
- The price data from which the PPPs are calculated are supposed to reflect national average prices in each country. However, in many countries, price surveys are carried out mainly in urban areas. In those instances, differentials between the national urban and rural poverty lines should be used to adjust the PPPs to correct for the putative “urban bias.”
- The quality of consumer price indexes around the world varies widely, which may affect the reliability of extrapolations over long periods of time and comparisons across countries.
- Differences in the relative importance of consumption of non-market goods may affect the accuracy of poverty gap estimates. The local market value of all consumption in kind (including own production) should be included in total consumption expenditure. Similarly, imputed profit from the production of non-market goods should be included in income. However, such consumption is not always recorded.

- Household survey questionnaires can vary widely making comparability difficult, and even similar surveys may not be strictly comparable because of quality differences.
- This indicator measures poverty based on household per capita income/consumption and so measures the poverty gap at the household level. Intra-household inequalities are not reflected by the indicator.

GENDER EQUALITY ISSUES

See Indicator 1.1.

DATA FOR GLOBAL AND REGIONAL MONITORING

The responsible agency for monitoring this indicator at the global level is the World Bank. In order to produce the estimates, international poverty indicators are produced for each country based on an internationally comparable poverty line, which allows for comparisons across countries.

See Indicator 1.1 for the procedure to line up country estimates to a common reference year, replacing ‘poverty headcount (H)’ with ‘poverty gap (PG)’.

REFERENCES

See Indicator 1.1.

Indicator 1.3: Share of poorest quintile in national consumption

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.A: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day

DEFINITION AND METHOD OF COMPUTATION

Definition

This indicator is defined as the share of a country’s national consumption or income that accrues to the *poorest quintile* (fifth) of the population.

This indicator is expressed in units of percentage.

Concepts

Poorest quintile is the bottom 20 percent of the population, ranked by income or consumption levels.

Method of computation

Consumption, including consumption from own production, or income is calculated from household data for the entire household, adjusted for household size, and then divided by the number of persons living in the household to derive a per capita measure. The population is then ranked by consumption or income, and the bottom fifth of the population's consumption or income is expressed as a percentage of aggregate household income. The calculations are made in local currency, without adjustment for price changes, exchange rates or spatial differences in the cost of living within countries because the data needed for such calculations are generally unavailable.

The share of poorest quintile in national consumption or income is calculated as follows:

$$Share = \frac{\sum_{i=1}^n y_i}{\sum_{i=1}^N y_i}$$

where $y_1 \leq y_2 \leq y_3 \dots \leq y_n \dots \leq y_N$, and the first n observations represent 20 per cent of the total population.

RATIONALE AND INTERPRETATION

This indicator is a measure of inequality in the distribution of income, reflected in the percentage shares of income or consumption accruing to portions of the population ranked by income or consumption levels. Inequality is a broader concept than poverty because it is defined over the entire population, not only the population below a certain poverty line.

Because the consumption of the poorest fifth is expressed as a percentage of total household consumption (or income), this indicator is a measure of "relative inequality". This means that while the absolute consumption of the poorest fifth may increase, its share of total consumption may remain the same (if the total goes up by the same proportion), decline (if the total goes up by a larger proportion) or increase (if the total goes up by a smaller proportion).

Values can range from 0 to 20. Smaller values indicate higher inequality, especially when compared to the share of income accruing to the wealthiest quintile. A value of 20 for each quintile would indicate perfect equality between quintiles.

The indicator does not reveal the distribution of income within the poorest quintile. Therefore, further disaggregation by deciles or percentiles is needed to assess inequality among the poorest quintile.

SOURCES AND DATA COLLECTION

Data on the distribution of income or consumption come from nationally representative household surveys. Where the original data from household surveys are available, they are used to directly calculate income or consumption shares by quintile. Otherwise, shares are estimated from the best available grouped data.

Distribution data are adjusted for household size, providing a more consistent measure of per capita income or consumption. No adjustments are made for spatial differences in the cost of living within countries because the data that are needed for such calculations are generally unavailable.

For more details on sources and data collection, see Indicator 1.1.

DISAGGREGATION

This indicator can be generated at the sub-national level (for example, by urban and rural location). However because often it cannot be decomposed at the sub-national level, estimates at the sub-national level are not widely produced.

COMMENTS AND LIMITATIONS

One of the main limitations on the calculation of this indicator is that, because household surveys differ in method and type of data collected, distribution data are not strictly comparable across countries. The surveys can differ in the following respects:

- Some surveys use income as the living standard indicator while others use consumption. The distribution of income is typically more unequal than the distribution of consumption. Also, definitions of income differ more often among surveys. Consumption is usually a much better welfare indicator, particularly in developing countries.
- Households differ in size (number of members) and in the extent that income is shared among household members since individuals differ in age and consumption needs. Differences among countries in this respect may bias comparisons of distribution.

Another major limitation to this indicator is the fact that it reflects only the income share of the bottom fifth (quintile) of the population. The proportionate share of national household income of this group may go up while the proportionate share of some other percentile, such as the bottom tenth (decile), or even of a broader group such as the bottom quarter (quartile), may go down, and vice versa.

GENDER EQUALITY ISSUES

See Indicator 1.1.

DATA FOR GLOBAL AND REGIONAL MONITORING

The World Bank Development Research Group produces this indicator using nationally representative household surveys that are conducted by national statistical offices or by private agencies under the supervision of government or international agencies. Data are obtained from government statistical offices and World Bank Group country departments.

For most countries the income distribution indicators are based on the same data used to derive the \$1.25 a day poverty estimates. In the case of high-income countries, income distributions are calculated directly from the Luxembourg Income Study database, using an estimation method consistent with that applied for developing countries.

To allow for comparability across countries, measures are interpolated from primary data sources (tabulations or household level data). Parameterized Lorenz curves with flexible functional forms are mainly used to make the estimates.

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Indicator 1.4: Growth rate of GDP per person employed

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.B: Achieve full and productive employment and decent work for all, including women and young people

DEFINITION AND METHOD OF COMPUTATION

Definition

The growth rate of *gross domestic product (GDP)* per person *employed* is defined as the growth rate of *output* per unit of *labour input*. The growth rate of GDP per person employed is expressed in units of percentage.

