

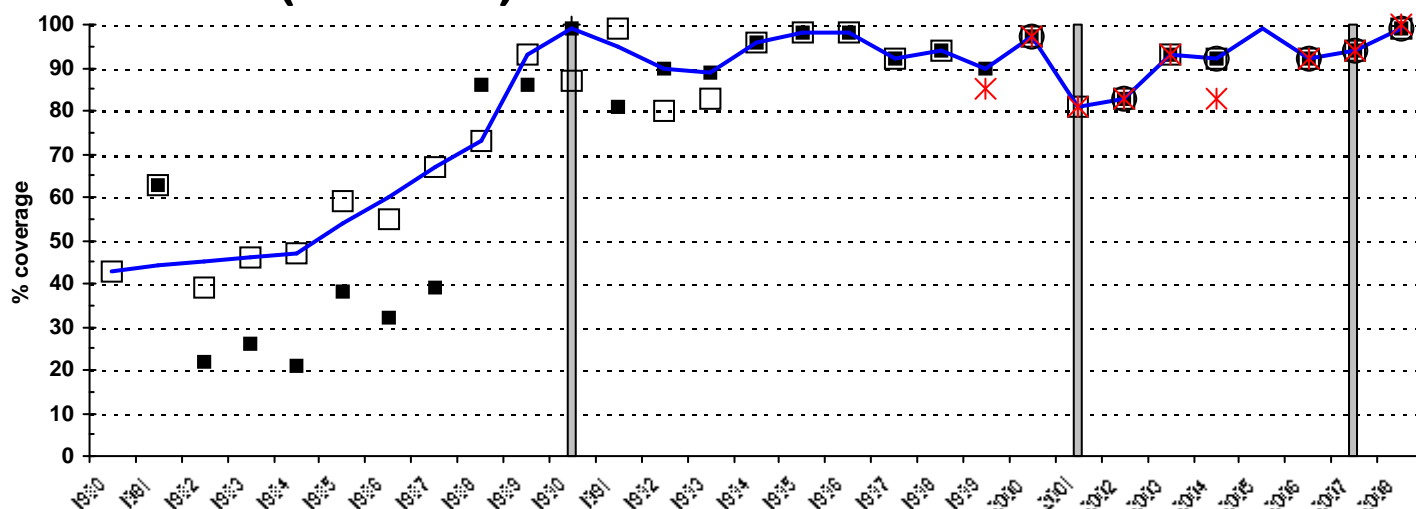
**WHO/UNICEF
Review of National Immunization Coverage
1980-2008**

Bhutan

July, 2009

Bhutan

BCG (1980-2008)



Description of trend

Officially reported data suggests an increase in coverage between the early and late 1980s. An EPI Cluster Survey reports a coverage rate of 100% in 1990 which supports UNICEF officially reported data for that year. Survey results for 2001 based on a sample size of 200 children. 2007 survey results support reported coverage.

Data presented in chart

Year	WHO/ UNICEF estimate (%)	Reported to:*		Government official estimate (%)	Reported doses administered (%)**	Survey data (%)***	
		WHO (%)	UNICEF (%)			Survey 12-23 months	Survey <12 months
	—	□	■	○	✕	▮	+
1980	43	43					
1981	44	63	63				
1982	45	39	22				
1983	46	46	26				
1984	47	47	21				
1985	54	59	38				
1986	60	55	32				
1987	67	67	39				
1988	73	73	86				
1989	93	93	86				
1990	99	87	99			100	100
1991	95	99	81				
1992	90	80	90				
1993	89	83	89				
1994	96	96	96				
1995	98	98	98				
1996	98	98	98				
1997	92	92	92				
1998	94	94	94				
1999	90		90		85		
2000	97	97	97	97	97		
2001	81	81			81	100	
2002	83	83	83	83	83		
2003	93	93	93		93		
2004	92	92	92	92	83		
2005	99	101	101	101	102		
2006	92	92	92	92	92		
2007	94	94	94	94	94	100	
2008	99	99	99	99	100		

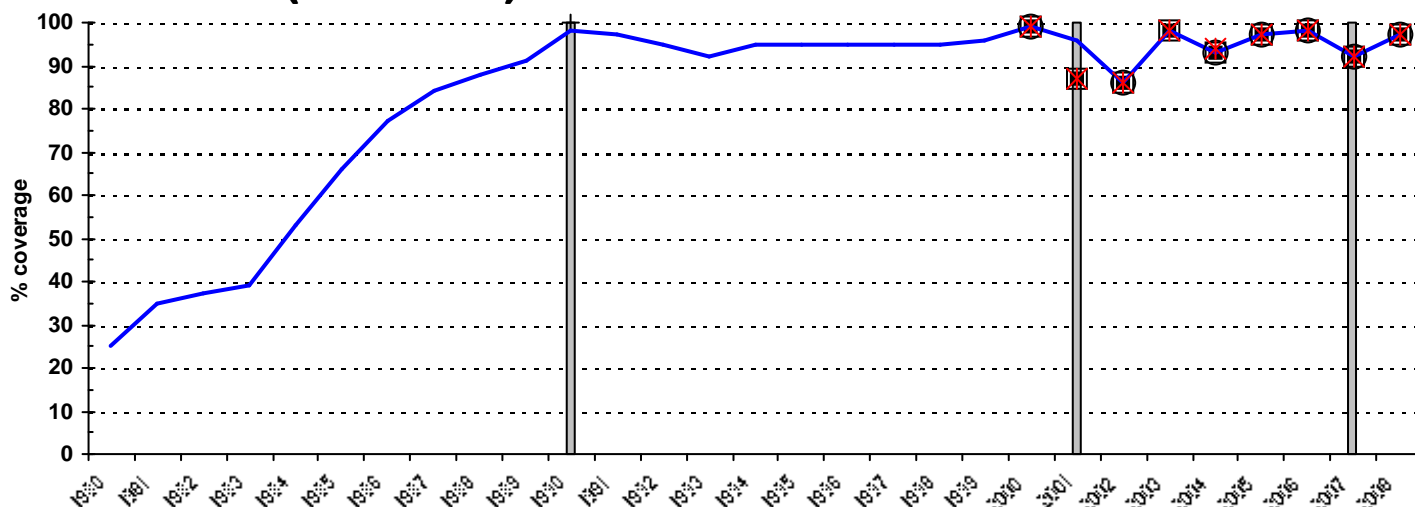
*Prior to 1998 national reports to WHO/UNICEF did not specify whether information was derived from administrative records, surveys or other sources.

**Coverage based on registration of doses administered by health care providers.

***In case more than one survey was implemented in a certain year the highest value is presented. Details of all data are presented in the second section of this report.

Bhutan

DTP1 (1980-2008)



Description of trend

WHO and UNICEF began requesting data on DTP1 coverage in 2001 and have received national reports reflecting DTP1 coverage from 2001 onward. The DTP1 estimates from 2000-2004 are based on these reports. For years prior to 2000 the estimates are derived from the WHO/UNICEF estimates of DTP3 and the relationship between the levels of DTP3 coverage and the drop-out between DTP1 and DTP3. This relationship results from an analysis of 282 surveys conducted in 101 countries which were published between 1980 and 2004. 2007 survey results support reported coverage.

