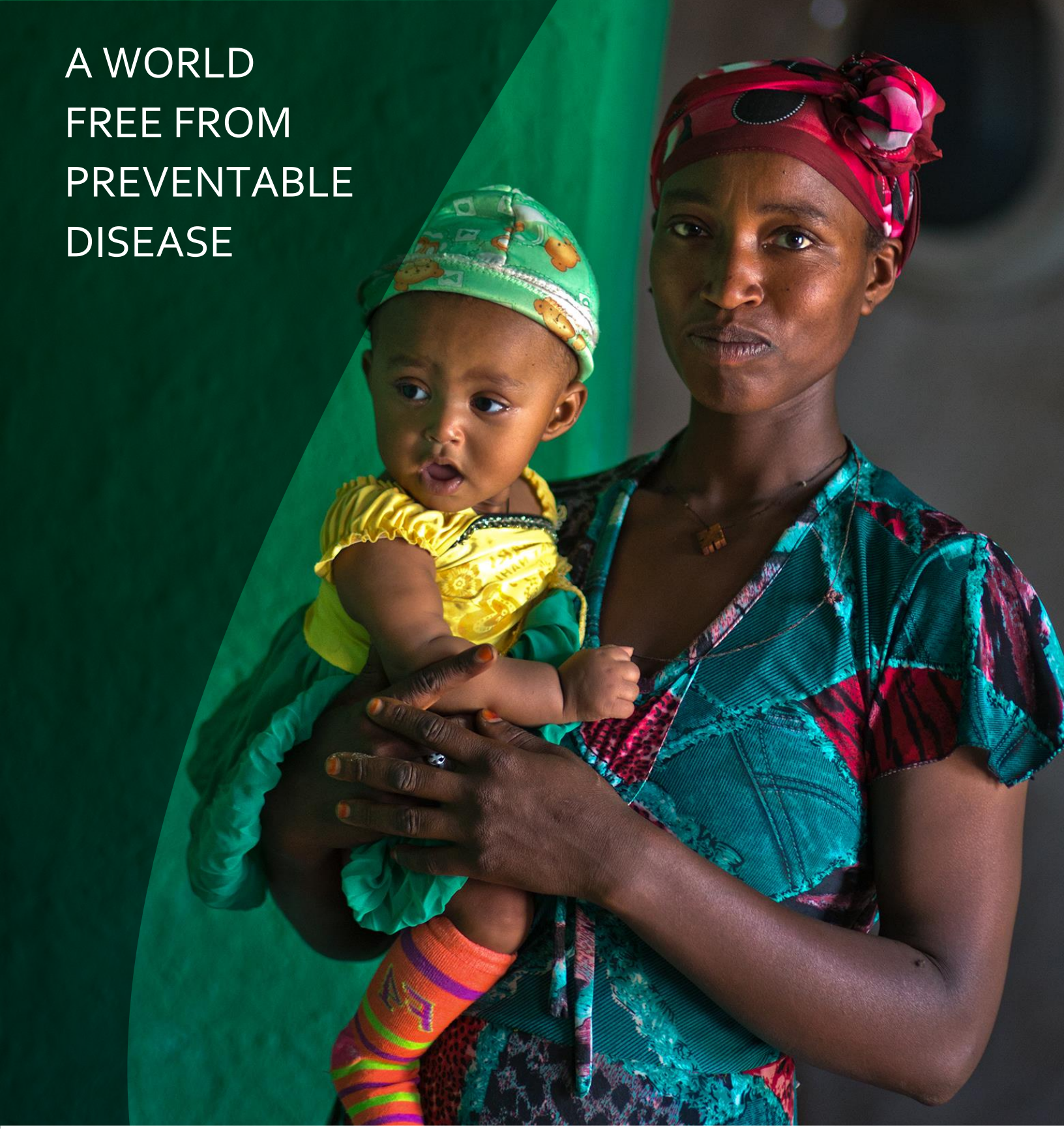
A WORLD FREE FROM PREVENTABLE DISEASE



2016-2020 STRATEGY INDICATOR DEFINITIONS

www.gavi.org

Gavi
The Vaccine Alliance

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Gavi, the Vaccine Alliance 2016-2020 Strategy

Mission

To save children's lives and protect people's health by increasing equitable use of vaccines in lower-income countries

Aspiration 2020

Under-five mortality rate	10% reduction
Future deaths averted	5-6 million
Future DALYs* averted	>250 million
Number of children vaccinated with Gavi support	>300 million
Vaccines sustained after transition	100%

Disease dashboard

Actual decrease in disease burden:

- Hepatitis B
- Rotavirus diarrhoea
- Measles

Principles

- **Country-led**
- **Community-owned**
- **Globally engaged**
- **Catalytic & sustainable**
- **Integrated**
- **Innovative**
- **Collaborative**
- **Accountable**

Goals

1. **Accelerate equitable uptake and coverage of vaccines**
2. **Increase effectiveness and efficiency of immunisation delivery as an integrated part of strengthened health systems**
3. **Improve sustainability of national immunisation programmes**
4. **Shape markets for vaccines and other immunisation products**

Objectives

A. Increase coverage and equity of immunisation

B. Support countries to introduce and scale up new vaccines

C. Respond flexibly to the special needs of children in fragile countries

A. Contribute to improving integrated and comprehensive immunisation programmes, including fixed, outreach and supplementary components

B. Support improvements in supply chains, health information systems, demand generation and gender-sensitive approaches

C. Strengthen engagement of civil society, private sector and other partners in immunisation

A. Enhance national and sub-national political commitment to immunisation

B. Ensure appropriate allocation and management of national human and financial resources to immunisation through legislative and budgetary means

C. Prepare countries to sustain performance in immunisation after graduation

A. Ensure adequate and secure supply of quality vaccines

B. Reduce prices of vaccines and other immunisation products to an appropriate and sustainable level

C. Incentivise development of suitable and quality vaccines and other immunisation products

Goal-level indicators

- **Reach of routine coverage:** pentavalent 3rd dose, measles 1st dose
- **Breadth of protection:** average coverage across supported vaccines
- **Equity of coverage and barriers based on:**
  - geography
  - wealth quintiles
  - education of mothers/female caretakers
  - fragile state status

- **Supply chain:** % countries meeting Effective Vaccine Management benchmarks
- **Data quality:** difference between administrative coverage and surveys
- **Access, demand and service delivery:** pentavalent 1st dose coverage and drop-out rate
- **Integration:** % countries meeting benchmark for integrated service delivery
- **Civil society:** % countries meeting benchmark for civil society engagement for improved coverage and equity

- **Co-financing:** % countries fulfilling co-financing commitments
- **Country investments:** % countries with increasing investments in routine immunisation per child
- **Programmatic sustainability:** % countries on track for successful transition
- **Institutional capacity:** % countries meeting institutional capacity benchmarks for national decision making, management and monitoring

- **Sufficient and uninterrupted supply:** % vaccine markets where Gavi supply meets demand
- **Reduction in price:** reduction in weighted average price of fully vaccinating a child with pentavalent, pneumococcal and rotavirus vaccines
- **Innovation:** number of vaccines and immunisation products with improved characteristics procured by Gavi
- **Healthy market dynamics:** % vaccine markets with moderate or high health

Strategic enablers

- **Country leadership, management & coordination**
- **Resource mobilisation**
- **Advocacy**
- **Monitoring & evaluation**

* Disability-adjusted life years (DALYs) is a measure of overall disease burden, expressed as the number of years lost due to ill health, disability or early death.

Under-five mortality rate

Indicator ID	MA1
Abbreviated name	U5MR
Definition	The under-five mortality rate measures the probability of a child born in a specific year or period dying before reaching the age of five, if subject to age-specific mortality rates for that period. Formally, this is not a rate (i.e., the number of deaths divided by the number of individuals at risk during a certain time period), but a probability of death derived from a life table. This indicator is expressed as the number of deaths among children under-five in a given year, per 1000 live births.
Numerator	Number of deaths among children aged 0-4 years (0-59 months of age)
Denominator	Number of live births
Level of disaggregation	Global versus Gavi-supported (68 countries)
Reporting schedule	Updated once annually
Rationale for use	The under-five mortality rate is a leading indicator of child health and overall human development. It is indicative of government commitment to health. The fourth Millennium Development Goal (MDG) indicator is: 'Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate'. This translated to a reduction from 91 deaths per 1000 live births in 1990 to 43 in 2015 – a target which was not met, but against which significant progress was made. A new target for under-five mortality rate for 2030 of 25 deaths per 1000 live births has been proposed as part of the new Sustainable Development Goals (SDGs). The use of this indicator as part of Gavi's strategy reflects Gavi's commitment to contributing to global and country health goals. It is recognised that Gavi's contributions toward averting these under-five deaths are intertwined with many other investments and actions—most importantly those made by countries themselves.
Method of measurement	This indicator is measured using population-weighted estimates from the UN Inter-agency Group for Child Mortality Estimates (IGME) for the 68 Gavi countries supported in the 2016-2020 strategy period. Generating accurate estimates of under-five mortality poses a considerable challenge because of limitations in data availability and quality. The IGME was established in 2004 to enhance country capacity to produce timely and properly assessed estimates of child mortality. This is led by UNICEF and WHO, and includes the World Bank and United Nations Population Division. The estimation process takes vital registration systems as the preferred source of data on child mortality because they collect information as events occur and cover the entire population. However, many developing countries lack vital registration systems that accurately record all births and deaths. Therefore, household surveys, such as the Multiple Indicator Cluster Surveys (MICs) and Demographic and Health Surveys (DHS), are the primary source of data on child mortality in developing countries. The IGME seeks to compile all available national-level data on child mortality, including data from vital registration systems, population censuses, household surveys and sample registration systems. Country-specific under-five mortality rate estimates are weighted by the number of live births to produce a weighted average rate across the 68 Gavi-supported countries.

