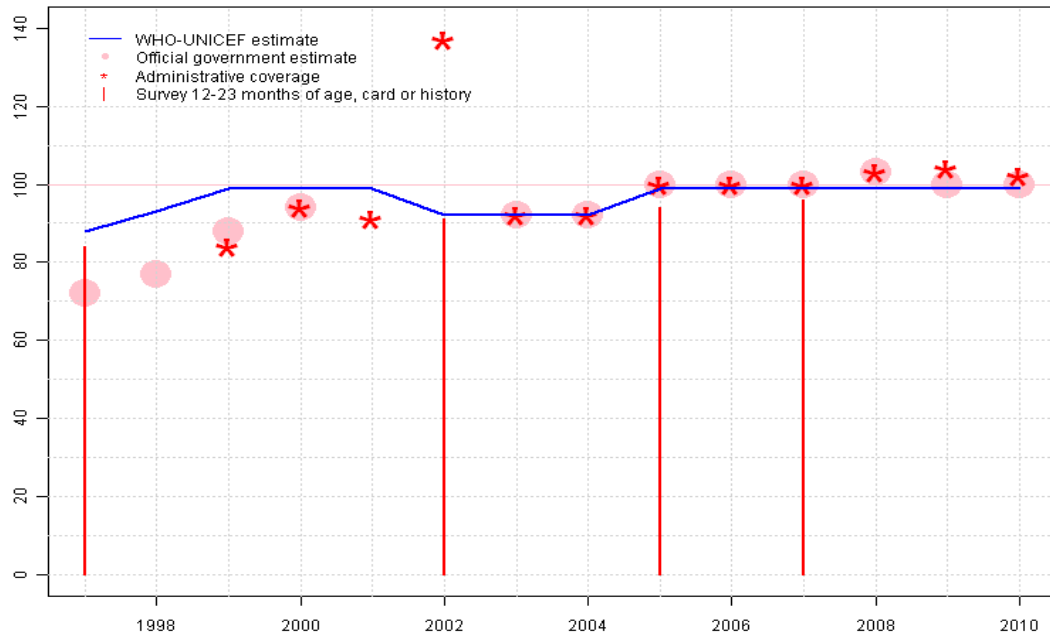


Ghana - BCG

GHA - BCG



Description:

1997: Legacy estimate.

1998: Reported data calibrated to 1997 and 2002 levels. Current estimate of 93 percent changed from previous revision value of 90 percent.

1999: Reported data calibrated to 1997 and 2002 levels. Current estimate of 99 percent changed from previous revision value of 98 percent.

2000: Reported data calibrated to 1997 and 2002 levels.

2001: Reported data calibrated to 1997 and 2002 levels. Current estimate of 99 percent changed from previous revision value of 94 percent.

2002: No accepted reported data. Reported data of 92 percent estimated by interpolation between 2001 and 2003 supports trend in reported data. 91 percent survey results Reported data of 137 percent greater than 100 percent. Reported data not accepted due to an increase from 91 percent to 137 percent with a subsequent decrease to 92 percent.

2003: Estimate based on reported data.

2004: Estimate based on reported data.

2005: Estimate based on reported data. 94 percent survey results supports reported data of 100 percent.

2006: Estimate based on reported data.

2007: Estimate based on reported data. 96 percent survey results supports reported data of 100 percent.

2008: Estimate based on interpolation between 2007 and 2009. Reported data of 103 percent greater than 100 percent.

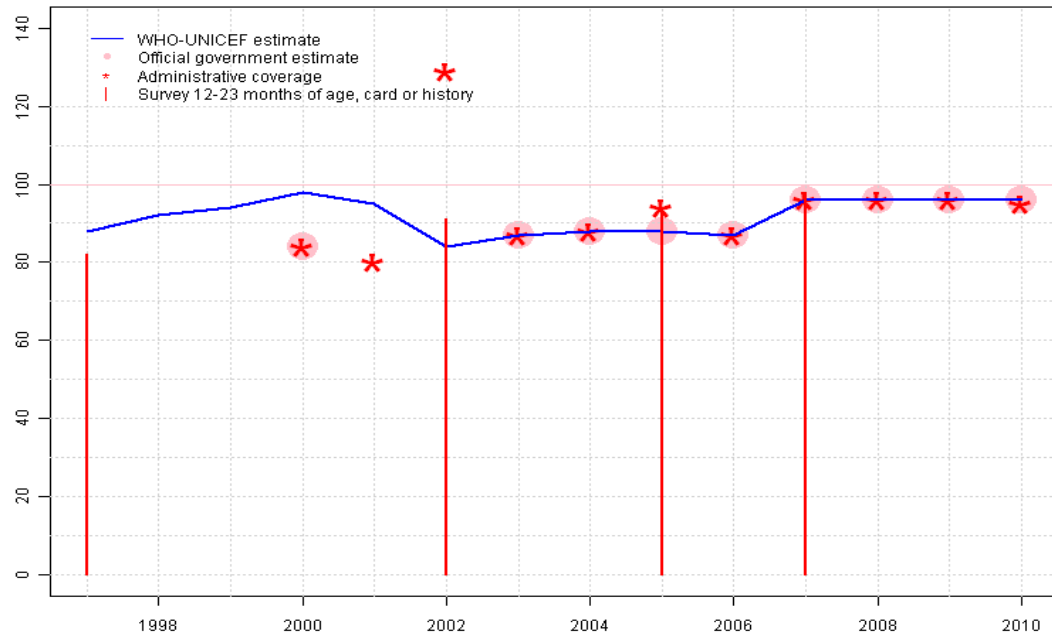
2009: Estimate based on reported data.

