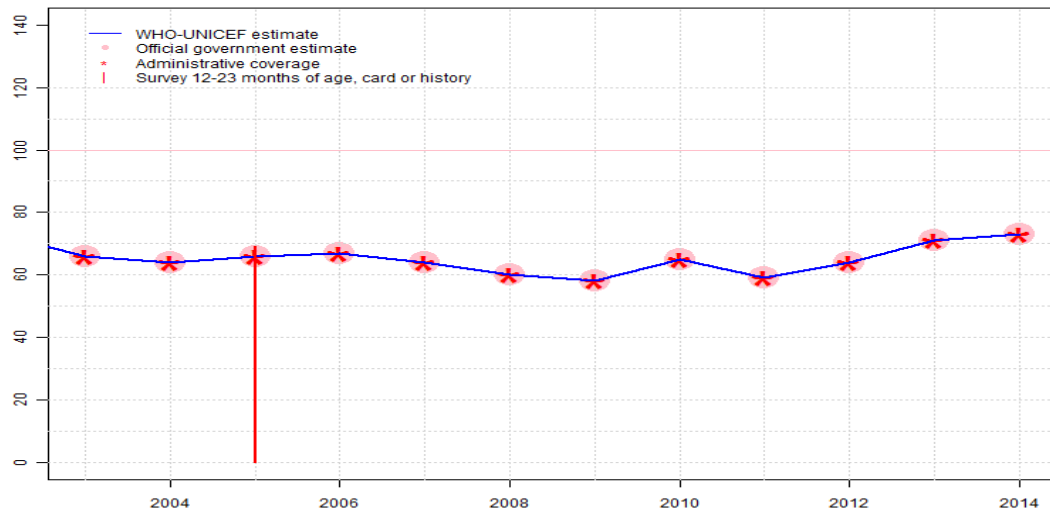


# Yemen - BCG

YEM - BCG



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | 66   | 64   | 66   | 67   | 64   | 60   | 58   | 65   | 59   | 64   | 71   | 73   |
| Estimate GoC   | •    | •    | •    | •    | •    | ••   | ••   | ••   | •    | •    | •    | •    |
| Official       | 66   | 64   | 66   | 67   | 64   | 60   | 58   | 65   | 59   | 64   | 71   | 73   |
| Administrative | 66   | 64   | 66   | 67   | 64   | 60   | 58   | 65   | 59   | 64   | 71   | 73   |
| Survey         | NA   | NA   | 69   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

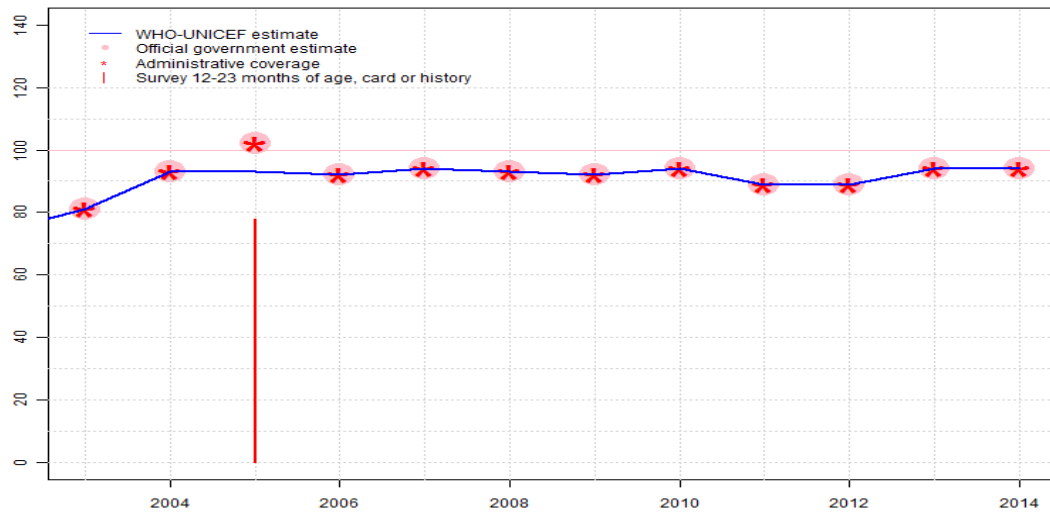
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2003: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2005: Estimate based on coverage reported by national government. Yemen Multiple Indicator Cluster Survey 2006, Final Report results ignored by working group. Survey results refer to immunizations of children less than one year of age vaccinated between October 2004 to September 2005. The survey results confirm reported coverage of 69 percent for this period. Estimate challenged by: S-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. GoC=R+D+
- 2009: Estimate based on coverage reported by national government. GoC=R+D+
- 2010: Estimate based on coverage reported by national government. GoC=R+D+
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Preliminary results from the 2013 DHS for the 2012 birth cohort suggest BCG coverage of 68 percent. Estimate challenged by: D-