Concepts

Gross domestic product (GDP) is an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs).

Employed refers to persons above the nationally defined working age (different in every country, but generally close to 15 years) who worked or held a job during a specified reference period. Included are persons who worked for pay or profit (or pay in kind); persons who were temporarily absent from a job for such reasons as illness, maternity or parental leave, holiday, training or industrial dispute; and unpaid family workers who worked for at least one hour, although many countries use a higher hour limit in their definition. The measure of employment is intended to capture persons working in both the formal and informal sectors.

Output, is measured as value added, which is total production value minus the value of intermediate inputs, such as raw materials, semi-finished products, services purchased and energy inputs. Value added, called gross domestic product (GDP) in the national accounts, represents the compensation for input of services from capital (including depreciation) and labour directly engaged in production.

Labour input is measured as the number of persons *employed*, also known as total employment.

Method of computation

The growth rate of GDP per person employed is equivalent to the growth rate of labour productivity. Labour productivity is measured as GDP per person employed. The following formulas are used in calculating this indicator:

$$\text{Labour productivity} = \frac{\text{GDP}_{\text{year N}}}{\text{labour input}_{\text{year N}}}$$

$$\text{Labour productivity growth rate} = \frac{\text{labour productivity}_{\text{year N}} - \text{labour productivity}_{\text{year N-1}}}{\text{labour productivity}_{\text{year N-1}}} \times 100$$

GDP is measured at market prices for the aggregate economy. This reflects the market value of the aggregate measure of production. Labour input is measured in units of persons employed.

RATIONALE AND INTERPRETATION

Labour productivity can be used to assess the likelihood of a country's economic environment to create and sustain decent employment opportunities with fair and equitable remuneration. While increases in productivity do not guarantee progress toward full and productive employment and decent work for all, improvements in conditions of work and employment opportunities are less likely to occur without productivity improvements.

There is empirical evidence that the link between productivity growth and poverty reduction is strong when productivity growth and employment growth go hand in hand. However, labour productivity growth is not always associated with employment growth. Consequently, measuring both growth in employment (see employment-to-population ratio, Indicator 1.5) and labour productivity is required to assess whether GDP growth is likely to reduce poverty.

Labour productivity growth relies on a number of factors including: increased efficiency in the use of labour; increased use of physical or human capital or intermediate inputs; and shifts in the mix of activities in the economy. For instance, an economy might shift from sectors and activities with low levels of productivity to sectors and activities with higher levels. In this case, it is important that labour productivity growth is accompanied by improvements in education and training systems so that the workforce is prepared to work in the new sectors.

SOURCES AND DATA COLLECTION

GDP measures are obtained from national accounts. Guidelines for measurement of GDP are outlined in the System of National Accounts 1993.

Employment data are obtained from population censuses, labour force or other household surveys, establishment surveys, administrative records and official estimates based on results from several of these sources. Labour force surveys can be designed to cover virtually the entire population of a country, all branches of economic activity, all sectors of the economy, and all categories of workers, including own-account workers, unpaid family workers and persons engaged in casual work or marginal economic activity. For this reason, household-based labour force surveys offer a unique advantage for obtaining information on the labour market of a country and its structure.

Other sources such as population censuses and administrative records differ in scope, coverage, units of measurement and methods of data collection. Labour force and household surveys may have limited geographical and population coverage. Each source has advantages and limitations in terms of the cost, quality and type of information gained. The ideal geographic coverage is the entire country (no geographic exclusions) and entire populations (no exclusion of population groups).

DISAGGREGATION

For the purpose of this indicator, no disaggregation is required. However, disaggregation of the growth rate of GDP per person employed by industry can be used to differentiate between high and low productivity industry which can serve to monitor the effects of policies to increase labour productivity through sectoral shifts.

COMMENTS AND LIMITATIONS

Estimates of employment are, as much as possible, for the average number of persons with one or more paid jobs during the year. Statistics on the number of self-employed and family workers in agricultural and informal manufacturing activities are frequently less reliable than those for paid employees, particularly for low- and middle-income economies. Employment estimates are also sensitive to under-coverage of informal or underground activities, which account for a substantial part of labour input. In some cases, informal activities are not included in production and employment statistics at all. In agriculture, labour force estimates do include a substantial part of the (part time and seasonal) labour input of family workers. However, the estimates presented for the economies in this data set are meant to cover all economic activities and are thus sensitive to under-estimates of labour input in informal activities.

GENDER EQUALITY ISSUES

As GDP is not measured by sex, it is not possible to disaggregate this indicator by sex. Indicators 1.5 and 1.7 provide for disaggregation by sex in order to obtain insights into the employment status of women (and young people) as called for in the Target 1.B.

DATA FOR GLOBAL AND REGIONAL MONITORING

The International Labour Organization (ILO) produces estimates for this indicator. The necessary data are obtained largely from international data repositories compiled by various international organisations.

The GDP estimates for Organisation for Economic Cooperation and Development (OECD) countries after 1990 are mostly obtained from OECD and the Statistical Office of the European Communities (Eurostat). Angus Maddison's publication, *The World Economy: Historical Statistics*, has been used to cover the period 1980-1990. Employment estimates are mostly taken from OECD, Eurostat and the Bureau of Labor Statistics (BLS).

For countries outside of the OECD, the national accounts and labour statistics assembled from national sources by the World Bank, the Asian Development Bank, the Food and Agriculture Organization of the United Nations (FAO), the ILO and the United Nations Statistics Division are mostly taken as the point of departure.

GDP measures are obtained from national accounts and represent an aggregate measure of production at market prices for the economy and value added at basic prices for the individual industry. All estimates are made according to the national accounts conventions to ensure that labour productivity for individual industries can be compared. For international comparisons of labour productivity, estimates of gross value added are always expressed in PPP for the aggregate economy in terms of 1990 United States dollars.

ILO produces aggregate estimates for regions and groups of countries. Not all countries report data for every year, so it is not possible to derive aggregate estimates of labour market indicators by merely summing across countries. To address this problem, the ILO maintains econometric models which are used to produce estimates of labour market indicators in the countries and years for which no real data exist. These models use multivariate regression techniques to impute missing values at the country level.

