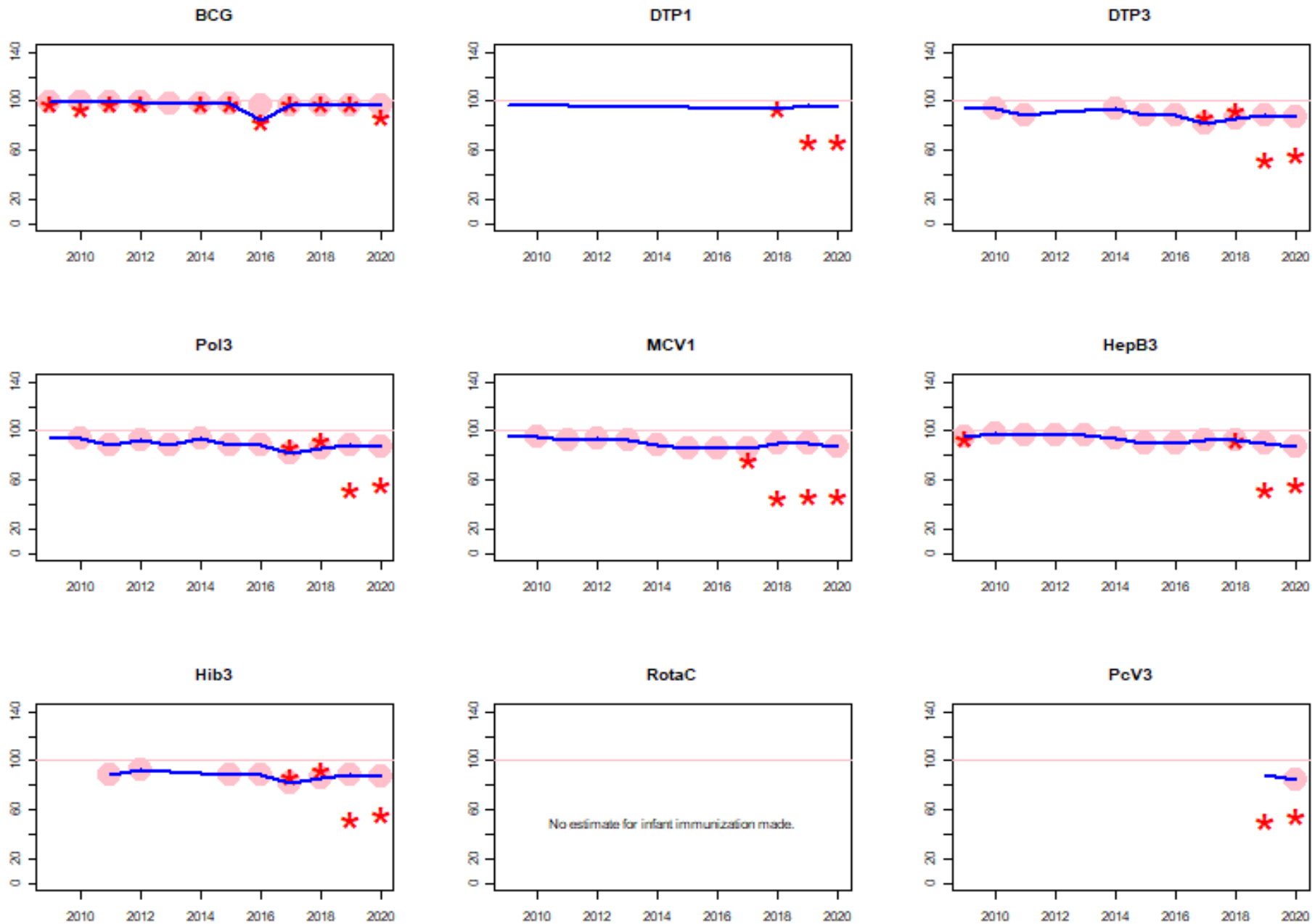


Romania: WHO and UNICEF estimates of immunization coverage: 2020 revision



**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.

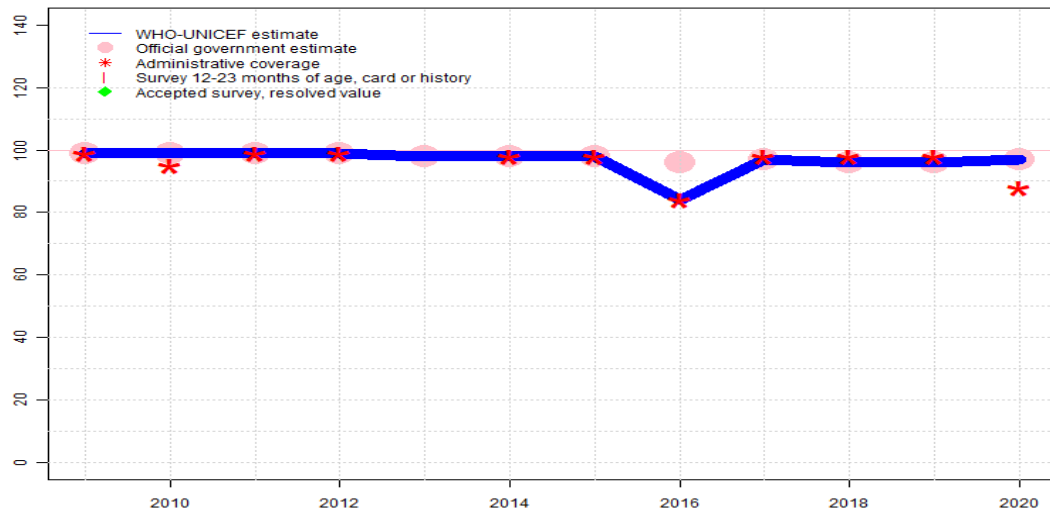
**PcV3:** percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine. In countries where the national schedule recommends two doses during infancy and a booster dose at 12 months or later based on the epidemiology of disease in the country, coverage estimates may reflect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

