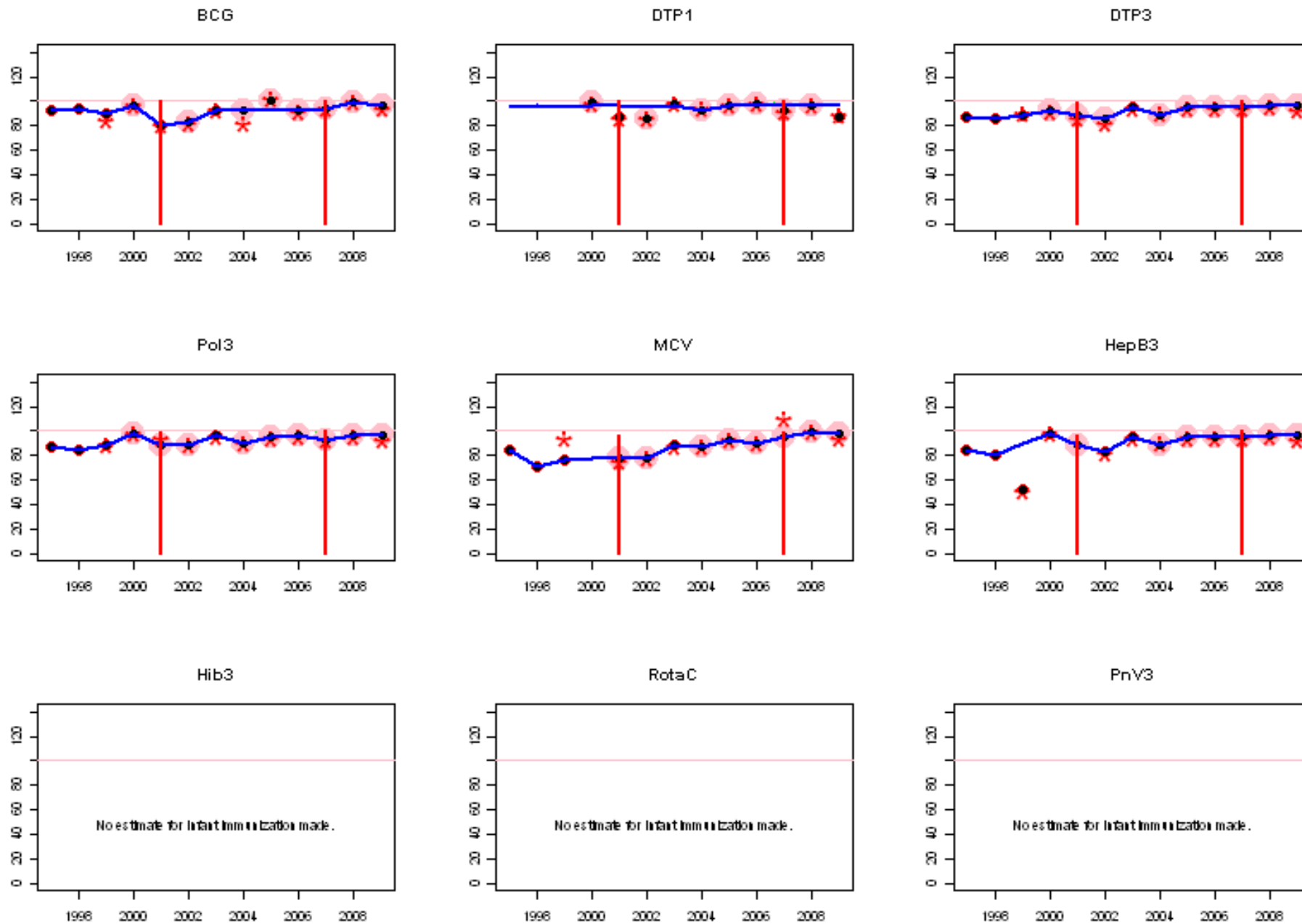
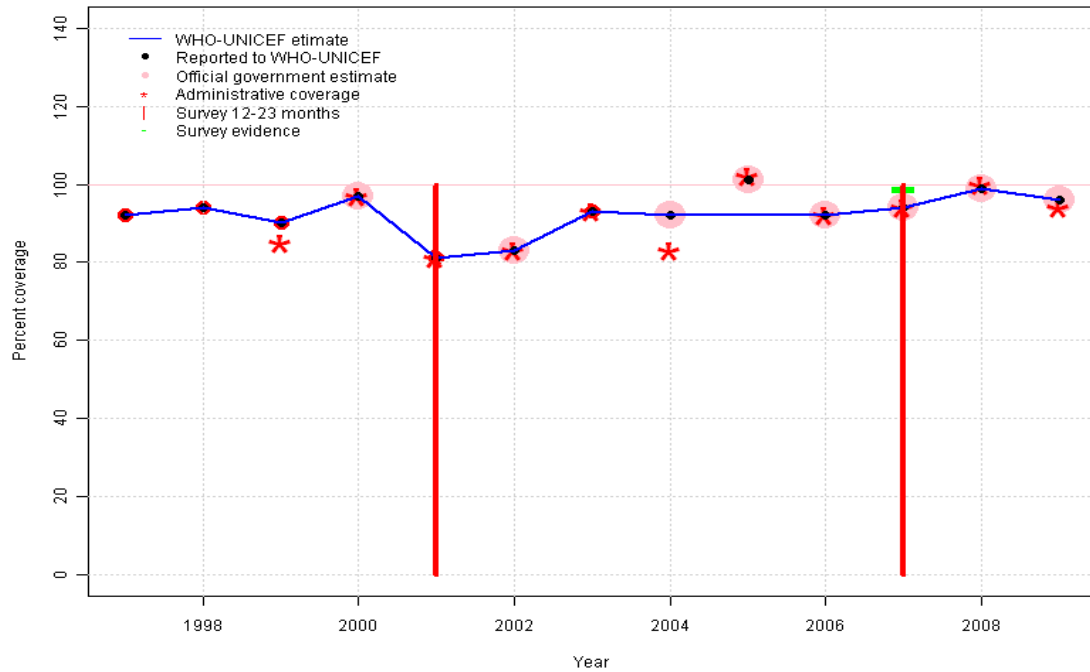


