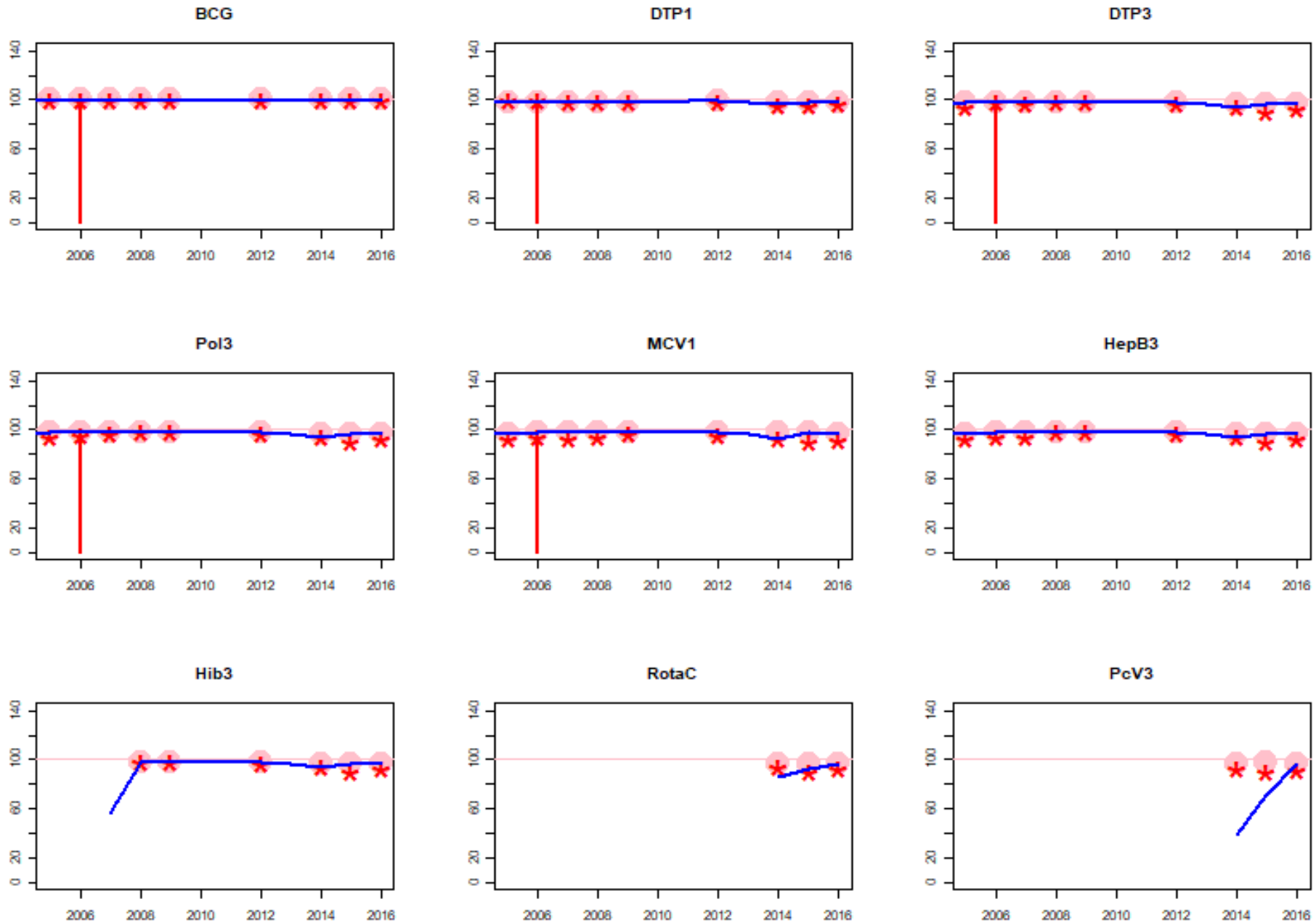


Libya: WHO and UNICEF estimates of immunization coverage: 2016 revision



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.

