

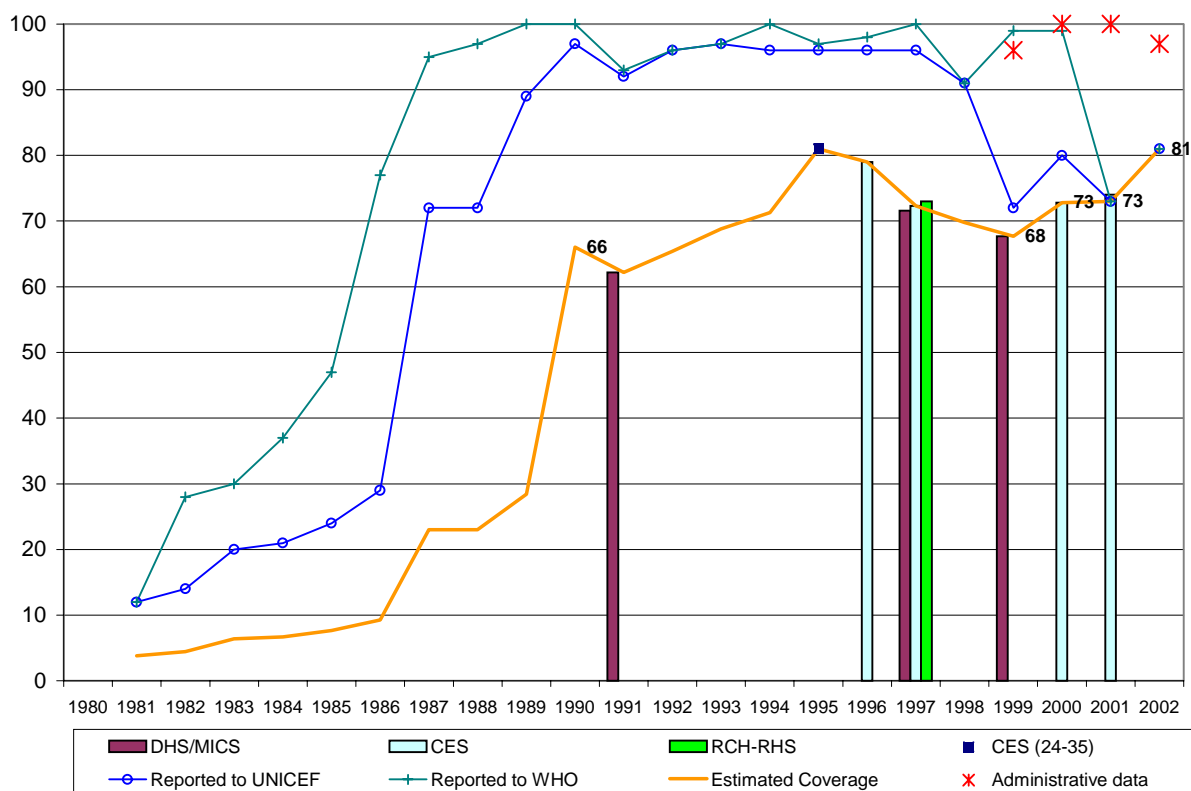


**WHO/UNICEF
Review of National Immunization Coverage
1980-2002**

India

October, 2003

India BCG Estimates, 1980-2002



Trends in officially reported data show an increase in coverage beginning in the early to mid 1980s reflecting the phased geographic expansion of the EPI programme from 31 districts in 1985 to all 452 districts by 1990. In 1985 the Universal Immunization Programme (UIP), the inclusion of immunization in India's Technology Mission (one of 5 missions reporting directly to the Prime Minister) and the infusion of resources associated with the global Universal Childhood Immunization (UCI) goal resulted in rapidly increasing coverage in the late 1980s. While official reports describe sustained high levels of coverage following 1990, survey data suggests significantly lower coverage beginning in the late 1980s. Officially reported data may be over estimated due to methods for ascertaining the size of the target population. Coverage for 1990 and 1991 was estimated to have been 66% and 62% respectively based on an extensive sub-national Immunization Coverage Survey of 1991 and results from the 1992 National Family Health Survey (NFHS). Estimates prior to 1990 were established by calibrating the data reported to UNICEF by the 1990 estimate established by an evaluation of the 1991 and 1992 surveys. The marked increase to 1990 and the subsequent decline are attributed to the extensive (but unsustainable) efforts to reach UCI goals. Coverage prior to 1990 is below that of DPT3, probably due to the number of home deliveries. The estimates for the periods following 1995 are based primarily on the Coverage Evaluation Surveys (CES), MICSS, and a second National Family & Health Survey (1997/98) and show a marked decline