ROU - BCG



## Description:

- 2020: 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. Reported coverage is based on monthly reports from all maternity hospitals (including private sector) and use the surviving infants as the denominator. Estimate challenged by: D-
- 2019: Estimate based on coverage reported by national government. GoC=R+ D+
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme recovered from reported stock-out in 2016. GoC=R+ D+
- 2016: Estimate based on reported administrative data. Results of a register based survey suggest vaccination coverage of 96 percent. Programme reports two month vaccine stock-out. Government official estimates based on 2014 survey results and not reflecting 3 months stock-out observed from administrative coverage data. 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. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. GoC=R+ D+

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	99	99	99	99	98	98	98	84	97	96	96	97
Estimate GoC	●●	●	●	●	●	●●	●●	●●	●●	●●	●●	●
Official	99	99	99	99	98	98	98	96	97	96	96	97
Administrative	99	95	99	99	NA	98	98	84	98	98	98	88
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

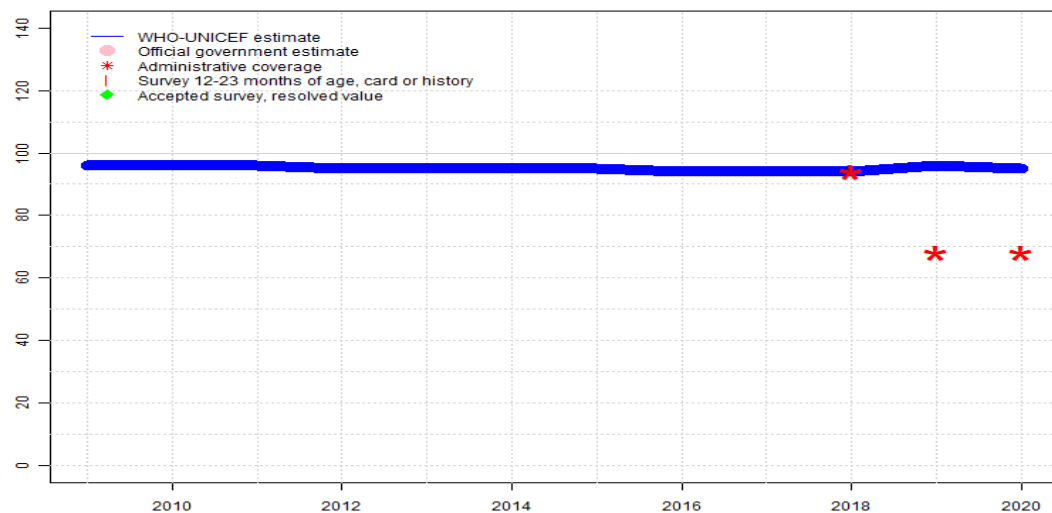
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

# Romania - DTP1

ROU - DTP1



## Description:

- 2020: DTP1 coverage estimated based on DTP3 coverage of 87. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-R-
- 2019: DTP1 coverage estimated based on DTP3 coverage of 88. Estimate of 96 percent changed from previous revision value of 94 percent. Estimate challenged by: D-R-
- 2018: Estimate based on reported data. GoC=R+ D+
- 2017: Reported data calibrated to 1997 and 2018 levels. Programme reports 5 to 6 months of vaccine stock-out. GoC=No accepted empirical data
- 2016: Reported data calibrated to 1997 and 2018 levels. Programme reports 4-5 months national stock-out. GoC=No accepted empirical data
- 2015: Reported data calibrated to 1997 and 2018 levels. GoC=No accepted empirical data
- 2014: Reported data calibrated to 1997 and 2018 levels. Programme reports a stock-out of DTP containing vaccine for 3-4 months at the national level. GoC=No accepted empirical data
- 2013: Reported data calibrated to 1997 and 2018 levels. GoC=No accepted empirical data
- 2012: Reported data calibrated to 1997 and 2018 levels. GoC=No accepted empirical data
- 2011: Reported data calibrated to 1997 and 2018 levels. GoC=No accepted empirical data
- 2010: Reported data calibrated to 1997 and 2018 levels. GoC=No accepted empirical data
- 2009: Reported data calibrated to 1997 and 2018 levels. GoC=No accepted empirical data

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	96	96	96	95	95	95	95	94	94	94	96	95
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	94	68	68
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