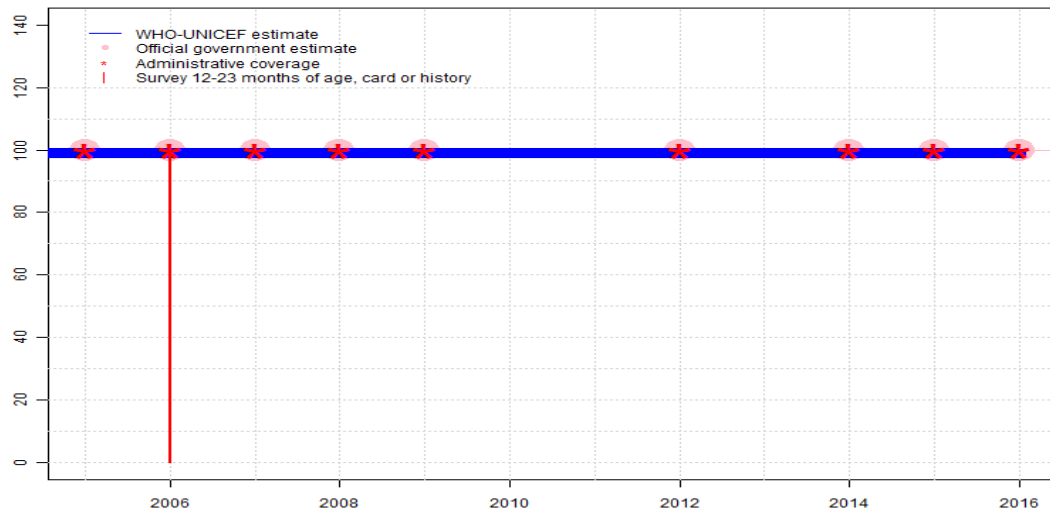
PcV3: percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine. In countries where the national schedule recommends two doses during infancy and a booster dose at 12 months or later based on the epidemiology of disease in the country, coverage estimates may reflect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

LBY - BCG



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	99	99	99	99	99	99	99	99	99	99	99	99
Estimate GoC	•	•••	•	•	•	•	•	•	•	•	•	•
Official	100	100	100	100	100	NA	NA	100	NA	100	100	100
Administrative	100	100	100	100	100	NA	NA	100	NA	100	100	100
Survey	NA	100	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.

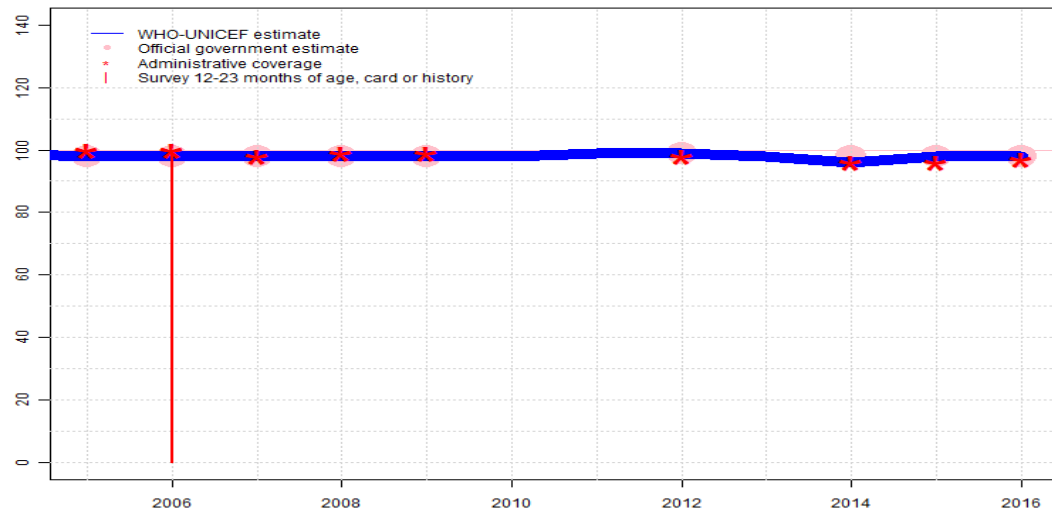
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

- 2016: Estimate based on coverage reported by national government. 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: D-
- 2015: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on reported administrative data. Declines in reported coverage are unexplained given increases in the reported number of children vaccinated. Reported coverage levels may carry a risk of overestimation given the use of the number of children vaccinated with BCG as the target population and civil unrest in the country. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-
- 2013: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on interpolation between data reported by national government. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2010: Estimate based on interpolation between data reported by national government. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government supported by survey. Survey evidence of 100 percent based on 1 survey(s). GoC=R+ S+ D+
- 2005: Estimate based on coverage reported by national government. Estimate challenged by: D-

Libya - DTP1

LBY - DTP1



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	98	98	98	98	98	98	99	99	98	96	98	98
Estimate GoC	●	●	●	●	●	●	●	●	●	●	●	●
Official	98	98	98	98	98	NA	NA	99	NA	98	98	98
Administrative	100	100	98	99	99	NA	NA	98	NA	96	96	97
Survey	NA	100	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.