2010: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	88	93	99	99	99	92	92	92	99	99	99	99	99	99
Official	72	77	88	94	NA	NA	92	92	100	100	100	103	100	100
Administrative	NA	NA	84	94	91	137	92	92	100	100	100	103	104	102
Survey	84	NA	NA	NA	NA	91	NA	NA	94	NA	96	NA	NA	NA

Ghana - DTP1

GHA - DTP1



Description:

1997: Legacy estimate.

1998: No DTP1 data. Estimate based on DTP3 coverage of 79. Current estimate of 92 percent changed from previous revision value of 87 percent.

1999: No DTP1 data. Estimate based on DTP3 coverage of 83. Current estimate of 94 percent changed from previous revision value of 86 percent.

2000: DTP1 coverage estimated based on DTP3 coverage of 95. Current estimate of 98 percent changed from previous revision value of 96 percent.

2001: DTP1 coverage estimated based on DTP3 coverage of 87. Current estimate of 95 percent changed from previous revision value of 85 percent.

2002: No accepted reported data. Reported data of 84 percent estimated by interpolation between 2001 and 2003 supports trend in reported data. 91 percent survey results Reported data of 129 percent greater than 100 percent. Reported data not accepted due to an increase from 80 percent to 129 percent with a subsequent decrease to 87 percent.

2003: Estimate based on reported data.

2004: Estimate based on reported data.

2005: Estimate based on reported data. 94 percent survey results supports reported data of 88 percent.

2006: Estimate based on reported data.

2007: Estimate based on reported data. 98 percent survey results supports reported data of 96 percent.

2008: Estimate based on reported data. Current estimate of 96 percent changed from previous revision value of 90 percent.

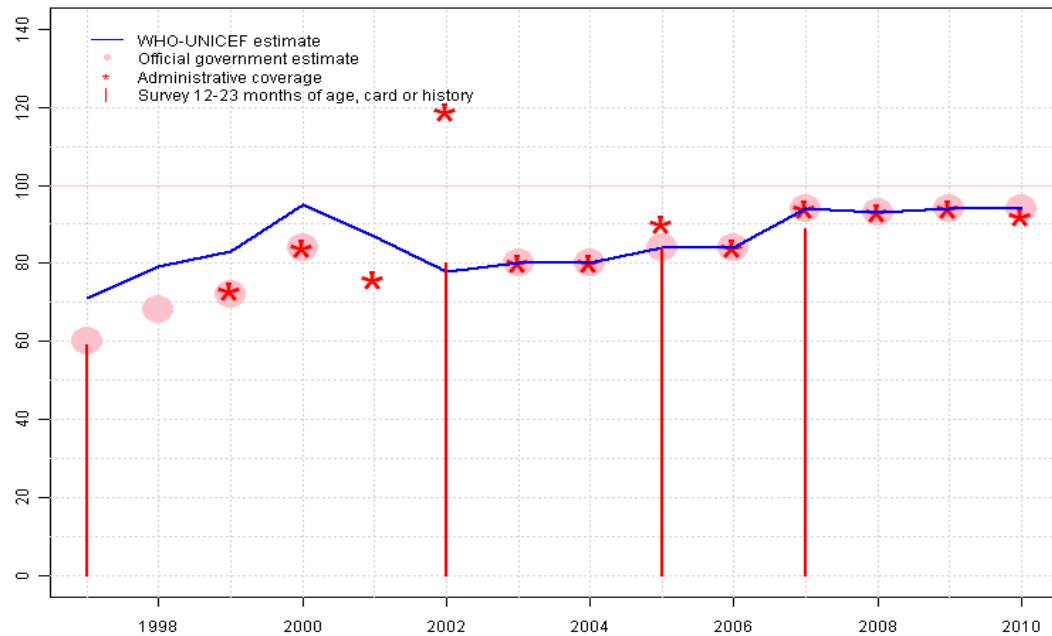
2009: Estimate based on reported data.

