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
Burton et al. 2012. A formal representation of the WHO and UNICEF estimates of national immunization coverage shows large variation, an attempt is made to identify the most likely estimate with consideration of the possible biases in available data. In methods see:

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 polo containing vaccine. May be either oral or inactivated polo vaccine.
IPV1: percentage of surviving infants who received at least one dose of inactivated polo vaccine. In countries utilizing an immunization schedule recommending either (i) a primary series of three doses of oral polo 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 polo 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.

HepB3: 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 either be 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.
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:**

2017: Reported data calibrated to 2014 levels. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Estimate challenged by: D-R.

2016: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 82 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R.

2015: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 82 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R.

2014: Estimate of 82 percent assigned by working group. Estimate based on DTP3. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 82 percent changed from previous revision value of 84 percent. Estimate challenged by: R-.

2013: Estimate of 87 percent assigned by working group. Estimate based on DTP3. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate of 87 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R.

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---|---|---|---|---|---|---|---|---|---|---|---|---
Estimate | 84 | 84 | 84 | 85 | 85 | 86 | 86 | 87 | 82 | 82 | 82 | 82
Estimate GoC | [R+] | [R+] | [R+] | [R+] | [R+] | [R+] | [R+] | [R+] | [R+] | [R+] | [R+] | [R+]
Official | 57 | 56 | 99 | 96 | 98 | 98 | 99 | 100 | 96 | 93 | 92 | 94
Administrative | NA | NA | 84 | NA | NA | NA | NA | NA | NA | NA | NA | NA
Survey | NA | NA | 84 | NA | NA | NA | NA | NA | NA | NA | NA | NA

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* 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.
Lebanon - DTP1

value of 84 percent. Estimate challenged by: R-
2012: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Estimate of 86 percent changed from previous revision value of 84 percent. Estimate challenged by: R-
2011: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Estimate of 86 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R-
2010: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Estimate of 85 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R-
2009: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate of 85 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R-
2008: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 84 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-
2006: Reported data calibrated to 2003 and 2008 levels. Reported data excluded. Reported data not consistent with survey results. Estimate challenged by: D-R-
**Lebanon - DTP3**

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**Description:**

2017: Reported data calibrated to 2014 levels. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Estimate challenged by: D-R-

2016: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 79 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2015: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 79 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2014: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 79 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 79 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2013: Estimate of 84 percent assigned by working group. Estimate based on survey results. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those

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- 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.
who recently entered the country. Estimate of 84 percent changed from previous revision value of 81 percent. Estimate challenged by: R-

2012: Estimate based on interpolation between 2008 and 2013 levels. Estimate based on survey results. Reported data excluded. Reported data not consistent with survey results. A national EPI coverage was conducted during 2013 among children aged 12-59 months and suggests that 90 percent of children received three doses of DTP containing vaccine by the 5th birthday. Coverage among children aged less than 12 months will be slightly lower. Estimate of 83 percent changed from previous revision value of 81 percent. Estimate challenged by: R-

2011: Estimate based on interpolation between 2008 and 2013 levels. Estimate based on survey results. Reported data excluded. Reported data not consistent with survey results. Estimate of 83 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2010: Estimate based on interpolation between 2008 and 2013 levels. Estimate based on survey results. Reported data excluded. Reported data not consistent with survey results. Estimate of 82 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2009: Estimate based on interpolation between 2008 and 2013 levels. Estimate based on survey results. Reported data excluded. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate of 82 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2008: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 81 percent based on 1 survey(s). Lebanon Multiple Indicator Cluster Survey 2009 card or history results of 72 percent modified for recall bias to 81 percent based on 1st dose card or history coverage of 84 percent, 1st dose card only coverage of 51 percent and 3rd dose card only coverage of 49 percent. Reported data excluded. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-


2006: Reported data calibrated to 2003 and 2008 levels. Reported data excluded. Reported data not consistent with survey results. Estimate challenged by: D-R-
Lebanon - Pol3

Description:

2017: Reported data calibrated to 2014 levels. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Estimate challenged by: D-R-

2016: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 80 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2015: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 80 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2014: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 80 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 80 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2013: Estimate of 85 percent assigned by working group. Estimate based on survey results. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those

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 direct 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.
who recently entered the country. Estimate of 85 percent changed from previous revision value of 75 percent. Estimate challenged by: R-

