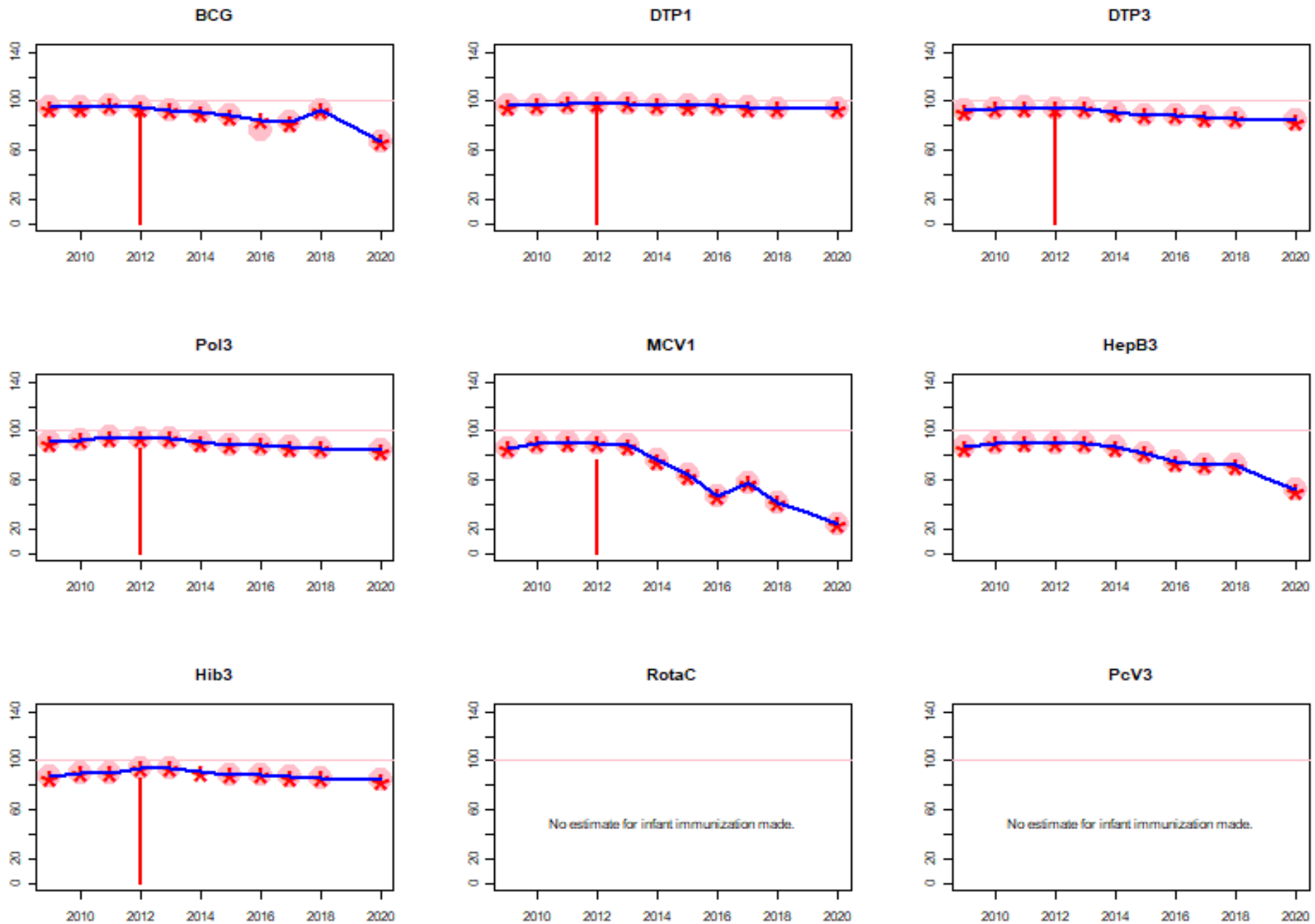


Montenegro: WHO and UNICEF estimates of immunization coverage: 2020 revision



# Montenegro: 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.

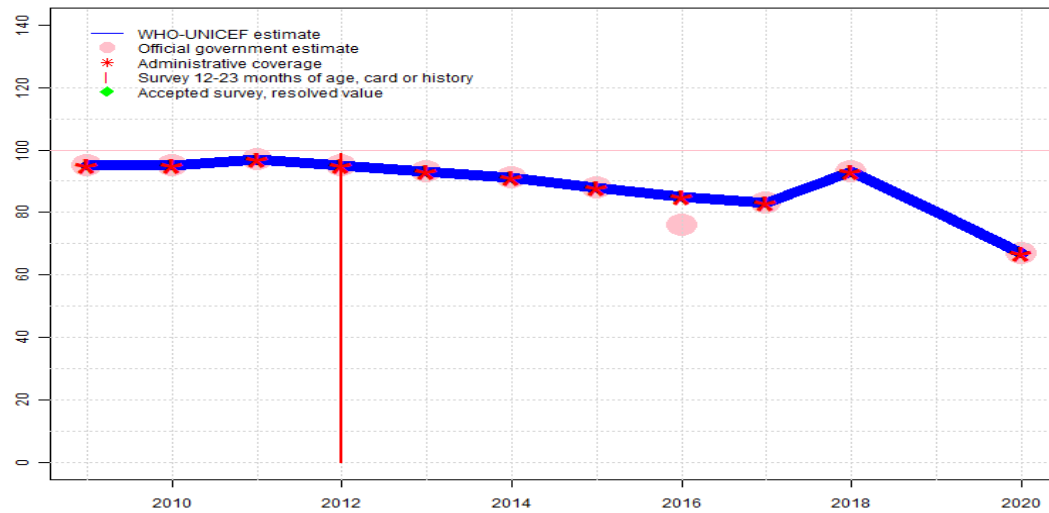
**PcV3:** percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine. In countries where the national schedule recommends two doses during infancy and a booster dose at 12 months or later based on the epidemiology of disease in the country, coverage estimates may reflect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