2010: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	88	92	94	98	95	84	87	88	88	87	96	96	96	96
Official	NA	NA	NA	84	NA	NA	87	88	88	87	96	96	96	96
Administrative	NA	NA	NA	84	80	129	87	88	94	87	96	96	96	95
Survey	82	NA	NA	NA	NA	91	NA	NA	94	NA	98	NA	NA	NA

Ghana - DTP3

GHA - DTP3



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	71	79	83	95	87	78	80	80	84	84	94	93	94	94
Official	60	68	72	84	NA	NA	80	80	84	84	94	93	94	94
Administrative	NA	NA	73	84	76	119	80	80	90	84	94	93	94	92
Survey	59	NA	NA	NA	NA	80	NA	NA	84	NA	89	NA	NA	NA

Description:

1997: Legacy estimate.

1998: Reported data calibrated to 1997 and 2002 levels. Current estimate of 79 percent changed from previous revision value of 77 percent.

1999: Reported data calibrated to 1997 and 2002 levels. Current estimate of 83 percent changed from previous revision value of 79 percent.

2000: Reported data calibrated to 1997 and 2002 levels. Current estimate of 95 percent changed from previous revision value of 88 percent.

2001: Reported data calibrated to 1997 and 2002 levels. Current estimate of 87 percent changed from previous revision value of 82 percent.

2002: No accepted reported data. Reported data of 78 percent estimated by interpolation between 2001 and 2003 supports trend in reported data. 84 percent survey results Reported data of 119 percent greater than 100 percent. Reported data not accepted due to an increase from 76 percent to 119 percent with a subsequent decrease to 80 percent. Survey 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. Current estimate of 78 percent changed from previous revision value of 80 percent.

2003: Estimate based on reported data.

2004: Estimate based on reported data.

2005: Estimate based on reported data. 87 percent survey results supports reported data of 84 percent. Survey 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.

2006: Estimate based on reported data.

2007: Estimate based on reported data. 95 percent survey results supports reported data of 94 percent. Survey 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.

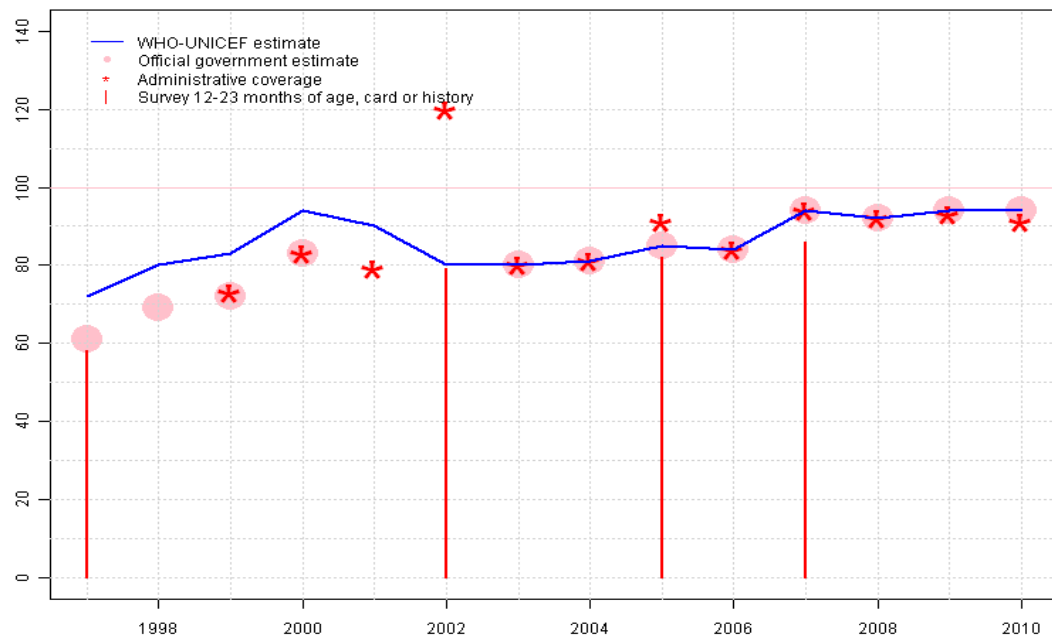
2008: Estimate based on reported data. Current estimate of 93 percent changed from previous revision value of 87 percent.

2009: Estimate based on reported data.

2010: Estimate based on reported data.

Ghana - Pol3

GHA - Pol3



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	72	80	83	94	90	80	80	81	85	84	94	92	94	94
Official	61	69	72	83	NA	NA	80	81	85	84	94	92	94	94
Administrative	NA	NA	73	83	79	120	80	81	91	84	94	92	93	91
Survey	58	NA	NA	NA	NA	79	NA	NA	82	NA	86	NA	NA	NA

Description:

1997: Legacy estimate.

1998: Reported data calibrated to 1997 and 2002 levels. Current estimate of 80 percent changed from previous revision value of 78 percent.