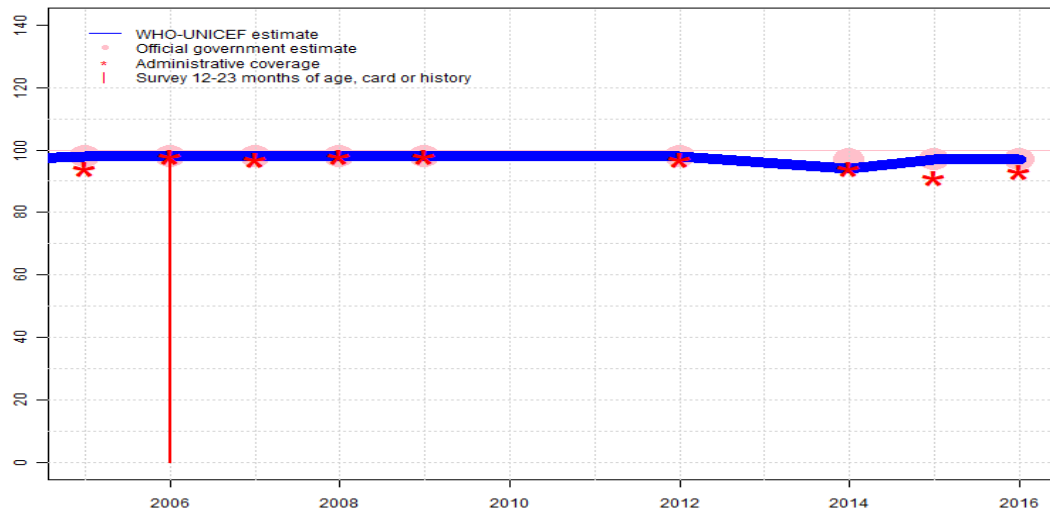
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- 2013: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
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- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government supported by survey. Survey evidence of 100 percent based on 1 survey(s). Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government. Estimate challenged by: D-

Libya - DTP3

LBY - DTP3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	98	98	98	98	98	98	98	98	96	94	97	97
Estimate GoC	●●●	●●●	●●●	●	●	●	●	●	●	●	●	●
Official	98	98	98	98	98	NA	NA	98	NA	97	97	97
Administrative	94	98	97	98	98	NA	NA	97	NA	94	91	93
Survey	NA	98	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.

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

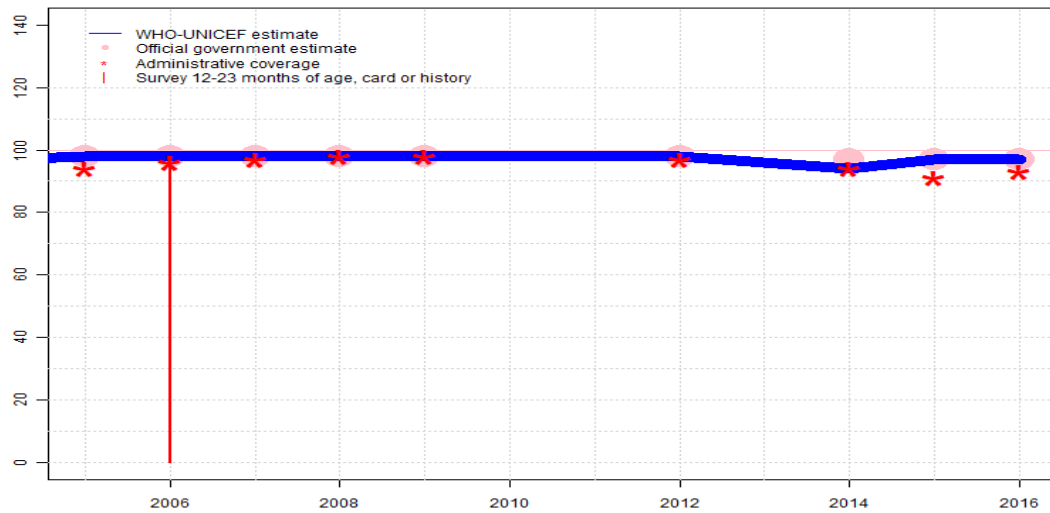
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- 2015: Estimate based on coverage reported by national government. Estimate of 97 percent changed from previous revision value of 94 percent. Estimate challenged by: D-
- 2014: Estimate based on reported administrative data. Declines in reported coverage are unexplained given increases in the reported number of children vaccinated. Reported coverage levels may carry a risk of overestimation given the use of the number of children vaccinated with BCG as the target population and civil unrest in the country. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-
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- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. GoC=R+ S+ D+
- 2006: Estimate based on coverage reported by national government supported by survey. Survey evidence of 98 percent based on 1 survey(s). GoC=R+ S+ D+
- 2005: Estimate based on coverage reported by national government. GoC=R+ S+ D+

