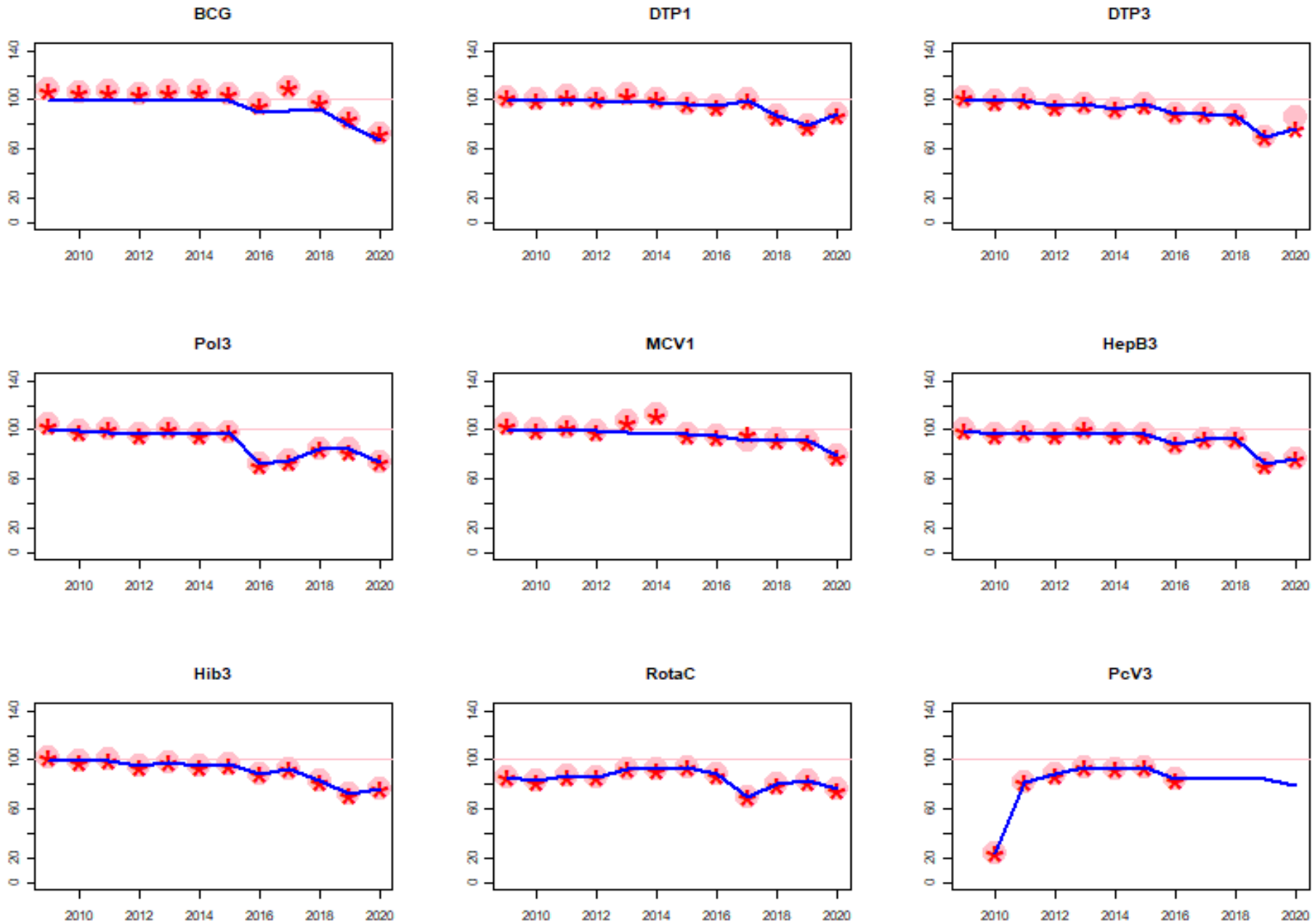


Brazil: WHO and UNICEF estimates of immunization coverage: 2020 revision



# Brazil: WHO and UNICEF estimates of immunization coverage: 2020 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.

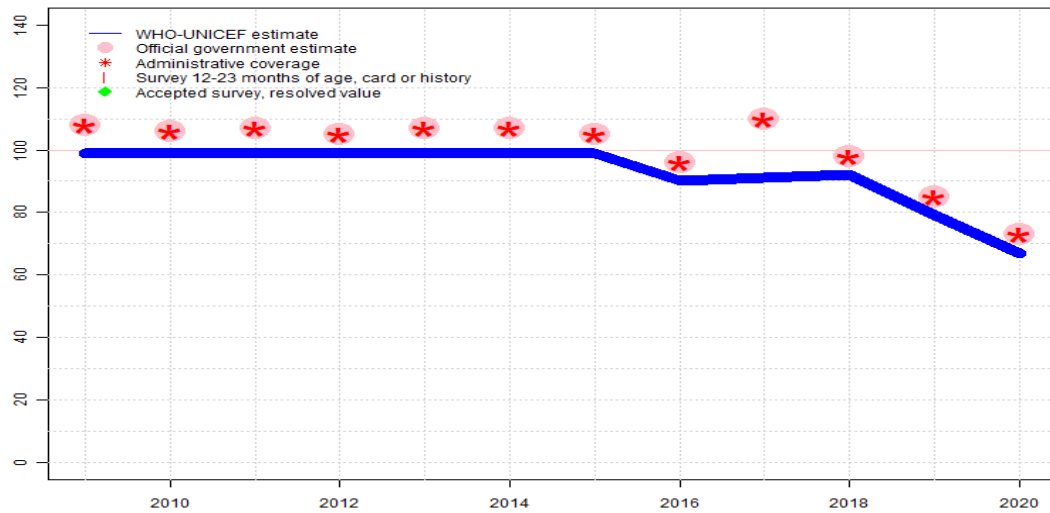
**PcV3:** percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine. In countries where the national schedule recommends two doses during infancy and a booster dose at 12 months or later based on the epidemiology of disease in the country, coverage estimates may reflect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

BRA - BCG



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	99	99	99	99	99	90	91	92	79	67
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	108	106	107	105	107	107	105	96	110	98	85	73
Administrative	108	106	107	105	107	107	105	96	110	98	85	73
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: 2020 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.

