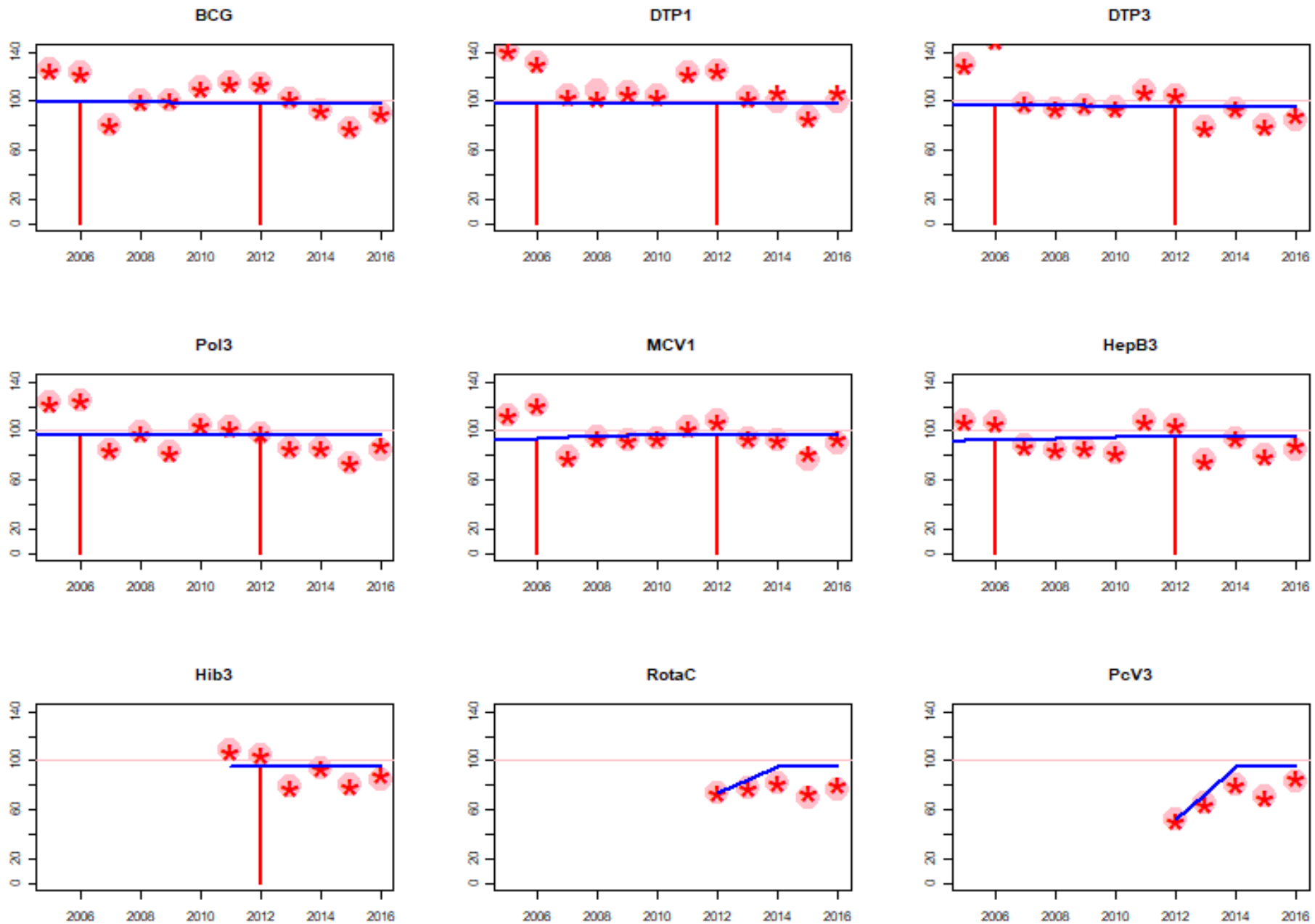


Botswana: WHO and UNICEF estimates of immunization coverage: 2016 revision



# Botswana: WHO and UNICEF estimates of immunization coverage: 2016 revision

**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 the WHO and UNICEF estimates of national immunization coverage.

## 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 adjustments. 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 either 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.