Libya - Pol3

LBY - Pol3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	98	98	98	98	98	98	98	98	96	94	97	97
Estimate GoC	●●●	●●●	●●●	●	●	●	●	●	●	●	●	●
Official	98	98	98	98	98	NA	NA	98	NA	97	97	97
Administrative	94	96	97	98	98	NA	NA	97	NA	94	91	93
Survey	NA	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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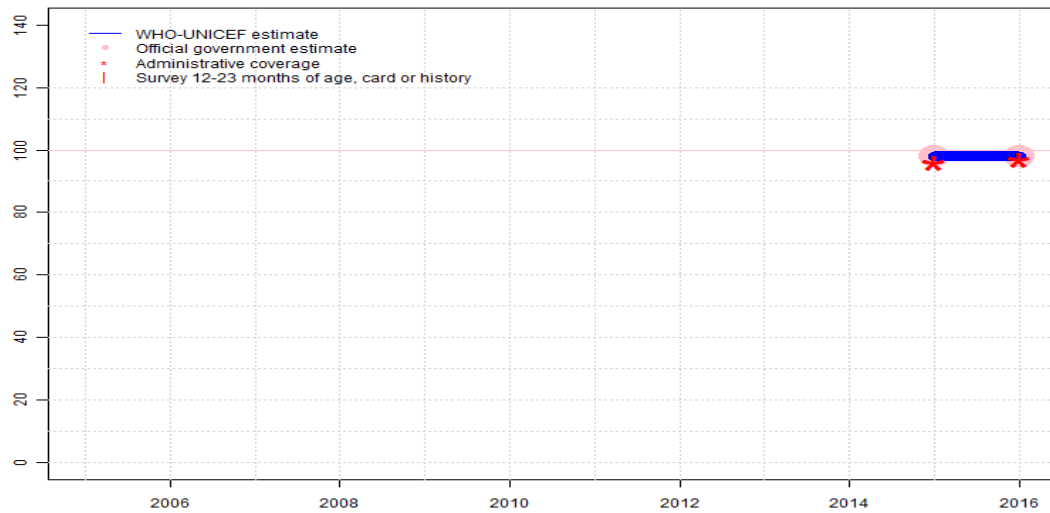
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

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- 2013: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
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- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. GoC=R+ S+ D+
- 2006: Estimate based on coverage reported by national government supported by survey. Survey evidence of 98 percent based on 1 survey(s). GoC=R+ S+ D+
- 2005: Estimate based on coverage reported by national government. GoC=R+ S+ D+

Libya - IPV1

LBY - IPV1



Description:

2016: Estimate based on coverage reported by national government. 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: D-

2015: Estimate based on coverage reported by national government. Inactivated polio vaccine introduced in April 2014. Reporting began in 2015. Vaccine presentation is DTP-HepB-Hib-IPV. Estimate challenged by: D-

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98	98
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	●	●
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98	98
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96	97
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

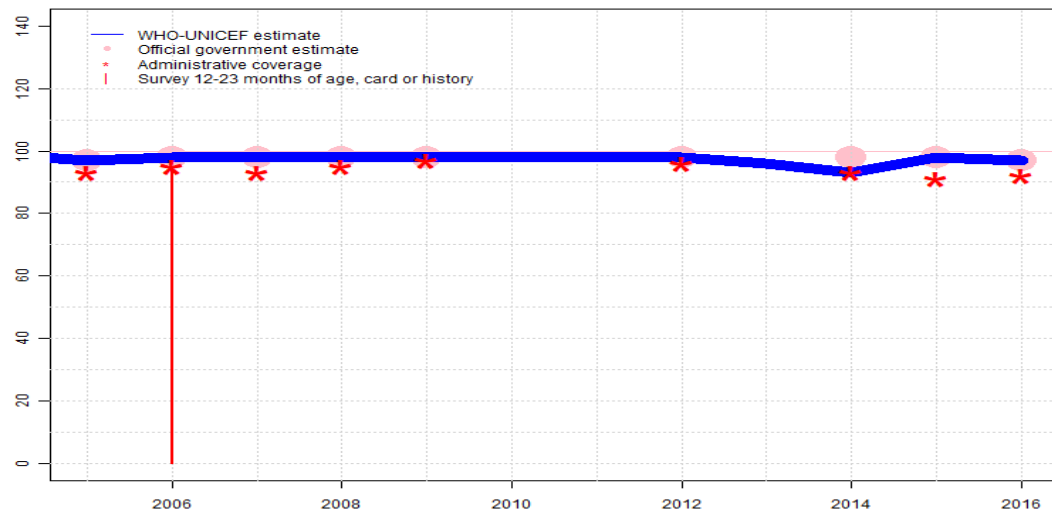
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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.
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- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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Libya - MCV1

LBY - MCV1



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	97	98	98	98	98	98	98	98	96	93	98	97
Estimate GoC	●●●	●●●	●●●	●	●	●	●	●	●	●	●	●
Official	97	98	98	98	98	NA	NA	98	NA	98	98	97
Administrative	93	95	93	95	97	NA	NA	96	NA	93	91	92
Survey	NA	94	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.