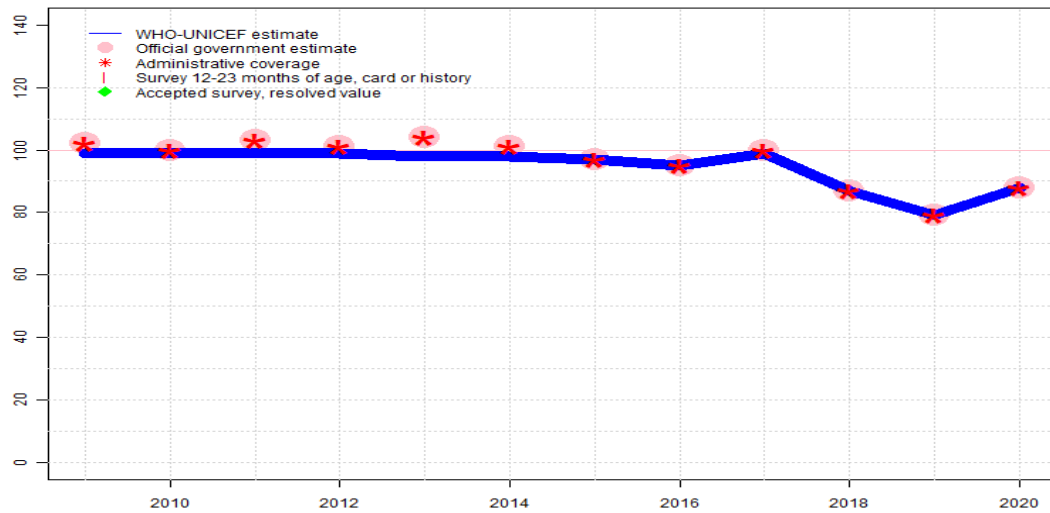
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2020: Reported data calibrated to 2018 levels. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Decline in reported coverage is unexplained by country but aligns with COVID-19 pandemic service disruptions. Estimate challenged by: R-
- 2019: Reported data calibrated to 2018 levels. . Estimate challenged by: R-
- 2018: Estimate of 92 percent assigned by working group. Estimate based on calibration from 2016 level. Estimate challenged by: R-
- 2017: Reported data calibrated to 2016 and 2018 levels. Reported data excluded because 110 percent greater than 100 percent. Reported data excluded due to an increase from 96 percent to 110 percent with decrease 98 percent. Programme reports 10 month vaccine stock-out. Estimate challenged by: D-R-
- 2016: Estimate of 90 percent assigned by working group. . Programme reports a 1-month vaccine stock-out. Estimate challenged by: R-
- 2015: Estimate of 99 percent assigned by working group. . Reported data excluded because 105 percent greater than 100 percent. Program reports 1 month stock-out. Estimate challenged by: R-
- 2014: Reported data calibrated to 1997 and 2015 levels. Reported data excluded because 107 percent greater than 100 percent. Estimate challenged by: R-
- 2013: Reported data calibrated to 1997 and 2015 levels. Reported data excluded because 107 percent greater than 100 percent. Estimate challenged by: R-
- 2012: Reported data calibrated to 1997 and 2015 levels. Reported data excluded because 105 percent greater than 100 percent. Estimate challenged by: R-
- 2011: Reported data calibrated to 1997 and 2015 levels. Reported data excluded because 107 percent greater than 100 percent. Estimate challenged by: R-
- 2010: Reported data calibrated to 1997 and 2015 levels. Reported data excluded because 106 percent greater than 100 percent. Estimate challenged by: R-
- 2009: Reported data calibrated to 1997 and 2015 levels. Reported data excluded because 108 percent greater than 100 percent. Estimate challenged by: R-

# Brazil - DTP1

BRA - DTP1



## Description:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Increase in reported coverage is unexplained but may reflect recovery from vaccine stockouts reported for 2019. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. Programme reports a one-month (February) followed by a four-month (July-Oct) vaccine stockout at the national level. Estimate of 79 percent changed from previous revision value of 81 percent. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. Consistency across vaccines. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 2 month vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports a 2-month vaccine stock-out. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on interpolation between data reported by national government. Reported data excluded because 101 percent greater than 100 percent. GoC=R+ D+
- 2013: Estimate based on interpolation between data reported by national government. Reported data excluded because 104 percent greater than 100 percent. GoC=R+ D+
- 2012: Estimate based on interpolation between data reported by national government. Reported data excluded because 101 percent greater than 100 percent. Recommended vaccine schedule changed in 2012 from DTP-Hib and OPV to a sequential DTaP-Hib-IPV for first and second dose and DTP-Hib and OPV for the third dose. GoC=R+ D+
- 2011: DTP1 coverage estimated based on DTP3 coverage of 100. Reported data excluded because 103 percent greater than 100 percent. Estimate challenged by: R-
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. Reported data excluded because 102 percent greater than 100 percent. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	99	99	98	98	97	95	99	87	79	88
Estimate GoC	••	••	•	••	••	••	••	••	••	••	••	••
Official	102	100	103	101	104	101	97	95	100	87	79	88
Administrative	102	100	103	101	104	101	97	95	100	87	79	88
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

