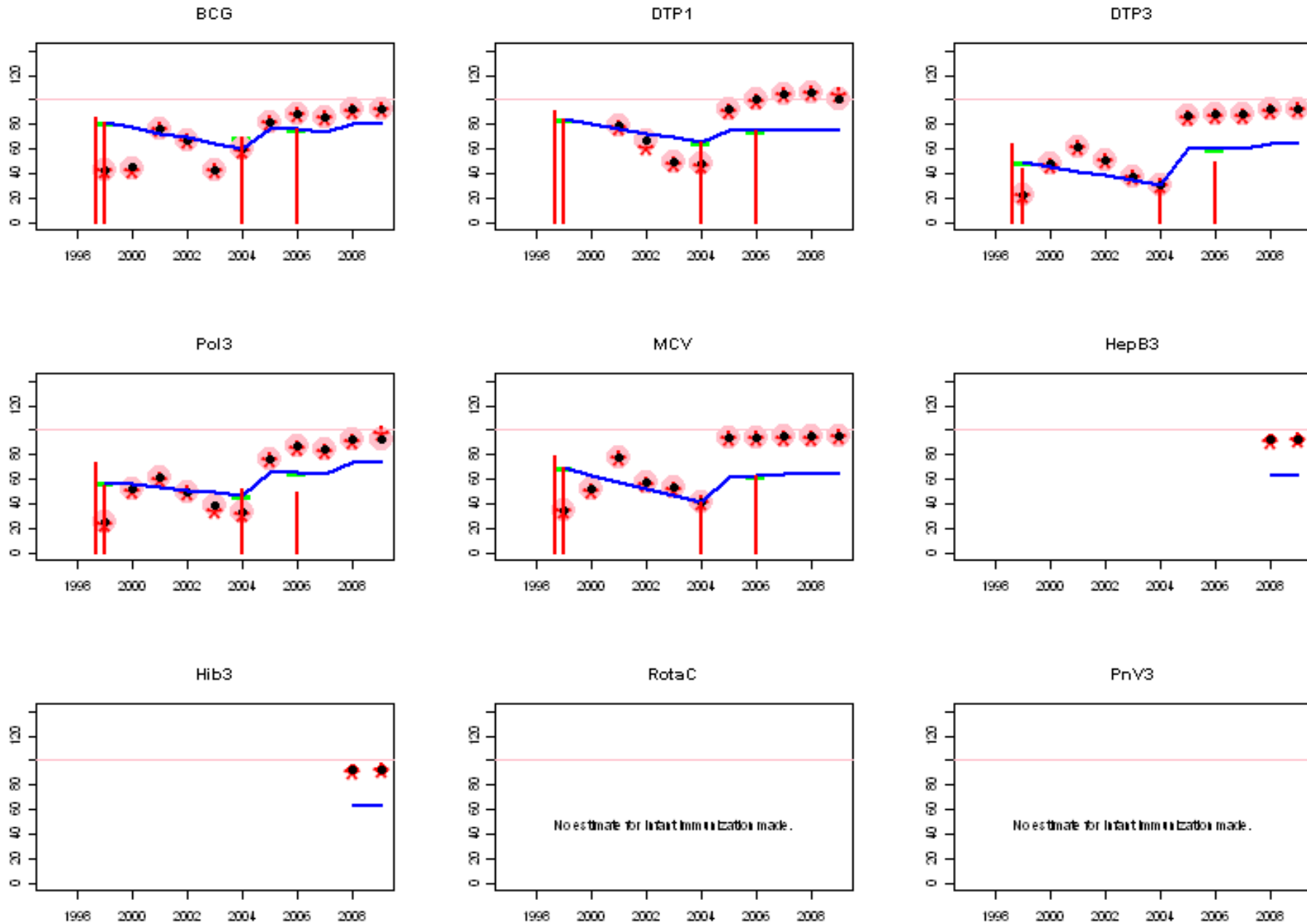