in coverage during this period. Estimates for 1993 through 1995 are interpolated between the levels established by the 1992 and 1996 surveys. The estimate for 1995 - 1997 are based on an evaluation of the survey data. The estimate of 1997 is based the CES. The estimate of 72% is supported by results from the 1997 Reproductive and Child Health Survey and NFHS (1997/98). The 1995 peak was established from data in the 1996 CES that described coverage in a cohort 25-36 months of age. The 1999 estimate is based on the MICS. The recent increase is supported by the 2001 and 2002 CES surveys.

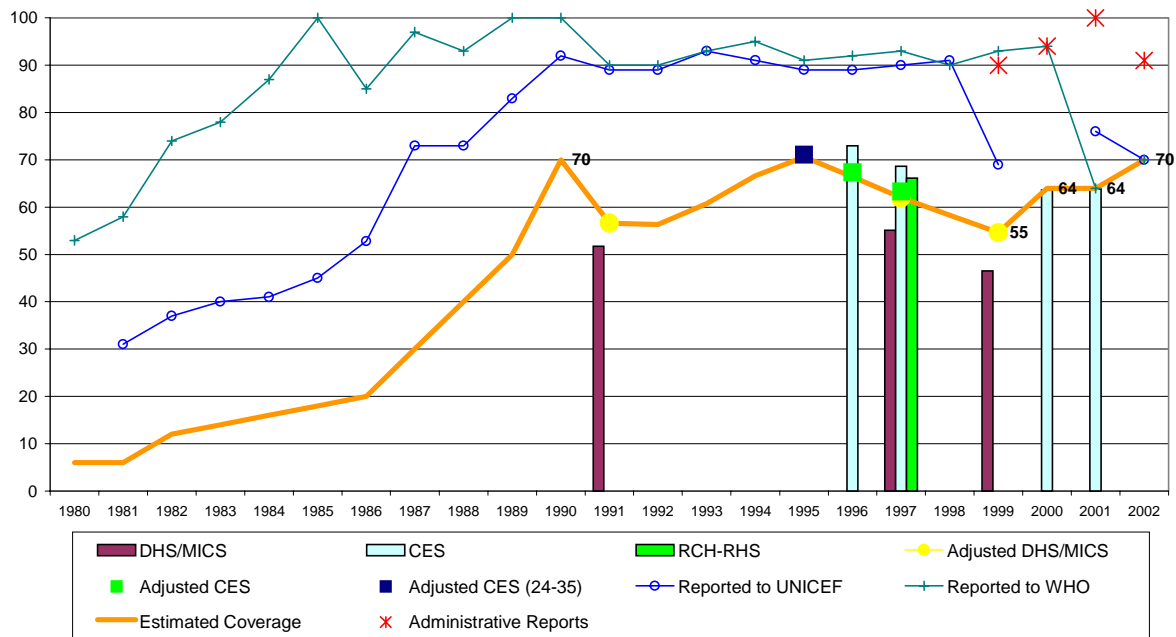
India

Data presented in chart - BCG

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	4	12	12				
1982	4	28	14				
1983	6	30	20				
1984	7	37	21				
1985	8	47	24				
1986	9	77	29				
1987	23	95	72				
1988	23	97	72				
1989	28	100	89				
1990	66	100	97				
1991	62	93	92				
1992	65	96	96			62	59
1993	69	97	97				
1994	71	100	96				
1995	81	97	96				
1996	79	98	96				
1997	72	100	96			81	
1998	70	91	91			72	69
1999	68	99	72	99	96	68	
2000	73	99		103	103		
2001	73	73	80	73	103		74
2002	81	81	81	81	97		

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

India DPT3 Estimates, 1980-2000



Trends in officially reported data show an increase in coverage beginning in the early to mid 1980s reflecting the phased geographic expansion of the EPI programme from 31 districts in 1985 to all 452 districts by 1990. In 1985 the Universal Immunization Programme (UIP), the inclusion of immunization in India's Technology Mission (one of 5 missions reporting directly to the Prime Minister) and the infusion of resources associated with the global Universal Childhood Immunization (UCI) goal resulted in rapidly increasing coverage in the late 1980s.

