PAHO STRATEGIC PLAN 2020-2025
"Equity at the Heart of Health"

Compendium of Impact Indicators

September 27, 2019

Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

INTRODUCTION

This compendium includes the technical specifications for the impact indicators of the Strategic Plan (SP) of the Pan American Health Organization (PAHO) 2020-2025. The compendium provides definitions and measurement criteria for all indicators, in order to facilitate a systematic approach to monitoring and reporting on implementation of the Strategic Plan.

The compendium was prepared by the Pan American Sanitary Bureau (PASB), in collaboration with the Strategic Plan Advisory Group (SPAG) for the SP 2020-2025. This group was established by the 162nd PAHO Executive Committee. The SPAG had representation 21 Member States from all PAHO subregions: the Caribbean (Antigua and Barbuda, Bahamas, Dominica, Guyana, Saint Lucia, and Trinidad and Tobago); Central America (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama); North America (Canada, Mexico, and the United States of America); and South America (Argentina, Bolivia, Brazil, Ecuador, Paraguay, and Venezuela). Panama was appointed Chair, and the Bahamas, Vice Chair.

The indicators below are subject to further revisions by the PASB in order to maintain alignment with both Sustainable Development Goals (SDG) indicators and Impact Framework indicators of the 13th General Programme of Work 2019-2023 of the World Health Organization (WHO). The PASB may also further clarify or refine the specifications for the measurement of the indicators, as needed. Baselines and targets are subject to validation with updated information from Member States and the PASB after the final assessment of the PAHO Strategic Plan 2014-2019.

The latest version of the compendium will be posted on the PAHO website under "About PAHO", accessible here.

Code and title of the indicator	**Impact indicator 1:** Reduction of within-country health inequalities
Definition of the indicator	This indicator refers to the number of countries achieving a measurable, proportional reduction of within-country absolute inequalities between groups, as defined by a relevant social stratifier, in at least two of the four core tracer health indicators under Sustainable Development Goal 3 (SDG 3). **Baseline 2019:** Not applicable **Target 2025:** 17
Purpose of the indicator	This indicator is used to quantify social inequalities in health within countries, providing evidence of, and generating accountability on, the commitment by countries to *leave no one behind*.
Technical note	This indicator requires data to be disaggregated subnationally, either geographically (e.g., by districts) or individually (e.g., as survey microdata). The four core tracer SDG 3 health indicators (CTHI), which cover the life course, are: • Neonatal mortality rate (SDG 3.2.1) • Adolescent birth rate (SDG 3.7.2) • Tuberculosis incidence rate (SDG 3.3.2) • Premature mortality rate attributable to noncommunicable diseases (NCDs) (SDG 3.4.1) A relevant social stratifier is any of the equity stratifiers listed in target 11.1 of the Sustainable Health Agenda for the Americas 2018-2030 (SHAA2030): place of residence (rural/urban), race, ethnicity, occupation, gender, sex, age, education, or socioeconomic status, as well as subnational geographic disaggregation. Absolute inequality (AbsIneq) is the arithmetic difference between the core tracer SDG 3 health indicator in the most vulnerable group and that of the reference group. For ordinal social stratifiers (such as income or years of education), the groups under comparison are the extremes of the appropriate distribution (e.g., lowest and highest quintiles). Proportional reduction of absolute inequality (PRAI) is computed as follows: $$PRAI = \frac{ln(AbsIneq_{CTHIcurrent}) - ln(AbsIneq_{CTHIbaseline})}{(t_{current} - t_{baseline})} \times 100$$ The final impact indicator calculation is computed as the sum of countries with PRAI <0 for at least two of the four CTHI.
Type of indicator	Absolute
Measurement units	Number of countries

Frequency of measurement	Data will be reported to Governing Bodies in the established years of the Strategic Plan reports (2022, 2024, and 2026).
PASB unit(s) responsible for monitoring the indicator	• Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA) • Office for Equity, Gender, and Cultural Diversity (EGC)
Data source	Official administrative data that are disaggregated subnationally (e.g., National Core Health Data) and/or microdata from relevant nationally representative surveys.
Limitations	• Insufficient data granularity (i.e., poor data disaggregation) and/or poor data quality can lead to unstable patterns of inequality. • Residual ecological bias with administrative data can be present.
References	1. Pan American Health Organization. Sustainable Health Agenda for the Americas 2018-2030 [Internet]. 29th Pan American Sanitary Conference, 69th Session of the Regional Committee of WHO for the Americas; 2017 Sep 25-29; Washington, DC. Washington, DC: PAHO; 2017 (Document CSP29/6, Rev. 3) [cited 2019 Aug 6]. Available from: https://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=41946&Itemid=270&lang=en 2. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development [Internet]. General Assembly, Seventieth Session of the General Assembly of the United Nations; 2015 Sep 11-18; New York. New York: UN; 2015 (Resolution A/RES/70/1) [cited 2019 Aug 6]. Available from: http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/70/1 3. World Health Organization. The handbook on health inequality monitoring. Geneva: WHO; 2013. Available from: https://www.who.int/social_determinants/action/handbook_inequality_monitoring/en/ 4. World Health Organization. Health Equity Assessment Toolkit (HEAT) Plus. Available from: https://www.who.int/gho/health_equity/assessment_toolkit/en/
Linkage	• SHAA2030 target 11.1 • Neonatal mortality rate (SDG 3.2.1) • Adolescent birth rate (SDG 3.7.2) • Tuberculosis incidence rate (SDG 3.3.2) • NCD-attributable premature mortality rate (SDG 3.4.1) • SDG targets 10.2 and 10.3

Code and title of the indicator	**Impact indicator 2:** Health-adjusted life expectancy (HALE)
Definition of the indicator	This indicator estimates the average time in years that a person (at a given age) could expect to live in good health (that is, taking into account fatal health outcomes caused by premature mortality and non-fatal health outcomes caused by disability). It serves as a summary measure of population health. **Baseline 2019:** 66.91 years **Target 2025:** 67.58 years
Purpose of the indicator	This indicator is a single index that captures the expected years of survival free of disability. Such single measures of overall population health provide a useful means to measure health gaps, such as disability-adjusted life years (DALYs), which are often disaggregated by disease and injury.
Technical note	To calculate healthy life expectancy for a particular population (defined by sex, country, and year), the first step is to compute the average health of individuals in that population within each age interval. Information about the prevalence of all sequelae and their associated disability weights are then combined, accounting for comorbidity. These average health values are equivalent to 1 minus the indicator Years Lived with Disability (YLD) per person in a population. Average health values are then incorporated into the life table by Sullivan's method (see Sullivan 1971 in the reference section). For the purpose of the PAHO Strategic Plan 2020-2025, the computations required for this index will be made in conjunction with the Institute for Health Metrics and Evaluation (IHME), which produces the data annually.
Type of indicator	Relative
Measurement units	Number of years
Frequency of measurement	HALE will be measured biennially. Information will be gathered from Member States between January and December of a given year, and will be analyzed in June of the following year.
PASB unit(s) responsible for monitoring the indicator	Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	PAHO/WHO Regional Mortality Database and IHME databases; estimates from WHO and from the IHME Global Burden of Disease Study.
Limitations	The indicator involves many steps and intensive computations for its calculation, which requires collaboration with IHME.

References	1. Imai K, Soneji S. On the estimation of disability-free life expectancy: Sullivan method and its extension. J Am Stat Assoc 2007;102(480): 1199-1211.
	2. Global, regional, and national disability-adjusted life-years (DALYs) for 359 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Global Health Metrics 2018; 392(10159): P1859-1922 [see Statistical approach in Appendix 1]. Available from: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)32335-3/fulltext
	3. Salomon JA, Vos T, Hogan DR, et al. Common values in assessing health outcomes from disease and injury: disability weights measurement study for the Global Burden of Disease 2010. Lancet 2012; 380(9859): 2129-2143.
	4. Salomon JA, Wang H, Freeman MK, et al. Healthy life expectancy for 187 countries, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012; 380(9859): 2144-2162.
	5. Sullivan DF. A single index of mortality and morbidity. HSMHA Health Rep 1971; 86(4): 347-354.
	6. Vos T, Flaxman AD, Naghavi M, et al. Years lived with disability (YLD) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012; 380(9859): 2163-2196.
	7. Wang H, Dwyer-Lindgren L, Lofgren KT, et al. Age-specific and sex-specific mortality in 187 countries, 1970-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012; 380(9859): 2071-2094.
Linkage	• SP14-19 impact 1.1
	• GPW13 Impact Framework (overarching measure)

Code and title of the indicator	**Impact indicator 3:** Neonatal mortality rate
Definition of the indicator	The neonatal mortality rate is the probability that a child born in a specific year or period will die in the first 28 days of life (0-27 days) if subject to age-specific mortality rates of that period, expressed per 1,000 live births. Neonatal deaths (deaths among live births during the first 28 completed days of life) may be subdivided into early neonatal deaths, which occur during the first 7 days of life, and late neonatal deaths, which occur after the 7th day but before the 28th completed day of life. **Baseline 2017:** 7.9 deaths per 1,000 live births **Target 2025:** 6.9 deaths per 1,000 live births * * This target was established based on an Average Annual Percent Change of -2.1% considering the estimates from UN IGME 2017. The 2018 estimates will be published in September 2019. Baseline and targets may change once the new estimates are published.
Purpose of the indicator	Neonatal mortality accounts for a significant proportion of under-5 mortality. The indicator provides information on the risk of mortality on days 0-27, which is related to different social determinants, coverage, and quality of health care.
Technical note	The United Nations Inter-agency Group for Child Mortality Estimation produces estimates of the trend of the neonatal mortality rate with a standardized methodology by country and region. To calculate the indicator: **Numerator**: total number of neonatal deaths (from 0 to 27 days of life) **Denominator**: total number of live births Each country uses, whenever possible, representative empirical data at the national level obtained from different sources (civil registry, household surveys, censuses), which are consolidated to obtain estimates by adjusting the curve to the observed mortality points. In the case of countries without annual civil registry data, the estimate for the current year is based on projections derived from data points that are inferred for at least the previous 3 or 4 years. These neonatal mortality rates are estimated by applying these methods to all Member States to ensure comparability between countries and periods; consequently, they are not necessarily equal to the official national data. The United Nations Inter-agency Group for Child Mortality Estimation is made up of representatives from UNICEF, WHO, the World Bank and the United Nations Population Division. Before publication, countries review the series of estimates and provide new data that may be available.
Type of indicator	Relative

Measurement units	Number of deaths per live births
Frequency of measurement	The indicator will be measured annually if based on registration systems; otherwise, less frequently (every 3-5 years if based on surveys).
PASB unit(s) responsible for monitoring the indicator	• Family, Health Promotion and Life Course/Latin American Center of Perinatology, Women and Reproductive Health (FPL/CLAP) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	Estimates from IGME that use all available sources of country data (civil registry, surveys, administrative registries, etc.) applying a comparable methodology.
Limitations	The estimates depend on the methodology applied and the sources of data used, as well as the quality of the data reported by the countries. Some countries provide very close values when contrasted with the estimates, others may present lower or higher values, which is related again to the quality of the data source, among other factors. The estimates have confidence intervals that should be considered when comparing the values reported by the country and the values over time or between countries. Similarly, these estimates are often affected by non-sampling errors. As in the case of census data, data from child mortality surveys and their components could omit births and deaths, include stillbirths along with live births, and present survivor selection bias and age truncation. Direct estimates of neonatal mortality based on survey data may also be affected by erroneous information provided by the mother when reporting the date of birth of her children, current age, or age at the time of death (there are probably more possibilities of error if the child has passed away). The civil registry and vital statistics systems are the preferred source of data on neonatal mortality. However, many developing countries do not have fully functioning registration systems that accurately record (cover) all births and all deaths. Therefore, household surveys, such as demographic and health surveys and multiple indicator surveys by clusters, have become an important source of data on neonatal mortality in developing countries, but there are some limits as to its quality and representativeness. The quality of the data reported by countries depends on the quality of their national information systems. Some countries provide accurate values using registration data, when contrasting them with estimates. Mean national values may not contribute to identifying inequities. Disaggregation by age (in days/weeks), birthweight, place of residence, sex, and socioeconomic status is highly recommended.
References	1. World Health Organization. Every newborn: an action plan to end preventable deaths. Geneva: WHO; 2014. Available from: http://www.everynewborn.org/Documents/Full-action-plan-EN.pdf 2. United Nations. Framework of actions for the follow-up to the Programme of Action of the International Conference on Population and Development

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beyond 2014: report of the Secretary-General. New York: UN; 2014. Available from: http://www.unfpa.org/sites/default/files/pub-pdf/ICPD_beyond2014_EN.pdf

3. UNICEF. UNICEF data: monitoring the situation of children and women. New York: UNICEF; 2017. Available from: https://data.unicef.org/

4. World Health Organization. World health statistics 2017. Geneva: WHO; 2017. Available from: http://apps.who.int/iris/bitstream/10665/255336/1/9789241565486-eng.pdf?ua=1

5. United Nations. World population prospects, 2017 revision. New York: UN; 2017. Available from: https://population.un.org/wpp/Publications/

6. United Nations Inter-agency Group for Child Mortality Estimation. Available from: https://childmortality.org/

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<td>**Linkage**</td>
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- SHAA2030 target 1.3
- SDG indicator 3.2.2
- GPW13 Impact Framework
- PAHO Plan of Action for Women's, Children's, and Adolescents' Health
- PAHO Core Indicator