Bhutan: WHO and UNICEF estimates of immunization coverage, 1997 - 2009



Bhutan - BCG

BTN - BCG

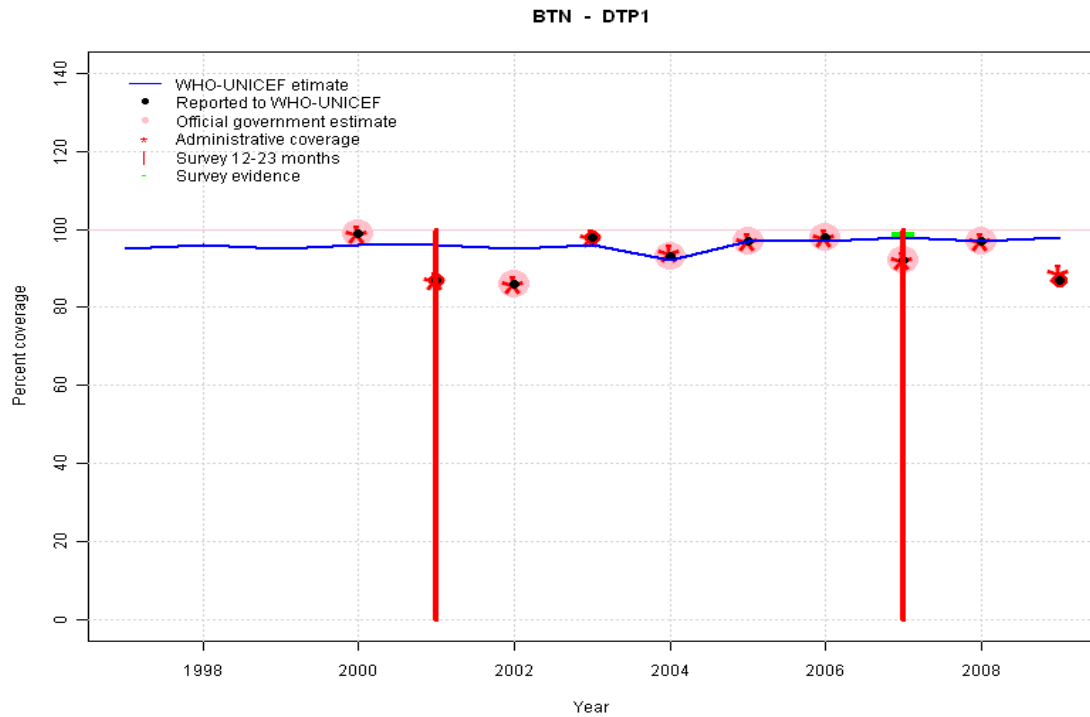


Description:

- 1997: Legacy estimate.
- 1998: Estimate based on reported data.
- 1999: Estimate based on reported data.
- 2000: Estimate based on reported data.
- 2001: Estimate based on reported data. Survey results of 100 percent with sample size 214 ignored; sample size less than 300.
- 2002: Estimate based on reported data.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on trend in reported data. Missing or ignored reported value estimated by interpolation between reported values of 92 percent in 2004 and 92 percent in 2006. 2005 reported data (101 percent) ignored; greater than 100 percent.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data (94 percent) confirmed by survey (99 percent).
- 2008: Estimate based on reported data.
- 2009: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	92	94	90	97	81	83	93	92	92	92	94	99	96
Reported	92	94	90	97	81	83	93	92	101	92	94	99	96
Official	NA	NA	NA	97	NA	83	NA	92	101	92	94	99	96
Administrative	NA	NA	85	97	81	83	93	83	102	92	94	100	94
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99	NA	NA

Bhutan - DTP1



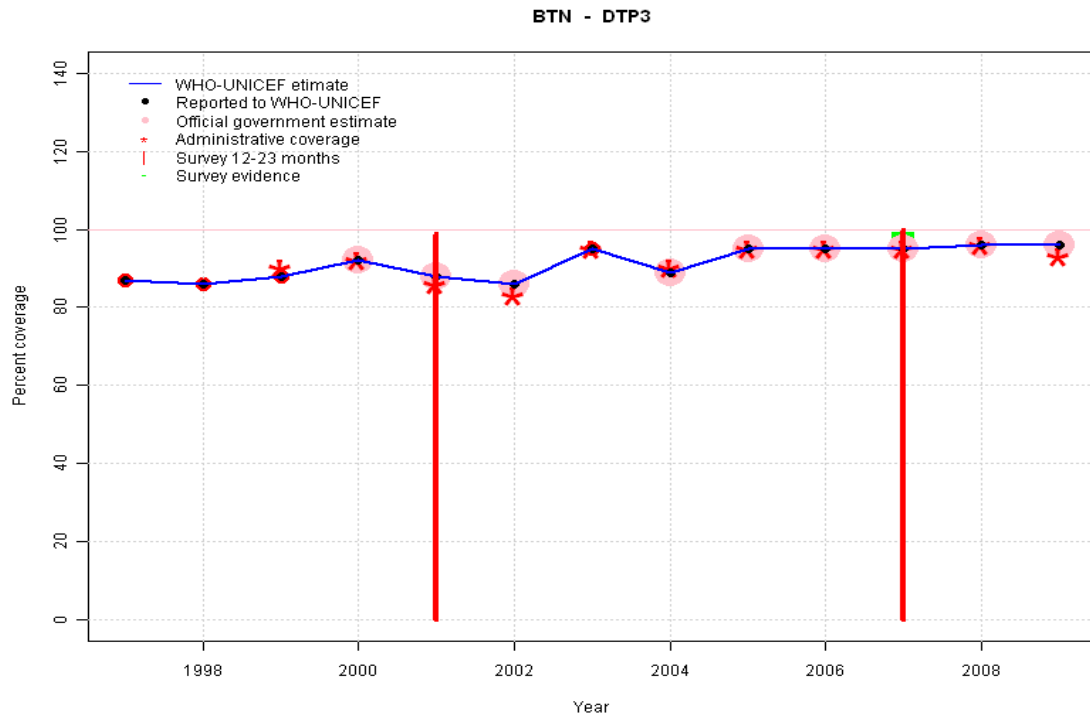
Description:

- 1997: Legacy estimate.
- 1998: Reported data (99 percent) calibrated to 1997 and 2007 levels. Missing or ignored reported value estimated by extrapolation from 2000 reported value of 99 percent.
- 1999: Reported data (99 percent) calibrated to 1997 and 2007 levels. Missing or ignored reported value estimated by extrapolation from 2000 reported value of 99 percent.
- 2000: Reported data (99 percent) calibrated to 1997 and 2007 levels.
- 2001: Estimated DTP3 greater than estimated DTP1; DTP1 estimate based on the relationship between DTP1 and DTP3 from 282 surveys.
- 2002: Estimated DTP3 greater than estimated DTP1; DTP1 estimate based on the relationship between DTP1 and DTP3 from 282 surveys.
- 2003: Reported data (98 percent) calibrated to 1997 and 2007 levels.
- 2004: Reported data (93 percent) calibrated to 1997 and 2007 levels.
- 2005: Reported data (97 percent) calibrated to 1997 and 2007 levels.
- 2006: Reported data (98 percent) calibrated to 1997 and 2007 levels.
- 2007: Estimated DTP3 greater than estimated DTP1; DTP1 estimate based on the relationship between DTP1 and DTP3 from 282 surveys.
- 2008: Estimate based on reported data.
- 2009: Estimated DTP3 greater than estimated DTP1; DTP1 estimate based on the relationship between DTP1 and DTP3 from 282 surveys.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	95	96	95	96	96	95	96	92	97	97	98	97	98
Reported	NA	NA	NA	99	87	86	98	93	97	98	92	97	87
Official	NA	NA	NA	99	NA	86	NA	93	97	98	92	97	NA
Administrative	NA	NA	NA	99	87	86	98	94	97	98	92	97	89
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99	NA	NA