MNE - BCG



## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey assessment of vaccination coverage within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Unexplained decline in BCG coverage. GoC=R+ D+
- 2019: Estimate based on interpolation between reported values. Estimate of 80 percent changed from previous revision value of 93 percent. GoC=No accepted empirical data
- 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 reported administrative estimate. . GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. Programme reports a one month stock-out at the national level. 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. Survey results ignored. Sample size 255 less than 300. 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	95	95	97	95	93	91	88	85	83	93	80	67
Estimate GoC	••	••	••	••	••	••	••	••	••	••	•	••
Official	95	95	97	95	93	91	88	76	83	93	NA	67
Administrative	95	95	97	95	93	91	88	85	83	93	NA	67
Survey	NA	NA	NA	99	NA	NA	NA	NA	NA	NA	NA	NA

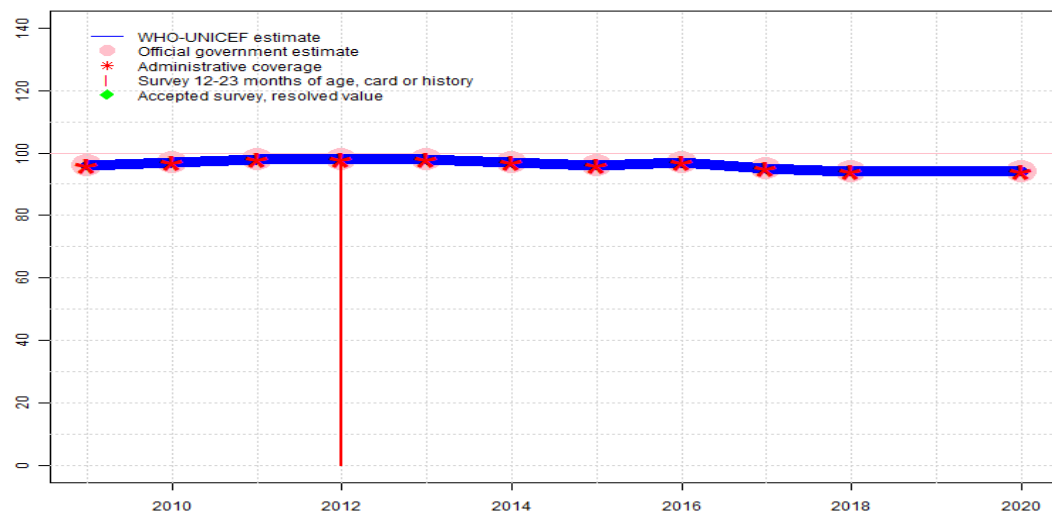
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

# Montenegro - DTP1

MNE - DTP1



## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey assessment of vaccination coverage 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 interpolation between reported values. GoC=No accepted empirical data
- 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. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. Programme reports two month stock-out of DTP containing vaccine at national level. GoC=R+ D+
- 2013: Estimate based on coverage reported by national government. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. Survey results ignored. Sample size 255 less than 300. 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	96	97	98	98	98	97	96	97	95	94	94	94
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●	●●
Official	96	97	98	98	98	97	96	97	95	94	NA	94
Administrative	96	97	98	98	98	97	96	97	95	94	NA	94
Survey	NA	NA	NA	97	NA	NA	NA	NA	NA	NA	NA	NA