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Code and title of the indicator	**Impact indicator 4:** Under-5 mortality rate
Definition of the indicator	The under-5 mortality rate (U5MR) is the probability that a child born in a specific year or period will die before reaching the age of 5 years, if subject to age-specific mortality rates of that period, expressed per 1,000 live births. Despite its name, this indicator should not be interpreted as a rate (i.e., the number of deaths divided by the number of the population at risk during a certain period of time). Rather, it is a probability of death derived from a life table, expressed as a rate per 1,000 live births. **Baseline 2017:** 14 deaths per 1,000 live births (90% uncertainty interval: 14-15) * **Target 2025:** 11.5 deaths per 1,000 live births ** * The 2018 estimates will be published in September 2019 by the UN Inter-agency Group for Child Mortality Estimation. ** Target will be revised once the 2018 data are published in 2019.
Purpose of the indicator	The under-5 mortality rate measures child survival. It also reflects the social, economic, and environmental conditions in which children (and others in society) live, including their health care. Because data on the incidence and prevalence of diseases (morbidity data) frequently are unavailable, mortality rates are often used to identify vulnerable populations. The under-5 mortality rate is one of the SDG indicators (SDG indicator 3.2.1).
Technical note	The UN Inter-agency Group for Child Mortality Estimation (UN IGME) produces estimates of the trend in the under-5 mortality rate, using standardized methodology, by country and region. **Numerator:** Total number of deaths among children aged 0-4 years. **Denominator:** Total number of live births. For each country, whenever possible, nationally representative empirical data from different sources (civil registration, household surveys, censuses) are consolidated to obtain estimates by fitting a curve to the observed mortality points. For countries without annual data from civil registries, the estimate for the current year is based on projections derived from data points going back at least 3-4 years. These under-5 mortality rates have been estimated by applying methods to all Member States to ensure comparability across countries and time; hence they are not necessarily the same as the official national data. The Inter-agency Group for Child Mortality Estimation includes representatives from UNICEF, WHO, World Bank, and United Nations Population Division. Before publication, countries review the series of estimates and provide any new data that might be available. **Live birth** refers to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after

	such separation, breathes or shows any other evidence of life—e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles—whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.
Type of indicator	Relative
Measurement units	Number of under-5 deaths per 1,000 live births for a given year or other specified period
Frequency of measurement	The indicator is measured annually.
PASB unit(s) responsible for monitoring the indicator	• Family, Health Promotion and Life Course/Healthy Life Course (FPL/HL) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	Civil registration and vital statistics, censuses, or household surveys.
Limitations	Civil registration and vital statistics systems are the preferred source of data on child mortality. However, many developing countries lack fully functioning registration systems that accurately record all births and deaths. Thus, household surveys, such as Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS), have become an important source of data on child mortality in developing countries, but there are some limits to their quality and representativeness. Estimates obtained from household surveys have attached confidence intervals that need to be considered when comparing values along time or across countries. Similarly, these estimates are often affected by non-sampling errors. Like census data, survey data on child mortality may omit births and deaths, include stillbirths along with live births, and suffer from survivor selection bias and age truncation. Direct estimates of child mortality based on survey data may also be affected by mothers misreporting their children's birth dates, current ages, or ages at death—perhaps more so in the case of children who have died.
References	1. World Health Organization. Global Health Observatory visualizations. Indicator Metadata Registry. Under-five mortality rate per 1000 live births. Available from: http://apps.who.int/gho/data/node.wrapper.imr?x-id=4717 2. United Nations. UN Inter-agency Group for Child Mortality Estimation (UN IGME). Child mortality estimates. Available from: https://childmortality.org/
Linkage	• SDG indicator 3.2.1 • SHAA2030 target 1.3 • GPW13 Impact Framework • PAHO Plan of Action for Women's, Children's, and Adolescents' Health • PAHO Core Indicator

Code and title of the indicator	**Impact indicator 5:** Proportion of children under 5 who are developmentally on track in health, learning, and psychosocial well-being
Definition of the indicator	This indicator is currently measured as the proportion of children aged 36-59 months who are developmentally on track in at least three of the following four domains: literacy-numeracy, physical, social-emotional, and learning. **Baseline (surveys in 15 countries from 2010 to 2016):** 84.5% * **Target 2025:** 90% ** * These surveys have a range between 71% and 97%, with 84.5% as the median. ** Given the limitations noted below, the target draws on the available data; a review of estimates on the percentage of children at risk of poor development produced by the 2016 Lancet series on Early Childhood development; and the global target set by WHO.
Purpose of the indicator	Early childhood development is a multidimensional construct, encompassing several aspects of a child's well-being: physical, socio-emotional, and cognitive-linguistic. In general, development takes place in a series of predictable and common stages. This indicator reflects the cumulative effect of social, economic, and environmental conditions in which children live from pregnancy through the first years of life.
Technical note	Data on the four domains of early childhood development are collected through a set of questions specially designed and tested for this purpose. The domains are defined as follows: • *Literacy-numeracy*: Children are identified as being developmentally on track if they can do at least two of the following: identify/name at least 10 letters of the alphabet; read at least four simple, popular words; and/or know the name and recognize the symbols of all numbers from 1 to 10. • *Physical*: If the child can pick up a small object with two fingers, like a stick or rock from the ground, and/or the mother/primary caregiver does not indicate that the child is sometimes too sick to play, then the child is regarded as being developmentally on track in the physical domain. • *Social-emotional*: The child is considered developmentally on track if two of the following are true: the child gets along well with other children; the child does not kick, bite or hit other children; and the child does not get distracted easily. • *Learning*: If the child follows simple directions on how to do something correctly and/or when given something to do, and is able to do it independently, then the child is considered to be developmentally on track in the learning domain. Response categories for all questions are yes, no, and don't know. The final score is then calculated as the proportion of children under the age of 5 years who are developmentally on track in at least three of these four domains.

	Numerator: Number of children under the age of 5 who are developmentally on track in at least three of the following four domains: literacy-numeracy, physical, social-emotional, and learning. **Denominator:** Total number of children under the age of 5 in the population being measured.
Type of indicator	Relative
Measurement units	Percentage
Frequency of measurement	The frequency is variable.
PASB unit(s) responsible for monitoring the indicator	• Family, Health Promotion and Life Course/Healthy Life Course (FPL/HL) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	The UNICEF Multiple Indicator Cluster Survey (MICS) is a household survey that has collected data on this indicator in low- and middle-income countries since around 2010. Demographic and Health Surveys (DHS) also have an optional module on early childhood development and include some of the MICS variables, but not all of them. Other household surveys may include questions that pertain to the development status of under-5 children but are not fully comparable to those used by MICS. For the calculation of this indicator, PAHO will consider population-based surveys where the numerator and denominator come from the same survey. PAHO will monitor the number of countries with survey data on the developmental status of children by type of survey and include this information as part of its report on this indicator.
Limitations	This indicator is aspirational, given that current measurement methods and tools have limitations. Currently, the indicator relies on household data collected by UNICEF MICS surveys. The frequency of surveys varies and the costs of conducting a survey may not be feasible for some countries in the Region. Since 2010, comparable MICS data are available in 18 countries in the Americas. Ten countries have only one survey, eight have two, and one has three. It is important to note that responses to the survey are provided by the children's primary guardians, which can introduce potential biases into the measurement. Some countries have data on the development status of children, but their methods and tools differ so the data may not be comparable to data collected through MICS. WHO, UNICEF, World Bank, and other partners are currently working to develop simple tools to measure the development status of young children. The tools would be administered through surveys or as part of program evaluations, and are expected to be ready for dissemination in 2020. PAHO will support countries in efforts to build their capacity to measure this indicator periodically.
References	1. UNICEF. UNICEF data: monitoring the situation of children and women. Early childhood development. Available from:

	https://data.unicef.org/topic/early-childhood-development/development-status/ 2. UNICEF. MICS: surveys. Available from: http://mics.unicef.org/surveys
Linkage	• SDG indicator 4.2.1 • GPW13 Impact Framework • PAHO Plan of Action for Women's, Children's, and Adolescents' Health

Code and title of the indicator	**Impact indicator 6:** Maternal mortality ratio (MMR) (deaths per 100,000 live births)
Definition of the indicator	The MMR approximates a woman's risk of dying while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. **Baseline 2015:** 52 deaths per 100,000 live births **Target 2025:** 35 deaths per 100,000 live births * * This target is aligned with SHAA2030 target 1.2, which is 30 deaths per 100,000 live births by 2030.
Purpose of the indicator	The maternal mortality ratio is the most widely used measure of maternal deaths and is a measure of obstetric risk. It is widely acknowledged as a general indicator of the overall health of a population, the status of women in society, and the functioning of the health system. The maternal mortality ratio is one of the indicators (3.1.1) under SDG target 3.1: "By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births." The MMR is also related to the Global Strategy for Women's, Children's and Adolescents' Health 2016-2030 (Survive Target 1) and the Sustainable Health Agenda for the Americas 2018-2030 (target 1.2).
Technical note	The maternal mortality ratio can be calculated by dividing recorded (or estimated) maternal deaths by total recorded (or estimated) live births in the same period and multiplying by 100,000. Measurement requires information on pregnancy status, time of death (during pregnancy, childbirth, or within 42 days of termination of pregnancy), and cause of death. The maternal mortality ratio can be calculated directly from data collected through civil vital registration systems (CVRS), household surveys, or other sources. There are often data quality problems, particularly related to the underreporting and misclassification of maternal deaths. Therefore, data are often adjusted in order to take these data quality issues into account. Potential disaggregation categories to be considered, in order to increase understanding of inequities, include race/ethnicity, wealth quintile, residence, and education. Maternal mortality estimates from the Interagency Group (comprised of WHO, UNICEF, United Nations Population Fund, and World Bank) are not the ideal source of information because these estimates do not always coincide with national data. Another disadvantage is that the estimates do not include all Member States. However, the use of these estimates from the Interagency Group has some advantages: *a)* the formula for calculation is completely transparent, *b)*

	data cover almost all Member States, and *c*) data are fully comparable and are presented at regular intervals of time. For this reason, Member States agreed to use this source of information, while efforts continue to ensure that all the countries are able to produce reliable, comparable, and timely reporting for this indicator.
Type of indicator	Relative
Measurement units	Number of maternal deaths per 100,000 live births at the regional level
Frequency of measurement	Countries publish national data on this indicator at varying intervals. Some countries do so annually, while others only produce information every five years from different surveys. Global estimates are produced approximately every two to five years by the Interagency Group.
PASB unit(s) responsible for monitoring the indicator	• Family, Health Promotion and Life Course/Latin American Center for Perinatology, Women and Reproductive Health (FPL/CLAP) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	PAHO Core Indicators database.
Limitations	Precise maternal mortality ratios are challenging to obtain, given insufficient mortality registry coverage and difficulties in the accurate classification of deaths. In places with serious limitations in their registries, censuses and surveys can be used as alternative data sources to estimate maternal mortality levels.
References	1. World Health Organization, World Bank, UNICEF, United Nations Population Fund. Trends in maternal mortality: 1990 to 2010: WHO, UNICEF, UNFPA and the World Bank estimates. Geneva: WHO; 2012. Available from: http://whqlibdoc.who.int/publications/2012/9789241503631_eng.pdf?ua=1 2. Pan American Health Organization. Health situation in the Americas: core indicators 2018. Washington, DC: PAHO; 2018. Available from: http://iris.paho.org/xmlui/handle/123456789/49511
Linkage	• SDG indicator 3.1.1 • SHAA2030 target 1.2 • SP14-19 impact 3.1 • GPW13 Impact Framework • PAHO Plan of Action for Women's, Children's, and Adolescents' Health • PAHO Core Indicator

Code and title of the indicator	**Impact indicator 7:** Rate of mortality amenable to health care (MAHR) (deaths per 100,000 population)
Definition of the indicator	MAHR refers to premature deaths that should have not occurred in the presence of timely and effective health care. **Baseline 2018:** 110.7 deaths per 100,000 population * **Target 2025:** 94.7 deaths per 100,000 population * Data currently under validation by PASB. The baseline and target will need to be adjusted upon completion of the data validation.
Purpose of the indicator	The indicator is useful for assessing the potential impact of health care on a population's health, given the assumption that there are a set of premature deaths that should not have occurred in the presence of timely and effective medical interventions. In other words, the causes of such deaths are considered treatable, and these deaths are therefore regarded as avoidable with appropriate medical care.
Technical note	The magnitude of the MAHR is calculated by adding a set of specific causes of death divided by the total population in a specific year, expressed as deaths per 100,000 population at regional level. To take into account the different demographic structures of the Americas, the regional rate is age-adjusted, using WHO's standard population. (See Ahmad et al. 2001 in the reference section.)
Type of indicator	Relative
Measurement units	Number of premature deaths per 100,000 population at the regional level
Frequency of measurement	MAHR is measured annually. Information is gathered from Member States between January and December of a given year, and the information is then analyzed in the following year.
PASB unit(s) responsible for monitoring the indicator	• Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA) • Health Systems and Services/Health Services and Access (HSS/HS)
Data source	PAHO/WHO Regional Mortality Database
Limitations	MAHR is a useful means to approximate the impact of health care on premature mortality, but it should not be considered definitive evidence of differences in effective health care. It is a proxy indicator of potential weaknesses in the health services. More in-depth research is required in this area before conclusions can be drawn. It is also important to consider that rankings of countries based on MAHR and other indicators such as Years of Potential Life Lost (YPLL) may differ substantially. YPLL, for instance, considers mortality from all causes and also depends on the threshold age selected for the calculations. In addition, MAHR may be underestimated because of data quality problems, such as the proportion of deaths not registered and the proportion of ill-defined causes, which differ from country to country. Nonetheless, MAHR provides useful information

	that is not directly reflected in general mortality indicators used to measure the outcomes of health systems.
References	1. Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. Age standardization of rates: a new WHO standard 2000-2025. Geneva: WHO; 2001 (GPE discussion paper series 31). 2. Canadian Institute for Health Information and Statistics Canada. Health indicators 2012: definitions, data sources and rationale, May 2012. Ottawa: CIHI; 2012). 3. Rutstein DD, et al. Measuring the quality of medical care: a clinical method. N Engl J Med 1976; 294(11): 582-588. 4. Mexico, Secretaría de Salud. La mortalidad en México 2000-2004: muertes evitables: magnitud, distribución y tendencias. México: Secretaría de Salud; 2006. 5. Nolte E, McKee M. Does health care save lives? Avoidable mortality revisited. London: Nuffield Trust; 2004. 6. Nolte E, McKee M. Measuring the health of nations: updating an earlier analysis. Health Affairs 2008; 27(1):58-71. 7. Nolte E, McKee M. Variations in amenable mortality: trends in 16 high-income nations. Health Policy 2011;103(1): 47-52. 8. Tobias M, Jackson G. Avoidable mortality in New Zealand, 1981-1997. Aust N Z Public Health 2001; 25(1): 12-20. 9. Tobias M, Yeh L. How much does health care contribute to health gain and to health inequality? Trends in amenable mortality in New Zealand 1981-2004. Aust N Z Public Health 2009; 33(1):70-78. 10. United Kingdom, Office for National Statistics. Avoidable mortality in England and Wales, 2010. Statistical Bulletins 2010 and 2011.
Linkage	• SHAA2030 target 1.1 • SP14-19 impact 4.1