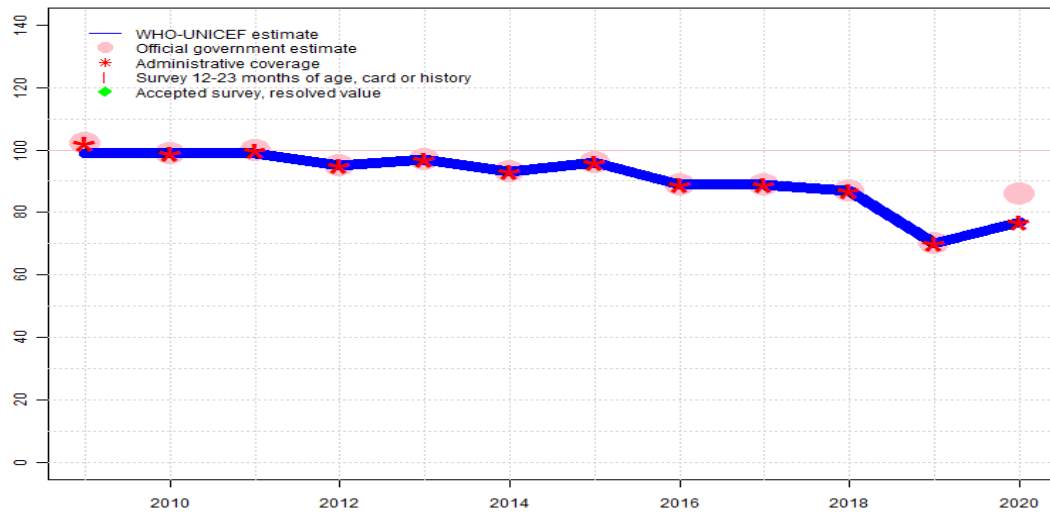
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2020 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.

# Brazil - DTP3

BRA - DTP3



## Description:

- 2020: Estimate based on administrative report. Increase in reported coverage is unexplained but may reflect recovery from vaccine stockouts reported for 2019. Reported data excluded due to sudden change in coverage from 70 level to 86 percent. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate challenged by: R-
- 2019: Estimate based on coverage reported by national government. Programme reports a one-month (February) followed by a four-month (July-Oct) vaccine stockout at the national level.. Estimate of 70 percent changed from previous revision value of 73 percent. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 2 month vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports a 2-month vaccine stock-out. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. GoC=R+ D+
- 2013: Estimate based on coverage reported by national government. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. Recommended vaccine schedule changed in 2012 from DTP-Hib and OPV to a sequential DTaP-Hib-IPV for first and second dose and DTP-Hib and OPV for the third dose. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. Reported data excluded because 102 percent greater than 100 percent. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	99	95	97	93	96	89	89	87	70	77
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●
Official	102	99	100	95	97	93	96	89	89	87	70	86
Administrative	102	99	100	95	97	93	96	89	89	87	70	77
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

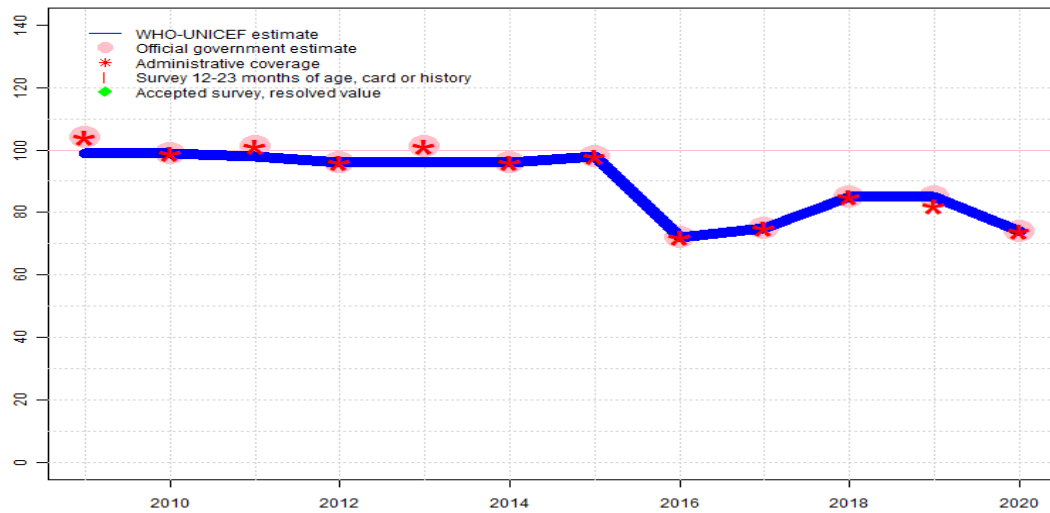
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2020 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.

# Brazil - Pol3

BRA - Pol3



## Description:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Decline in reported coverage is unexplained by country but aligns with COVID-19 pandemic service disruptions. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Estimate based on reported data. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Decrease in coverage is unexplained but consistent with a decrease in first dose of IPV vaccine. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. Programme switched from OPV to IPV for the 3rd dose of polio vaccine. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. GoC=R+ D+
- 2013: Estimate based on interpolation between data reported by national government. Reported data excluded because 101 percent greater than 100 percent. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. Recommended vaccine schedule changed in 2012 from DTP-Hib and OPV to a sequential IPV for first and second dose and OPV for the third dose and to DTP-Hib-HepB. GoC=R+ D+
- 2011: Estimate based on interpolation between data reported by national government. Reported data excluded because 101 percent greater than 100 percent. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. Reported data excluded because 104 percent greater than 100 percent. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	98	96	96	96	98	72	75	85	85	74
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●
Official	104	99	101	96	101	96	98	72	75	85	85	74
Administrative	104	99	101	96	101	96	98	72	75	85	82	74
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.