# Yemen - DTP1

YEM - DTP1



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | 81   | 93   | 93   | 92   | 94   | 93   | 92   | 94   | 89   | 89   | 94   | 94   |
| Estimate GoC   | •    | •    | •    | •    | •    | ••   | •    | •    | •    | •    | •    | •    |
| Official       | 81   | 93   | 102  | 92   | 94   | 93   | 92   | 94   | 89   | 89   | 94   | 94   |
| Administrative | 81   | 93   | 102  | 92   | 94   | 93   | 92   | 94   | 89   | 89   | 94   | 94   |
| Survey         | NA   | NA   | 78   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

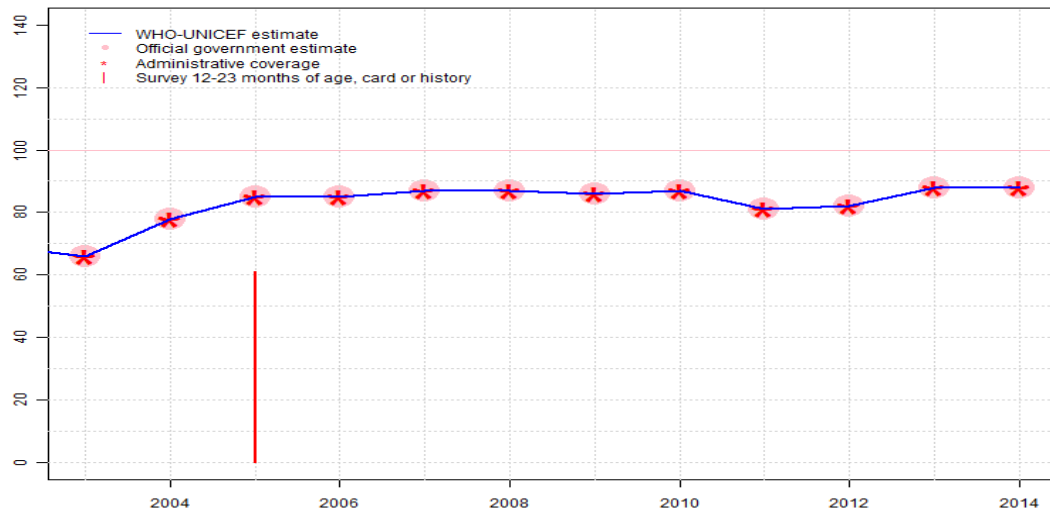
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2003: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2005: Estimate based on interpolation between data reported by national government. Yemen Multiple Indicator Cluster Survey 2006, Final Report results ignored by working group. Survey results refer to immunizations of children less than one year of age vaccinated between October 2004 to September 2005. Reported data excluded. 102 percent greater than 100 percent. DTP-HepB-Hib pentavalent vaccine introduced during April 2005. Estimate challenged by: D-S-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. GoC=R+D+
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Preliminary results from the 2013 DHS for the 2012 birth cohort suggest DTP1 coverage of 77 percent. Estimate challenged by: D-

# Yemen - DTP3

YEM - DTP3



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | 66   | 78   | 85   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Estimate GoC   | ●    | ●    | ●    | ●    | ●    | ●●   | ●●   | ●    | ●    | ●    | ●    | ●    |
| Official       | 66   | 78   | 85   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Administrative | 66   | 78   | 85   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Survey         | NA   | NA   | 61   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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:

- 2003: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2005: Estimate based on coverage reported by national government. Yemen Multiple Indicator Cluster Survey 2006, Final Report results ignored by working group. Survey results refer to immunizations of children less than one year of age vaccinated between October 2004 to September 2005. Yemen Multiple Indicator Cluster Survey 2006, Final Report card or history results of 61 percent modified for recall bias to 65 percent based on 1st dose card or history coverage of 78 percent, 1st dose card only coverage of 47 percent and 3d dose card only coverage of 39 percent. DTP-HepB-Hib pentavalent vaccine introduced during April 2005. Estimate challenged by: S-
- 2006: Estimate based on coverage reported by national government. Disaggregated coverage data show 58 percent coverage through routine services and 27 percent coverage through outreach activities conducted over 5 rounds in 2006. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Disaggregated coverage data show 58 percent coverage through routine services and 27 percent coverage through outreach activities conducted over 6 rounds in 2007. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. Disaggregated coverage data show 57 percent coverage through routine services and 30 percent coverage through outreach activities conducted over 4 rounds in 2008. GoC=R+ D+
- 2009: Estimate based on coverage reported by national government. Disaggregated coverage data show 58 percent coverage through routine services and 28 percent coverage through outreach activities conducted over 4 rounds in 2009. GoC=R+ D+
- 2010: Estimate based on coverage reported by national government. Disaggregated coverage data show 58 percent coverage through routine services and 28 percent coverage through outreach activities conducted over 4 rounds in 2010. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-

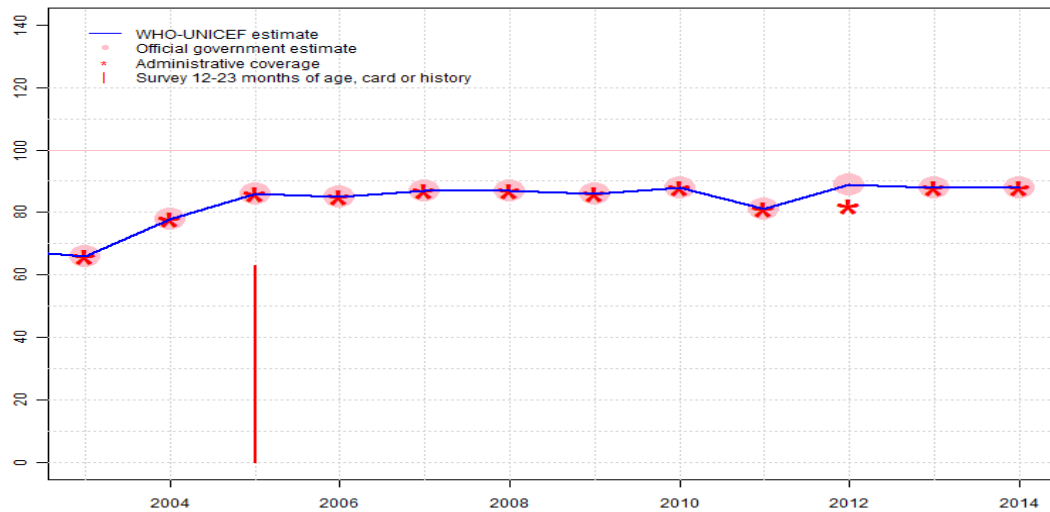
# Yemen - DTP3

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2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Preliminary results from the 2013 DHS for the 2012 birth cohort suggest coverage that does not support the reported coverage level. Estimate challenged by: D-

# Yemen - Pol3

YEM - Pol3



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | 66   | 78   | 86   | 85   | 87   | 87   | 86   | 88   | 81   | 89   | 88   | 88   |
| Estimate GoC   | •    | •    | •    | •    | •    | ••   | ••   | •    | •    | ••   | •    | •    |
| Official       | 66   | 78   | 86   | 85   | 87   | 87   | 86   | 88   | 81   | 89   | 88   | 88   |
| Administrative | 66   | 78   | 86   | 85   | 87   | 87   | 86   | 88   | 81   | 82   | 88   | 88   |
| Survey         | NA   | NA   | 63   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

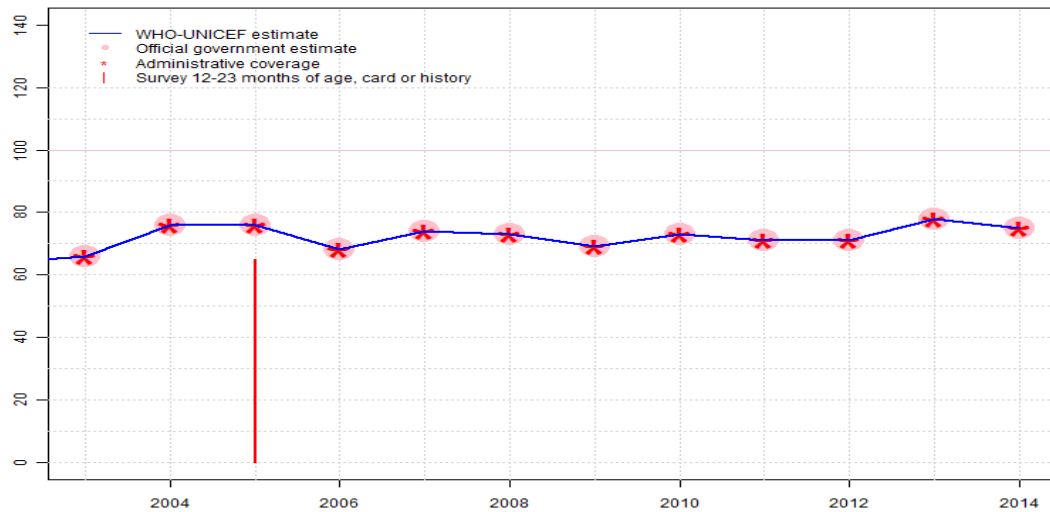
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2003: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2005: Estimate based on coverage reported by national government. Yemen Multiple Indicator Cluster Survey 2006, Final Report results ignored by working group. Survey results refer to immunizations of children less than one year of age vaccinated between October 2004 to September 2005. Yemen Multiple Indicator Cluster Survey 2006, Final Report card or history results of 63 percent modified for recall bias to 65 percent based on 1st dose card or history coverage of 81 percent, 1st dose card only coverage of 45 percent and 3d dose card only coverage of 36 percent. Estimate challenged by: S-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. GoC=R+D+
- 2009: Estimate based on coverage reported by national government. GoC=R+D+
- 2010: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. GoC=R+D+
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Preliminary results from the 2013 DHS for the 2012 birth cohort suggest coverage that does not support the reported coverage level. Estimate challenged by: D-

# Yemen - MCV1

YEM - MCV1



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | 66   | 76   | 76   | 68   | 74   | 73   | 69   | 73   | 71   | 71   | 78   | 75   |
| Estimate GoC   | •    | •    | •    | •    | •    | ••   | ••   | •    | •    | •    | •    | •    |
| Official       | 66   | 76   | 76   | 68   | 74   | 73   | 69   | 73   | 71   | 71   | 78   | 75   |
| Administrative | 66   | 76   | 76   | 68   | 74   | 73   | 69   | 73   | 71   | 71   | 78   | 75   |
| Survey         | NA   | NA   | 65   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

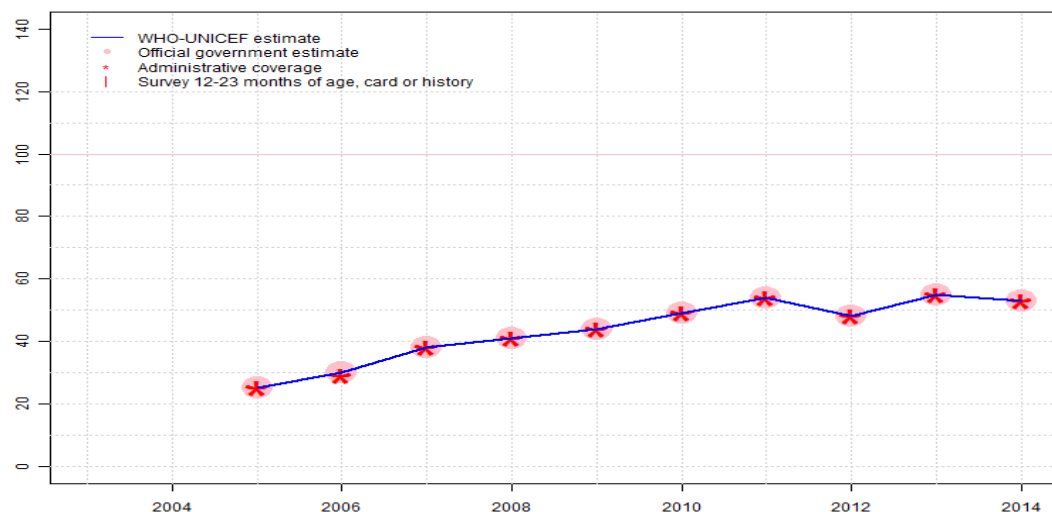
## Description:

- 2003: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2005: Estimate based on coverage reported by national government. Yemen Multiple Indicator Cluster Survey 2006, Final Report results ignored by working group. Survey results refer to immunizations of children less than one year of age vaccinated between October 2004 to September 2005. Estimate challenged by: S-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. GoC=R+D+
- 2009: Estimate based on coverage reported by national government. GoC=R+D+
- 2010: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Preliminary results from the 2013 DHS for the 2012 birth cohort suggest coverage of 63 percent for MCV1. Estimate challenged by: D-



# Yemen - MCV2

YEM - MCV2



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | NA   | NA   | 25   | 30   | 38   | 41   | 44   | 49   | 54   | 48   | 55   | 53   |
| Estimate GoC   | NA   | NA   | •    | •    | •    | ••   | ••   | ••   | ••   | ••   | •    | •    |
| Official       | NA   | NA   | 25   | 30   | 38   | 41   | 44   | 49   | 54   | 48   | 55   | 53   |
| Administrative | NA   | NA   | 25   | 29   | 38   | 41   | 44   | 49   | 54   | 48   | 55   | 53   |
| Survey         | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

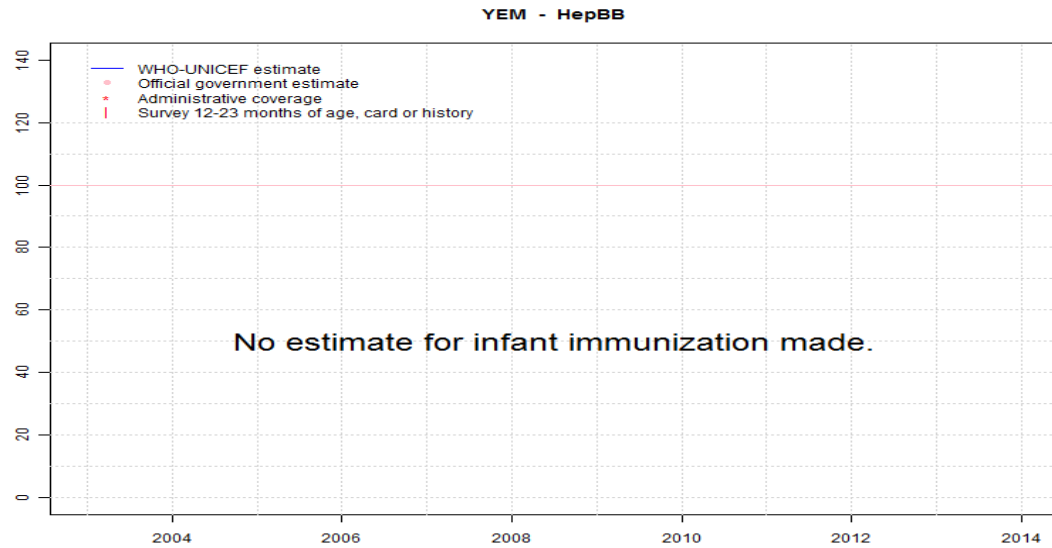
## Description:

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

- 2005: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. GoC=R+D+
- 2009: Estimate based on coverage reported by national government. GoC=R+D+
- 2010: Estimate based on coverage reported by national government. GoC=R+D+
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. GoC=R+D+
- 2012: Estimate based on coverage reported by national government. GoC=R+D+
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Estimate challenged by: D-



# Yemen - HepBB



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |
| Estimate GoC   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |
| Official       | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |
| Administrative | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |
| Survey         | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

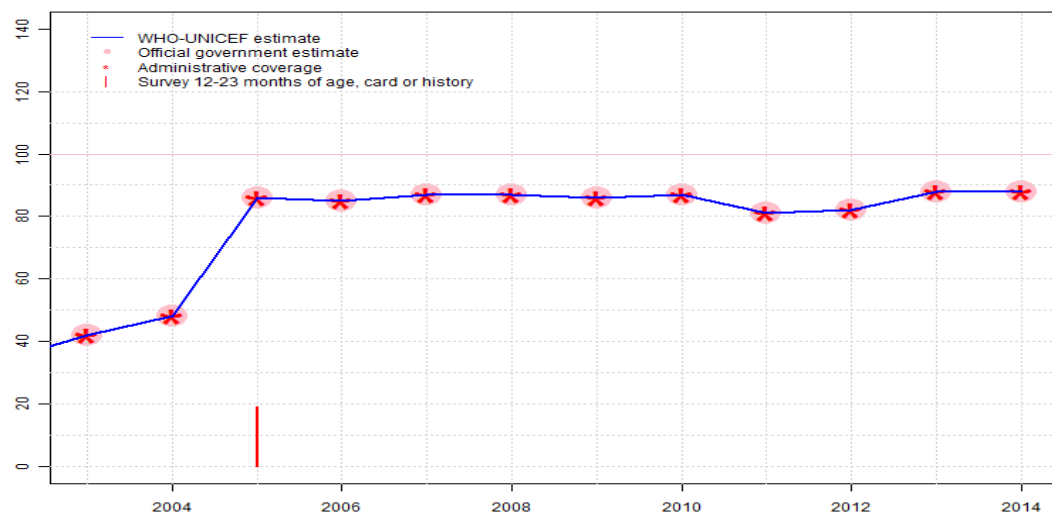
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

# Yemen - HepB3

YEM - HepB3



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | 42   | 48   | 86   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Estimate GoC   | •    | •    | •    | •    | •    | ••   | ••   | •    | •    | •    | •    | •    |
| Official       | 42   | 48   | 86   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Administrative | 42   | 48   | 86   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Survey         | NA   | NA   | 19   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

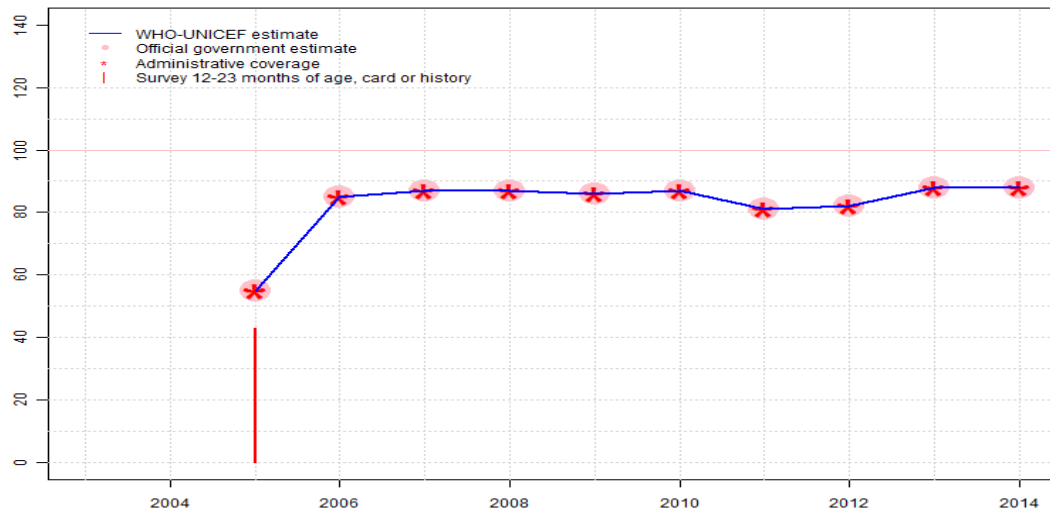
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2003: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2005: Estimate based on coverage reported by national government. Yemen Multiple Indicator Cluster Survey 2006, Final Report results ignored by working group. Survey results refer to immunizations of children less than one year of age vaccinated between October 2004 to September 2005. Yemen Multiple Indicator Cluster Survey 2006, Final Report card or history results of 19 percent modified for recall bias to 21 percent based on 1st dose card or history coverage of 28 percent, 1st dose card only coverage of 12 percent and 3d dose card only coverage of 9 percent. DTP-HepB-Hib pentavalent vaccine introduced during April 2005. Estimate challenged by: S-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. GoC=R+D+
- 2009: Estimate based on coverage reported by national government. GoC=R+D+
- 2010: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Preliminary results from the 2013 DHS for the 2012 birth cohort suggest coverage that does not support the reported coverage level. Estimate challenged by: D-

# Yemen - Hib3

YEM - Hib3



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | NA   | NA   | 55   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Estimate GoC   | NA   | NA   | •    | •    | •    | ••   | ••   | •    | •    | •    | •    | •    |
| Official       | NA   | NA   | 55   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Administrative | NA   | NA   | 55   | 85   | 87   | 87   | 86   | 87   | 81   | 82   | 88   | 88   |
| Survey         | NA   | NA   | 43   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

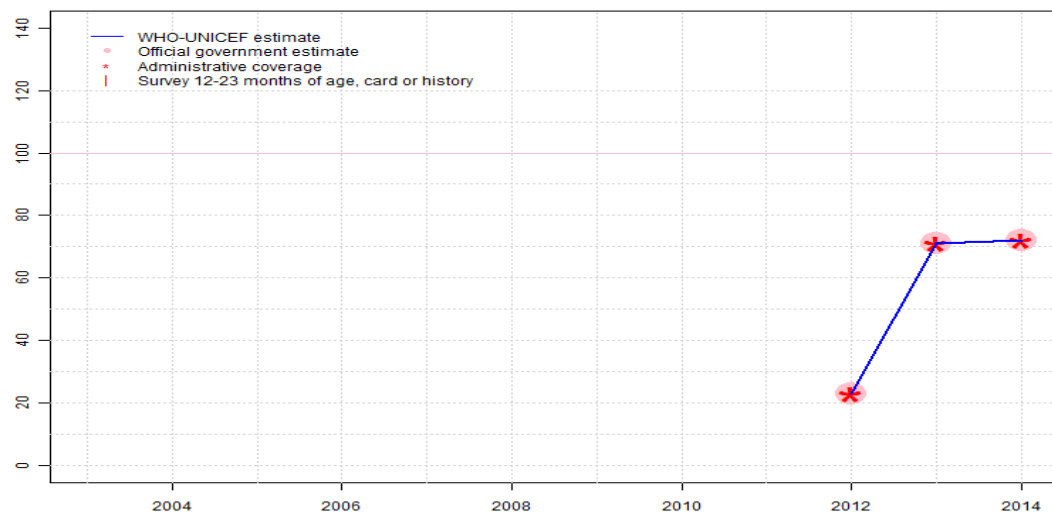
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2005: Estimate based on coverage reported by national government. Yemen Multiple Indicator Cluster Survey 2006, Final Report results ignored by working group. Survey results refer to immunizations of children less than one year of age vaccinated between October 2004 to September 2005. Yemen Multiple Indicator Cluster Survey 2006, Final Report card or history results of 43 percent modified for recall bias to 48 percent based on 1st dose card or history coverage of 59 percent, 1st dose card only coverage of 33 percent and 3d dose card only coverage of 27 percent. DTP-HepB-Hib pentavalent vaccine introduced during April 2005. Estimate challenged by: S-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: S-
- 2008: Estimate based on coverage reported by national government. GoC=R+D+
- 2009: Estimate based on coverage reported by national government. GoC=R+D+
- 2010: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Estimate challenged by: D-
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Preliminary results from the 2013 DHS for the 2012 birth cohort suggest coverage that does not support the reported coverage level. Estimate challenged by: D-

# Yemen - RotaC

YEM - RotaC



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | 23   | 71   | 72   |
| Estimate GoC   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | •    | •    | •    |
| Official       | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | 23   | 71   | 72   |
| Administrative | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | 23   | 71   | 72   |
| Survey         | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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.

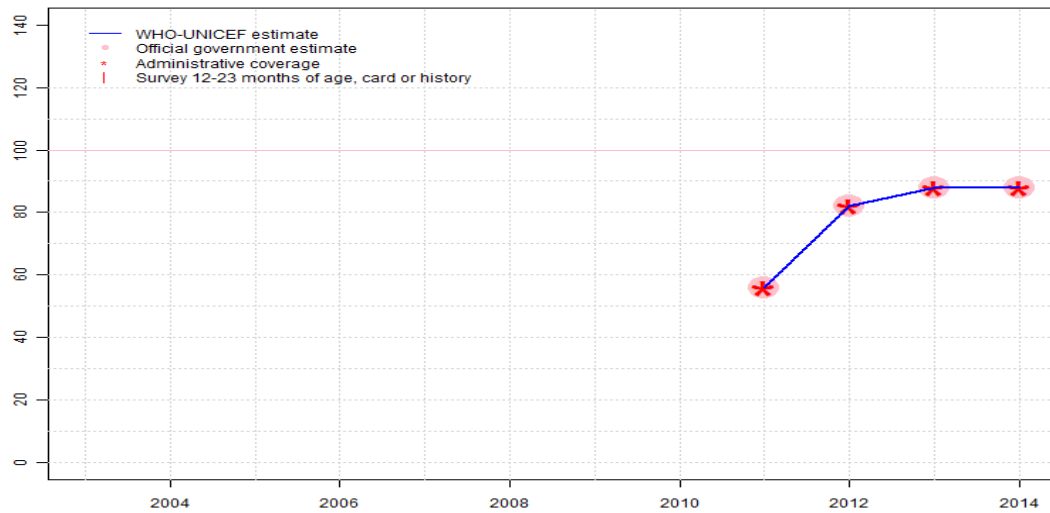
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

- 2012: Estimate based on coverage reported by national government. Rotavirus vaccine was introduced in 2012. GoC=Assigned by working group. Introduction period.
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Estimate challenged by: D-

# Yemen - PcV3

YEM - PcV3



|                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Estimate       | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | 56   | 82   | 88   | 88   |
| Estimate GoC   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | •    | •    | •    | •    |
| Official       | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | 56   | 82   | 88   | 88   |
| Administrative | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | 56   | 82   | 88   | 88   |
| Survey         | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   | NA   |

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

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 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:

- 2011: Estimate based on coverage reported by national government. Decline in immunization coverage partially due to disruptions in immunization delivery due to the political disturbances and prevailing insecurity. Pneumococcal conjugate vaccine introduced in 2011. GoC=Assigned by working group. Introduction period.
- 2012: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2013: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2014: Estimate based on coverage reported by national government. WHO and UNICEF are aware of a coverage survey conducted during 2013 among children aged 12-23 m (33 percent HBR retention) and await final results. Estimate challenged by: D-

# Yemen - survey details

## 2005 Yemen Multiple Indicator Cluster Survey 2006, Final Report

| Vaccine | Confirmation method | Coverage | Age cohort | Sample | Cards seen |
|---------|---------------------|----------|------------|--------|------------|
| BCG     | C or H <12 months   | 67       | 12-23 m    | 721    | 48         |
| BCG     | Card                | 38       | 12-23 m    | 721    | 48         |
| BCG     | Card or History     | 69       | 12-23 m    | 721    | 48         |
| BCG     | History             | 31       | 12-23 m    | 721    | 48         |
| DTP1    | C or H <12 months   | 77       | 12-23 m    | 721    | 48         |
| DTP1    | Card                | 47       | 12-23 m    | 721    | 48         |
| DTP1    | Card or History     | 78       | 12-23 m    | 721    | 48         |
| DTP1    | History             | 32       | 12-23 m    | 721    | 48         |
| DTP3    | C or H <12 months   | 60       | 12-23 m    | 721    | 48         |
| DTP3    | Card                | 39       | 12-23 m    | 721    | 48         |
| DTP3    | Card or History     | 61       | 12-23 m    | 721    | 48         |
| DTP3    | History             | 22       | 12-23 m    | 721    | 48         |
| HepB1   | C or H <12 months   | 26       | 12-23 m    | 721    | 48         |
| HepB1   | Card                | 12       | 12-23 m    | 721    | 48         |
| HepB1   | Card or History     | 28       | 12-23 m    | 721    | 48         |
| HepB1   | History             | 16       | 12-23 m    | 721    | 48         |
| HepB3   | C or H <12 months   | 19       | 12-23 m    | 721    | 48         |
| HepB3   | Card                | 9        | 12-23 m    | 721    | 48         |
| HepB3   | Card or History     | 19       | 12-23 m    | 721    | 48         |
| HepB3   | History             | 11       | 12-23 m    | 721    | 48         |
| Hib1    | C or H <12 months   | 57       | 12-23 m    | 721    | 48         |
| Hib1    | Card                | 33       | 12-23 m    | 721    | 48         |
| Hib1    | Card or History     | 59       | 12-23 m    | 721    | 48         |
| Hib1    | History             | 26       | 12-23 m    | 721    | 48         |

|      |                   |    |         |     |    |
|------|-------------------|----|---------|-----|----|
| Hib3 | C or H <12 months | 40 | 12-23 m | 721 | 48 |
| Hib3 | Card              | 27 | 12-23 m | 721 | 48 |
| Hib3 | Card or History   | 43 | 12-23 m | 721 | 48 |
| Hib3 | History           | 16 | 12-23 m | 721 | 48 |
| MCV1 | C or H <12 months | 59 | 12-23 m | 721 | 48 |
| MCV1 | Card              | 31 | 12-23 m | 721 | 48 |
| MCV1 | Card or History   | 65 | 12-23 m | 721 | 48 |
| MCV1 | History           | 34 | 12-23 m | 721 | 48 |
| Pol1 | C or H <12 months | 79 | 12-23 m | 721 | 48 |
| Pol1 | Card              | 45 | 12-23 m | 721 | 48 |
| Pol1 | Card or History   | 81 | 12-23 m | 721 | 48 |
| Pol1 | History           | 36 | 12-23 m | 721 | 48 |
| Pol3 | C or H <12 months | 60 | 12-23 m | 721 | 48 |
| Pol3 | Card              | 36 | 12-23 m | 721 | 48 |
| Pol3 | Card or History   | 63 | 12-23 m | 721 | 48 |
| Pol3 | History           | 27 | 12-23 m | 721 | 48 |

## 2002 The Family Health Survey in the Republic of Yemen 2003

| Vaccine | Confirmation method | Coverage | Age cohort | Sample | Cards seen |
|---------|---------------------|----------|------------|--------|------------|
| BCG     | Card                | 55       | 12-23 m    | 2058   | 27         |
| DTP1    | Card                | 56       | 12-23 m    | 2058   | 27         |
| DTP3    | Card                | 45       | 12-23 m    | 2058   | 27         |
| MCV1    | Card                | 45       | 12-23 m    | 2058   | 27         |
| Pol1    | Card                | 62       | 12-23 m    | 2058   | 27         |
| Pol3    | Card                | 47       | 12-23 m    | 2058   | 27         |

Further information and estimates for previous years are available at:

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

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

## Yemen

### WHO/UNICEF Estimates of Protection at Birth (PAB) against tetanus

In countries where tetanus is recommended for girls and women coverage is usually reported as "TT2+", i.e. the proportion of (pregnant) women who have received their second or superior TT dose in a given year. TT2 + coverage, however, can under-represent the actual proportion of births that are protected against tetanus as it does not include women who have previously received protective doses, women who received one dose without documentation of previous doses, and women who received doses in TT (or Td) supplemental immunization activities (SIA). In addition, girls who have received DTP in their childhood and are entering childbearing age, may be protected with TT booster doses.

WHO and UNICEF have developed a model that takes into account the above scenarios, and calculates the proportion of births in a given year that can be considered as having been protected against tetanus - "Protection at Birth".

In this model, annual cohorts of women are followed from infancy through their life. A proportion receives DTP in infancy (estimated based on the WHO-UNICEF estimates of DTP3 coverage). In addition some of these women also receive TT through routine services when they are pregnant and may also receive TT during SIAs. The model also adjusts reported data, taking into account coverage patterns in other years, and/or results available through surveys. The duration of protection is then calculated, based on WHO estimates of the duration of protection by doses ever received. The proportion of births that are protected against tetanus as a result of maternal immunization reflects the tetanus immunization received by the mother throughout her life rather than simply the TT immunizations received during the current pregnancy.

The model was used in the mid to late 2000. Currently, the coverage series developed by the model is used as the baseline, and efforts are made to obtain data from all sources that include the JRF and reported trend over the years, routine PAB reporting and its trend over the years, data from surveys (DHS, MICS, EPI), whether countries have been validated for the attainment of maternal and neonatal tetanus elimination and what the TT coverage figures are from the survey etc and all the information is used to arrive at an estimate of the protection-at-birth from TT vaccination.

| Year | PAB coverage estimate (%) |
|------|---------------------------|
| 2003 | 65                        |
| 2004 | 69                        |
| 2005 | 59                        |
| 2006 | 56                        |
| 2007 | 52                        |
| 2008 | 63                        |
| 2009 | 66                        |
| 2010 | 66                        |
| 2011 | 66                        |
| 2012 | 66                        |
| 2013 | 70                        |
| 2014 | 70                        |

<sup>1</sup> This model is described in: Griffiths U., Wolfson L., Quddus A., Younus M., Hafiz R.. Incremental cost-effectiveness of supplementary immunization activities to prevent neo-natal tetanus in Pakistan. Bulletin of the World Health Organization 2004; 82:643-651.