2012: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate of 83 percent changed from previous revision value of 75 percent. Estimate challenged by: R-

2011: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate of 81 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2010: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate of 79 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2009: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate of 77 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2008: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 75 percent based on 1 survey(s). Lebanon Multiple Indicator Cluster Survey 2009 card or history results of 74 percent modified for recall bias to 75 percent based on 1st dose card or history coverage of 86 percent, 1st dose card only coverage of 53 percent and 3rd dose card only coverage of 46 percent. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-

2007: Reported data calibrated to 2003 and 2008 levels. Reported data not consistent with survey results. Estimate challenged by: D-R-

2006: Reported data calibrated to 2003 and 2008 levels. Reported data not consistent with survey results. Estimate challenged by: D-R-
Lebanon - IPV1

Description:

Estimates for a dose of IPV begin in 2015 following the Global Polio Eradication Initiative’s Polio Eradication and Endgame Strategic Plan: 2013-2018 which recommended at least one dose of inactivated polio vaccine (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).

2017: Estimate based on DTP1 coverage level. Reported data excluded. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Estimate challenged by: D-R-

2016: Estimate based on DTP1 coverage level. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 87 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R-

2015: IPV1 introduced during 2011. Estimate based on DTP1 coverage level. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 87 percent changed from previous revision value of 84 percent. Estimate challenged by: D-R-

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

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Survey estimated are not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate challenged by: D-R-

2013: Reported data calibrated to 2008 levels. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage among displaced populations. Estimate challenged by: R-

2012: Reported data calibrated to 2008 levels. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2011: Reported data calibrated to 2008 levels. Reported data not consistent with survey results. Estimate challenged by: D-R-

2010: Reported data not consistent with 2008 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2010 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2009: Reported data not consistent with 2008 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2009 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2008: Reported data not consistent with 2007 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2008 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2007: Reported data not consistent with 2006 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2007 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2006: Reported data not consistent with 2005 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2006 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2005: Reported data not consistent with 2004 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2005 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2004: Reported data not consistent with 2003 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2004 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2003: Reported data not consistent with 2002 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2003 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2002: Reported data not consistent with 2001 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2002 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2001: Reported data not consistent with 2000 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2001 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

2000: Reported data not consistent with 1999 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2000 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

1999: Reported data not consistent with 1998 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 1999 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-
consistent with survey results. Estimate challenged by: D-R-
2010: Reported data calibrated to 2008 levels. Reported data excluded. Reported data not consistent with survey results. Estimate challenged by: D-R-
2009: Reported data calibrated to 2008 levels. Reported data excluded. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate challenged by: D-R-
2008: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 79 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-
2007: Reported data calibrated to 2003 and 2008 levels. Reported data excluded. Reported data not consistent with survey results. Estimate challenged by: R-
2006: Reported data calibrated to 2003 and 2008 levels. Reported data excluded. Reported data not consistent with survey results. Reported data excluded due to decline in reported coverage from 54 percent to 26 percent with increase to 55 percent. Estimate challenged by: R-
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:

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

2017: Reported data calibrated to 2014 levels. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Reported data excluded due to sudden change in coverage from 71 level to 87 percent. Estimate challenged by: D-R-

2016: Reported data calibrated to 2014 levels. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 68 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2015: Reported data calibrated to 2014 levels. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 68 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2014: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 68 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimation of 68 percent changed from previous revision value of 75 percent. Estimate challenged by: R-

2013: Reported data calibrated to 2009 and 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the coun-
try. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate of 69 percent changed from previous revision value of 75 percent. Estimate challenged by: R-

2012: Reported data calibrated to 2009 and 2014 levels. Reported data not consistent with survey results. Estimate of 71 percent changed from previous revision value of 75 percent. Estimate challenged by: R-

2011: Reported data calibrated to 2009 and 2014 levels. Reported data not consistent with survey results. Estimate of 72 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2010: Reported data calibrated to 2009 and 2014 levels. Reported data not consistent with survey results. Estimate of 74 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2009: Estimate of 75 percent assigned by working group. Measles second dose is adjusted from reported MCV first dose coverage levels. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate challenged by: D-R-

2008: Reported data calibrated to 2003 and 2009 levels. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-

2007: Reported data calibrated to 2003 and 2009 levels. Reported data not consistent with survey results. Reported data excluded due to decline in reported coverage from 48 percent to 30 percent with increase to 71 percent. Estimate challenged by: D-R-

2006: Reported data calibrated to 2003 and 2009 levels. Reported data not consistent with survey results. Reported data excluded due to an increase from 17 percent to 48 percent with decrease 30 percent. Estimate challenged by: D-R-
Lebanon - 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 accompanying graph and data table.