Data presented in chart

Year	WHO/ UNICEF estimate (%)	Reported to:*		Government official estimate (%)	Reported doses administered (%)**	Survey data (%)***	
		WHO (%)	UNICEF (%)			Survey 12-23 months	Survey <12 months
1980	25						
1981	35						
1982	37						
1983	39						
1984	53						
1985	66						
1986	77						
1987	84						
1988	88						
1989	91						
1990	98					100	100
1991	97						
1992	95						
1993	92						
1994	95						
1995	95						
1996	95						
1997	95						
1998	95						
1999	96						
2000	99	99	99	99	99		
2001	96	87	87		87	100	
2002	86	86	86	86	86		
2003	98	98	98		98		
2004	93	93	93	93	94		
2005	97	97	97	97	97		
2006	98	98	98	98	98		
2007	92	92	92	92	92	100	
2008	97	97	97	97	97		

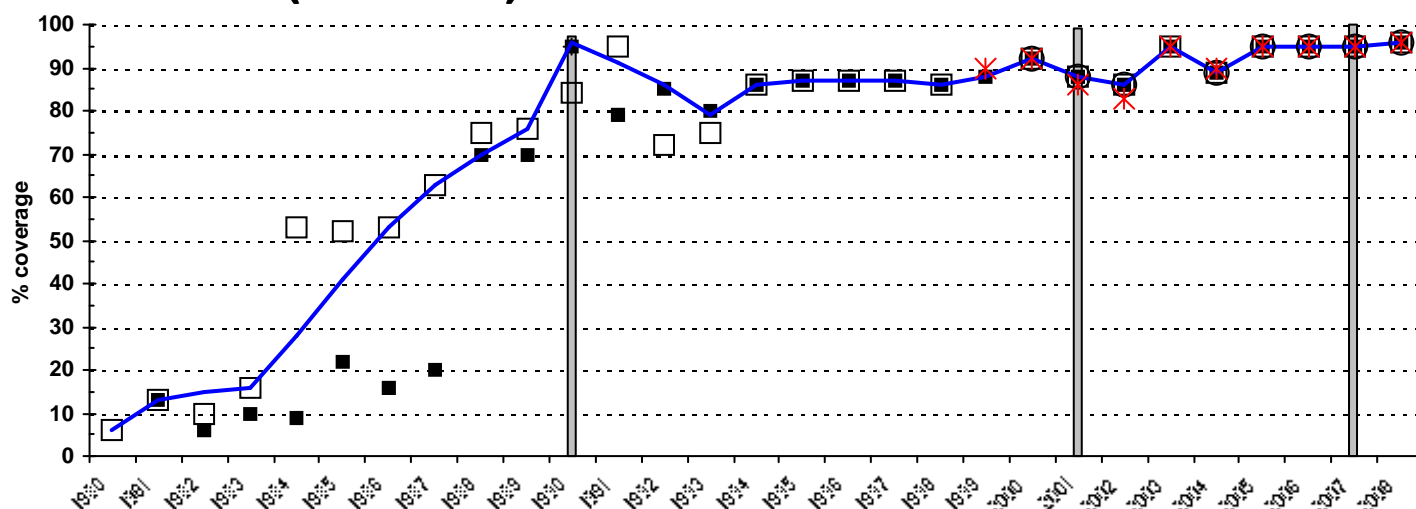
*Prior to 1998 national reports to WHO/UNICEF did not specify whether information was derived from administrative records, surveys or other sources.

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DTP3 (1980-2008)



Description of trend

Officially reported data shows a steep and steady increase in coverage between the early and late 1980s. An EPI Cluster Survey reports a coverage rate of 96% in 1990 which supports UNICEF officially reported data for that year. Survey results for 2001 based on a sample size of 2007 children. 2007 survey results support reported coverage.