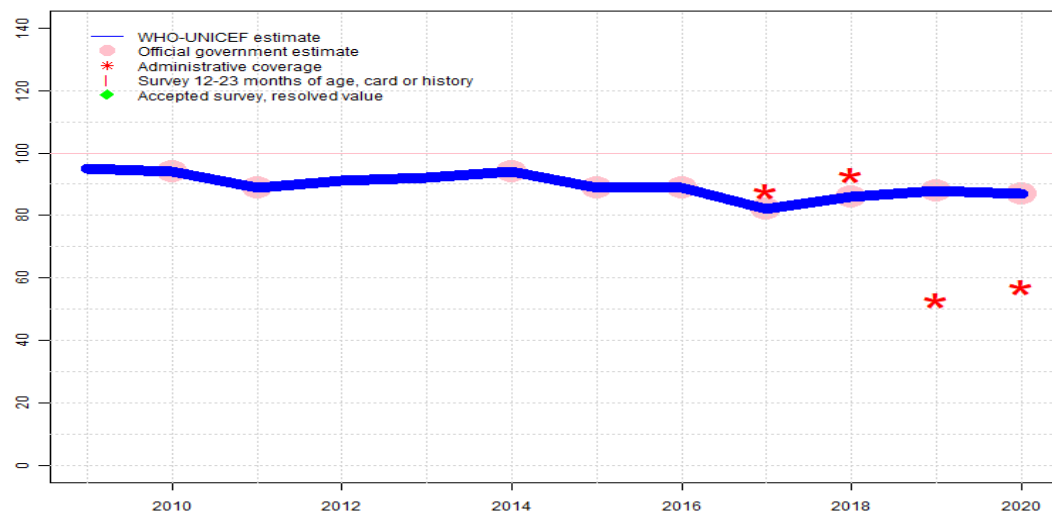
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

# Romania - DTP3

ROU - DTP3



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	95	94	89	91	92	94	89	89	82	86	88	87
Estimate GoC	•	••	••	•	•	••	••	••	••	••	•	•
Official	NA	94	89	NA	NA	94	89	89	82	86	88	87
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	88	93	53	57
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

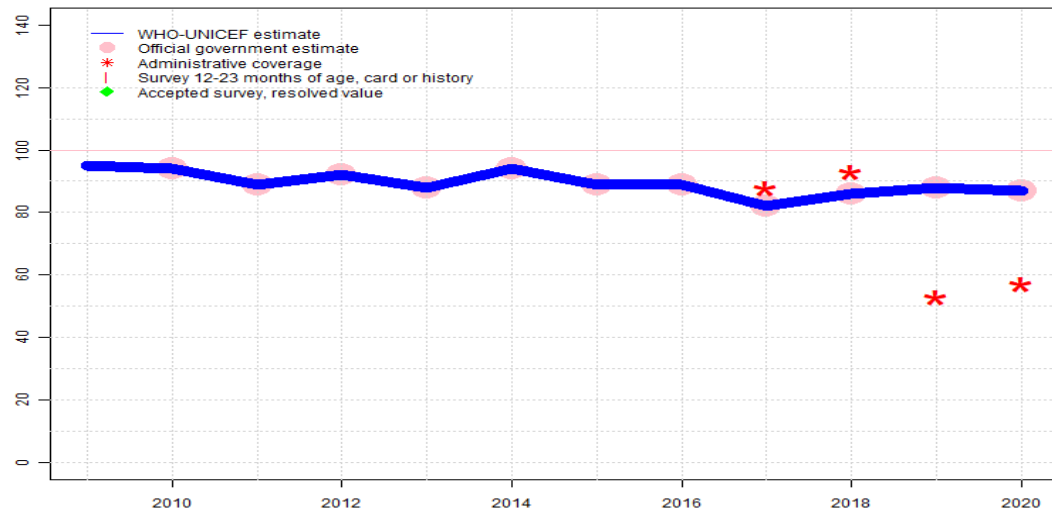
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-
- 2019: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 5 to 6 months of vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports four to five month national stock-out. Results of a register based survey suggest vaccination coverage of 86 percent. GoC=R+
- 2015: Estimate based on coverage reported by national government. Programme reports 3-4 month national level stock-out of hexavalent DTP-HepB-Hib-IPV vaccine. GoC=R+
- 2014: Estimate based on coverage reported by national government. Programme reports a stock-out of DTP containing vaccine for 3-4 months at the national level. GoC=R+
- 2013: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2012: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data
- 2011: Estimate based on coverage reported by national government. GoC=R+
- 2010: Estimate based on coverage reported by national government. GoC=R+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data

# Romania - Pol3

ROU - Pol3



## Description:

- 2020: 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. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-
- 2019: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. GoC=R+
- 2015: Estimate based on coverage reported by national government. Programme reports 3-4 month national level stock-out of hexavalent DTP-HepB-Hib-IPV vaccine. GoC=R+
- 2014: Estimate based on coverage reported by national government. GoC=R+
- 2013: Estimate based on coverage reported by national government. GoC=R+
- 2012: Estimate based on coverage reported by national government. GoC=R+
- 2011: Estimate based on coverage reported by national government. GoC=R+
- 2010: Estimate based on coverage reported by national government. GoC=R+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	95	94	89	92	88	94	89	89	82	86	88	87
Estimate GoC	•	••	••	••	••	••	••	••	••	••	•	•
Official	NA	94	89	92	88	94	89	89	82	86	88	87
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	88	93	53	57
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