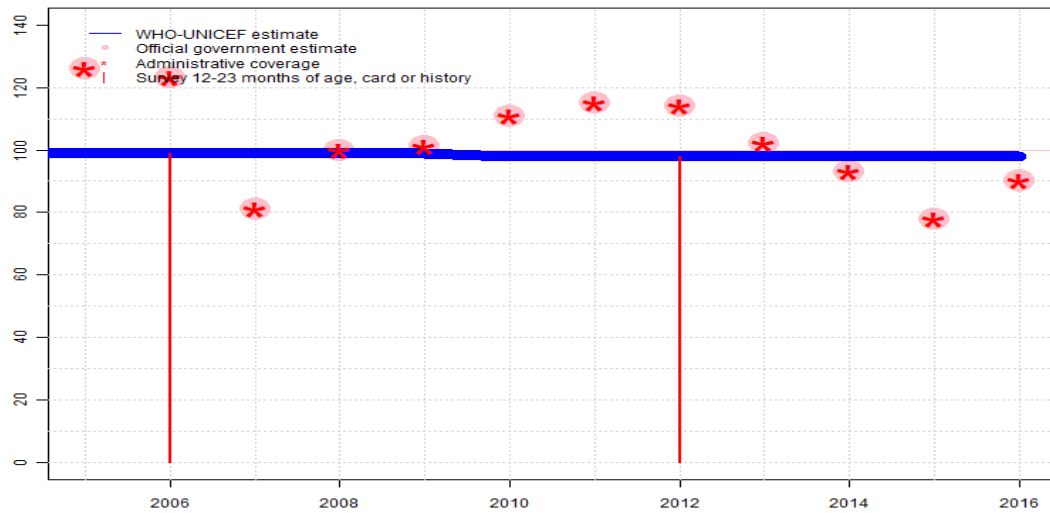
**PcV3:** percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine. In countries where the national schedule recommends two doses during infancy and a booster dose at 12 months or later based on the epidemiology of disease in the country, coverage estimates may reflect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

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# Botswana - BCG

BWA - BCG



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	99	99	99	99	99	98	98	98	98	98	98	98
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	126	123	81	100	101	111	115	114	102	93	78	90
Administrative	126	123	81	100	101	111	115	114	102	93	78	90
Survey	NA	99	NA	NA	NA	NA	NA	98	NA	NA	NA	NA

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: 2015 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:

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 unexplained sudden change in coverage from 78 level to 90 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 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

# Botswana - BCG

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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.

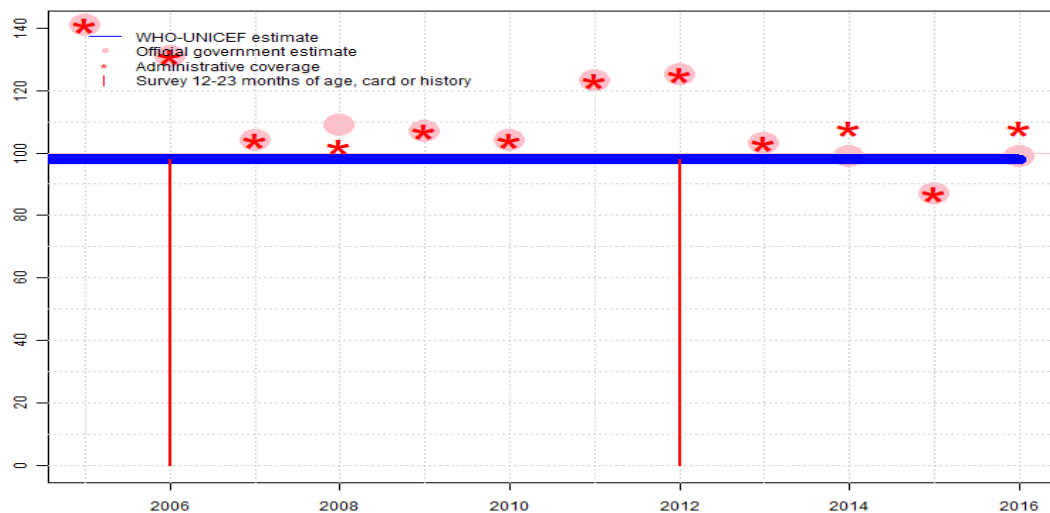
2007: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to decline in 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.

2005: Estimate based on interpolation between 1999 and 2006 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 126 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.

# Botswana - DTP1

BWA - DTP1



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	98	98	98	98	98	98	98	98	98	98	98	98
Estimate GoC	●	●	●	●	●	●	●	●	●	●	●	●
Official	141	131	104	109	107	104	123	125	103	99	87	99
Administrative	141	131	104	102	107	104	123	125	103	108	87	108
Survey	NA	98	NA	NA	NA	NA	NA	98	NA	NA	NA	NA

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: 2015 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:

- 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 unexplained sudden change in coverage from 87 level 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.
- 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. 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.