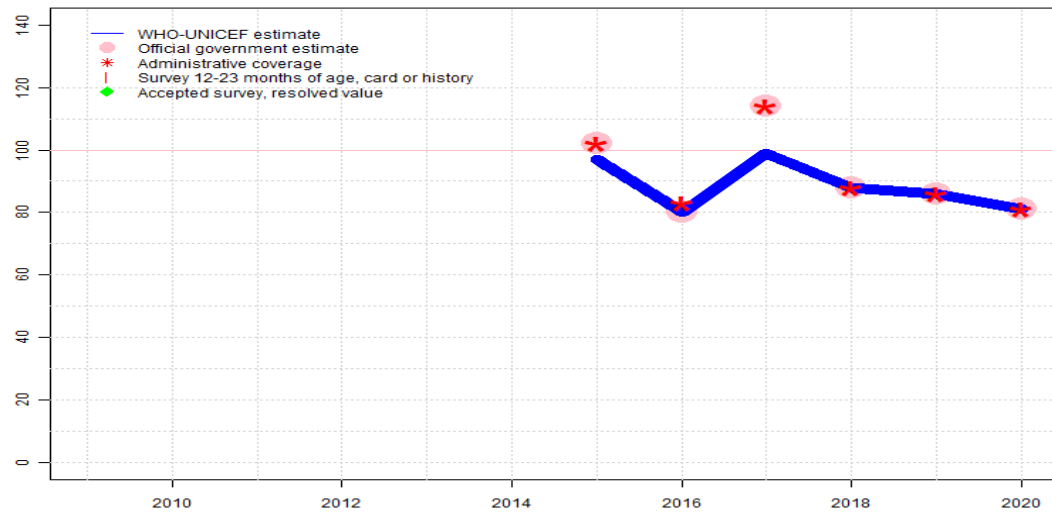
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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.



# Brazil - IPV1

BRA - IPV1



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	NA	NA	NA	NA	NA	NA	97	80	99	88	86	81
Estimate GoC	NA	NA	NA	NA	NA	NA	•	••	•	••	••	••
Official	NA	NA	NA	NA	NA	NA	102	80	114	88	86	81
Administrative	NA	NA	NA	NA	NA	NA	102	83	114	88	86	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: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

## Description:

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

2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+

2019: Estimate based on coverage reported by national government. GoC=R+ D+

2018: Estimate based on coverage reported by national government. Consistency across vaccines. GoC=R+ D+

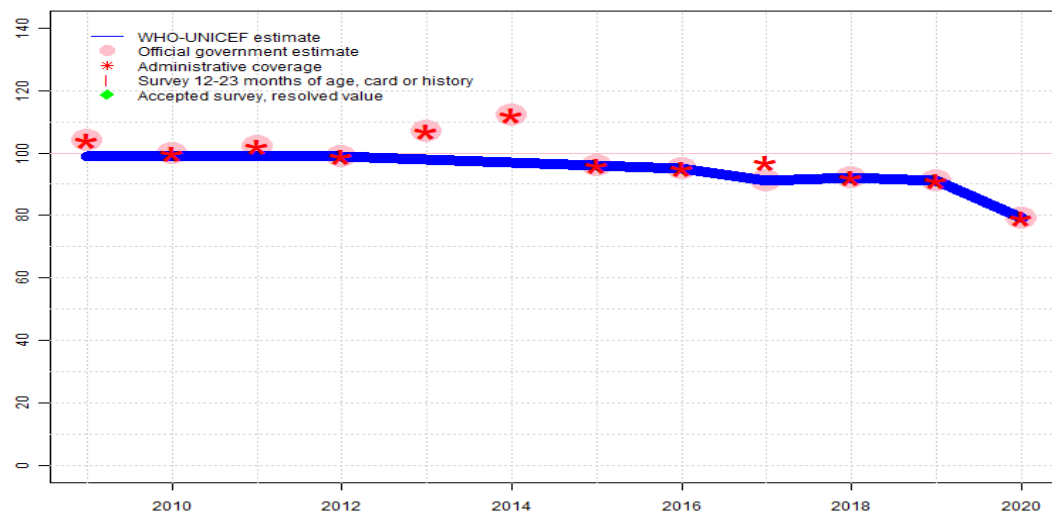
2017: Estimate is based on estimated DTP1 coverage. Reported data excluded because 114 percent greater than 100 percent. Reported data excluded due to an increase from 80 percent to 114 percent with decrease 88 percent. Estimate challenged by: D-R-

2016: Estimate based on coverage reported by national government. Unexplained decline in reported coverage from 2015. GoC=R+ D+

2015: Inactivated polio vaccine in 2012 and is recommended as part of a sequential schedule. Reported coverage is over 100 percent. Estimated coverage based on reported DTP1 coverage. Reported data excluded because 102 percent greater than 100 percent. Estimate challenged by: R-

# Brazil - MCV1

BRA - MCV1



## Description:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Decline in reported coverage is unexplained by country but aligns with COVID-19 pandemic service disruptions. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 1 month vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. Program reports 1 month stock-out of MMR vaccine. GoC=R+ D+
- 2014: Estimate based on interpolation between data reported by national government. Reported data excluded because 112 percent greater than 100 percent. Estimate challenged by: D-
- 2013: Estimate based on interpolation between data reported by national government. Reported data excluded because 107 percent greater than 100 percent. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. GoC=R+ D+
- 2011: Estimate based on interpolation between data reported by national government. Reported data excluded because 102 percent greater than 100 percent. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. Reported data excluded because 104 percent greater than 100 percent. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	99	99	98	97	96	95	91	92	91	79
Estimate GoC	●●	●●	●●	●●	●●	●	●●	●●	●●	●●	●●	●●
Official	104	100	102	99	107	112	96	95	91	92	91	79
Administrative	104	100	102	99	107	112	96	95	97	92	91	79
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.

