BACKGROUND NOTE: Each year WHO and UNICEF jointly review reports submitted by Member States regarding national immunization coverage, finalized survey reports as well as data from the published and grey literature. Based on these data, with due consideration to potential biases and the views of local experts, WHO and UNICEF attempt to distinguish between situations where the available empirical data accurately reflect immunization system performance and those where the data are likely to be compromised and present a misleading view of immunization coverage while jointly estimating the most likely coverage levels for each country.

WHO and UNICEF estimates are country-specific; that is to say, each country’s data are reviewed individually, and data are not borrowed from other countries in the absence of data. Estimates are not based on ad hoc adjustments to reported data; in some instances empirical data are available from a single source, usually the nationally reported coverage data. In cases where no data are available for a given country/vaccine/year combination, data are considered from earlier and later years and interpolated to estimate coverage for the missing year(s). In cases where data sources are mixed and show large variation, an attempt is made to identify the most likely estimate with consideration of the possible biases in available data. For methods see: *Burton et al. 2009. WHO and UNICEF estimates of national infant immunization coverage: methods and processes. *Burton et al. 2012. A formal representation of the WHO and UNICEF estimates of national immunization coverage: a computational logic approach. *Brown et al. 2013. An introduction to the grade of confidence used to characterize uncertainty around immunization coverage: a computational logic approach.

DATA SOURCES.

ADMINISTRATIVE coverage: Reported by national authorities and based on aggregated administrative reports from health service providers on the number of vaccinations administered during a given period (numerator data) and reported target population data (denominator data). May be biased by inaccurate numerator and/or denominator data.

OFFICIAL coverage: Estimated coverage reported by national authorities that reflects their assessment of the most likely coverage based on any combination of administrative coverage, survey-based estimates or other data sources or approaches. Approaches to determine OFFICIAL coverage may differ across countries.

SURVEY coverage: Based on estimated coverage from population-based household surveys among children aged 12-23 months or 24-35 months following a review of survey methods and results. Information is based on the combination of vaccination history from documented evidence or caregiver recall. Survey results are considered for the appropriate birth cohort based on the period of data collection.

ABBREVIATIONS

BCG: percentage of births who received one dose of Bacillus Calmette Guerin vaccine.

DTP1 / DTP3: percentage of surviving infants who received the 1st / 3rd dose, respectively, of diphtheria and tetanus toxoid with pertussis containing vaccine.

Pol3: percentage of surviving infants who received the 3rd dose of polio containing vaccine. May be oral or inactivated polio vaccine.

IPV1: percentage of surviving infants who received at least one dose of inactivated polio vaccine. In countries utilizing an immunization schedule recommending either (i) a primary series of three doses of oral polio vaccine (OPV) plus at least one dose of IPV where OPV is included in routine immunization and/or campaign or (ii) a sequential schedule of IPV followed by OPV, WHO and UNICEF estimates for IPV1 reflect coverage with at least one routine dose of IPV among infants <1 year of age among countries. For countries utilizing IPV containing vaccine use only, i.e., no recommended dose of OPV, the WHO and UNICEF estimate for IPV1 corresponds to coverage for the 1st dose of IPV.

Production of IPV coverage estimates, which begins in 2015, results in no change of the estimated coverage levels for the 3rd dose of polio (Pol3). For countries recommending routine immunization with a primary series of three doses of IPV alone, WHO and UNICEF estimated Pol3 coverage is equivalent to estimated coverage with three doses of IPV. For countries with a sequential schedule, estimated Pol3 coverage is based on that for the 3rd dose of polio vaccine regardless of vaccine type.

MCV1: percentage of surviving infants who received the 1st dose of measles containing vaccine. In countries where the national schedule recommends the 1st dose of MCV at 12 months or later based on the epidemiology of disease in the country, coverage estimates reflect the percentage of children who received the 1st dose of MCV as recommended.

MCV2: percentage of children who received the 2nd dose of measles containing vaccine according to the nationally recommended schedule.