While official reports describe sustained high coverage following 1990, survey data suggests significantly lower coverage beginning in the late 1980s. Officially reported data may be over estimated due to methods for ascertaining the size of the target population. Coverage for 1990 & 1991 was estimated to have been 70% and 57% respectively based on an extensive sub-national Immunization Coverage Survey of 1991 and results from the 1992 National Family Health Survey (NFHS). Estimates prior to 1990 were established by calibrating the data reported to UNICEF by the 1990 estimate established by an evaluation of the 1991 & 1992 surveys. The marked increase to 1990 and the subsequent decline are attributed to the extensive (but unsustainable) efforts to reach UCI goals.

The estimates for the periods following 1995 are based on the Coverage Evaluation Surveys (CES), MICSs, and a second NFHS (1997/98) and show a marked decline in coverage during this period. Estimates for 1993 through 1995 are interpolated between the levels established by the 1992 and 1996 surveys. The estimate for 1995-1997 are based an evaluation of the survey data. Results from previous Demographic and Health Surveys (similar to the NFHS and MICS) suggest that coverage values based on mother's history are effected by a recall bias for the multi-antigen vaccines (i.e., OPV 1,2,3 and DPT 1,2,3.) and to most likely occur in longer surveys covering a variety of indicators. It does not appear to be a problem in surveys focused on immunization coverage such as the EPI 30 cluster surveys and the CES. To control for this bias we have adjusted the DPT3 card or history value by calculating the dropout rate from DPT1 to DPT3 based on card results and applying this multiplier to the DPT1 card or history value. This adjustment may result in an overestimate since children without a card are less likely to be immunized than children with a card.

The 1996 and 1997 results of the CES seem to estimate the upper range of actual coverage. The dropout rate of 6% from DPT1 to DPT3 in the 1998/1999 CES is unusually low (dropout from the NFHS 98/99 is 13% based on card only data). The estimate of 1997 is based on an adjustment of the NFHS (1997/98) results to account for recall bias and the CES. The estimate of 62% is supported by results from the 1997 Reproductive and Child Health Survey. The 1995 peak was established from data in the 1996 CES that described coverage in a cohort 25-36 months of age. The 1999 estimate is based on the MICS adjusted for recall bias. The recent increase is supported by the 2001 and 2002 CES surveys.