Data presented in chart

Year	WHO/ UNICEF estimate (%)	Reported to:*		Government official estimate (%)	Reported doses administered (%)**	Survey data (%)***	
		WHO (%)	UNICEF (%)			Survey 12-23 months	Survey <12 months
1980	6	6					
1981	13	13	13				
1982	15	10	6				
1983	16	16	10				
1984	28	53	9				
1985	41	52	22				
1986	53	53	16				
1987	63	63	20				
1988	70	75	70				
1989	76	76	70				
1990	96	84	95			97	95
1991	91	95	79				
1992	86	72	85				
1993	79	75	80				
1994	86	86	86				
1995	87	87	87				
1996	87	87	87				
1997	87	87	87				
1998	86	86	86				
1999	88	88	88		90		
2000	92	92	92	92	92		
2001	88	88	88	88	86	99	
2002	86	86	86	86	83		
2003	95	95	95		95		
2004	89	89	89	89	90		
2005	95	95	95	95	95		
2006	95	95	95	95	95		
2007	95	95	95	95	95	100	
2008	96	96	96	96	96		

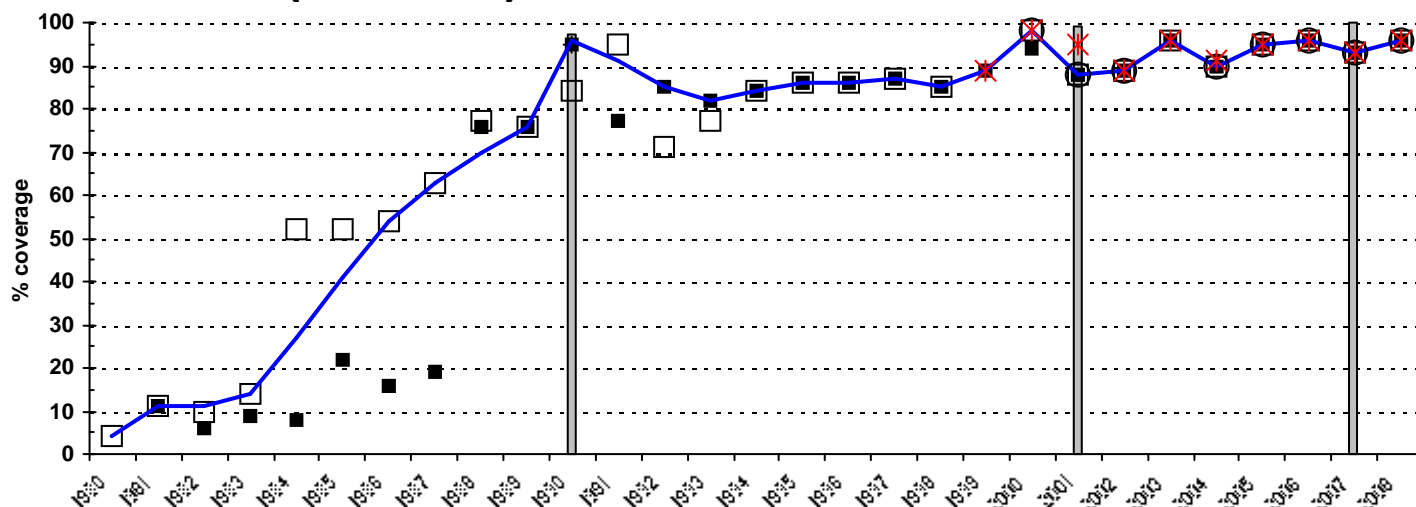
*Prior to 1998 national reports to WHO/UNICEF did not specify whether information was derived from administrative records, surveys or other sources.

**Coverage based on registration of doses administered by health care providers.

***In case more than one survey was implemented in a certain year the highest value is presented. Details of all data are presented in the second section of this report.

Bhutan

Pol3 (1980-2008)



Description of trend

Officially reported data shows a steep and steady increase in coverage between the early and late 1980s. An EPI Cluster Survey reports a coverage rate of 96% in 1990 which supports UNICEF officially reported data for that year. Survey results for 2001 based on a sample size of 200 child 2007 survey results support reported coverage.