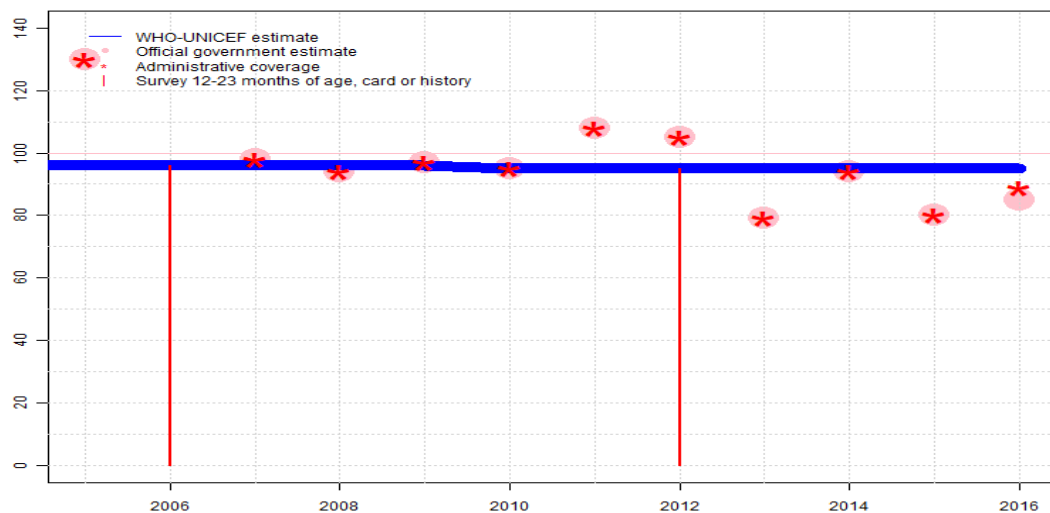
# Botswana - DTP1

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- 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.
- 2005: Estimate based on interpolation between 1999 and 2006 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 141 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.

# Botswana - DTP3

BWA - DTP3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	96	96	96	96	96	95	95	95	95	95	95	95
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	130	150	98	94	97	95	108	105	79	94	80	85
Administrative	130	150	98	94	97	95	108	105	79	94	80	89
Survey	NA	96	NA	NA	NA	NA	NA	95	NA	NA	NA	NA

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: 2015 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:

- 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 unexplained 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 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.

# Botswana - DTP3

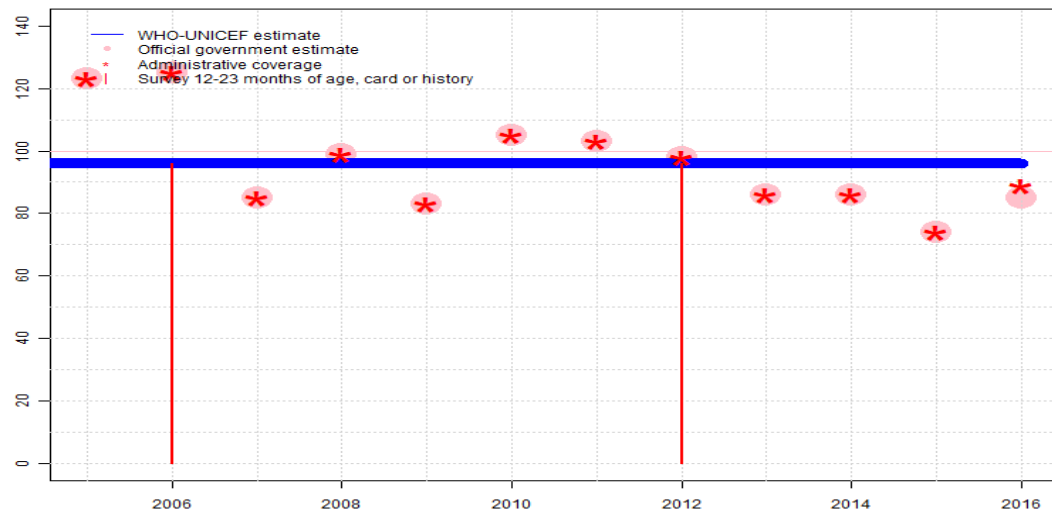
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- 2008: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for 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 unexplained 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.
- 2005: Estimate based on interpolation between 1999 and 2006 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 130 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.



# Botswana - Pol3

BWA - Pol3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	96	96	96	96	96	96	96	96	96	96	96	96
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	123	125	85	99	83	105	103	98	86	86	74	85
Administrative	123	125	85	99	83	105	103	98	86	86	74	89
Survey	NA	96	NA	NA	NA	NA	NA	96	NA	NA	NA	NA

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: 2015 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:

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 unexplained sudden change in coverage from 74 level to 85 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 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.

2012: Estimate of 96 percent assigned by working group. Estimate based on survey results. 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 unexplained 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.