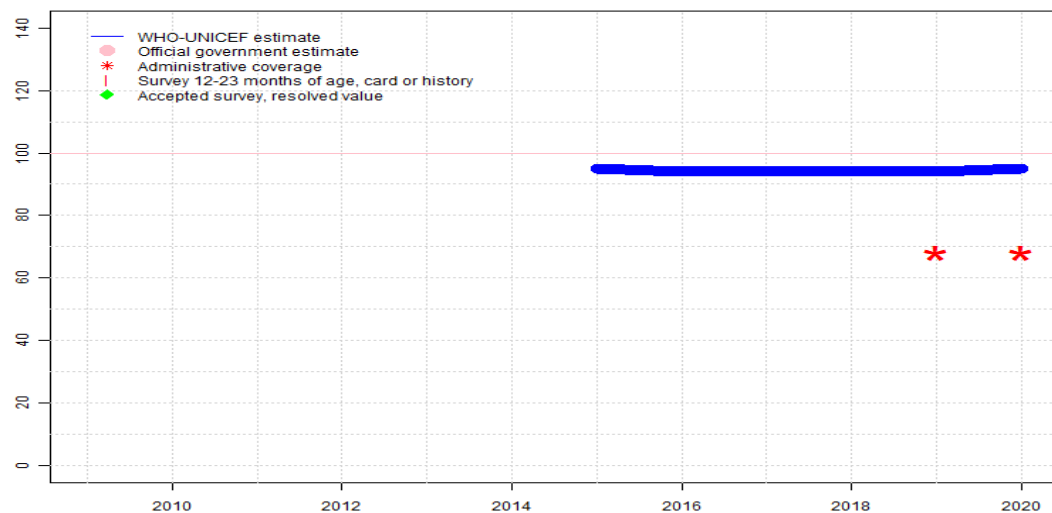
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

# Romania - IPV1

ROU - 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 is based on estimated DTP1 coverage. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-R-

2019: Estimate is based on estimated DTP1 coverage. Estimate challenged by: D-R-

2018: Estimate is based on estimated DTP1 coverage. GoC=No accepted empirical data

2017: Estimate is based on estimated DTP1 coverage. GoC=No accepted empirical data

2016: Estimate is based on estimated DTP1 coverage. GoC=No accepted empirical data

2015: DTP-HepB-Hib-IPV vaccine recommended at 2, 4 and 11 months. Coverage estimate based on estimated DTP1 coverage. Programme reports four to five month vaccine stock-out at national level. GoC=No accepted empirical data

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	NA	NA	NA	NA	NA	NA	95	94	94	94	94	95
Estimate GoC	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	68	68
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.

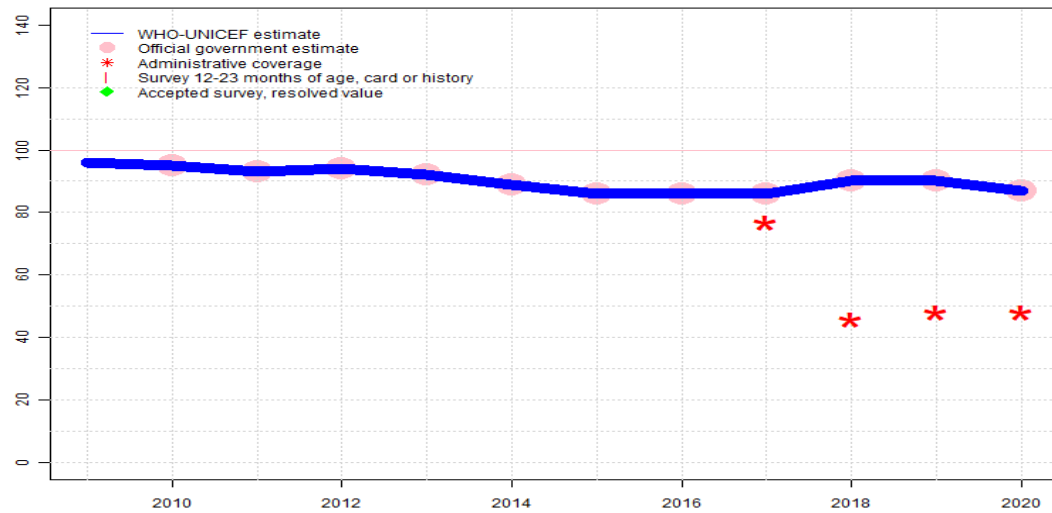
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk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



# Romania - MCV1

ROU - MCV1



## Description:

- 2020: 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. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-
- 2019: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2018: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2017: Estimate based on coverage reported by national government. Programme reports 1 to 2 months of vaccine stock-out. Estimate challenged by: D-
- 2016: Estimate based on coverage reported by national government. Results of a register based survey suggest vaccination coverage of 90 percent. GoC=R+
- 2015: Estimate based on coverage reported by national government. GoC=R+
- 2014: Estimate based on coverage reported by national government. GoC=R+
- 2013: Estimate based on coverage reported by national government. GoC=R+
- 2012: Estimate based on coverage reported by national government. GoC=R+
- 2011: Estimate based on coverage reported by national government. GoC=R+
- 2010: Estimate based on coverage reported by national government. GoC=R+
- 2009: Estimate based on interpolation between data reported by national government. GoC=No accepted empirical data

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	96	95	93	94	92	89	86	86	86	90	90	87
Estimate GoC	•	••	••	••	••	••	••	••	•	•	•	•
Official	NA	95	93	94	92	89	86	86	86	90	90	87
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	77	46	48	48
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.