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

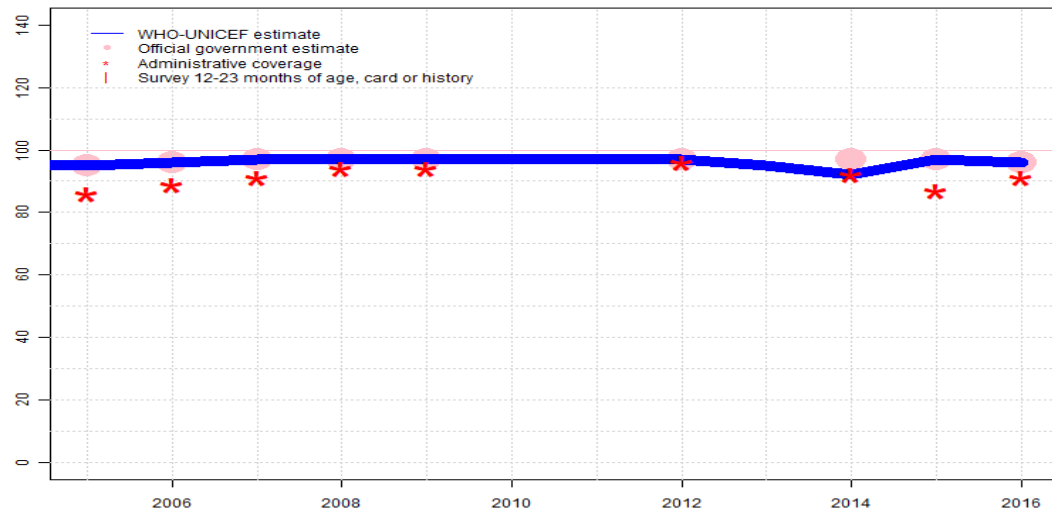
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

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- 2015: Estimate based on coverage reported by national government. Estimate of 98 percent changed from previous revision value of 93 percent. Estimate challenged by: D-
- 2014: Estimate based on reported administrative data. Declines in reported coverage are unexplained given increases in the reported number of children vaccinated. Reported coverage levels may carry a risk of overestimation given the use of the number of children vaccinated with BCG as the target population and civil unrest in the country. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-
- 2013: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on interpolation between data reported by national government. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
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- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. GoC=R+ S+ D+
- 2006: Estimate based on coverage reported by national government supported by survey. Survey evidence of 94 percent based on 1 survey(s). GoC=R+ S+ D+
- 2005: Estimate based on coverage reported by national government. GoC=R+ S+ D+

Libya - MCV2

LBY - MCV2



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. 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: D-

2015: Estimate based on coverage reported by national government. Estimate of 97 percent changed from previous revision value of 92 percent. Estimate challenged by: D-

2014: Estimate based on reported administrative estimate. Declines in reported coverage are unexplained given increases in the reported number of children vaccinated. Reported coverage levels may carry a risk of overestimation given the use of the number of children vaccinated with BCG as the target population and civil unrest in the country. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-

2013: Estimate based on interpolation between reported values. GoC=No accepted empirical data

2012: Estimate based on coverage reported by national government. Estimate challenged by: D-

2011: Estimate based on interpolation between reported values. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data

2010: Estimate based on interpolation between reported values. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data

2009: Estimate based on coverage reported by national government. Estimate challenged by: D-

2008: Estimate based on coverage reported by national government. Estimate challenged by: D-

2007: Estimate based on coverage reported by national government. GoC=R+ D+

2006: Estimate based on coverage reported by national government. GoC=R+ D+

2005: Estimate based on coverage reported by national government. GoC=R+ D+

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	95	96	97	97	97	97	97	97	95	92	97	96
Estimate GoC	●●	●●	●●	●	●	●	●	●	●	●	●	●
Official	95	96	97	97	97	NA	NA	97	NA	97	97	96
Administrative	86	89	91	94	94	NA	NA	96	NA	92	87	91
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

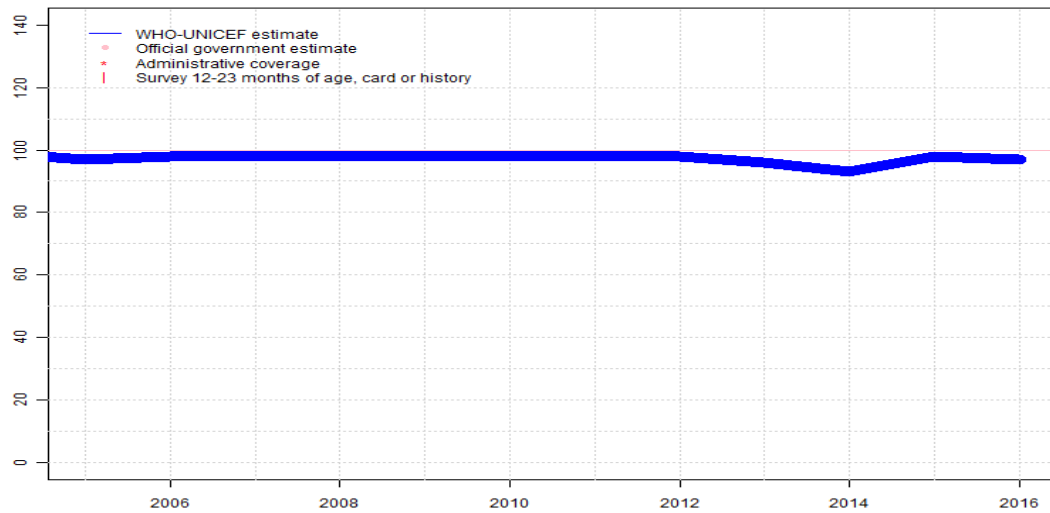
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

Libya - RCV1

LBY - RCV1



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	97	98	98	98	98	98	98	98	96	93	98	97
Estimate GoC	●●●	●●●	●●●	●	●	●	●	●	●	●	●	●
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.