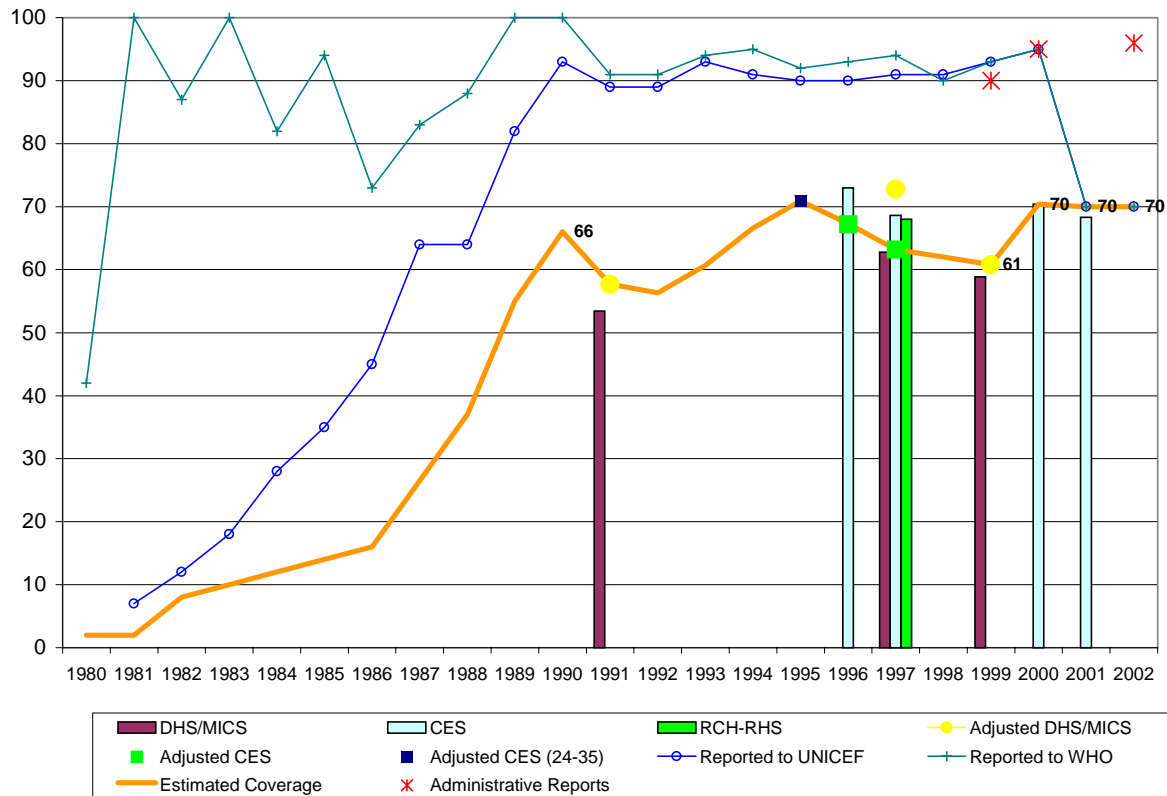
India

Data presented in chart - DTP3

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	53					
1981	6	58	31				
1982	12	74	37				
1983	14	78	40				
1984	16	87	41				
1985	18	100	45				
1986	20	85	53				
1987	30	97	73				
1988	40	93	73				
1989	50	100	83				
1990	70	100	92				
1991	57	90	89				
1992	56	90	89			52	47
1993	61	93	93				
1994	67	95	91				
1995	71	91	89				
1996	66	92	89			77	
1997	62	93	90			77	
1998	58	90	91			69	52
1999	55	93	69	93	90	47	
2000	64	94		94	94		
2001	64	64	76	64	100		64
2002	70	70	70	70	91		

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

India OPV3 Estimates, 1980-2002



Trends in officially reported data show an increase in coverage beginning in the early to mid 1980s reflecting the phased geographic expansion of the EPI programme from 31 districts in 1985 to all 452 districts by 1990. In 1985 the Universal Immunization Programme (UIP), the inclusion of immunization in India's Technology Mission (one of 5 missions reporting directly to the Prime Minister) and the infusion of resources associated with the global Universal Childhood Immunization (UCI) goal resulted in rapidly increasing coverage in the late 1980s.

While official reports describe sustained high levels of coverage following 1990, survey data suggests significantly lower coverage beginning in the late 1980s. Officially reported data may be over estimated due to methods for ascertaining the size of the target population. Coverage for 1990 and 1991 was estimated to have been 66% and 58% respectively based on an extensive sub-national Immunization Coverage Survey of 1991 and results from the 1992 National Family Health Survey (NFHS). Estimates prior to 1990 were established by calibrating the data reported to UNICEF by the 1990 estimate established by an evaluation of the 1991 & 1992 surveys. The marked increase to 1990 and the subsequent decline are attributed to the extensive (but unsustainable) efforts to reach UCI goals. The estimates for the periods following 1995 are based primarily on the Coverage Evaluation Surveys (CES), MICSs, and a second National Family & Health Survey (1997/98) and show a marked decline in coverage during this period. Estimates for 1993 through 1995 are interpolated between the levels established by the 1992 and 1996 surveys. The estimate for 1995 - 1997 are based on an evaluation of the survey data. Results from previous Demographic and Health Surveys (similar to the NFHS and MICS) suggest that coverage values based on mother's history are effected by a recall bias for the multi-antigen vaccines (i.e., OPV 1,2,3 and DPT 1,2,3.) and to most likely occur in longer surveys covering a variety of indicators. It does not appear to be a problem in surveys focused on immunization coverage such as the EPI 30 cluster surveys and the CES. To control for this bias we have adjusted the OPV3 card or history value by calculating the dropout rate from OPV1 to OPV3 based on card results and applying this multiplier to the OPV1 card or history value. This adjustment may result in an overestimate since children without a card are less likely to be immunized than children with a card. The 1996 and 1997 results of the CES surveys seem to estimate the upper range of actual coverage. The dropout rate of 6% from OPV1 to OPV3 in the 1998/1999 CES is unusually low (dropout from the NFHS 98/99 is 13% based on card only data). The estimate of 1997 is based on an adjustment of the NFHS (1997/98) results to account for recall bias and the CES. The estimate of 63% is supported by results from the 1997 Reproductive and Child Health Survey. The 1995 peak was established from data in the 1996 CES that described coverage in a cohort 25-36 months of age. The 1999 estimate is based on the MICS adjusted for recall bias. The recent coverage level at 70% is supported by the 2001 and 2002 CES surveys.