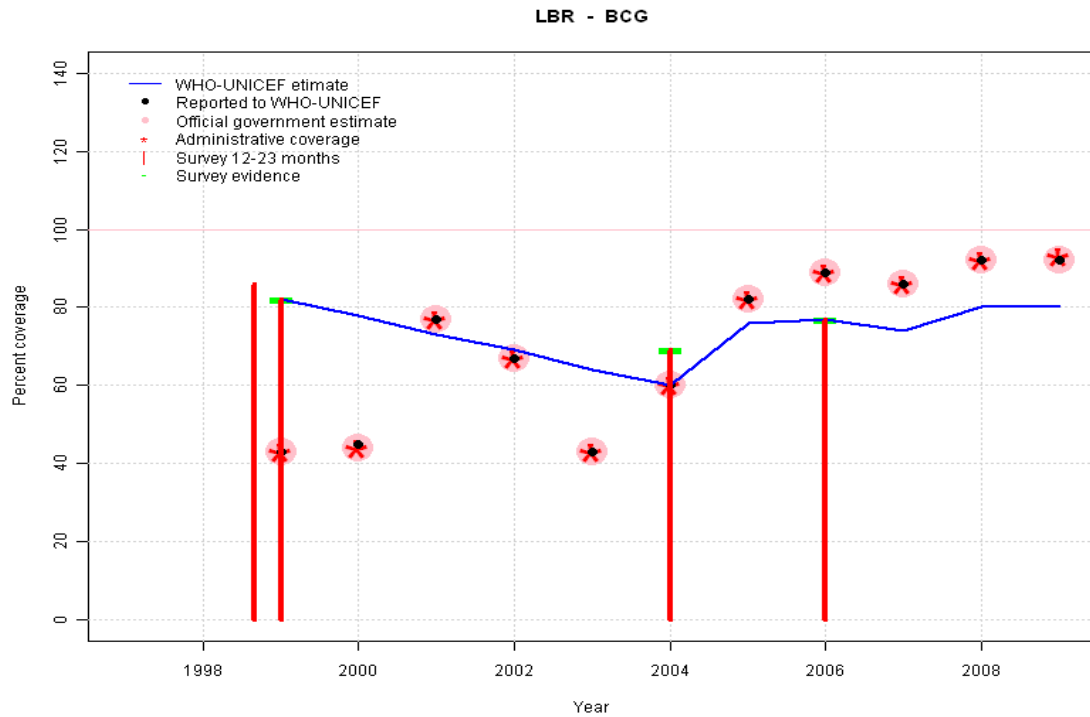