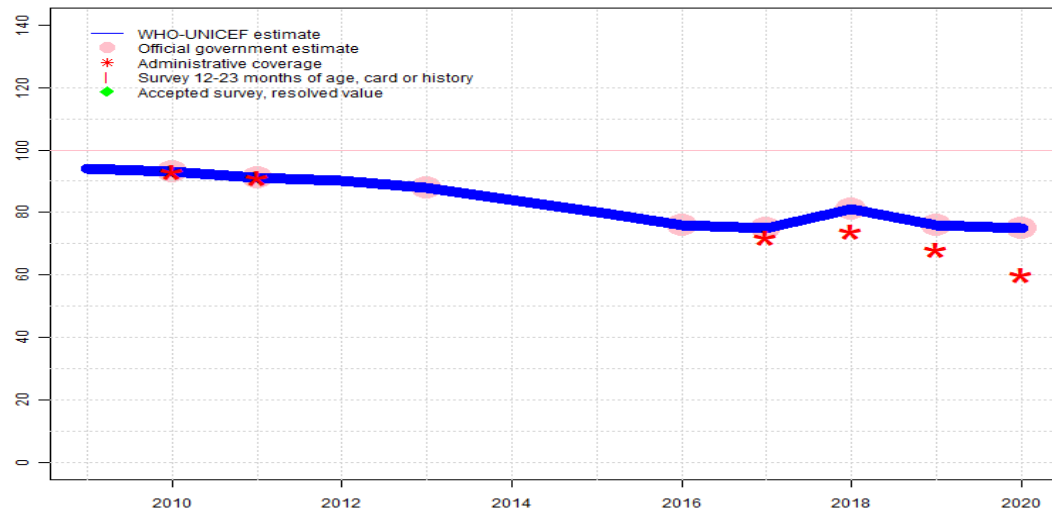
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk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



# Romania - MCV2

ROU - MCV2



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	94	93	91	90	88	84	80	76	75	81	76	75
Estimate GoC	•	••	••	•	•	•	•	••	••	•	•	•
Official	NA	93	91	NA	88	NA	NA	76	75	81	76	75
Administrative	NA	93	91	NA	NA	NA	NA	NA	72	74	68	60
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. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. 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-

2019: Estimate based on coverage reported by national government. Estimate challenged by: D-

2018: Estimate based on coverage reported by national government. Estimate challenged by: D-

2017: Estimate based on coverage reported by national government. Programme reports 1 to 2 months of vaccine stock-out. GoC=R+ D+

2016: Estimate based on coverage reported by national government. Government estimates of MMR second dose refer to children 5 years of age. GoC=R+

2015: Estimate based on interpolation between reported values. GoC=No accepted empirical data

2014: Estimate based on interpolation between reported values. GoC=No accepted empirical data

2013: Estimate based on coverage reported by national government. Estimate challenged by: D-

2012: Estimate based on interpolation between reported values. GoC=No accepted empirical data

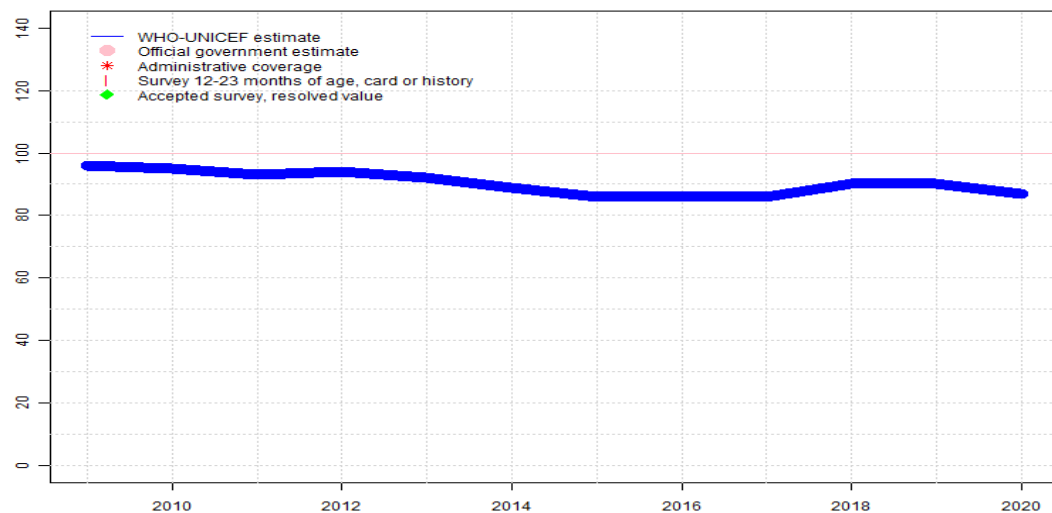
2011: Estimate based on coverage reported by national government. GoC=R+ D+