There are some potential disparities between international and national data. Primarily, the use of different data sources can create comparability issues. National labour force surveys tend to be similar in essential features. Nevertheless, survey data may contain non-comparable elements in terms of scope and coverage or variations in national definitions of the employment concept.

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Indicator 1.5: Employment-to-population ratio

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.B: Achieve full and productive employment and decent work for all, including women and young people

DEFINITION AND METHOD OF COMPUTATION

Definition

The employment-to-population ratio is the proportion of a country's *working-age population* that is *employed*.

The employment-to-population ratio is expressed in units of percentage.

Concepts

Working-age population is determined on the basis of national circumstances, but in most countries the working-age population is defined as persons aged 15 years and older. The International Labour Organization (ILO) standard for the lower limit of the working-age population is 15.

The *employed* are defined as persons above the nationally defined *working-age* who performed any work at all, in the reference period, for pay or profit (or pay in kind), or

were temporarily absent from a job for such reasons as illness, maternity or parental leave, holiday, training or industrial dispute. Unpaid family workers who work for at least one hour should be included in the count of employment, although many countries use a higher hour limit in their definition.

Method of computation

The employment-to-population ratio is calculated by dividing the number of persons employed by the working-age population and multiplying by 100.

$$\text{Employment-to-population ratio} = \frac{\text{Persons employed}}{\text{working age population}} \times 100$$

RATIONALE AND INTERPRETATION

The employment-to-population ratio provides information on the ability of an economy to provide employment for those who want to work. The ratio typically falls between 50 and 75 per cent with a high ratio indicating that a large proportion of the working-age population is employed. A low ratio indicates that a large share of the population is not involved directly in market-related activities.

Trends in the employment-to-population ratio can be monitored to inform policies to increase opportunities for decent work. A reduction of employment-to-population ratios for young people can be seen as positive if this is caused by an increase of youth participation in education. Efforts to increase employment-to-population ratios are needed when unemployment is very high in a country (indicating that people are looking for work but not finding it), or when the ratio is low because people have given up hope of finding a job. On the other hand, employment-to-population ratios should not be too high. Ratios above 80 per cent, for instance, often occur in very poor countries and usually indicate an abundance of low quality jobs. During the development process, employment-to-population ratios and poverty rates can both be high because people simply have to work to survive.

The annual employment-to-population ratio and the ratio's rate of change over time can be viewed in connection with economic growth rates to determine the extent to which economic growth is pro-employment and pro-poor. Reviewing the indicator by sex (male versus female) and age (youth versus total) also provides a picture of the equality of employment opportunities across different population groups.

SOURCES AND DATA COLLECTION

Data are obtained from population censuses, labour force or other household surveys, establishment surveys, administrative records and official estimates based on results from several of these sources. Both components (employment and population) should come from the same source.

Sources differ in scope, coverage, units of measurement and methods of data collection. Each source has advantages and limitations in terms of the cost, quality and type of information gained. The ideal geographic coverage is the entire country (no geographic exclusions) and entire populations (no exclusion of population groups), so the source that can best provide this coverage should be used.

Contrary to censuses, surveys may have limited geographical and population coverage. However, household-based labour force surveys offer a unique advantage for obtaining information on the labour market of a country and its structure. Labour force surveys can be designed to cover virtually the entire population of a country, all branches of economic activity, and all sectors of the economy. In addition, labour force surveys can include all categories of workers, including own-account workers, unpaid family workers and persons engaged in casual work or marginal economic activity.

The ILO standard for the lower age limit of employment is 15 years. For many countries, this age corresponds directly to societal standards for education and work eligibility. Some countries impose an upper limit for eligibility, such as 65 or 70 years. However, if possible age groups beyond this upper limit should be included in the employable population.

DISAGGREGATION

Ideally, the data should be disaggregated by sex and age group. When broken down by sex, the ratios for men and women can provide information on gender differences in labour market activity. Disaggregation of the ratio for persons of working age (aged 15 years and over), prime working-age (25 to 54 years), older workers (55 to 64 years or 65 years and over) and youth (15 to 24 years) are useful for revealing relationships between labour force participation and availability of educational facilities, attitudes toward retirement, availability of earning opportunities for different age groups and the existence of social safety nets. Countries might also want to consider disaggregating according to urban/rural residence.

COMMENTS AND LIMITATIONS

The employment-to-population ratio indicator measures the quantity of persons in employment only. It says nothing about the quality of employment in which people work and this poses a dilemma in terms of prescribing that the indicator should increase over time. An increase in the ratio has positive implications on poverty reduction only if the jobs gained are well-paid, productive and secure—in other words, if the jobs gained are decent jobs. Reviewing this indicator along with the other indicators for Target 1.B will provide a broader picture of the direction and quality of employment growth.

There is no optimal employment-to-population ratio. Developed economies tend to have lower ratios than developing economies because developed countries' higher productivity and income levels mean that fewer workers are required to meet the needs of the entire population. Also, low ratios for young people can indicate that youth forgo employment

to pursue educational opportunities. Very high ratios, on the other hand, indicate that the majority of poor people are working out of the necessity to subsist regardless of the quality of work.

To some degree, the way in which persons in employment is measured can have an effect on the extent to which individuals are included in the data counts. Unless specific probes are built into the data collection instruments, certain groups of workers may be underestimated—particularly the number of employed persons who: (a) work for only a few hours in the reference period, especially if they do not do so regularly; (b) are in unpaid employment or (c) work near or in their home, thus mixing work and personal activities during the day. Since women, more so than men, are in these situations, it is to be expected that the number of women in employment will tend to be underestimated to a larger extent than the number of men.

GENDER EQUALITY ISSUES

Ratios for women may be lower than those for men as a result of women voluntarily or involuntarily staying at home and not participating in labour markets. Efforts should be made to determine whether the gender difference is the result of involuntarily low labour force participation for women.

DATA FOR GLOBAL AND REGIONAL MONITORING

The ILO is the agency responsible for compiling and publishing international figures for the employment-to-population ratio. The ILO assembles data using existing compilations maintained by various international organizations. Information compiled by these organizations is normally obtained from national sources or is based on official national publications.

