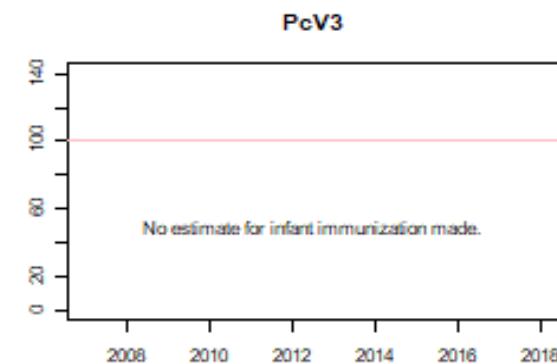
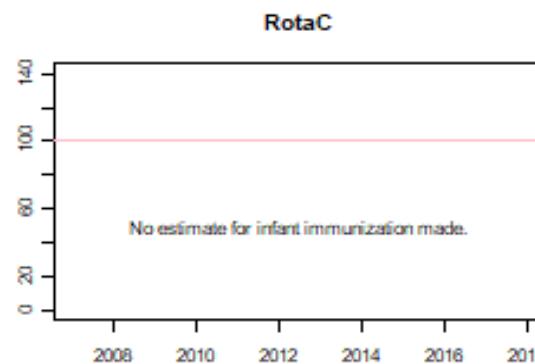
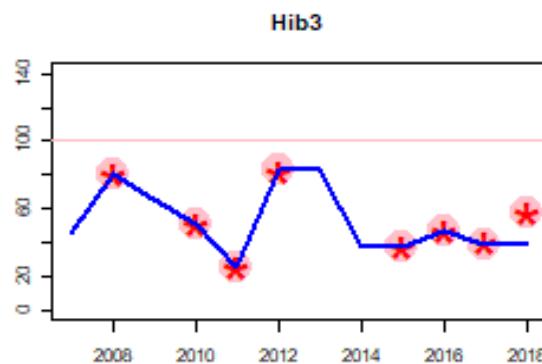
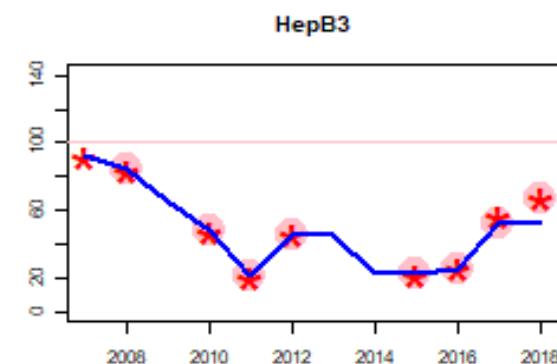
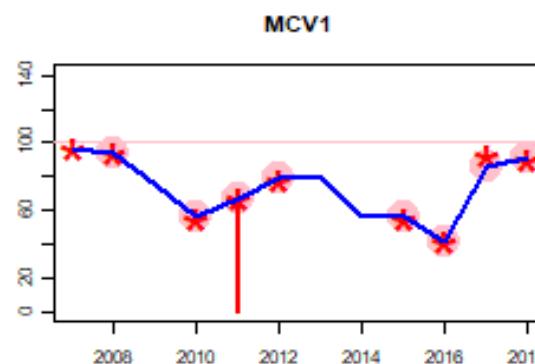
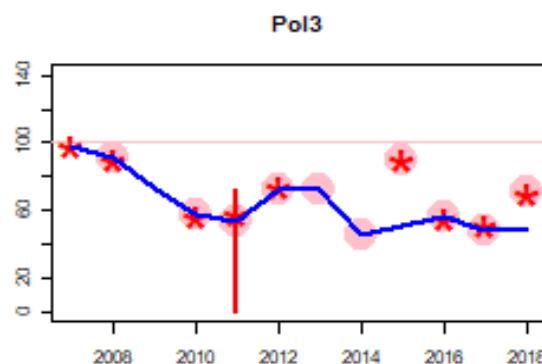
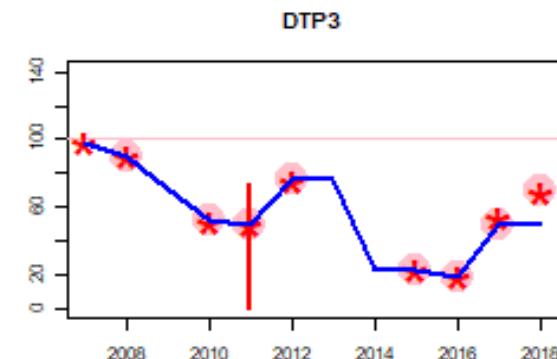
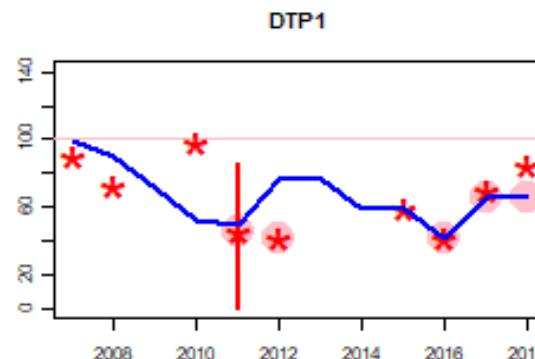
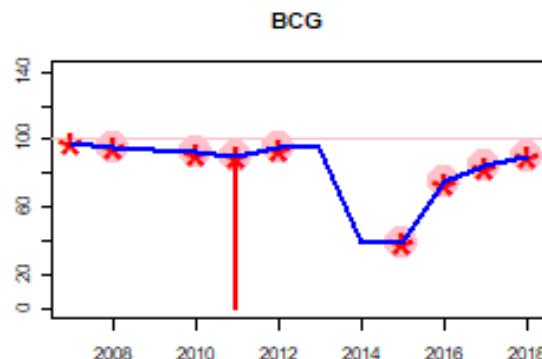


# Ukraine: WHO and UNICEF estimates of immunization coverage: 2018 revision



# Ukraine: WHO and UNICEF estimates of immunization coverage: 2018 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.