Liberia: WHO and UNICEF estimates of immunization coverage, 1997 - 2009



Liberia - BCG

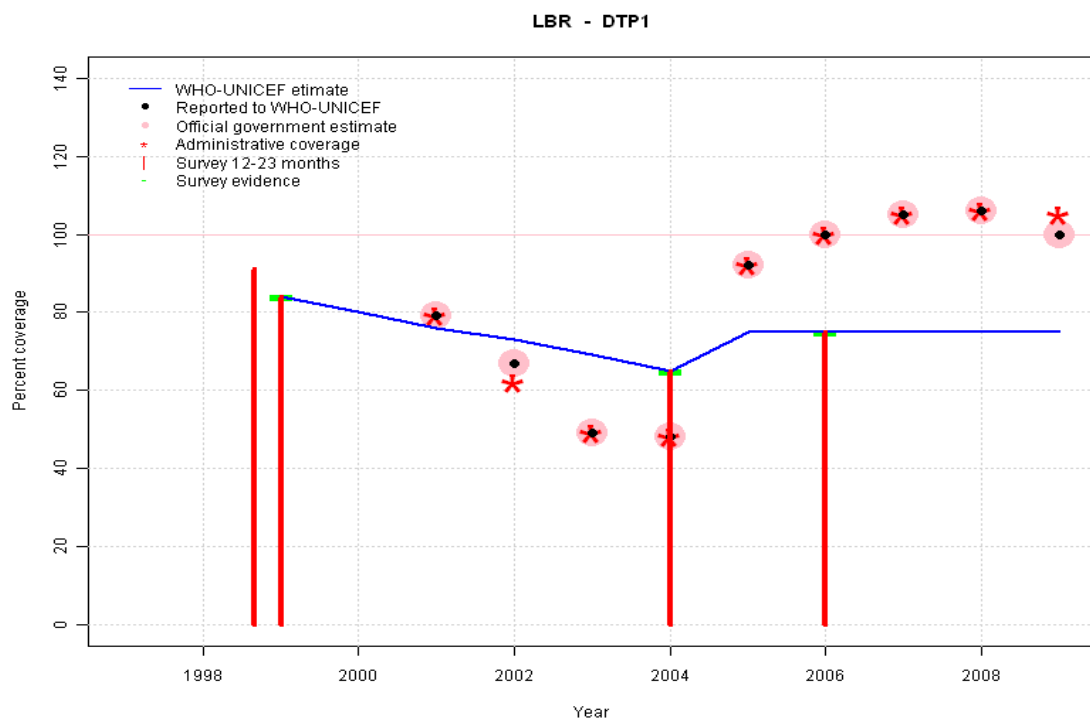


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	82	78	73	69	64	60	76	77	74	80	80
Reported	NA	NA	43	45	77	67	43	60	82	89	86	92	92
Official	NA	NA	43	44	77	67	43	60	82	89	86	92	92
Administrative	NA	NA	43	44	77	67	43	60	82	89	86	92	93
Survey	NA	NA	82	NA	NA	NA	NA	69	NA	77	NA	NA	NA

Description:

- 1999: Estimate based on survey results. Reported data (43 percent) not consistent with survey results (82 percent). Survey results of 86 percent with sample size 89 ignored; sample size less than 300.
- 2000: Estimate interpolated between 1999 and 2004 estimates.
- 2001: Estimate interpolated between 1999 and 2004 estimates.
- 2002: Estimate interpolated between 1999 and 2004 estimates.
- 2003: Estimate interpolated between 1999 and 2004 estimates. 2003 reported data (43 percent) inconsistent with data from other years.
- 2004: Estimate based on reported data (60 percent) confirmed by survey (69 percent).
- 2005: Reported data (82 percent) calibrated to 2004 and 2006 levels. During 2005 Liberia carried out six multi-antigen immunization outreach activities.
- 2006: Estimate based on survey results. Reported data (89 percent) not consistent with survey results (77 percent).
- 2007: Reported data (86 percent) calibrated to 2006 level (77 percent).
- 2008: Reported data (92 percent) calibrated to 2006 level (77 percent).
- 2009: Reported data (92 percent) calibrated to 2006 level (77 percent).