The ILO produces aggregate estimates for regions and groups of countries. Not all countries report data for every year, so it is not possible to derive aggregate estimates of labour market indicators by merely summing across countries. To address this problem, the ILO maintains econometric models which are used to produce estimates of labour market indicators in the countries and years for which no real data exist. These models use multivariate regression techniques to impute missing values at the country level.

There are some potential disparities between national and international data. First, the official working age varies from country to country. For ILO calculations, the lower age limit is 15 years. For many countries, this age corresponds directly to the standard age for education completion and employment commencement. For others, it is appropriate to include younger workers because “working age” can, and often does, begin earlier. Similarly, some countries have an upper limit for eligibility because youth are expected to complete a certain level of education before working.

Secondly, the population base for employment ratios can vary across countries. In most cases, the resident population of working age is used, excluding members of the armed

forces and individuals residing in mental, penal or other types of institution. Many countries, however, consider different population groups.

Thirdly, while national labour force surveys tend to be similar in essential features, data may contain non-comparable elements in terms of scope and coverage or variations in national definitions of the employment concept. Use of different sources can thus lead to distinct results.

Finally, differences can appear due to different definitions of the concept of work. While the international definition calls for inclusion of all persons who worked for at least one hour during the reference period, other definitions are used at the country level. Some countries measure persons employed in paid employment only, while other countries measure paid employees plus working proprietors who receive some remuneration based only on corporate shares.

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Indicator 1.6: Proportion of employed people living below \$1 (PPP) per day

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.B: Achieve full and productive employment and decent work for all, including women and young people

DEFINITION AND METHOD OF COMPUTATION

Definition

The proportion of employed persons living below \$1 (PPP) per day, or *working poor*, is the proportion of individuals who are in the *labour force*, but nonetheless live in a household whose members are estimated to be living below the *international poverty line* of \$1.25 a day *purchasing power parity* (PPP).

This indicator is expressed in units of percentage.

Concepts

Working poor refers to persons in the *labour force* living below \$1.25 PPP per day.

Labour force is the economically active population, aged 15 and above, or the sum of the *employed* and *unemployed*.

The *poverty line* is the minimum level of income deemed necessary to achieve an adequate standard of living in a given country. For international comparisons, a poverty line of \$1.25 a day measured at 2005 international prices and adjusted for *PPP* is used. (See Indicator 1.1 for the methodology and computation)

The *purchasing power parity* (PPP) conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as one United States dollar would buy in the United States.

Employed refers to persons above the nationally defined working age (different in every country, but generally close to 15 years) who worked or held a job during a specified

reference period. Included are persons who worked for pay or profit (or pay in kind); persons who were temporarily absent from a job for such reasons as illness, maternity or parental leave, holiday, training or industrial dispute; and unpaid family workers who worked for at least one hour, although many countries use a higher hour limit in their definition. The measure of employment is intended to capture persons working in both the formal and informal sectors.

Unemployed refers to all persons not in employment who would have accepted a suitable job or started an enterprise during the reference period if the opportunity arose, and who actively looked for ways to obtain a job or start an enterprise in the recent past.

Method of computation

The number of working poor is calculated by multiplying the labour force by the poverty rate.

$$\text{Poverty rate} = \frac{\text{Population living below poverty line}}{\text{Total population}}$$

$$\text{Working poor} = \text{poverty rate} \times \text{labour force}$$

The key assumption behind using the labour force instead of employment numbers to calculate the working poor is that all, or nearly all, of the poor in the labour force are employed. This assumption is made because in countries where social safety nets do not exist, poor individuals must work in order to maintain a subsistence level of living. While 15 years and over is typically used to define the standard working-age population of a country, some countries apply other age limits. It is the nationally-defined working-age population which should be used for this calculation.

The proportion of working poor in total employment equals the number of persons in the labour force living in a household with income below the poverty line divided by total employment multiplied by 100.

$$\text{Proportion of working poor} = \frac{\text{working poor}}{\text{total employment}} \times 100$$

RATIONALE AND INTERPRETATION

The proportion of working poor in total employment gives an indication of the lack of decent work in a country. Jobs that do not provide incomes high enough to lift individuals and their families out of poverty, at the very least, do not fulfil the income component of decent work and it is likely that other components are not being fulfilled either. Within the development process, the share of working poor should decrease, and in turn, further foster development.

The working poor definition combines poverty data with countries' specific labour market characteristics, such as the size of the labour force. Working poor estimates

thereby provide a picture of the relationship between poverty and employment that is not depicted by standard poverty data.

SOURCES AND DATA COLLECTION

To estimate the number and proportion of the working poor, it is necessary to establish the poverty line. National poverty lines are defined differently across countries based on different calculation methods (See Indicator 1.1a).

Labour market information (labour force and total employment) are obtained from population censuses, labour force or other household surveys, establishment surveys, administrative records and official estimates based on results from several of these sources. Labour force surveys can be designed to cover virtually the entire population of a country, all branches of economic activity, all sectors of the economy, and all categories of workers, including own-account workers, unpaid family workers and persons engaged in casual work or marginal economic activity. For this reason, household-based labour force surveys offer a unique advantage for obtaining information on the labour market of a country and its structure.

Other sources such as population censuses and administrative records differ in scope, coverage, units of measurement and methods of data collection. Labour force and household surveys may have limited geographical and population coverage. Each source has advantages and limitations in terms of the cost, quality and type of information gained. The ideal geographic coverage is the entire country (no geographic exclusions) and entire populations (no exclusion of population groups).

The best method for calculating the number of working poor is on the basis of cross-tabulations from micro survey data sets that include variables on both poverty status and labour force characteristics. However, these data are usually not available.

DISAGGREGATION

While it might be desirable to disaggregate the proportion of working poor by sex or age groups, disaggregation is frequently not feasible. This is mainly because of the difficulties of producing disaggregated poverty rate information. However, if estimates are derived from micro survey datasets, disaggregation is sometimes feasible.

COMMENTS AND LIMITATIONS

If the methodology used in the poverty surveys in a particular country changes over time, it is extremely difficult to make useful temporal comparisons. However, if the same poverty line is used consistently over time and the same survey methodology has been used for collecting income and expenditure data, it should be possible to make valid temporal comparisons. Even if these conditions are met, however, poverty rates may vary quite substantially from year to year because of economic or weather conditions. For

example, natural disasters or financial crises can have a major effect on poverty rates, at least in the short term.