2017: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate Estimate challenged by: D-R-

2016: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 68 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2015: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 68 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2014: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 68 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2013: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate of 69 percent changed from previous revision value of 75 percent. Estimate challenged by: R-

2012: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate Estimate of 71 percent changed from previous revision value of 75 percent. Estimate challenged by: R-

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.
2011: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate. Estimate of 72 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2010: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate. Estimate of 74 percent changed from previous revision value of 75 percent. Estimate challenged by: D-R-

2009: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate challenged by: D-R-

2008: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-

2007: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate. Estimate challenged by: D-R-

2006: First dose of rubella vaccine given with second dose of measles containing vaccine. Estimate based on MCV2 estimate. Estimate challenged by: D-R-
## Lebanon - HepBB

### Description:

- **2017:** Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Estimate challenged by: D-R-
- **2016:** Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 80 percent changed from previous revision value of 94 percent. Estimate challenged by: D-R-
- **2015:** Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 80 percent changed from previous revision value of 94 percent. Estimate challenged by: D-R-
- **2014:** Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 80 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 80 percent changed from previous revision value of 94 percent. Estimate challenged by: D-R-
- **2013:** Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 82 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian

### Table: WHO and UNICEF estimates of national immunization coverage

<table>
<thead>
<tr>
<th>Year</th>
<th>Official</th>
<th>Administrative</th>
<th>Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>94</td>
<td>64</td>
<td>NA</td>
</tr>
<tr>
<td>2007</td>
<td>94</td>
<td>67</td>
<td>NA</td>
</tr>
<tr>
<td>2008</td>
<td>94</td>
<td>91</td>
<td>NA</td>
</tr>
<tr>
<td>2009</td>
<td>94</td>
<td>96</td>
<td>NA</td>
</tr>
<tr>
<td>2010</td>
<td>92</td>
<td>99</td>
<td>NA</td>
</tr>
<tr>
<td>2011</td>
<td>89</td>
<td>94</td>
<td>NA</td>
</tr>
<tr>
<td>2012</td>
<td>87</td>
<td>100</td>
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<tr>
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</tr>
<tr>
<td>2017</td>
<td>80</td>
<td>97</td>
<td>NA</td>
</tr>
</tbody>
</table>

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.

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Data received as of July 4, 2018
subpopulations living in Lebanon, particularly those who recently entered the country. Estimate of 82 percent changed from previous revision value of 94 percent. Estimate challenged by: R-

2012: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Estimate of 84 percent changed from previous revision value of 94 percent. Estimate challenged by: R-

2011: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Estimate of 87 percent changed from previous revision value of 94 percent. Estimate challenged by: D-R-

2010: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Estimate of 89 percent changed from previous revision value of 94 percent. Estimate challenged by: D-R-

2009: Reported data calibrated to 2008 and 2013 levels. Reported data excluded. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate of 92 percent changed from previous revision value of 94 percent. Estimate challenged by: D-R-

2008: Estimate based on extrapolation from data reported by national government supported by survey. Survey evidence of 91 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-

2007: Estimate based on extrapolation from data reported by national government. Reported data excluded. Reported data not consistent with survey results. Estimate challenged by: D-

2006: Estimate based on extrapolation from data reported by national government. Reported data excluded. Reported data not consistent with survey results. Estimate challenged by: D-
Description:

2017: Reported data calibrated to 2014 levels. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 78 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2016: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 78 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2015: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 78 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2014: Estimate of 78 percent assigned by working group. Estimate based on survey results. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 78 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2013: Estimate of 81 percent assigned by working group. Estimate based on survey results. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those who recently entered the country. Estimate challenged by: R-

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+] or [S+], 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+] When 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.
Lebanon - HepB3

2012: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate challenged by: R-

2011: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate challenged by: D-R-

2010: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate challenged by: D-R-

2009: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate challenged by: D-R-