Supplemental data and/or analyses	NA
Data source	Child mortality estimates from IGME, and estimates of live births from the United Nations Population Division.
Strengths and limitations	A strength of including the under-five mortality rate as part of the Gavi strategy is that this is a key impact indicator used globally for multiple purposes, including the MDGs and SDGs. This indicator measures the ultimate impact on child survival at the population level using publicly available data, requiring no additional reporting burden from countries. A limitation of this indicator is that many other factors beyond the influence of Gavi affect a country's under-five mortality rate—including poverty, conflict, nutrition and many other factors. Therefore, a contribution perspective is essential. An additional limitation relates to extensive challenges in measurement and estimation. Due to the lack of consistent and high-quality data across countries, the values for this indicator come from an estimation process with large uncertainty. Furthermore, this indicator may also be slow in responding to policy changes given that it is at the end of a long results chain and frequently measured through surveys which reflect child mortality from earlier time periods.
Further information and related links	For further information on methods used by IGME: http://www.childinfo.org/mortality_methodology.html For under-five mortality rate estimates: http://www.childmortality.org For population estimates: http://esa.un.org/wpp/

Number of future deaths averted

Indicator ID	MA2
Abbreviated name	Future deaths averted
Definition	Number of future deaths averted as a result of vaccination with Gavi-supported vaccines in 68 Gavi countries
Numerator	NA
Denominator	NA
Level of disaggregation	By direct and catalytic support
Reporting schedule	Updated twice annually
Rationale for use	This indicator estimates the impact of Gavi-supported vaccines in terms of averting future deaths from vaccine-preventable diseases. Mortality reduction is one of the ultimate impacts of Gavi support, and is therefore important to estimate on a periodic basis. It is recognised that Gavi's contributions toward averting these future deaths are intertwined with many other investments and actions—most importantly those made by countries themselves.
Method of measurement	Future deaths averted are estimated through an expert process convened jointly by Gavi, the Vaccine Alliance and the Bill and Melinda Gates Foundation, using publicly available, peer-reviewed models. Methods are described further in Lee et al, Vaccine, 2013. Disease models used, assumptions (e.g., underlying disease burden, vaccine effectiveness and mortality risk) and inputs will continue to be reviewed and refined through expert processes annually as new data (including enhanced disease surveillance outputs) and improved models become available. Results from targeted studies and evaluations will be used to validate and refine assumptions used in the models. As described in its M&E framework and strategy, Gavi adopts a contribution perspective when estimating impact—recognising that impact numbers reported do not reflect exclusive attribution to Gavi, but a broader impact at country level to which Gavi is one of many contributors, in support of countries and alongside other development partners. In order to assess the long-term impact of Gavi support in countries which may not have otherwise funded vaccine programmes, the numbers reported against this indicator reflect both where Gavi has provided direct support (i.e. active funding for vaccine programmes in a given year), as well as catalytic support (i.e. in the five-year period immediately following a country's transition out of Gavi support). All vaccines included in the portfolio supported by Gavi are included in the calculation. This includes the following vaccines/antigens: hepatitis B, *Haemophilus influenzae* type-b (Hib), pneumococcal, rotavirus, yellow fever (campaign and routine), meningitis A (campaign and routine), Japanese Encephalitis (campaign and routine), human papillomavirus, measles second dose, measles-rubella campaigns, and rubella routine.[1] Additional vaccines will be added as and when Gavi begins to provide support for them.
Supplemental data and/or analyses	NA

[1] Inactivated polio vaccine is included within the Gavi portfolio but not assumed to contribute to future deaths averted.

Data source	Publicly-available, peer-reviewed disease models are used to estimate future deaths averted, as described further in: Lee, LA et al. (2013). The estimated mortality impact of vaccinations forecast to be administered during 2011-2020 in 73 countries supported by the Gavi Alliance. Vaccine, 31S: B61-B72. The disease models use WHO/UNICEF estimates of immunisation coverage (WUENIC) for historical coverage, the Gavi Operational Demand Forecast for future coverage projections, and estimates of target population size from the United Nations Population Division.
Strengths and limitations	The strength of this indicator is that it estimates the ultimate impact of Gavi-supported vaccines on mortality. The primary limitation of this indicator is that there is substantial measurement error, which is difficult to quantify. Model-based estimates of impact rely on a number of assumptions that are difficult to test. In addition, this indicator is based on counts rather than rates, and therefore does not provide information on whether and why mortality rates may decrease over time. An additional limitation is that this indicator estimates impact of Gavi support of vaccination against a simple alternative scenario of no vaccination with the vaccines in question, rather than a more complex scenario that seeks to determine which countries may have introduced which vaccines in the absence of Gavi support; this may lead to an overestimation of Gavi-attributable impact. Lastly, to reduce complexity, the reporting process does not distinguish between deaths that would have occurred many years into the future in the absence of vaccination and deaths that would have occurred in the immediate future (i.e., during the Gavi strategic period in question). As a result, deaths averted estimates are specified as "future" deaths averted, rather than deaths expected to be averted in the strategic period during which the target population is immunised.
Further information and related links	Lee, LA et al. (2013). The estimated mortality impact of vaccinations forecast to be administered during 2011-2020 in 73 countries supported by the GAVI Alliance. Vaccine, 31S: B61-B72. Available at: http://www.sciencedirect.com/science/article/pii/S0264410X12016283

Number of future disability-adjusted life years (DALYs) averted

Indicator ID	MA3
Abbreviated name	Future DALYs averted
Definition	Number of future disability-adjusted life years (DALYs) averted as a result of vaccination with Gavi-supported vaccines in 68 Gavi countries.
Numerator	NA
Denominator	NA
Level of disaggregation	By direct and catalytic support
Reporting schedule	Updated twice annually
Rationale for use	This indicator measures the impact of Gavi-supported vaccines on morbidity and disability as well as mortality. Reduction in overall disease burden from vaccine-preventable diseases is one of the ultimate impact measures of Gavi support, and is therefore important to estimate on a periodic basis. The use of DALYs comes from recognition that focusing exclusively on deaths averted misses important morbidity-related impact achieved as a result of reduction in disability. This helps supplement the tracking of future deaths averted in indicator 3. It is recognised that Gavi's contributions toward averting these future DALYs are intertwined with many other investments and actions—most importantly those made by countries themselves.
Method of measurement	DALYs measure the number of healthy life years lost due to disability or premature death. DALYs are calculated as the sum of the years of life (YLL) lost due to premature mortality and the number of years lost due to disability (YLD) amongst people living with a health condition. Years lost from premature mortality are estimated using a standard expectation of the age of death. Years lost due to disability are estimated by applying to the number of years disabled a set of disability weights which reflect the severity of the condition and its impact on functional capacity. Future DALYs averted are estimated through an expert process convened jointly by the Gavi Alliance and the Bill and Melinda Gates Foundation, described above (Indicator MA2). Estimates of cases and deaths averted from this process are used as inputs to calculate the number of DALYs averted. No time discounting or age weights are applied to the DALY estimates. The numbers reported against this indicator reflect where Gavi has provided direct support, as well as catalytic support. See Annex 1 for definitions of direct and catalytic support.
Supplemental data and/or analyses	NA
Data source	Publicly-available, peer-reviewed disease models are used to estimate future deaths and DALYs averted, as described further in: Lee, LA et al. (2013) and Ozawa, S et al (draft). Estimates of disability weights are from the latest revision of the Global Burden of Disease Study (GBD), co-ordinated by the Institute for Health Metrics and Evaluation (IHME). The DALY models use WHO/UNICEF estimates of immunisation coverage (WUENIC) for historical coverage, the Gavi Operational Demand Forecast for future coverage projections, and estimates of target population size from the United Nations Population Division.

Strengths and limitations	The strength of this indicator is that it broadens the estimated impact of Gavi-supported vaccines to morbidity/disability, alongside mortality reduction. Many vaccine-preventable diseases and their sequalae have a significant impact on non-fatal health outcomes that are captured in DALYs. The primary limitation of this indicator is that there is substantial measurement error, which is difficult to quantify. Model-based estimates of impact rely on a number of assumptions that are difficult to test and are sensitive to methodological assumptions about morbidity estimates, life expectancies, and disability weights. The derivation of disability weights through the Global Burden of Disease Study is based on results from an internet-based survey and from population-based household surveys in a limited number of countries, and thus may not be representative of health valuation in all 68 Gavi countries.
Further information and related links	For further information on methods used in producing global burden of disease estimates: http://www.who.int/topics/global_burden_of_disease/en/ For further information on Global Burden of Disease Study: www.healthdata.org/gbd

Number of unique children immunised with Gavi support

Indicator ID	MA4
Abbreviated name	Children immunised with Gavi support
Definition	Number of children immunised with the last recommended dose of a Gavi-supported vaccine delivered through routine systems
Numerator	NA
Denominator	NA
Level of disaggregation	By direct and catalytic support
Reporting schedule	Updated once annually
Rationale for use	This indicator is important for tracking the number of children reached with Gavi support.
Method of measurement	This indicator refers to the total number of children reached with the last recommended dose of any Gavi-supported vaccine delivered through routine systems, corrected on a country-by-country basis so that children receiving multiple vaccines are not double-counted. Campaigns and supplementary immunisation activities are not considered. On a country-by-country basis, the Gavi-supported vaccine delivered through the routine system with the highest level of coverage at national level is selected. In the majority of countries, this is pentavalent vaccine, but theoretically other Gavi-supported vaccines could have higher coverage at national level. Coverage is translated into an estimate of the number of children reached with that vaccine by multiplying the fraction of the target cohort reached, per the WHO/UNICEF estimates of national immunisation coverage, by a target population estimate (for the vaccines included in this indicator, this is the estimate of surviving infants from the United Nations Population Division for the corresponding country and year). Numbers are expressed as a count and updated once per year. The numbers reported against this indicator reflect where Gavi has provided direct support, as well as catalytic support. See Annex 1 for definitions of direct and catalytic support.
Supplemental data and/or analyses	NA
Data source	WHO/UNICEF estimates of national immunisation coverage; United Nations Population Division estimates of population size (surviving infants)
Strengths and limitations	The strength of this indicator is that it directly estimates the number of children reached with Gavi-supported vaccines using publicly available data, requiring no additional reporting burden from countries. It is simple to understand and communicate. The primary limitation of this indicator is underlying uncertainty in available coverage and population estimates. The quality of the coverage and population estimates are constrained by the quality and availability of underlying data sources, which have gaps for many countries. In addition, many other factors in a country influence the number of children reached with routine immunisation coverage. This indicator is based on a count rather than a rate, and thus does not measure whether immunisation coverage is increasing over time, nor whether the distribution of coverage is equitable. Coverage and equity dimensions are, however, captured by Strategic Goal 1 indicators.

Lastly, this indicator does not discern whether children reached are fully immunised with *all* recommended vaccines; it only counts the largest proportion of surviving infants reached with *any* Gavi-supported vaccine.

Further information and related links

For further information on methods used in producing WHO/UNICEF estimates:
http://www.who.int/bulletin/volumes/87/7/08-053819/en/index.html

For current country coverage estimates:

http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragedtp3.html

Vaccines sustained after transition

Indicator ID	MA5
Abbreviated name	Vaccines sustained after transition
Definition	Percentage of countries sustaining delivery of all recommended vaccines in their routine programmes after transition away from Gavi financing
Numerator	Number of countries that have completed their transition away from Gavi support and continue to deliver all vaccines recommended for their routine programmes by national authorities, as evidenced by WHO/UNICEF coverage estimates
Denominator	Number of countries that have completed their transition away from Gavi support
Level of disaggregation	NA
Reporting schedule	Updated twice annually, with additional updates pre-PPC
Rationale for use	This indicator measures the overall level of sustainability of Gavi investments. For the Gavi model to be successful in supporting countries to catalyse introduction and sustainably deliver vaccines, it is critical to track whether countries continue to deliver vaccines following their transition away from Gavi support.
Method of measurement	This indicator is expressed as a percentage of countries meeting specific critieria. For every country that has transitioned away from Gavi support, including the first four that crossed the eligibility threshold prior to the Board's adoption of the graduation or co-financing policies (Albania, Bosnia & Herzegovina, China and Turkmenistan), coverage estimates will be tracked each year to assess whether they continue to deliver all recommended vaccines in their routine programmes and at what coverage levels. All vaccines recommended by national authorities for delivery through the routine programme are included within the indicator, rather than only those introduced with Gavi support. The numerator and denominator are defined above. If any country that has completed its transition drops a vaccine from its routine immunisation programme, it will appear in the denominator but not the numerator. The Secretariat will report such cases to the Board, along with the reason for it and relevant contextual information to the extent that it can be established (e.g., based on revised recommendation by national authorities informed by evidence, or due to financial or other barriers).
Supplemental data and/or analyses	Trends in coverage in phase 3 and beyond, relative to the time that countries transitioned from phase 2 to phase 3, will be assessed and reported in a complementary manner. If any country experiences a gradual or abrupt drop in coverage of vaccines nominally sustained within programmes, this will also be reported. It is recognised that many of the issues detected—temporary suspension of delivery of a specific vaccine or drops in coverage due to conflict, civil strife or disease outbreaks—will be captured in the measurement of this indicator, even though they may not be strictly related to transition from Gavi support. Explanatory text will be provided in such circumstances.
Data source	WHO/UNICEF estimates of national immunisation coverage
Strengths and limitations	The strength of this indicator is that it directly tracks whether countries that have completed their transition away from Gavi financing continue to deliver vaccines within their routine programmes. It will monitor coverage levels relative to the time that they transitioned from phase 2 to phase 3, directly addressing a key strategic concern for the Alliance.