This indicator is also limited because of the way in which non-market production and consumption are valued. In some countries these activities may represent an important part of income and consumption, and decisions must be made about the value to attach to these items. The attached value will have an important effect on poverty rates.

GENDER EQUALITY ISSUES

If disaggregation by sex is feasible in view of data availability, the indicator can be used to analyse gender differentials in the incidence of working poverty.

DATA FOR GLOBAL AND REGIONAL MONITORING

The International Labour Organization (ILO) produces estimates for this indicator. Estimates of the working poor are based on labour market input data (working-age population, labour force and employment) from econometric models that utilize available national data and apply multivariate regression techniques to impute missing values at the country level. The first step in each model is to assemble all data points with available data for each indicator in question. It is important to note that only data that are national in coverage and comparable across countries and over time are used as inputs. This is an important selection criterion when the models are run, because they are designed to use the relationship between the various labour market indicators and their macroeconomic correlates—such as per-capita gross domestic product (GDP), GDP growth rates, demographic trends, country membership in the Highly Indebted Poor Country Initiative, geographic indicators and country and time dummy variables—to produce estimates of the labour market indicators where no data exist. Thus, comparability of the labour market data that are used as inputs in the imputation models is essential to ensure that the models accurately capture the relationships between the labour market indicators and the macroeconomic variables.

For the calculation of the number of working poor, ILO uses poverty data from the World Bank based on the international poverty line of \$1.25 a day. Because country-level estimates are model-driven and produced such that harmonized data are provided for every country and every year, there may be discrepancies between international and national data.

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Indicator 1.7: Proportion of own-account and contributing family workers in total employment

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.B: Achieve full and productive employment and decent work for all, including women and young people

DEFINITION AND METHOD OF COMPUTATION

Definition

The proportion of *own-account workers* and *contributing family workers* in total employment is defined as the proportion of workers in *self-employment* who do not have *employees*, and *unpaid family workers* in total *employment*.

This indicator is expressed in units of percentage.

Concepts

Own-account workers are those workers who, working on their own account or with one or more partners, hold *self-employment* jobs and who have not engaged on a continuous basis any *employees* to work for them.

Contributing family workers, also known as *unpaid family workers*, are those workers who are self-employed in a market-oriented establishment operated by a related person living in the same household, who cannot be regarded as partners, because their degree of commitment to the operation of the establishment, in terms of working time or other factors to be determined by national circumstances, is not at a level comparable to that of the head of the establishment.

Self employment includes those jobs where the remuneration is directly dependent upon the profits (or the potential for profits) derived from the goods and services produced (where own consumption is considered to be part of profits).

Employees are all those workers who hold paid employment jobs, where the incumbents hold explicit (written or oral) or implicit employment contracts that give them a basic remuneration that is not directly dependent upon the revenue of the unit for which they work.

Employment refers to persons above the nationally defined working age (different in every country, but generally close to 15 years) who worked or held a job during a specified reference period. Included are persons who worked for pay or profit (or pay in kind); persons who were temporarily absent from a job for such reasons as illness, maternity or parental leave, holiday, training or industrial dispute; and unpaid family workers who worked for at least one hour, although many countries use a higher hour limit in their definition. The measure of employment is intended to capture persons working in both the formal and informal sectors.

Vulnerable employment is defined as the sum of the employment status groups of own-account workers and contributing family workers.

Method of computation

This indicator is calculated as the sum of contributing family workers and own-account workers divided by total employment multiplied by 100.

The indicator is based on categories of status in employment as defined by the International Classification by Status in Employment (ICSE). The ICSE defines six employment status categories that are largely based on the types of economic risk associated with different jobs. Economic risk includes the strength of the attachment

between the person and the job, and the type of authority over establishments and other workers which the job incumbents have or will have.

RATIONALE AND INTERPRETATION

Vulnerable employment is a newly defined measure of persons who are employed under relatively precarious circumstances as determined by their status in employment. Because contributing family workers and own-account workers are less likely to have formal work arrangements, access to benefits or social protection programmes, and are more “at risk” to downturns in economic cycles, these categories of work are considered “vulnerable”.

There is a connection between vulnerable employment and poverty. If the proportion of vulnerable workers in total employment is sizeable, it may be an indication of widespread poverty. The connection arises because vulnerable workers lack social protection and safety nets to guard against poverty in periods of low economic demand. In addition, vulnerable workers are often incapable of generating sufficient savings for themselves and their families to offset declines in remuneration during economic downturns.

SOURCES AND DATA COLLECTION

Data are obtained from population censuses, labour force or other household surveys, establishment surveys, administrative records and official estimates based on results from several of these sources. Labour force surveys can be designed to cover virtually the entire population of a country, all branches of economic activity, all sectors of the economy, and all categories of workers, including own-account workers, unpaid family workers and persons engaged in casual work or marginal economic activity. For this reason, household-based labour force surveys offer a unique advantage for obtaining information on the labour market of a country and its structure.

Other sources such as population censuses and administrative records differ in scope, coverage, units of measurement and methods of data collection. Labour force and household surveys may have limited geographical and population coverage. Each source has advantages and limitations in terms of the cost, quality and type of information gained. The ideal geographic coverage is the entire country (no geographic exclusions) and entire populations (no exclusion of population groups).

DISAGGREGATION

Ideally, the data should be disaggregated by sex and age group. Information can also be disaggregated by urban/rural location.

COMMENTS AND LIMITATIONS

Using the proportion of own-account and contributing family workers in total employment as an indicator of decent work is not without its limitations. Specifically, the jobs of some wage and salaried workers that are not included in the categorization of

vulnerable workers might carry high economic risks, while some own-account workers might be quite well off and not vulnerable at all. Despite these limitations, vulnerable employment is especially relevant for the less developed economies and regions, and the fact that a strong correlation has been established between high poverty rates for a region and high shares of workers in vulnerable employment does substantiate the utility of the indicator to measure progress towards the goal of decent employment for all.