List of Causes of Death Considered to be Amenable to Health Care[a]

Causes/ categories	Group or cause name	Age	ICD-10 code
Certain infectious and parasitic diseases	Intestinal infections	0-14	A00-A09
	Tuberculosis	0-74	A15-A19, B90
	Certain zoonotic bacterial diseases (tularemia, anthrax, brucellosis, glanders and melioidosis, rat-bite fevers, erysipelas, other zoonotic bacterial diseases)	0-74	A21-A26, A28
	Leprosy, infection due to other mycobacteria, listeriosis, tetanus neonatorum, obstetrical tetanus, streptococcal septicaemia, other septicaemia, other bacterial diseases	0-74	A30-A33, A34, A40, A41, A48
	Other infectious diseases (diphtheria, tetanus, poliomyelitis)	0-74	A35, A36, A80
	Whooping cough	0-14	A37
	Scarlet fever, erysipelas, other bacterial diseases	0-74	A38, A46, A49.1
	Chlamydial lymphogranuloma (venereum), chancroid, granuloma inguinale, unspecified sexually transmitted disease	0-74	A55, A57, A58, A64
	Relapsing fevers	0-74	A68
	Measles, rubella (German measles), unspecified viral infection characterized by skin and mucous membrane lesions	1-14	B05, B06, B09
	Acute hepatitis A, acute hepatitis B, other acute viral hepatitis (C), chronic viral hepatitis (chronic), unspecified viral hepatitis, HIV-AIDS infection	0-74	B15 – B19, B20 – B24
	Plasmodium falciparum malaria, *Plasmodium vivax* malaria, *Plasmodium malariae* malaria, other parasitologically confirmed malaria, unspecified malaria	0-74	B50- B54
	Schistosomiasis, other fluke infections, echinococcosis, teniasis, cysticercosis, other cestode infections, onchocerciasis, filariasis, trichinellosis, hookworm disease, ascariasis, strongyloidiasis, trichiuriasis, enterobiasis, other intestinal helminthiases, unspecified intestinal parasitism, other helminthiases, cellulitis	0-74	B65-B69, B71, B73-B83, L03
Neoplasms (cancers)	Malignant neoplasm of lip	0-74	C00
	Malignant neoplasm of stomach, colon, rectosigmoid junction, rectum, anus and anal canal, liver and intrahepatic bile ducts	0-74	C16, C18-C21, C22

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[a] **Mortality amenable to health care** has been defined as "those premature deaths that should have not occurred in the presence of timely and effective health care." The list is based on proposals from England (Nolte and McKee, 2004, 2008, 2011), England & Wales (United Kingdom, 2010), Mexico (Mexico, 2006), Canada (Canada, 2012), New Zealand (Tobias and Jackson, 2001; Tobias and Yeh, 2009). (See the full citations in the references section.)

Causes/ categories	Group or cause name	Age	ICD-10 code
	Malignant melanoma of skin, other malignant neoplasm of skin	0-74	C43, C44
	Malignant neoplasm of breast (female only)	0-74	C50
	Malignant neoplasm of cervix uteri	0-74	C53
	Malignant neoplasm of cervix of the uteri and body of the uterus	0-74	C54, C55
	Malignant neoplasm of testis	0-74	C62
	Malignant neoplasm of bladder	0-74	C67
	Malignant neoplasm of Thyroid gland	0-74	C73
	Hodgkin's disease	0-74	C81
	Leukemia	0-44	C91-C95
	In situ neoplasms	0-74	D00 – D09
	Benign neoplasms	0-74	D10 – D36
Endocrine, nutritional and metabolic diseases	Diseases of the thyroid	0-74	E00-E07
	Diabetes mellitus, Cushing's syndrome, adrenogenital disorders, other disorders of adrenal gland, glycogen storage disease, disorders of galactose metabolism	0-49	E10-E14, E24, E25, E27, E74.0, E74.2
Diseases of the nervous system	bacterial meningitis (not elsewhere classified); meningitis due to other and unspecified causes; encephalitis, myelitis, and encephalomyelitis; intracranial and intraspinal abscess and granuloma (except nonpyogenic meningitis)	0-74	G00, G03, (except G03.0), G04, G06
	Epilepsy	0-74	G40-G41
Diseases of the circulatory system	Rheumatic fever without heart involvement, Rheumatic fever with heart involvement, Rheumatic chorea	0-74	I00 – I02
	Chronic rheumatic heart disease	0-74	I05-I09
	Hypertensive disease	0-74	I10-I13, I15
	Ischemic heart disease	0-74	I20-I25 [except I24.9 y I25.0]
	Cerebrovascular diseases, atherosclerosis,[a] peripheral vascular disease, unspecified	0-74	I60-I69, I70, I73.9
Diseases of the respiratory system	All respiratory diseases (excluding pneumonia/influenza)	1-14	J00-J09, J20-J99
	Influenza	0-74	J10-J11
	Pneumonia, asthma	0-74	J12-J18, J45-J46
	Gastric ulcer, duodenal ulcer, peptic ulcer-site unspecified, gastrojejunal ulcer, gastritis and duodenitis	0-74	K25-K27, K28, K29

[a] Deaths by I70 and I73.9 diminished by 50%.

Causes/ categories	Group or cause name	Age	ICD-10 code
Diseases of the digestive system	Diseases of appendix	0-74	K35-K38
	Hernia	0-74	K40-K46
	Paralytic ileus and intestinal obstruction without hernia	0-74	K56
	Cholelithiasis, cholecystitis, other diseases of gallbladder, other diseases of biliary tract, acute pancreatitis, other diseases of pancreas	0-74	K80-K86
	Postprocedural disorders of digestive system, not elsewhere classified	0-74	K91
Diseases of the genitourinary system	Glomerular diseases, obstructive and reflux uropathy, renal failure, calculus of kidney, calculus of lower urinary tract, unspecified renal colic, disorders resulting from impaired renal tubular function, unspecified contracted kidney, small kidney, nonspecific urethritis, urethral stricture	0-74	N00-N08, N13, N17-N19, N20, N21, N23, N25-N27, N34.1, N35
	Hyperplasia of prostate	0-74	N40
	Salpingitis and oophoritis, Inflammatory disease of uterus (except cervix), inflammatory disease of cervix uteri, other female pelvic inflammatory diseases, diseases of Bartholin's gland, other inflammation of vagina and vulva	0-74	N70 – N73, N75, N76
	Dysplasia of cervix uteri, other non inflammatory disorders of cervix uteri, other non inflammatory disorders of vulva and perineum	0-74	N87, N88, N90
	Postprocedural urethral stricture	0-74	N99.1
Maternal and perinatal	Pregnancy, childbirth and the puerperium	All	O00-O99
	Certain conditions originating in the perinatal period	0-74	P00-P96
	Congenital malformations, deformations and chromosomal abnormalities	All	Q00-Q99
External causes	Misadventures to patients and medical care	All	Y60-Y69, Y83-Y84

Figure 1. Relationship between different concepts of avoidable and amenable mortality
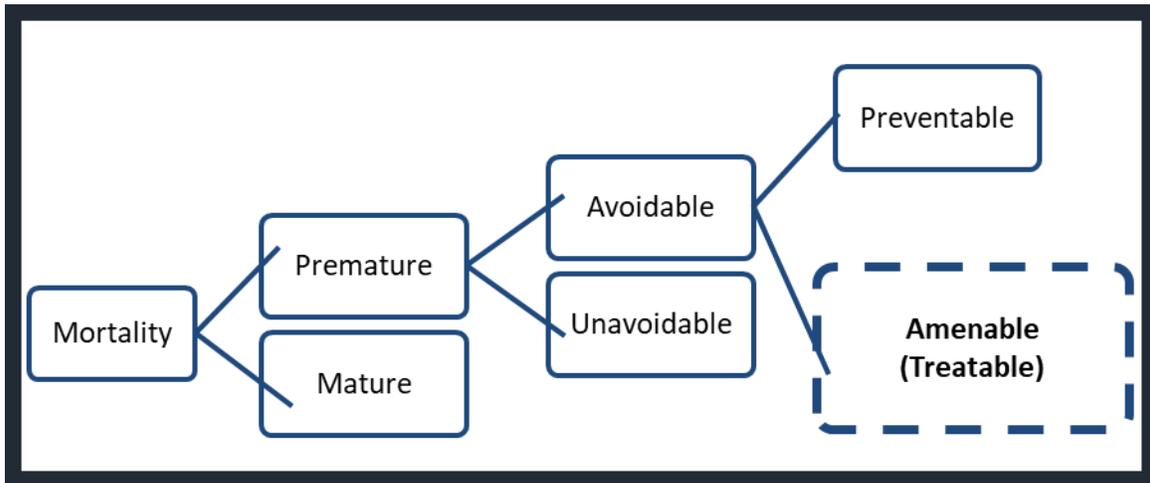
Avoidable mortality refers to untimely deaths that should not occur in the presence of timely and effective health care, including prevention. It serves to focus attention on the portion of population health attainment that can potentially be influenced by the health system.

- Potentially **avoidable** mortality—are premature deaths that could potentially have been avoided through all levels of prevention (primary, secondary, tertiary).
- Mortality from **preventable** causes—refers to a subset of avoidable mortality that informs efforts to reduce the number of initial cases (that is, incidence reduction); through these efforts, deaths can be prevented by avoiding new cases altogether.
- Mortality from **amenable** (treatable) causes—is a subset of avoidable mortality that informs efforts to reduce the number of people who die once they have a condition, or case - fatality reduction.

Sources: Adapted from Tobias and Yeh, 2009 and Statistics Canada — Canadian Institute for Health Information: Health Indicators 2012. (see the full citation in the reference section)

Code and title of the indicator	**Impact indicator 8:** Proportion of adults 65+ who are care-dependent
Definition of the indicator	This indicator measures the percentage of people aged 65+ who have severe or extreme difficulty in performing at least one activity among the basic activities of daily living (ADL). **Baseline 2010:** ~8.0% **Target 2025:** 6.5%
Purpose of the indicator	Major changes in population structures and disease patterns over the past decade have resulted in an increased number of individuals aged 65+ who live with disabilities. These disabilities may result in loss of ability to perform key activities, leading to dependence on others for support (see Harwood et al. 2004). Therefore, it is important to shift the focus away from specific diseases in the elderly toward ensuring equitable access to quality health care by measuring the proportion of adults aged 65+ who are care-dependent. The baseline estimate draws on information from the WHO Long-term Care Futures Toolkit and the World Alzheimer Report 2013. The age group considered in the toolkit is 60+. It is hypothesized that the percentage of care-dependent individuals has increased from 2010 until the present. Therefore, the target for 2025 is close to the 2010 baseline.
Technical note	**Numerator:** Number of respondents 65+ years of age who report having severe/extreme limitations in performing at least one of the six basic activities of daily life (eating, bathing, dressing, grooming, mobility, and toileting/continence). **Denominator:** All respondents 65+ years of age.
Type of indicator	Relative
Measurement units	Percentage
Frequency of measurement	The indicator is measured every 5 years.
PASB unit(s) responsible for monitoring the indicator	• Family, Health Promotion and Life Course/Healthy Life Course (FPL/HL) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	Longitudinal studies on aging, such as SAGE, HRS, ELSA, and SHARE. Other sources include administrative data sources on older adults in long-term care facilities, national surveys, and censuses. Information on demands of older adults for long-term care facilities; Katz Index of Independence in Activities of Daily Living; Washington Group of Disability; Functional Independence Measure (FIM); WHO Disability Assessment Schedule 2.0; national surveys or disability model surveys. Some countries (e.g., Argentina) are developing specific, more sensitive tools and methodologies to measure care dependence. These could be tracked during this period to develop a better measurement approach.