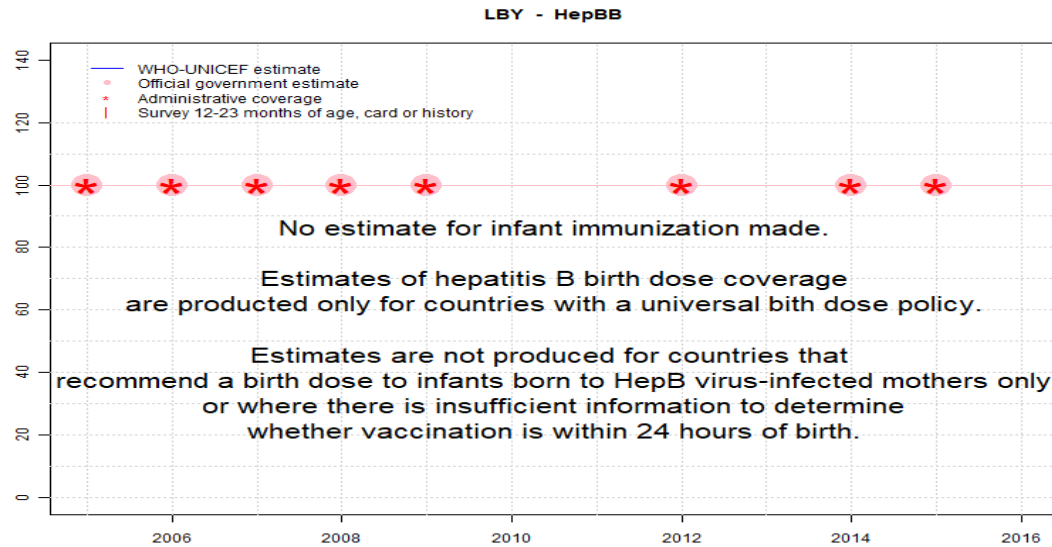
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

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. 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: D-
- 2015: Estimate based on estimated MCV1. Estimate of 98 percent changed from previous revision value of 93 percent. Estimate challenged by: D-
- 2014: Estimate based on estimated MCV1. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-
- 2013: Estimate based on estimated MCV1. GoC=No accepted empirical data
- 2012: Estimate based on estimated MCV1. Estimate challenged by: D-
- 2011: Estimate based on estimated MCV1. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2010: Estimate based on estimated MCV1. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2009: Estimate based on estimated MCV1. Estimate challenged by: D-
- 2008: Estimate based on estimated MCV1. Estimate challenged by: D-
- 2007: Estimate based on estimated MCV1. GoC=R+ S+ D+
- 2006: Estimate based on estimated MCV1. GoC=R+ S+ D+
- 2005: Estimate based on estimated MCV1. GoC=R+ S+ D+

Libya - HepBB



	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	100	100	100	100	100	NA	NA	100	NA	100	100	NA
Administrative	100	100	100	100	100	NA	NA	100	NA	100	100	NA
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

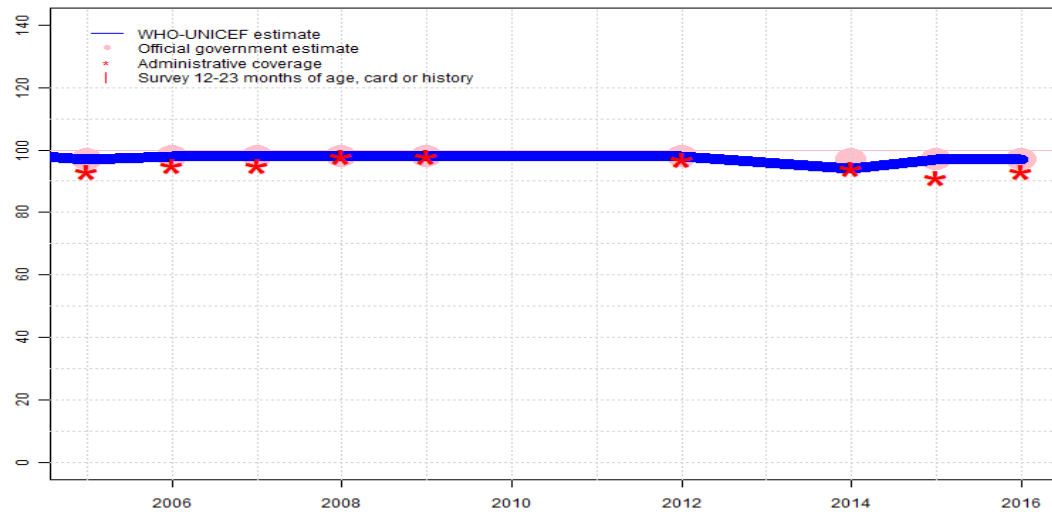
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

Libya - HepB3

LBY - HepB3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	97	98	98	98	98	98	98	98	96	94	97	97
Estimate GoC	●●	●●	●●	●	●	●	●	●	●	●	●	●
Official	97	98	98	98	98	NA	NA	98	NA	97	97	97
Administrative	93	95	95	98	98	NA	NA	97	NA	94	91	93
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.