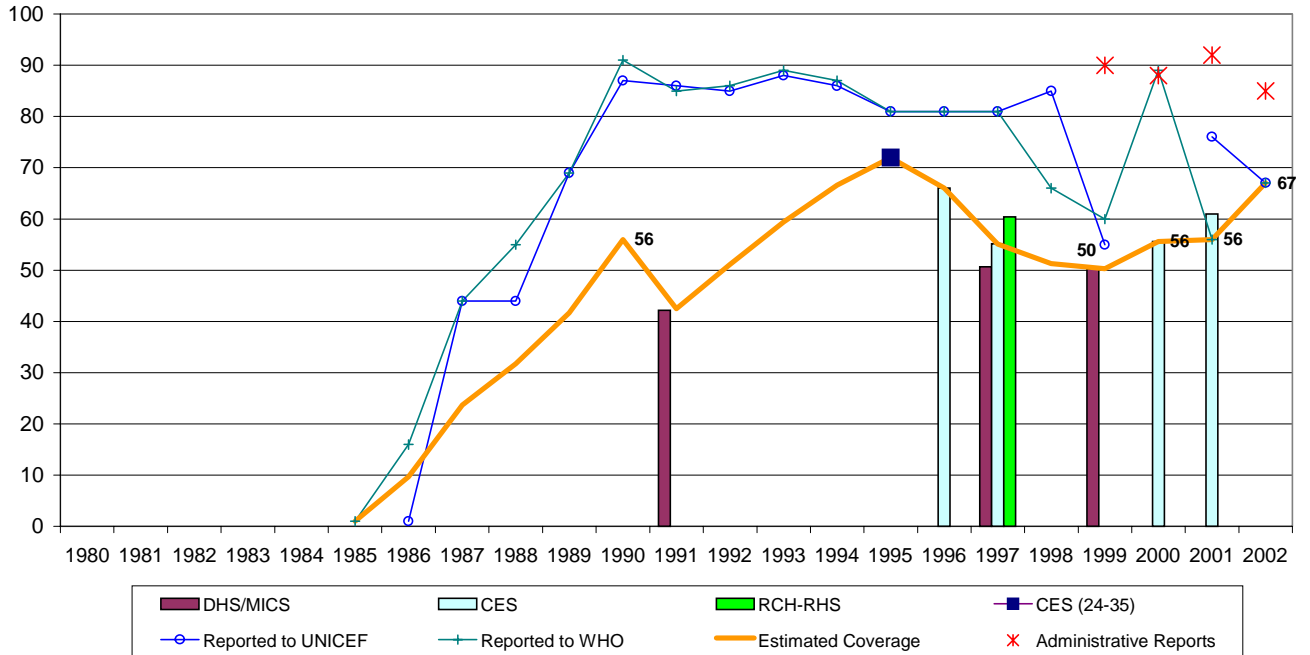
India

Data presented in chart - Pol3

Year	WHO/ UNICEF estimate (%)	Reported to:		Government official estimate (%)	Reported doses administered (%)	Survey data (%)*	
		WHO (%)	UNICEF (%)			Survey 12-23 months	Survey <12 months
1980	2	42					
1981	2	100	7				
1982	8	87	12				
1983	10	100	18				
1984	12	82	28				
1985	14	94	35				
1986	16	73	45				
1987	27	83	64				
1988	37	88	64				
1989	55	100	82				
1990	66	100	93				
1991	58	91	89				
1992	56	91	89			53	48
1993	61	94	93				
1994	67	95	91				
1995	71	92	90				
1996	67	93	90			77	
1997	63	94	91			77	
1998	62	90	91			69	60
1999	61	93	69	93	90	59	
2000	70	95		95	95		
2001	70	70	77	70			68
2002	70	70	70	70	96		