Data presented in chart

Year	WHO/ UNICEF estimate (%)	Reported to:*		Government official estimate (%)	Reported doses administered (%)**	Survey data (%)***	
		WHO (%)	UNICEF (%)			Survey 12-23 months	Survey <12 months
1980	4	4					
1981	11	11	11				
1982	11	10	6				
1983	14	14	9				
1984	27	52	8				
1985	41	52	22				
1986	54	54	16				
1987	63	63	19				
1988	70	77	76				
1989	76	76	76				
1990	96	84	95			97	95
1991	91	95	77				
1992	85	71	85				
1993	82	77	82				
1994	84	84	84				
1995	86	86	86				
1996	86	86	86				
1997	87	87	87				
1998	85	85	85				
1999	89		89		89		
2000	98	98	94	98	98		
2001	88	88	88	88	95	99	
2002	89	89	89	89	89		
2003	96	96	96		96		
2004	90	90	90	90	91		
2005	95	95	95	95	95		
2006	96	96	96	96	96		
2007	93	93	93	93	93	100	
2008	96	96	96	96	96		

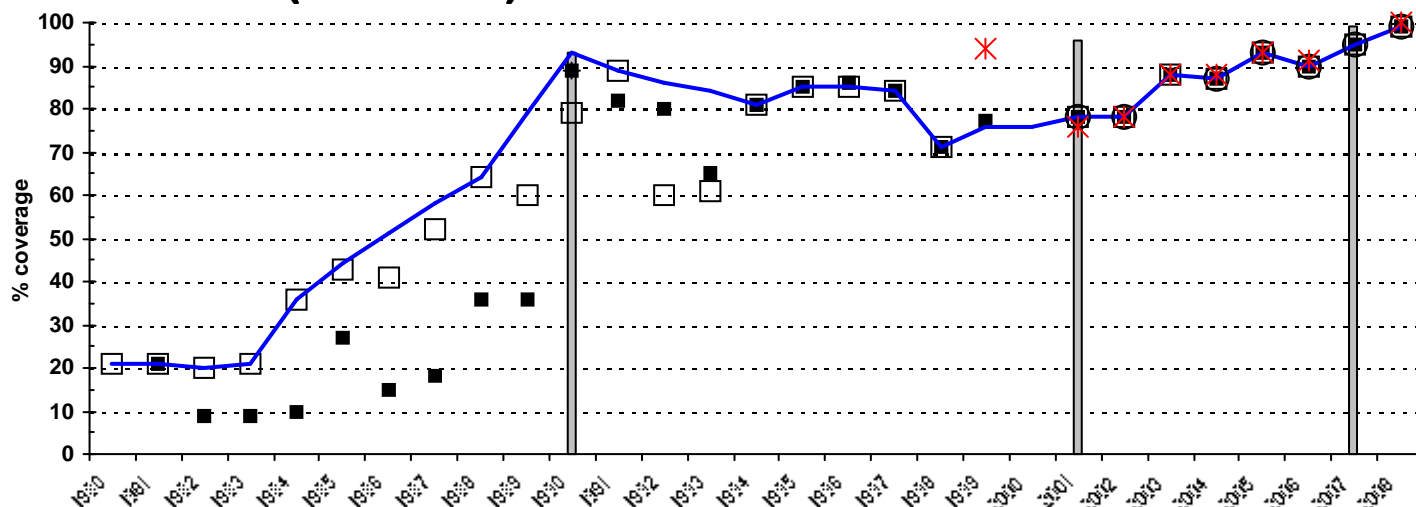
*Prior to 1998 national reports to WHO/UNICEF did not specify whether information was derived from administrative records, surveys or other sources.

**Coverage based on registration of doses administered by health care providers.

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Bhutan

MCV (1980-2008)



Description of trend

Officially reported data shows a steep and steady increase in coverage between the early and the late 1980s. An EPI Cluster Survey reports a coverage rate of 93% in 1990 which supports UNICEF officially reported data for that year. Survey results for 2001 based on a sample size of children. 2007 survey results support reported coverage.