2010: Estimate based on coverage reported by national government. GoC=R+ D+

2009: Estimate based on interpolation between reported values. GoC=No accepted empirical data

# Romania - RCV1

ROU - RCV1



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	96	95	93	94	92	89	86	86	86	90	90	87
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 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 estimated MCV1. Estimate challenged by: D-

2018: Estimate based on estimated MCV1. Estimate challenged by: D-

2017: Estimate based on estimated MCV1. Estimate challenged by: D-

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

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

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

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

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

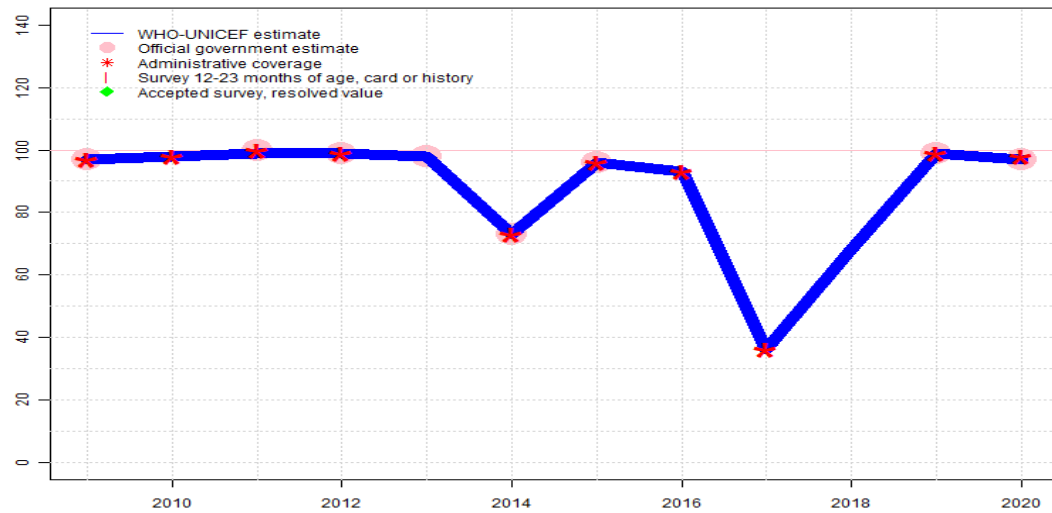
2011: Estimate based on estimated MCV1. GoC=R+

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

2009: Estimate based on estimated MCV1. GoC=No accepted empirical data

# Romania - HepBB

ROU - HepBB



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	97	98	99	99	98	73	96	93	36	68	99	97
Estimate GoC	●●	●●	●	●●	●	●●	●●	●●	●●	●	●	●
Official	97	NA	100	99	98	73	96	NA	NA	NA	99	97
Administrative	97	98	100	99	NA	73	96	93	36	NA	99	98
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

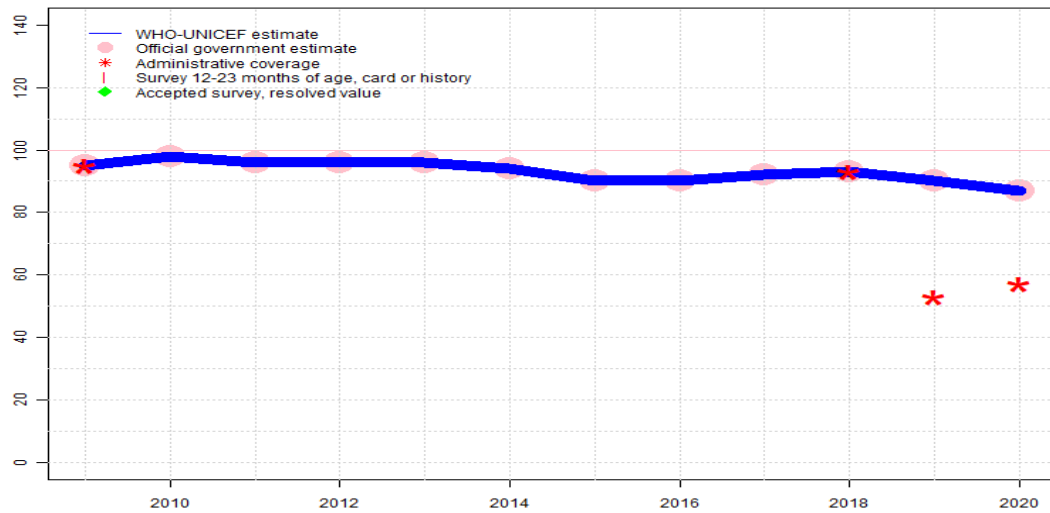
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Reported coverage is based on monthly reports from all maternity hospitals (including private sector) and use the surviving infants as the denominator. Estimate challenged by: D-
- 2019: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2018: Estimate based on interpolation between reported values. Programme reports 94 percent coverage. Unclear if the information system is able to separate timely doses from those given after 24 hours. GoC=No accepted empirical data
- 2017: Estimate based on reported administrative estimate. Reported data reflects subnational coverage. Programme reports six month vaccine stock-out at national level. GoC=R+ D+
- 2016: Estimate based on reported administrative estimate. GoC=R+ D+
- 2015: Estimate based on coverage reported by national government. Recovery from prior year stock-out. GoC=R+ D+
- 2014: Estimate based on coverage reported by national government. Programme reports a stock-out of HepB containing vaccine for 2-3 months at the national level. GoC=R+
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. GoC=R+ D+
- 2011: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on reported administrative estimate. GoC=R+ D+
- 2009: Estimate based on coverage reported by national government. GoC=R+ D+