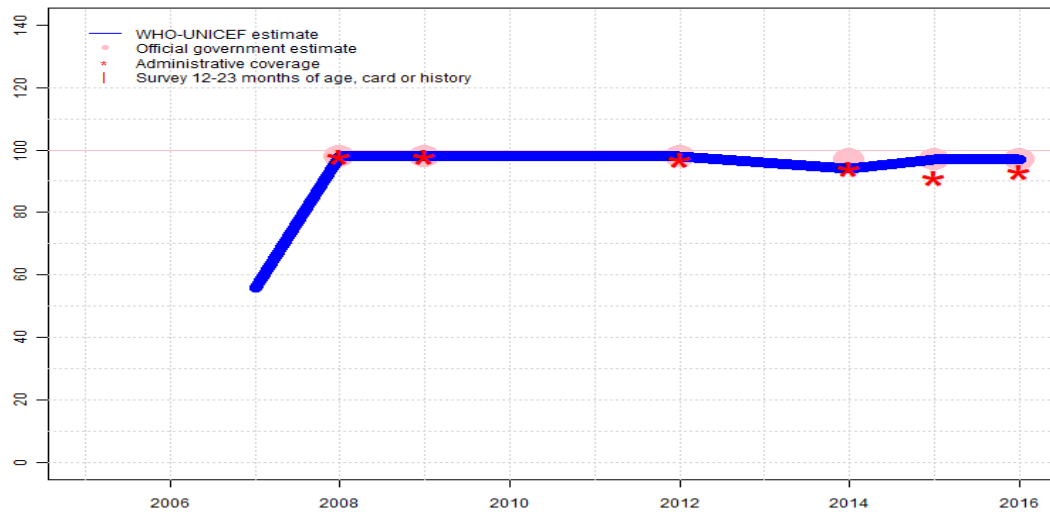
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

- 2016: Estimate based on coverage reported by national government. 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: D-
- 2015: Estimate based on coverage reported by national government. Estimate of 97 percent changed from previous revision value of 94 percent. Estimate challenged by: D-
- 2014: Estimate based on reported administrative data. Declines in reported coverage are unexplained given increases in the reported number of children vaccinated. Reported coverage levels may carry a risk of overestimation given the use of the number of children vaccinated with BCG as the target population and civil unrest in the country. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-
- 2013: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on interpolation between data reported by national government. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2010: Estimate based on interpolation between data reported by national government. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. GoC=R+ D+
- 2006: Estimate based on coverage reported by national government. GoC=R+ D+
- 2005: Estimate based on coverage reported by national government. GoC=R+ D+

Libya - Hib3

LBY - Hib3



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	56	98	98	98	98	98	96	94	97	97
Estimate GoC	NA	NA	••	•	•	•	•	•	•	•	•	•
Official	NA	NA	NA	98	98	NA	NA	98	NA	97	97	97
Administrative	NA	NA	NA	98	98	NA	NA	97	NA	94	91	93
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.

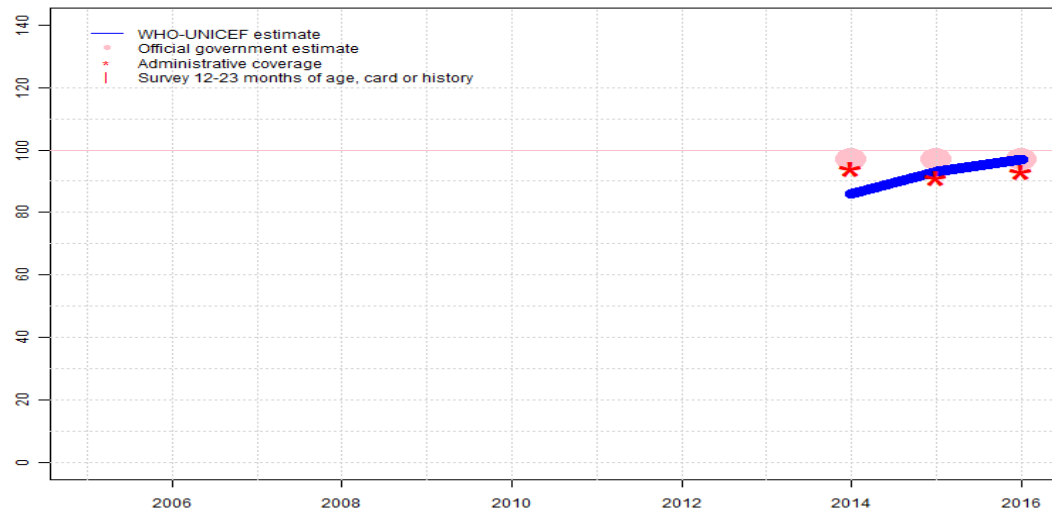
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