Data presented in chart

Year	WHO/ UNICEF estimate (%)	Reported to:*		Government official estimate (%)	Reported doses administered (%)**	Survey data (%)***	
		WHO (%)	UNICEF (%)			Survey 12-23 months	Survey <12 months
1980	21	21	21				
1981	21	21	21				
1982	20	20	9				
1983	21	21	9				
1984	36	36	10				
1985	44	43	27				
1986	51	41	15				
1987	58	52	18				
1988	64	64	36				
1989	79	60	36				
1990	93	79	89			93	89
1991	89	89	82				
1992	86	60	80				
1993	84	61	65				
1994	81	81	81				
1995	85	85	85				
1996	85	85	86				
1997	84	84	84				
1998	71	71	71				
1999	76		77		94		
2000	76						
2001	78	78	78	78	76	96	
2002	78	78	78	78	78		
2003	88	88	88		88		
2004	87	87	87	87	88		
2005	93	93	93	93	93		
2006	90	90	90	90	91		
2007	95	95	95	95	110	99	
2008	99	99	99	99	100		

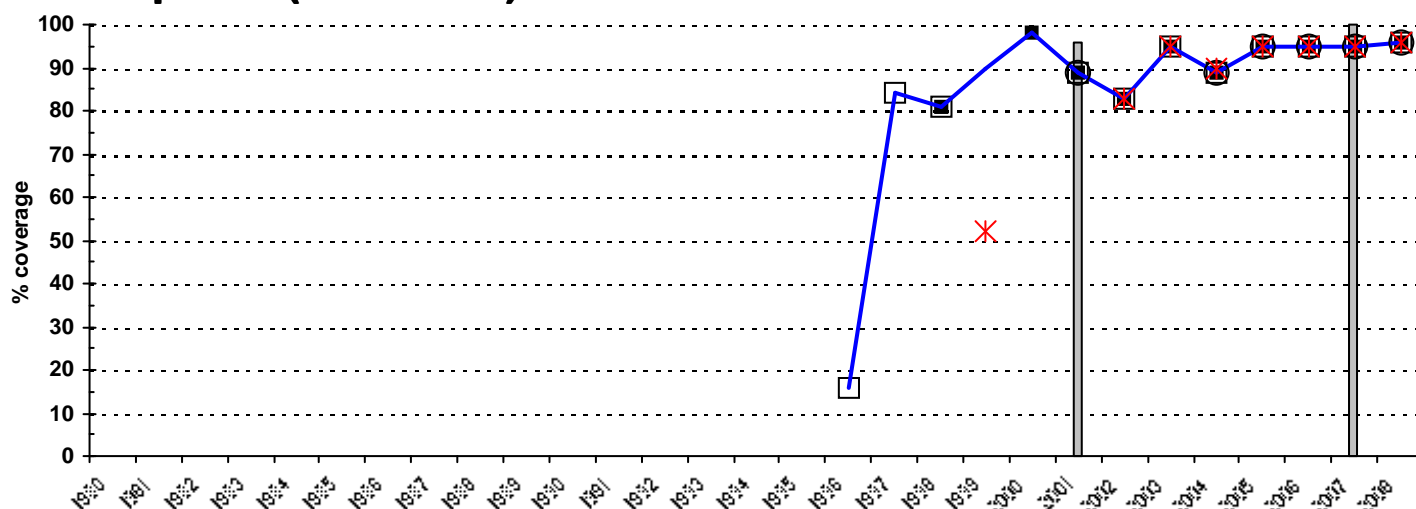
*Prior to 1998 national reports to WHO/UNICEF did not specify whether information was derived from administrative records, surveys or other sources.

**Coverage based on registration of doses administered by health care providers.

***In case more than one survey was implemented in a certain year the highest value is presented. Details of all data are presented in the second section of this report.

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HepB3 (1980-2008)



Description of trend

The Hepatitis vaccine was introduced in 1997. Estimates based on nationally reported data. Survey results for 2001 based on a sample size of 200 children. 2007 survey results support reported coverage.