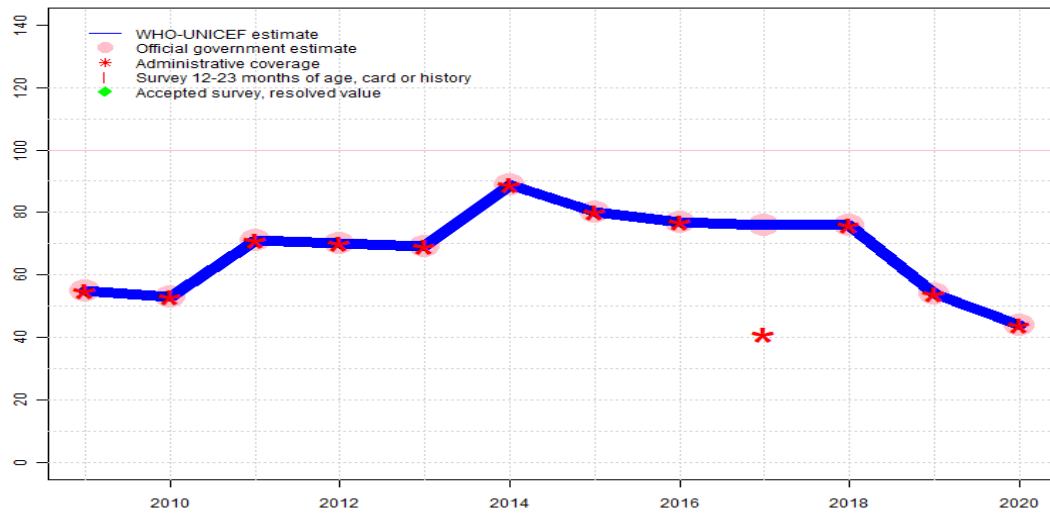
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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.



# Brazil - MCV2

BRA - MCV2



## Description:

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

2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+

2019: Estimate based on coverage reported by national government. . GoC=R+ D+

2018: Estimate based on coverage reported by national government. GoC=R+ D+

2017: Estimate based on coverage reported by national government. Programme reports 1 month vaccine stock-out. Estimate challenged by: D-

2016: Estimate based on coverage reported by national government. GoC=R+ D+

2015: Estimate based on coverage reported by national government. Program reports 1 month stock-out of MMR vaccine. GoC=R+ D+

2014: Estimate based on coverage reported by national government. GoC=R+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ D+

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

2011: Estimate based on coverage reported by national government. Estimate challenged by: D-

2010: Estimate based on coverage reported by national government. Estimate challenged by: D-

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

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	55	53	71	70	69	89	80	77	76	76	54	44
Estimate GoC	•	•	•	•	••	••	••	••	•	••	••	••
Official	55	53	71	70	69	89	80	77	76	76	54	44
Administrative	55	53	71	70	69	89	80	77	41	76	54	44
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

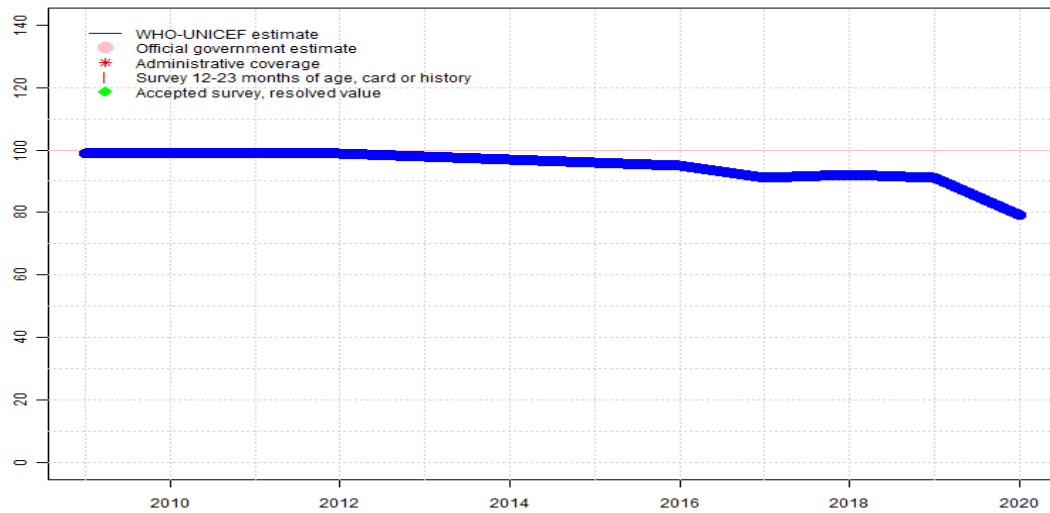
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2020 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.

# Brazil - RCV1

BRA - RCV1



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	99	99	98	97	96	95	91	92	91	79
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: 2020 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.

2020: Estimate based on estimated MCV1. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+

2019: Estimate based on estimated MCV1. GoC=R+ D+

2018: Estimate based on estimated MCV1. GoC=R+ D+

2017: Estimate based on estimated MCV1. Programme reports 1 month vaccine stock-out. GoC=R+ D+

2016: Estimate based on estimated MCV1. GoC=R+ D+

2015: Estimate based on estimated MCV1. Program reports 1 month stock-out of MMR vaccine. GoC=R+ D+