# Romania - HepB3

ROU - HepB3



## Description:

- 2020: 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. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-
- 2019: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 5 to 6 months of vaccine stock-out. GoC=R+
- 2016: Estimate based on coverage reported by national government. Programme reports 4-5 months national stock-out. Results of a register based survey suggest vaccination coverage of 93 percent. GoC=R+
- 2015: Estimate based on coverage reported by national government. Programme reports 3-4 month national level stock-out of hexavalent DTP-HepB-Hib-IPV vaccine. GoC=R+
- 2014: Estimate based on coverage reported by national government. Programme reports a stock-out of HepB containing vaccine for 2-3 months at the national level. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. GoC=R+
- 2012: Estimate based on coverage reported by national government. GoC=R+
- 2011: Estimate based on coverage reported by national government. GoC=R+
- 2010: Estimate based on coverage reported by national government. GoC=R+
- 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	98	96	96	96	94	90	90	92	93	90	87
Estimate GoC	●●	●●	●●	●●	●●	●	●●	●●	●●	●●	●	●
Official	95	98	96	96	96	94	90	90	92	93	90	87
Administrative	95	NA	NA	NA	NA	NA	NA	NA	NA	93	53	57
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

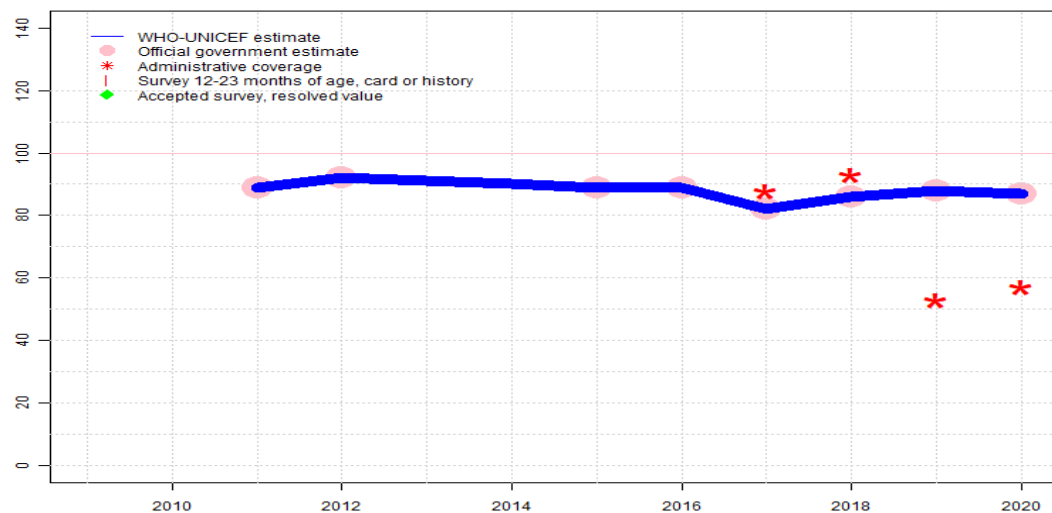
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

# Romania - Hib3

ROU - Hib3



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	NA	NA	89	92	91	90	89	89	82	86	88	87
Estimate GoC	NA	NA	••	••	•	•	••	••	••	••	•	•
Official	NA	NA	89	92	NA	NA	89	89	82	86	88	87
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	88	93	53	57
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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

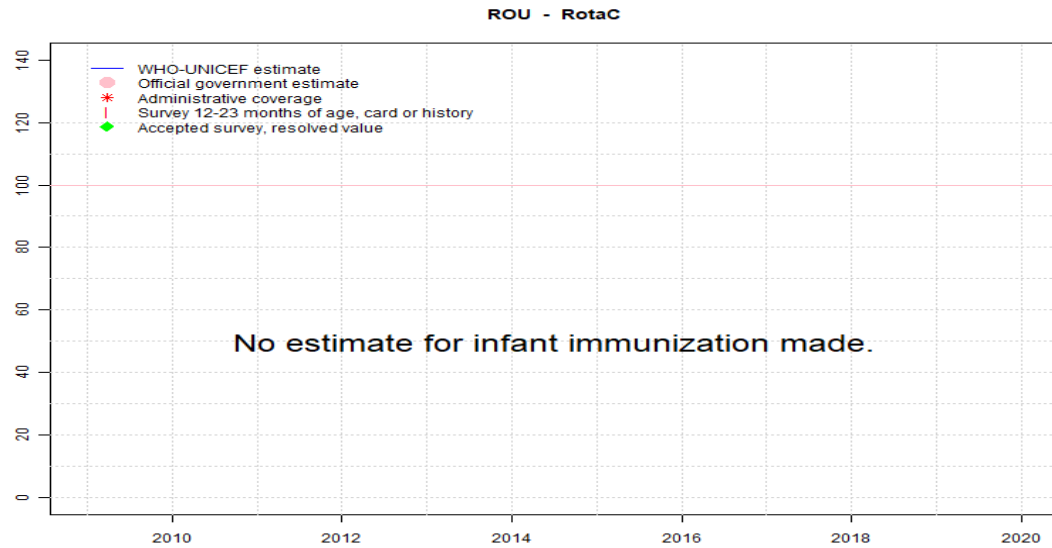
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2020 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