1999: Reported data calibrated to 1997 and 2002 levels. Current estimate of 83 percent changed from previous revision value of 78 percent.

2000: Reported data calibrated to 1997 and 2002 levels. Current estimate of 94 percent changed from previous revision value of 88 percent.

2001: Reported data calibrated to 1997 and 2002 levels. Current estimate of 90 percent changed from previous revision value of 82 percent.

2002: No accepted reported data. Reported data of 80 percent estimated by interpolation between 2001 and 2003 supports trend in reported data. 84 percent survey results Reported data of 120 percent greater than 100 percent. Reported data not accepted due to an increase from 79 percent to 120 percent with a subsequent decrease to 80 percent. Survey 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.

2003: Estimate based on reported data.

2004: Estimate based on reported data.

2005: Estimate based on reported data. 87 percent survey results supports reported data of 85 percent. Survey 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.

2006: Estimate based on reported data.

2007: Estimate based on reported data. 92 percent survey results supports reported data of 94 percent. Survey 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.

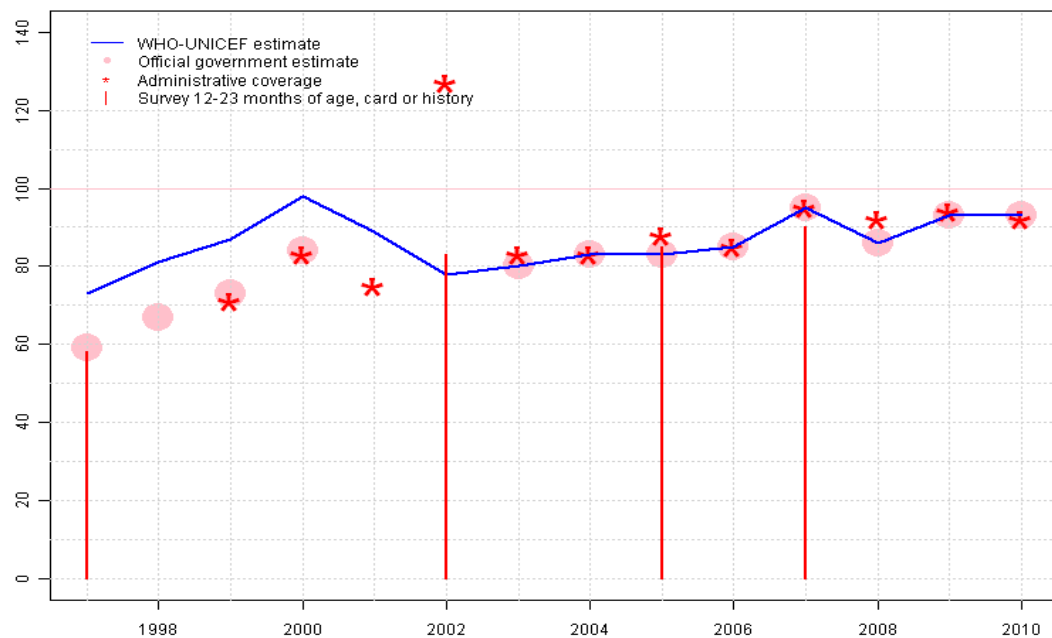
2008: Estimate based on reported data. Current estimate of 92 percent changed from previous revision value of 86 percent.

2009: Estimate based on reported data.

2010: Estimate based on reported data.

Ghana - MCV

GHA - MCV



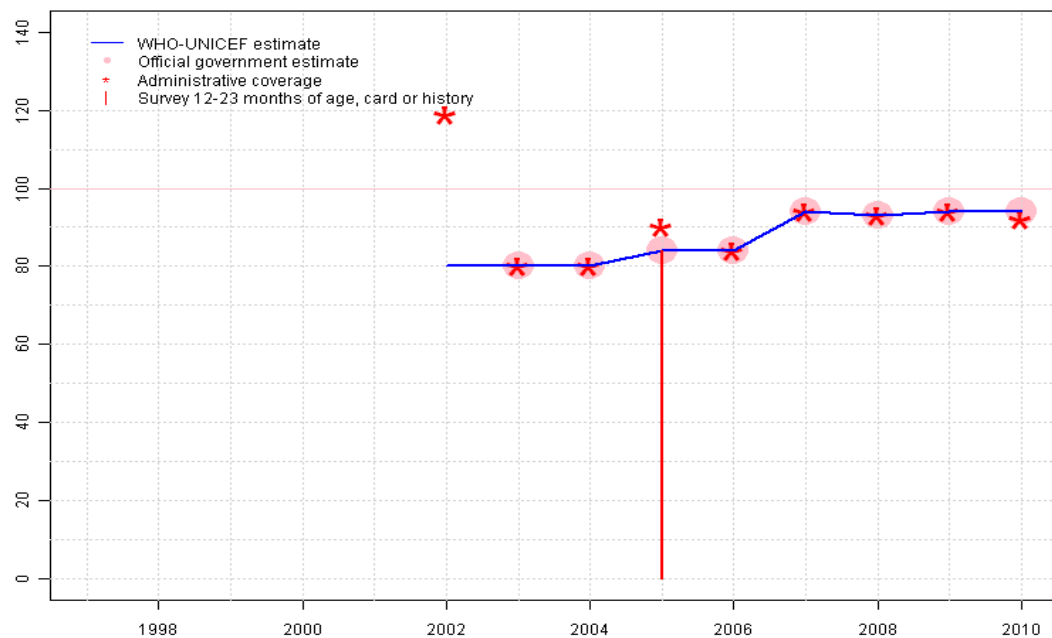
Description:

- 1997: Legacy estimate.
- 1998: Reported data calibrated to 1997 and 2002 levels. Current estimate of 81 percent changed from previous revision value of 79 percent.
- 1999: Reported data calibrated to 1997 and 2002 levels. Current estimate of 87 percent changed from previous revision value of 81 percent.
- 2000: Reported data calibrated to 1997 and 2002 levels. Current estimate of 98 percent changed from previous revision value of 90 percent.
- 2001: Reported data calibrated to 1997 and 2002 levels. Current estimate of 89 percent changed from previous revision value of 83 percent.
- 2002: No accepted reported data. Reported data of 78 percent estimated by interpolation between 2001 and 2003 supports trend in reported data. 83 percent survey results Reported data of 127 percent greater than 100 percent. Reported data not accepted due to an increase from 75 percent to 127 percent with a subsequent decrease to 80 percent. Current estimate of 78 percent changed from previous revision value of 81 percent.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on reported data. 85 percent survey results supports reported data of 83 percent.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data. 90 percent survey results supports reported data of 95 percent.
- 2008: Estimate based on reported data.
- 2009: Estimate based on reported data.
- 2010: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	73	81	87	98	89	78	80	83	83	85	95	86	93	93
Official	59	67	73	84	NA	NA	80	83	83	85	95	86	93	93
Administrative	NA	NA	71	83	75	127	83	83	88	85	95	92	94	92
Survey	58	NA	NA	NA	NA	83	NA	NA	85	NA	90	NA	NA	NA

Ghana - HepB3

GHA - HepB3

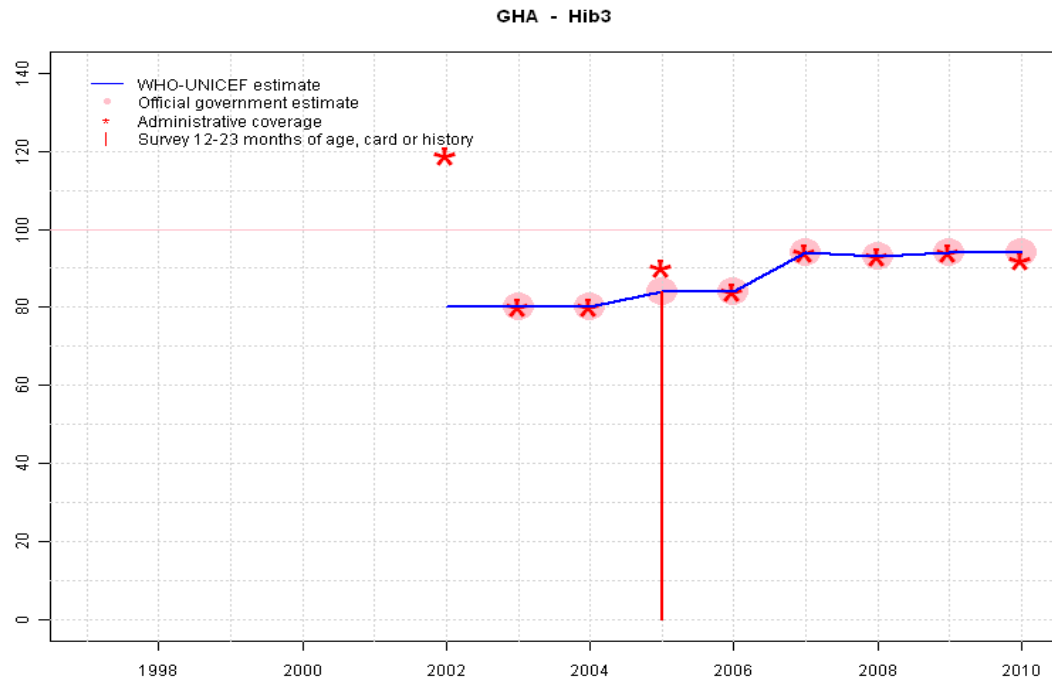


Description:

- 2002: Estimate based on extrapolation from 2003 value of 80 percent. Reported data of 119 percent greater than 100 percent. HepB introduced in 2002. Vaccine presentation is DTP-HepB-Hib.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on reported data. 87 percent survey results supports reported data of 84 percent. Survey 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.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data.
- 2008: Estimate based on reported data. Current estimate of 93 percent changed from previous revision value of 87 percent.
- 2009: Estimate based on reported data.
- 2010: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	NA	NA	NA	NA	NA	80	80	80	84	84	94	93	94	94
Official	NA	NA	NA	NA	NA	NA	80	80	84	84	94	93	94	94
Administrative	NA	NA	NA	NA	NA	119	80	80	90	84	94	93	94	92
Survey	NA	NA	NA	NA	NA	NA	NA	NA	84	NA	NA	NA	NA	NA

Ghana - Hib3

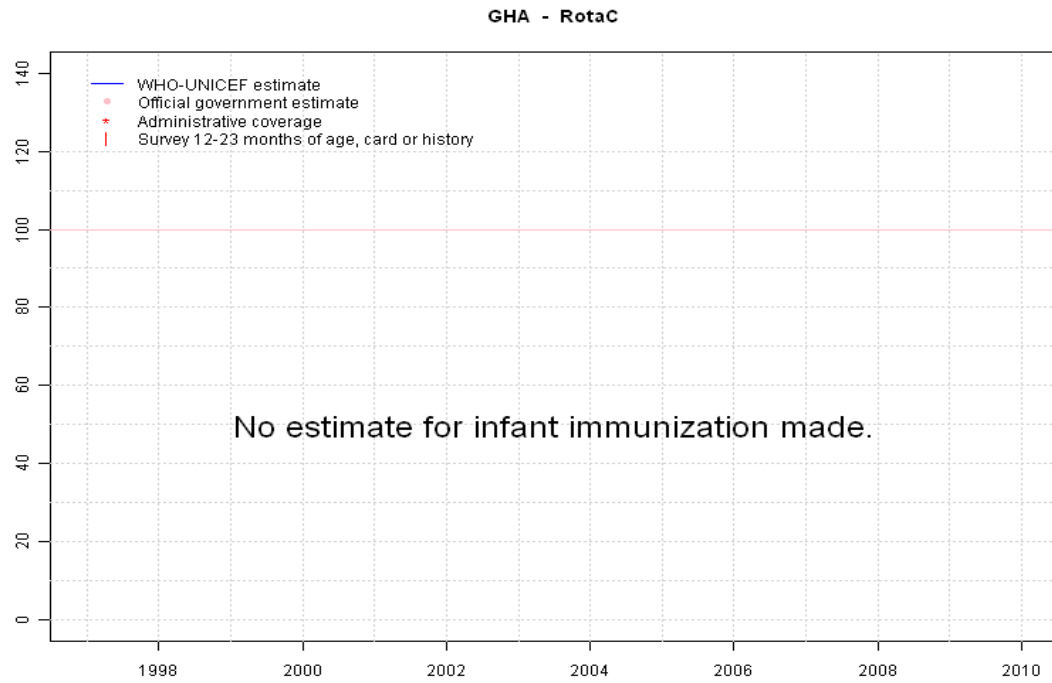


Description:

- 2002: Estimate based on extrapolation from 2003 value of 80 percent. Reported data of 119 percent greater than 100 percent. Hib introduced in 2002. Vaccine presentation is DTP-HepB-Hib.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on reported data. 87 percent survey results supports reported data of 84 percent. Survey 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.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data.
- 2008: Estimate based on reported data. Current estimate of 93 percent changed from previous revision value of 87 percent.
- 2009: Estimate based on reported data.
- 2010: Estimate based on reported data.