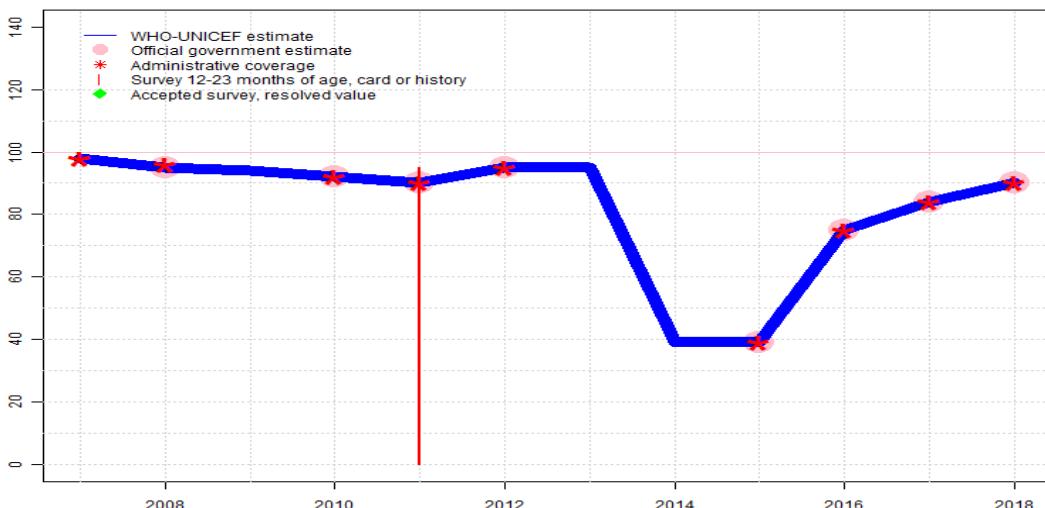
**PcV3:** percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine. In countries where the national schedule recommends two doses during infancy and a booster dose at 12 months or later based on the epidemiology of disease in the country, coverage estimates may reflect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

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

# Ukraine - BCG

UKR - BCG



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	98	95	94	92	90	95	95	39	39	75	84	90
Estimate GoC	●●	●●	●	●●	●●	●●	●	●	●●	●●	●	●
Official	NA	95	NA	92	90	95	NA	NA	39	75	84	90
Administrative	98	96	NA	92	90	95	NA	NA	39	75	84	90
Survey	NA	NA	NA	NA	95	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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

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

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

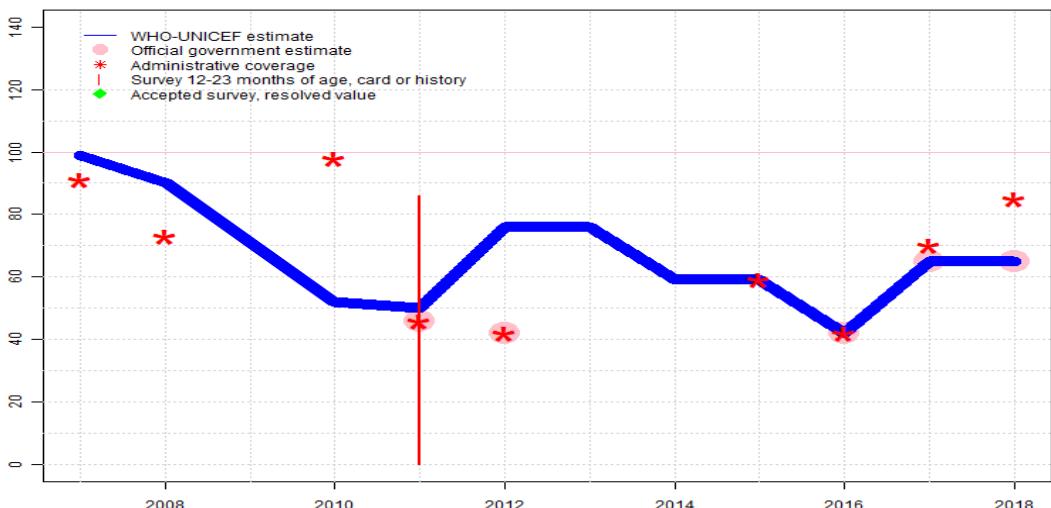
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

- 2018: Estimate based on coverage reported by national government. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate challenged by: D-
- 2017: Estimate based on coverage reported by national government. Programme recovering from vaccine shortages.. Estimate challenged by: D-
- 2016: Estimate based on coverage reported by national government. Programme reports 9 month national stock-out. Estimate based on reported data. GoC=R+ D+
- 2015: Estimate based on reported BCG coverage for 2015. Programme reports 5-month stock-out at the national level. GoC=R+ D+
- 2014: Estimate of 39 percent assigned by working group. Estimate based on reported BCG coverage for 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 95 percent assigned by working group. Estimate based on reported BCG coverage for 2012. GoC=No accepted empirical data
- 2012: Estimate based on reported BCG coverage for 2012. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. Ukraine Multiple Indicator Cluster Survey 2012 results ignored by working group. Survey results for children aged 18-29 months reflect late vaccination. Survey coverage by 12 months support reported coverage levels. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between coverage reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on coverage reported by national government. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on reported administrative data. GoC=R+ D+

# Ukraine - DTP1

UKR - DTP1



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	99	90	71	52	50	76	76	59	59	42	65	65
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	NA	NA	NA	46	42	NA	NA	NA	42	65	65
Administrative	91	73	NA	98	46	42	NA	NA	59	42	70	85
Survey	NA	NA	NA	NA	86	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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