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

## Description:

- 2020: Estimate based on coverage reported by national government. No nationally representative household survey within the last 5 years. WHO and UNICEF recommend a high-quality survey to confirm reported levels of coverage. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-
- 2019: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2018: Estimate based on coverage reported by national government. GoC=R+ D+
- 2017: Estimate based on coverage reported by national government. Programme reports 5 to 6 months of vaccine stock-out. GoC=R+ D+
- 2016: Estimate based on coverage reported by national government. Programme reports four to five month national stock-out. Results of a register based survey suggest vaccination coverage of 86 percent. GoC=R+
- 2015: Estimate based on coverage reported by national government. Programme reports 3-4 month national level stock-out of hexavalent DTP-HepB-Hib-IPV vaccine. GoC=R+
- 2014: Estimate based on interpolation between reported values. Programme reports a stock-out of DTP containing vaccine for 3-4 months at the national level. GoC=No accepted empirical data
- 2013: Estimate based on interpolation between reported values. GoC=No accepted empirical data
- 2012: Estimate based on coverage reported by national government. GoC=R+
- 2011: Estimate based on coverage reported by national government. Hib vaccine introduced in 2010. Reporting started in 2011. GoC=R+

# Romania - 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

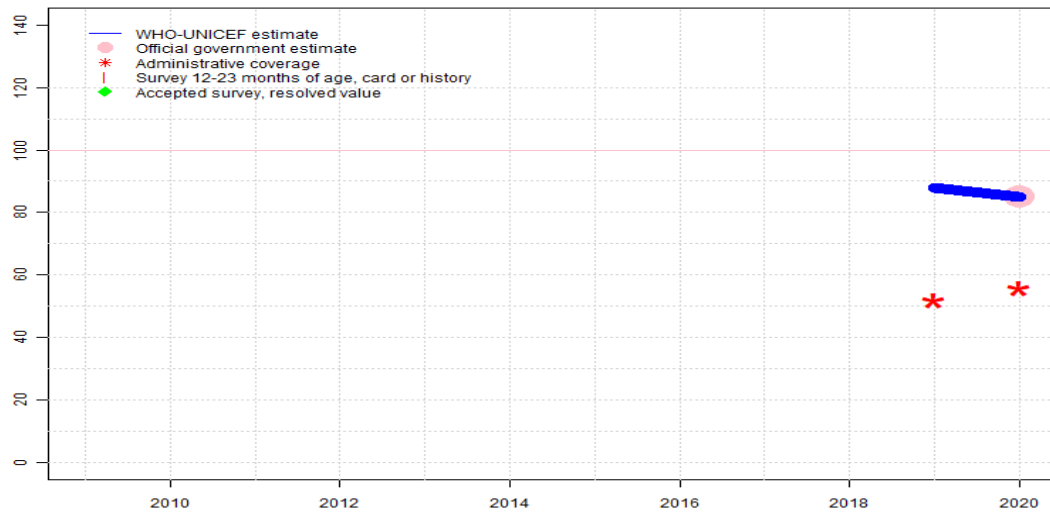
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

# Romania - PcV3

ROU - PcV3



## Description:

2020: 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. Estimates may be overestimated. Reported coverage is from annual survey estimation based on July 2018 birth cohort from the family doctors lists as denominator and number of dosed administrated until 18 month of age as the numerator. Estimate challenged by: D-

2019: Estimate based on estimated DTP3 level. Pneumococcal conjugate vaccine introduced during October 2017. Reporting began in 2019. Estimate challenged by: D-R-

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	88	85
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	•	•
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	85
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52	56
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.



# Romania - survey details

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2016 ANALIZA REZULTATELOR ESTIMARII ACOPERIRII VACCINALE LA VARSTA DE 18 LUNI PENTRU COPIII NASCUTI IN LUNA IULIE, 2016

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Register	96	18 m	14766	-
DTP3	Register	86.2	18 m	14766	-
HepB3	Register	92.6	18 m	14766	-
Hib3	Register	86.2	18 m	14766	-
MCV1	Register	89.6	18 m	14766	-

2007 Anchetei semestriale de acoperire vaccinala efectuata in luna ianuarie 2009

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card	99.2	18-24 m	33897	-
DTP3	Card	95.7	18-24 m	33897	-
HepB3	Card	98.2	18-24 m	33897	-
MCV1	Card	96.5	18-24 m	33897	-
Pol3	Card	95.7	18-24 m	33897	-

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>