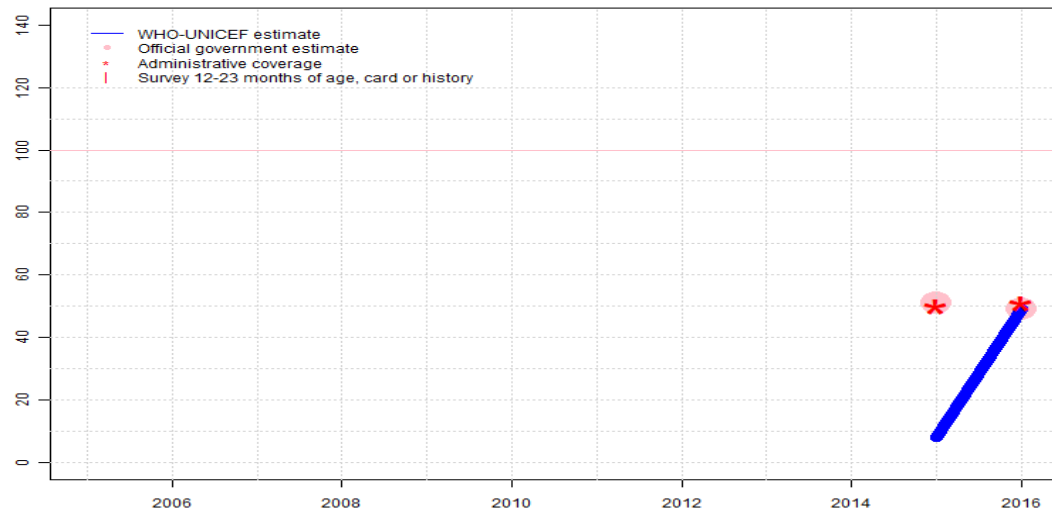
2007: Estimate based on interpolation between 2006 and 2012 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. Reported data excluded due to decline in 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.

2005: Estimate based on interpolation between 1999 and 2006 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. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

# Botswana - IPV1

BWA - IPV1



## Description:

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-

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8	49
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	•	•
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	51	49
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50	51
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

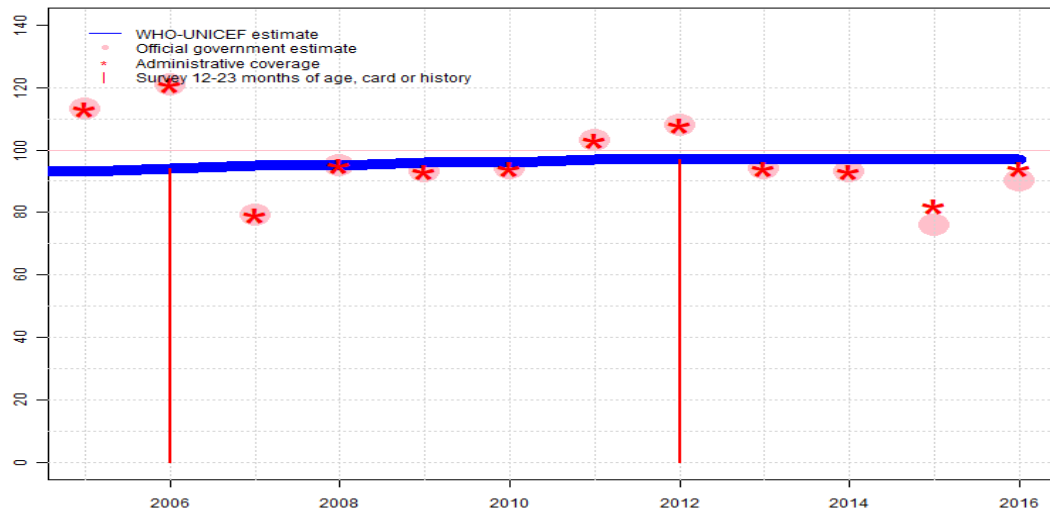
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2015 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 - MCV1

BWA - MCV1



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	93	94	95	95	96	96	97	97	97	97	97	97
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	113	121	79	95	93	94	103	108	94	93	76	90
Administrative	113	121	79	95	93	94	103	108	94	93	82	94
Survey	NA	94	NA	NA	NA	NA	NA	97	NA	NA	NA	NA

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: 2015 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:

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 unexplained sudden change in coverage from 76 level to 90 percent. Programme reported a measles-containing vaccines of less than a month. 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 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=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. 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 97 percent assigned by working group. Estimate based on survey results. 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.

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. 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,

# Botswana - MCV1

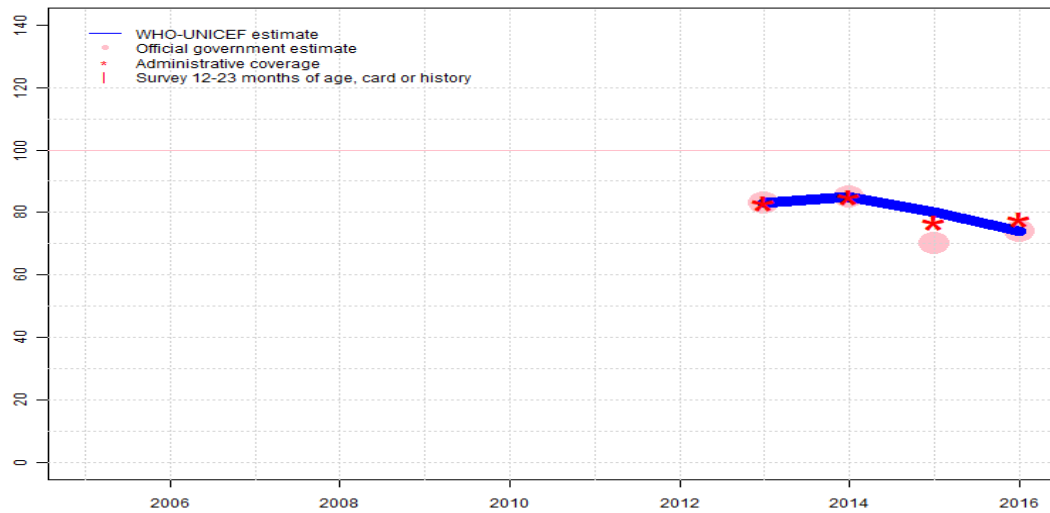
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and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