An additional strength is that this indicator utilises publicly available data and thus does not entail any additional reporting requirement for countries that have completed their transition; the transaction cost involved in tracking coverage values over time is minimal.

The primary limitation of this indicator is underlying uncertainty in available coverage estimates. The quality of the WHO/UNICEF estimates is constrained by the quality and availability of underlying data sources, which have gaps in availability and quality for many countries.

An additional limitation is that this indicator by itself does not provide any information on the financial or programmatic constraints faced by countries that have completed their transition. Identifying the reasons why countries have dropped vaccines or experienced decreases in coverage with vaccines and establishing relevant context information would require additional effort by the Alliance beyond the tracking of WHO/UNICEF coverage estimates.

Further information and related links

For Gavi Graduation Policy:

http://www.gavi.org/Library/GAVI-documents/Policies/GAVI-Alliance-Graduation-Policy/

For Gavi Co-financing Policy:

http://www.gavi.org/Library/GAVI-documents/Policies/GAVI-Alliance-Revised-Co-financing-Policy/

Primary indicator: Hepatitis B burden

Indicator ID	D1
Abbreviated name	Hepatitis B burden
Definition	Number of countries out of 68 Gavi-supported countries that have less than 2% hepatitis B surface antigen (HBsAg) prevalence among children less than 5 years of age, among countries with surveys meeting inclusion criteria
Numerator	NA
Denominator	NA
Level of disaggregation	NA
Reporting schedule	Updated once annually
Rationale for use	This indicator leverages existing empirical data to measure progress toward reducing hepatitis B infection among young children in 68 Gavi-supported countries through use of hepatitis B containing vaccines (such as pentavalent vaccine). Hepatitis B surface antigen is a biologic marker of chronic hepatitis B infection that accounts for the majority of hepatitis B related disease burden. Unvaccinated young children have high risk of developing chronic hepatitis B infection later in life, which can lead to disease and death.
Method of measurement	This indicator is measured through cross-sectional national surveys measuring the seroprevalence of hepatitis B surface antigen. This indicator is tracked as the cumulative number of countries having quality evidence of less than 2% HBsAg prevalence in children younger than 5 years of age. The quality of surveys reporting results to be included in the measurement (sampling methods, sample size, laboratory methodology, etc.) and target age groups is assessed by WHO regional hepatitis B control verification committees. In regions where guidance is not available from regional hepatitis B control verification committee, the following quality criteria will apply: nationally representative survey using probability sampling or census survey; acceptable specimen collection and laboratory methods, and precision around the HBsAg seroprevalence estimate with a confidence interval within +/- 0.5. The most recent survey meeting quality criteria will be considered. All surveys meeting quality criteria will be considered for inclusion in the measurement. Surveys should adhere to WHO guidelines for designing and implementing a hepatitis B serosurvey and have adequate sample size in children less than 5 years of age to ensure adequate precision of point estimates. If a survey is conducted among children 5-18 years old and shows less than 2% prevalence, it is assumed that the prevalence in children younger than 5 is less than 2%, unless there is evidence of decreasing vaccination coverage or higher prevalence in recent birth cohorts. The interpretation of survey results should be in line with WHO regional hepatitis B control programs.
Supplemental data and/or analyses	The number of countries reporting relevant data from surveys meeting quality criteria will also be documented.
Data source	WHO regional hepatitis B control initiatives, supplemented with other identified surveys

Strengths and limitations	The strength of the indicator is that it directly measures HBsAg prevalence among children, which is predictive of future burden of chronic disease associated with hepatitis B. This indicator is aligned with regional hepatitis B control initiatives and leverages existing efforts in measuring chronic hepatitis B prevalence in children through seroprevalence surveys. The primary weakness of this indicator is the limited availability and variable quality of data from nationally representative serosurveys. By 2020, a significant number of countries may not have national serosurveys to contribute towards measurement of the indicator. Data will likely be biased towards countries who are ready to measure their achievement towards their regional hepatitis B control goal, which is why this indicator is tracked as a count rather than a percentage. As of April 2015, the WHO South-East Asia region has not yet established a hepatitis B control goal. Of the regions that have established a hepatitis B control goal, only the Western Pacific Region has established guidelines for certification of the achievement of their hepatitis B control goal.
Further information and related links	For further information on regional hepatitis B control goals: http://www.wpro.who.int/entity/hepb_control/goals/en/

Primary indicator: Rotavirus burden

Indicator ID	D2
Abbreviated name	Rotavirus burden
Definition	Median proportion (and interquartile range) of acute gastroenteritis hospitalisations positive for rotavirus among children less than one year of age among Gavi countries with any site meeting inclusion criteria
Numerator	NA
Denominator	NA
Level of disaggregation	NA
Reporting schedule	Updated once annually
Rationale for use	This indicator measures the impact of rotavirus vaccine on rotavirus positive acute gastroenteritis hospitalisations. Rotavirus infection is a significant cause of child mortality due to severe diarrhoea and a major cause of diarrheal hospitalisation in many developing countries.
Method of measurement	Data from sites in the WHO Coordinated Global Rotavirus Surveillance Network in the 68 Gavi-supported countries meeting inclusion criteria for consistency of reporting and enrolment of cases will be included. Sites will be included if they reported data for all 12 months of a calendar year, tested stool samples from at least 100 children under the age of 5 and use enzyme immunoassay for rotavirus detection. If a country has more than one surveillance site that meets inclusion criteria for analysis, the aggregated case-based data from each site will be used as the estimate for the country. The median percentage of rotavirus positivity in stool specimens in children under 1 year of age, among the countries with at least one site meeting the quality criteria, will be tracked.
Supplemental data and/or analyses	NA
Data source	WHO Coordinated Global Rotavirus Surveillance Network
Strengths and limitations	The strength of this indicator is that it is an etiology-specific indicator that will likely be impacted by rotavirus vaccine introduction. Tracking proportions of rotavirus positivity across sites also ensures stability if absolute numbers of cases and hospitalisations vary from year to year. A limitation is that the indicator is based on sentinel surveillance site data, which are unlikely to be geographically representative of an entire country. Rotavirus surveillance has not been established in all Gavi countries, and not all countries with rotavirus surveillance are members of the WHO Coordinated Global Rotavirus Surveillance Network. Also, this indicator might be sensitive to changes in surveillance practices and data quality improvements, such that the enhanced ability to detect rotavirus positive cases may lead to difficulties in interpreting trends in this indicator.
Further information and related links	For further information on the WHO rotavirus laboratory network: http://www.who.int/immunization/monitoring_surveillance/burden/laboratory/Rotavirus/en/

Primary indicator: Measles burden

Indicator ID	D3
Abbreviated name	Measles burden
Definition	Number of Gavi countries reporting an annual measles incidence of less than 5 cases per million population
Numerator	NA
Denominator	NA
Level of disaggregation	NA
Reporting schedule	Updated once annually
Rationale for use	This indicator measures Gavi contribution towards reducing measles incidence with Gavi support for measles second dose, and preventive measles campaigns (measles-rubella and standalone measles supplementary immunisation activities). Measles remains an important cause of death and disability in many Gavi-supported countries. Measles incidence is a proxy indicator for impact on measles morbidity and mortality.
Method of measurement	Measles incidence is estimated from cases identified through surveillance systems in each country. Most Gavi countries report measles cases monthly and annually to WHO regional offices, and the data is updated annually at global level. Measles laboratory networks have been set up in all WHO regions, which perform confirmative tests of measles cases, and genotyping the circulating strain. Incidence is defined as the number of measles cases per million population in a given country. The United Nations Population Division's World Population Prospects is the source for estimates of total population in each country. The indicator tracks number of Gavi countries reporting an annual incidence of less than 5 confirmed cases per million population among the number of Gavi countries meeting inclusion criteria.
Supplemental data and/or analyses	NA
Data source	WHO Vaccine Preventable Disease Surveillance System Reported Incidence Time Series
Strengths and limitations	The strength of the indicator is that it measures the impact of measles immunisation on disease incidence, and is a standard indicator established by the World Health Assembly in 2010. This indicator is also tracked as part of the Global Vaccine Action Plan, and uses publicly available data without imposing additional reporting burden on countries. Measles surveillance is functional in most countries; as a consequence, there are sufficient data available for annual updates, but with variable quality of reported data by country. This indicator is aligned with the strategic objective of Gavi investments in measles to date: disease control and mortality reduction rather than elimination. Limitations of this indicator include quality concerns with country-reported estimates of cases; the sensitivity of this indicator to changing surveillance practices and data quality over time; and annual variation in country case reporting and outbreaks. Trends in this indicator may be difficult to interpret – for example, as surveillance quality improves, there may be an enhanced ability to detect cases.