Bhutan - DTP3

Description:

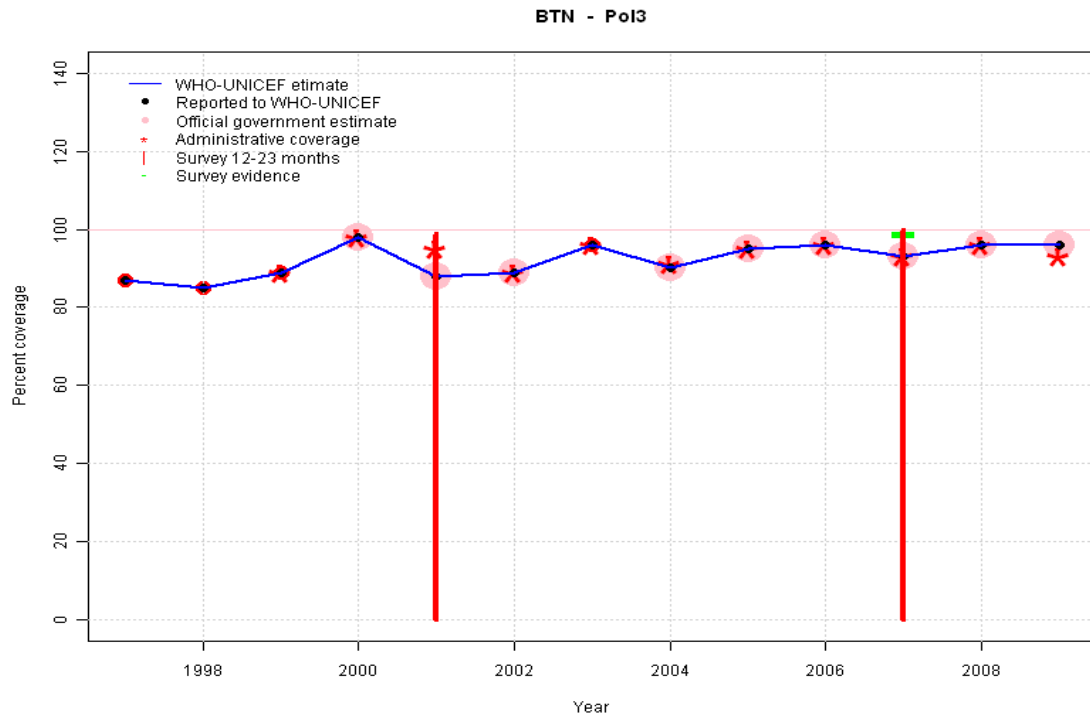


- 1997: Legacy estimate.
- 1998: Estimate based on reported data.
- 1999: Estimate based on reported data.
- 2000: Estimate based on reported data.
- 2001: Estimate based on reported data. Survey results of 99 percent with sample size 214 ignored; sample size less than 300.
- 2002: Estimate based on reported data.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on reported data.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data (95 percent) confirmed by survey (99 percent). Survey results (100 percent) adjusted for recall bias to 99 percent based on first dose card or history coverage (100 percent) and documented drop-out between first (97 percent) and third (97 percent) doses.
- 2008: Estimate based on reported data.
- 2009: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	87	86	88	92	88	86	95	89	95	95	95	96	96
Reported	87	86	88	92	88	86	95	89	95	95	95	96	96
Official	NA	NA	NA	92	88	86	NA	89	95	95	95	96	96
Administrative	NA	NA	90	92	86	83	95	90	95	95	95	96	93
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99	NA	NA

Bhutan - Pol3

Description:

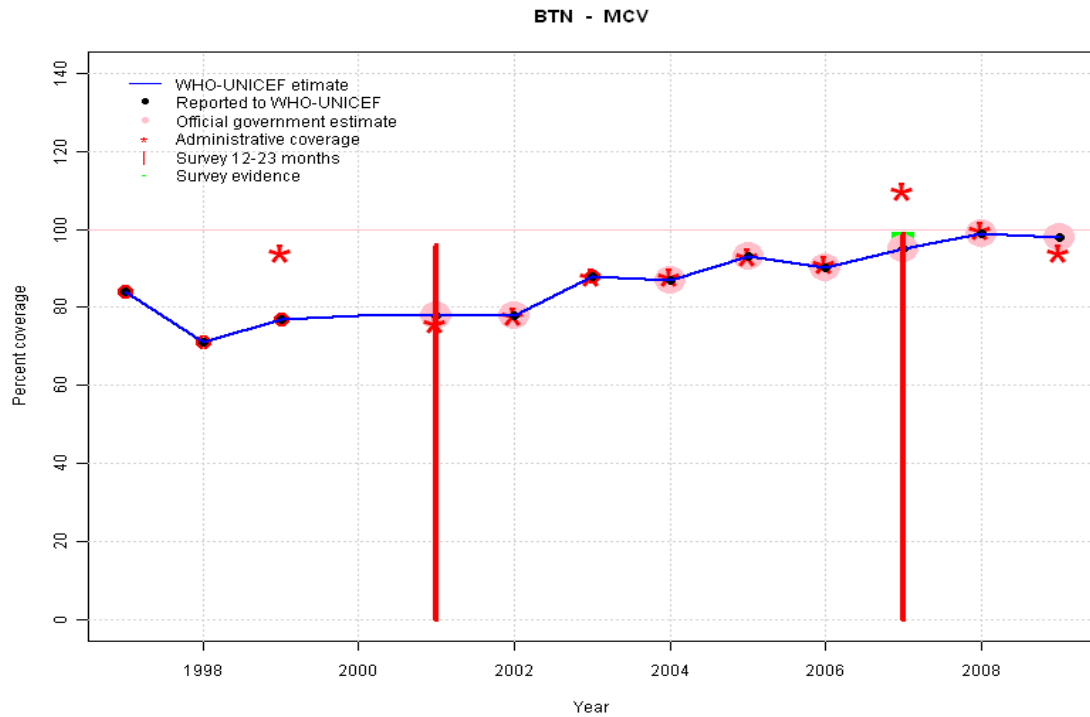


- 1997: Legacy estimate.
- 1998: Estimate based on reported data.
- 1999: Estimate based on reported data.
- 2000: Estimate based on reported data.
- 2001: Estimate based on reported data. Survey results of 99 percent with sample size 214 ignored; sample size less than 300.
- 2002: Estimate based on reported data.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on reported data.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data (93 percent) confirmed by survey (99 percent). Survey results (100 percent) adjusted for recall bias to 99 percent based on first dose card or history coverage (100 percent) and documented drop-out between first (97 percent) and third (97 percent) doses.
- 2008: Estimate based on reported data.
- 2009: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	87	85	89	98	88	89	96	90	95	96	93	96	96
Reported	87	85	89	98	88	89	96	90	95	96	93	96	96
Official	NA	NA	NA	98	88	89	NA	90	95	96	93	96	96
Administrative	NA	NA	89	98	95	89	96	91	95	96	93	96	93
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99	NA	NA

Bhutan - MCV

Description:

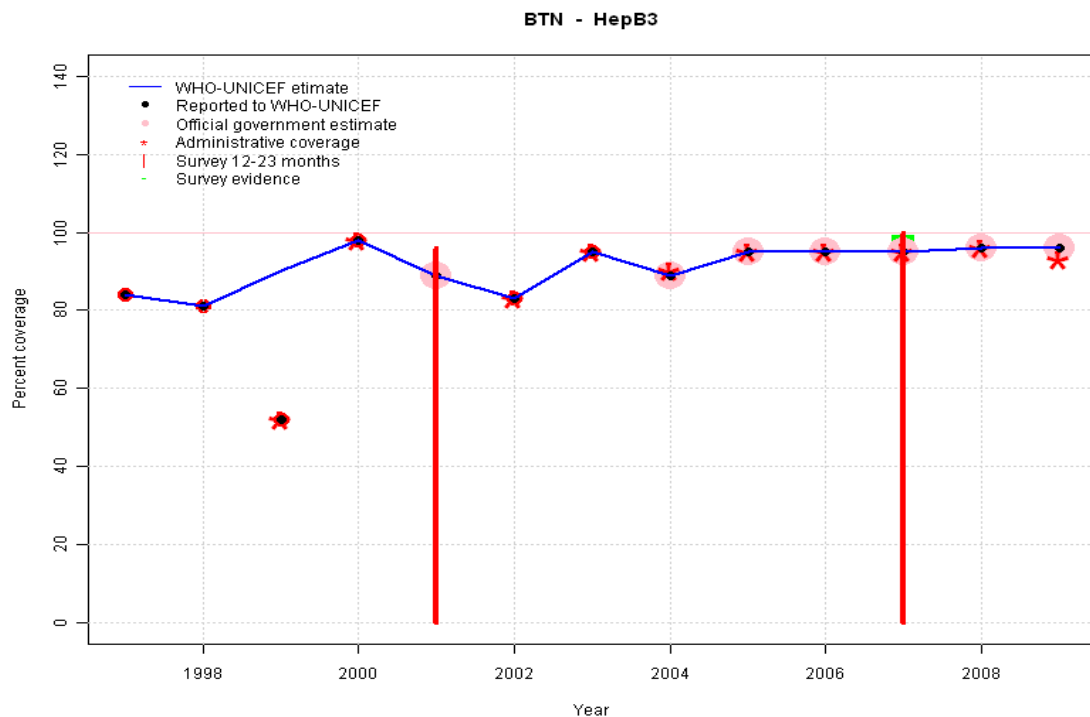


- 1997: Legacy estimate.
- 1998: Estimate based on reported data.
- 1999: Estimate based on reported data.
- 2000: Estimate based on trend in reported data. Missing or ignored reported value estimated by interpolation between reported values of 77 percent in 1999 and 78 percent in 2001.
- 2001: Estimate based on reported data. Survey results of 96 percent with sample size 214 ignored; sample size less than 300.
- 2002: Estimate based on reported data.
- 2003: Estimate based on reported data.
- 2004: Estimate based on reported data.
- 2005: Estimate based on reported data.
- 2006: Estimate based on reported data.
- 2007: Estimate based on reported data (95 percent) confirmed by survey (99 percent).
- 2008: Estimate based on reported data.
- 2009: Estimate based on reported data.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	84	71	77	78	78	78	88	87	93	90	95	99	98
Reported	84	71	77	NA	78	78	88	87	93	90	95	99	98
Official	NA	NA	NA	NA	78	78	NA	87	93	90	95	99	98
Administrative	NA	NA	94	NA	76	78	88	88	93	91	110	100	94
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99	NA	NA

Bhutan - HepB3

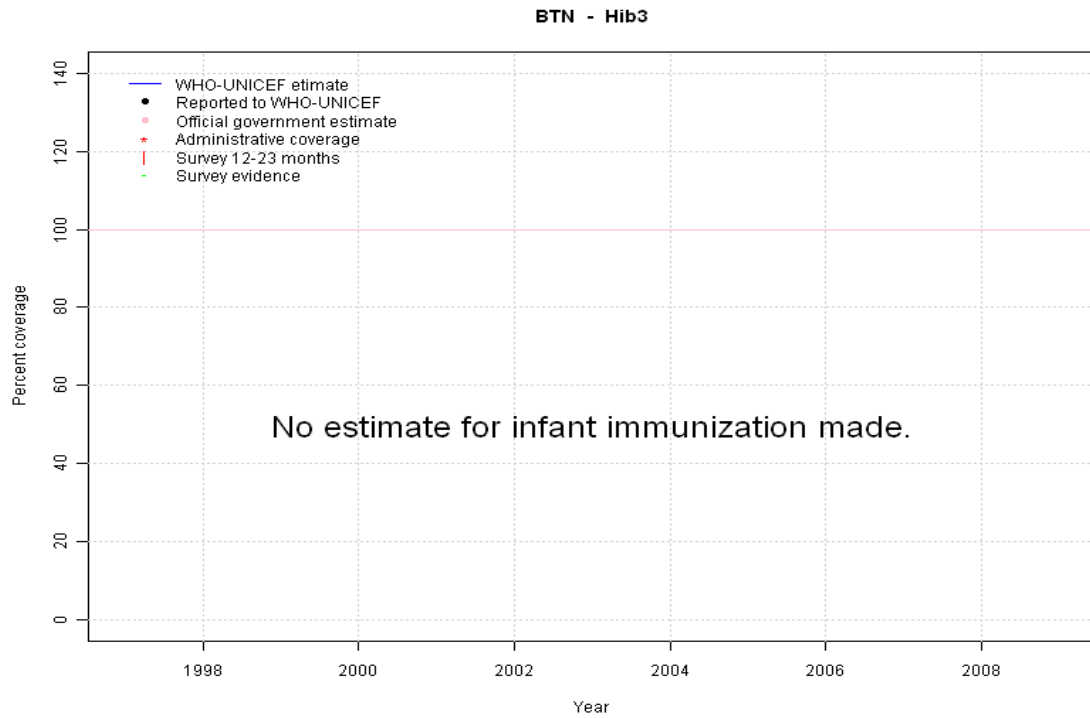
Description:



- 1997: Legacy estimate.
 1998: Estimate based on reported data.
 1999: Estimate based on trend in reported data. Missing or ignored reported value estimated by interpolation between reported values of 81 percent in 1998 and 98 percent in 2000. 1999 reported data (52 percent) inconsistent with data from other years.
 2000: Estimate based on reported data.
 2001: Estimate based on reported data. Survey results of 96 percent with sample size 214 ignored; sample size less than 300.
 2002: Estimate based on reported data.
 2003: Estimate based on reported data.
 2004: Estimate based on reported data.
 2005: Estimate based on reported data.
 2006: Estimate based on reported data.
 2007: Estimate based on reported data (95 percent) confirmed by survey (99 percent).
 2008: Estimate based on reported data.
 2009: Estimate based on reported data.

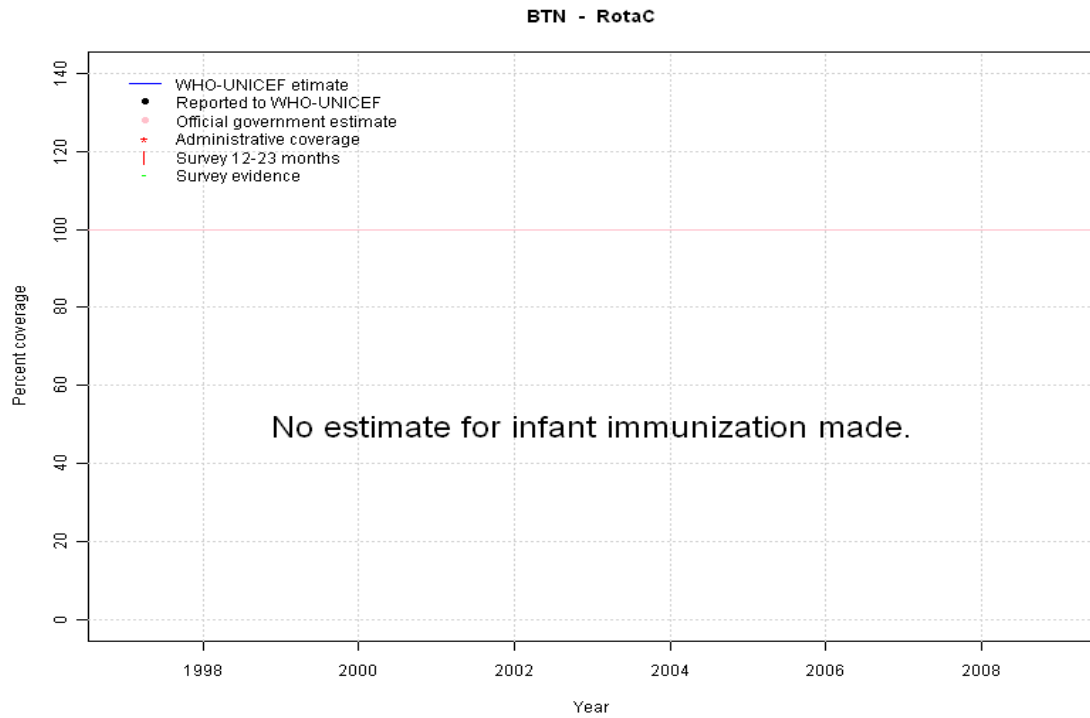
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	84	81	90	98	89	83	95	89	95	95	95	96	96
Reported	84	81	52	98	89	83	95	89	95	95	95	96	96
Official	NA	NA	NA	NA	89	NA	NA	89	95	95	95	96	96
Administrative	NA	NA	52	98	NA	83	95	90	95	95	95	96	93
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99	NA	NA