- 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.
- 2005: Estimate based on interpolation between 1999 and 2006 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded because 113 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.

# Botswana - MCV2

BWA - MCV2



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	83	85	80	74
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	•	•	•	•
Official	NA	NA	NA	NA	NA	NA	NA	NA	83	85	70	74
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	83	85	77	78
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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: 2015 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:

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

2016: 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. Programme reported a measles-containing vaccines of less than a month. GoC=Assigned by working group. Consistency with other antigens.

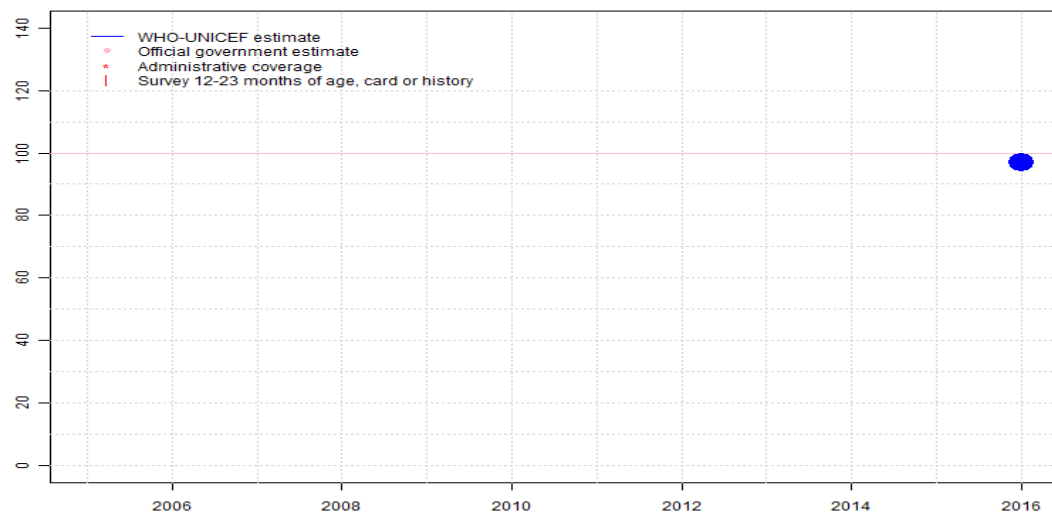
2015: Estimate based on interpolation between reported values. Reported data excluded. Vaccine to vaccine consistency. Decline in reported coverage appears to be an artifact of an increase in the target population from 2014 to 2015 combined with a slight decrease in the reported number of children vaccinated in 2015 compared to 2014 reported totals. 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 80 percent changed from previous revision value of 85 percent. GoC=Assigned by working group. Consistency with other antigens.

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. Consistency with other antigens.

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. Consistency with other antigens.

# Botswana - RCV1

BWA - RCV1



## Description:

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 the accompanying graph and data table.

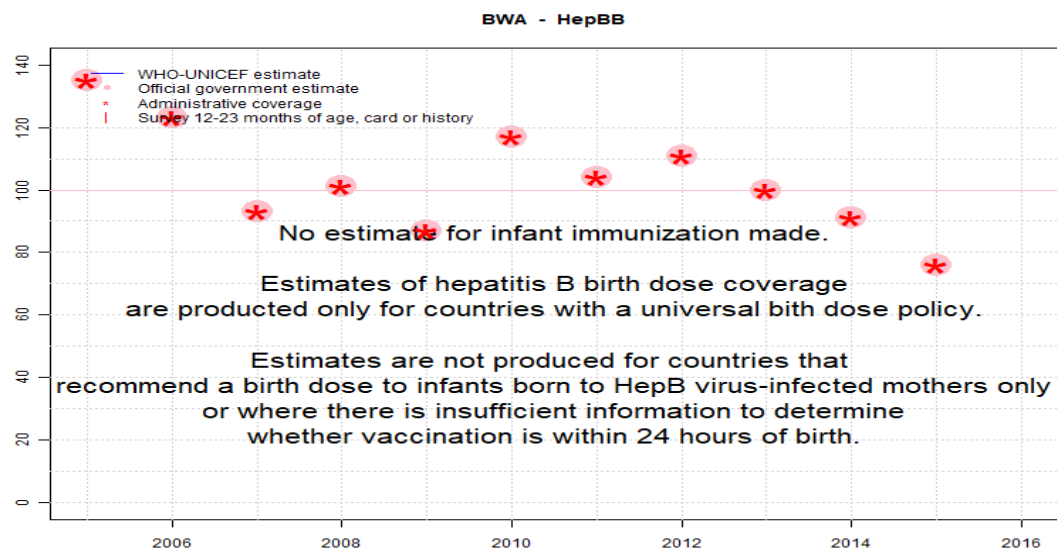
2016: Estimate based on estimated MCV1. Rubella containing vaccine introduced during 2016. GoC=Assigned by working group. Reported coverage and denominator are inconsistent, and the estimate is confirmed only by survey for 2006 and 2012 birth cohorts.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	●
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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: 2015 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.