Further information and related links

For more information on measles surveillance standards and definitions:

http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_standards/en/

For current country measles incidence estimates:

http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tsincidencemeasles.html

Reach of routine coverage

Indicator ID	S1.1
Abbreviated name	Reach of routine
Definition	Coverage of third dose of diphtheria-tetanus-pertussis-hepatitis B-Hib containing vaccine (pentavalent vaccine, or Penta3) and coverage of first dose of routine measles containing vaccine in Gavi-supported countries
Numerator	NA
Denominator	NA
Level of disaggregation	By vaccine, fragile state status and transition status
Reporting schedule	Updated once annually
Rationale for use	Pentavalent and measles vaccines are now present in the routine immunisation schedules of all Gavi-supported countries; both are measures of the reach of routine immunisation systems. Pentavalent requires three contacts with the health system at appropriate times, and routine measles first dose is given at the end of the infant schedule.
Method of measurement	This indicator is measured using annually updated WHO/UNICEF estimates of coverage for the 3rd dose of pentavalent and 1st dose of measles vaccines. The vaccine-specific coverage estimates are tracked separately rather than at the unit of the same child or country. Given that WHO/UNICEF do not produce estimates of coverage with pentavalent vaccine, DTP3 is used as a proxy for receipt of third dose of pentavalent vaccine for countries that have taken pentavalent to scale throughout the entire country. The overall coverage estimates for Gavi-supported countries is based on the population-weighted average of the coverage estimates from each of the countries, using the number of surviving infants as the weight. Coverage indicators are expressed as percentages.
Supplemental data and/or analyses	NA
Data source	WHO/UNICEF estimates of national immunisation coverage for DTP3 and routine measles first dose; estimates of number of surviving infants from the United Nations Population Division. Fragile state status and transition status from Gavi Secretariat.
Strengths and limitations	The strength of this indicator is that it directly measures the reach of routine immunisation services, and thus provides information on the level of coverage achieved by the routine immunisation platform. Publicly available data is used, imposing no additional reporting burden on countries. The primary limitation of this indicator is underlying uncertainty in available coverage estimates. The quality of the WHO/UNICEF estimates is constrained by the quality and availability of underlying data sources, which have gaps for many countries. It is also recognised that many other factors in a country influence the proportion of children reached with routine immunisation coverage. This indicator does not track coverage with pentavalent and measles vaccines together at the unit of the individual child, but separately by vaccine.
Further information and related links	For further information on methods used in producing WHO/UNICEF estimates: http://www.who.int/bulletin/volumes/87/7/08-053819/en/index.html

http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0047806
http://benthamopen.com/contents/pdf/TOPHJ/TOPHJ-6-73.pdf
For current country coverage estimates:
http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragedtp3.html
For population estimates:
http://esa.un.org/wpp/

Breadth of protection

Indicator ID	S1.2
Abbreviated name	Breadth of protection
Definition	Average coverage across all Gavi-supported vaccines in Gavi-supported countries
Numerator	NA
Denominator	NA
Level of disaggregation	By vaccine, fragile state status and transition status
Reporting schedule	Updated once annually, with additional updates in the event of significant changes to vaccine introduction schedule
Rationale for use	This indicator tracks progress in increasing the overall breadth of protection delivered through routine immunisation during the 2016-2020 strategy period, through introductions of new vaccines as well as increases in routine coverage with vaccines already in country programmes.
Method of measurement	This indicator is measured an overall average of the annual estimates of coverage via the routine immunisation system for the last recommended dose of all Gavi-supported vaccines among all eligible children in Gavi-supported countries. This includes the following vaccines in all Gavi-supported countries: pentavalent, pneumococcal, rotavirus, measles second dose, rubella, inactivated polio vaccine (IPV), and human papilloma virus (HPV) vaccines, as well as the following vaccines in specific regions only: yellow fever, Japanese encephalitis (JE), and meningitis type A. Campaign delivery is not included. Vaccine-specific coverage estimates are first combined across all Gavi-supported countries via weighted average. For the three regional vaccines, the number of individuals targeted by each vaccine across all 68 Gavi-supported countries is taken as the weight, to account for the smaller geographical scope of the three regional vaccines. The other vaccines, which do not have a regional focus, have equal weights equivalent to the sum of the target population (number of surviving infants) across all 68 Gavi-supported countries. Although HPV targets a different population than surviving infants, it is given the same weight as these other globally delivered vaccines, since there is no geographic restriction to the recommendation for HPV use and since boys also receive protection through girl-targeted delivery strategies. Excluding the three regional vaccines, all 68 Gavi-supported countries contribute to the denominator for each vaccine-specific coverage estimate, irrespective of whether they have actually introduced the vaccines in question. To obtain the final breadth of protection value, the vaccine-specific coverage estimates, calculated across all Gavi-supported countries as above, are aggregated via a second weighted average, using the sums of the target population for each vaccine across all Gavi-supported countries as the weights. This results in a single value expressing the overall progress in coverage of the full Gavi vaccine portfolio, accounting for varying target population sizes on a per-country and per-vaccine basis.
Supplemental data and/or analyses	A graphical representation showing new vaccine introductions that occur as well as increases in routine coverage will be used to help communicate results over time. Vaccine-specific coverage estimates are reported alongside the overall breadth of protection value. Country-specific values are not reported.
Data source	WHO/UNICEF estimates of national immunisation coverage (WUENIC) are used for vaccines currently tracked by WUENIC. Gavi Operational Forecast estimates of fully vaccinated persons are used both for

	forecasted values (for target setting) as well as for the remaining vaccines (JE, meningitis A and HPV); this source may be revised as historical coverage data becomes publicly available for these vaccines. Estimates of target population size come from the United Nations Population Division. Vaccine introduction data sourced from Gavi internal vaccine launches database.
Strengths and limitations	This indicator provides a single composite measure of average levels of coverage with all Gavi-supported vaccines and thus provides information on the level of progress over time in raising coverage with a range of vaccines across the portfolio. Publicly available data is used, imposing no additional reporting burden on countries. This indicator is sensitive to coverage changes over time resulting from new vaccine introductions, as well as increases in routine coverage with vaccines already in country programmes. As such, this indicator reflects two Global Vaccine Action Plan goals: increases in routine coverage and new vaccine introductions. The primary limitations of this indicator are communication challenges and the underlying uncertainty in available coverage estimates. The quality of the WHO/UNICEF estimates is constrained by the quality and availability of underlying data sources, which have gaps for many countries. Additional limitations include the lack of available WHO/UNICEF estimates at present for some vaccines in the portfolio and the fact that this indicator does not track co-coverage of multiple vaccines at the unit of the individual (i.e., it does not reflect how many children have individually received each recommended vaccine). Furthermore, schedules and age of vaccination may vary by country, which can complicate the interpretation of results. As per-country target populations are used as the weights, averaged values are highly sensitive coverage shifts in countries with large cohorts.
Further information and related links	For further information on methods used in producing WHO/UNICEF estimates: http://www.who.int/bulletin/volumes/87/7/08-053819/en/index.html For current country coverage estimates: http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragedtp3.html For population estimates: http://esa.un.org/wpp/

Equity of vaccination coverage by geography

Indicator ID	S1.3
Abbreviated name	Equity by geography
Definition	Average proportion of districts with DTP3 coverage ≥80%, across all Gavi68 countries
Numerator	Sum of the proportion of districts with DTP3 coverage ≥80% for each Gavi country that passes data quality criteria
Denominator	Number of Gavi68 countries that meet the data quality criteria
Level of disaggregation	By fragile state status and transition status
Reporting schedule	Updated once annually
Rationale for use	The indicator helps Gavi understand whether interventions may be needed to ensure an equitable distribution of high coverage across all parts of Gavi-supported countries.
Method of measurement	This indicator is measured using the latest available data from the WHO/UNICEF Joint Reporting Form: 1) the proportion of districts achieving >=80% DTP3 coverage are calculated for each country; 2) the values across countries are aggregated to a sum total; 3) an unweighted average of values produced in step 2 is calculated by dividing by the number of Gavi countries that meet the data quality criteria. Following the approach taken for the same indicator in the Global Vaccine Action Plan, a country is deemed to pass the data quality check if 1) the national administrative coverage and WHO/UNICEF estimate of national coverage are the same, or 2) the WHO/UNICEF estimate of national coverage is ≥90%.
Supplemental data and/or analyses	NA
Data source	WHO/UNICEF Joint Reporting Form
Strengths and limitations	The strength of this indicator is that it directly measures geographic inequities using existing data and methodology aligned with the Global Vaccine Action Plan. Publicly available data is used, imposing no additional reporting burden on countries. The primary limitation of this indicator is underlying uncertainty in available coverage estimates, both from the Joint Reporting Form and the WHO/UNICEF estimates. The inclusion of a data quality filter based on WHO/UNICEF estimates helps address this limitation, but WHO/UNICEF estimates have their own limitations as described above. In addition, the inclusion of a data quality filter limits the number of countries eligible to report on this indicator.
Further information and related links	For further information on methods used in producing WHO/UNICEF estimates: http://www.who.int/bulletin/volumes/87/7/08-053819/en/index.html For current country coverage estimates from WHO/UNICEF: http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragedtp3.html For JRF: http://www.who.int/immunization/monitoring_surveillance/data/en

Equity of vaccination coverage by poverty status

Indicator ID	S1.4
Abbreviated name	Equity by wealth
Definition	Average (unweighted) difference in coverage of third dose pentavalent vaccine between the richest and poorest quintiles
Numerator	Sum of the difference in DTP3 coverage between highest and lowest wealth quintiles for each Gavi country with at least one Democratic Health Survey (DHS), Multiple Indicator Cluster Survey (MICS) or comparable survey
Denominator	Number of Gavi-supported countries (Gavi68) with at least one DHS, MICS or comparable survey
Level of disaggregation	By fragile state status and transition status
Reporting schedule	Updated once annually
Rationale for use	Although global access to vaccines has become more equitable, within-country disparities persist in many countries. The most consistent disparity in immunisation coverage across a wide range of settings is between the poorest and those who are less poor. The poor are also the most vulnerable, and generally the most likely to die from vaccine-preventable diseases in the absence of vaccination.
Method of measurement	This indicator is measured using the latest available household survey (DHS, MICS or comparable survey) data from each Gavi-supported country since year 2000: 1) the difference in coverage of third dose of pentavalent vaccine between the richest and poorest quintile is calculated for each country with at least one DHS or MICS survey; 2) the values across countries are aggregated to a sum total; 3) an unweighted average of values produced in step 2 is calculated by dividing by the number of Gavi countries with at least one DHS, MICS or comparable survey. Country data will be updated in the measurement in one of two ways: 1) country with existing survey data on equity by wealth publishes new data; 2) country without prior survey data on equity by wealth publishes new survey which includes data on equity by wealth.
Supplemental data and/or analyses	NA
Data source	DHS and MICS reports, or reports from other surveys that use comparable methods for calculating wealth quintiles and ascertaining vaccination status of the child, based on criteria defined in WHO/UNICEF household survey guidance.
Strengths and limitations	The strength of this indicator is that it will enable improved trend monitoring—an annual snapshot of evolution of magnitude of gap between highest/lowest quintiles education) across the 68 Gavi-supported countries. This indicator highlights coverage disparities related to the poorest households, which generally have the greatest risk of dying due to a vaccine-preventable disease in the absence of vaccination. This measure of equity is also simpler to compile and interpret than many other measures of equity, such as concentration indices. Publicly available data is used, imposing no additional reporting burden on countries. Key limitations of this indicator include: 1) annual reporting will include new data points for a very limited number of countries since new DHS or MICS surveys are conducted every 3-5 years; changes in annual value will not be easily interpreted with respect to Gavi investments or programming.

Household surveys have their own limitations in quality and certainty, due to sampling and non-sampling error. Furthermore, in basing the calculation on only the poorest and the least poor quintiles, this indicator does not capture what is happening in the middle three quintiles. It is noted, however, that the Global Vaccine Action Plan progress reports include a description of the distribution across all five quintiles each year.

Finally, the defined wealth quintiles may have an urban bias in their basic construction that has been documented in the literature.