When using this indicator to assess vulnerable employment, differences in definitions and coverage over time (and across countries when making international comparisons) make comparisons difficult. Some definitional changes or differences in coverage can be overlooked, for example, differing age limits for measurement of employment. What is more important to note is that information from labour force surveys is not necessarily consistent with what is included in employment. For example, the information supplied in some countries may reflect civilian employment, which can result in an underestimation of “employees” and “workers not classifiable by status”, especially in countries that have large armed forces. Numbers of self-employed and contributing family workers would not be affected by this underestimation, but their relative shares in employment would be.

GENDER EQUALITY ISSUES

The indicator is highly gender sensitive since, historically, contributing family work is a status that is dominated by women. Consequently, women account for a disproportionate number of vulnerable workers in most countries.

DATA FOR GLOBAL AND REGIONAL MONITORING

Data for global and regional monitoring for this indicator are reported by the International Labour Organization (ILO). The majority of ILO data for this indicator reflect nationally-reported data collected by the ILO Bureau of Labour Statistics or other international organizations such as the Organization for Economic Co-operation and Development.

ILO produces aggregate estimates for regions and groups of countries. Because not all countries report data every year, it is not possible to derive aggregate estimates of labour market indicators by merely summing across countries. To address this problem, the ILO maintains econometric models which are used to produce estimates of labour market indicators in the countries and years for which no real data exist. These models use multivariate regression techniques to impute missing values at the country level.

The ILO reports only available country-level information for this indicator. Therefore, no discrepancies between nationally reported and internationally reported data are likely to exist.

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Indicator 1.8: Prevalence of underweight children under-five years of age

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger

DEFINITION AND METHOD OF COMPUTATION

Definition

This indicator is defined as the percentage of children aged 0–59 months whose weight is less than two standard deviations below the median weight for age of the *international reference population*.

Concepts

The *international reference population* is a population against which the growth of children can be compared. The reference population is defined by the World Health Organisation (WHO) Child Growth Standards. The standards are based on more than 8,000 children from Brazil, Ghana, India, Norway, Oman and the United States of America. These children were selected based on their exposure to an optimal environment for proper growth including recommended infant and young child feeding practices, good healthcare, non-smoking mothers, and other factors associated with good health outcomes.

Method of computation

The weights of children under five years of age are compared with the weights given in the standard reference population for each age group. The percentage of children whose weights are less than 2 standard deviations below the median weight for each age are then aggregated to form the total percentage of children under five who are underweight.

$$\text{Percentage of children under five that are underweight} = \frac{\text{Number of children under age five whose weights fall below minus two standard deviations from the median weight for age of the standard (moderate and severe)}}{\text{Total number of children under age five that were weighed}} * 100$$

RATIONALE AND INTERPRETATION

Child undernutrition, measured as the prevalence of underweight children, is an important component of the MDGs since it is linked to poverty, low levels of education, and poor access to health services. Undernourishment in children, even moderate, increases their risk of death, inhibits their cognitive development, and affects their health status later in life. Sufficient and good quality nutrition is the cornerstone for development, health and survival of current and succeeding generations. Healthy nutrition is also important for women during pregnancy and lactation, so that their children are born into sound developmental paths, both physically and mentally.

Under-five underweight prevalence is an internationally recognized public health indicator for monitoring nutritional status and health in populations. Child nutritional status is monitored more closely than adult nutritional status.

The numeric value of this indicator refers to the proportion of children under five years of age who are underweight according to the international standard reference. Within the reference group, approximately 2.3 per cent of the children are underweight. In the developing world, about a quarter (24 per cent) of children under-five are underweight according to the WHO Child Growth Standards.

SOURCES AND DATA COLLECTION

At the national level, data are generally collected from national household surveys, including Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and national nutrition surveys. It should be noted that when comparing estimates within a country over time or across countries, these estimates should be based on the same *international reference population*.

DHS and MICS are generally conducted every three-to-five years. Some countries conduct national nutrition surveys annually.

DISAGGREGATION

Indicators of malnutrition generally show differences between rural and urban settings and among socioeconomic groups. In some countries, child nutrition may vary across geographical areas, and/or ethnic groups. Gender differences may also be more pronounced in some social and ethnic groups than in others.

Estimates of child undernutrition cross-tabulated by background information are available from most DHS and MICS surveys and from some national nutrition surveys as well.

COMMENTS AND LIMITATIONS

Certain aspects of the nature of the indicator may limit the international comparability or accuracy of the figures:

- The underweight indicator reflects body mass relative to chronological age and is influenced both by the height of the child, and weight-for-height. Its composite nature complicates its interpretation. For example, the indicator fails to distinguish between short children of adequate body weight and tall, thin children.
- The accuracy of nutritional status indicators depends on proper measurements in age, weight, and height. For example, only those children with month and year of birth recorded and with valid height and weight measurements are included in the calculations.

- In April 2006, the WHO released the *WHO Child Growth Standards* to replace the widely used *National Center for Health Statistics (NCHS)/WHO* reference population. Studies have shown important differences between these two reference populations, especially during infancy. Therefore, to allow for comparability over time, it is likely that for some time the anthropometric indicators will have to be analyzed using both the NCHS/WHO and the new WHO Child Growth Standards.

While underweight prevalence is a useful indicator to assess overall nutritional status of the population; stunting and wasting prevalence are also useful indicators for tracking trends in child malnutrition.

Stunting, also known as low height-for-age, measures levels of cumulative deficient growth associated with long-term factors, including chronic insufficient daily protein intake. This indicator is defined as the percentage of children under five whose heights are less than two standard deviations below the median height for the age of the standard reference population.

Wasting, also known as low weight-for-height, indicates in most cases a recent and severe process of weight loss, often associated with acute starvation and/or severe disease. This indicator is defined as the percentage of children under five whose weights are less than two standard deviations below the median weight for height of the reference population.

When possible, all three indicators (underweight, stunting, and wasting) should be analyzed and presented since they measure and reflect different aspects of child nutrition.

GENDER EQUALITY ISSUES

In most countries, data from national household surveys do not show significant differences in the underweight prevalence of boys and girls. However, these trends should continue to be monitored, particularly at the sub-national level and within subgroups of the population.

DATA FOR GLOBAL AND REGIONAL MONITORING

For international comparisons and global or regional monitoring, the United Nations Children's Fund (UNICEF) compiles international data series and estimates based on data from national surveys.