Bhutan - Hib3



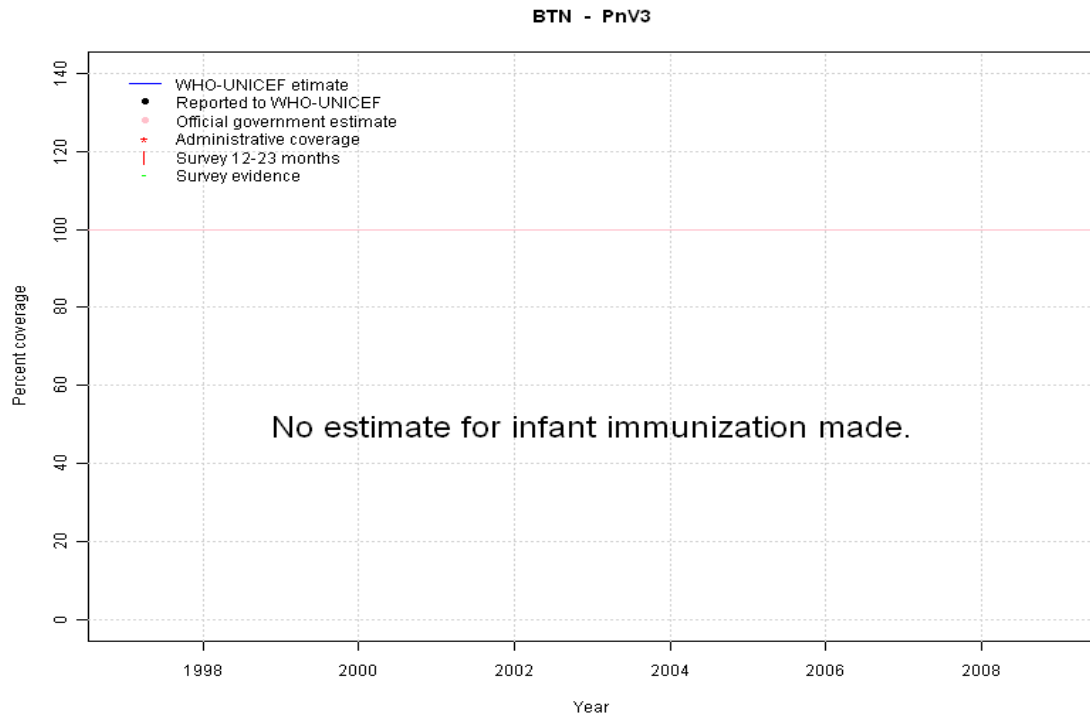
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Reported	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA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

Bhutan - RotaC



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

Bhutan - PnV3



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

Bhutan - survey details

2007 The National EPI Coverage Survey, 2009

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	History	3	12-23 m	1193	98
BCG	Card or History	100	12-23 m	1193	98
BCG	Card	97	12-23 m	1193	98
DTP1	Card	97	12-23 m	1193	98
DTP1	Card or History	100	12-23 m	1193	98
DTP1	History	3	12-23 m	1193	98
DTP3	History	3	12-23 m	1193	98
DTP3	Card	97	12-23 m	1193	98
DTP3	Card or History	100	12-23 m	1193	98
HepB1	Card or History	100	12-23 m	1193	98
HepB1	History	3	12-23 m	1193	98
HepB1	Card	97	12-23 m	1193	98
HepB3	Card	97	12-23 m	1193	98
HepB3	Card or History	100	12-23 m	1193	98
HepB3	History	3	12-23 m	1193	98
MCV	Card	95	12-23 m	1193	98
MCV	Card or History	99	12-23 m	1193	98
MCV	History	4	12-23 m	1193	98
Pol1	Card	97	12-23 m	1193	98
Pol1	Card or History	100	12-23 m	1193	98
Pol1	History	3	12-23 m	1193	98
Pol3	History	3	12-23 m	1193	98
Pol3	Card	97	12-23 m	1193	98
Pol3	Card or History	100	12-23 m	1193	98

2001 Bhutan National EPI Coverage Evaluation Survey 2002

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card or History	100	12-23 m	214	95
BCG	History	4	12-23 m	214	95
BCG	Card	95	12-23 m	214	95
DTP1	Card or History	100	12-23 m	214	95
DTP1	History	5	12-23 m	214	95
DTP1	Card	95	12-23 m	214	95
DTP3	Card	94	12-23 m	214	95
DTP3	Card or History	99	12-23 m	214	95
DTP3	History	5	12-23 m	214	95
HepB1	History	5	12-23 m	214	95
HepB1	Card	94	12-23 m	214	95
HepB1	Card or History	98	12-23 m	214	95
HepB3	Card or History	96	12-23 m	214	95
HepB3	History	5	12-23 m	214	95
HepB3	Card	92	12-23 m	214	95
MCV	Card	92	12-23 m	214	95
MCV	Card or History	96	12-23 m	214	95
MCV	History	5	12-23 m	214	95
Pol1	Card	95	12-23 m	214	95
Pol1	Card or History	100	12-23 m	214	95
Pol1	History	5	12-23 m	214	95
Pol3	Card	94	12-23 m	214	95
Pol3	History	5	12-23 m	214	95
Pol3	Card or History	99	12-23 m	214	95

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

Bhutan

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	81
1998	85
1999	84
2000	85
2001	86
2002	87
2003	87
2004	86
2005	85
2006	85
2007	84
2008	89
2009	89

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.