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

India Measles Vaccine Estimates, 1980-2002



Measles vaccine was in 1985. Trends in officially reported data show a rapid increase in coverage reflecting the phased geographic expansion of the EPI programme from 31 districts in 1985 to all 452 districts by 1990. In 1985 the Universal Immunization Programme (UIP), the inclusion of immunization in India's Technology Mission (one of 5 missions reporting directly to the Prime Minister) and the infusion of resources associated with the global Universal Childhood Immunization (UCI) goal resulted in rapidly increasing coverage in the late 1980s.

While official reports describe sustained high levels of coverage following 1990, survey data suggests significantly lower coverage beginning in the late 1980s. Officially reported data may be over estimated due to methods for ascertaining the size of the target population. Coverage for 1990 and 1991 was estimated to have been 56% and 43% respectively based on an extensive sub-national Immunization Coverage Survey of 1991 and results from the 1992 National Family Health Survey (NFHS). Estimates prior to 1990 were established by calibrating the data reported to UNICEF by the 1990 estimate established by an evaluation of the 1991 and 1992 surveys. The marked increase to 1990 and the subsequent decline are attributed to the extensive (but unsustainable) efforts to reach UCI goals.

The estimates for the periods following 1995 are based primarily on the Coverage Evaluation Surveys (CES), MICSS, and a second National Family & Health Survey (1997/98) and show a marked decline in coverage during this period. Estimates for 1993 through 1995 are interpolated between the levels established by the 1992 and 1996 surveys. The estimate for 1995 - 1997 are based an evaluation of the survey data.

The estimate of 1997 is based the CES. The estimate of 55% is supported by results from the 1997 Reproductive and Child Health Survey and NFHS (1997/98). The 1995 peak was established from data in the 1996 CES that described coverage in a cohort 25-36 months of age. The 1999 estimate is based on the MICS. The recent increase is supported by the 2001 and 2002 CES surveys.