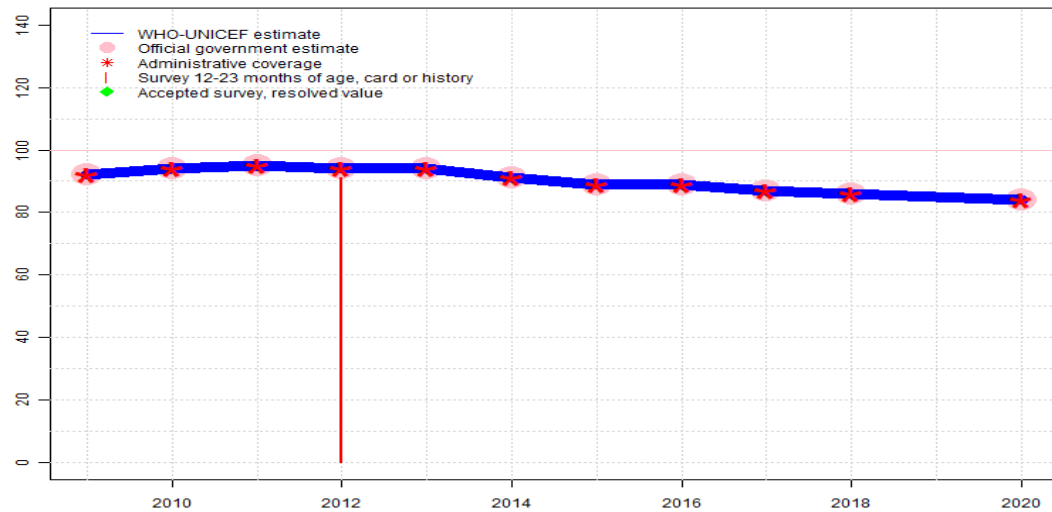
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

# Montenegro - DTP3

MNE - DTP3



## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey assessment of vaccination coverage 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 interpolation between reported values. Estimate of 85 percent changed from previous revision value of 86 percent. GoC=No accepted empirical data
- 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. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. Programme reports two month stock-out of DTP containing vaccine at national level. GoC=R+ D+
- 2013: Estimate based on coverage reported by national government. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. Survey results ignored. Sample size 255 less than 300. Montenegro Multiple Indicator Cluster Survey 2013 card or history results of 91 percent modified for recall bias to 92 percent based on 1st dose card or history coverage of 97 percent, 1st dose card only coverage of 90 percent and 3rd dose card only coverage of 85 percent. 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	92	94	95	94	94	91	89	89	87	86	85	84
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●	●●
Official	92	94	95	94	94	91	89	89	87	86	NA	84
Administrative	92	94	95	94	94	91	89	89	87	86	NA	84
Survey	NA	NA	NA	91	NA	NA	NA	NA	NA	NA	NA	NA

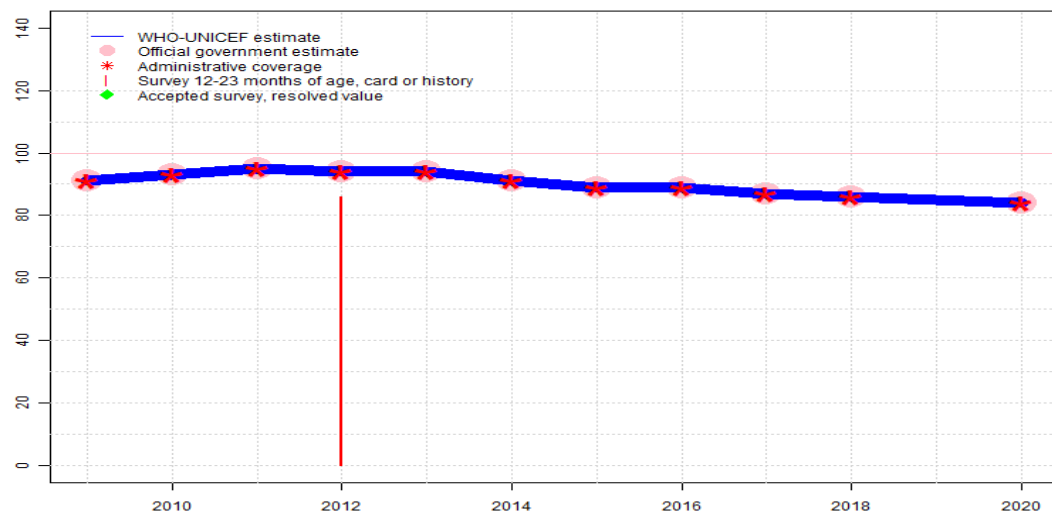
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

# Montenegro - Pol3

MNE - Pol3



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	91	93	95	94	94	91	89	89	87	86	85	84
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●	●●
Official	91	93	95	94	94	91	89	89	87	86	NA	84
Administrative	91	93	95	94	94	91	89	89	87	86	NA	84
Survey	NA	NA	NA	86	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.