## Description:

- 2018: Estimate based on coverage reported by national government. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme recovering from vaccine shortages.. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports 6 month national stock-out. GoC=R+ D+
- 2015: Programme reports 5-month stock-out at the national level. GoC=R+ D+
- 2014: Estimate of 59 percent assigned by working group. Estimate based on reported DTP1 coverage for 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 76 percent assigned by working group. Reported DTP1 coverage levels less than reported DTP3. The historical performance of the system suggests minimal dropout not only for completion of multi-dose vaccines but for all vaccines. In the absence of better data DTP1 coverage is assumed to be the GoC=No accepted empirical data
- 2012: Estimate of 76 percent assigned by working group. Reported DTP1 coverage levels less than reported DTP3. The historical performance of the system suggests minimal dropout not only for completion of multi-dose vaccines but for all vaccines. In the absence of better data DTP1 coverage is assumed to be the GoC=No accepted empirical data
- 2011: Reported DTP1 coverage levels less than reported DTP3. The historical performance of the system suggests minimal dropout not only for completion of multi-dose vaccines but for all vaccines. In the absence of better data DTP1 coverage is assumed to be the GoC=No accepted empirical data
- 2010: Reported DTP1 coverage levels less than reported DTP3. The historical performance of the system suggests minimal dropout not only for completion of multi-dose vaccines but for all vaccines. In the absence of better data DTP1 coverage is assumed to be the same as DTP3 coverage. Estimate challenged by: D-R-
- 2009: Reported DTP1 coverage levels less than reported DTP3. The historical performance of the system suggests minimal dropout not only for completion of multi-dose vaccines but for all vaccines. In the absence of better data DTP1 coverage is assumed to be the GoC=No accepted empirical data
- 2008: Reported DTP1 coverage levels less than reported DTP3. The historical performance of the system suggests minimal dropout not only for completion of multi-dose vaccines but for all vaccines. In the absence of better data DTP1 coverage is assumed to be the same as DTP3 coverage. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. Estimate challenged by: D-R-

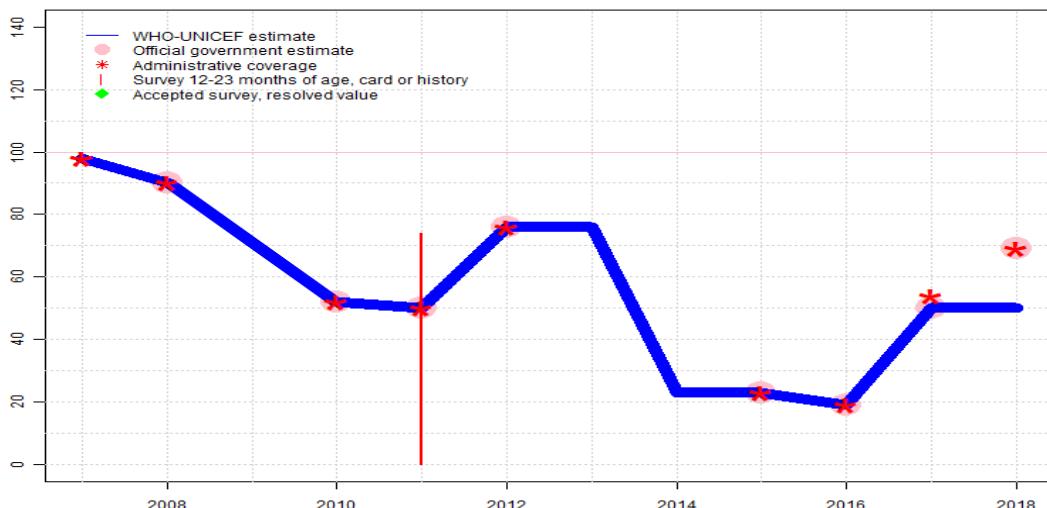
# Ukraine - DTP1

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2007: Reported data calibrated to 2001 and 2012 levels. Estimate challenged by: D-R-

# Ukraine - DTP3

UKR - DTP3



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	98	90	71	52	50	76	76	23	23	19	50	50
Estimate GoC	••	••	•	••	•	••	•	•	••	••	••	••
Official	NA	90	NA	52	50	76	NA	NA	23	19	50	69
Administrative	98	90	NA	52	50	76	NA	NA	23	19	54	69
Survey	NA	NA	NA	NA	74	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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

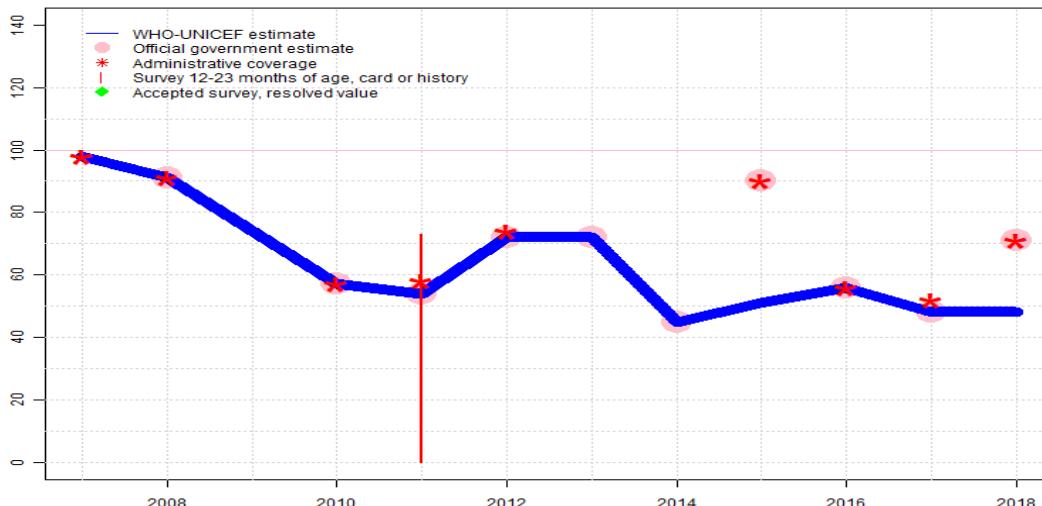
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2018: Estimate based on extrapolation from data reported by national government. Reported data excluded due to sudden change in coverage from 50 level to 69 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme recovering from vaccine shortages.. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports 6 month national stock-out. Reported number of children vaccinated with three doses of DTP containing vaccine has declined by 78 percent between 2012 and 2016. GoC=R+ D+
- 2015: Estimate based on estimated DTP3 coverage level in 2015. Programme reports 5-month stock-out at the national level. GoC=R+ D+
- 2014: Estimate of 23 percent assigned by working group. Estimate based on estimated DTP3 coverage level in 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 76 percent assigned by working group. Estimate based on estimated DTP3 coverage level in 2012. GoC=No accepted empirical data
- 2012: Estimate based on estimated DTP3 coverage level in 2012. Increase in coverage likely represents restoration of public confidence in the national immunization system and improved vaccine supply. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. Ukraine Multiple Indicator Cluster Survey 2012 results ignored by working group. Survey results for children aged 18-29 months reflect late vaccination. Survey coverage by 12 months support reported coverage levels.Ukraine Multiple Indicator Cluster Survey 2012 card or history results of 74 percent modified for recall bias to 76 percent based on 1st dose card or history coverage of 86 percent, 1st dose card only coverage of 82 percent and 3rd dose card only coverage of 72 percent. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between coverage reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on coverage reported by national government. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on reported administrative data. GoC=R+ D+