Limitations	Measurement error in surveys can affect the usefulness of this indicator. Quality of surveys and administrative data sources is an additional constraint.
References	1. Harwood RH, Sayer AA, Hirschfeld M. Current and future worldwide prevalence of dependency, its relationship to total population, and dependency ratios. Bull World Health Organ. 2004;82(4):251–8. 2. World Health Organization. International classification of functioning, disability and health: ICF. Geneva: WHO; 2001. 3. World Health Organization. Long-term care futures toolkit. Geneva: WHO; 2002. 4. Alzheimer's Disease International. World Alzheimer report 2013: journey of caring: an analysis of long-term care for dementia. London: Alzheimer's Disease International; 2013.
Linkage	WHO Global Strategy and Action Plan on Ageing and Health

Code and title of the indicator	**Impact indicator 9:** Unconditional probability of dying between ages 30 and 70 years from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases
Definition of the indicator	This indicator measures the probability of dying between the ages of 30 and 70 years from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases. Deaths from these four causes will be based on the following ICD-10 codes: I00-I99, C00-C97, E10-E14, and J30-J98. **Baseline 2016:** 15.1% **Target 2025:** 11.9% (20% relative reduction) Background: A relative reduction of 25% in premature mortality (age 30-70 years) from NCDs (cardiovascular, cancer, diabetes, or chronic respiratory diseases) is established in the WHO Global Monitoring Framework (GMF) on NCDs, approved as part of the global and regional action plans on NCDs, to be measured within 15 years (2010-2025). The SDGs established a 30% relative reduction in the period 2015-2030. In 2010, the estimated unconditional probability of dying prematurely in the Americas from any of the four NCDs was 15.9%. The latest comparable estimate is 15.1% for 2016, a figure presented to the UN High-level Meeting on NCDs in 2018. The 2025 target was established in line with the WHO 13th General Programme of Work (GPW13).
Purpose of the indicator	The indicator quantifies the probability and trends of premature NCD mortality. NCDs account for the highest proportion of deaths in a majority of countries in the Region. It is helpful to monitor the progress of policies, programs, and interventions implemented in a country, territory, or geographic area that are intended to reduce premature mortality due to NCDs.
Technical note	This is the overarching indicator of the WHO Global Monitoring Framework for NCD prevention and control, as well as the indicator for SDG target 3.4. This indicator was defined by a WHO expert epidemiology reference group in charge of the formulation of the GMF. Method of calculation: Age-specific death rates are calculated for the combined four cause categories (typically in terms of five-year age groups from 30-34 through 65-69). A life table method allows for calculation of the risk of death between exact ages 30 and 70 from any of these causes, in the absence of other causes of death. The causes to be included in the calculation are cardiovascular disease (ICD codes I00-I99), cancer (C00-C97), diabetes (E10-E14), and chronic respiratory diseases (J30-J98). To calculate age-specific mortality rate for each five-year age group and country, for each five-year age range between ages 30 and 70:

$$_5^*M_x = \frac{\text{Total deaths from four NCD causes between exact age } x \text{ and exact age } x + 5}{\text{Total population between exact age } x \text{ and exact age } x + 5}$$

Then translate the 5-year death rate to the probability of death in each 5-year age range:

$$_5^*q_x = \frac{_5^*M_x * 5}{1 + _5^*M_x * 2.5}$$

The probability of death from age 30 to age 70, independent of other causes of death can be calculated as:

$$_{40}^*q_{30} = 1 - \prod_{x=30}^{65}(1 - _5^*q_x)$$

Type of indicator	Relative
Measurement units	Percentage
Frequency of measurement	The NCD mortality rate is measured annually. Information is gathered from countries between January and December of a given year, and the information is then analyzed in the following year.
PASB unit(s) responsible for monitoring the indicator	• Noncommunicable Diseases and Mental Health/Noncommunicable Diseases, Violence and Injury Prevention Unit (NMH/NV) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	Vital registration systems that record deaths with sufficient completeness to allow for the estimation of all-cause death rates. Other possible data sources include household surveys with verbal autopsy and sample or sentinel registration systems.
Limitations	This indicator relies on the quality of the national vital registration systems. Estimates for this indicator require the application of WHO standard procedures aimed at overcoming data quality issues, such as incompleteness, underregistration, and irregularities in cause-of-death diagnosis and coding.
References	1. World Health Organization. Noncommunicable diseases global monitoring framework: indicator definitions and specifications. Geneva: WHO; 2014. Available from: https://bit.ly/2QGbDdE 2. Alwan A, et al. Monitoring and surveillance of chronic noncommunicable diseases: progress and capacity in high-burden countries. Lancet 2010; 376(9755):1861-1868. 3. World Health Organization. WHO methods and data sources for life tables 1990-2016. Geneva: WHO; 2018. Available from: https://bit.ly/2sjQ4pG 4. World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013-2020. Geneva: WHO; 2013 Available from: https://bit.ly/2Fnr6OR 5. United Nations. SDG Indicators Metadata Repository. Metadata for SDG indicator 3.4.1. Available from: https://bit.ly/2M3nhPn

	6. World Health Organization. World Health Statistics data visualizations dashboard. Data tables: Region data. Last updated: 2018-04-17. Available from: https://bit.ly/2JipPdZ 7. World Health Organization. Follow-up to the high-level meetings of the United Nations General Assembly on health-related issues. 72nd World Health Assembly. Geneva: WHO; 2019 (Document A72/19). Available from: https://bit.ly/2Hdxjwn 8. World Health Organization. 13th General Programme of Work (GPW13): WHO impact framework metadata. Available from: http://origin.who.int/about/what-we-do/GPW13_WHO_Impact_Framework_Indicator_Metadata.pdf (subject to updates by WHO)
Linkage	• SDG indicator 3.4.1 • SHAA2030 target 9.1 • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 10:** Mortality rate due to cervical cancer
Definition of the indicator	The age-standardized mortality rate (ASR) due to cervical cancer is calculated by using the number of cervical cancer deaths (C53 in ICD 10) occurring in the female population during one year. The mortality rate is expressed as the number of deaths due to cervical cancer per 100,000 female population. The numerator of the mortality rate is the number of deaths due to cervical cancer; the denominator is total female population in a given year. To take into account the different population structures in the Americas, the regional rate is age-standardized using the WHO's standard population. **Baseline 2018:** 4.9 deaths per 100,000 women **Target 2025:** 4.0 deaths per 100,000 women
Purpose of the indicator	Cervical cancer is a significant public health problem among women, yet it is largely preventable through human papillomavirus (HPV) vaccination, screening, and pre-cancer treatment. A regional plan of action to prevent and control cervical cancer, with the goal of reducing mortality by one-third by 2030, has been adopted by countries in the Region in recognition of the potential for future elimination of this disease.
Technical note	The number of deaths in which cervical cancer is the underlying cause of death, occurring in adult women during a given year, expressed as the number per 100,000 female population. In other words: cervical cancer mortality rate = (cervical cancer deaths (C53)/female population) $\times$ 100,000
Type of indicator	Relative
Measurement units	Number of deaths due to cervical cancer per 100,000 female population
Frequency of measurement	Data estimates are produced annually, based on mortality data submitted by Member States to PAHO.
PASB unit(s) responsible for monitoring the indicator	Noncommunicable Diseases and Mental Health/Noncommunicable Diseases, Violence and Injury Prevention Unit (NMH/NV)
Data source	PAHO Regional Mortality Database.
Limitations	Vital statistics data may suffer from time lag from the occurrence of an event until the information is available for use. In addition, not all vital statistics mortality data are reported to PAHO in a timely manner. Therefore, country-data subsets might be used in order to ensure a comparable analysis of the rate.
References	1. Pan American Health Organization. Plan of action for cervical cancer prevention and control 2018-2030. 56th PAHO Directing Council, 70th Regional Committee of WHO for the Americas; 23-27 September 2018;

	Washington, DC: PAHO; 2018 (Document CD56/9). Available from: https://www.paho.org/hq/index.php?option=com_docman&view=download&category_slug=56-directing-council-english-9964&alias=45803-cd56-9-e-poa-cervical-cancer-803&Itemid=270&lang=en
Linkage	• SHAA2030 target 9.1 • PAHO Plan of Action for Cervical Cancer Prevention and Control 2018-2030

Code and title of the indicator	**Impact indicator 11:** Mortality rate due to homicide among youths 15-24 years of age
Definition of the indicator	This indicator measures the rate of death due to homicide for youth aged 15 to 24 years. **Baseline 2015:** 35.6 deaths per 100,000 youth 15 to 24 years of age **Target 2025:** 33.5 deaths per 100,000 youth 15 to 24 years of age The target is at least a 6% reduction in the youth homicide rate: from 35.6 per 100,000 youth 15-24 years of age in 2015 (the latest year of available data) to 33.5 per 100,000 by 2025.
Purpose of the indicator	Violence is a significant public health issue because of its tremendous impact on health and well-being. Of all the forms of violence, homicide is perhaps the most devastating, as it leads to avoidable loss of life. Adolescents and young adults are disproportionately affected by homicide, which is among the leading causes of death in this age group in the Americas. Violence can be prevented through public health interventions, and this indicator serves to measure reductions in violence, with a focus on homicide deaths among youth.
Technical note	The rate is calculated by summing up the number of deaths in the age group 15-24 years in which the cause of death is recorded with an ICD-10 code of X85 to Y09 (assaults) or Y35 (legal interventions), and dividing that number by the total population 15-24 years of age, using population projections to estimate the population, for a calendar year for all countries in the Region. The rate is then age-adjusted using WHO's standard population to take into account the differences between countries with respect to their demographic structures of adolescents and young adults. (See Ahmad et al. 2001 in the reference section.)
Type of indicator	Relative
Measurement units	Number of deaths due to homicide per 100,000 population aged 15-24, per year
Frequency of measurement	Member States submit their mortality data to PAHO/WHO annually. This indicator is then measured between January and December of a given year.
PASB unit(s) responsible for monitoring the indicator	• Noncommunicable Diseases and Mental Health/Noncommunicable Diseases, Violence and Injury Prevention (NMH/NV) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	PAHO Regional Mortality Database
Limitations	The greatest limitation is the quality of mortality data and the underregistration of deaths, particularly deaths due to homicide.
References	1. Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. Age standardization of rates: a new WHO standard 2000-2025. Geneva: WHO; 2001 (GPE discussion paper series 31).
Linkage	• SDG indicator 16.1.1 • SHAA2030 target 9.4 • SP14-19 impact 7.1 • PAHO Core Indicators

Code and title of the indicator	**Impact indicator 12:** Proportion of ever-partnered women and girls aged 15-49 years subjected to physical and/or sexual violence by a current or former intimate partner in the previous 12 months
Definition of the indicator	This indicator uses a regional estimate to measure the proportion of ever-partnered women and girls aged 15-49 years who report experiencing physical and/or sexual violence by a current or former intimate partner in the previous 12 months, expressed as a percentage of all ever-partnered women and girls aged 15-49 years. **Baseline 2019:** TBD * **Target 2025:** No increase ** * Regional estimate is currently under review. It is expected to be available after September 2019. ** The target is for no increase in the regional estimate of ever-partnered women and girls aged 15-49 years who are subjected to physical and/or sexual violence by a current or former intimate partner in the previous 12 months.
Purpose of the indicator	This indicator measures changes in the levels of recent intimate partner violence against women and girls within marriage or marriage-like relationships. The indicator is limited to physical and/or sexual violence (SDG 5.2.1, sub-indicator 4) because of a lack of internationally comparable measures and definitions of psychological violence by intimate partners.
Technical note	SDG operational definitions for this indicator have not been finalized, but they are likely to follow those used by the Demographic and Health Surveys (DHS) and WHO Multicountry Study on Women's Health and Domestic Violence against Women (WHO MCS). These surveys define an "intimate partner" as a husband or male cohabiting partner, except in settings where stable, long-term, non-cohabiting sexual partners are common and culturally relevant. "Ever-partnered" women and girls are those who are married or cohabiting or have ever had such a partner. DHS and WHO MCS measure partner violence using questions that are specific both to the (partner) perpetrator and to behavior. They cover acts of "physical violence," adapted from the Conflict Tactics Scale, and acts of "sexual violence," such as forced and coerced sexual intercourse and other sex acts, but not attempted (non-completed) sex acts or unwanted sexual touch. Decades of research in this area shows that if well-established ethical and methodological guidelines are followed, the response rate by women to surveys is very high. In fact, studies indicate that for many women, surveys are the first time someone has asked about their experience of violence, and that when this is done properly, it can be a powerful step in the process of recovery.

	Numerator: Number of ever-partnered women and girls aged 15-49 years who report experiencing physical and/or sexual violence by any current or former intimate partner in the past 12 months. **Denominator:** Total number of ever-partnered women and girls aged 15-49 years asked about intimate partner violence. * * National estimates should be weighted to the population.
Type of indicator	Relative
Measurement units	Percentage
Frequency of measurement	Suggested measurement frequency is every 5 years, given that this indicator is not likely to show significant change within shorter intervals of time.
PASB unit(s) responsible for monitoring the indicator	• Noncommunicable Diseases and Mental Health/Noncommunicable Diseases, Violence and Injury Prevention (NMH/NV) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data sources	Population-based household surveys with a violence module, such as Demographic and Health Surveys, and dedicated surveys on violence, such as those based on ENDIREH (Mexico) and the WHO Multi-Country Study on Women's Health and Domestic Violence against Women. As of late 2018, 24 countries in the Americas had national estimates for this indicator, with surveys in development or close to publication in four additional countries (see Indicator 12 Annex below).
Limitations	• Surveys that collect these estimates are not always carried out at regular intervals. • National surveys that measure this indicator are not always comparable across sites or over time in terms of age range and operational definitions of violence and partnership.
References	1. United Nations. SDG Indicators Metadata Repository. Metadata for SDG Indicator 5.2.1. Available from: https://unstats.un.org/sdgs/metadata/files/Metadata-05-02-01.pdf 2. United Nations, Department of Economic and Social Affairs, UN Statistics Division. Guidelines for producing statistics on violence against women: statistical surveys. New York: UN; 2014. Available from: https://unstats.un.org/unsd/gender/docs/guidelines_statistics_vaw.pdf 3. Global SDG Indicators Database. Available from: https://unstats.un.org/sdgs/indicators/database 4. UN Women. Global database on violence against women. Available from: http://evaw-global-database.unwomen.org/en 5. United Nations, Department of Economic and Social Affairs, UN Statistics Division. Minimum set of gender indicators. 6. United Nations, Department of Economic and Social Affairs, UN Statistics Division. Data and metadata on violence against women. Available from: http://unstats.un.org/unsd/gender/vaw/

	See Indicator 12 Annex below: Characteristics of most recent eligible national intimate partner violence estimates.
Linkage	- SDG indicator 5.2.1 - SHAA target 9.4 - GPW13 Impact Framework

Indicator 12 Annex: Summary of most recent eligible national estimates for intimate partner violence

Country, year	Name of survey	Instrument	Method	Women's age and partnership status
Argentina 2015	Primer estudio nacional sobre violencias contra la mujer	IVAWS	Dedicated, telephone	18-69; all women
Belize 2015	National Public Health Survey: Family and Community Safety	WHO	Dedicated, household	18-64; ever had romantic partner
Bolivia 2016	Encuesta de prevalencia y características de la violencia contra las mujeres	Based on ENDIREH	Dedicated, household	15-49; ever married/cohabited
Brazil 2017	Violência doméstica e familiar contra a mulher	–	Dedicated, telephone	16+; all women
Canada 2014	General Social Survey	–	Dedicated, mixed	15+; past 5 years married, cohabiting, or in contact with ex
Chile 2016/17	Encuesta nacional de victimización por violencia intrafamiliar y delitos sexuales	–	Dedicated, household	15-65; all women/currently have romantic partner
Colombia 2015	Encuesta nacional de demografía y salud	DHS	Module, household	15-49; ever married/cohabited
Costa Rica 2003	International Violence Against Women Survey	IVAWS	Dedicated, household	18-69; ever had romantic partner
Cuba	*In development*			
Dominican Republic 2013	Encuesta demográfica y de salud	DHS	Module, household	15-49; ever married/cohabited
Ecuador 2011	Encuesta nacional de relaciones familiares y violencia de género contra las mujeres	Based on ENDIREH	Dedicated, household	15-49; ever married/cohabited
El Salvador 2017	Encuesta nacional de violencia contra las mujeres	Based on ENDIREH	Dedicated, household	Ever had romantic partner
El Salvador 2013/14	Estudio de población de violencia contra las mujeres	WHO	Dedicated, household	15-49; ever married/cohabited
Grenada	*In development*			
Guatemala 2014/15	Encuesta nacional de salud materno infantil	DHS	Module, household	15-49; ever married/cohabited
Guyana	*In development*			
Haiti 2016/17	Enquête mortalité, morbidité et utilisation des services	DHS	Module, household	15-49; ever married/cohabited
Honduras 2011	Encuesta nacional de demografía y salud	DHS	Module, household	15-49; ever married/cohabited

Country, year	Name of survey	Instrument	Method	Women's age and partnership status
Jamaica 2016	Women's Health Survey	WHO	Dedicated, household	Ever married, cohabited, or had regular (visiting) partner
Mexico 2016	Encuesta nacional sobre la dinámica de las relaciones en los hogares	ENDIREH	Dedicated, household	15-49; ever married/cohabited
Nicaragua 2011/12	Encuesta nicaragüense de demografía y salud	DHS	Module, household	15-49; ever married/cohabited
Panama 2009	Encuesta nacional de salud sexual y reproductiva	DHS	Module, household	15-49; ever married/cohabited
Paraguay 2008	Encuesta nacional de demografía y salud sexual y reproductiva	RHS	Module, household	15-44
Peru 2017	Encuesta demográfica y de salud familiar	DHS	Module, household	15-49; ever married/cohabited
Suriname	*In development*			
Trinidad and Tobago 2017	Women's Health Survey	WHO	Dedicated, household	15-64; ever had romantic partner
United States 2010/12	National Intimate Partner and Sexual Violence Survey	–	Dedicated, telephone	18+; all women
Uruguay 2013	Encuesta nacional de prevalencia sobre violencia basada en género con enfoque en generaciones	Based on ENDIREH	Dedicated, household	Ever had male/female spouse/cohabiting partner
Venezuela 2010	Encuesta demográfica	DHS	Module, household	

Abbreviations:

IVAWS: International Violence Against Women Survey

DHS: Demographic and Health Survey

ENDIREH: National Survey on the Dynamics of Household Relationships (Spanish acronym)

Code and title of the indicator	**Impact indicator 13:** Number of deaths due to road traffic injuries
Definition of the indicator	This indicator refers to the number of people who die due to road traffic injuries each year. **Baseline 2016:** 154,000 deaths **Target 2025:** 123,000 deaths Magnitude target: By 2025, reduce by 30% the number of deaths due to road traffic injuries, taking 2016 as a baseline.
Purpose of the indicator	Measuring and monitoring the number of people who die due to road traffic injuries will provide a tool to assess the trend and impact of policies and legislation, highlighting areas where more action is needed.
Technical note	Countries provide data on deaths from underlying causes covered by any ICD-10 code from V01 to V89.
Type of indicator	Absolute
Measurement units	Number of deaths due to road traffic injuries
Frequency of measurement	The indicator is measured annually. Information is gathered from Member States between January and December of a given year, and the information is then analyzed in the following year.
PASB unit(s) responsible for monitoring the indicator	Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	PAHO Regional Mortality Database.
Limitations	One of the limitations is the tendency to underregister the cause of death due to road traffic injuries. In addition, absolute numbers of deaths are not useful for comparisons.
References	1. World Health Organization. World report on road traffic injury prevention. Geneva: WHO; 2004. Available from: http://apps.who.int/iris/bitstream/handle/10665/42871/9241562609.pdf;jsessionid=EBC29908F67232806EE090C62F26BFDE?sequence=1 2. GBD 2015 SDG Collaborators. Measuring the health-related Sustainable Development Goals in 188 countries: a baseline analysis from the Global Burden of Disease Study 2015. Lancet 2016;388(10053):1813-1850. https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)31467-2.pdf
Linkage	• SDG indicator 3.6.1 • SHAA2030 target 9.5 • SP14-19 impact 7.3, adapted • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 14:** Mortality rate due to suicide
Definition of the indicator	This indicator measures the progress of the Region in reducing the number of deaths due to suicide per 100,000 population. **Baseline 2014:** 7.8 deaths per 100,000 population **Target 2025:** 7.0 deaths per 100,000 population The target is a 10% reduction from the 2014 baseline.
Purpose of the indicator	Suicide is a leading cause of premature mortality in the Americas; nearly 100,000 people die by suicide annually in the Region. This indicator monitors mortality due to suicide as a basis for designing programs to prevent and control suicidal behavior, based on scientific evidence.
Technical note	The percentage is calculated by dividing the sum of all deaths with an underlying cause corresponding to any ICD-10 code from X60 to X84 by the total population (both sexes) above the age of 5 years. This is then expressed per 100,000 population. In order to account for differing demographic structures in the countries of the Americas, the rate is adjusted according to age, using WHO standard population. At the country level, the indicator should, at a minimum, be disaggregated by sex, age, and method of suicide.
Type of indicator	Relative
Measurement units	Number of deaths per 100,000 population
Frequency of measurement	The indicator is measured annually, with information gathered from Member States between January and December of a given year. The PAHO report is analyzed every 5 years.
PASB unit(s) responsible for monitoring the indicator	Noncommunicable Diseases and Mental Health/Mental Health and Substance Use (NMH/MH)
Data source	PAHO Regional Mortality Database.
Limitations	• Deficiencies in national health information systems represent a key limitation. • There is the tendency to underregister deaths, particularly deaths due to suicide.
References	1. Pan American Health Organization. Suicide mortality in the Americas: regional report. Washington, DC: PAHO; 2014. 2. World Health Organization. Mental health atlas 2017. Geneva: WHO; 2017. 3. World Health Organization. Preventing suicide: a global imperative. Geneva: WHO; 2014.
Linkage	• SDG indicator 3.4.2 • SHAA2030 target 9.6 • SP14-19 impact 7.2

	• GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 15:** Incidence rate of measles
Definition of the indicator	This indicator measures the incidence rate of endemic measles in the Americas. **Baseline 2018:** 0.9412 per 1,000,000 population **Target 2025:** 0 per 1,000,000 population
Purpose of the indicator	In 1994, a measles elimination goal was established by the ministers of health during the PAHO Directing Council. By 2002 all the countries had eliminated endemic measles, and by 2005 they had reached the critical benchmark of three years without endemic cases. However, in the post-elimination era, Brazil reestablished endemic transmission in March 2014 due to the presence of a chain of transmission of a D8 genotype, which continued uninterrupted for more than 12 months. Finally, the Region of the Americas was certified by an International Expert Committee as free of measles in 2016. Unfortunately, Venezuela reestablished endemic transmission in July 2018. The Plan of Action for the Sustainability of Measles, Rubella and Congenital Rubella Syndrome Elimination in the Americas 2018-2023 was approved in September 2017. It sets out clearly defined strategic lines, objectives, indicators, and targets for 2023. One of these indicators is "Number of countries and territories in which endemic transmission of measles or rubella virus has been reestablished." The target is for zero countries to fall in this category by 2023.
Technical note	The incidence rate of endemic measles is for the countries and territories that have reestablished endemic transmission of measles virus in the Region of the Americas, expressed per million population. **Numerator:** Number of endemic cases in countries and territories that have reestablished endemic measles transmission in the Region. **Denominator:** Total population of the Region of the Americas.
Type of indicator	Relative
Measurement units	Number of endemic cases per million population per year
Frequency of measurement	The indicator is measured annually.
PASB unit(s) responsible for monitoring the indicator	Measles and rubella team at Family, Health Promotion and Life Course/Comprehensive Family Immunization (FPL/IM)
Data source	The leading data source will be the PAHO Measles/Rubella Weekly Bulletin, for which data are collected on a weekly basis throughout the year. A second source is data from the International Health Regulations (IHR) national focal points, available for publishing on a monthly basis.
Limitations	Measles and rubella cases are under mandatory notification and must be reported at international level because both diseases are subject to elimination goals in the

	Americas. However, this indicator depends on the timely notification of measles cases throughout the year by all countries and territories.
References	1. Measles/Rubella Weekly Bulletins. Available from: https://www.paho.org/hq/index.php?option=com_content&view=article&id =730:2009-measlesrubella-weekly-bulletin&Itemid=39426&lang=en 2. Pan American Health Organization. Plan of action for the sustainability of measles, rubella, and congenital rubella syndrome elimination in the Americas 2018-2023. 29th Pan American Sanitary Conference, 69th Session of the Regional Committee of WHO for the Americas; 2017 Sep 25-29; Washington, DC. Washington, DC: PAHO; 2017. Available from: https://www.paho.org/hq/index.php?option=com_docman&view=download &category_slug=29-en-9249&alias=41210-csp29-8-e-210&Itemid=270&lang=en 3. Pan American Health Organization. Regional immunization action plan. Available from: https://www.paho.org/hq/index.php?option=com_content&view=article&id =13101:regional-immunization-action-plan&Itemid=42296&lang=en
Linkage	• SHAA2030 target 10.4

Code and title of the indicator	**Impact indicator 16:** Incidence rate of HIV infections
Definition of the indicator	This indicator measures the number of people newly infected with HIV in the reporting period per 1,000 population in Latin America and the Caribbean. **Baseline 2017:** 0.16 per 1,000 population **Target 2025:** 0.04 per 1,000 population
Purpose of the indicator	This indicator measures progress toward ending the AIDS epidemic. The global goal is to reduce the number of people newly infected with HIV to less than 200,000 in 2030. Monitoring the rate of people newly infected over time measures the progress toward achieving this goal. This indicator is one of the 10 global indicators in the WHO consolidated strategic information guidelines.
Technical note	The indicator relies on estimates constructed from mathematical modelling tools, such as Spectrum. **Numerator:** Number of people newly infected with HIV during the reporting period. **Denominator:** Total population in a given year.
Type of indicator	Relative
Measurement units	Number of new infections per 1,000 population
Frequency of measurement	The indicator is measured annually.
PASB unit(s) responsible for monitoring the indicator	• Communicable Diseases and Environmental Determinants of Health/HIV, Hepatitis, Tuberculosis, and Sexually Transmitted Infections (CDE/HT) • Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA)
Data source	Joint United Nations Programme on HIV/AIDS (UNAIDS) Spectrum estimates.
Limitations	This indicator relies on modelling and will have the uncertainty of the estimate produced by the models. Data for North America will not be available.
References	1. Joint United Nations Programme on HIV/AIDS. Global AIDS monitoring 2019: indicators for monitoring the 2016 Political Declaration on Ending AIDS. Geneva: UNAIDS; 2018. Available from: http://www.unaids.org/sites/default/files/media_asset/global-aids-monitoring_en.pdf
Linkage	• SDG indicator 3.3.1 • SHAA2030 target 10.1 • GPW13 Impact Framework • Global AIDS Monitoring indicator 3.1 (UNAIDS)

Code and title of the indicator	Impact indicator 17: Rate of mother-to-child transmission of HIV
Definition of the indicator	This indicator refers to the estimated percentage of children newly infected with HIV through mother-to-child transmission among women living with HIV who have delivered in the past 12 months. **Baseline 2017:** 12% of births to women living with HIV **Target 2025:** 2% of births to women living with HIV Elimination refers to the reduction of vertical transmission of HIV to a level below public health significance. A country or territory has achieved elimination once the rate of mother-to-child transmission of HIV has been reduced to 2% or less.
Purpose of the indicator	This indicator reflects the commitment of PAHO Member States to eliminate mother-to-child transmission of HIV (Resolution CD50.R12). Vertical transmission of HIV and syphilis are preventable through primary prevention of HIV and syphilis infection among women of reproductive age, high coverage of quality antenatal care that includes routine HIV and syphilis screening, and effective follow-up of seropositive women and exposed infants. Indicator 1.1.2 of the Plan of Action for the Prevention and CONTROL of HIV and Sexually Transmitted Infections 2016-2021 shows countries' commitment toward this goal.
Technical note	The annual estimated percentage of children newly infected with HIV through mother-to-child transmission is calculated as follows: **Numerator:** Estimated number of children newly infected with HIV in the preceding 12 months through mother-to-child transmission. **Denominator:** Estimated number of births to women living with HIV in the preceding 12 months.
Type of indicator	Relative
Measurement units	Percentage
Frequency of measurement	The indicator is measured annually.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/HIV, Hepatitis, Tuberculosis, and Sexually Transmitted Infections (CDE/HT)
Data source	UNAIDS Spectrum estimates developed with countries.
Limitations	Given the nature of concentrated HIV epidemics in the Region, country values for this indicator are usually too imprecise to adequately reflect progress. Monitoring of this indicator is usually done at regional level for Latin America and the Caribbean. No data are available for North America.
References	1. Joint United Nations Programme on HIV/AIDS. Global AIDS monitoring 2019: indicators for monitoring the 2016 Political Declaration on Ending AIDS. Geneva: UNAIDS; 2018. Available from:

	http://www.unaids.org/sites/default/files/media_asset/global-aids-monitoring_en.pdf
Linkage	• SHAA2030 target 10.3 • Global AIDS Monitoring indicator 2.2

Code and title of the indicator	**Impact indicator 18:** Incidence rate of congenital syphilis (including stillbirths)
Definition of the indicator	This indicator measures the incidence rate of reported cases of congenital syphilis per 1,000 live births. **Baseline 2017:** 2.1 per 1,000 live births **Target 2025:** 0.5 per 1,000 live births Elimination refers to the reduction of vertical transmission of syphilis to a level below public health significance. A country or territory has achieved elimination once the incidence of congenital syphilis (including stillbirths) is reduced to 0.5 cases or fewer per 1,000 live births.
Purpose of the indicator	This indicator reflects the commitment of PAHO Member States to the elimination of mother-to-child transmission of congenital syphilis (Resolution CD50.R12). This indicator also serves to monitor progress toward the goal of elimination of congenital syphilis in the Region. Vertical transmission of HIV and syphilis are preventable through primary prevention of HIV and syphilis infection among women of reproductive age, high coverage of quality antenatal care that includes routine HIV and syphilis screening, and effective follow-up of seropositive women and exposed infants.
Technical note	The annual rate of reported cases of congenital syphilis per 1,000 live births is calculated as follows: **Numerator:** Number of reported cases of congenital syphilis according to the national case definition in a given year. The national case definition should include stillbirths due to syphilis. **Denominator:** Estimated number of live births within the same year.
Type of indicator	Relative
Measurement units	Reported cases of congenital syphilis per 1,000 live births
Frequency of measurement	Data for a given year are usually reported in the second quarter of the following year. After data cleaning and verification, updates are available in the second half of the year following the reporting period.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/HIV, Hepatitis, Tuberculosis, and Sexually Transmitted Infections (CDE/HT)
Data source	UNAIDS Global AIDS Monitoring (GAM) reporting process. **Numerator:** In most Latin American and Caribbean countries, congenital syphilis is subject to compulsory notification; the data source is the national registration system for congenital syphilis cases. **Denominator:** This is generated through a population estimate of the number of live births over the past 12 months. This can be obtained from national vital

	statistics, from UN Population Division estimates, or from PAHO's health information system.
Limitations	This indicator requires external validation of the reported data. A limitation of vital statistics data is the time lag from occurrence of the event until information is available for use.
References	1. Joint United Nations Programme on HIV/AIDS. Global AIDS monitoring 2019: indicators for monitoring the 2016 Political Declaration on Ending AIDS. Geneva: UNAIDS; 2018. Available from: http://www.unaids.org/sites/default/files/media_asset/global-aids-monitoring_en.pdf
Linkage	• SHAA2030 target 10.3 • Global AIDS Monitoring indicator 2.5

Code and title of the indicator	**Impact indicator 19:** Mortality rate due to chronic viral hepatitis
Definition of the indicator	This indicator refers to the estimated mortality rate from hepatocellular carcinoma (HCC), cirrhosis, and chronic liver diseases attributable to hepatitis B virus (HBV) and hepatitis C virus (HCV) infections, and from acute HBV and HCV infections. **Baseline 2017:** 11.4 deaths per 100,000 population **Target 2025:** 6.3 deaths per 100,000 population (45% reduction) The target of 6.3 deaths per 100,000 population corresponds to the 2025 milestone defined for the Region by WHO . Achieving it would put the Region on track to reach the target of 3.84 deaths per 100,000 population by 2030. In doing so, the Region would also contribute to the global target of a 65% reduction by 2030, as compared to 2015.
Purpose of the indicator	This indicator measures the ultimate outcome of activities for prevention, testing, care, and treatment of viral hepatitis.
Technical note	Mortality rate due to HBV and HCV includes deaths from HCC, cirrhosis, and other chronic liver diseases attributable to HBV and HCV infection, as well as the smaller number of deaths due to acute HBV and HCV infection, per 100,000 population. **Numerator:** Estimated deaths due to HBV and HCV infection in a given year. **Denominator:** Total population in the same year.
Type of indicator	Relative
Measurement units	Number of deaths due to chronic viral hepatitis per 100,000 population
Frequency of measurement	The indicator is measured annually.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/HIV, Hepatitis, Tuberculosis, and Sexually Transmitted Infections (CDE/HT)
Data source	Mortality estimates from the Global Burden of Disease (GBD) collaborative network of the Institute for Health Metrics and Evaluation (IHME).
Limitations	This indicator will be measured using the GBD estimates, given constraints on testing for HBV and HCV, underreporting in vital registration systems, and challenges in identifying deaths due to chronic HBV and HCV based on ICD-10 codes. PAHO will continue to support countries' vital registration systems to strengthen data on cause of death and on the fraction of HCC, cirrhosis, and other chronic liver diseases attributable to HBV and HCV infection. This will allow for triangulation with modelled estimates. Modeled estimates are produced with a possible time lag of two to three years.
References	1. Institute for Health Metrics and Evaluation. Global Health Data Exchange. GBD results tool. Available from: http://ghdx.healthdata.org/gbd-results-tool

	2. Institute for Health Metrics and Evaluation. GBD 2017 online tools overview. http://www.healthdata.org/sites/default/files/files/ Data_viz/GBD_2017_Tools_Overview.pdf
Linkage	• SDG indicator 3.3.4 • SHAA2030 target 10.5 • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 20:** Incidence rate of tuberculosis
Definition of the indicator	This indicator measures the number of new and relapsed tuberculosis (TB) cases divided by the total population in a given year. **Baseline 2015:** 28 per 100,000 population **Target 2025:** 14 per 100,000 population The target is consistent with the 2025 global target for a 50% reduction from the 2015 level.
Purpose of the indicator	This indicator measures the reduction in TB cases over time. It reflects the impact of the implementation of the End TB strategy, and it is one of high-level indicators of the global strategy.
Technical note	The indicator is calculated by dividing all new and relapsed TB cases by the total population in a given year.
Type of indicator	Relative
Measurement units	Estimated number of new and relapsed TB cases per 100,000 population
Frequency of measurement	Data for a given year are collected between April and June of the following year, and then published in the WHO Global Tuberculosis Report in October/November of that year.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/HIV, Hepatitis, Tuberculosis, and Sexually Transmitted Infections Unit (CDE/HT)
Data source	WHO global tuberculosis database.
Limitations	Challenges include timely reporting by countries and quality of the information.
References	1. World Health Organization. Global tuberculosis report 2018. Geneva: WHO; 2018. Available from: https://www.who.int/tb/publications/global_report/en/
Linkage	• SDG indicator 3.3.2 • SHAA2030 target 10.2 • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 21:** Incidence rate of malaria
Definition of the indicator	This indicator measures the number of cases of malaria per 1,000 population. **Baseline 2015:** 0.78 cases per 1,000 population **Target 2025:** 0.20 cases per 1,000 population (75% reduction) The target is consistent with the 2025 milestone in the WHO Global Technical Strategy for Malaria 2016-2030.
Purpose of the indicator	This indicator reports on the commitment of Member States to eliminate the transmission of malaria, expressed by the progress made by the Region in reducing transmission. The elimination of malaria is a consequence of sustained efforts to interrupt transmission in the endemic areas of countries and territories. Effective actions to eliminate malaria should lead to a gradual reduction in the incidence of the disease until elimination is consolidated.
Technical note	Annual parasite incidence: laboratory-confirmed malaria cases (by microscopy or Rapid Diagnostic Tests, RDT) per 1,000 persons per year. **Numerator:** Number of laboratory (microscopy or RDT) confirmed cases. **Denominator:** UN population estimates for the country or territory.
Type of indicator	Relative
Measurement units	Number of cases of malaria per 1,000 population
Frequency of measurement	Data are reported annually, usually in the second quarter of the year following the reporting period. After data cleaning and verification, updates are available in the second half of that year.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/Neglected, Tropical and Vector Borne Diseases (CDE/VT)
Data source	**Numerator:** Health information system/routine surveillance system. **Denominator:** UN population estimates.
Limitations	A single regional value based on data from a few countries that concentrate the greatest burden of malaria will mask the achievements of other endemic countries.
References	1. World Health Organization. Global technical strategy for malaria 2016-2030. Geneva: WHO; 2015. 2. Pan American Health Organization. Plan of action for malaria elimination 2016-2020. 55th Directing Council of PAHO, 68th Session of the Regional Committee of WHO for the Americas; 2016 Sep 26-30; Washington, DC. Washington, DC: PAHO; 2016 [cited 2019 Feb 28]. Available from: https://www.paho.org/hq/dmdocuments/2016/CD55-13-e.pdf

	3. World Health Organization. World malaria report 2018. Geneva: WHO; 2018 [cited 2019 Apr 20]. Available from: http://www.who.int/malaria/publications/world-malaria-report-2018/report/en/ 4. Pan American Health Organization. Interactive malaria statistics [cited 2019 Jul 30]. Available from: www.paho.org/malariastats
Linkage	• SDG indicator 3.3.3 • SHAA2030 target 10.6 • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 22:** Number of endemic countries in 2015 that maintain or achieve elimination of malaria
Definition of the indicator	This indicator reports the number of endemic countries in 2015 that report zero autochthonous cases of malaria in the last calendar year. **Baseline 2018:** 3 out of 21 countries and territories that were endemic in 2015 **Target 2025:** 6 out of 21 countries and territories that were endemic in 2015
Purpose of the indicator	This indicator measures progress made in the countries toward the elimination of malaria by 2025. It reflects their compliance with the PAHO/WHO malaria elimination recommendations and the installed capacities that the countries have developed. The indicator is also very important for monitoring Region-wide progress related to PAHO's Directing Council Resolution CD55.R7 of 2016, the Plan of Action for Malaria Elimination 2016-2020.
Technical note	The annual country report to PAHO/WHO facilitates country reporting of important data sets used to calculate this indicator. Malaria-endemic countries in 2015: Argentina, Belize, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Venezuela.
Type of indicator	Absolute
Measurement units	Number of countries that have eliminated malaria per year
Frequency of measurement	Measurement is annual. Data from the preceding year are published annually in December, coinciding with the scheduled year-end annual publication of the WHO World Malaria Report. For example, 2018 data will be published in December 2019.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/Neglected, Tropical and Vector Borne Diseases (CDE/VT)
Data source	Annual malaria country report and PAHO/WHO technical missions.
Limitations	• Variations in the reporting and assessment cycles in the countries can affect the data. • Quality of surveillance and investigation of cases is also variable.
References	1. World Health Organization. Global technical strategy for malaria 2016-2030. Geneva: WHO; 2015. 2. Pan American Health Organization. Plan of action for malaria elimination 2016-2020. 55th Directing Council of PAHO, 68th Session of the Regional Committee of WHO for the Americas; 2016 Sep 26-30; Washington, DC. Washington, DC: PAHO; 2016 [cited 2019 Feb 28]. Available from: https://www.paho.org/hq/dmdocuments/2016/CD55-13-e.pdf 3. World Health Organization. World malaria report 2018. Geneva: WHO; 2018 [cited 2019 Apr 20]. Available from:

	http://www.who.int/malaria/publications/world-malaria-report-2018/report/en/ 4. Pan American Health Organization. Interactive malaria statistics [cited 2019 Jul 30]. Available from: www.paho.org/malariastats
Linkage	• SHAA2030 target 10.6 • SP14-19 impact 8.4

Code and title of the indicator	**Impact indicator 23:** Case-fatality rate due to dengue
Definition of the indicator	This indicator reports on the regional case-fatality rate for dengue fever. **Baseline (for the period 2012-2018**): 0.056% **Target 2025:** 0.050% The target is a regional reduction of the dengue fever case-fatality rate by at least 10% in 2020-2025.
Purpose of the indicator	The indicator measures the impact of the appropriate use of PAHO/WHO dengue clinical management guidelines in the reduction of preventable deaths due to dengue in the context of co-circulation of other arboviruses.
Technical note	The regional case-fatality rate is calculated by determining the proportion of all dengue cases that result in death. "All dengue cases" includes both non-severe and severe cases of dengue, regardless of laboratory confirmation. **Numerator:** Number of deaths due to dengue in the Americas. **Denominator:** Total number of dengue cases in the Americas. For calculation of the baseline regional case-fatality rate, data for 2012-2018 were used to account for annual variations.
Type of indicator	Relative
Measurement units	Percentage
Frequency of measurement	The indicator is monitored on a weekly basis as countries report surveillance data, and monthly assessments are conducted so that direct assistance can be provided if the severity of the disease appears to increase. A regional report with an analysis of the information will be produced twice a year.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/Neglected, Tropical and Vector Borne Diseases (CDE/VT)
Data source	Country reports to PAHO/WHO
Limitations	• The indicator measures regional progress on implementation of the PAHO/WHO guidelines in the reduction of the dengue fever case-fatality rate; however, it does not account for variability in the case-fatality rate in individual countries and territories. • Because the indicator is based on the number of dengue cases and the deaths among those cases, data from countries with larger populations—and more cases—will be weighted more heavily.
References	1. World Health Organization. Dengue guidelines for diagnosis, treatment, prevention and control. Geneva: WHO; 2009. Available from: https://www.who.int/neglected_diseases/resources/9789241547871/en/

	2. World Health Organization. Global strategy for dengue prevention and control, 2012-2020. Geneva: WHO; 2012. Available from: https://www.who.int/denguecontrol/9789241504034/en/ 3. PAHO. Health Information Platform for the Americas (PLISA). Dengue. Available from: http://www.paho.org/data/index.php/en/mnu-topics/indicadores-dengue-en.html
Linkage	• SHAA2030 target 10.10 • SP14-19 impact 6.2

Code and title of the indicator	**Impact indicator 24:** Elimination of neglected infectious diseases in countries and territories
Definition of the indicator	This indicator measures the success of countries in achieving the elimination of one or more of the neglected infectious diseases as established in the Plan of Action for the Elimination of Neglected Infectious Diseases and Post-elimination Actions 2016-2022, approved through PAHO's Directing Council Resolution CD55.R9 in September 2016. The diseases include trachoma, Chagas disease, dog-mediated human rabies, leprosy (Hansen's disease, eliminated as a public health problem), human taeniasis/cysticercosis, lymphatic filariasis, onchocerciasis (river blindness), and schistosomiasis. <table><tr><th>Neglected Infectious Disease</th><th>Baseline 2019</th><th>Target 2025</th></tr><tr><td>Trachoma</td><td>1 out of 5</td><td>3 out of 5</td></tr><tr><td>Chagas disease</td><td>17 out of 21</td><td>21 out of 21</td></tr><tr><td>Dog-mediated human rabies</td><td>32 out of 35</td><td>35 out of 35</td></tr><tr><td>Leprosy</td><td>17 out of 23</td><td>23 out of 23</td></tr><tr><td>Human taeniasis/cysticercosis</td><td>0 out of 16</td><td>3 out of 16</td></tr><tr><td>Lymphatic filariasis</td><td>3 out of 7</td><td>5 out of 7</td></tr><tr><td>Onchocerciasis</td><td>4 out of 6</td><td>6 out of 6</td></tr><tr><td>Schistosomiasis</td><td>3 out of 10</td><td>5 out of 10</td></tr></table> **Baseline countries:** • Trachoma: Mexico eliminated trachoma in 2017. • Chagas disease: 17 countries have eliminated the main vector species in all or part of their territory. ○ In all of their territory: Belize, Brazil, Chile, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Paraguay, and Uruguay. ○ In part of their territory: Argentina, Bolivia, Colombia, Costa Rica, Mexico, Panama, and Peru. • Dog-mediated human rabies: 32 of 35 endemic countries or territories have eliminated dog-mediated human rabies, but canine rabies persists in specific areas of 8 countries, with a continuing risk of resurgence. • Leprosy: 17 countries have eliminated leprosy as a public health problem at the first subnational level: Argentina, Brazil, Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Saint Lucia, Suriname, Trinidad and Tobago, and Uruguay. • Human taeniasis/cysticercosis: As of 2019, none of the 16 known endemic countries in Latin America and the Caribbean has eliminated taeniasis/cysticercosis as a public health problem, and most of them do not have any control program. • Lymphatic filariasis: Costa Rica, Suriname, and Trinidad and Tobago were removed from the list of endemic countries in 2011.