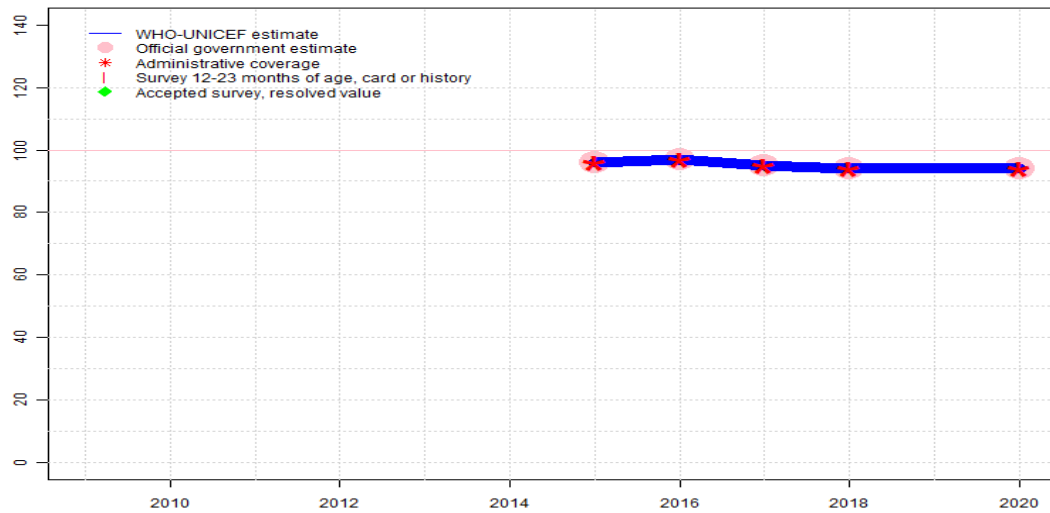
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey assessment of vaccination coverage 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 interpolation between reported values. Estimate of 85 percent changed from previous revision value of 86 percent. GoC=No accepted empirical data
- 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. 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. Survey results ignored. Sample size 255 less than 300. Montenegro Multiple Indicator Cluster Survey 2013 card or history results of 86 percent modified for recall bias to 87 percent based on 1st dose card or history coverage of 94 percent, 1st dose card only coverage of 86 percent and 3rd dose card only coverage of 80 percent. 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+

# Montenegro - IPV1

MNE - IPV1



## 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. No nationally representative household survey assessment of vaccination coverage 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 interpolation between reported values. GoC=No accepted empirical data

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. GoC=R+ D+

2015: Estimate based on coverage reported by national government. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	NA	NA	NA	NA	NA	NA	96	97	95	94	94	94
Estimate GoC	NA	NA	NA	NA	NA	NA	●●	●●	●●	●●	●	●●
Official	NA	NA	NA	NA	NA	NA	96	97	95	94	NA	94
Administrative	NA	NA	NA	NA	NA	NA	96	97	95	94	NA	94
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.

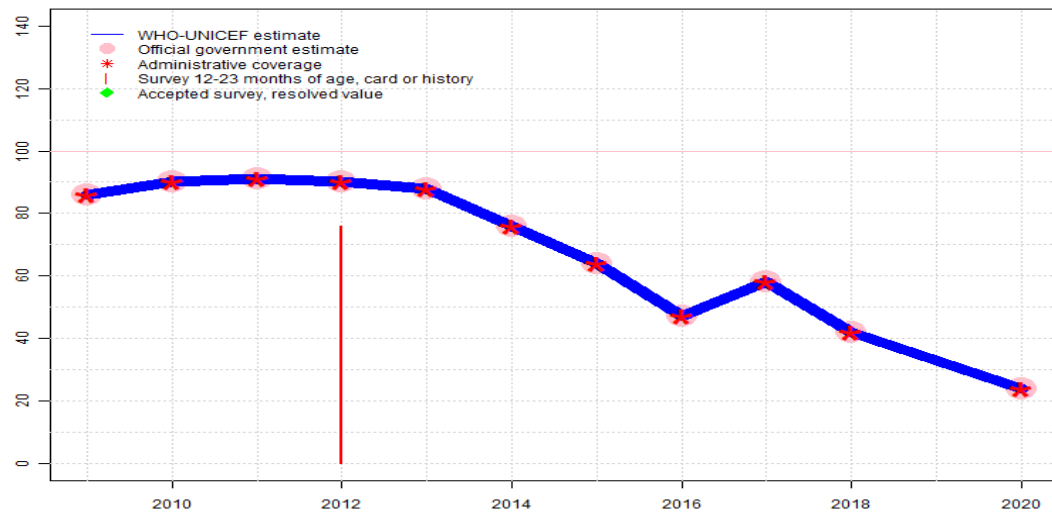
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk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



# Montenegro - MCV1

MNE - MCV1



## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey assessment of vaccination coverage within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Unexplained decline in MCV1 coverage. GoC=R+ D+
- 2019: Estimate based on interpolation between reported values. Estimate of 33 percent changed from previous revision value of 42 percent. GoC=No accepted empirical data
- 2018: Estimate based on coverage reported by national government. . GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Increase possibly explained by time elapsed since the negative rumors of 2016. Please see prior year comments. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports circulating rumors of linkages between measles containing vaccine and autism which may partly explain the decline in reported coverage between 2015 and 2016; otherwise, decline in measles coverage from 88 to 47 percent over the past several years is unexplained. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. Programme reports a two months stock-out at the national level. 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. Survey results ignored. Sample size 255 less than 300. 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	90	91	90	88	76	64	47	58	42	33	24
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●	●●
Official	86	90	91	90	88	76	64	47	58	42	NA	24
Administrative	86	90	91	90	88	76	64	47	58	42	NA	24
Survey	NA	NA	NA	76	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.