- 2016: Estimate based on coverage reported by national government. 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: D-
- 2015: Estimate based on coverage reported by national government. Estimate of 97 percent changed from previous revision value of 94 percent. Estimate challenged by: D-
- 2014: Estimate based on reported administrative estimate. Declines in reported coverage are unexplained given increases in the reported number of children vaccinated. Reported coverage levels may carry a risk of overestimation given the use of the number of children vaccinated with BCG as the target population and civil unrest in the country. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-
- 2013: Estimate based on interpolation between reported values. GoC=No accepted empirical data
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on interpolation between reported values. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2010: Estimate based on interpolation between reported values. No empirical data available. Estimate is based on interpolation and actual coverage levels were likely lower during the time of civil strife. GoC=No accepted empirical data
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Hib vaccine introduced in 2007. 94 percent coverage was achieved in 60 percent of the country. Hib vaccine introduced in 2007 Vaccine presentation is DTP-HepB-Hib. GoC=D+

Libya - RotaC

LBY - RotaC



Description:

2016: Estimate based on reported data following introduction. 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: D-

2015: Reported data calibrated to 2014 and 2016 levels. Estimate of 93 percent changed from previous revision value of 86 percent. Estimate challenged by: D-R-

2014: Estimate of 86 percent assigned by working group. Rotavirus vaccine introduced during 2013 and reporting started in 2014. Programme reports 97 percent coverage in 92 percent of the target population. Estimate is based on annualized coverage achieved in the national birth cohort. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-R-

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	86	93	97
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	●	●	●
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	97	97	97
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	94	91	93
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

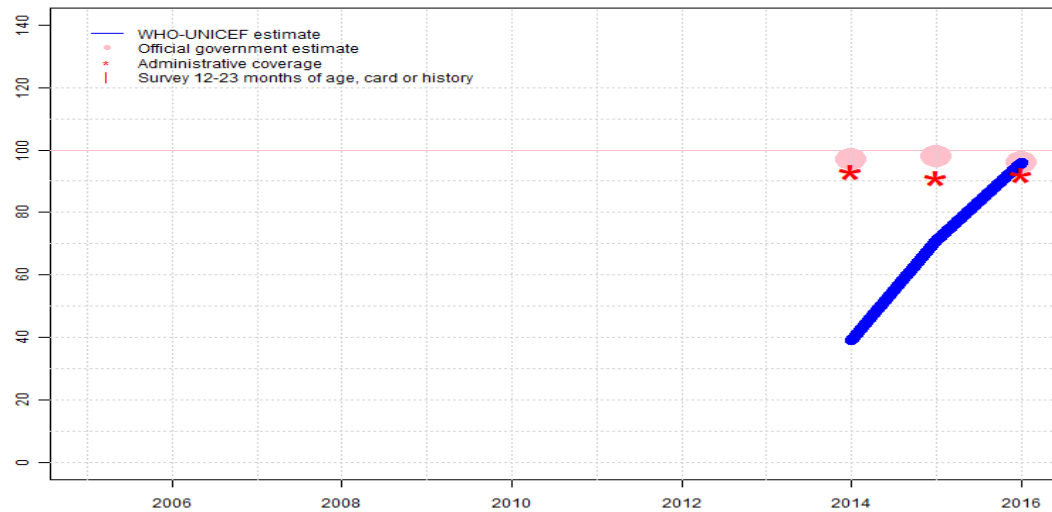
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

Libya - PcV3

LBY - PcV3



Description:

- 2016: Estimate based on reported data following introduction. 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: D-
- 2015: Reported data calibrated to 2014 and 2016 levels. Estimate of 71 percent changed from previous revision value of 39 percent. Estimate challenged by: D-R-
- 2014: Estimate of 39 percent assigned by working group. Pneumococcal conjugate vaccine introduced during 2013 and reporting started in 2014. Programme reports 97 percent coverage in 42 percent of the target population. Estimate is based on coverage achieved in the national target population. Programme does not provide an explanation for adjustment of government official coverage from administrative reported data. Estimate challenged by: D-R-

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	39	71	96
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	●	●	●
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	97	98	96
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	93	91	92
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.

Libya - survey details

2006 Libyan Arab Republic 2007 Family Health Survey

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card or History	100	12-23 m	11920	81
DTP1	Card or History	100	12-23 m	11920	81

DTP3	Card or History	98	12-23 m	11920	81
MCV1	Card or History	94	12-23 m	11920	81
Pol1	Card or History	100	12-23 m	11920	81
Pol3	Card or History	98	12-23 m	11920	81

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