UNICEF reviews and compiles survey results reported by individual countries every year and updates its global database on child nutrition indicators. As of 2009, UNICEF is converting its global trend database on child undernutrition from estimates based on the United States National Center for Health Statistics (NCHS)/WHO reference population to estimates based on the new WHO Child Growth Standards by re-analyzing available household survey data.

Estimates may come from different data sources, usually surveys conducted in different years that are recorded and published separately. In rare cases when nationally representative estimates come from different sources in the same year, all sources are included in the global database. However, only one source is selected as the point estimate to be published, and this selection is based on a thorough data quality review.

Regional and global estimates are based on averages weighted by the total number of children under five years of age. These estimates are presented only if available data cover at least 50 per cent of the total children under five years of age in the regional or global groupings.

Latest available estimates of underweight prevalence are published annually in December by UNICEF in *The State of the World's Children* and online. WHO also publishes estimates through its online database: *WHO Database on Child Growth and Nutrition*. However, due to slight differences in calculations, there may be discrepancies between the estimates of UNICEF and WHO.

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Indicator 1.9: Proportion of population below minimum level of dietary energy consumption

GOAL AND TARGET ADDRESSED

Goal 1. Eradicate extreme poverty and hunger

Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger

DEFINITION AND METHOD OF COMPUTATION

Definition

The proportion of the population below the minimum level of dietary energy consumption, referred to as the proportion of *undernourished people*, is the percentage of people in a population who suffer from hunger or food deprivation.

Concepts

Undernourishment refers to the condition of people whose food consumption is continuously below a minimum dietary energy requirement for maintaining an acceptable minimum body size, a healthy life and carrying out light physical activity.

The estimate of the proportion of *undernourished people* is a measure of food deprivation based on the following three parameters:

- The three-year average amount of *food available for human consumption* per person per day;
- The *level of inequality* in access to that food; and
- The *minimum dietary energy required* for an average person—expressed in kilocalories per day.

The *food available for human consumption* is the sum of domestically produced and imported food products, minus food exports, food withdrawn from stocks for purposes other than consumption and food losses. This is then converted into dietary energy terms expressed in kilo-calories and divided by the total population and the number of days in the year to come up with the average dietary energy consumption per person per day. To smooth annual fluctuations, a three-year average is calculated.

The *level of inequality in access to food* is measured by two coefficients. First, variation of dietary energy consumption due to income differences derived from food consumption and income data collected in household surveys. Second, variation of dietary energy consumption due to biological factors derived from anthropometric survey data on attained height by sex and age, standards on energy requirements and data on the country sex-age population structure. Inequality in access to food due to income differences may be affected by changes in economic, socio-political and environmental factors such as physical availability of food and prices. Inequality in access to food due to biological factors reflects sex and age ranges in the total population and is affected by the population ageing.

The *minimum level of dietary energy requirements*, or cut-off point, is derived using energy standards established by the Food and Agriculture Organization of the United

Nations, World Health Organization and United Nations University (FAO/WHO/UNU) for different sex and age groups performing sedentary physical activity and with a minimum acceptable body-weight for attained heights. Since a large adult needs almost double the dietary energy of a three-year old child, the minimum energy requirement per person for each country should take into account its mix of age, gender and body sizes. The cut-off point for the purpose of estimating undernourishment is calculated nationally as a population per person per day average value, based on dietary energy needed by different age and gender groups and the proportion of the population represented by each age group for a given year.

Method of computation

As it is not feasible to determine the precise energy consumption of individuals, the estimate of the proportion of individuals with insufficient energy consumption is defined within a probability distribution framework, as follows:

$$P(U) = P(x < r_L) = \int_{x < r_L} f(x) dx = F_x(r_L)$$

where:

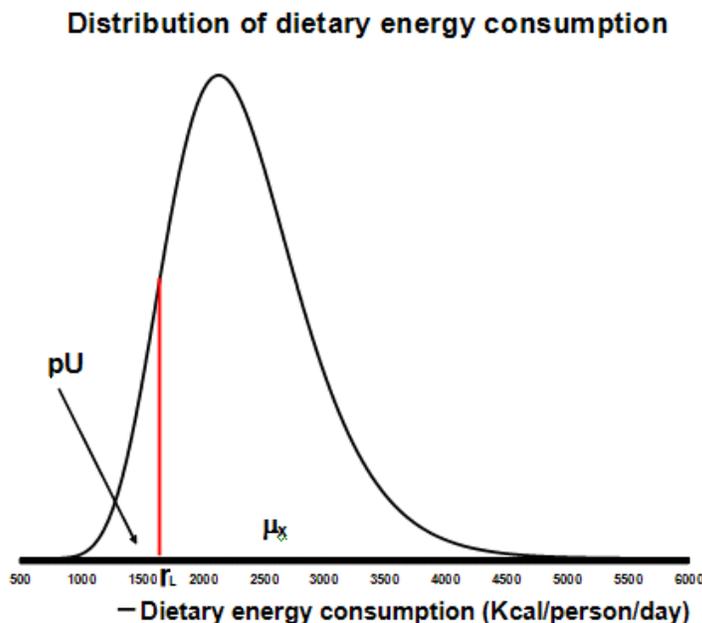
$P(U)$ is the proportion of undernourished in the total population;

(x) refers to the dietary energy consumption or intake;

r_L is a cut-off point reflecting the minimum acceptable level of dietary energy consumption;

$f(x)$ is the density function of dietary energy intake; and

F_x is the cumulative distribution function.



The graph above illustrates the assumption that dietary energy consumption follows a log normal distribution. The curve depicts the proportion of the population corresponding to different per person per day dietary energy consumption levels (x) represented by the

horizontal line. The area under the curve up to the minimum acceptable dietary energy consumption (r_L) represents the proportion of the population below the minimum level of dietary energy consumption or the proportion of the population undernourished (pU).

RATIONALE AND INTERPRETATION

This indicator measures an important aspect of the food insecurity of a population and the capacity for sustainable development which demands efforts to reduce poverty, including finding solutions to hunger and malnutrition. Alleviating hunger is a prerequisite for sustainable poverty reduction since under-nourishment seriously affects, among other things, labour productivity, health and learning capacity and hence earning propensity. It is necessary to use both food deprivation and child malnutrition (Indicator 1.8) indicators to have a comprehensive understanding of changes in the food and nutrition situation of countries.