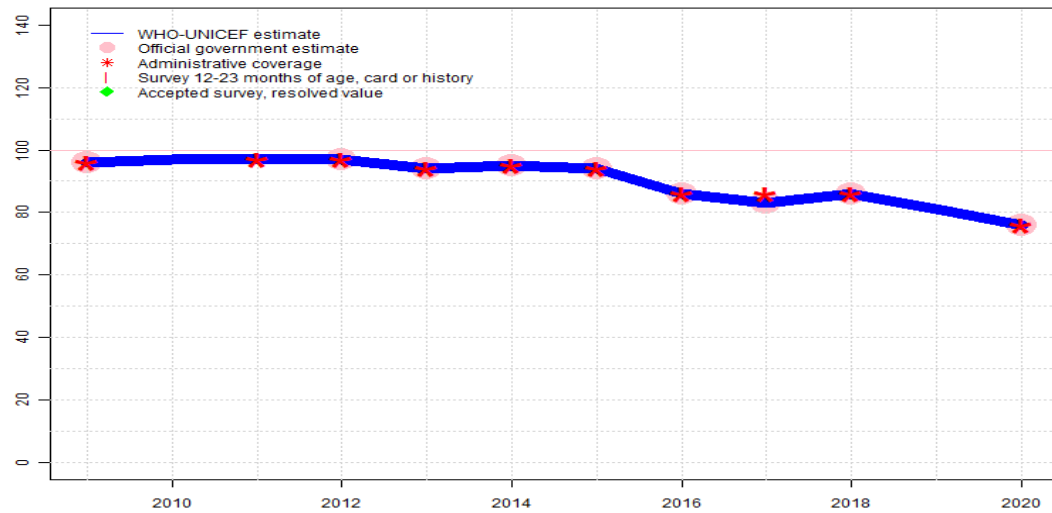
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk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



# Montenegro - MCV2

MNE - MCV2



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	96	97	97	97	94	95	94	86	83	86	81	76
Estimate GoC	●●	●	●●	●●	●●	●●	●●	●●	●●	●●	●	●
Official	96	NA	NA	97	94	95	94	86	83	86	NA	76
Administrative	96	NA	97	97	94	95	94	86	86	86	NA	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.

## 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. No nationally representative household survey assessment of vaccination coverage within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate challenged by: D-

2019: Estimate based on interpolation between reported values. Estimate of 81 percent changed from previous revision value of 86 percent. GoC=No accepted empirical data

2018: Estimate based on coverage reported by national government. WHO and UNICEF are aware that estimated coverage for the second dose of measles containing vaccine is greater than that for the first dose during 2015-2018. The difference in coverage levels may be partly explained by the recommended age for the second dose at 6 years. 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 circulating rumors of linkages between measles containing vaccine and autism which may partly explain the decline in reported coverage between 2015 and 2016. GoC=R+ D+

2015: Estimate based on coverage reported by national government. Programme reports a two months stock-out at the national level. 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+

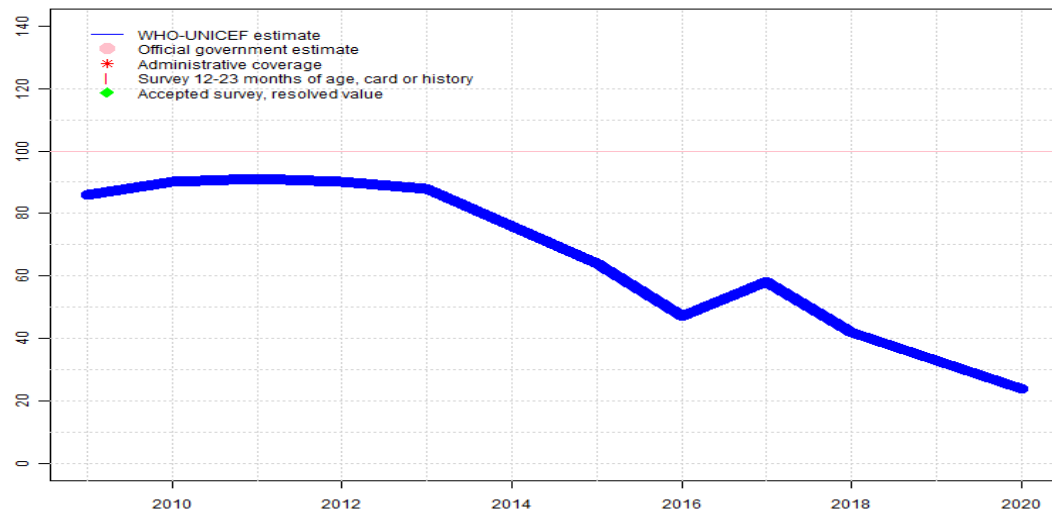
2011: Estimate based on reported administrative estimate. GoC=R+ D+

2010: Estimate based on interpolation between reported values. GoC=No accepted empirical data

2009: Estimate based on coverage reported by national government. GoC=R+ D+

# Montenegro - RCV1

MNE - RCV1



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	86	90	91	90	88	76	64	47	58	42	33	24
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. No nationally representative household survey assessment of vaccination coverage 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. Estimate of 33 percent changed from previous revision value of 42 percent. GoC=No accepted empirical data