# Ukraine - Pol3

UKR - Pol3



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	98	91	74	57	54	72	72	45	51	56	48	48
Estimate GoC	••	••	•	••	•	••	••	••	•	••	••	••
Official	NA	91	NA	57	54	72	72	45	90	56	48	71
Administrative	98	91	NA	57	58	74	NA	NA	90	56	52	71
Survey	NA	NA	NA	NA	73	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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

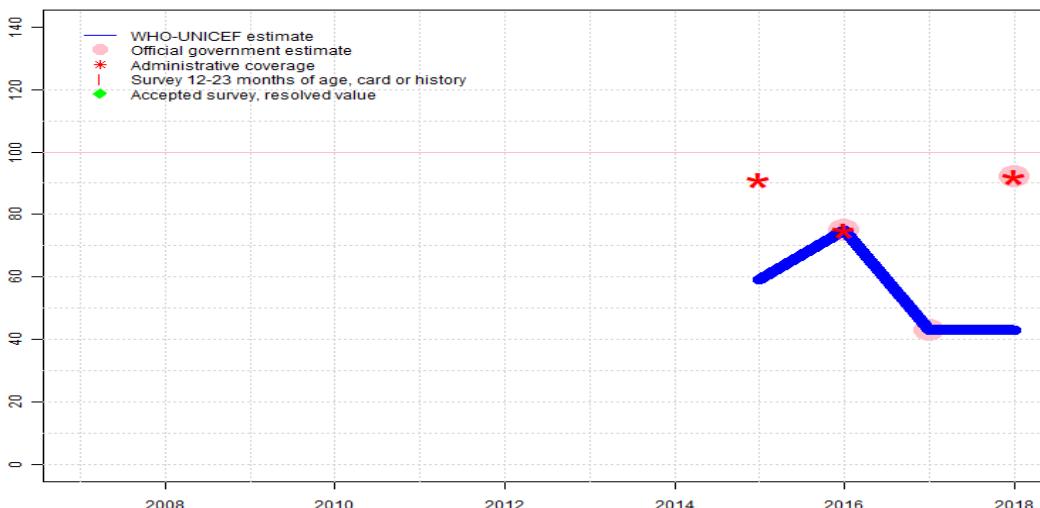
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

- 2018: Estimate based on extrapolation from data reported by national government. Reported data excluded due to sudden change in coverage from 48 level to 71 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=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 4 month national stock-out. GoC=R+ D+
- 2015: Estimate based on interpolation between data reported by national government. Reported data excluded. Reported coverage likely includes doses given during polio campaigns. Reported data excluded due to an increase from 45 percent to 90 percent with decrease 56 percent. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. Drop in reported coverage due to vaccine shortage. GoC=R+
- 2013: Estimate based on coverage reported by national government. GoC=R+
- 2012: Estimate based on coverage reported by national government. Increase in coverage likely represents restoration of public confidence in the national immunization system and improved vaccine supply. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. Ukraine Multiple Indicator Cluster Survey 2012 results ignored by working group. Survey results for children aged 18-29 months reflect late vaccination. Survey coverage by 12 months support reported coverage levels. Ukraine Multiple Indicator Cluster Survey 2012 card or history results of 73 percent modified for recall bias to 75 percent based on 1st dose card or history coverage of 85 percent, 1st dose card only coverage of 81 percent and 3rd dose card only coverage of 71 percent. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on coverage reported by national government. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on reported administrative data. GoC=R+ D+

# Ukraine - IPV1

UKR - 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).

- 2018: Estimate based on extrapolation from data reported by national government. Reported data excluded due to sudden change in coverage from 43 level to 92 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate challenged by: D-
- 2017: Estimate based on coverage reported by national government. GoC=R+
- 2016: Estimate based on coverage reported by national government. Estimate based on reported data. GoC=R+ D+
- 2015: Estimate based on estimated DTP1 coverage level. Inactivated polio vaccine introduced in 2007 as a sequential schedule with IPV recommended at 2 and 4 months and OPV recommended afterwards. Estimate challenged by: D-R-

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	NA	59	75	43	43							
Estimate GoC	NA	●	●●	●●	●							
Official	NA	75	43	92								
Administrative	NA	91	75	NA	92							
Survey	NA											