The indicator ranges from 0 (no undernourished population) to 100 (the entire population is undernourished). A higher value of this indicator, means that more people suffer from undernourishment (food deprivation) in a given country. The following undernourishment categories for a population are considered the most common:

- Less than 5 per cent—Not a significant level of undernourishment.
- From 5 to 9 per cent—Low level of undernourishment.
- From 10 to 19 per cent—Moderate level of undernourishment.
- From 20 to 34 per cent—High level of undernourishment.
- 35 per cent and above—Very high level of undernourishment.

Changes in the indicator guide governments and international organizations in formulating policies and implementing actions towards: improving food availability and access by the population, decreasing the negative impact of increasing income inequalities on food access and coping with trends in food needs generated by the impact of population policies.

SOURCES AND DATA COLLECTION

Data are usually produced by national statistical offices, ministries of agriculture and other public institutions that prepare national food balances or are engaged in national food security. Data on food production and trade are generally available on a yearly basis. Food production data are compiled in accordance with the agricultural calendar, while trade data are compiled in accordance with the business calendar. Undernourishment estimates are derived for three-year periods to account for differences between these calendars.

Data for the calculation of this indicator could be obtained from the following sources:

- Food production is compiled by ministries of agriculture, ministries of industry, etc. on an annual basis;
- Food trade is compiled by ministries of trade, industry and commerce and customs departments on an annual basis;

- Private and public sector food balance sheets which estimate food availability for human consumption;
- Average daily dietary energy consumption per person (private consumption) by income or total expenditure levels (deciles of per person income or total expenditure) is derived from National Household Surveys that collect food consumption data. Such surveys are conducted on a less frequent basis by national statistical offices to estimate inequality in access to food due to income;
- Average heights attained by sex and age-group are derived from National Anthropometric Surveys to derive inequality in access to food due to biological factors. Such surveys are available on an occasional basis from national statistical offices or ministries of health; and
- Population and sex and age structure data are from national censuses conducted by national statistical offices.

The accuracy of dietary energy consumption estimates varies from country to country. Evaluation of accuracy is done through consistency checks, based on complete revisions of all related information (concepts, definitions and methods).

Country data on changes in the variance of the distribution of dietary energy consumption due to income variations in the population have been limited during the last three decades. This is because food consumption data collected in national household surveys need to be converted to dietary energy consumption in order to be utilized. Also, data on height secular trends by sex and age-groups are scarce since countries don't usually conduct regular anthropometric surveys in the total population.

Data on population structure by sex and age group are updated periodically. Changes in the age-sex structure of the population impact both minimum dietary energy consumption and the variance of dietary energy consumption. Therefore, these changes need to be taken into account.

DISAGGREGATION

In assessing food insecurity, it is important to consider geographical areas that may be particularly vulnerable (such as areas with a high probability of major variations in food production or supply, or areas that are subject to natural disasters or are not well connected to markets) and the population groups whose access to food is precarious or sporadic (due to structural or economic vulnerabilities), such as particular ethnic or social groups. Gender differences may also be more pronounced in some social and ethnic groups.

To support disaggregated estimates, food consumption data collected through National Household Budget Surveys are used to estimate the proportion of undernourished people in various population groups at sub-national levels (defined geographically or by household or household member characteristics).

COMMENTS AND LIMITATIONS

In the methodology for estimating the proportion of undernourished population, a basic problem concerns the use of energy requirement norms and energy consumption for individuals. Even after taking into account the most influential factors on energy requirements and consumption, such as age, sex, body weight and activity, differences exist in the energy requirement of individuals. As it is not feasible to determine the energy consumption of individuals, the estimate of the proportion of individuals with insufficient energy consumption is defined within a probability distribution framework, which means that the results are not always 100 per cent accurate.

For many countries, the reliability of the underlying data and measures of inequality are uncertain. A relatively small variation in just one of these parameters can produce significant differences in a country's estimated levels of hunger. Furthermore, estimates based on national production and trade figures cannot be used to pinpoint whether hunger has become concentrated in specific geographic areas and/or socio-economic groups.

This indicator is based on quantities of food that are available and accessible for human consumption but it does not take into account the quality of the food. Food deprivation can decrease because people have reached minimum levels of energy requirements, but people can still face deficiencies due to insufficient quantities of vitamins and minerals, as well as deficiencies in protein and essential amino-acids that are required for proper body growth and maintenance.

GENDER EQUALITY ISSUES

Intra-household access to food may show disparities by gender. Also, cultural patterns of distribution and nutritional taboos may affect women's nutrition. Women's higher requirements for iron during pregnancy and breast-feeding may result in iron deficiency anaemia, which affects the result of pregnancy and may increase women's susceptibility to diseases. Therefore, whenever household survey food consumption data are available by sex, efforts should be made to conduct gender-based undernourishment analyses, including analyses of iron available in diets.

DATA FOR GLOBAL AND REGIONAL MONITORING

FAO is the agency responsible for compiling and monitoring this indicator at the global level, and for producing regional aggregates periodically.

Average food available for human consumption comes from national "food balance sheets" compiled by FAO every year. FAO then divides the energy equivalent of the available food by the total population to come up with the amount of average daily energy consumption. Data from household surveys are used to derive a coefficient of variation to account for the degree of inequality in access to food. The minimum dietary energy requirement level is derived from the FAO/WHO/UNU energy standards for different sex and age population groups.

A number of countries have estimated the proportion of undernourished people at national and sub-national levels using the FAO methodology, but using different sources of data on the amount of food available for human consumption. Private food consumption data are collected in household surveys that do not necessarily coincide with international level estimates which are derived from national food balances.

The national estimate is based on food consumed in households while the international estimate includes not only household food consumption but also public food consumption, except the food consumed by tourists and other non-local population groups (e.g.: refugees). Public food consumption occurs in establishments such as prisons, hospitals, hotels, military barracks, residences and public food services (e.g.: Red Cross).

Estimates for regional and sub regional monitoring are aggregated by adding up the number of undernourished population in each country within a region or sub-region and dividing this by the total population of the same region or sub-region.

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