2014: Estimate based on estimated MCV1. Estimate challenged by: D-

2013: Estimate based on estimated MCV1. GoC=R+ D+

2012: Estimate based on estimated MCV1. GoC=R+ D+

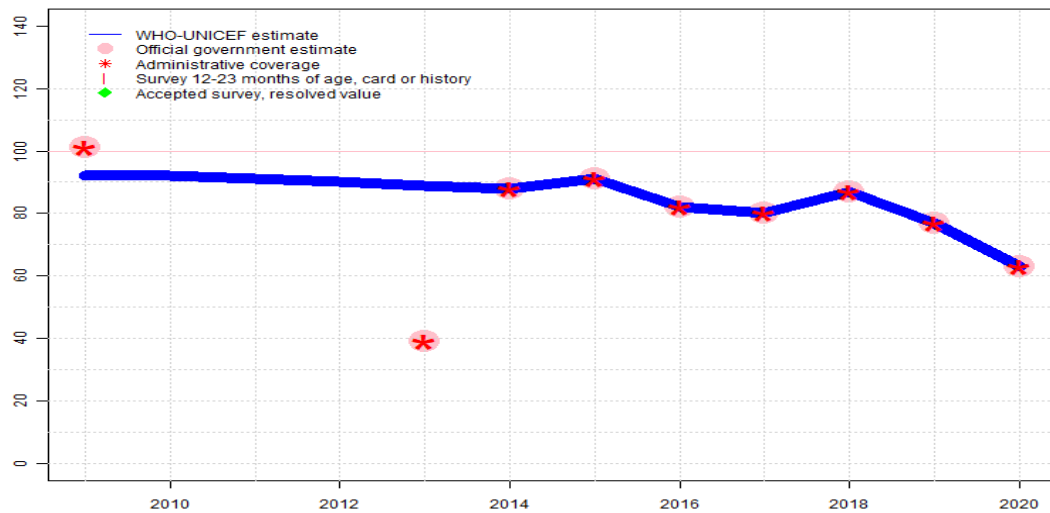
2011: Estimate based on estimated MCV1. GoC=R+ D+

2010: Estimate based on estimated MCV1. GoC=R+ D+

2009: Estimate based on estimated MCV1. GoC=R+ D+

# Brazil - HepBB

BRA - HepBB



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	92	92	91	90	89	88	91	82	80	87	77	63
Estimate GoC	●●	●	●	●	●	●●	●●	●●	●●	●●	●●	●●
Official	101	NA	NA	NA	39	88	91	82	80	87	77	63
Administrative	101	NA	NA	NA	39	88	91	82	80	87	77	63
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: 2020 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.

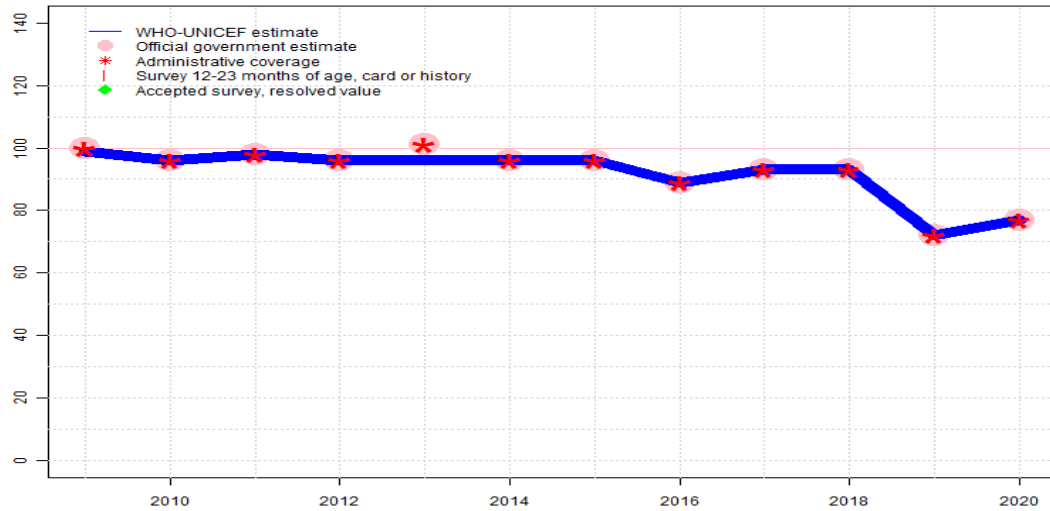
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Decline in reported coverage is unexplained by country but aligns with COVID-19 pandemic service disruptions. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. Estimate of 77 percent changed from previous revision value of 78 percent. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports a 3-month vaccine stock-out of HepB vaccine, not clear if combination or single antigen. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. Recovery in reported coverage level reflects successful revisions in the information system. GoC=R+ D+
- 2013: Estimate based on interpolation between reported values. Reported data excluded. Reported coverage level is an artifact of reporting. The HepB birth dose data field was changed in the information system during 2013. Estimate challenged by: D-
- 2012: Estimate based on interpolation between reported values. GoC=No accepted empirical data
- 2011: Estimate based on interpolation between reported values. GoC=No accepted empirical data
- 2010: Estimate based on interpolation between reported values. GoC=No accepted empirical data
- 2009: Estimate based on interpolation between reported values. Reported data excluded because 101 percent greater than 100 percent. GoC=R+ D+

# Brazil - HepB3

BRA - HepB3



## Description:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Increase in reported coverage is unexplained but may reflect recovery from vaccine stockouts reported for 2019. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. Programme reports a one-month (February) followed by a four-month (July-Oct) vaccine stockout at the national level.. Estimate of 72 percent changed from previous revision value of 80 percent. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 2 month vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports a 3-month vaccine stock-out of HepB vaccine, not clear if combination or single antigen. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. GoC=R+ D+
- 2013: Estimate based on interpolation between data reported by national government. Reported data excluded because 101 percent greater than 100 percent. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on coverage reported by national government. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	96	98	96	96	96	96	89	93	93	72	77
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●
Official	100	96	98	96	101	96	96	89	93	93	72	77
Administrative	100	96	98	96	101	96	96	89	93	93	72	77
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