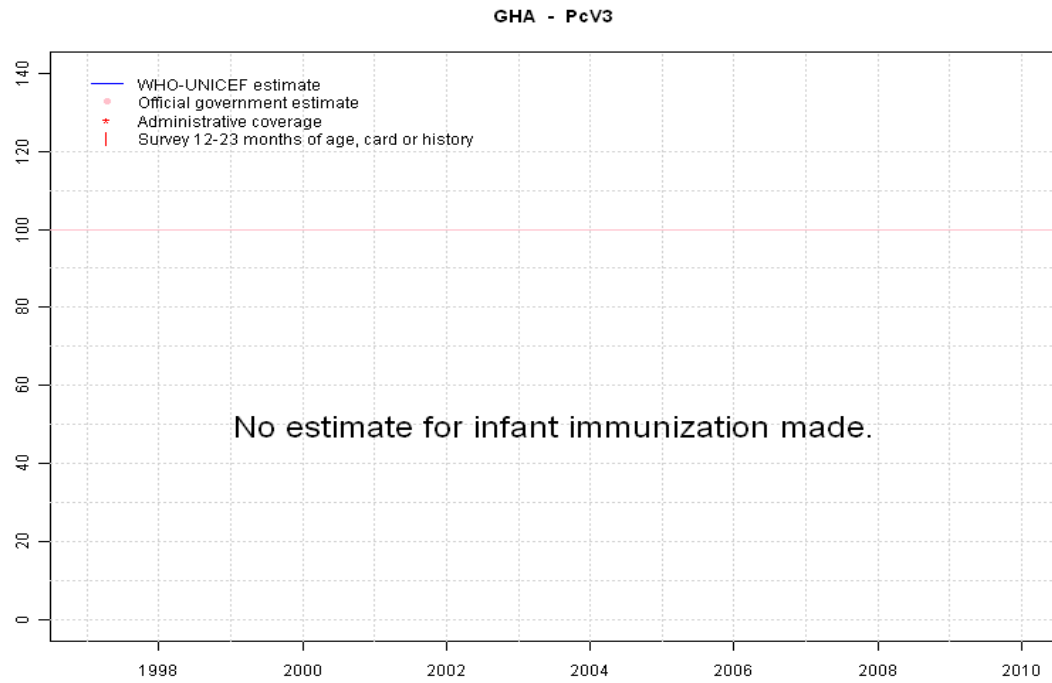
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	NA	NA	NA	NA	NA	80	80	80	84	84	94	93	94	94
Official	NA	NA	NA	NA	NA	NA	80	80	84	84	94	93	94	94
Administrative	NA	NA	NA	NA	NA	119	80	80	90	84	94	93	94	92
Survey	NA	NA	NA	NA	NA	NA	NA	NA	84	NA	NA	NA	NA	NA

Ghana - RotaC



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	NA	NA	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	NA	NA
Administrative	NA	NA	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	NA	NA

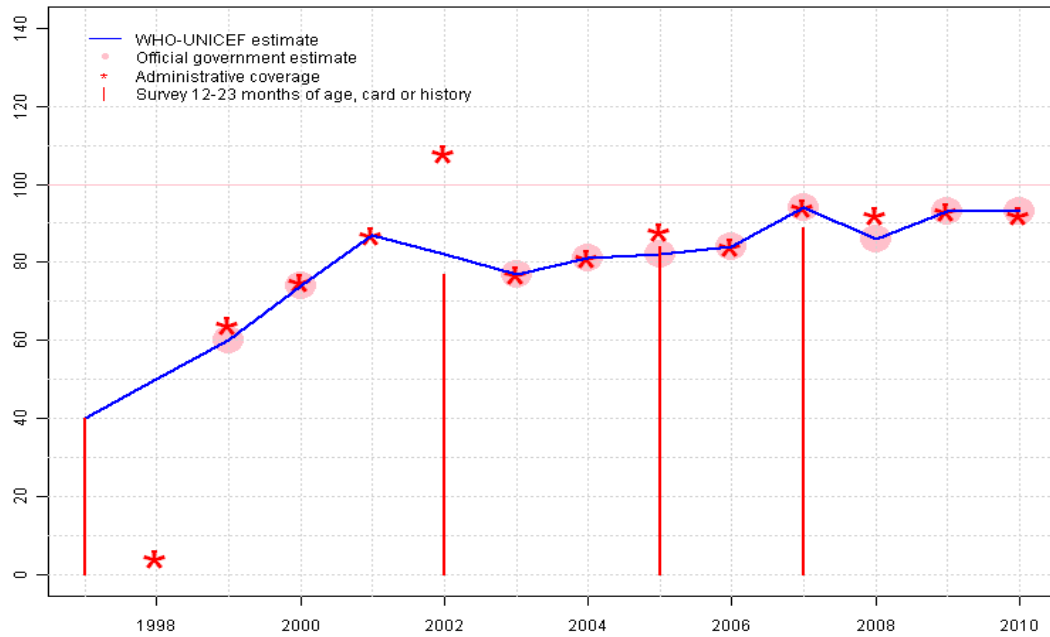
Ghana - PcV3



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	NA	NA	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	NA	NA
Administrative	NA	NA	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	NA	NA

Ghana - YFV

GHA - YFV



Description:

- 1997: No accepted reported data. Reported data of 60 percent estimated by extrapolating from 1999 does not support trend in reported data. 40 percent survey results
- 1998: Estimate based on interpolation between 1997 and 1999. Estimate not based on reported data.
- 1999: Estimate based on reported data.
- 2000: Estimate based on reported data.
- 2001: Estimate based on reported data.
- 2002: No accepted reported data. Reported data of 82 percent estimated by interpolation between 2001 and 2003 supports trend in reported data. 77 percent survey results Reported data of 108 percent greater than 100 percent. Reported data not accepted due to an increase from 87 percent to 108 percent with a subsequent decrease to 77 percent.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on reported data. 84 percent survey results supports reported data of 82 percent.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data. 89 percent survey results supports reported data of 94 percent.
- 2008: Estimate based on reported data.
- 2009: Estimate based on reported data.
- 2010: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estimate	40	50	60	74	87	82	77	81	82	84	94	86	93	93
Official	NA	NA	60	74	NA	NA	77	81	82	84	94	86	93	93
Administrative	NA	4	64	75	87	108	77	81	88	84	94	92	93	92
Survey	40	NA	NA	NA	NA	77	NA	NA	84	NA	89	NA	NA	NA