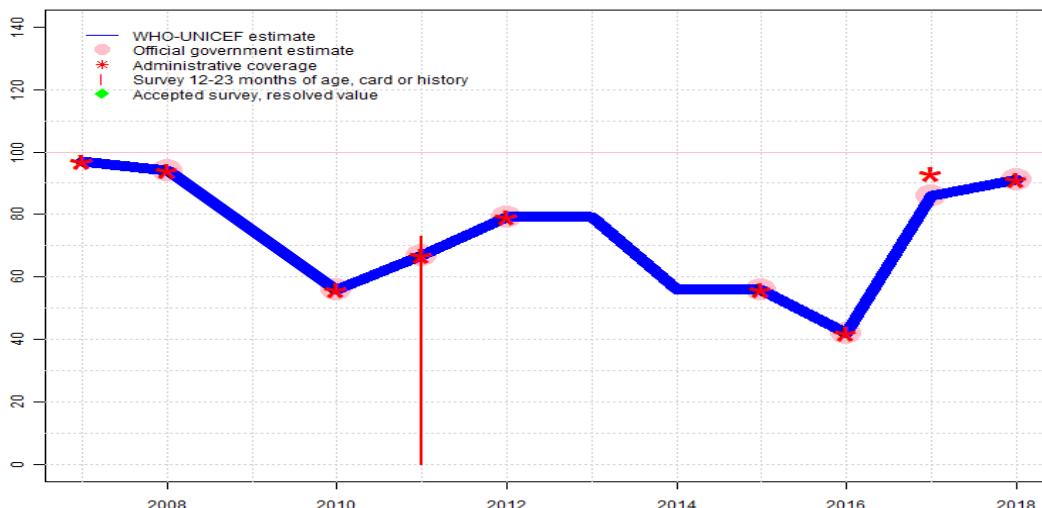
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

# Ukraine - MCV1

UKR - MCV1



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	97	94	75	56	67	79	79	56	56	42	86	91
Estimate GoC	●●	●●	●	●●	●●	●●	●	●	●●	●●	●	●
Official	NA	94	NA	56	67	79	NA	NA	56	42	86	91
Administrative	97	94	NA	56	67	79	NA	NA	56	42	93	91
Survey	NA	NA	NA	NA	73	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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

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

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

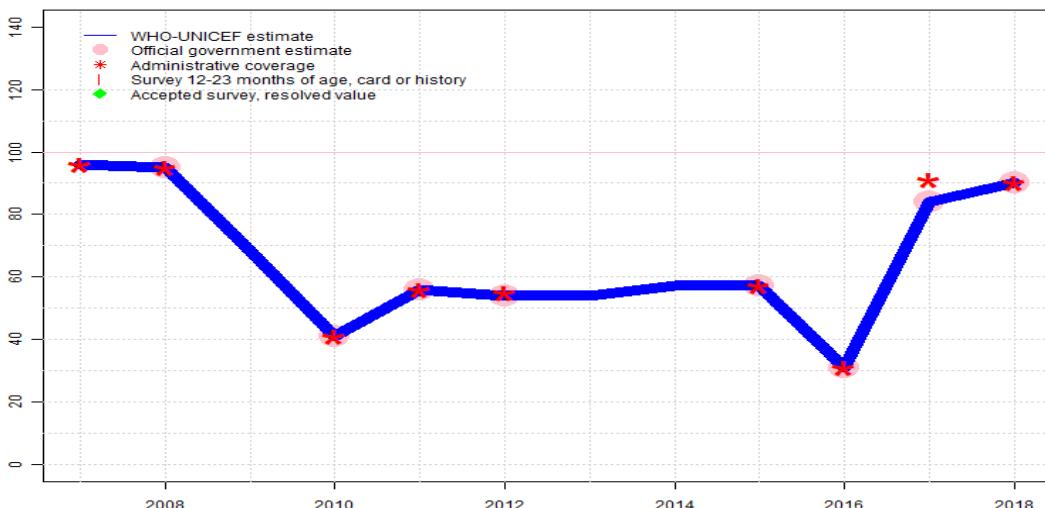
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2018: Estimate based on coverage reported by national government. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate challenged by: D-
- 2017: Estimate based on coverage reported by national government. Programme recovering from vaccine shortages.. Estimate challenged by: D-
- 2016: Estimate based on coverage reported by national government. Programme reports 6 month national stock-out. GoC=R+ D+
- 2015: Estimate based on estimated MCV1 coverage level in 2015. Programme reports 7-month stock-out at the national level. GoC=R+ D+
- 2014: Estimate of 56 percent assigned by working group. Estimate based on estimated MCV1 coverage level in 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 79 percent assigned by working group. Estimate based on estimated MCV1 coverage level in 2012. GoC=No accepted empirical data
- 2012: Estimate based on estimated MCV1 coverage level in 2012. Increase in coverage likely represents restoration of public confidence in the national immunization system and improved vaccine supply. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. Ukraine Multiple Indicator Cluster Survey 2012 results ignored by working group. Survey results for children aged 18-29 months reflect late vaccination. Survey coverage by 12 months support reported coverage levels. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. GoC=R+ D+
- 2009: Estimate based on interpolation between coverage reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on coverage reported by national government. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on reported administrative data. GoC=R+ D+

# Ukraine - MCV2

UKR - MCV2



## Description:

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

- 2018: Estimate based on coverage reported by national government. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme recovering from vaccine shortages.. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports 6 month national stock-out. GoC=R+ D+
- 2015: Estimate based on estimated MCV2 coverage level in 2015. Programme reports 7-month stock-out at the national level. GoC=R+ D+
- 2014: Estimate of 57 percent assigned by working group. Estimate based on estimated MCV2 coverage level in 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 54 percent assigned by working group. Estimate based on estimated MCV2 coverage level in 2012. GoC=No accepted empirical data
- 2012: Estimate based on estimated MCV2 coverage level in 2012. Estimate challenged by: D-
- 2011: Estimate based on reported data. Estimate challenged by: D-
- 2010: Estimate based on reported data. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on reported data. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. Estimate challenged by: D-
- 2007: Estimate based on reported data. Estimate challenged by: D-

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	96	95	68	41	56	54	54	57	57	31	84	90
Estimate GoC	•	•	•	••	•	•	•	•	••	••	••	••
Official	NA	95	NA	41	56	54	NA	NA	57	31	84	90
Administrative	96	95	NA	41	56	55	NA	NA	57	31	91	90
Survey	NA											