Further information and related links

Gwatkin 2007 on ten best resources on health equity:
http://heapol.oxfordjournals.org/content/22/5/348.long

For methods related to calculation of wealth quintiles:

http://vanneman.umd.edu/socy699J/FilmerP01.pdf

For DHS and MICS, respectively:

http://www.measuredhs.com; http://www.childinfo.org/mics.html

Urban-rural bias in wealth index:

http://pdf.usaid.gov/pdf_docs/PNADN521.pdf

For multi-dimensional poverty index:

http://hdr.undp.org/en/content/multidimensional-poverty-index-mpi

Equity of vaccination coverage by education status of mothers/female caretakers

Indicator ID	S1.5
Abbreviated name	Equity by maternal education
Definition	Average (unweighted) difference in coverage of third dose of pentavalent vaccine between children whose mothers/female caretakers have received no education and children whose mothers/female caretakers have completed secondary education or higher
Numerator	Sum of differences in DTP3 coverage between highest and lowest quintiles in female caretaker's education
Denominator	Number of Gavi-supported countries (Gavi68) with at least one DHS, MICS or comparable survey
Level of disaggregation	By fragile state status and transition status
Reporting schedule	Updated once annually
Rationale for use	This indicator is consistent with the focus in the new strategy on the need to better understand and address barriers to improving coverage and equity. This is also consistent with the revised Gavi Gender Policy's shift in emphasis from the difference in coverage between boys and girls to gender-related barriers, including the role of female education and empowerment. Whereas the association between father's education and immunisation coverage of children is variable across settings, maternal/female caretaker education is strongly associated with immunisation coverage of children across a wide range of settings.
Method of measurement	This indicator is measured using the latest available household survey (DHS, MICS or comparable survey) data from each Gavi-supported country since year 2000: 1) the difference in coverage of third dose of pentavalent vaccine between children whose mothers/female caretakers have received no education and children whose mothers/female caretakers have completed secondary education or higher is calculated for each country with at least one DHS, MICS or comparable survey; 2) the values across countries are aggregated to a sum total; 3) an unweighted average of values produced in step 2 is calculated by dividing by the number of Gavi countries with at least one DHS, MICS or comparable survey. Country data will be updated in one of two ways: 1) country with existing survey data on equity by female caretaker's education publishes new data; 2) country without prior survey data on equity by female caretaker's education publishes new survey which includes data on equity by female caretaker education.
Supplemental data and/or analyses	NA
Data source	DHS and MICS reports, or reports from other surveys that use comparable methods for ascertaining maternal/female caretaker education and vaccination status of the child, based on criteria defined in WHO/UNICEF household survey guidance.

Strengths and limitations

This indicator addresses important barriers to immunisation that affect boys and girls alike. If countries are successful in addressing barriers related to maternal education and empowerment, and improving coverage among children of mothers/female caretakers who have not received education (as required in Gavi's Gender Policy and application guidelines) this indicator should detect signals of progress over time. Publicly available data is used, imposing no additional reporting burden on countries.

Key limitations of this indicator include: 1) annual reporting will include new data points for a very limited number of countries since new DHS or MICS surveys are conducted every 3-5 years; changes in annual value may not be attributable to Gavi investments or programming.

Household surveys have their own limitations in quality and certainty, due to sampling and non-sampling error. Some DHS and MICS surveys do not demonstrate consistent classifications for secondary education attainment; in these cases, this indicator uses the classification most closely reflecting completion of at least secondary education.

By itself, this indicator cannot distinguish between education-related barriers that affect both mothers and fathers and those that are specific to women's empowerment; however, it can provide a signal as to whether the gap in immunisation coverage between children of uneducated mothers/female caretakers and those that have received secondary education or higher is changing over time.

Further information and related links

Gavi Gender Policy:

http://www.gavi.org/Library/GAVI-documents/Policies/GAVI-Alliance-Gender-Policy/

For DHS and MICS, respectively:

http://www.measuredhs.com, http://www.childinfo.org/mics.html

Strategic Goal 2: Increase effectiveness and efficiency of immunisation delivery as an integrated part of health systems

Effective vaccine management

Indicator ID	S2.1
Abbreviated name	Effective vaccine management
Definition	Average of country composite score on last completed Effective Vaccine Management (EVM) assessment
Numerator	Sum of most recent EVM composite score for each Gavi68 country
Denominator	Number of Gavi68 countries with at least one EVM assessment
Level of disaggregation	By fragile state status and transition status
Reporting schedule	Updated once annually
Rationale for use	This indicator assesses progress over time in effective vaccine management, which reflects the objectives of the Gavi supply chain strategy to increase availability, quality and efficiency of vaccine supply chain systems.
Method of measurement	The indicator will measure the average of the composite scores across Gavi68 countries that have undergone an EVM assessment since 2011: 1) the most recent composite score from EVM assessments for each country is obtained; 2) the values across countries are summed; 3) an unweighted average of values produced in step 2 is calculated by dividing by the number of Gavi countries with at least one EVM assessment.
Supplemental data and/or analyses	Secondary analysis will enable assessment of the distribution of countries relative to the benchmark for EVM composite score of 80%.
Data source	WHO/UNICEF through EVM Global Analysis based on EVM Assessment database.
Strengths and limitations	The strength of this indicator is that it is the best available proxy to measure the objectives of the Gavi supply chain strategy (i.e., improved supply chain availability, quality and efficiency) that has a relatively robust data source covering a wide range of countries. Calculating the aggregated average of EVM composite scores will enable improved trend monitoring and assessment of the collective strength of supply chains across Gavi68 countries. The primary limitations of this indicator are 1) the lag time between EVM assessments, and 2) that the composite score is a high-level proxy measure aggregating several streams of information—provides no detail on levels of achievement across individual components of EVM.
Further information and related links	For further information on EVMs: http://www.who.int/immunization/programmes_systems/supply_chain/evm/en/

Data quality and consistency

Indicator ID	S2.2
Abbreviated name	Data quality
Definition	Percentage of Gavi-supported countries that have a household survey in the last five years and less than ten percentage point difference between national administrative coverage and the corresponding point estimate from the most recent nationally representative household survey within the last five years
Numerator	Number of Gavi-supported countries having had a household survey in the last five years and with a less than ten percentage point difference between national administrative coverage and the corresponding point estimate from the most recent nationally representative household survey
Denominator	Number of Gavi-supported countries having had a household survey in the last five years
Level of disaggregation	By fragile state status and transition status
Reporting schedule	Updated once annually, with updates pre-PPC if new data available
Rationale for use	This is a direct measure of two issues that have an important bearing on data quality: the availability of survey data at minimum frequency levels and the consistency between administrative coverage and the point estimate from national surveys. This provides information that helps inform an assessment of the level of confidence in the underlying data sources. Inconsistency between the two provides a non-specific signal that there are issues with underlying data sources—this requires further exploration to determine what is driving the observed differences. What is measured directly is data consistency, with the broader goal of using this as one source to inform an understanding of data quality challenges more holistically, as well as opportunities to strengthen country data systems.
Method of measurement	Countries are included in the numerator if they meet each of two criteria: having a survey in the last five years and having less than a ten percentage point difference between national administrative coverage and the point estimate from a national household survey for the same cohort. Gavi-supported countries that have not had a survey in the five years preceding the year of calculation are excluded from the numerator and denominator. Countries that report administrative coverage over 100% are not deemed to meet the criteria for inclusion in the numerator, as this is suggestive of a data quality issue. Survey availability within the last five years by country is assessed through regular tracking of the DHS and MICS websites, as well as through regular exchange of information with countries and partners, including as part of Joint Appraisals. The difference between administrative coverage and the point estimate from the survey is tracked by comparing administrative coverage for third dose of pentavalent vaccine as reported through the Joint Reporting Form for the reference year for the survey in question to the corresponding point estimate for the same cohort from the most recent survey. Third dose DTP-containing vaccine is used in place of penta3 coverage for countries where pentavalent vaccine was not yet fully scaled up at the time of the survey.
Supplemental data and/or analyses	The following measures are tracked and reported as complementary information to this indicator: a) the percentage of countries with a survey in the last five years, and

	b) the median and mean difference between administrative coverage and survey point estimates among countries with surveys in the last five years.
Data source	WHO/UNICEF Joint Reporting Form for administrative coverage, and DHS and MICS reports for survey data. Reports from other surveys that use comparable methods for calculating wealth quintiles and ascertaining vaccination status of the child may be included, based on criteria defined in WHO/UNICEF household survey guidance. Surveys must have been conducted within the last five years.
Strengths and limitations	The strength of this indicator is that it directly and objectively measures the level of consistency between data sources that are critical for understanding levels of immunisation coverage. Reported administrative coverage and estimates of coverage from household surveys represent two very different ways of tracking immunisation coverage; if the difference between the two sources is within the ten percentage point threshold defined here, this increases confidence in the underlying data sources considered. An additional strength is that this indicator reinforces the data quality requirement in Gavi's application guidelines, which require a minimum of one household survey in five years. Publicly available data is used, imposing no additional reporting burden on countries. The primary limitation of this indicator is that inconsistent values between administrative coverage and household surveys represent a non-specific signal; further explorations are needed to determine what is driving the observed difference. Household surveys are not a gold standard; they are subject to sampling and non-sampling error, and non-sampling error is likely to be larger where the coverage of home based records is low and the number of vaccines in national immunisation schedule is high, as is the case in many Gavi-supported countries. Administrative coverage data are also subject to error in recording of the number of children vaccinated, reporting and aggregation errors and error in the target population. One cannot interpret a difference as indicating conclusively that administrative data are inaccurate and the survey point estimate is accurate, or vice versa. The use of confidence intervals to establish the threshold of difference between administrative coverage and survey point estimates was weighed, but this was rejected because confidence intervals only capture sampling error and do not capture non-sampling error present in household surveys. Rolling updates to the Gavi survey database are made each quarter based on new survey reports published in that quarter, but most countries will only have a new data point available every 2-5 years. Therefore, some of the information captured in this indicator reflects the situation as of several years earlier. For such countries, this measure would not detect changes in data systems that have occurred since the reference period considered by this indicator.
Further information and related links	For further information on the Joint Reporting Process: http://www.who.int/immunization/monitoring_surveillance/routine/reporting/reporting/en/ For further information on DHS and MICS, respectively: http://www.dhsprogram.com/, http://www.unicef.org/statistics/index_24302.html For new WHO Vaccination Coverage Cluster Survey Manual: http://www.who.int/immunization/monitoring_surveillance/Vaccination_coverage_cluster_survey_with_annexes.pdf

Access, demand and service delivery

Indicator ID	S2.3
Abbreviated name	Access, demand and service delivery
Definition	Coverage of first dose of pentavalent vaccine and percentage point drop-out between first and third dose coverage in Gavi-supported countries
Numerator	NA
Denominator	NA
Level of disaggregation	By fragile state status, transition status and coverage of first dose of pentavalent vaccine (<80%, 80-89%, ≥90%)
Reporting schedule	Updated once annually
Rationale for use	Taken together, coverage of first dose of pentavalent vaccine and drop-out between first and third dose coverage provide information on levels of access, demand and service delivery. In countries with minimal barriers to access, strong demand and strong delivery systems, first dose coverage should be high and drop-out from first to third dose should be low. Low levels of first dose coverage and high levels of drop-out between first and third dose coverage provide a non-specific signal of problems with access, demand and service delivery, with further explorations needed to understand the nature and extent of problems across these three dimensions. Dropout rates show the ability of the system to reach children with the third dose in a series. In strong systems, children have a sufficient number of contacts with the system at appropriate times to ensure high coverage with three doses of DTP-containing vaccine. Weaker systems may have the ability to reach a child with the first dose in the series, but not the third dose.
Method of measurement	The overall estimate for Gavi-supported countries is calculated as the target population-weighted average of first dose pentavalent coverage and drop-out from first to third dose of pentavalent vaccine. The formula for calculating drop-out is (first dose pentavalent coverage) – (third dose pentavalent coverage). DTP coverage is used as a proxy for pentavalent coverage for this calculation. WHO/UNICEF Estimates of National Immunisation Coverage are the source for country-specific first dose coverage estimates and drop-out from first to third dose coverage. WHO/UNICEF estimates are based on data officially reported to WHO and UNICEF by countries, as well as data reported in household surveys and the published and grey literature.
Supplemental data and/or analyses	NA
Data source	WHO/UNICEF estimates of national immunisation coverage and estimates of target population size (surviving infants) from the United Nations Population Division.
Strengths and limitations	The strength of this indicator is that it provides a concrete basis for understanding shifts in access, demand and service delivery over time. First dose coverage provides information on access, while drop-out from first to third dose provides information on demand and service delivery. Because the interpretation of first dose coverage varies by level of access, it is important to stratify values by level of first dose coverage. Publicly available data is used, imposing no additional reporting burden on countries.