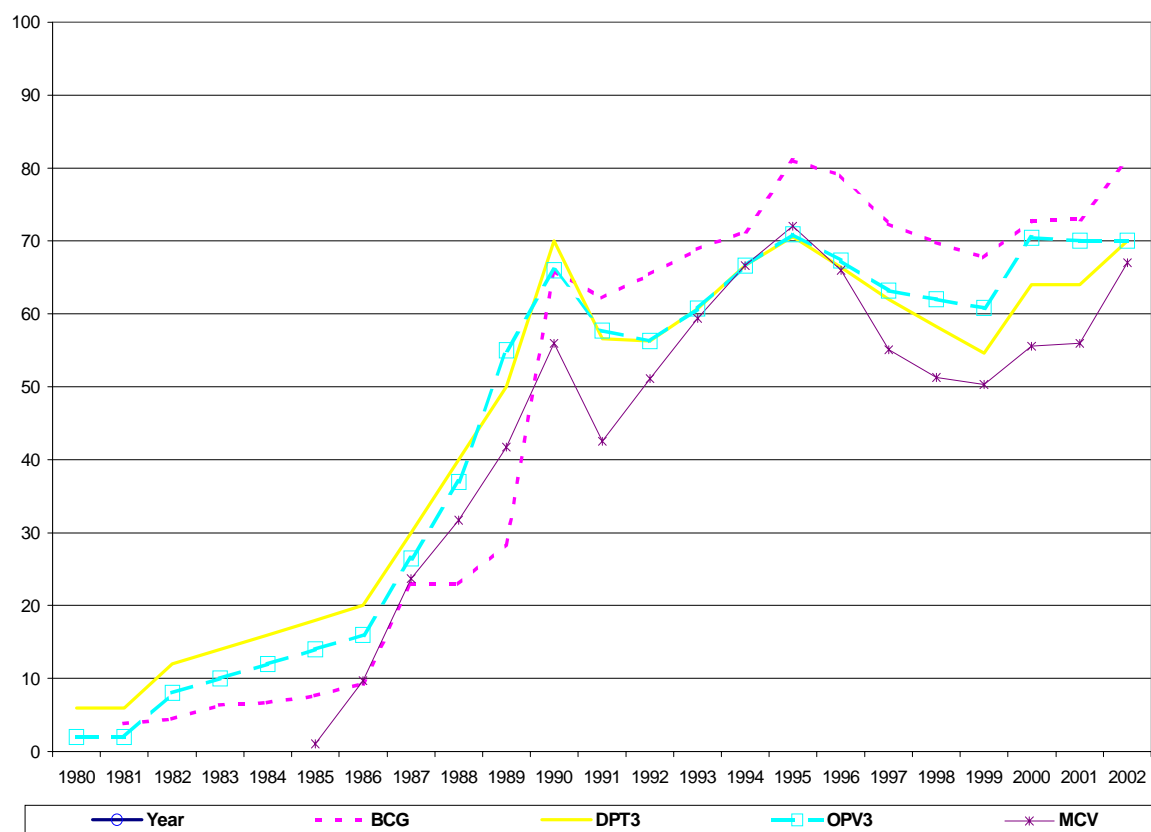
India

Data presented in chart - MCV

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	1	1					
1986	10	16	1				
1987	24	44	44				
1988	32	55	44				
1989	42	69	69				
1990	56	91	87				
1991	43	85	86				
1992	51	86	85			42	33
1993	59	89	88				
1994	67	87	86				
1995	72	81	81				
1996	66	81	81				
1997	55	81	81			72	
1998	51	66	85			55	42
1999	50	60	55	87	90	50	
2000	56	89		88	88		
2001	56	56	76	56	92		61
2002	67	67	67	67	85		

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

Estimated Immunization Coverage, 1980-2000



1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002

—○— Year
 - - - * BCG
 — DPT3
 - - - □ - - - OPV3
 — * MCV

Year	BCG	DPT3	OPV3	MCV
1980		6	2	
1981	4	6	2	
1982	4	12	8	
1983	6	14	10	
1984	7	16	12	
1985	8	18	14	1
1986	9	20	16	10
1987	23	30	27	24
1988	23	40	37	32
1989	28	50	55	42
1990	66	70	66	56
1991	62	57	58	43
1992	65	56	56	51
1993	69	61	61	59
1994	71	67	67	67
1995	81	71	71	72
1996	79	66	67	66
1997	72	62	63	55
1998	70	58	62	51
1999	68	55	61	50
2000	73	64	70	56
2001	73	64	70	56
2002	81	70	70	67