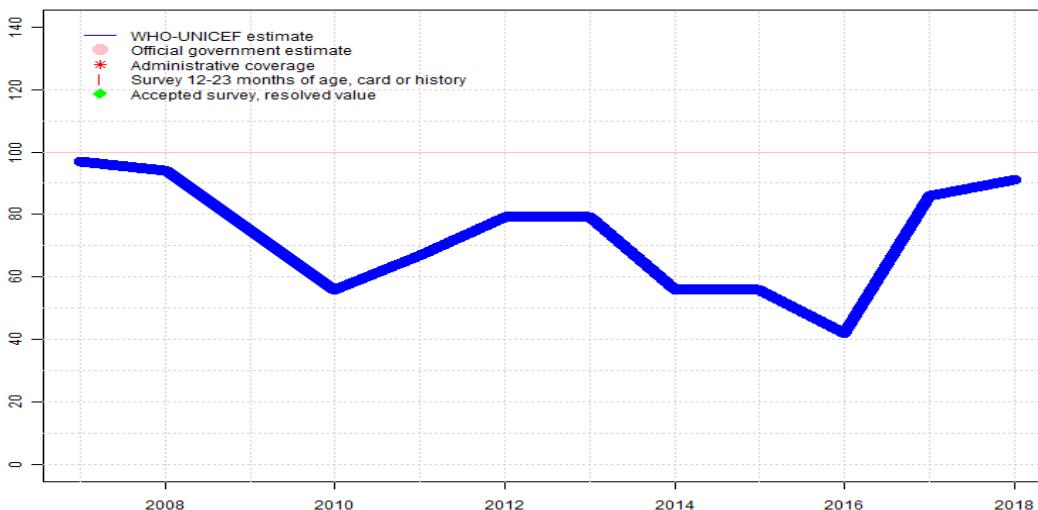
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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# Ukraine - RCV1

UKR - RCV1



## Description:

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

- 2018: Estimate based on estimated MCV1. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimate challenged by: D-
- 2017: Estimate based on estimated MCV1. Programme recovering from vaccine shortages.. Estimate challenged by: 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. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate based on estimated MCV1. GoC=No accepted empirical data
- 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=No accepted empirical data
- 2008: Estimate based on estimated MCV1. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on estimated MCV1. GoC=R+ D+

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	97	94	75	56	67	79	79	56	56	42	86	91
Estimate GoC	••	••	•	••	••	••	•	•	••	••	•	•
Official	NA											
Administrative	NA											
Survey	NA											

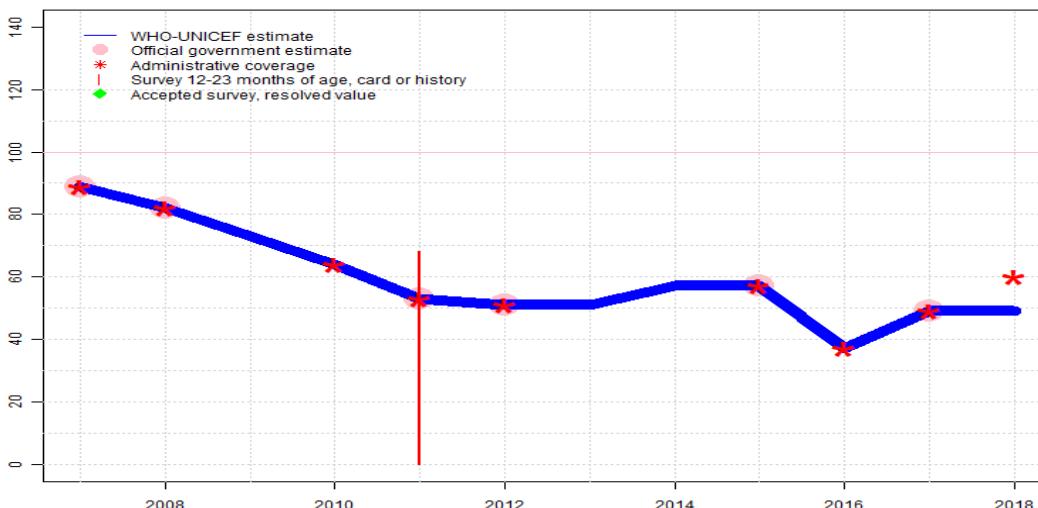
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability 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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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# Ukraine - HepBB

UKR - HepBB



## Description:

- 2018: Estimate based on extrapolation from data reported by national government. Reported data excluded due to sudden change in coverage from 49 level to 60 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme recovering from vaccine shortages.. GoC=R+ D+
- 2016: Estimate based on reported administrative data. Estimate based on reported data. GoC=R+ D+
- 2015: Estimate based on estimated HepBB coverage level in 2015. GoC=R+ D+
- 2014: Estimate of 57 percent assigned by working group. Estimate based on estimated HepBB coverage level in 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 51 percent assigned by working group. Estimate based on estimated HepBB coverage level in 2012. GoC=No accepted empirical data
- 2012: Estimate based on estimated HepBB coverage level in 2012. GoC=R+ D+
- 2011: Estimate based on reported data. Ukraine Multiple Indicator Cluster Survey 2012 results ignored by working group. Survey results for children aged 18-29 months reflect late vaccination. Survey coverage by 12 months support reported coverage levels. GoC=R+ D+
- 2010: Estimate based on reported data. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on reported data. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on reported data. GoC=R+ D+