Data presented in chart

Year	WHO/ UNICEF estimate (%) —	Reported to:*		Government official estimate (%) ○	Reported doses administered (%)** ✕	Survey data (%)***	
		WHO (%) □	UNICEF (%) ■			Survey 12-23 months 	Survey <12 months +
1980							
1981							
1982							
1983							
1984							
1985							
1986	16	16					
1987	84	84					
1988	81	81	81				
1989	90				52		
1990	98						
1991	89	89	89	89		96	
1992	83	83	83		83		
1993	95	95	95		95		
1994	89	89	89	89	90		
1995	95	95	95	95	95		
1996	95	95	95	95	95		
1997	95	95	95	95	95		
1998	95	95	95	95	95		
1999	95	95	95	95	95		
2000	95	95	95	95	95		
2001	95	95	95	89	52	96	
2002	95	95	95	89	83		
2003	95	95	95	89	95		
2004	95	95	95	89	90		
2005	95	95	95	95	95		
2006	95	95	95	95	95		
2007	95	95	95	95	95	100	
2008	96	96	96	96	96		

*Prior to 1998 national reports to WHO/UNICEF did not specify whether information was derived from administrative records, surveys or other sources.

**Coverage based on registration of doses administered by health care providers.

***In case more than one survey was implemented in a certain year the highest value is presented. Details of all data are presented in the second section of this report.

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Details Survey Data

Year Source

Antigen	Confirmation method	% coverage	Compliance with schedule	Age group	Sample size	% cards seen	Survey year	Comments
2007 The National EPI Coverage Survey, 2009								
BCG	Card or History	100	Crude	12-23 m	1193	98	2008	
DTP1	Card or History	100	Crude	12-23 m	1193	98	2008	
DTP3	Card or History	99.9	Crude	12-23 m	1193	98	2008	
Pol3	Card or History	99.9	Crude	12-23 m	1193	98	2008	
MCV	Card or History	99	Crude	12-23 m	1193	98	2008	
HepB	Card or History	99.9	Crude	12-23 m	1193	98	2008	
2001 Bhutan National EPI Coverage Evaluation Survey 2002								
BCG	Card or History	99.5		12-23 m	214	94.9	2002	
DTP1	Card or History	99.5		12-23 m	214	94.9	2002	
DTP3	Card or History	98.6		12-23 m	214	94.9	2002	
Pol3	Card or History	98.6		12-23 m	214	94.9	2002	
MCV	Card or History	96.3		12-23 m	214	94.9	2002	
HepB	Card or History	96.3		12-23 m	214	94.9	2002	
1990 Achievement of Universal Immunization in the Kingdom of Bhutan: A Joint Government/Unicef/Who Epi Survey and Review, 1991								
BCG	Card or History	100		12-23 m	210	96	1991	
BCG	C or H <12 month	100	Valid	12-23 m	210	96	1991	
DTP1	Card or History	100		12-23 m	210	96	1991	
DTP1	C or H <12 month	100	Valid	12-23 m	210	96	1991	
DTP3	Card or History	97		12-23 m	210	96	1991	
DTP3	C or H <12 month	95	Valid	12-23 m	210	96	1991	
Pol3	Card or History	97		12-23 m	210	96	1991	
Pol3	C or H <12 month	95	Valid	12-23 m	210	96	1991	
MCV	Card or History	93		12-23 m	210	96	1991	
MCV	C or H <12 month	89	Valid	12-23 m	210	96	1991	

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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.

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.

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Year	PAB coverage estimate (%)
1980	
1981	
1982	
1983	
1984	3
1985	3
1986	6
1987	14
1988	14
1989	39
1990	63
1991	68
1992	58
1993	60
1994	70
1995	78
1996	79
1997	81
1998	85
1999	84
2000	85
2001	86
2002	87
2003	87
2004	86
2005	85
2006	85
2007	84
2008	89