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Official	135	123	93	101	87	117	104	111	100	91	76	NA
Administrative	135	123	93	101	87	117	104	111	100	91	76	NA
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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.

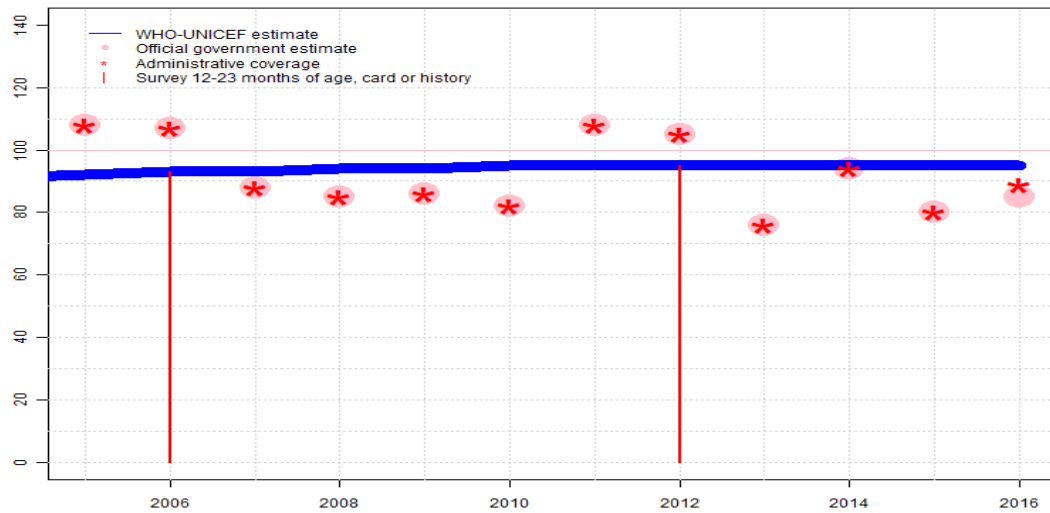
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2015 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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 - HepB3

BWA - HepB3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	92	93	93	94	94	95	95	95	95	95	95	95
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	108	107	88	85	86	82	108	105	76	94	80	85
Administrative	108	107	88	85	86	82	108	105	76	94	80	89
Survey	NA	93	NA	NA	NA	NA	NA	95	NA	NA	NA	NA

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: 2015 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:

- 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 unexplained 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 ex-

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.

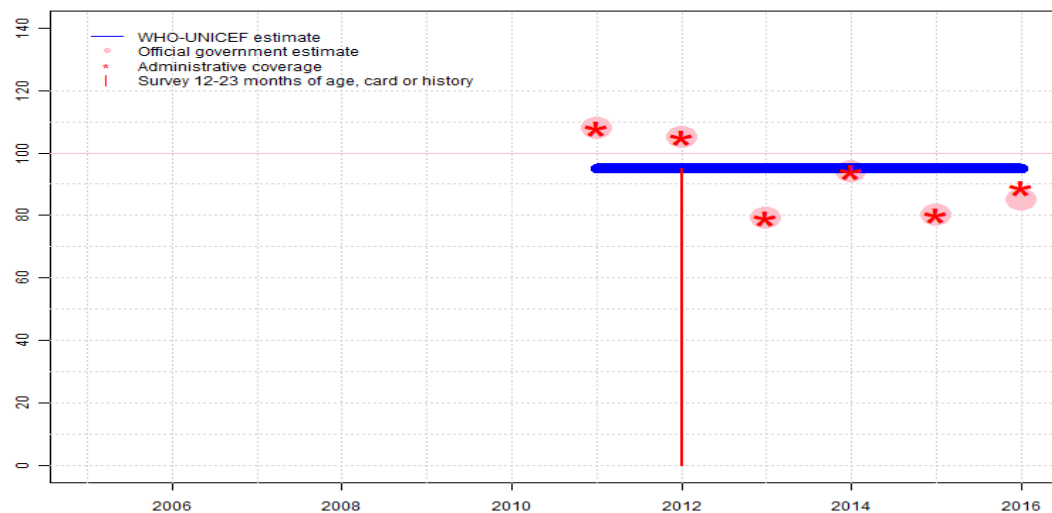
2007: Estimate based on interpolation between 2006 and 2011 levels. Fluctuation in reported data suggest poor quality administrative recording and reporting. Reported data excluded. Nationally reported data vary widely and exceed 100 percent for some antigens. GoC=Assigned by working group. Reported 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.