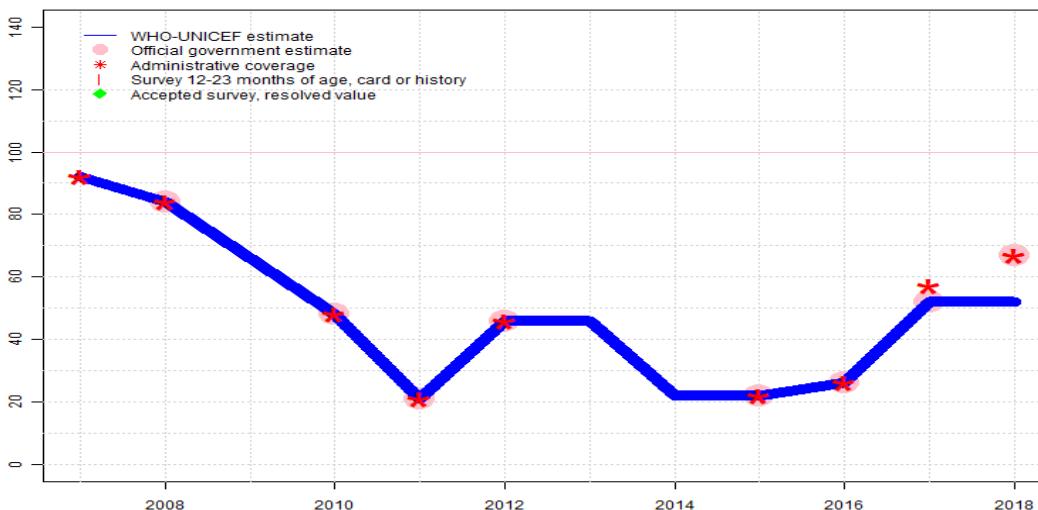
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

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

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

# Ukraine - HepB3

UKR - HepB3



## Description:

- 2018: Estimate based on extrapolation from data reported by national government. Reported data excluded due to sudden change in coverage from 52 level to 67 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme recovering from vaccine shortages.. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports 6 month national stock-out. GoC=R+ D+
- 2015: Estimate based on estimated HepB3 coverage level in 2015. Programme reports 7-month stock-out at the national level. GoC=R+ D+
- 2014: Estimate of 22 percent assigned by working group. Estimate based on estimated HepB3 coverage level in 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 46 percent assigned by working group. Estimate based on estimated HepB3 coverage level in 2012. GoC=No accepted empirical data
- 2012: Estimate based on estimated HepB3 coverage level in 2012. GoC=R+ D+
- 2011: Estimate based on reported data. Increase in coverage likely represents restoration of public confidence in the national immunization system and improved vaccine supply. Estimate challenged by: D-
- 2010: Estimate based on reported data. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on reported data. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on reported data. GoC=R+ D+

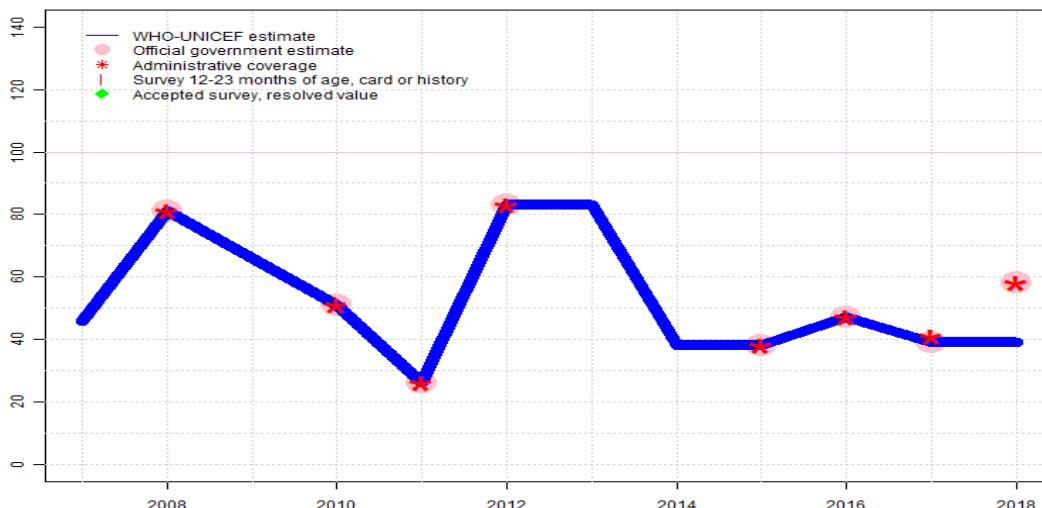
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

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

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# Ukraine - Hib3

UKR - Hib3



Description:

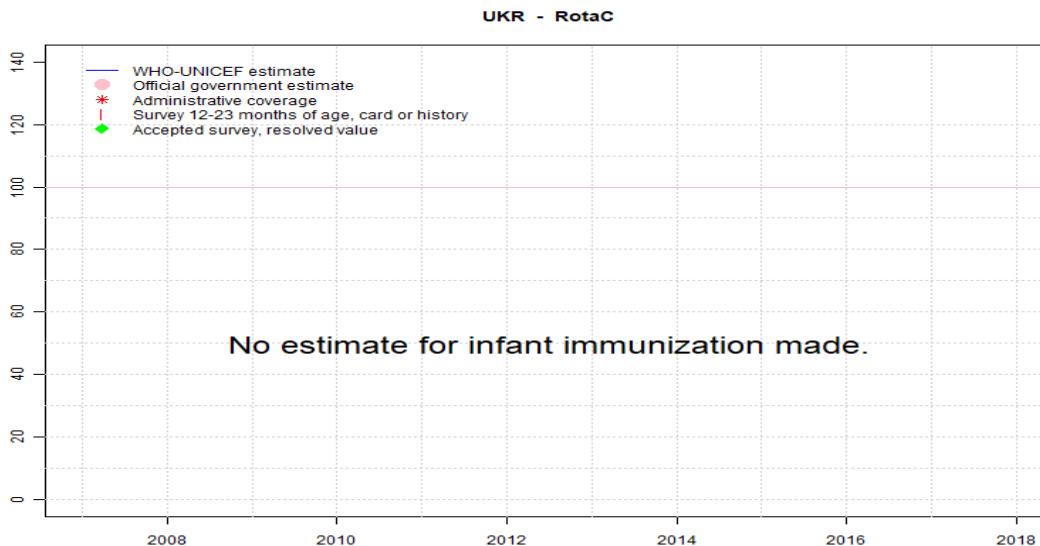
- 2018: Estimate based on extrapolation from data reported by national government. Reported data excluded due to sudden change in coverage from 39 level to 58 percent. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. GoC=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 6 month national stock-out. GoC=R+ D+
- 2015: Estimate based on estimated Hib1 coverage level in 2015. Programme reports 9-month stock-out at the national level. GoC=R+ D+
- 2014: Estimate of 38 percent assigned by working group. Estimate based on estimated Hib1 coverage level in 2015. Reduced coverage may be explained by a combination of vaccine shortages and an erosion in public confidence in vaccination, coinciding with civil unrest. GoC=No accepted empirical data
- 2013: Estimate of 83 percent assigned by working group. Estimate based on estimated Hib1 coverage level in 2012. GoC=No accepted empirical data
- 2012: Estimate based on estimated Hib1 coverage level in 2012. GoC=R+ D+
- 2011: Estimate based on reported data. Increase in coverage likely represents restoration of public confidence in the national immunization system and improved vaccine supply. GoC=R+ D+
- 2010: Estimate based on reported data. GoC=R+ D+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2008: Estimate based on reported data. A 2011 external review of Ukraine's National Immunization Programme reports that programme performance in Ukraine begin to decline in previous years due to vaccine stock-outs, excessive medicalization of vaccine delivery, and the loss in public confidence in immunization. GoC=R+ D+
- 2007: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data