2008: Estimate of 81 percent assigned by working group. Estimate based on DTP3 coverage estimates. Lebanon Multiple Indicator Cluster Survey 2009 card or history results of 72 percent modified for recall bias to 81 percent based on 1st dose card or history coverage of 84 percent, 1st dose card only coverage of 51 percent and 3rd dose card only coverage of 49 percent. Reported data excluded. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-


2006: Reported data calibrated to 2003 and 2008 levels. Reported data not consistent with survey results. Estimate challenged by: D-R-
Lebanon - Hib3

Description:

2017: Reported data calibrated to 2014 levels. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Estimate challenged by: D-R-

2016: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government of Lebanon does not concur with the WHO and UNICEF estimates of vaccination coverage. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 79 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2015: Reported data calibrated to 2014 levels. Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Government reports target population estimates reflect estimated number of Lebanese and non-Lebanese children. Programme also reports increases in number of children vaccinated. Estimate of 79 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2014: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 79 percent based on 1 survey(s). Reported data excluded. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. The influx of Syrian subpopulations into Lebanon during 2014 continued to increase potentially impacting reported coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. Beginning in 2015 a stream of work has begun to further understand recent patterns in coverage across recommended vaccines in Lebanon, including a review of administrative recording and reporting systems as well as immunization coverage among displaced populations. Estimate of 79 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2013: Estimate of 85 percent assigned by working group. Estimate based on survey results. Reported data not consistent with 2013 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format; activity to address results presentation is on-going. Beginning in the middle of 2013, there was an influx of displaced populations from Syria into Lebanon potentially impacting coverage levels in the country. In spite of reports from UNHCR, reported target population estimates from the national immunization programme do not reflect increases beyond the expected year-to-year population growth. A 2013 national EPI coverage survey suggests lower coverage levels among Syrian subpopulations living in Lebanon, particularly those

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.
Lebanon - Hib3

who recently entered the country. Programme reports Hib containing vaccine stockout for 5 months in 26 districts. Estimate of 85 percent changed from previous revision value of 81 percent. Estimate challenged by: R-

2012: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate of 84 percent changed from previous revision value of 81 percent. Estimate challenged by: R-

2011: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate of 83 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2010: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Estimate of 83 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2009: Reported data calibrated to 2008 and 2013 levels. Reported data not consistent with survey results. Administrative data and government estimate includes both data reported by the public sector as well as for immunizations delivered in the private sector. The private sector provides immunization services for between 5 percent to 80 percent of all immunization services. Estimate of 82 percent changed from previous revision value of 81 percent. Estimate challenged by: D-R-

2008: Survey evidence does not support reported data. Estimate based on survey results. Survey evidence of 81 percent based on 1 survey(s). Lebanon Multiple Indicator Cluster Survey 2009 card or history results of 72 percent modified for recall bias to 81 percent based on 1st dose card or history coverage of 84 percent, 1st dose card only coverage of 51 percent and 3rd dose card only coverage of 49 percent. Reported data excluded. Reported data not consistent with survey results. Administrative data is based on immunizations provided in the public sector. The government estimate includes immunizations delivered in both the public and private sector. Estimate challenged by: D-R-


2006: Reported data calibrated to 2003 and 2008 levels. Reported data excluded. Reported data not consistent with survey results. Estimate challenged by: D-R-
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.

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---

**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:**

2017: Vaccine introduced in 2015 and reporting began in 2017. Estimate based on MCV2 because both vaccines are recommended at the same age. Reported data excluded. Reported data not consistent with 2016 EPI coverage evaluation survey results across all vaccines. Survey results not presented in a standard format. Estimate challenged by: D-R-
## Lebanon - survey details

### 2014 Expanded Programme on Immunization - District Based Immunization

#### Coverage Cluster Survey 2016

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<tr>
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### 2013 Expanded Programme on Immunization - District Based Immunization

#### Coverage Cluster Survey 2016

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### 2010 Expanded Programme of Immunization (EPI) Study - Lebanon: A Cluster Based Survey, 2013

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### 2008 Lebanon Multiple Indicator Cluster Survey 2009

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### Lebanon - survey details

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### 2003 Lebanon Family Health Survey (PAPFAM) 2004

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Further information and estimates for previous years are available at:
http://www.data.unicef.org/child-health/immunization