- Onchocerciasis: Colombia (2013), Ecuador (2014), Mexico (2015), and Guatemala (2016) have eliminated onchocerciasis.
- Schistosomiasis: There is evidence that a few countries in the Caribbean have interrupted transmission or eliminated schistosomiasis (Antigua and Barbuda, Saint Lucia, and Suriname), but this has to be confirmed. At least two other countries are expected to achieve elimination of this disease as a public health problem by 2025.

Target countries:
- Trachoma: The PAHO Disease Elimination Initiative states that trachoma will be eliminated in 2022 according to WHO targets. However, countries in the Region will need more time, as there have been some delays, and countries lack of funding or capacity to accelerate efforts toward elimination. Two countries, Brazil and Guatemala, may complete the process for the elimination of trachoma as a public health problem by 2025. This includes providing a dossier of evidence to PAHO/WHO that they have achieved all of the following indicators:
    - A prevalence of trachomatous trichiasis (TT) unknown to the health system in adults aged ≥15 years of <0.2% in each formerly endemic district. (The phrase "unknown to the health system" excludes individuals with post-surgery TT, individuals who have refused surgery, and individuals who have not yet received an operation but for whom a surgical date has been set).
    - A prevalence of trachomatous inflammation-follicular (TF) in children aged 1-9 years of <5%, sustained for at least two years in the absence of antibiotic mass drug administration, in each formerly endemic district.
    - Documented evidence that the health system can identify and manage incident cases of trachomatous trichiasis, using defined strategies, with evidence of appropriate financial resources to implement those strategies.
- Chagas disease: The target is for all 21 endemic countries to achieve elimination of the main Chagas disease vector throughout their territory by 2025 (Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, French Guyana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay, and Venezuela). In the Elimination Initiative, the target is to eliminate transmission by the principal vector by 2020, but this target will not be achieved by that date.
- Dog-mediated human rabies: The target for 2025 is that all 35 endemic countries or territories will have eliminated dog-mediated human rabies and put in place measures to prevent disease resurgence or reintroduction. The countries with canine rabies are still being monitored. The target is the same as in the Elimination Initiative.
- Leprosy: Target countries to achieve elimination at first subnational level include Bolivia, Dominican Republic, Ecuador, Guyana, Paraguay, and Venezuela. According to the PAHO Plan of Action for the Elimination of

	Neglected Infectious Diseases and Post-elimination Actions 2016-2022, this target should be reached by 2020. • Human taeniasis/cysticercosis: The Elimination Initiative states that the target is to eliminate deaths in children, morbidity in communities at risk, and disability in children by 2030. The impact target is a step toward reaching the target in the Elimination Initiative. • Lymphatic filariasis: The Elimination Initiative states that the WHO target is to eliminate this disease in 2022 in the Region, but this will not be possible. Brazil and the Dominican Republic will achieve the target by 2025, and Haiti and Guyana between 2026 and 2030. • Onchocerciasis: Brazil and Venezuela will possibly eliminate onchocerciasis by 2025, not by 2022 as stated in the Elimination Initiative. • Schistosomiasis: It is expected that the Caribbean countries endemic for schistosomiasis will have eliminated the disease by 2022-2025. The other two endemic countries may possibly achieve elimination by 2030.
Purpose of the indicator	The goal of eliminating neglected infectious diseases has been established both through global mandates, i.e., World Health Assembly resolutions, and through regional mandates, i.e., PAHO Directing Council Resolution CD55.R9. It is also included in the Sustainable Development Goals, target 3.3: "By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases." The purpose of the indicator is to measure progress toward the achievement of these public health goals.
Technical note	Data are based on PAHO and WHO criteria and procedures for the verification or validation of elimination for each of the diseases.
Type of indicator	Absolute
Measurement units	Number of countries
Frequency of measurement	For Chagas disease, leprosy, and human rabies transmitted by dogs, measurement is once a year. For human taeniasis/cysticercosis, lymphatic filariasis, trachoma, onchocerciasis, and schistosomiasis, measurement is every 2 to 3 years.
PASB unit(s) responsible for monitoring the indicator	Neglected Infectious Diseases Program, Communicable Diseases and Environmental Determinants of Health/Neglected, Tropical and Vector Borne Diseases (CDE/VT)
Data source	Official data provided to PAHO by the national health authorities; results from surveys and surveillance studies.
Limitations	For several of the diseases listed, such as leprosy, schistosomiasis, and human taeniasis/cysticercosis, guidelines have yet to be developed for criteria and procedures for the verification or validation of elimination.
References	1. Pan American Health Organization. Plan of action for the elimination of neglected infectious diseases and post-elimination actions 2016-2022. 55th Directing Council of PAHO, 68th Session of the Regional Committee of WHO for the Americas; 2016 Sep 26-30; Washington, DC. Washington, DC: PAHO; 2016 (Document CD55/15). Available from: https://www.paho.org/hq/dmdocuments/2016/CD55-15-e.pdf

	2. World Health Organization. Global leprosy strategy 2016-2020. New Delhi: WHO Regional Office for South-East Asia; 2016. Available from: https://apps.who.int/iris/bitstream/handle/10665/208824/9789290225096_en.pdf?sequence=14&isAllowed=y 3. World Health Organization. Validation of elimination of lymphatic filariasis as a public health problem. Geneva: WHO; 2017. Available from: https://apps.who.int/iris/bitstream/handle/10665/254377/9789241511957-eng.pdf?sequence=1 4. World Health Organization. Validation of elimination of trachoma as a public health problem. Geneva: WHO; 2016. Available from: https://apps.who.int/iris/bitstream/handle/10665/208901/WHO-HTM-NTD-2016.8-eng.pdf?sequence=1 5. World Health Organization. Onchocerciasis: guidelines for stopping mass drug administration and verifying elimination of human onchocerciasis. Geneva: WHO; 2016. Available from: https://apps.who.int/iris/bitstream/handle/10665/204180/9789241510011_eng.pdf?sequence=1
Linkage	• SDG target 3.3 • SHAA2030 target 10.7 • PAHO Plan of Action for the Elimination of Neglected Infectious Diseases and Post-elimination Actions 2016-2022 • GPW13 Impact Framework • WHA66.12 Resolution on Neglected Tropical Diseases

Code and title of the indicator	**Impact indicator 25:** Number of bloodstream infections per 1,000 patients per year caused by carbapenem-resistant organisms
Definition of the indicator	This indicator measures the total number of carbapenem-resistant Enterobacteriaceae, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii* infections that are isolated from blood per 1,000 hospitalized patients per year, based on data collected through the national antimicrobial resistance (AMR) surveillance system. **Baseline 2019:** To be determined after current pilot project on enhanced AMR surveillance of bloodstream infections * **Target 2025:** At least a 10% reduction from the baseline * The pilot project will collect 2018 data from selected countries in the second semester of 2019; the validated information will be available by the end of 2019 or early 2020.
Purpose of the indicator	The indicator measures the reduction of bloodstream infections caused by multidrug-resistant bacteria for which there is no adequate antimicrobial treatment. These infections caused by carbapenem-resistant Enterobacteriaceae, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii* are endemic and outbreak-related. They are extensively disseminated in the Region and are responsible for severe infections with lethality above 50%. Infections caused by these organisms can be reduced by addressing risk factors such as inappropriate use of antimicrobials, by strengthening infection prevention and control practices, and by increasing the laboratory capacity for AMR detection and monitoring. The aim of the indicator is to enable detailed reporting of resistance among bloodstream infections throughout the Region.
Technical note	**Numerator:** Number of bloodstream infections caused by carbapenem-resistant Enterobacteriaceae, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii* in hospitalized patients from selected sentinel sites. **Denominator:** Total number of patients admitted per year to those sentinel hospitals. The data will be collected through the enhanced AMR surveillance project that has been launched in the Region, which will enable countries to report the above-mentioned carbapenem-resistant pathogens isolated from blood cultures. Resistance to carbapenems is defined according to the international guidelines for antimicrobial susceptibility testing provided by the Clinical & Laboratory Standards Institute and used by the countries. The results will be reported on a yearly basis to PAHO through the national AMR focal point. For the Latin American countries, this enhanced surveillance of AMR data from blood isolates will be built upon the existing Latin American Network for Antimicrobial Resistance Surveillance (ReLAVRA). For the Caribbean countries, the enhanced surveillance project will support them with setting up or strengthening their national AMR surveillance systems.

	The total number of hospitalized patients is defined as the total number of patients admitted per year to the sentinel hospitals participating in the national AMR surveillance system. This number will be provided to PAHO through the enhanced surveillance initiative. The methodology used in the enhanced surveillance initiative is aligned with the methodology used by the Global Antimicrobial Resistance Surveillance System (GLASS), and will also enable countries to participate in GLASS.
Type of indicator	Relative
Measurement units	Number of carbapenem-resistant bloodstream infections per 1,000 hospitalized patients per year.
Frequency of measurement	The indicator is collected through the national AMR surveillance systems and reported to PAHO through the regional AMR surveillance networks for Latin America and the Caribbean on a yearly basis. Data for a given year are compiled by the middle of the following year (June) and become available for reporting/publishing by the end of that year.
PASB unit(s) responsible for monitoring the indicator	Communicable Diseases and Environmental Determinants of Health/Antimicrobial Resistance (CDE/AR)
Data source	National AMR surveillance systems; additional data come through the regional AMR surveillance network for Latin America and the Caribbean.
Limitations	• Countries have limited capacity to report on this indicator. Currently, not all Member States have the capacity to monitor AMR in bloodstream infections, and PAHO does not yet collect this type of data. In 2019, a new initiative was launched to support countries in collecting, reporting, and analyzing this type of information; 13 countries are participating. • The indicator provides only partial information about the impact of AMR on human health, and it does not show whether countries are increasing efforts to address AMR from a multisectoral perspective.
References	1. Pan American Health Organization. Plan of action on antimicrobial resistance. 54th Directing Council of PAHO, 67th Session of the Regional Committee of WHO for the Americas; 2015 Sep 28-Oct 2; Washington, DC. Washington, DC: PAHO; 2015 (Document CD54/12, Rev. 1). Available from: https://www.paho.org/hq/dmdocuments/2015/CD54-12-e.pdf 2. World Health Organization. Global antimicrobial resistance surveillance system: manual for early implementation. Geneva: WHO. Available from: https://apps.who.int/iris/handle/10665/188783
Linkage	• SHAA2030 target 10.8 • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 26:** Mortality rate attributed to household and ambient air pollution
Definition of the indicator	This indicator will measure the mortality rate attributed to household and ambient air pollution per 100,000 population. **Baseline 2019:** 13.05 deaths per 100,000 population **Target 2025:** 12.40 deaths per 100,000 population. * * The target is for a 5% reduction by 2025.
Purpose of the indicator	This indicator measures progress toward the reduction of avoidable deaths attributed to air pollution in the Americas. It is a composite indicator, as it measures deaths caused by the use of polluting fuels in the household for cooking, heating, and lighting, as well as deaths caused by ambient air pollution. Polluting fuels include wood, coal, animal dung, charcoal, crop wastes, and kerosene. Ambient air pollution is the result of emissions from industrial activity, households, and motor vehicles; these emissions contain complex mixtures of air pollutants, many of which are harmful to health. Of all these pollutants, fine particulate matter has the greatest effect on human health.
Technical note	Mortality attributable to the joint effects of household and ambient air pollution can be expressed as either the number of deaths or the death rate. Death rates are calculated by dividing the number of deaths by the total population (or a specific population group if relevant, e.g., children under 5 years). Evidence from epidemiological studies has shown that exposure to air pollution is linked to the following important diseases, among others: • Acute respiratory infections in young children (estimated under 5 years of age) • Cerebrovascular diseases (stroke) in adults (estimated above 25 years) • Ischemic heart diseases (IHD) in adults (estimated above 25 years) • Chronic obstructive pulmonary disease (COPD) in adults (estimated above 25 years) • Lung cancer in adults (estimated above 25 years) The indicator follows the methodology used by WHO to estimate the burden of disease attributable to air pollution. This methodology is well established and is used to monitor SDG indicator 3.9.1 (a Tier 1 indicator). The first step in calculating attributable mortality is to combine *a)* information on the increased (or relative) risk of a disease resulting from exposure with *b)* information on how widespread the exposure is in the population (e.g., the annual mean concentration of particulate matter to which the population is exposed and proportion of population relying primarily on polluting fuels for cooking). The next step is to calculate the "population attributable fraction" (PAF), which is the fraction of disease seen in a given population that can be attributed to the

exposure (in this case, both the annual mean concentration of particulate matter and exposure to polluting fuels for cooking).