2005: Estimate based on interpolation between 1999 and 2006 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.

# Botswana - Hib3

BWA - Hib3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	95	95	95	95	95	95
Estimate GoC	NA	NA	NA	NA	NA	NA	•	•	•	•	•	•
Official	NA	NA	NA	NA	NA	NA	108	105	79	94	80	85
Administrative	NA	NA	NA	NA	NA	NA	108	105	79	94	80	89
Survey	NA	NA	NA	NA	NA	NA	NA	95	NA	NA	NA	NA

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: 2015 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.

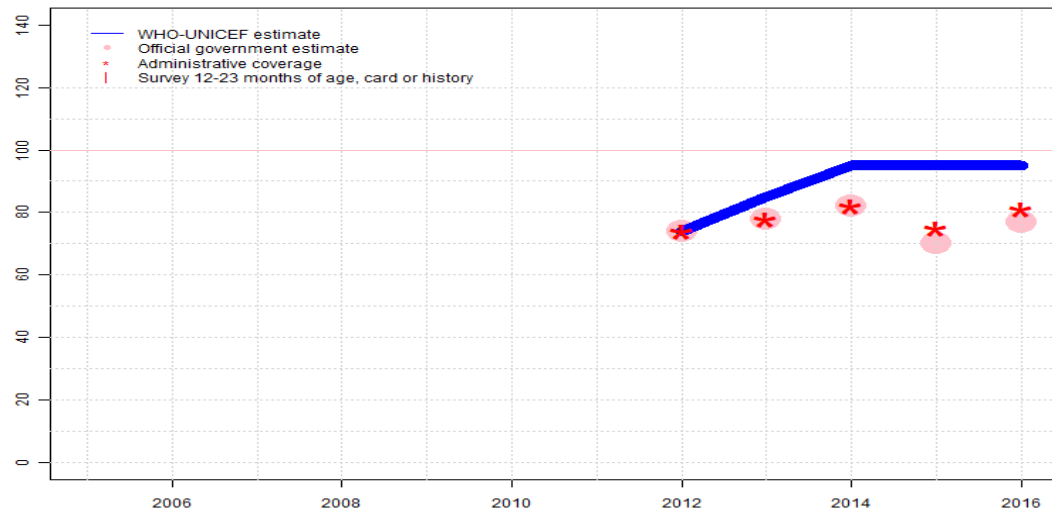
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 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 unexplained 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.

# Botswana - RotaC

BWA - RotaC



## Description:

- 2016: Reported data calibrated to 2014 levels. Reported data excluded. Fluctuation in reported data suggest poor quality administrative recording and reporting. GoC=Assigned by working group. Consistency with other antigens.
- 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 95 percent changed from previous revision value of 82 percent. GoC=Assigned by working group. Consistency with other antigens.
- 2014: Estimate of 95 percent assigned by working group. Estimate is based on estimated DTP3 coverage. Estimate of 95 percent changed from previous revision value of 82 percent. GoC=Assigned by working group. Consistency with other antigens.
- 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. Estimate of 85 percent changed from previous revision value of 78 percent. GoC=Assigned by working group. Consistency with other antigens.
- 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. Consistency with other antigens.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	74	85	95	95	95
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	•	•	•	•	•
Official	NA	NA	NA	NA	NA	NA	NA	74	78	82	70	77
Administrative	NA	NA	NA	NA	NA	NA	NA	74	78	82	75	81
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