RCV1: percentage of surviving infants who received the 1st dose of rubella containing vaccine. Coverage estimates are based on WHO and UNICEF estimates of coverage for the dose of measles containing vaccine that corresponds to the first measles-rubella combination vaccine. Nationally reported coverage of RCV is not taken into consideration nor are the data represented in the accompanying graph and data table.

HepBB: percentage of births which received a dose of hepatitis B vaccine within 24 hours of delivery. Estimates of hepatitis B birth dose coverage are produced only for countries with a universal birth dose policy. Estimates are not produced for countries that recommend a birth dose to infants born to HepB virus-infected mothers only or where there is insufficient information to determine whether vaccination is within 24 hours of birth.

HepB3: percentage of surviving infants who received the 3rd dose of hepatitis B containing vaccine following the birth dose.

Hib3: percentage of surviving infants who received the 3rd dose of Haemophilus influenzae type b containing vaccine.

RotaC: percentage of surviving infants who received the final recommended dose of rotavirus vaccine, which can be either the 2nd or the 3rd dose depending on the vaccine.

PcV3: percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine. In countries where the national schedule recommends two doses during infancy and a booster dose at 12 months or later based on the epidemiology of disease in the country, coverage estimates may reflect the percentage of surviving infants who received two doses of PcV prior to the 1st birthday.

YFV: percentage of surviving infants who received one dose of yellow fever vaccine in countries where YFV is part of the national immunization schedule for children or is recommended in at risk areas; coverage estimates are annualized for the entire cohort of surviving infants.

Disclaimer: All reasonable precautions have been taken by the World Health Organization and United Nations Children’s Fund to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization or United Nations Children’s Fund be liable for damages arising from its use.

July 7, 2018; page 2 WHO and UNICEF estimates of national immunization coverage - next revision available July 15, 2019 data received as of July 4, 2018
Botswana - BCG

Description:

2017: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to sudden change in coverage from 90 percent to 73 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2016: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to an increase from 78 percent to 90 percent with decrease 73 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2015: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to decline in reported coverage from 93 percent to 78 percent with increase to 90 percent. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2014: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2013: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 102 percent greater than 100 percent. Nationally reported data vary widely and exceed 100 percent for some antigens GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2012: Estimate of 98 percent assigned by working group. Estimate based on survey results. Reported data excluded because 114 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2011: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 115 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2010: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data exclude...
data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded because 111 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2009: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded because 101 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2008: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2007: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to decline in reported coverage from 123 percent to 81 percent with increase to 100 percent. GoC= Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2006: Estimate of 99 percent assigned by working group. Estimate based on survey results. Reported data excluded because 123 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

### Botswana - DTP1

#### Description:

**2017:** Estimate based on extrapolation from data reported by national government. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to sudden change in coverage from 99 percent to 79 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

**2016:** Estimate based on extrapolation from data reported by national government. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to an increase from 87 percent to 99 percent with decrease 79 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

**2015:** Estimate based on extrapolation from data reported by national government. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to decline in reported coverage from 99 percent to 87 percent with increase to 99 percent. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

**2014:** Estimate based on extrapolation from data reported by national government. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

**2013:** Estimate based on extrapolation from data reported by national government. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 103 percent greater than 100 percent. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

**2012:** Estimate based on survey results. Reported data excluded because 125 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

**2011:** Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 123 percent greater than 100 percent. GoC=Assigned by working group.
Botswana - DTP1

Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2010: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded because 104 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2009: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded because 107 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2008: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded because 109 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2007: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded because 104 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2006: Estimate based on survey results. Reported data excluded because 131 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+] (e.g., not a judgment of the quality of data reported by national authorities).

- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-]; challenges the estimate.

- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

### Botswana - DTP3

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Description:

2017: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2016: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2015: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2014: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to an increase from 79 percent to 91 percent with decrease 80 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2013: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to decline in reported coverage from 105 percent to 79 percent with increase to 94 percent. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2012: Estimate of 95 percent assigned by working group. Estimate based on survey results. Reported data excluded because 105 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2011: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 108 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2010: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent,
and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2009: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2008: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2007: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2006: Estimate of 96 percent assigned by working group. Estimate based on survey results. Reported data excluded because 150 percent greater than 100 percent. Reported data excluded due to an increase from 130 percent to 150 percent with decrease 98 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.
**Botswana - Pol3**

**Description:**

2017: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2016: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2015: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to decline in reported coverage from 86 percent to 74 percent with increase to 85 percent. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2014: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Programme reports one month stock-out of polio vaccine. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2013: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Nationally reported data vary widely and exceed 100 percent for some antigens GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.


2011: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 103 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2010: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded because 105 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent,
and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2009: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to decline in reported coverage from 99 percent to 83 percent with increase to 105 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2008: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to an increase from 85 percent to 99 percent with decrease 83 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2007: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to decline in reported coverage from 125 percent to 85 percent with increase to 99 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2006: Estimate of 96 percent assigned by working group. Estimate based on survey results. Reported data excluded because 125 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

*** Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

** Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

* There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

### Description:

Estimates for a dose of IPV begin in 2015 following the Global Polio Eradication Initiative’s Polio Eradication and Endgame Strategic Plan: 2013-2018 which recommended at least one dose of inactivated polio vaccine (IPV) into routine immunization schedules as a strategy to mitigate the potential consequences should any re-emergence of type 2 poliovirus occur following the planned withdrawal of Sabin type 2 strains from oral polio vaccine (OPV).

2017: Estimate based on DTP3 coverage estimate. Programme reported 2.8 months stock-out of IPV. Reported data excluded due to sudden change in coverage from 49 level to 80 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate challenged by: R-

2016: Programme reported 6 and a half months stock-out of IPV. Estimate challenged by: R-

2015: Estimate of 8 percent assigned by working group. IPV introduced in November 2015. Programme reports 50 percent coverage in 17 percent of target population. Estimate is based on coverage achieved in total annual national target population. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. Estimate challenged by: R-

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WHO and UNICEF estimates of national immunization coverage - next revision available July 15, 2019

data received as of July 4, 2018
Description:

2017: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to sudden change in coverage from 90 percent to 73 percent. Report accuracy is confirmed only by survey for 2006 and 2012 birth cohorts.

2016: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to an increase from 76 percent to 90 percent with decrease 73 percent. Programme reported measles-containing vaccines of less than a month. GoC=Estimated by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2015: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded due to decline in reported coverage from 93 percent to 76 percent with increase to 90 percent. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Estimated by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2014: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. GoC=Estimated by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2013: Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Estimated by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2012: Estimate of 97 percent assigned by working group. Estimate based on survey results. Reported data excluded because 108 percent greater than 100 percent. GoC=Estimated by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2011: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 103 percent greater than 100 percent. GoC=Estimated by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2010: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data ex-
Botswana - MCV1

cluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2009: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2008: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2007: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to decline in reported coverage from 121 percent to 79 percent with increase to 95 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2006: Estimate of 94 percent assigned by working group. Estimate based on survey results. Reported data excluded because 121 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.
### Description:

Coverage estimates for the second dose of measles containing vaccine are for children by the nationally recommended age.

- **2017**: Estimate based on extrapolation from data reported by national government. Reported data excluded due to sudden change in coverage from 74 level to 96 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

- **2016**: Estimate based on coverage reported by national government. Programme reported a measles-containing vaccines of less than a month. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

- **2015**: Estimate based on interpolation between reported values. Reported data excluded. Vaccine to vaccine consistency. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

- **2014**: Estimate based on coverage reported by national government. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

- **2013**: Estimate based on coverage reported by national government. Measles 2nd dose introduced in 2011, reporting started in 2013. Recommended age of administration is 18 months. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

### Coverage Estimates

The WHO and UNICEF estimates of national immunization coverage are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

- **Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+].** While well supported, the estimate still carries a risk of being wrong.