Details Survey Data

Year Source

Antigen	Confirmation method	% coverage	Compliance with schedule	Age group	Sample size	% cards seen	Survey year	Comments
2001 Routine Immunization and Maternal Care, CES, 2002								
BCG	C or H <12 months	74		12-23 m		53.8	2002	
DPT1	C or H <12 months	70.6		12-23 m		53.8	2002	
DPT3	C or H <12 months	63.8		12-23 m		53.8	2002	
Pol3	C or H <12 months	68.3		12-23 m		53.8	2002	
MCV1	C or H <12 months	61.4		12-23 m		53.8	2002	
2000 Routine Immunization and Maternal Care, CES, 2001								
BCG	Card or History	72.8		12-23 m		57.2	2001	
DPT1	Card or History	71.1		12-23 m		57.2	2001	
DPT3	Card or History	63.6		12-23 m		57.2	2001	
Pol3	Card or History	70.4		12-23 m		57.2	2001	
MCV1	Card or History	55.6		12-23 m		57.2	2001	
1999 India, Multiple Indicator Cluster Survey India (MICS-II) 2000								
BCG	Card or History	67.7		12-23 m			2000	
DPT1	Card or History	64.4		12-23 m			2000	
DPT3	Card or History	46.6		12-23 m			2000	
Pol3	Card or History	58.9		12-23 m			2000	
MCV1	Card or History	50.4		12-23 m			2000	
1997 Evaluation of Routine Immunization 1998-99								
BCG	Card or History	72.3		12-23 m	7855	48.5	1998/99	Confirmation Method assumed
DPT1	Card or History	72.8		12-23 m	7855	48.5	1998/99	Confirmation Method assumed
DPT3	Card or History	68.6		12-23 m	7855	48.5	1998/99	Confirmation Method assumed
Pol3	Card or History	68.6		12-23 m	7855	48.5	1998/99	Confirmation Method assumed
MCV1	Card or History	55.2		12-23 m	7855	48.5	1998/99	Confirmation Method assumed
1997 National Family Health Survey, India 1998-99								
BCG	Card or History	71.6		12-23 m		33.7	1998/99	
BCG	C or H <12 months	69.1		12-23 m		33.7	1998/99	
DPT1	Card or History	71.4		12-23 m		33.7	1998/99	
DPT1	C or H <12 months	68.8		12-23 m		33.7	1998/99	
DPT3	Card or History	55.1		12-23 m		33.7	1998/99	
DPT3	C or H <12 months	52.1		12-23 m		33.7	1998/99	
Pol3	Card or History	62.8		12-23 m		33.7	1998/99	
Pol3	C or H <12 months	59.2		12-23 m		33.7	1998/99	
MCV1	Card or History	50.7		12-23 m		33.7	1998/99	
MCV1	C or H <12 months	41.7		12-23 m		33.7	1998/99	
1996 Evaluation of Routine Immunization 1997-98								
BCG	Card or History	79		12-23 m	7295	56	1997/98	Confirmation Method assumed
DPT1	Card or History	n.a.		12-23 m	7295	56	1997/98	Confirmation Method assumed
DPT3	Card or History	73		12-23 m	7295	56	1997/98	Confirmation Method assumed
Pol3	Card or History	73		12-23 m	7295	56	1997/98	Confirmation Method assumed
MCV1	Card or History	66		12-23 m	7295	56	1997/98	Confirmation Method assumed
1996 Evaluation of Routine Immunization 1998-99								

India

Details Survey Data

Year Source

Antigen	Confirmation method	% coverage	Compliance with schedule	Age group	Sample size	% cards seen	Survey year	Comments
DPT3	Card or History	77		12-23 m			1996/97	as DPT3/OPV3 is the same in 1998/1999, it is assumed to be the same for 1997 too
Pol3	Card or History	77		12-23 m			1996/97	Confirmation Method assumed

1991 India, National Family Health Survey (MCH and Family Planning) 1992-93, 1995

BCG	Card or History	62.2		12-23 m	11853	30.6	1992/93	
BCG	C or H <12 months	58.7		12-23 m	11853	30.6	1992/93	
DPT1	Card or History	66.3		12-23 m	11853	30.6	1992/93	
DPT1	C or H <12 months	62.4		12-23 m	11853	30.6	1992/93	
DPT3	Card or History	51.7		12-23 m	11853	30.6	1992/93	
DPT3	C or H <12 months	46.9		12-23 m	11853	30.6	1992/93	
Pol3	Card or History	53.4		12-23 m	11853	30.6	1992/93	
Pol3	C or H <12 months	48.3		12-23 m	11853	30.6	1992/93	
MCV1	Card or History	42.2		12-23 m	11853	30.6	1992/93	
MCV1	C or H <12 months	32.7		12-23 m	11853	30.6	1992/93	

INDIA

WHO/UNICEF estimates of the percent of children born in 2000-2002 protected against tetanus by vaccination of their mothers with tetanus toxoid (PAB)

In most instances PAB reflects the number of mothers receiving two doses of tetanus toxoid during pregnancy. In some cases the mother may have received an adequate number of doses of tetanus toxoid prior to the pregnancy, protecting the child even though no doses were received during the current pregnancy.

These estimates are based on data provided through the WHO/UNICEF Joint Reporting Form on Vaccine Preventable Diseases and have been supplemented by information from national household surveys conducted under the auspices of the National government and from data available in the published literature.

Year	WHO and UNICEF's estimate of the percent of newborn infants protected against neonatal tetanus through maternal immunization with tetanus toxoid	Data source
2000	74	Administrative Coverage and Maternal Care Coverage Survey 1999
2001	75.5	Administrative Coverage and Maternal Care Coverage Survey 2001
2002	78.3	Administrative Coverage and Maternal Care Coverage Survey 2002