The primary limitation of this indicator is that the signal it provides is a non-specific one. Further explorations are needed to understand the drivers of low first dose coverage or high drop-out from first to third dose. Additional limitations relate to the underlying uncertainty in available estimates of first dose coverage and drop-out. The quality of the WHO/UNICEF estimates is determined by the quality and availability of empirical data, which are lacking for many countries.

Further information and related links

For further information on methods used in producing WHO/UNICEF estimates:

http://www.who.int/bulletin/volumes/87/7/08-053819/en/index.html

For current country coverage estimates:

http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragemcv.html

Integration of immunisation delivery into child health services

Indicator ID	S2.4
Abbreviated name	Integration
Definition	Percentage of Gavi-supported countries meeting benchmark for integrated delivery of antenatal care, protection at birth against neonatal tetanus, pentavalent vaccine and measles vaccine
Numerator	Number of Gavi-supported countries where 1) coverage levels for DTP3, MCV1, PAB, and ANC1 services are within a range of 10 percentage points, and 2) coverage levels for all four services are above 70 percent
Denominator	68 Gavi-supported countries
Level of disaggregation	By fragile state status and transition status
Reporting schedule	Updated once annually
Rationale for use	The SAGE Decade of Vaccines Working Group has identified co-coverage of DTP-containing vaccine, measles, at least one antenatal care visit (ANC1) and protection at birth against neonatal tetanus as a good proxy for integrated service delivery. A weak correlation between coverage levels of the four indicates that service delivery is unlikely to be integrated, with many missed opportunities for improving service coverage.
Method of measurement	The four services tracked by this indicator are those identified by the SAGE Decade of Vaccines Working Group as informative of service integration: DTP third dose (DTP3), measles first dose (MCV1), protection at birth against neonatal tetanus (PAB), and at least one antenatal care visit (ANC1). This indicator is measured as the percentage of Gavi-supported countries meeting each of the following two criteria: 1) coverage levels for all four services are within a range of 10 percentage points, and 2) coverage levels for all four are above 70 percent. Threshold values for both criteria were established through an analysis of the distribution of country values. The rationale for the former criterion is that it directly measures the extent to which all four interventions are delivered at coverage levels that fall within reasonably close range. The rationale for the latter criterion is that it ensures that all four intervention coverage levels are above a minimum benchmark level—this helps avoid classifying countries that have low coverage levels for all interventions that happen to fall within a relatively narrow range as having a high level of integration, as opposed to a weak system with low service coverage levels across the board. The indicator is evaluated using the latest values available for each service (i.e., they are not time-matched against a single service measure). If a data point is missing entirely (typically PAB – refer to the Strengths and Limitations section), the indicator is evaluated using the latest values available for the remaining services. There is no survey age limit set for ANC1 data. This methodology may be revisited should PAB and ANC1 data become more widely and frequently available in Gavi-supported countries.
Supplemental data and/or analyses	NA
Data source	WHO/UNICEF Estimates of National Immunisation Coverage used for DTP3, MCV1 and protection at birth, and UNICEF global databases used for ANC1, based on DHS, MICS and other nationally representative household surveys.

Strengths and limitations

The strength of this indicator is that it directly measures whether complementary services delivered through the routine system are achieving similar levels of coverage—if they are, this indicates that linkages and coordination in delivery of services is likely to be strong. If they are not achieving similar levels of coverage, this suggests a lack of effective linkages and coordination and missed opportunities for strengthening service delivery.

An additional strength is that, in contrast to several other indicators of integration explored, this indicator can be tracked regularly using existing data and thus imposes no additional measurement burden on countries.

The main limitation of this indicator is that it is lagged, given that ANC1 coverage estimates are not available annually. In addition, PAB is not consistently available in all Gavi-supported countries, with some countries dropping reporting on PAB following the achievement of high tetanus toxoid coverage.

A baseline analysis indicated that despite the age of ANC1 survey data in some countries, even old ANC data was useful in informing the level of achievement of service integration; evaluating against the other WUENIC-sourced values may overestimate the level of integration if ANC1 were not included. As a result, no survey age limit was imposed, and the indicator evaluates against the latest data available for each service.

An additional limitation is that it is conceivable that countries could achieve high coverage of all four services through vertical approaches that are not linked and coordinated—however, this is unlikely to be the case, given that the services included in the indicator are delivered through the primary health care system.

Further information and related links

For current WHO/UNICEF National Immunisation Coverage Estimates:

http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragedtp3.html

UNICEF global databases for ANC1:

http://data.unicef.org/maternal-health/antenatal-care.html

Civil society engagement

Indicator ID	S2.5
Abbreviated name	Civil society engagement
Definition	Percentage of Gavi-supported countries meeting benchmarks for civil society engagement in national immunisation programmes to improve coverage and equity
Numerator	Number of Gavi-supported countries having had a Programme Capacity Assessment in the last five years, with validated results meeting each of three engagement criteria
Denominator	Gavi68 countries
Level of disaggregation	By fragile state status and transition status, and by each of the three criteria comprising the indicator
Reporting schedule	Updated once annually, with updates to PPC and Board if new data available
Rationale for use	This indicator is a measure of the engagement of civil society organisations for improved coverage and equity, in line with Objective C under the Alliance's second strategic goal: 'strengthen engagement of civil society, private sector and other partners in immunisation'.
Method of measurement	This indicator is measured as the percentage of countries meeting each of the following three criteria for civil society engagement for improved coverage and equity: 1) civil society organisations (CSOs) appear in national plans with clearly stated activities and plans that support improved coverage and equity; 2) CSOs appear with clear budgetary allocations for defined activities and plans (or justification given in national plans why not indicated); and 3) evidence is documented that CSO activities planned for improving coverage and equity have been completed and/or are being implemented according to stated plans. Gavi Programme Capacity Assessments (PCAs) will be used as the primary data source for this indicator. As needed, information collected from PCAs will be further validated against other sources including the annual survey on Leadership, Management and Coordination, conducted by Senior Country Managers and Joint Appraisal reports. PCAs are conducted once every three years in a subset of Gavi-supported countries. All 68 Gavi-supported countries are included in the denominator even though the PCAs will be conducted in a subset (approx. 53 of 68) of these countries. Validated responses that indicate clearly defined CSO engagement plans such as activities or implementation strategies, that indicate budgeting against those plans, and that demonstrate progress toward activity completion in accordance with stated plans, will be included in the numerator.
Supplemental data and/or analyses	The list of countries included in each update will be reported, as it will take up to three years to capture data for all Gavi countries that undergo a PCA.
Data source	Gavi Programme Capacity Assessments
Strengths and limitations	The strength of this indicator is that it measures in a direct way the engagement of civil society in support of improved coverage and equity, in line with Gavi's strategy. In contrast to other civil society engagement indicators explored, this indicator has the advantage of including direct verification of whether CSO activities planned for improving coverage and equity have been completed, and/or are being implemented according to plan.

The primary limitation is that this indicator does not provide information about outcomes associated with civil society engagement in immunisation. Additional assessment and engagement would be needed to understand to what extent and in what ways civil society actors are contributing to different outcomes of interest. An additional limitation is that this indicator cannot be tracked using existing data sources—this will require additional effort, and possibly resources, to measure at country level.

The documentation of CSO activities may not be consistent from one report to another. This was verified during a desk review of comprehensive multi-year plans (cMYPs), which were found to provide insufficient and inconsistent data on CSO plans and activities to meaningfully evaluate CSO engagement. In addition, the plans and activities were out of sync temporally and programmatically with activities being reported through other channels including Joint Appraisals. Other data sources, such as the Gavi CSO Platform reporting indicators, did not capture CSO plans and activities across all Gavi-supported countries.

As a result, the PCA tool was selected as a primary data source to enable systematic capture of CSO plans in Gavi-supported countries, with Joint Appraisal and other reports serving to enhance the data base established through the PCAs.

The indicator is time-lagged; PCAs are conducted once every three years in a different subset of Gavi-supported countries each year, meaning that up to three years will be needed to develop an understanding of CSO engagement across all Gavi-supported countries.

Further information and related links

Gavi web page on civil society support:

http://www.gavi.org/support/cso/

Information on Joint Appraisals and Programme Capacity Assessments:

http://www.gavi.org/library/gavi-documents/guidelines-and-forms/frequently-asked-questions-about-the-joint-appraisal/

Strategic Goal 3:
Improve sustainability of national immunisation programmes

Fulfilment of co-financing commitments

Indicator ID	S3.1
Abbreviated name	Co-financing fulfilment
Definition	Percentage of countries with a co-financing obligation to Gavi that meet their co-financing commitments
Numerator	Number of countries with co-financing obligations to Gavi that complete co-financing payments by 31 December of the year in question, or that clear default by 31 December of the following year
Denominator	Number of countries with a co-financing obligation to Gavi
Level of disaggregation	By fragile state status, co-financing category and timeliness of payment (i.e., proportion paying by December 31 of the year in question and proportion clearing default within the following twelve month period)
Reporting schedule	Updated once annually, with updates to PPC and Board if new data available
Rationale for use	The fulfilment of co-financing commitments is a measure of country commitment to financing vaccines. Co-financing serves as a mechanism to support countries on a path toward greater sustainability.
Method of measurement	The numerator is the number of countries that either make their co-financing payments by the end of the year in question, or that clear default within the following twelve months (per the Gavi policy). Per the co-financing policy, a country is considered to be in default if it does not make its co-financing payment by December 31 of each year. The denominator is all countries with a co-financing commitment to Gavi, per the Board-approved co-financing policy. The indicator is expressed as a percentage and updated once annually with additional updates performed ahead of PPC and Board meetings if new data (e.g., default cleared by a country) becomes available, while recognising that results for a given year cannot be considered final until after December 31 of that year.
Supplemental data and/or analyses	The number and proportion of countries paying on time and that of countries clearing default within the following 12 month period will be reported as complementary information, along with the amounts paid.
Data source	UNICEF Supply Division, PAHO Revolving Fund and Gavi Secretariat records (for self-procuring countries). Each agency records receipt of country vaccine payments, against the deadline for payment submission.
Strengths and limitations	The strength of this indicator is that it directly measures country fulfilment of co-financing commitments. A similar indicator has been actively measured and monitored by the Alliance since the beginning of the co-financing policy and tracked as part of the strategy for 2011-2015. Including in the numerator any countries that clear default within 12 months is important for enabling the indicator to accommodate countries with variable fiscal cycles. The primary limitation of this indicator is that it is not a comprehensive measure of sustainable national financing of all vaccines. Sustainability of national immunisation programmes requires more than investment in Gavi-supported vaccines.
Further information and related links	Detailed explanation of co-financing policy and related requirements on Gavi website: http://www.gavi.org/about/governance/programme-policies/co-financing/