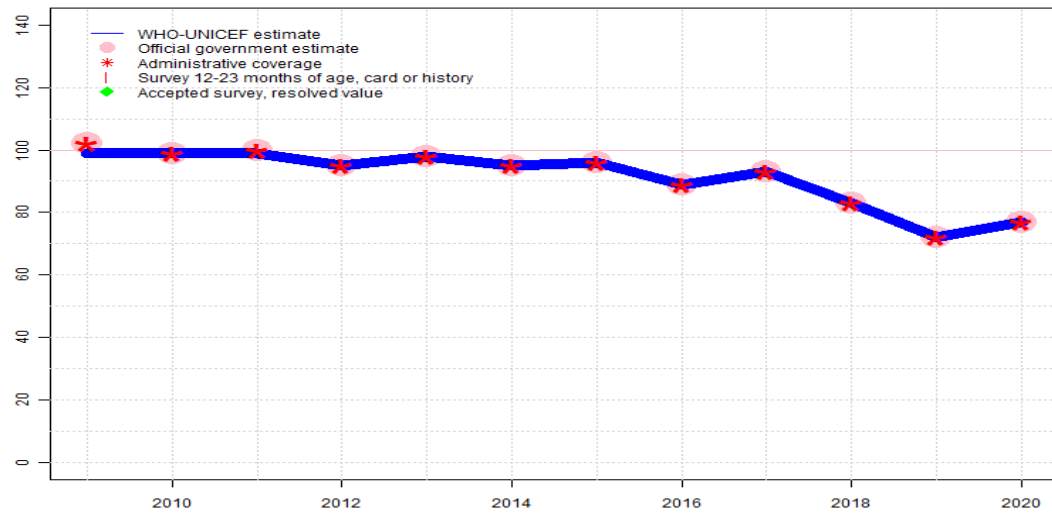
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2020 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.

# Brazil - Hib3

BRA - Hib3



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	99	95	98	95	96	89	93	83	72	77
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●
Official	102	99	100	95	98	95	96	89	93	83	72	77
Administrative	102	99	100	95	98	95	96	89	93	83	72	77
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: 2020 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.

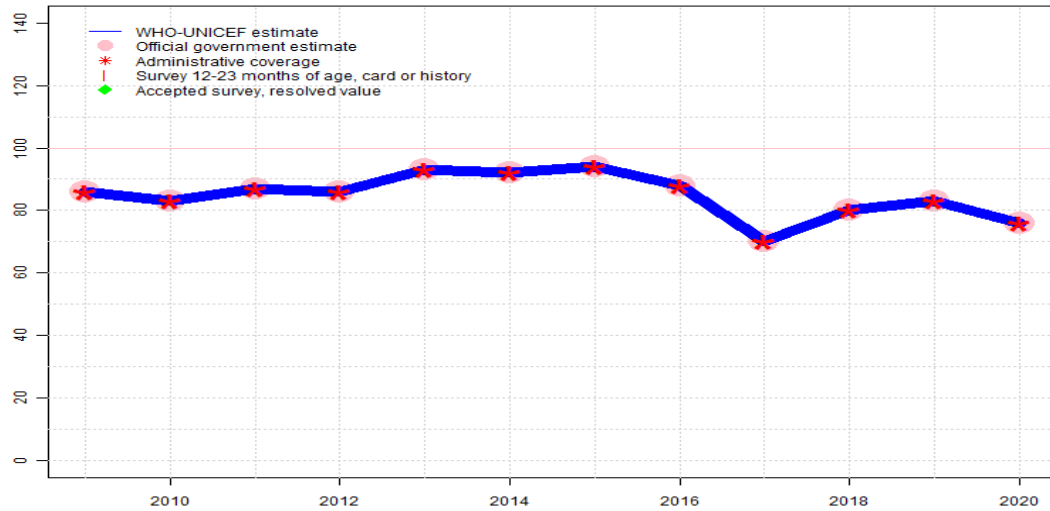
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Increase in reported coverage is unexplained but may reflect recovery from vaccine stockouts reported for 2019. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. Programme reports a one-month (February) followed by a four-month (July-Oct) vaccine stockout at the national level. Estimate of 72 percent changed from previous revision value of 80 percent. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 2 month vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports a 1-month vaccine stock-out. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. GoC=R+ D+
- 2013: Estimate based on coverage reported by national government. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. Recommended vaccine schedule changed in 2012 from DTP-Hib and OPV to a sequential DTaP-Hib-IPV for first and second dose and DTP-Hib and OPV for the third dose. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between reported values. Reported data excluded because 102 percent greater than 100 percent. GoC=R+ D+

# Brazil - RotaC

BRA - RotaC



## Description:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 1 month vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. GoC=R+ D+
- 2013: Estimate based on coverage reported by national government. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on coverage reported by national government. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	86	83	87	86	93	92	94	88	70	80	83	76
Estimate GoC	••	••	••	••	••	••	••	••	••	••	••	••
Official	86	83	87	86	93	92	94	88	70	80	83	76
Administrative	86	83	87	86	93	92	94	88	70	80	83	76
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.

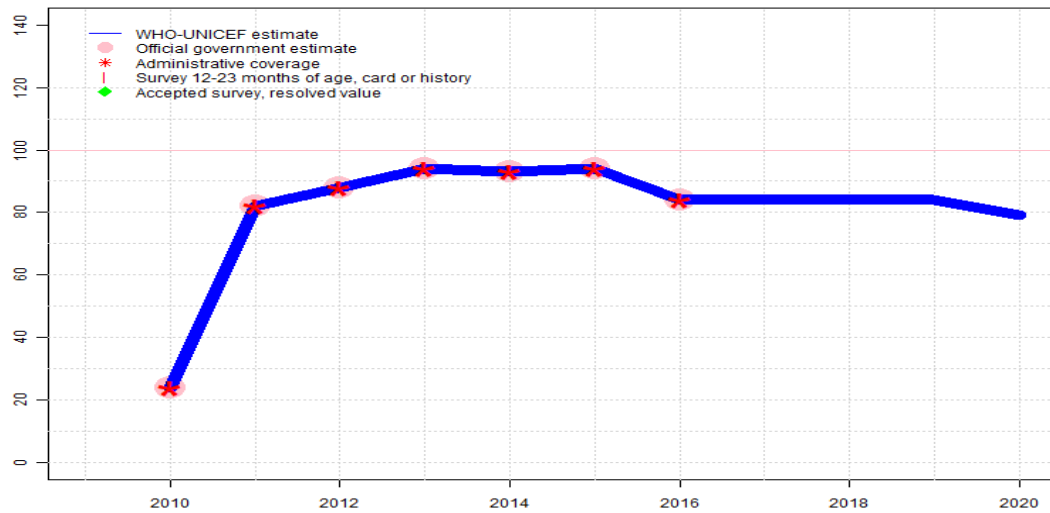
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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.