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

2017: Estimate based on estimated MCV1. GoC=R+ D+

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

2015: Estimate based on estimated MCV1. GoC=R+ D+

2014: Estimate based on estimated MCV1. GoC=R+ D+

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

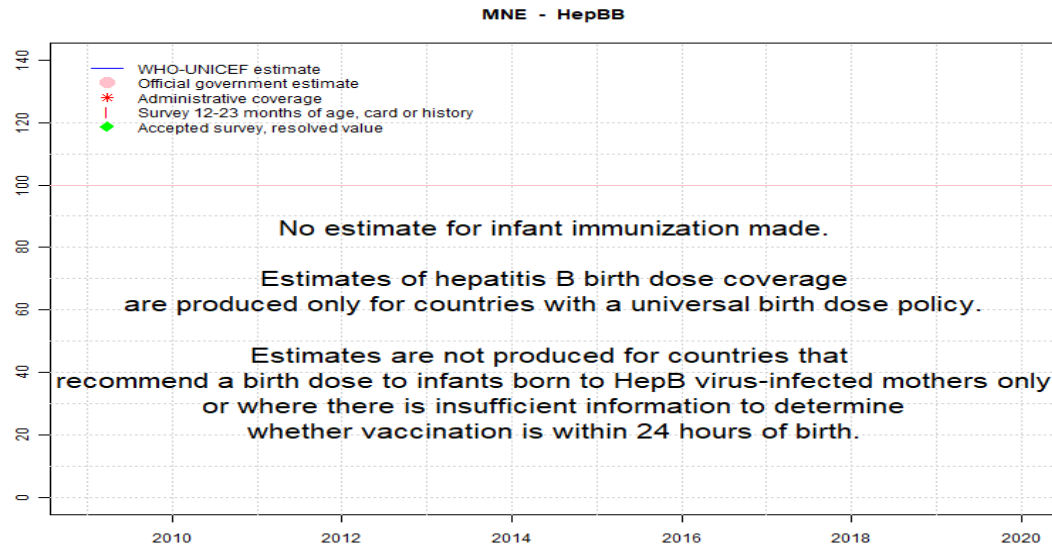
2012: Estimate based on estimated MCV1. GoC=R+ D+

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+

# Montenegro - HepBB



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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	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

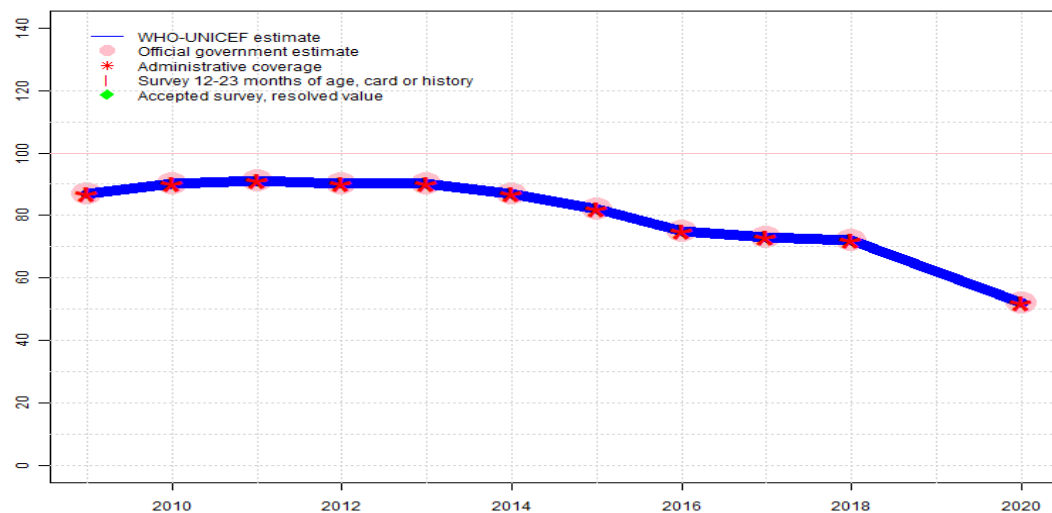
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

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# Montenegro - HepB3

MNE - HepB3



## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey assessment of vaccination coverage within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Programme reports a nine month vaccine stock out at national and district levels. GoC=R+ D+
- 2019: Estimate based on interpolation between reported values. Estimate of 62 percent changed from previous revision value of 72 percent. GoC=No accepted empirical data
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Country reports one month stock-out of HepB vaccine. 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	87	90	91	90	90	87	82	75	73	72	62	52
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●	●●
Official	87	90	91	90	90	87	82	75	73	72	NA	52
Administrative	87	90	91	90	90	87	82	75	73	72	NA	52
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