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

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

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

# Ukraine - RotaC



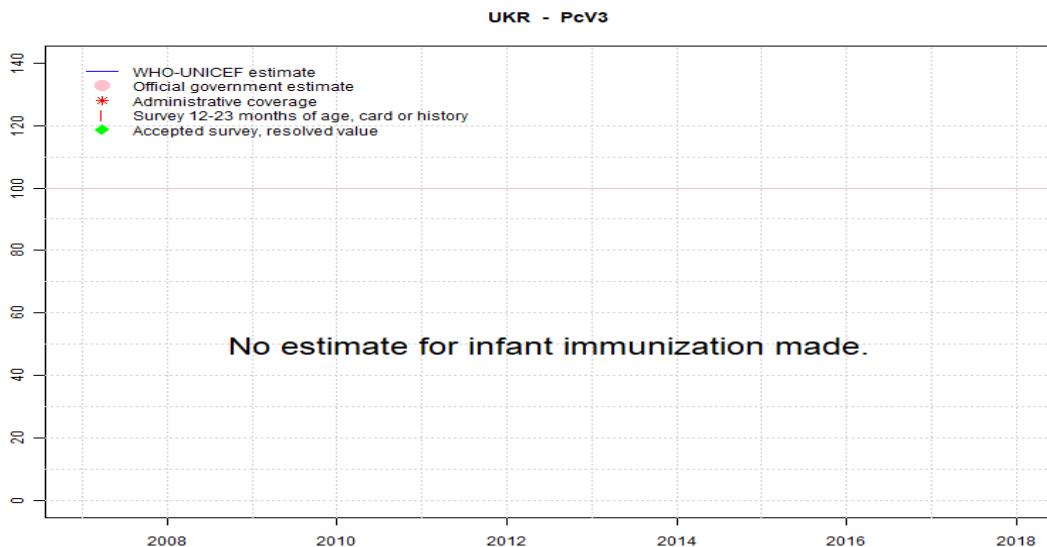
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	NA											
Estimate GoC	NA											
Official	NA											
Administrative	NA											
Survey	NA											

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

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

# Ukraine - PcV3



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Estimate	NA											
Estimate GoC	NA											
Official	NA											
Administrative	NA											
Survey	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: 2017 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

# Ukraine - survey details

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## 2011 Ukraine Multiple Indicator Cluster Survey 2012

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen	HepBB	Card	64.9	18-29 m	-	92
BCG	C or H <12 months	94.5	18-29 m	829	92	HepBB	Card or History	68.4	18-29 m	829	92
BCG	Card	89.5	18-29 m	-	92	HepBB	History	3.5	18-29 m	-	92
BCG	Card or History	95.4	18-29 m	829	92	Hib1	C or H <12 months	74.9	18-29 m	829	92
BCG	History	5.9	18-29 m	-	92	Hib1	Card	76.4	18-29 m	-	92
DTP1	C or H <12 months	79.4	18-29 m	829	92	Hib1	Card or History	80.4	18-29 m	829	92
DTP1	Card	81.8	18-29 m	-	92	Hib1	History	4	18-29 m	-	92
DTP1	Card or History	86	18-29 m	829	92	MCV1	C or H <18 months	62.7	18-29 m	829	92
DTP1	History	4.2	18-29 m	-	92	MCV1	Card	65.8	18-29 m	-	92
DTP3	C or H <12 months	41.8	18-29 m	829	92	MCV1	Card or History	73.1	18-29 m	829	92
DTP3	Card	71.5	18-29 m	-	92	MCV1	History	7.3	18-29 m	-	92
DTP3	Card or History	74.3	18-29 m	829	92	Pol1	C or H <12 months	79	18-29 m	829	92
DTP3	History	2.8	18-29 m	-	92	Pol1	Card	81.4	18-29 m	-	92
HepB1	C or H <12 months	53.6	18-29 m	829	92	Pol1	Card or History	85.4	18-29 m	829	92
HepB1	Card	58.7	18-29 m	-	92	Pol1	History	4.1	18-29 m	-	92
HepB1	Card or History	68.7	18-29 m	829	92	Pol3	C or H <12 months	47.8	18-29 m	829	92
HepB1	History	10	18-29 m	-	92	Pol3	Card	70.8	18-29 m	-	92
HepBB	C or H <12 months	65.1	18-29 m	829	92	Pol3	Card or History	73.3	18-29 m	829	92
						Pol3	History	2.4	18-29 m	-	92

Further information and estimates for previous years are available at:

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

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