# Brazil - PcV3

BRA - PcV3



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	NA	24	82	88	94	93	94	84	84	84	84	79
Estimate GoC	NA	●●	●●	●●	●●	●●	●●	●●	●	●	●	●
Official	NA	24	82	88	94	93	94	84	NA	NA	NA	NA
Administrative	NA	24	82	88	94	93	94	84	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: 2020 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.

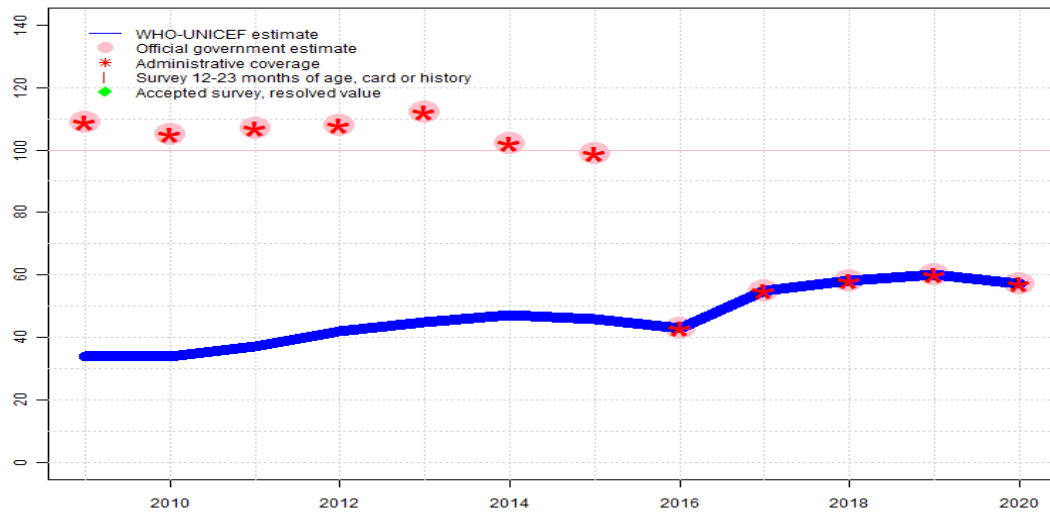
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2020: Estimate based on data reported for the second PCV dose. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=No accepted empirical data
- 2019: Estimate based on extrapolation from data reported by national government. GoC=No accepted empirical data
- 2018: Estimate based on extrapolation from data reported by national government. GoC=No accepted empirical data
- 2017: Estimate based on extrapolation from data reported by national government. GoC=No accepted empirical data
- 2016: Estimate based on coverage reported by national government. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. GoC=R+ D+
- 2013: Estimate based on coverage reported by national government. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. Pneumococcal conjugate vaccine introduced in 2010. GoC=R+ D+

# Brazil - YFV

BRA - YFV



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	34	34	37	42	45	47	46	43	55	58	60	57
Estimate GoC	•	•	•	•	•	•	•	••	••	••	••	••
Official	109	105	107	108	112	102	99	43	55	58	60	57
Administrative	109	105	107	108	112	102	99	43	55	58	60	57
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: 2020 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:

- 2020: Estimate based on coverage reported by national government. A nationwide study by Silveira et al. (doi.org/10.1016/j.vaccine.2021.04.046) observed that the COVID-19 pandemic was associated with a 20 percent decrease in childhood vaccinations though much of the decline was reversed by the end of 2020. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+
- 2019: Estimate based on coverage reported by national government. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 1 month vaccine stock-out. GoC=R+ D+
- 2016: Programme reports coverage for a national target population, in contrast to previous years. Programme reports 1 month vaccine stock-out. GoC=R+ D+
- 2015: Estimate of 46 percent assigned by working group. Reported coverage of 99 percent in 46 percent of the national target population. Estimate is based on coverage achieved in the total annual national target population. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.
- 2014: Estimate of 47 percent assigned by working group. Programme reports 102 percent coverage in 46 percent of the national target population. Estimate is based on coverage achieved in the total annual national target population. Reported data excluded because 102 percent greater than 100 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.
- 2013: Reported data calibrated to 2012 and 2014 levels. Reported data excluded because 112 percent greater than 100 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.
- 2012: Estimate of 42 percent assigned by working group. Forty six percent of surviving infants living in yellow fever endemic areas. Reported data excluded. Reported data are based on subnational coverage for at-risk population sub groups. Reported data excluded because 108 percent greater than 100 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.
- 2011: Reported data calibrated to 2010 and 2012 levels. Reported data excluded. Reported data are based on subnational coverage for at-risk population sub groups. Reported data excluded because 107 percent greater than 100 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.
- 2010: Estimate of 34 percent assigned by working group. Thirty-eight percent of surviving infants assumed to be living in yellow fever endemic areas based on 2009 information. No other areas were targeted. Reported data excluded. Reported data are based on subnational coverage for at-risk population sub groups. Reported data excluded because 105 percent greater than 100 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.
- 2009: Estimate of 34 percent assigned by working group. Thirty-eight percent of surviving infants living in yellow fever endemic areas. Eighty-nine percent coverage achieved in

# Brazil - YFV

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these areas. No other areas were targeted. Reported data excluded because 109 percent greater than 100 percent. GoC=Assigned by working group. GoC assigned to maintain consistency across vaccines.

Further information and estimates for previous years are available at:

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

<https://www.who.int/teams/immunization-vaccines-and-biologicals/immunization-analysis-and-insights/global-monitoring/data-statistics-and-graphics>