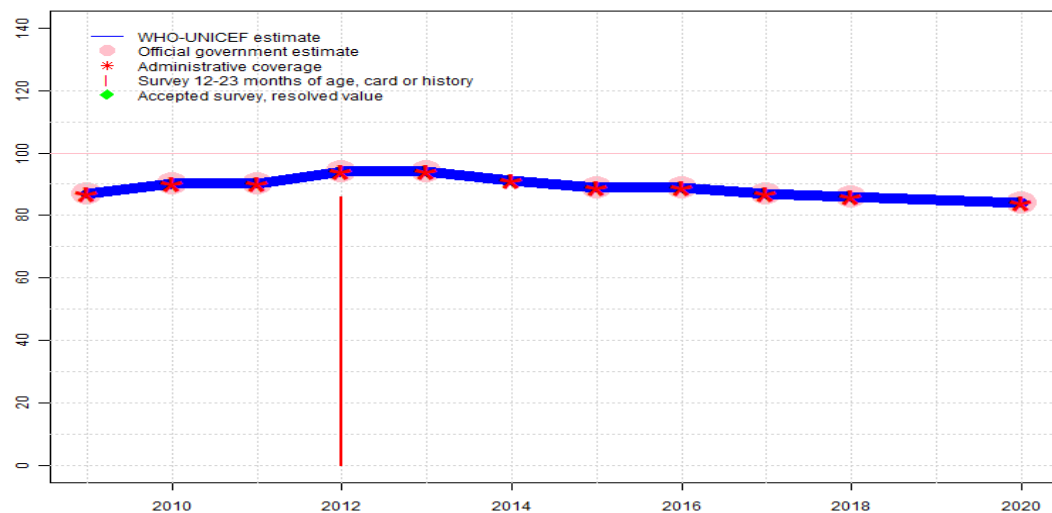
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

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# Montenegro - Hib3

MNE - Hib3



## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey assessment of vaccination coverage 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 interpolation between reported values. Estimate of 85 percent changed from previous revision value of 86 percent. GoC=No accepted empirical data
- 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. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. GoC=R+ D+
- 2014: Estimate based on reported administrative estimate. GoC=R+ D+
- 2013: Estimate based on coverage reported by national government. GoC=R+ D+
- 2012: Estimate based on coverage reported by national government. Survey results ignored. Sample size 255 less than 300. Montenegro Multiple Indicator Cluster Survey 2013 card or history results of 86 percent modified for recall bias to 87 percent based on 1st dose card or history coverage of 93 percent, 1st dose card only coverage of 87 percent and 3rd dose card only coverage of 81 percent. 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+

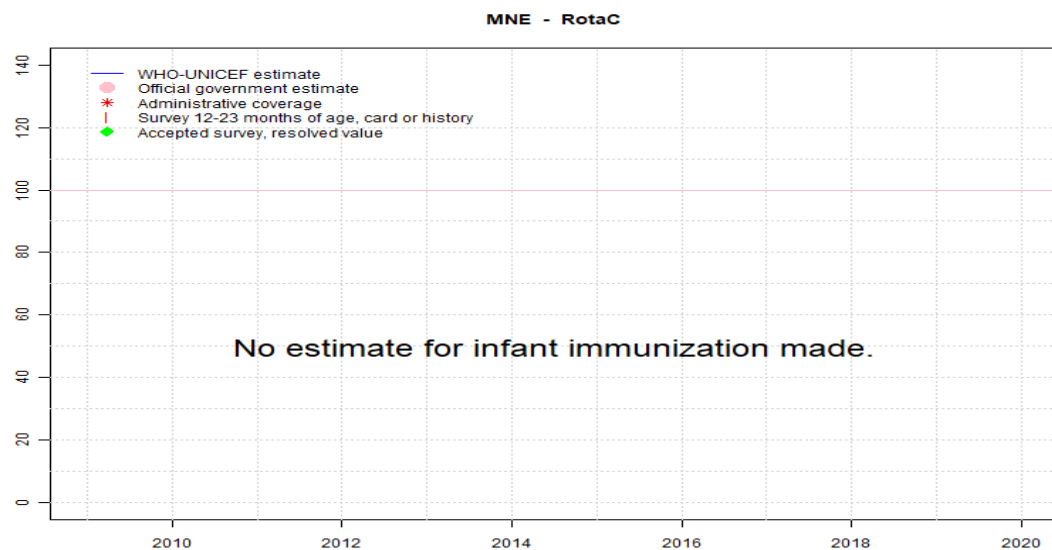
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	87	90	90	94	94	91	89	89	87	86	85	84
Estimate GoC	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●	●●
Official	87	90	90	94	94	NA	89	89	87	86	NA	84
Administrative	87	90	90	94	94	91	89	89	87	86	NA	84
Survey	NA	NA	NA	86	NA	NA	NA	NA	NA	NA	NA	NA

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.