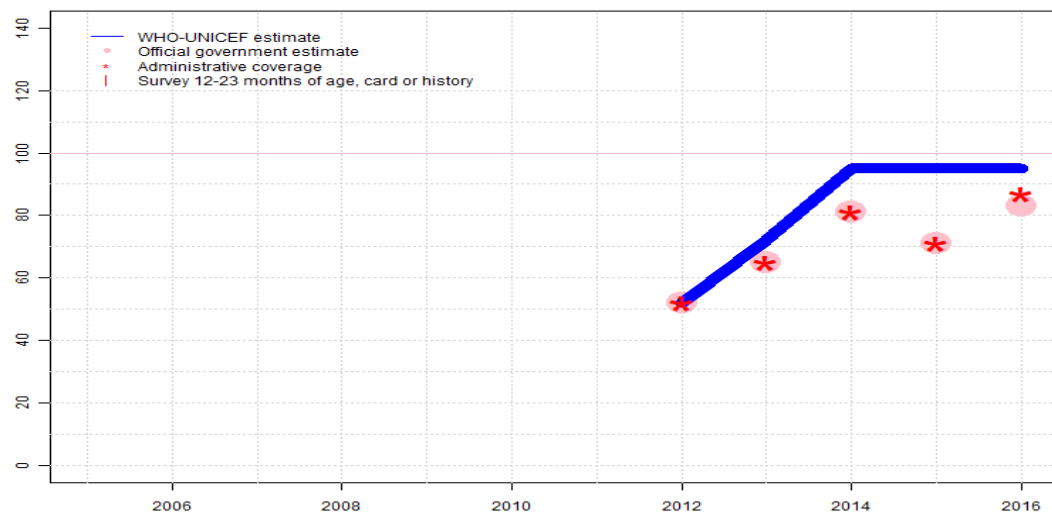
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2015 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 - PcV3

BWA - PcV3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	52	72	95	95	95
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	•	•	•	•	•
Official	NA	NA	NA	NA	NA	NA	NA	52	65	81	71	83
Administrative	NA	NA	NA	NA	NA	NA	NA	52	65	81	71	87
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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: 2015 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:

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. GoC=Assigned by working group. Consistency with other antigens.

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 95 percent changed from previous revision value of 81 percent. GoC=Assigned by working group. Consistency with other antigens.

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. Estimate of 95 percent changed from previous revision value of 81 percent. GoC=Assigned by working group. Consistency with other antigens.

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. Estimate of 72 percent changed from previous revision value of 65 percent. GoC=Assigned by working group. Consistency with other antigens.

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. Consistency with other antigens.

# Botswana - survey details

## 2012 Botswana Post Measles Campaign and Immunization Coverage Survey 2013

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card	97	12-23 m	442	97
BCG	Card or History	98	12-23 m	456	97
DTP1	Card	96	12-23 m	442	97
DTP1	Card or History	98	12-23 m	456	97
DTP3	Card	93	12-23 m	442	97
DTP3	Card or History	95	12-23 m	456	97
HepB1	Card	96	12-23 m	442	97
HepB1	Card or History	98	12-23 m	456	97
HepB3	Card	93	12-23 m	442	97
HepB3	Card or History	95	12-23 m	456	97
Hib1	Card	96	12-23 m	442	97
Hib1	Card or History	98	12-23 m	456	97
Hib3	Card	93	12-23 m	442	97
Hib3	Card or History	95	12-23 m	456	97
MCV1	Card	94	12-23 m	442	97
MCV1	Card or History	97	12-23 m	456	97
Pol1	Card	96	12-23 m	442	97
Pol1	Card or History	98	12-23 m	456	97
Pol3	Card	94	12-23 m	442	97
Pol3	Card or History	96	12-23 m	456	97

## 2006 Botswana EPI Coverage Survey 2007

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card or History	99	12-23 m	9083	98
DTP1	Card or History	98	12-23 m	9083	98
DTP3	Card or History	96	12-23 m	9083	98
HepB1	Card or History	97	12-23 m	9083	98

HepB3	Card or History	93	12-23 m	9083	98
MCV1	Card or History	94	12-23 m	9083	98
Pol1	Card or History	97	12-23 m	9083	98
Pol3	Card or History	96	12-23 m	9083	98

## 1999 Botswana Multiple Indicator Cluster Survey 2000, 2001

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	99	12-23 m	618	84
BCG	Card	87	12-23 m	618	84
BCG	Card or History	99	12-23 m	618	84
BCG	History	12	12-23 m	618	84
DTP1	C or H <12 months	98	12-23 m	618	84
DTP1	Card	86	12-23 m	618	84
DTP1	Card or History	98	12-23 m	618	84
DTP1	History	12	12-23 m	618	84
DTP3	C or H <12 months	94	12-23 m	618	84
DTP3	Card	85	12-23 m	618	84
DTP3	Card or History	97	12-23 m	618	84
DTP3	History	12	12-23 m	618	84
MCV1	C or H <12 months	83	12-23 m	618	84
MCV1	Card	78	12-23 m	618	84
MCV1	Card or History	90	12-23 m	618	84
MCV1	History	12	12-23 m	618	84
Pol1	C or H <12 months	98	12-23 m	618	84
Pol1	Card	86	12-23 m	618	84
Pol1	Card or History	98	12-23 m	618	84
Pol1	History	12	12-23 m	618	84
Pol3	C or H <12 months	94	12-23 m	618	84
Pol3	Card	85	12-23 m	618	84
Pol3	Card or History	97	12-23 m	618	84
Pol3	History	12	12-23 m	618	84

Further information and estimates for previous years are available at:

<http://www.data.unicef.org/child-health/immunization>

[http://www.who.int/immunization/monitoring\\_surveillance/routine/coverage/en/index4.html](http://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/index4.html)