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:

*Brown et al. 2013. An introduction to the grade of confidence used to characterize uncertainty around

ADMINISTRATIVE coverage: Reported by national authorities that reflects their

SURVEY coverage: Based on 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.

OFFICIAL coverage may differ across countries.

OFFICIAL coverage: Estimated coverage reported by national authorities that reflects their

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.
PcV3: percentage of births which received a dose of hepatitis B vaccine within 24 hours of delivery.
PcV: percentage of children who received the 2nd dose of measles containing vaccine according to

RAVAGE 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.

RCV2: 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. Co

 отношении the 1st dose of rubella containing vaccine. Co

Hib3: percentage of surviving infants who received the 3rd dose of Haemophilus influenzae type b

PcV3: percentage of surviving infants who received the 3rd dose of pneumococcal conjugate vaccine.

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.
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.

### Description:

2019: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2015. Estimate challenged by: D-

2018: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. Estimate challenged by: D-

2017: Estimate based on reported administrative data. Programme reports 1.5 months stock out. An assessment of the national registry was conducted during 2018. Results for the 2017 birth cohort suggest 98 percent coverage. GoC=R+ D+

2016: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2012 derived from national immunization registry. GoC=R+ D+

2015: Estimate based on coverage reported by national government. Reported official government estimates are based on telephone-based surveys with verification of home-based records. GoC=R+ D+

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

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

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

2011: Estimate based on coverage reported by national government. National data adjusted based on the results of the 2011 coverage survey to reflect vaccination in private sector. Estimate challenged by: D-

2010: Estimate based on coverage reported by national government. National data adjusted based on the results of the 2008 coverage survey to reflect vaccination in private sector. Survey results presented for the age group of 0 to 72 months and thus not showing. Estimate challenged by: D-

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

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- **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:


2018: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. GoC=R+ D+

2017: Estimate based on reported administrative data. GoC=R+ D+

2016: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2012 derived from national immunization registry. GoC=R+ D+

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

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*** 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.

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

### Description:

2019: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2015. Estimate challenged by: D-

2018: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. GoC=R+ D+

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2012: Estimate based on coverage reported by national government. GoC=R+ D+

2011: Estimate based on coverage reported by national government. National data adjusted based on the results of the 2011 coverage survey to reflect vaccination in private sector. GoC=R+ D+

2010: Estimate based on coverage reported by national government. National data adjusted based on the results of the 2008 coverage survey to reflect vaccination in private sector. Survey results presented for the age group of 0 to 72 months and thus not showing. GoC=R+ D+

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

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July 8, 2021; page 5  WHO and UNICEF estimates of national immunization coverage - next revision available July 15, 2022  data received as of July 6, 2021
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

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2019: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2015. Estimate challenged by: D-

2018: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. GoC=R+ D+

2017: Estimate based on reported administrative data. An assessment of the national registry was conducted during 2018. Results for the 2017 birth cohort suggest 98 percent coverage. GoC=R+ D+

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2015: Estimate based on coverage reported by national government. Reported official government estimates are based on telephone-based surveys with verification of home-based records. GoC=R+ D+

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

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

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.
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 coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. GoC=R+ D+

2017: Estimate based on reported administrative estimate. Programme reports 4 months stock out. GoC=R+ D+

2016: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2012 derived from national immunization registry. GoC=R+ D+

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- 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.

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### Description:

- **2019**: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2015. GoC=R+ D+
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- **2009**: Estimate based on coverage reported by national government. GoC=R+ D+

July 8, 2021; page 8
The WHO and UNICEF estimates of national immunization coverage (wunirc) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

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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.