Country investments in routine immunisation

Indicator ID	S3.2
Abbreviated name	Country investment in vaccines
Definition	Percentage of Gavi-supported countries increasing their investment in routine immunisation per child relative to the baseline year of 2015 (with average amount and percentage increase relative to baseline)
Numerator	Number of countries increasing government expenditures on routine immunisation per child, relative to 2015 baseline expenditures
Denominator	Gavi-supported countries (Gavi72), with available data
Level of disaggregation	By fragile state status and co-financing category
Reporting schedule	Updated once annually
Rationale for use	This indicator measures the level of government financing for immunisation and thus the priority that governments place on routine immunisation as a core public function.
Method of measurement	The numerator is the number of countries that increase their government expenditures on routine immunisation per child relative to the baseline year of 2015, as reported by the WHO/UNICEF Joint Reporting Form. The numerator is divided by the number Gavi72 countries—Gavi73 countries, excluding Ukraine—with available data. To calculate the average amount invested each year (to be reported alongside the main indicator of percentage of countries), the values from the Joint Reporting Form will be converted into constant 2015 US$ using the World GDP deflator information published by the World Bank. Country-specific estimates will be weighted by the size of each country's population of surviving infants to produce a final population-weighted estimate for Gavi-supported countries.
Supplemental data and/or analyses	The average amount of investment, and the amount and percentage of increase relative to 2015 baseline will be reported as complementary information.
Data source	WHO/UNICEF Joint Reporting Form; United Nations, Department of Economic and Social Affairs, Population Division; World Bank, World Development Indicators; United Nations Population Division.
Strengths and limitations	The strength of this indicator is that it directly measures whether countries are increasing their level of national financing for immunisation over time, and if so, by how much. An additional strength is that this indicator is also used in the Global Vaccine Action Plan to measure government commitment to immunisation. The primary limitation of this indicator relates to data quality. This indicator will require additional work with countries to improve measurement and reporting through the Joint Reporting Form. An additional limitation is that by itself, the indicator only provides information on the directionality of country investment in immunisation; the indicator does not assess whether the level of investment is appropriate to a given country context.

The Vaccine Alliance has invested through WHO to strengthen the quality and reporting of data on immunisation expenditures through the Joint Reporting Form and the System of Health Accounts, which is being rolled-out in countries in a phased manner. Health Accounts data are used in a supplementary manner to strengthen tracking of vaccine expenditures within the broader context of health expenditures as part of a longer term effort; this indicator is calculated exclusively on JRF data for reporting progress against the 2016-2020 strategy.

Further information and related links

WHO and UNICEF Joint Reporting Form and associated process:
http://www.who.int/immunization/monitoring_surveillance/routine/reporting/en/
WHO System of Health Accounts:
http://www.who.int/health-accounts/methodology/en/

Countries on track to successful transition

Indicator ID	S3.3
Abbreviated name	Countries on track to transition
Definition	Percentage of Gavi-supported countries in transition on track for successful transition per three defined criteria
Numerator	Number of Gavi-supported countries above the Gavi gross national income per capita eligibility threshold that meet each of three criteria assessing preparedness for successful transition
Denominator	All Gavi-supported countries above the Gavi gross national income per capita eligibility threshold that are not yet fully self-financing (i.e., phase 2 countries)
Level of disaggregation	Breakdown of values by each of the three criteria included in the definition of successful transition
Reporting schedule	Updated once annually, with updates to PPC and Board if new data available
Rationale for use	Tracking whether countries that have crossed the eligibility threshold for Gavi support, as defined by Gross National Income per capita, are on track for successful transition is critical for understanding to what extent Vaccine Alliance efforts taken during the 2016-2020 period are fulfilling their intended purpose.
Method of measurement	The numerator is the number of countries above the eligibility threshold that are not yet fully self-financing that meet three specific and objectively verifiable criteria for what constitutes 'successful transition': 1) Meaningful progress in implementation of transition plan, based on at least 75% of milestones and activities being completed on time; 2) Pentavalent third dose coverage is increasing over the most recent three-year period (or sustained at above 90% over three-year period if the country has pentavalent third dose coverage at or above 90%); and 3) Co-financing requirements met, based on countries not being in default for the previous year. The denominator includes all countries above the eligibility threshold that are not yet fully self-financing (i.e., countries in 'phase 2' or 'accelerated transition'). Once countries complete their transition away from Gavi support, they are removed from both denominator and numerator and reported separately. The denominator thus changes over time, based on where countries are in their transition. The indicator is expressed as a percentage and updated once per year. Additional updates may be made for PPC and Board updates if new data becomes available (e.g., if expenditure data for a given year was delayed).
Supplemental data and/or analyses	NA
Data source	Measurable progress in implementation of the transition plan will be tracked through routine reporting by countries / partners on implementation progress against their agreed action plans. Immunisation coverage will be measured through the WHO/UNICEF Estimates of National Immunisation Coverage. Fulfilment of co-financing commitments will be measured as described in the description above for indicator S3.1, fulfilment of co-financing commitments.

Strengths and limitations	The strength of this indicator is that it provides timely and actionable information on whether countries in the transition process are on track for successful transition. This can help target and prioritise the support given to different countries which are in the transition process. An additional strength is that the indicator addresses three critical dimensions of successful transition: progress in implementation of transition plan, coverage and co-financing. The primary limitation is that the first of the three criteria—progress in implementation of the transition plan—is process-oriented rather than outcome-oriented. Theoretically, a country could score well on implementation progress, yet still be far from achieving a sustainable transition due to limitations and constraints not addressed through the plan. A second limitation is that the denominator is not stable over time, with countries coming into the denominator when they cross the eligibility threshold and countries leaving the denominator when they become fully self-financing. This may affect the interpretation of results over time.
Further information and related links	Gavi's Eligibility and Transition Policy: http://www.gavi.org/Library/GAVI-documents/Policies/Gavi-Eligibility-and-Transition-Policy/

Institutional capacity

Indicator ID	S3.4
Abbreviated name	Institutional capacity
Definition	Average of country composite score for national decision making, programme management and monitoring
Numerator	Sum of institutional capacity composite scores for each Gavi68 country
Denominator	Gavi68 countries
Level of disaggregation	By fragile state status and transition status; breakdown of values by subcomponents (i.e. EPI management capacity, functionality of Inter-agency coordinating mechanisms and functionality of National Immunisation Technical Advisory Group).
Reporting schedule	Updated once annually
Rationale for use	The indicator tracks three areas defined as the key fields of engagement under the Leadership, Management and Coordination Strategic Focus Area: EPI management capacity, functionality of Inter-agency coordinating mechanisms and functionality of National Immunisation Technical Advisory Group. Strengthened institutional capacity for national decision making, programme management and monitoring is on the critical pathway to programmatic and financial sustainability, and is a strategic enabler of Gavi's overall 2016-2020 strategy.
Method of measurement	Data will be collected through an annual assessment of the following areas of a country's institutional capacity: 1) EPI management capacity, 2) ICC functionality and 3) NITAG functionality. The assessment will be based on an annual survey completed by Gavi Senior Country Managers, in consultation with Alliance partners. The data collection tool—Gavi institutional capacity tool—was developed by a working group under the Leadership, Management and Coordination Strategic Focus Area
Supplemental data and/or analyses	NA
Data source	Gavi institutional capacity assessment tool
Strengths and limitations	The strength of this indicator is that it begins to address issues of institutional capacity in three critical areas through objective measurement. This will help provide a baseline picture of country capacity in these areas for the 2016-2020 strategy and a basis for tracking progress in strengthening capacity over time. The Gavi institutional capacity tool enables data to be collected from all Gavi68 countries on an annual basis. This is an improvement on two critical limitations identified in the original methodology (Programme Capacity Assessment): 1) only a subset of countries are eligible to undergo the PCA; 2) each country will undergo a PCA once every three years. The primary limitation is that assessment is coordinated by the SCMs and this presents a potential risk that results may be subject to bias. To mitigate risk, the findings from the annual survey will be validated in consultation with members of the Alliance Working Group on institutional capacity, as well PCA findings.
Further information and related links	Information about the Programme Capacity Assessment: http://www.gavi.org/library/gavi-documents/guidelines-and-forms/frequently-asked-questions-about-the-joint-appraisal/

Strategic Goal 4:
Shape markets for vaccines and other immunisation products

Sufficient and uninterrupted supply

Indicator ID	S4.1
Abbreviated name	Supply security
Definition	Number of Gavi vaccine markets meeting the criteria for sufficient and uninterrupted supply of appropriate vaccines
Numerator	NA
Denominator	NA
Level of disaggregation	By vaccine; breakdown of values by each of the two criteria included in the definition of sufficient and uninterrupted supply
Reporting schedule	Updated once annually
Rationale for use	This indicator provides information on whether vaccine supply is sufficient to meet demand from Gavi-supported countries, and whether suppliers are able to meet supply commitments without interrupting the supply of vaccines. Ensuring sufficient and uninterrupted supply of vaccines represents a key aspect of healthy market dynamics; this indicator captures these dimensions.
Method of measurement	The indicator tracks the number of Gavi vaccine markets that meet each of two criteria: 1) sufficient supply to meet Gavi-supported country demand; and 2) uninterrupted supply to Gavi-supported countries. Sufficiency of supply is based on supply being sufficient to meet Gavi demand, with supply and demand measured through the following criteria: - Supply is measured as the number of doses of appropriate vaccines offered to Gavi through UNICEF tenders. - Demand is measured as the number of doses requested by Gavi in UNICEF tenders, based on Gavi-supported country demand. The criterion related to uninterrupted supply to Gavi-supported countries is measured as follows: Suppliers deliver doses to meet supply commitments, as defined in UNICEF annual shipment plans (which are supplier-, presentation- and country-specific). Supply will be counted as interrupted if the cause of the interruption is a result of supplier failure, and if UNICEF has not been able to reallocate supply plans to ensure the total planned number of doses of the required presentation is met. If UNICEF is able to reallocate supply plans to ensure that the total planned number of doses of the required presentation is met, this will not be counted as an interruption of supply. For each vaccine in the Gavi portfolio, sufficient supply and uninterrupted supply will receive a yes/no rating. If the rating for each of the two criteria is yes, then this vaccine will be included in the numerator. If one or both of the ratings are no, then this vaccine will not be included in the numerator. This indicator is expressed as a count (with the total number of vaccine markets, eleven at present, included in parentheses) and updated once per year.
Supplemental data and/or analyses	NA
Data source	UNICEF Supply Division and Gavi Secretariat

Strengths and limitations	The strength of this indicator is that it directly measures whether there is sufficient and uninterrupted supply of vaccines available to meet Gavi-supported county demand. This represents one of Gavi's key market shaping objectives. The primary weakness is that it is possible in some cases that the number of doses requested by Gavi in UNICEF tenders could be revised downward to what is possible, because it is known in advance that there are limitations in the availability of supply. Moreover, it is possible that the number of doses offered by manufacturers in UNICEF tenders could differ from the actual number of doses available to Gavi (due, for example, to changing manufacturer production and/or business plans). However, inclusion of the second criterion - measuring suppliers' ability to meet supply commitments – makes this indicator sufficiently sensitive to capture unexpected supply constraints that may affect the supply of vaccines to Gavi-supported countries. An additional weakness is that this indicator does not capture self-procurement by a very small number of Gavi-supported countries. Self-procurement by countries is outside this indicator definition but tracked separately, with a view toward understanding broader implications for healthy market dynamics across procurement mechanisms. Lastly, ensuring supply security is another key market shaping objective and a key dimension of healthy market dynamics, which is not directly measured by this indicator.
Further information and related links	Description of market shaping strategic goal on Gavi Website: http://www.gavialliance.org/results/goal-level-indicators/market-shaping-goal-indicators/

Change in vaccine price

Indicator ID	S4.2
Abbreviated name	Vaccine price
Definition	Change in the weighted average vaccine price per child to fully vaccinate with pentavalent, rotavirus and pneumococcal vaccines
Numerator	NA
Denominator	NA
Level of disaggregation	By vaccine
Reporting schedule	Updated once annually, with updates to PPC and Board if new data available
Rationale for use	Tracking vaccine price over time is central to understanding the extent to which Gavi is achieving its goal to shape healthy vaccine markets for low income countries. Pentavalent, pneumococcal and rotavirus vaccines will be the major cost drivers in Gavi's portfolio over the coming years. Use of this indicator also maintains continuity with the indicator used in the 2011-2015 strategic period, giving a continuous ten-year time series over which to monitor trends in price reduction.
Method of measurement	UNICEF Supply Division provides data on weighted average price per dose, number of doses procured and the total value of the doses procured for each vaccine on an annual basis. These data are provided at the level of a specific supplier of the vaccine, and are further delineated by presentation and/or formulation. All prices are for the vaccine only and do not include costs of freight, the syringe and safety box. To calculate the weighted average price per dose for a vaccine, the total value of the procured doses for the vaccine (summed across suppliers, presentations and formulations) is divided by the total number of procured doses. This weighted average price per dose is converted to a price per series by multiplying by the number of doses required to fully vaccinate a child for that vaccine. For pentavalent and pneumococcal there are 3 doses per series for all vaccines and suppliers. For rotavirus vaccine, the number of doses per series required to fully vaccinate a child varies by product (supplier) and is either 2 or 3 doses. In this case, the number of doses procured from each supplier is first converted to the number of complete series procured by dividing the number of doses by 2 or 3. The total number of series procured is calculated by summing across all suppliers. The weighted average price per series for rotavirus is then calculated by dividing the total value of procured doses across all suppliers by the total number of series procured across all suppliers.
Supplemental data and/or analyses	NA
Data source	UNICEF Supply Division
Strengths and limitations	The strength of this indicator is that it is a direct measure of Gavi's ability to shape vaccine markets, per its fourth strategic goal. The limitation of this indicator is that it does not capture other costs, including the cost of vaccine delivery to countries. This indicator also does not capture process steps in the pathway to reducing price or price reduction achievements for other vaccines in Gavi's portfolio. Also, it does not reflect security of supply

achievements while reducing price, which underscores the importance of assessing this indicator alongside the other indicators under the fourth strategic goal.

Further information and related links

Product menu for vaccines supplied by UNICEF for Gavi:
http://www.unicef.org/supply/index_gavi.html
Historical prices of vaccines procured by UNICEF:
http://www.unicef.org/supply/index_57476.html

Vaccine innovation

Indicator ID	S4.3
Abbreviated name	Vaccine innovation
Definition	Number of vaccines with improved characteristics procured by Gavi as compared to the baseline year
Numerator	NA
Denominator	NA
Level of disaggregation	By vaccine and product type
Reporting schedule	Updated once annually, with updates to PPC and Board if new data available
Rationale for use	Innovation is a key driver of Gavi's added value to global health and immunisation programmes. A principle of the Alliance strategy for 2016-2020 is 'foster and take to scale innovation' including immunisation-related technologies. This indicator provides information regarding the number of innovative products adopted.
Method of measurement	The indicator includes all antigens approved by the Board, as well as related delivery technologies (e.g., microneedles/patches, jet injectors, intranasal spray/aerosol devices, etc.). Other immunisation products, including safety boxes and cold chain equipment such as temperature monitoring devices, are not included due to the complexity of meaningfully characterising the value of new developments in a very broad and heterogeneous range of products. Objective criteria for assessing what constitutes 'improved characteristics' is essential. For vaccines, this is relatively straightforward, given well defined, objective criteria against which new products can be assessed. These include the following: 1) Programmatic suitability of vaccine candidates for WHO prequalification (also known as "PSPQ") 2) Vaccine Presentation and Packaging Advisory Group (VPPAG) Generic preferred product profile (gPPP) 3) In some instances, improved characteristics will refer to characteristics not explicitly included in PSPQ or gPPP. In these cases, SAGE recommendations, WHO Position Papers and other objective reference documents will be used to determine whether the new vaccine meets the definition for 'improved characteristics' (e.g., reduction in number of doses required, or addition of serotypes) Vaccine products assessed by one or more of the above sources as having improved characteristics over previous products will become a candidate for inclusion in the innovation indicator count, subject to the next assessment below. Some new products will represent an improvement in one attribute and a drawback/disadvantage in another (e.g., pentavalent 5 dose vial will have reduced wastage versus a 10 dose vial, but greater cold chain requirements). The procurement process entails an assessment of these trade-offs. If the procurement process determines that the trade-off is worthwhile and the new product is procured, it will be counted toward this indicator.
Supplemental data and/or analyses	NA
Data source	Gavi Secretariat

Strengths and limitations

The strength of this indicator is that it directly tracks the number of concrete innovations in vaccine products of immediate relevance to the Alliance and its overall strategy for 2016-2020. This indicator offers a view into how successful the Alliance is in translating pipeline products into meaningful and improved products with market demand.

The primary limitation lies in the lack of objective benchmark for what constitutes 'improved characteristics' for all products. This is not a significant problem for vaccines, for which there is a clear objective basis for determining whether one product has improved characteristics relative to another; however, the difficult in establishing objective criteria for non-vaccine immunisation product innovation has resulted in the exclusion of these products from this indicator.

An additional limitation is that this indicator counts all innovations that meet the objective criteria as equal, irrespective of relative potential impact.

Further information and related links

Programmatic suitability of vaccine candidates for WHO prequalification (PSPQ)

http://www.who.int/immunization_standards/vaccine_quality/ps_pq/en/

Vaccine Presentation and Packaging Advisory Group (VPPAG)

http://www.who.int/immunization/policy/committees/vppag/en/

WHO Performance, Quality and Safety (PQS) prequalified devices and equipment

http://www.who.int/immunization_standards/vaccine_quality/pqs_prequalified_devices/en/

Healthy market dynamics

Indicator ID	S4.4
Abbreviated name	Healthy market dynamics
Definition	Number of Gavi vaccine markets with moderate or high healthy market dynamics
Numerator	NA
Denominator	NA
Level of disaggregation	By vaccine
Reporting schedule	Updated once annually
Rationale for use	One of Gavi's market shaping objectives for 2016-2020 is to continue to build healthy vaccine markets. While there is no one-size-fits-all approach to making vaccine markets "healthy", SG4 Alliance partners' have collectively identified common market elements for measuring the health of a market, as captured in this indicator. The purpose of this indicator is to define the "health state" of each Gavi vaccine market, based on an assessment of these common market elements. The goal is to move vaccine markets towards a greater "health state", and achieve specific targets set for the 2016-2020 period. This definition of market health should help to better align SG4 partners on specific market shaping objectives and decisions within individual vaccine markets.
Method of measurement	Assessment of a particular vaccine market "health state" or level of healthy market dynamics (HMD) will follow the below criteria: 1) **No healthy market dynamics**. Characterised by inadequate supply; total market supply offered does not meet demand. 2) **Low level of healthy market dynamics.** Supply of prequalified antigen(s) meets demand for antigen(s). The total market supply offered (within realistic capacity) meets Gavi country demand (includes all PQ vaccines for given antigen(s) and all presentations after adjusting available doses for wastage per WHO standards). 3) **Moderate level of healthy market dynamics.** Supply of prequalified antigen(s) meets or exceeds demand for antigen(s). Country presentation preference accommodated and moderate supply security exists, with some level of buffer capacity available to mitigate supply risks. 4) **High level of healthy market dynamics.** Country presentation preference accommodated, high level of supply security, and market supports long-term competition and innovation (where considered important). This indicator is expressed as a count and updated once per year. Eleven vaccines are currently included in the assessment.
Supplemental data and/or analyses	NA
Data source	Manufacturer supply offered to Gavi, by antigen and presentation: UNICEF Supply Division (tender/offer/awards/procurement data) Requested Gavi country demand, by antigen and presentation: UNICEF Supply Division (tender/offer/awards/procurement data)

	Country presentation preference: Gavi Secretariat (annual progress report data) Buffer capacity: UNICEF-Supply Division (tender/offer/awards/procurement data) Individual supplier risk: SG4 partners analysis of multiple data sources Competitive price offers in tenders, and sustainable over long-term: SG4 partners analysis of multiple data sources Evidence of product innovation: SG4 partners analysis of multiple data sources
Strengths and limitations	The strength of this indicator is that it provides a holistic view of a market's health, based on a composite of metrics. The primary limitation is that the notion of a healthy market is somewhat subjective. The framework developed by SG4 stakeholders to define a market's health state is designed to be as objective as possible, but given the complexity of vaccine markets, a combination of quantitative and qualitative analyses are required to measure the status of certain market elements.
Further information and related links	Description of market shaping strategic goal on Gavi Website: http://www.gavialliance.org/results/goal-level-indicators/market-shaping-goal-indicators/

Glossary of terms

ANC1	Antenatal care, first visit
Catalytic support	Support attributable to Gavi during the five-year period immediately following a country's transition out of Gavi support
Direct support	Support attributable to active funding provided by Gavi for vaccine programmes in a given year
DHS	Demographic and Health Surveys
DTP	Diphtheria-tetanus-pertussis vaccine
GNIpc	World Bank gross national income per capita, Atlas method
JRF	WHO/UNICEF Joint Reporting Form
MCV	Measles-containing vaccine
MICS	Multiple Indicator Cluster Surveys
PAB	Protection at birth against tetanus
Penta3	Pentavalent vaccine third dose
PPC	Programme and Policy Committee
WUENIC	WHO-UNICEF Estimates of National Immunisation Coverage