Applying this fraction to the total burden of disease (e.g., cardiopulmonary disease expressed as deaths) gives the total number of deaths that result from exposure to that particular risk factor (in this case, to ambient and household air pollution).

To estimate the combined effects of risk factors, a joint population attributable fraction is calculated, as described in Ezzati et al. (2003).

The mortality associated with household and ambient air pollution was estimated based on calculation of the joint population attributable fractions, assuming independently distributed exposures and independent hazards, as described by Ezzati et al. (2003).

The joint population attributable fraction was calculated using the following formula:

PAF=1-PRODUCT (1-PAFi)

where PAFi is the PAF of individual risk factors

The PAF for ambient air pollution and the PAF for household air pollution were assessed separately, based on comparative risk assessment (Ezzati et al. 2002) and expert groups for the Global Burden of Disease Study 2010 (Lim et al. 2012; Smith et al. 2014).

- For exposure to ambient air pollution, annual mean estimates of particulate matter less than 2.5 μm in diameter (PM2.5) were modelled as described by WHO (2016), or in the methodology for SDG indicator 11.6.2.
- For exposure to household air pollution, the proportion of population with primary reliance on polluting fuels for cooking was modelled (see SDG indicator 7.1.2). Details on the model are published by Bonjour et al. (2013).

The integrated exposure-response functions (IER) developed for the GBD 2010 (Burnett et al. 2014) and further updated for the GBD 2013 study (Forouzanfar et al. 2015) were used.

The percentage of the population exposed to a specific risk factor (here, ambient air pollution, i.e., PM2.5) was provided by country and by increment of 1 μg/m3; relative risks were calculated for each PM2.5 increment, based on the IER. The counterfactual concentration was selected to be between 5.6 and 8.8 ug/m3, as described elsewhere (Ezzati et al. 2002; Lim et al. 2012). The country population attributable fractions for acute lower respiratory infections, COPD, IHD, stroke, and lung cancer were calculated using the following formula:

| | PAF=SUM(Pi(RR-1)/(SUM(RR-1)+1)

where i is the level of PM2.5 in ug/m3, and Pi is the percentage of the population exposed to that level of air pollution, and RR is the relative risk.

The calculations for household air pollution are similar and are explained in detail elsewhere (see WHO 2014, "Methods Description").

Disaggregation: The data are available by country, sex, disease, and age.

Treatment of missing values:

- At country level: Countries with no data are reported as blank.
- At regional and global levels: Countries with no data are not reported in the regional and global averages. |
|---|---|
| **Type of indicator** | Relative |
| **Measurement units** | Deaths per 100,000 population |
| **Frequency of measurement** | Measurement is annually or every 5 years (following WHO definition of frequency). |
| **PASB unit(s) responsible for monitoring the indicator** | Communicable Diseases and Environmental Determinants of Health/Climate Change and Environmental Determinants of Health (CDE/CE) |
| **Data source** | Exposure: SDG indicator 7.1.2 was used as exposure indicator for household air pollution. Annual mean concentration of particulate matter of less than 2.5 µm was used as exposure indicator for ambient air pollution. The data are modelled according to methods described for SDG indicator 11.6.2.

Exposure-risk function: The integrated exposure-response functions (IER) developed for GBD 2010 (Burnett et al. 2014) and further updated for the GBD 2013 study (Forouzanfar et al. 2015) were used.

Health data on the total number of deaths by disease, country, sex, and age group have been developed by the World Health Organization (WHO 2014, "Global Health Estimates"). |
| **Limitations** | An approximation of the combined effects of risk factors is possible if independence and little correlation between risk factors with impacts on the same diseases can be assumed (Ezzati et al. 2003). In the case of air pollution, however, there are some constraints on estimating the joint effects. These include limited knowledge on the distribution of population exposed to both household and ambient air pollution, on correlation of exposures at individual level (as household air pollution is a contributor to ambient air pollution), and on nonlinear interactions (Lim et al. 2012; Smith et al. 2014). In several regions, however, household air pollution remains mainly a rural issue, while ambient air pollution is predominantly an urban problem. Also, in some regions of the world, many countries are relatively |

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unaffected by household air pollution, while ambient air pollution is a major concern. If independence and little correlation are assumed, it becomes possible to calculate a rough estimate of the total impact that is less than the sum of the separate impacts of the two risk factors.

There are other limitations as well:

- The indicator does not include all diseases that have been linked to air pollution. This may have an impact on burden of disease estimations. Not all mortality attributed to air pollution has been taken into consideration.
- Mortality data may be unreliable because of incomplete or unusable death registration data.
- Availability of measurements on exposure may be limited (e.g., because of low coverage of air quality monitoring stations).
- Exposure and mortality data may be outdated if the country does not report periodically.
- Exposure modelled using remote sensing data from satellites may be less reliable in small areas or for small populations.
- Measurement errors may affect exposure estimates.
- The indicator only includes the causes of death that have enough clinical and epidemiological evidence of a causal relationship with air pollution (given in statistical measures of association).
- There are knowledge gaps in the Region of the Americas (e.g., differences of exposure and effect in high altitudes; unmeasured exposure sites at ground level, etc.)

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Linkage	• SDG indicator 3.9.1 • SHAA2030 target 11.2 • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 27:** Mortality rate attributed to unsafe water, unsafe sanitation, and lack of hygiene
Definition of the indicator	This indicator measures the number of deaths attributed to unsafe water, unsafe sanitation, and lack of hygiene in a year per 100,000 population.
	Diseases attributable to unsafe water, sanitation and hygiene (^WASH) include the attributable fractions of diarrhea, intestinal nematode infections, and protein-energy malnutrition.
	Baseline 2016: 1.65 deaths per 100,000 population *
	Target 2025: 1.32 deaths per 100,000 population
	* The baseline is calculated using data from 29 countries in the Region.
Purpose of the indicator	The indicator expresses the number of deaths from inadequate water, sanitation, and hygiene (with a focus on ^WASH services) that could be prevented by improving those services and practices. It is based both on ^WASH service provision in the country and on the related health outcomes. It therefore provides important information on the actual disease caused by the risk measured in SDG targets 6.1, 6.2, and 6.3.
	Measuring the number of deaths that can be attributed to unsafe ^WASH supports preventive actions through improving ^WASH services and practices.
Technical note	Attributable diarrhea deaths are calculated by first combining *a)* information on the increased (or relative) risk of a disease resulting from exposure and *b)* information on how widespread the exposure is in the population (in this case, the percentage of the population with exposure to unsafe and inadequate water, sanitation, and hygiene). This allows calculation of the population attributable fraction (PAF), which is the fraction of disease observed in a given population that can be attributed to the exposure, in this case lack of access to improved water, sanitation, and hygiene. Applying this fraction to the total deaths from diarrhea results in the number of diarrhea deaths that result from inadequate ^WASH. Deaths from protein-energy malnutrition attributable to inadequate ^WASH are estimated by evaluating the impacts of repeated infectious diarrhea episodes on nutritional status (in particular stunting). All deaths from intestinal nematode infections are attributed to inadequate water, sanitation, and hygiene due to their transmission pathway.
	Numerator: Number of deaths from inadequate ^WASH in a year.
	Denominator: Population.
	The calculation is expressed as the rate per 100,000 population.
	Methods with agreed international standards have been developed, reviewed, and published in various documents, including: • World Health Organization. Preventing diarrhoea through better water, sanitation and hygiene: Exposures and impacts in low- and middle-income countries. Geneva:

	WHO; 2014. Available from: http://www.who.int/water_sanitation_health/diseases-risks/gbd_poor_water/en/ • Prüss-Ustün A, et al. Burden of disease from inadequate water, sanitation and hygiene in low- and middle-income settings: a retrospective analysis of data from 145 countries. Trop Med Int Health 2014;19(8):894-905. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4255749/
Type of indicator	Relative
Measurement units	Number of deaths in a year per 100,000 population
Frequency of measurement	Not available.
PASB unit(s) responsible for monitoring the indicator	• Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA) • Communicable Diseases and Environmental Determinants of Health/Climate Change and Environmental Determinants of Health (CDE/CE)
Data source	Data are compiled mainly from country and other databases. To maximize the data for robust estimates, as well as to reduce duplication of data collection and avoid imposing a further data reporting burden on countries, complementary data from various databases are also used. The main data providers are national statistics offices, various ministries, and databases that offer civil registration with complete coverage and medical certification of cause of death. WHO conducts a formal country consultation process before releasing its estimates on causes of death.
Limitations	Data are available for practically all countries. For some countries, however, national data are incomplete, and statistics are provided by international agencies. In these cases, the data have been interpolated/extrapolated, adjusted, and completed using additional data and cause-of-death models.
References	1. United Nations. SDG Indicators Metadata Repository. Metadata for SDG Target 3.9. Available from: https://unstats.un.org/sdgs/metadata/?Text=&Goal=3&Target=3.9 2. World Health Organization. WHO methods and data sources for country-level causes of death 2000-2012. Geneva: WHO; 2014 (Global Health Estimates Technical Paper WHO/HIS/HSI/GHE/2014.7). Available from: https://www.who.int/healthinfo/global_burden_disease/GlobalCOD_method_2000_2012.pdf
Linkage	• SDG indicator 3.9.2 • SHAA2030 target 11.3 • GPW13 Impact Framework

Code and title of the indicator	**Impact indicator 28:** Mortality rate due to disasters per 100,000 population
Definition of the indicator	This indicator measures the number of people whose deaths were directly related to disasters, per 100,000 population. For purposes of this indicator, a disaster means a Grade 2 or 3 emergency as defined in the WHO Emergency Response Framework: Grade 2 emergency: A single or multiple country event with moderate public health consequences that requires a moderate PAHO/WHO Country Office response and/or moderate international WHO response. Grade 3 emergency: A single or multiple country event with substantial public health consequences that requires a substantial PAHO/WHO Country Office response and/or substantial international WHO response. **Baseline 2019:** TBD (to be calculated once disaster-related mortality data for 2019 become available) **Target 2025:** At least a 10% reduction from the baseline
Purpose of the indicator	This indicator provides a measure of disaster-attributable deaths caused by direct exposure to emergencies and disasters. Such a measure is an important proxy by which to assess the effectiveness of national disaster/emergency preparedness, risk management, and response policies and programs in protecting population health.
Technical note	This indicator considers the total number of deaths directly related to a natural, human-induced, or chemical/radiological disaster during a calendar year. A directly related death is defined as one that is directly attributable to the forces of the disaster or to the direct consequences of these forces, such as structural collapse, flying debris, or radiation exposure. This indicator does not consider indirectly related deaths, which occur when the unsafe or unhealthy conditions present during any phase of a disaster (i.e., pre-event or preparations, during the actual occurrence, or post-event during cleanup after a disaster) contribute to a death. These conditions include, for example, the loss or disruption of usual services, personal loss, and disruption of an individual's lifestyle (see Combs et al. 1999 and NVSS 2017). Method of calculation/estimation: Mortality rate due to disasters per 100,000 population = (number of deaths attributed to disasters/regional population) x 100,000 **Numerator:** Number of deaths attributed to disasters: the number of people who died during the disaster, or directly after, as a direct result of the hazardous event. **Denominator:** Regional population.
Type of indicator	Relative
Measurement units	Mortality rate

Frequency of measurement	The information on emergencies occurring between January and December of a given year is compiled and analyzed during June of the following year.
PASB unit(s) responsible for monitoring the indicator	• Evidence and Intelligence for Action in Health/Health Analysis, Metrics and Evidence (EIH/HA) • Health Emergencies (PHE)
Data source	PAHO/WHO Regional Mortality Database; official statistics and demographics reports from countries; estimates from WHO Global Burden of Disease Study; Centre for Research on the Epidemiology of Disasters (CRED); International Disaster Database (EM-DAT, https://www.emdat.be/); DesInventar Sendai, disaster loss data for Sustainable Development Goals and Sendai Framework Monitoring System (https://www.desinventar.net/).
Limitations	Limitations include: • Inaccurate reporting of deaths caused by disasters • Absence of reliable mortality information • Delay in reporting of mortality information • Focus on acute events due to challenges
References	1. United Nations. SDG Indicators Metadata Repository. Metadata for SDG Indicator 1.5.1. Available from: https://unstats.un.org/sdgs/metadata/files/Metadata-01-05-01.pdf 2. World Health Organization. 13th General Programme of Work (GPW13): WHO impact framework metadata. Available from: http://origin.who.int/about/what-we-do/GPW13_WHO_Impact_Framework_Indicator_Metadata.pdf (subject to updates by WHO) 3. Centre for Research on the Epidemiology of Disasters (CRED). CE-DAT Glossary. Available from: http://cedat.be/glossary 4. Combs DL, Quenemoen LE, Parrish RG, Davis JH. Assessing disaster-attributed mortality: development and application of a definition and classification matrix. Int J Epidemiol 1999;28(6):1124-1129. Available from: https://www.ncbi.nlm.nih.gov/pubmed/10661657 5. National Vital Statistics System (NVSS). A reference guide for certification of deaths in the event of a natural, human-induced, or chemical/radiological disaster. Vital Statistics Reporting Guidance, Report No. 1. Hyattsville, MD: US Centers for Disease Control and Prevention, National Center for Health Statistics; 2017. Available from: https://www.cdc.gov/nchs/data/nvss/vsrg/vsrg01.pdf
Linkage	• SDG indicators 1.5.1, 11.5.1, and 13.1.1, adapted • SHAA2030 target 8.1 • GPW13 Impact Framework