- **2019:** Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2012. Estimate challenged by: D-

- **2018:** Estimate based on reported administrative estimate. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. Estimate challenged by: D-

- **2017:** Estimate based on reported administrative estimate. Estimate challenged by: D-

- **2016:** Estimate based on reported administrative estimate. Government official estimate reflects coverage for children born in 2012 derived from national immunization registry. Estimate challenged by: D-

- **2015:** Estimate based on reported administrative estimate. Reported official government estimates are based on telephone-based surveys with verification of home-based records. Estimate challenged by: D-

- **2014:** Estimate based on reported administrative estimate. Estimate challenged by: D-

- **2013:** Estimate based on reported administrative estimate. GoC=R+ D+

- **2012:** Estimate based on coverage reported by national government. GoC=R+ D+

- **2011:** Estimate based on coverage reported by national government. National data adjusted based on the results of the 2011 coverage survey to reflect vaccination in private sector. GoC=R+ D+

- **2010:** Estimate based on coverage reported by national government. National data adjusted based on the results of the 2008 coverage survey to reflect vaccination in private sector. Survey results presented for the age group of 0 to 72 months and thus not showing. GoC=R+ D+

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

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

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

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

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 accompanying graph and data table.

#### Coverage Estimates for the First Dose of Rubella Containing Vaccine:

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The WHO and UNICEF estimates of national immunization coverage (wunic) 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.

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

Description:

2019: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2015. Estimate challenged by: D-

2018: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. Estimate challenged by: D-

2017: Estimate based on reported administrative estimate. GoC=R+ D+

2016: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2012 derived from national immunization registry. GoC=R+ D+

2015: Estimate based on coverage reported by national government. Reported official government estimates are based on telephone-based surveys with verification of home-based records. GoC=R+ D+

2014: Estimate based on reported administrative estimate. Documentation of the delivery of HepB doses within 24 hours of birth is unclear prior to 2014. As such, WHO and UNICEF estimates begin in 2014. 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.

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

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

July 8, 2021; page 11  WHO and UNICEF estimates of national immunization coverage - next revision available July 15, 2022  data received as of July 6, 2021
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.

Description:


2018: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. GoC=R+ D+

2017: Estimate based on reported administrative data. An assessment of the national registry was conducted during 2018. Results for the 2017 birth cohort suggest 98 percent coverage. GoC=R+ D+

2016: Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2012 derived from national immunization registry. GoC=R+ D+

2015: Estimate based on coverage reported by national government. Reported official government estimates are based on telephone-based surveys with verification of home-based records. GoC=R+ D+

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

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

2012: Estimate based on coverage reported by national government. GoC=R+ D+

2011: Estimate based on coverage reported by national government. National data adjusted based on the results of the 2011 coverage survey to reflect vaccination in private sector. GoC=R+ D+

2010: Estimate based on coverage reported by national government. National data adjusted based on the results of the 2008 coverage survey to reflect vaccination in private sector. Survey results presented for the age group of 0 to 72 months and thus not showing. GoC=R+ D+

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

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

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

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### Description:

**2019:** Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2015. Estimate challenged by: D-

**2018:** Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2014 derived from national immunization registry. GoC=R+ D+

**2017:** Estimate based on reported administrative estimate. An assessment of the national registry was conducted during 2018. Results for the 2017 birth cohort suggest 98 percent coverage. GoC=R+ D+

**2016:** Estimate based on coverage reported by national government. Government official estimate reflects coverage for children born in 2012 derived from national immunization registry. GoC=R+ D+

**2015:** Estimate based on reported administrative estimate. Reported official government estimates are based on telephone-based surveys with verification of home-based records. GoC=R+ D+

**2014:** Estimate based on reported administrative estimate. Hib vaccine introduced during 2013 and reporting started in 2014. Vaccine presentation is monovalent Hib. GoC=R+ D+

### Table:

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<thead>
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<th>Year</th>
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WHO and UNICEF estimates of national immunization coverage - next revision available July 15, 2022

Data received as of July 6, 2021
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

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

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

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July 8, 2021; page 15
WHO and UNICEF estimates of national immunization coverage - next revision available July 15, 2022
data received as of July 6, 2021
### Republic of Korea - survey details

#### 2009 Korea National Immunization Survey

<table>
<thead>
<tr>
<th>Vaccine</th>
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<th>Coverage</th>
<th>Age cohort</th>
<th>Sample</th>
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2008 Republic of Korea Nationwide vaccine coverage level: Conceptual Methodology and Survey

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<thead>
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<th>Vaccine</th>
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<th>Coverage</th>
<th>Age cohort</th>
<th>Sample</th>
<th>Cards seen</th>
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Further information and estimates for previous years are available at: