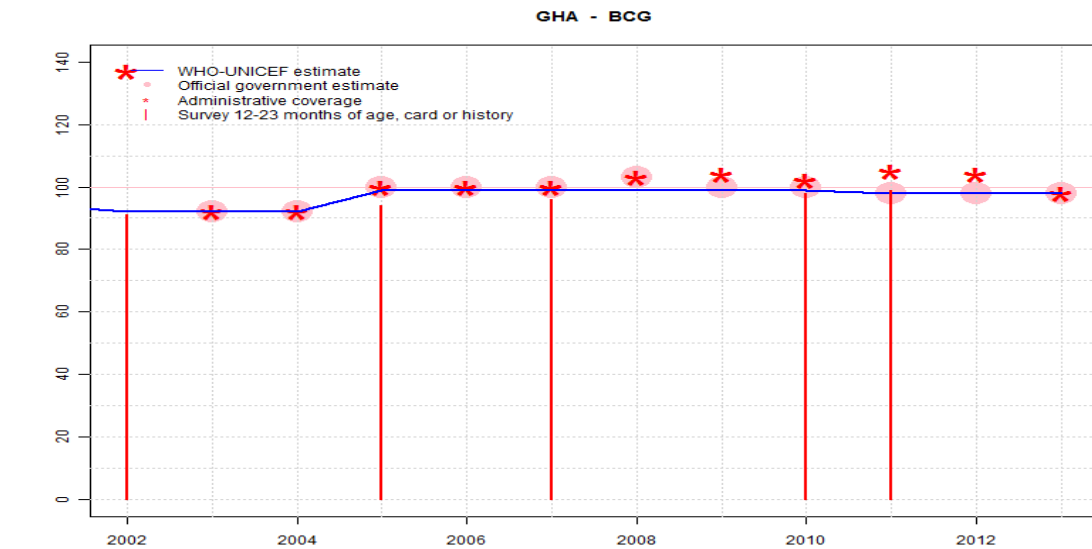


Ghana - BCG



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	92	92	92	99	99	99	99	99	99	98	98	98
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	92	92	100	100	100	103	100	100	98	98	98
Administrative	137	92	92	100	100	100	103	104	102	105	104	98
Survey	91	NA	NA	94	NA	96	NA	NA	98	99	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.

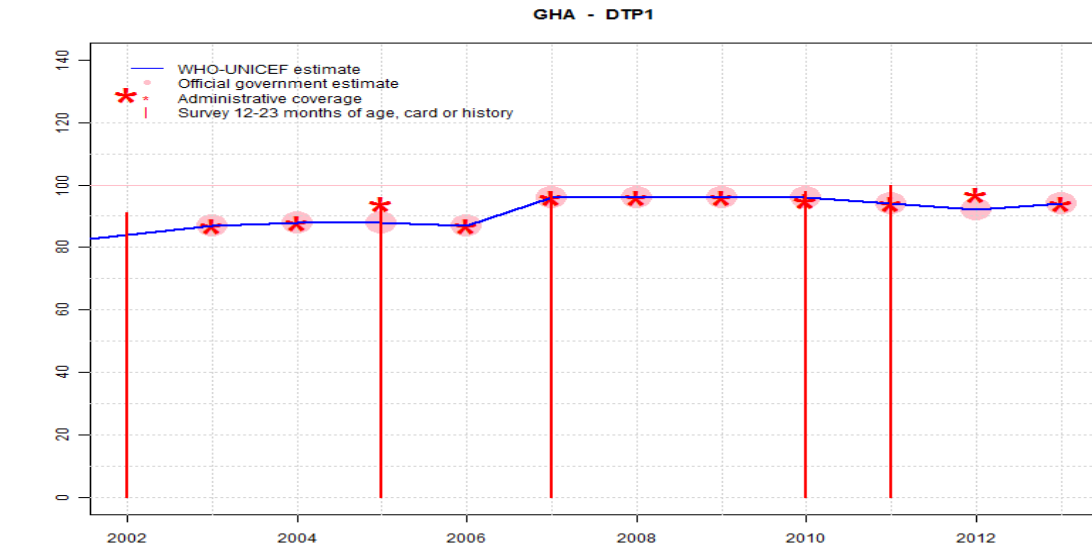
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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:

- 2002: Estimate based on interpolation between data reported by national government supported by survey. Survey evidence of 91 percent based on 1 survey(s). Reported data excluded. 137 percent greater than 100 percent. Reported data excluded. Unexplained increase from 91 percent to 137 percent with decrease 92 percent. Estimate challenged by: D-
- 2003: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 94 percent based on 1 survey(s). Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 96 percent based on 1 survey(s). Estimate challenged by: D-
- 2008: Estimate based on interpolation between coverage reported by national government. Reported data excluded. 103 percent greater than 100 percent. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 98 percent based on 1 survey(s). Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). 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-

Ghana - DTP1



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	84	87	88	88	87	96	96	96	96	94	92	94
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	87	88	88	87	96	96	96	96	94	92	94
Administrative	129	87	88	94	87	96	96	96	95	94	97	94
Survey	91	NA	NA	94	NA	98	NA	NA	98	100	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.

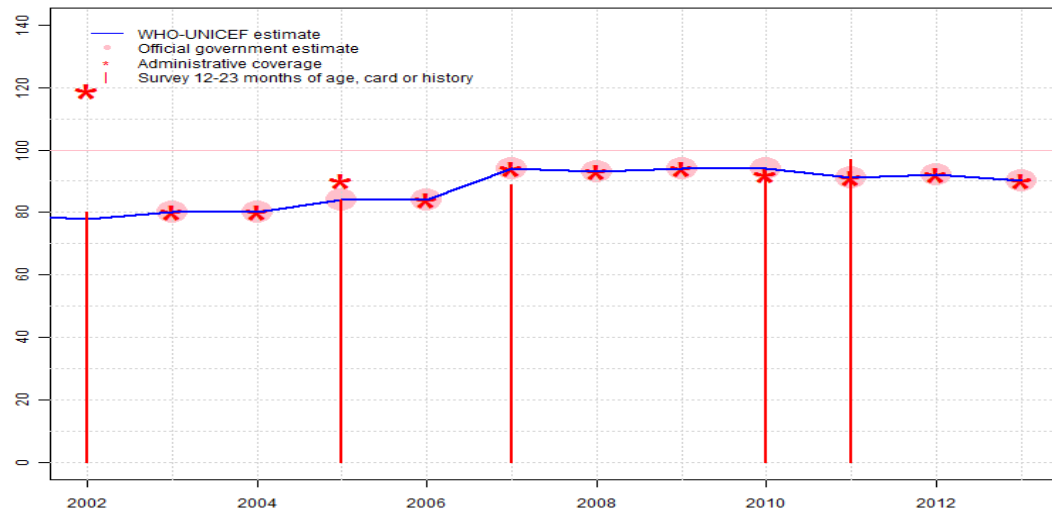
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

- 2002: Estimate based on interpolation between data reported by national government supported by survey. Survey evidence of 91 percent based on 1 survey(s). Reported data excluded. 129 percent greater than 100 percent. Reported data excluded. Unexplained increase from 80 percent to 129 percent with decrease 87 percent. Estimate challenged by: D-
- 2003: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 94 percent based on 1 survey(s). Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 98 percent based on 1 survey(s). Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 98 percent based on 1 survey(s). Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 100 percent based on 1 survey(s). 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-

Ghana - DTP3

GHA - DTP3



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	78	80	80	84	84	94	93	94	94	91	92	90
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	80	80	84	84	94	93	94	94	91	92	90
Administrative	119	80	80	90	84	94	93	94	92	91	92	90
Survey	80	NA	NA	84	NA	89	NA	NA	93	97	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:

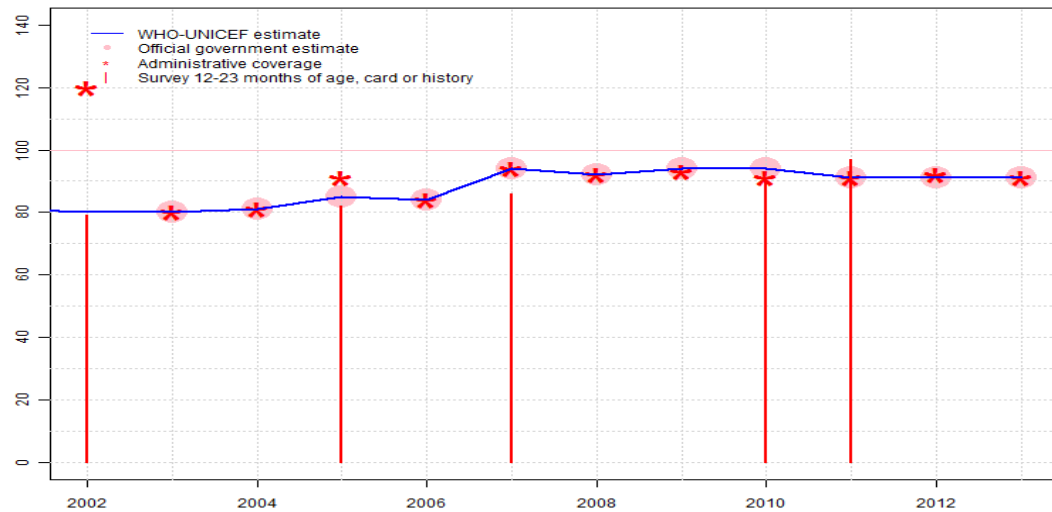
- 2002: Estimate based on interpolation between data reported by national government supported by survey. Survey evidence of 84 percent based on 1 survey(s). Ghana National Demographic and Health Survey 2003 card or history results of 80 percent modified for recall bias to 84 percent based on 1st dose card or history coverage of 91 percent, 1st dose card only coverage of 80 percent and 3d dose card only coverage of 74 percent. Reported data excluded. 119 percent greater than 100 percent. Reported data excluded. Unexplained increase from 76 percent to 119 percent with decrease 80 percent. Estimate challenged by: D-
- 2003: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 87 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey 2006 card or history results of 84 percent modified for recall bias to 87 percent based on 1st dose card or history coverage of 94 percent, 1st dose card only coverage of 84 percent and 3d dose card only coverage of 78 percent. Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 95 percent based on 1 survey(s). Ghana Demographic and Health Survey 2008 card or history results of 89 percent modified for recall bias to 95 percent based on 1st dose card or history coverage of 98 percent, 1st dose card only coverage of 85 percent and 3d dose card only coverage of 82 percent. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 95 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey with an Enhanced Malaria Module and Biomarker 2011 card or history results of 93 percent modified for recall bias to 95 percent based on 1st dose card or history coverage of 98 percent, 1st dose card only coverage of 88 percent and 3d dose card only coverage of 85 percent. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 97 percent based on 1 survey(s). Estimate challenged by: D-

Ghana - DTP3

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-

GHA - Pol3



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	80	80	81	85	84	94	92	94	94	91	91	91
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	80	81	85	84	94	92	94	94	91	91	91
Administrative	120	80	81	91	84	94	92	93	91	91	92	91
Survey	79	NA	NA	82	NA	86	NA	NA	91	97	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:

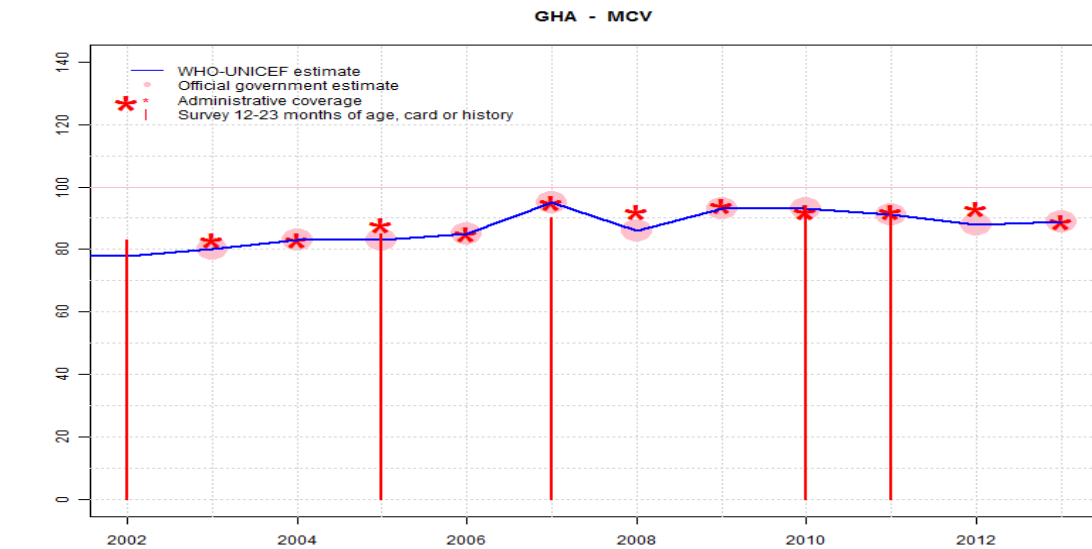
- 2002: Estimate based on interpolation between data reported by national government supported by survey. Survey evidence of 84 percent based on 1 survey(s). Ghana National Demographic and Health Survey 2003 card or history results of 79 percent modified for recall bias to 84 percent based on 1st dose card or history coverage of 93 percent, 1st dose card only coverage of 82 percent and 3d dose card only coverage of 74 percent. Reported data excluded. 120 percent greater than 100 percent. Reported data excluded. Unexplained increase from 79 percent to 120 percent with decrease 80 percent. Estimate challenged by: D-
- 2003: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 87 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey 2006 card or history results of 82 percent modified for recall bias to 87 percent based on 1st dose card or history coverage of 96 percent, 1st dose card only coverage of 84 percent and 3d dose card only coverage of 76 percent. Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 92 percent based on 1 survey(s). Ghana Demographic and Health Survey 2008 card or history results of 86 percent modified for recall bias to 92 percent based on 1st dose card or history coverage of 97 percent, 1st dose card only coverage of 85 percent and 3d dose card only coverage of 81 percent. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 97 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey with an Enhanced Malaria Module and Biomarker 2011 card or history results of 91 percent modified for recall bias to 97 percent based on 1st dose card or history coverage of 99 percent, 1st dose card only coverage of 87 percent and 3d dose card only coverage of 85 percent. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). Ghana EPI Cluster Survey 2012 card or history results of 97 percent modified for re-

call bias to 99 percent based on 1st dose card or history coverage of 100 percent, 1st dose card only coverage of 98 percent and 3d dose card only coverage of 97 percent. 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-

Ghana - MCV



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	78	80	83	83	85	95	86	93	93	91	88	89
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	80	83	83	85	95	86	93	93	91	88	89
Administrative	127	83	83	88	85	95	92	94	92	92	93	89
Survey	83	NA	NA	85	NA	90	NA	NA	94	94	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.

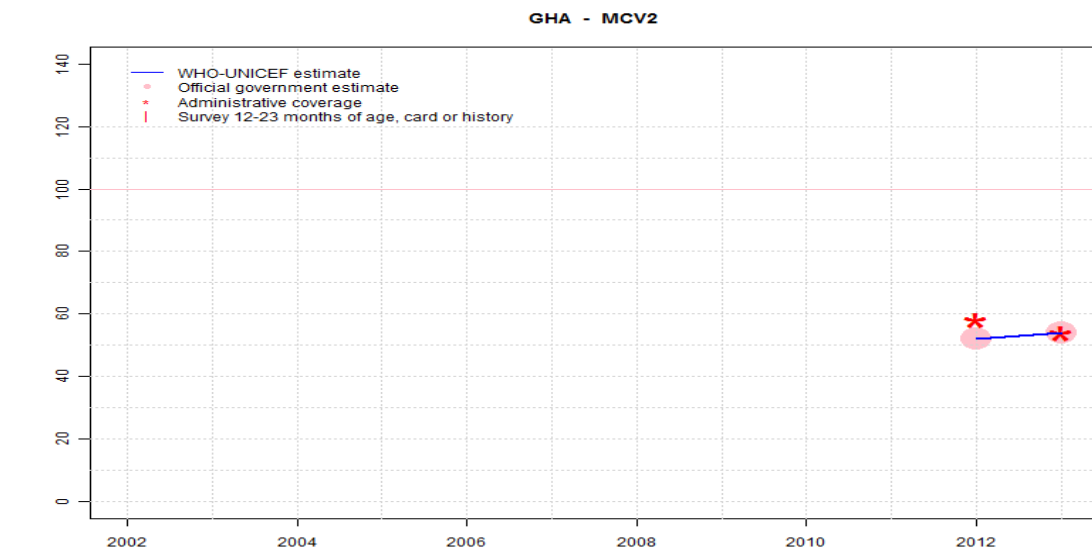
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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:

- 2002: Estimate based on interpolation between data reported by national government supported by survey. Survey evidence of 83 percent based on 1 survey(s). Reported data excluded. 127 percent greater than 100 percent. Reported data excluded. Unexplained increase from 75 percent to 127 percent with decrease 80 percent. Estimate challenged by: D-
- 2003: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 85 percent based on 1 survey(s). Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 90 percent based on 1 survey(s). Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 94 percent based on 1 survey(s). Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 94 percent based on 1 survey(s). 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. Measles rubella vaccine introduced in September 2013. Estimate challenged by: D-

Ghana - MCV2



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52	54
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	●	●
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52	54
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	58	54
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.

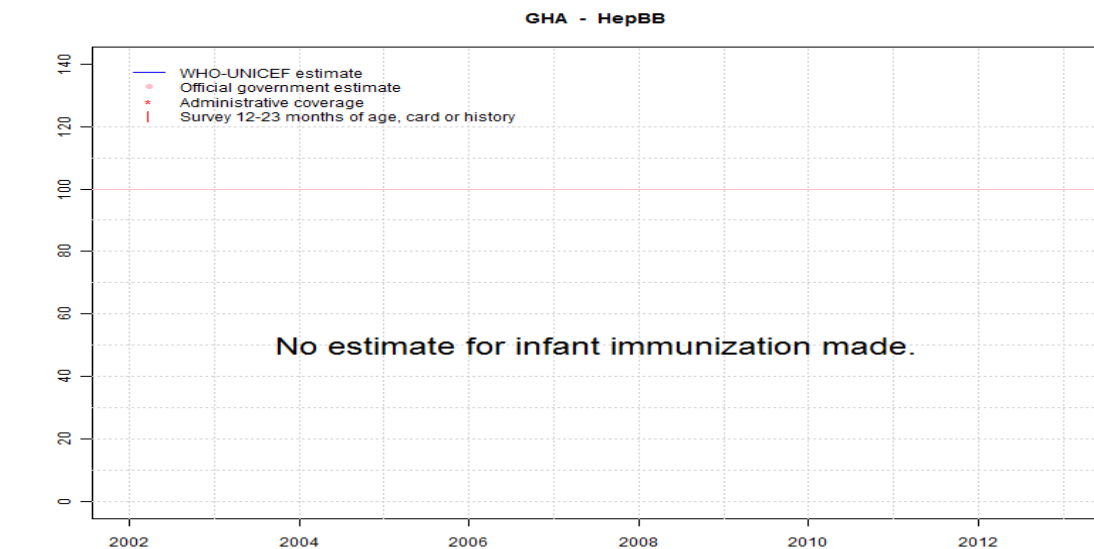
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

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

2012: Estimate based on coverage reported by national government. Measles second dose introduced in 2012. Recommended at 18 months. Estimate challenged by: D-

2013: Estimate based on coverage reported by national government. Measles rubella vaccine introduced in September 2013. Estimate challenged by: D-



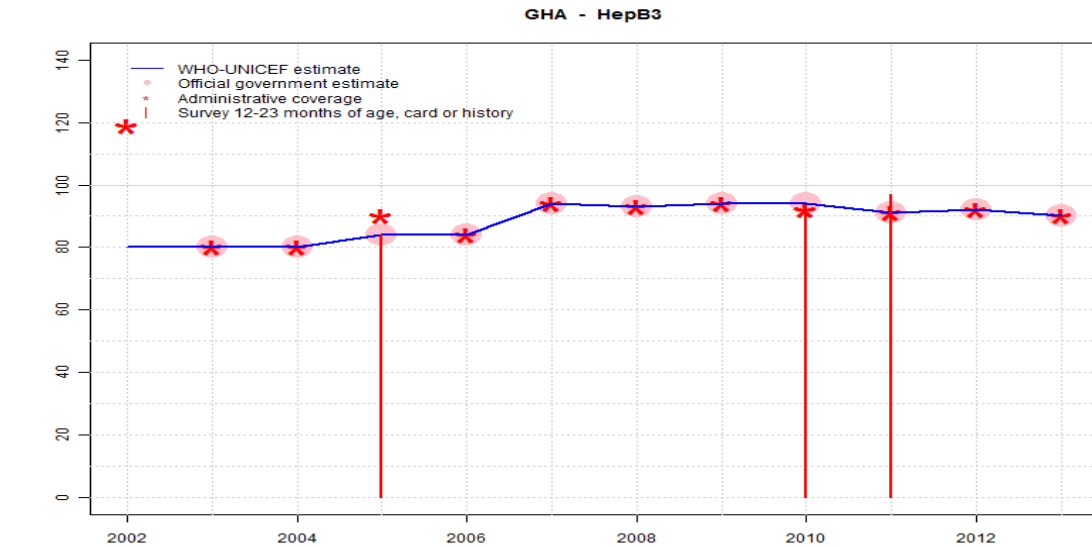
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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.

Ghana - HepB3



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	80	80	80	84	84	94	93	94	94	91	92	90
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	80	80	84	84	94	93	94	94	91	92	90
Administrative	119	80	80	90	84	94	93	94	92	91	92	90
Survey	NA	NA	NA	84	NA	NA	NA	NA	93	97	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.

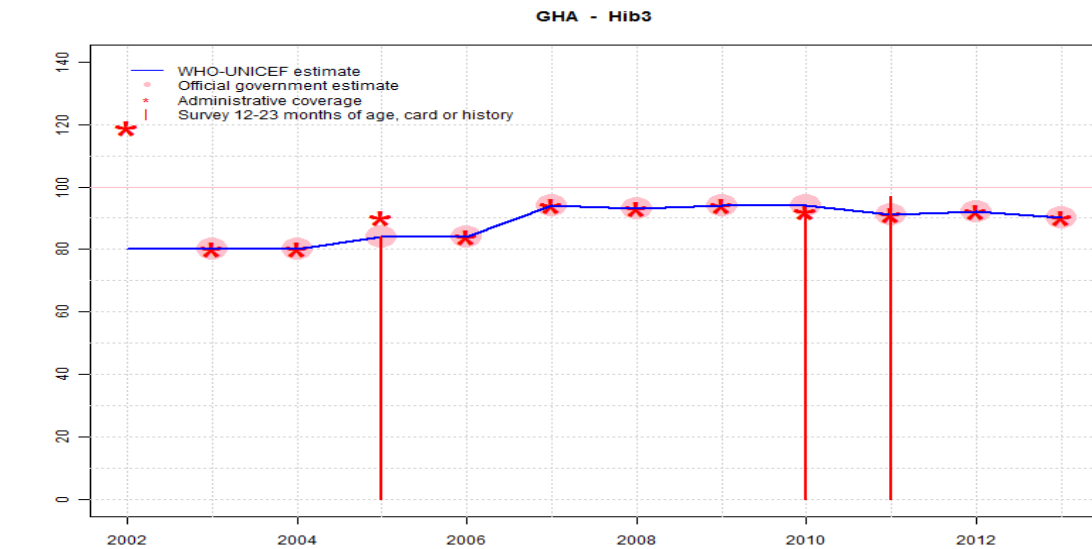
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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:

- 2002: Estimate based on extrapolation from data reported by national government. Reported data excluded. 119 percent greater than 100 percent. HepB vaccine introduced in 2002 Vaccine presentation is DTP-HepB-Hib. Estimate challenged by: D-
- 2003: Estimate based on reported data. Estimate challenged by: D-
- 2004: Estimate based on reported data. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 87 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey 2006 card or history results of 84 percent modified for recall bias to 87 percent based on 1st dose card or history coverage of 94 percent, 1st dose card only coverage of 84 percent and 3d dose card only coverage of 78 percent. Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 95 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey with an Enhanced Malaria Module and Biomarker 2011 card or history results of 93 percent modified for recall bias to 95 percent based on 1st dose card or history coverage of 98 percent, 1st dose card only coverage of 88 percent and 3d dose card only coverage of 85 percent. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 97 percent based on 1 survey(s). 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-

Ghana - Hib3



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	80	80	80	84	84	94	93	94	94	91	92	90
Estimate GoC	•	•	•	•	•	•	•	•	•	•	•	•
Official	NA	80	80	84	84	94	93	94	94	91	92	90
Administrative	119	80	80	90	84	94	93	94	92	91	92	90
Survey	NA	NA	NA	84	NA	NA	NA	NA	93	97	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.

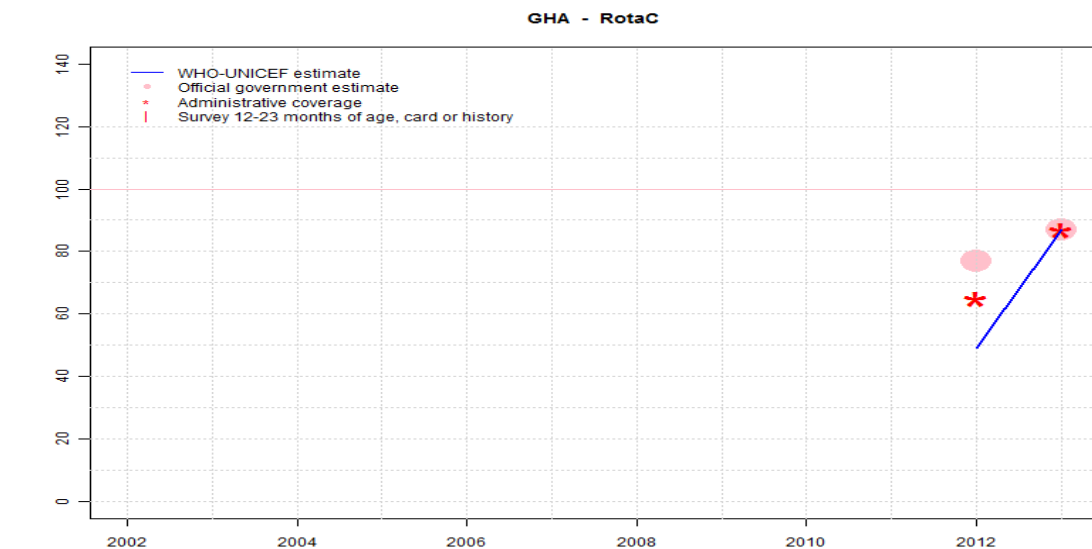
- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk 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:

- 2002: Estimate based on extrapolation from data reported by national government. Reported data excluded. 119 percent greater than 100 percent. Hib vaccine introduced in 2002 Vaccine presentation is DTP-HepB-Hib. Estimate challenged by: D-
- 2003: Estimate based on reported data. Estimate challenged by: D-
- 2004: Estimate based on reported data. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 87 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey 2006 card or history results of 84 percent modified for recall bias to 87 percent based on 1st dose card or history coverage of 94 percent, 1st dose card only coverage of 84 percent and 3d dose card only coverage of 78 percent. Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 95 percent based on 1 survey(s). Ghana Multiple Indicator Cluster Survey with an Enhanced Malaria Module and Biomarker 2011 card or history results of 93 percent modified for recall bias to 95 percent based on 1st dose card or history coverage of 98 percent, 1st dose card only coverage of 88 percent and 3d dose card only coverage of 85 percent. Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 97 percent based on 1 survey(s). 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-

Ghana - RotaC



Description:

2012: Rotavirus vaccine was introduced in 2012. 65 percent coverage in 75 percent of national target population. Estimate challenged by: D-R-

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

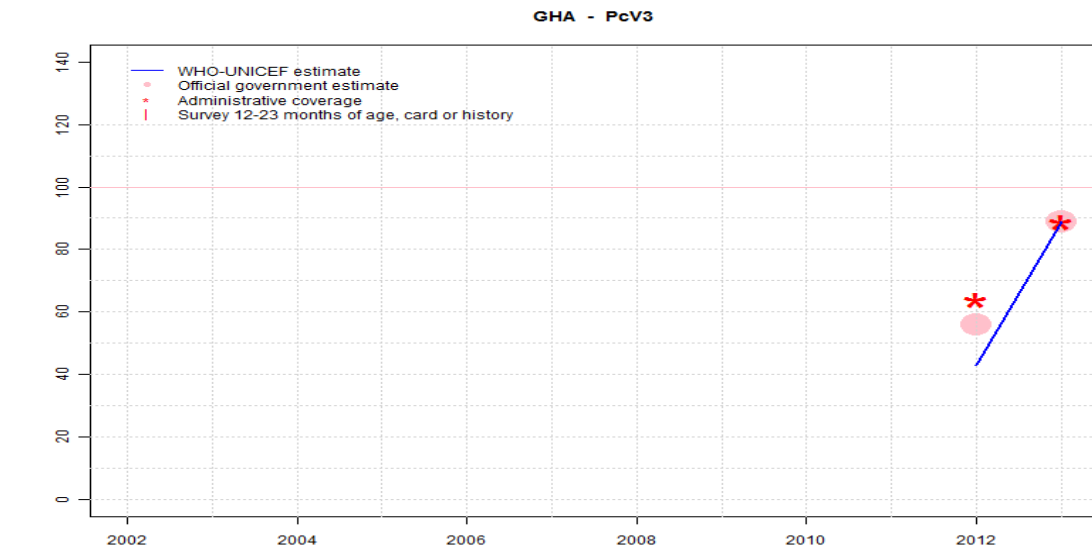
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	49	87
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	●	●
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77	87
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	65	87
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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.

Ghana - PcV3



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43	89
Estimate GoC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	●	●
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	56	89
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	64	89
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.

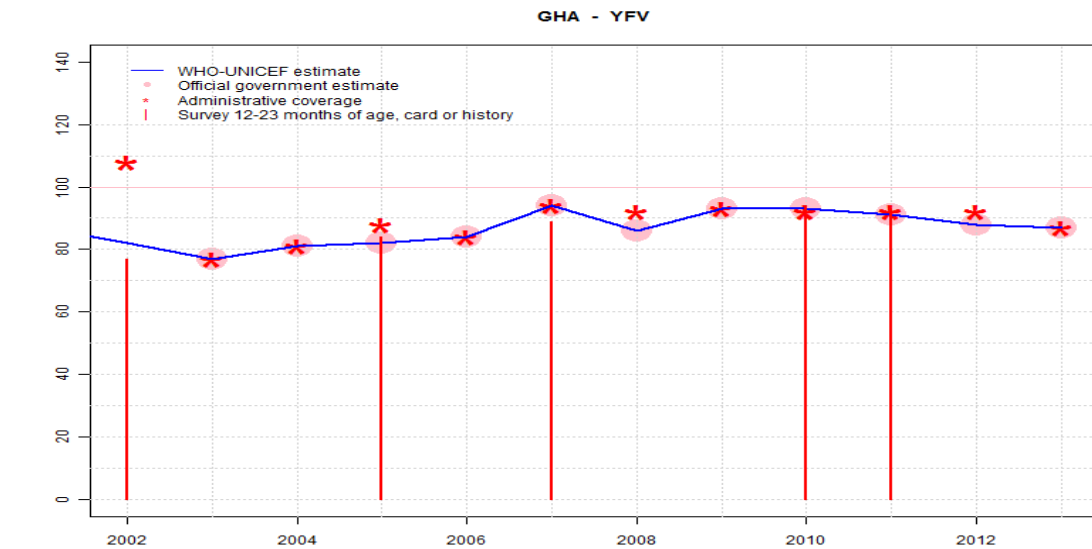
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

Description:

2012: Pneumococcal conjugate vaccine introduced in 2012. 64 percent coverage in 66 percent of national target population. Estimate challenged by: D-R-

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

Ghana - YFV



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	82	77	81	82	84	94	86	93	93	91	88	87
Estimate GoC	••	•	•	•	•	•	•	•	•	•	•	•
Official	NA	77	81	82	84	94	86	93	93	91	88	87
Administrative	108	77	81	88	84	94	92	93	92	92	92	87
Survey	77	NA	NA	84	NA	89	NA	NA	94	93	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:

- 2002: Estimate based on interpolation between data reported by national government supported by survey. Survey evidence of 77 percent based on 1 survey(s). Reported data excluded. 108 percent greater than 100 percent. Reported data excluded. Unexplained increase from 87 percent to 108 percent with decrease 77 percent. GoC=S+ D+
- 2003: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2004: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2005: Estimate based on coverage reported by national government supported by survey. Survey evidence of 84 percent based on 1 survey(s). Estimate challenged by: D-
- 2006: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 89 percent based on 1 survey(s). Estimate challenged by: D-
- 2008: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2009: Estimate based on coverage reported by national government. Estimate challenged by: D-
- 2010: Estimate based on coverage reported by national government supported by survey. Survey evidence of 94 percent based on 1 survey(s). Estimate challenged by: D-
- 2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 93 percent based on 1 survey(s). 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-

Ghana - survey details

2011 Ghana EPI Cluster Survey 2012

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card	96	12-23 m	300	98
BCG	Card or History	99	12-23 m	300	98
DTP1	Card	98	12-23 m	300	98
DTP1	Card or History	100	12-23 m	300	98
DTP3	Card	95	12-23 m	300	98
DTP3	Card or History	97	12-23 m	300	98
HepB1	Card	98	12-23 m	300	98
HepB1	Card or History	100	12-23 m	300	98
HepB3	Card	95	12-23 m	300	98
HepB3	Card or History	97	12-23 m	300	98
Hib1	Card	98	12-23 m	300	98
Hib1	Card or History	100	12-23 m	300	98
Hib3	Card	95	12-23 m	300	98
Hib3	Card or History	97	12-23 m	300	98
MCV	Card	92	12-23 m	300	98
MCV	Card or History	94	12-23 m	300	98
Pol1	Card	98	12-23 m	300	98
Pol1	Card or History	100	12-23 m	300	98
Pol3	Card	97	12-23 m	300	98
Pol3	Card or History	97	12-23 m	300	98
YFV	Card	91	12-23 m	300	98
YFV	Card or History	93	12-23 m	300	98

2010 Ghana Multiple Indicator Cluster Survey with an Enhanced Malaria Module and Biomarker 2011

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	98	12-23 m	1453	89
BCG	Card	86	12-23 m	-	89
BCG	Card or History	98	12-23 m	1453	89
BCG	History	12	12-23 m	-	89
DTP1	C or H <12 months	98	12-23 m	1453	89
DTP1	Card	88	12-23 m	-	89
DTP1	Card or History	98	12-23 m	1453	89
DTP1	History	11	12-23 m	-	89

DTP3	C or H <12 months	92	12-23 m	1453	89
DTP3	Card	85	12-23 m	-	89
DTP3	Card or History	93	12-23 m	1453	89
DTP3	History	8	12-23 m	-	89
HepB1	C or H <12 months	98	12-23 m	1453	89
HepB1	Card	88	12-23 m	-	89
HepB1	Card or History	98	12-23 m	1453	89
HepB1	History	11	12-23 m	-	89
HepB3	C or H <12 months	92	12-23 m	1453	89
HepB3	Card	85	12-23 m	-	89
HepB3	Card or History	93	12-23 m	1453	89
HepB3	History	8	12-23 m	-	89
Hib1	C or H <12 months	98	12-23 m	1453	89
Hib1	Card	88	12-23 m	-	89
Hib1	Card or History	98	12-23 m	1453	89
Hib1	History	11	12-23 m	-	89
Hib3	C or H <12 months	92	12-23 m	1453	89
Hib3	Card	85	12-23 m	-	89
Hib3	Card or History	93	12-23 m	1453	89
Hib3	History	8	12-23 m	-	89
MCV	C or H <12 months	88	12-23 m	1453	89
MCV	Card	81	12-23 m	-	89
MCV	Card or History	94	12-23 m	1453	89
MCV	History	13	12-23 m	-	89
Pol1	C or H <12 months	98	12-23 m	1453	89
Pol1	Card	87	12-23 m	-	89
Pol1	Card or History	99	12-23 m	1453	89
Pol1	History	12	12-23 m	-	89
Pol3	C or H <12 months	91	12-23 m	1453	89
Pol3	Card	85	12-23 m	-	89
Pol3	Card or History	91	12-23 m	1453	89
Pol3	History	6	12-23 m	-	89
YFV	C or H <12 months	88	12-23 m	1453	89
YFV	Card	81	12-23 m	-	89
YFV	Card or History	94	12-23 m	1453	89
YFV	History	12	12-23 m	-	89

2007 Ghana Demographic and Health Survey 2008

Ghana - survey details

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	96	12-23 m	552	86
BCG	Card	83	12-23 m	552	86
BCG	Card or History	96	12-23 m	552	86
BCG	History	13	12-23 m	552	86
DTP1	C or H <12 months	98	12-23 m	552	86
DTP1	Card	85	12-23 m	552	86
DTP1	Card or History	98	12-23 m	552	86
DTP1	History	13	12-23 m	552	86
DTP3	C or H <12 months	88	12-23 m	552	86
DTP3	Card	82	12-23 m	552	86
DTP3	Card or History	89	12-23 m	552	86
DTP3	History	7	12-23 m	552	86
MCV	C or H <12 months	80	12-23 m	552	86
MCV	Card	79	12-23 m	552	86
MCV	Card or History	90	12-23 m	552	86
MCV	History	11	12-23 m	552	86
Pol1	C or H <12 months	97	12-23 m	552	86
Pol1	Card	85	12-23 m	552	86
Pol1	Card or History	97	12-23 m	552	86
Pol1	History	12	12-23 m	552	86
Pol3	C or H <12 months	85	12-23 m	552	86
Pol3	Card	81	12-23 m	552	86
Pol3	Card or History	86	12-23 m	552	86
Pol3	History	5	12-23 m	552	86
YFV	C or H <12 months	78	12-23 m	552	86
YFV	Card	79	12-23 m	552	86
YFV	Card or History	89	12-23 m	552	86
YFV	History	10	12-23 m	552	86

2005 Ghana Multiple Indicator Cluster Survey 2006

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	94	12-23 m	706	85
BCG	Card	83	12-23 m	706	85
BCG	Card or History	94	12-23 m	706	85
BCG	History	11	12-23 m	706	85
DTP1	C or H <12 months	94	12-23 m	706	85
DTP1	Card	84	12-23 m	706	85

DTP1	Card or History	94	12-23 m	706	85
DTP1	History	10	12-23 m	706	85
DTP3	C or H <12 months	81	12-23 m	706	85
DTP3	Card	78	12-23 m	706	85
DTP3	Card or History	84	12-23 m	706	85
DTP3	History	6	12-23 m	706	85
HepB1	C or H <12 months	94	12-23 m	706	85
HepB1	Card	84	12-23 m	706	85
HepB1	Card or History	94	12-23 m	706	85
HepB1	History	10	12-23 m	706	85
HepB3	C or H <12 months	81	12-23 m	706	85
HepB3	Card	78	12-23 m	706	85
HepB3	Card or History	84	12-23 m	706	85
HepB3	History	6	12-23 m	706	85
Hib1	C or H <12 months	94	12-23 m	706	85
Hib1	Card	84	12-23 m	706	85
Hib1	Card or History	94	12-23 m	706	85
Hib1	History	10	12-23 m	706	85
Hib3	C or H <12 months	81	12-23 m	706	85
Hib3	Card	78	12-23 m	706	85
Hib3	Card or History	84	12-23 m	706	85
Hib3	History	6	12-23 m	706	85
MCV	C or H <12 months	78	12-23 m	706	85
MCV	Card	74	12-23 m	706	85
MCV	Card or History	85	12-23 m	706	85
MCV	History	11	12-23 m	706	85
Pol1	C or H <12 months	96	12-23 m	706	85
Pol1	Card	84	12-23 m	706	85
Pol1	Card or History	96	12-23 m	706	85
Pol1	History	12	12-23 m	706	85
Pol3	C or H <12 months	80	12-23 m	706	85
Pol3	Card	76	12-23 m	706	85
Pol3	Card or History	82	12-23 m	706	85
Pol3	History	6	12-23 m	706	85
YFV	C or H <12 months	77	12-23 m	706	85
YFV	Card	74	12-23 m	706	85
YFV	Card or History	84	12-23 m	706	85
YFV	History	10	12-23 m	706	85

Ghana - survey details

2002 Ghana National Demographic and Health Survey 2003

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	90	12-23 m	695	83
BCG	Card	79	12-23 m	695	83
BCG	Card or history	91	12-23 m	695	83
BCG	History	12	12-23 m	695	83
DTP1	C or H <12 months	90	12-23 m	695	83
DTP1	Card	80	12-23 m	695	83
DTP1	Card or history	91	12-23 m	695	83
DTP1	History	10	12-23 m	695	83
DTP3	C or H <12 months	77	12-23 m	695	83
DTP3	Card	74	12-23 m	695	83
DTP3	Card or history	80	12-23 m	695	83
DTP3	History	5	12-23 m	695	83
MCV	C or H <12 months	69	12-23 m	695	83
MCV	Card	74	12-23 m	695	83
MCV	Card or history	83	12-23 m	695	83
MCV	History	9	12-23 m	695	83
Pol1	C or H <12 months	92	12-23 m	695	83
Pol1	Card	82	12-23 m	695	83
Pol1	Card or history	93	12-23 m	695	83
Pol1	History	12	12-23 m	695	83
Pol3	C or H <12 months	76	12-23 m	695	83
Pol3	Card	74	12-23 m	695	83
Pol3	Card or history	79	12-23 m	695	83

Pol3	History	5	12-23 m	695	83
YFV	C or H <12 months	58	12-23 m	695	83
YFV	Card	69	12-23 m	695	83
YFV	Card or history	77	12-23 m	695	83
YFV	History	8	12-23 m	695	83

1997 Ghana Demographic and Health Survey 1998

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	86	12-23 m	1193	76
BCG	Card or History	84	12-23 m	1193	76
DTP1	C or H <12 months	88	12-23 m	1193	76
DTP1	Card or History	82	12-23 m	1193	76
DTP3	C or H <12 months	68	12-23 m	1193	76
DTP3	Card or History	59	12-23 m	1193	76
MCV	C or H <12 months	61	12-23 m	1193	76
MCV	Card or History	58	12-23 m	1193	76
Pol1	C or H <12 months	90	12-23 m	1193	76
Pol1	Card or History	85	12-23 m	1193	76
Pol3	C or H <12 months	67	12-23 m	1193	76
Pol3	Card or History	58	12-23 m	1193	76
YFV	C or H <12 months	39	12-23 m	1193	76
YFV	Card or History	40	12-23 m	1193	76

Further information and estimates prior to 2002 are available at:

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

http://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/index4.html

Ghana

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 receive 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.

Year	PAB coverage estimate (%)
2002	70
2003	74
2004	77
2005	83
2006	85
2007	86
2008	86
2009	86
2010	86
2011	88
2012	88
2013	88

¹ 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.