Ghana - survey details

2007 Ghana Demographic and Health Survey 2008

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card	83	12-23 m	552	86
BCG	History	13	12-23 m	552	86
BCG	Card or History	96	12-23 m	552	86
BCG	C or H <12 months	96	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	History	7	12-23 m	552	86
DTP3	Card or History	89	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	History	11	12-23 m	552	86
MCV	Card or History	90	12-23 m	552	86
Pol1	C or H <12 months	97	12-23 m	552	86
Pol1	Card or History	97	12-23 m	552	86
Pol1	History	12	12-23 m	552	86
Pol1	Card	85	12-23 m	552	86
Pol3	Card	81	12-23 m	552	86
Pol3	History	5	12-23 m	552	86
Pol3	Card or History	86	12-23 m	552	86
Pol3	C or H <12 months	85	12-23 m	552	86
YFV	Card or History	89	12-23 m	552	86
YFV	C or H <12 months	78	12-23 m	552	86
YFV	History	10	12-23 m	552	86
YFV	Card	79	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	Card	84	12-23 m	706	85
DTP1	Card or History	94	12-23 m	706	85
DTP1	C or H <12 months	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	History	10	12-23 m	706	85
HepB1	C or H <12 months	94	12-23 m	706	85
HepB1	Card or History	94	12-23 m	706	85
HepB1	Card	84	12-23 m	706	85
HepB3	C or H <12 months	81	12-23 m	706	85
HepB3	History	6	12-23 m	706	85
HepB3	Card or History	84	12-23 m	706	85
HepB3	Card	78	12-23 m	706	85
Hib1	History	10	12-23 m	706	85
Hib1	Card or History	94	12-23 m	706	85
Hib1	Card	84	12-23 m	706	85
Hib1	C or H <12 months	94	12-23 m	706	85
Hib3	History	6	12-23 m	706	85
Hib3	Card or History	84	12-23 m	706	85
Hib3	Card	78	12-23 m	706	85
Hib3	C or H <12 months	81	12-23 m	706	85
MCV	C or H <12 months	78	12-23 m	706	85
MCV	History	11	12-23 m	706	85
MCV	Card	74	12-23 m	706	85
MCV	Card or History	85	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	Card or History	84	12-23 m	706	85
YFV	History	10	12-23 m	706	85
YFV	C or H <12 months	77	12-23 m	706	85

Ghana - survey details

YFV	Card	74	12-23 m	706	85
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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	Card or history	91	12-23 m	695	83
DTP1	Card	80	12-23 m	695	83
DTP1	C or H <12 months	90	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	History	5	12-23 m	695	83
DTP3	Card	74	12-23 m	695	83
DTP3	Card or history	80	12-23 m	695	83
MCV	History	9	12-23 m	695	83
MCV	Card or history	83	12-23 m	695	83
MCV	Card	74	12-23 m	695	83
MCV	C or H <12 months	69	12-23 m	695	83
Pol1	History	12	12-23 m	695	83
Pol1	C or H <12 months	92	12-23 m	695	83
Pol1	Card or history	93	12-23 m	695	83
Pol1	Card	82	12-23 m	695	83
Pol3	Card or history	79	12-23 m	695	83

Pol3	Card	74	12-23 m	695	83
Pol3	History	5	12-23 m	695	83
Pol3	C or H <12 months	76	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	Card or History	84	12-23 m	1193	76
BCG	C or H <12 months	86	12-23 m	1193	70
DTP1	Card or History	82	12-23 m	1193	76
DTP1	C or H <12 months	88	12-23 m	1193	70
DTP3	C or H <12 months	68	12-23 m	1193	70
DTP3	Card or History	59	12-23 m	1193	76
MCV	Card or History	58	12-23 m	1193	76
MCV	C or H <12 months	61	12-23 m	1193	70
Pol1	Card or History	85	12-23 m	1193	76
Pol1	C or H <12 months	90	12-23 m	1193	70
Pol3	Card or History	58	12-23 m	1193	76
Pol3	C or H <12 months	67	12-23 m	1193	70
YFV	C or H <12 months	39	12-23 m	1193	70
YFV	Card or History	40	12-23 m	1193	76

Further information and estimates for 1980-1996 are available at:

http://www.childinfo.org/immunization_countryreports.html

http://www.who.int/immunization_monitoring/routine/immunization_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 (%)
1997	69
1998	69
1999	69
2000	69
2001	70
2002	70
2003	74
2004	77
2005	83
2006	85
2007	86
2008	86
2009	86
2010	86

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.