- **Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.**

- **There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.**

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

### Table: Botswana - MCV2

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The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

For this revision, coverage estimates for the first dose of rubella containing vaccine are based on WHO and UNICEF estimates of coverage of measles containing vaccine. Nationally reported coverage of rubella containing vaccine is not taken into consideration nor are they represented in the accompanying graph and data table.

2017: Estimate based on estimated MCV1. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2016: Estimate based on estimated MCV1. Rubella containing vaccine introduced during 2016. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

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Description:

2017: Reported data calibrated to 2012 levels. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2016: Reported data calibrated to 2012 levels. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2015: Reported data calibrated to 2012 levels. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2014: Reported data calibrated to 2012 levels. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to an increase from 76 percent to 94 percent with decrease 80 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2013: Reported data calibrated to 2012 levels. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to decline in reported coverage from 105 percent to 76 percent with increase to 94 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2012: Estimate of 95 percent assigned by working group. Estimate based on survey results. Reported data excluded because 105 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2011: Estimate of 95 percent assigned by working group. Based on DTP3 coverage. Reported data excluded because 108 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2010: Estimate based on interpolation between 2006 and 2011 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2009: Estimate based on interpolation between 2006 and 2011 levels. Fluctuation in reported
data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2008: Estimate based on interpolation between 2006 and 2011 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2007: Estimate based on interpolation between 2006 and 2011 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

2006: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 93 percent based on 1 survey(s). Reported data excluded because 107 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.
The WHO and UNICEF estimates of national immunization coverage (vaccine) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

### Description:

#### 2017:
Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2012 birth cohort.

#### 2016:
Reported data calibrated to 2012 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2012 birth cohort.

#### 2015:
Estimate based on survey results. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2012 birth cohort.

#### 2014:
Estimate based on survey results. Reported data excluded due to an increase from 79 percent to 94 percent with decrease 80 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2012 birth cohort.

#### 2013:
Estimate based on survey results. Reported data excluded due to decline in reported coverage from 105 percent to 79 percent with increase to 94 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2012 birth cohort.

#### 2012:
Estimate based on survey results. Reported data excluded because 105 percent greater than 100 percent. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2012 birth cohort.

#### 2011:
Based on DTP3 coverage Reported data excluded because 108 percent greater than 100 percent. Hib vaccine introduced in 2011. The presentation is DTP-HepB-Hib. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2012 birth cohort.

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**Table: BOTSWANA - Hib3**

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**Notes:**
- **Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]**. While well supported, the estimate still carries a risk of being wrong.
- **Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.**
- **There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.**

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

---

July 7, 2018; page 19  WHO and UNICEF estimates of national immunization coverage - next revision available July 15, 2019  data received as of July 4, 2018
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

*** Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

** Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

• There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

### Description:

2017: Reported data calibrated to 2014 levels. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2016: Reported data calibrated to 2014 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Estimate of 88 percent changed from previous revision value of 95 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2015: Reported data calibrated to 2014 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. Estimate of 92 percent changed from previous revision value of 95 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2014: Estimate of 95 percent assigned by working group. Estimate is based on estimated DTP3 coverage. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2013: Reported data calibrated to 2012 and 2014 levels. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2012: Rotavirus vaccine was introduced in 2012. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

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The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.
Description:

2017: Reported data calibrated to 2014 levels. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2016: Reported data calibrated to 2014 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. Estimate of 91 percent changed from previous revision value of 95 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2015: Reported data calibrated to 2014 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. Estimate of 93 percent changed from previous revision value of 95 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2014: Estimate of 95 percent assigned by working group. Estimate is based on estimated DTP3 coverage. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2013: Reported data calibrated to 2012 and 2014 levels. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

2012: Pneumococcal conjugate vaccine was introduced in 2012. Estimate is exceptionally based on official reported coverage in the absence of recent survey data on which other estimated coverage levels are based. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

> Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

> Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

> There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.
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Further information and estimates for previous years are available at:
http://www.data.unicef.org/child-health/immunization