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# Montenegro - RotaC



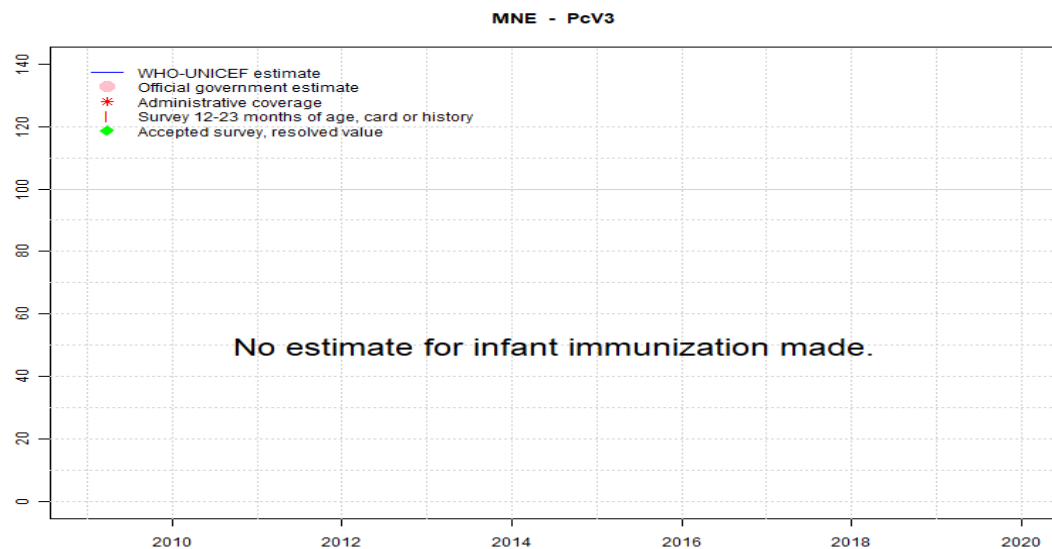
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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.

# Montenegro - PcV3



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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	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.



# Montenegro - survey details

## 2012 Montenegro Multiple Indicator Cluster Survey 2013

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	99.4	12-23 m	255	90
BCG	Card	87.1	12-23 m	-	90
BCG	Card or History	99.4	12-23 m	255	90
BCG	History	12.2	12-23 m	-	90
DTP1	C or H <12 months	97	12-23 m	255	90
DTP1	Card	89.9	12-23 m	-	90
DTP1	Card or History	97	12-23 m	255	90
DTP1	History	7.1	12-23 m	-	90
DTP3	C or H <12 months	84.5	12-23 m	255	90
DTP3	Card	85	12-23 m	-	90
DTP3	Card or History	91.4	12-23 m	255	90
DTP3	History	6.4	12-23 m	-	90
Hib1	C or H <12 months	92.1	12-23 m	255	90
Hib1	Card	87.3	12-23 m	-	90
Hib1	Card or History	93.1	12-23 m	255	90
Hib1	History	5.7	12-23 m	-	90
Hib3	C or H <12 months	80.3	12-23 m	255	90
Hib3	Card	80.7	12-23 m	-	90
Hib3	Card or History	86.3	12-23 m	255	90
Hib3	History	5.5	12-23 m	-	90
MCV1	Card	67.1	12-23 m	-	90
MCV1	Card or History	75.6	12-23 m	255	90
MCV1	History	8.5	12-23 m	-	90
Pol1	C or H <12 months	92.8	12-23 m	255	90
Pol1	Card	86	12-23 m	-	90
Pol1	Card or History	93.8	12-23 m	255	90
Pol1	History	7.8	12-23 m	-	90
Pol3	C or H <12 months	80.3	12-23 m	255	90
Pol3	Card	79.5	12-23 m	-	90
Pol3	Card or History	86.4	12-23 m	255	90
Pol3	History	6.9	12-23 m	-	90

## 2011 Montenegro Multiple Indicator Cluster Survey 2013

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	98.1	24-35 m	267	90
DTP1	C or H <12 months	96.6	24-35 m	267	90
DTP3	C or H <12 months	81.4	24-35 m	267	90
Hib1	C or H <12 months	93.5	24-35 m	267	90
Hib3	C or H <12 months	80.3	24-35 m	267	90
MCV1	C or H <24 months	92.2	24-35 m	267	90
Pol1	C or H <12 months	93.4	24-35 m	267	90
Pol3	C or H <12 months	79.9	24-35 m	267	90

## 2004 Montenegro Multiple Indicator Cluster Survey 2005

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	87.6	18-29 m	201	71
BCG	Card	57.7	18-29 m	201	71
BCG	Card or History	89.2	18-29 m	201	71
BCG	History	31.6	18-29 m	201	71
DTP1	C or H <12 months	96.5	18-29 m	201	71
DTP1	Card	73.1	18-29 m	201	71
DTP1	Card or History	98.6	18-29 m	201	71
DTP1	History	25.5	18-29 m	201	71
DTP3	C or H <12 months	88.6	18-29 m	201	71
DTP3	Card	78.7	18-29 m	201	71
DTP3	Card or History	92.3	18-29 m	201	71
DTP3	History	13.5	18-29 m	201	71
MCV1	C or H <12 months	78.3	18-29 m	201	71
MCV1	Card	60.1	18-29 m	201	71
MCV1	Card or History	83.3	18-29 m	201	71
MCV1	History	23.2	18-29 m	201	71
Pol1	C or H <12 months	93.7	18-29 m	201	71
Pol1	Card	69.4	18-29 m	201	71
Pol1	Card or History	94.3	18-29 m	201	71
Pol1	History	24.9	18-29 m	201	71
Pol3	C or H <12 months	85.8	18-29 m	201	71
Pol3	Card	74.5	18-29 m	201	71
Pol3	Card or History	88.7	18-29 m	201	71
Pol3	History	14.3	18-29 m	201	71

# Montenegro - survey details

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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>