Liberia - DTP1

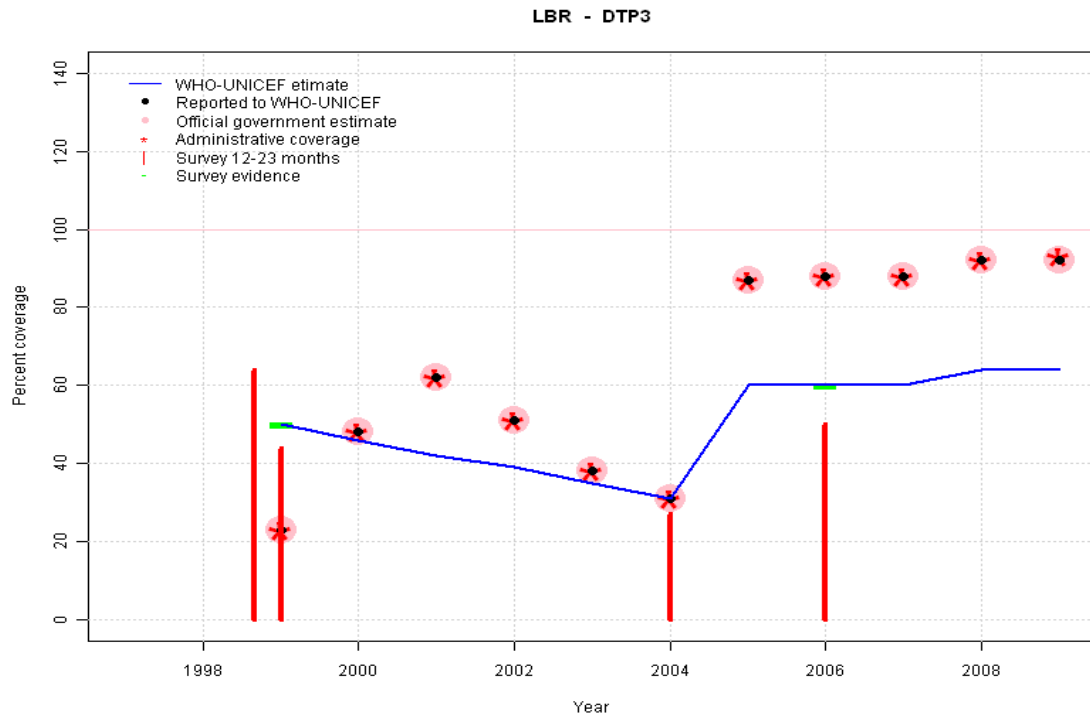


Description:

- 1999: Estimate is based on survey results Survey results of 91 percent with sample size 89 ignored; sample size less than 300.
- 2000: Estimate based on working group decision to interpolated between 1999 and 2004. Fluctuating and inconsistent data suggest poor reporting.
- 2001: Estimate based on working group decision to interpolated between 1999 and 2004. Fluctuating and inconsistent data suggest poor reporting.
- 2002: Estimate based on working group decision to interpolated between 1999 and 2004. Fluctuating and inconsistent data suggest poor reporting.
- 2003: Estimate based on working group decision to interpolated between 1999 and 2004. Fluctuating and inconsistent data suggest poor reporting.
- 2004: Estimate based on survey results. Reported data (48 percent) not consistent with survey results (65 percent).
- 2005: The results of the 2006 survey are presumed to reflect accurately the coverage levels following the 2005 outreach activities. During 2005 Liberia carried out six multi-antigen immunization outreach activities.
- 2006: Estimate based on survey results. Reported data (99 percent) not consistent with survey results (75 percent).
- 2007: Estimate extrapolated from 2006 level (75 percent). 2007 reported data (105 percent) ignored; greater than 100 percent.
- 2008: Estimate extrapolated from 2006 level (75 percent). 2008 reported data (106 percent) ignored; greater than 100 percent.
- 2009: Estimate extrapolated from 2006 level (75 percent).

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	84	80	76	73	69	65	75	75	75	75	75
Reported	NA	NA	NA	NA	79	67	49	48	92	100	105	106	100
Official	NA	NA	NA	NA	79	67	49	48	92	100	105	106	100
Administrative	NA	NA	NA	NA	79	62	49	48	92	100	105	106	105
Survey	NA	NA	84	NA	NA	NA	NA	65	NA	75	NA	NA	NA

Liberia - DTP3



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	50	46	42	39	35	31	60	60	60	64	64
Reported	NA	NA	23	48	62	51	38	31	87	88	88	92	92
Official	NA	NA	23	48	62	51	38	31	87	88	88	92	92
Administrative	NA	NA	23	48	62	51	38	31	87	88	88	92	93
Survey	NA	NA	50	NA	NA	NA	NA	33	NA	60	NA	NA	NA

Description:

1999: Estimate based on survey results. Reported data (23 percent) not consistent with survey results (50 percent). Survey results of 64 percent with sample size 89 ignored; sample size less than 300. Survey results (44 percent) adjusted for recall bias to 50 percent based on first dose card or history coverage (84 percent) and documented drop-out between first (50 percent) and third (30 percent) doses.

2000: Estimate interpolated between 1999 and 2004 estimates.

2001: Estimate interpolated between 1999 and 2004 estimates. 2001 reported data (62 percent) inconsistent with data from other years.

2002: Estimate interpolated between 1999 and 2004 estimates.

2003: Estimate interpolated between 1999 and 2004 estimates.

2004: Estimate based on reported data (31 percent) confirmed by survey (33 percent). Survey results (27 percent) adjusted for recall bias to 33 percent based on first dose card or history coverage (65 percent) and documented drop-out between first (35 percent) and third (18 percent) doses.

2005: The results of the 2006 survey are presumed to reflect accurately the coverage levels following the 2005 outreach activities. During 2005 Liberia carried out six multi-antigen immunization outreach activities.

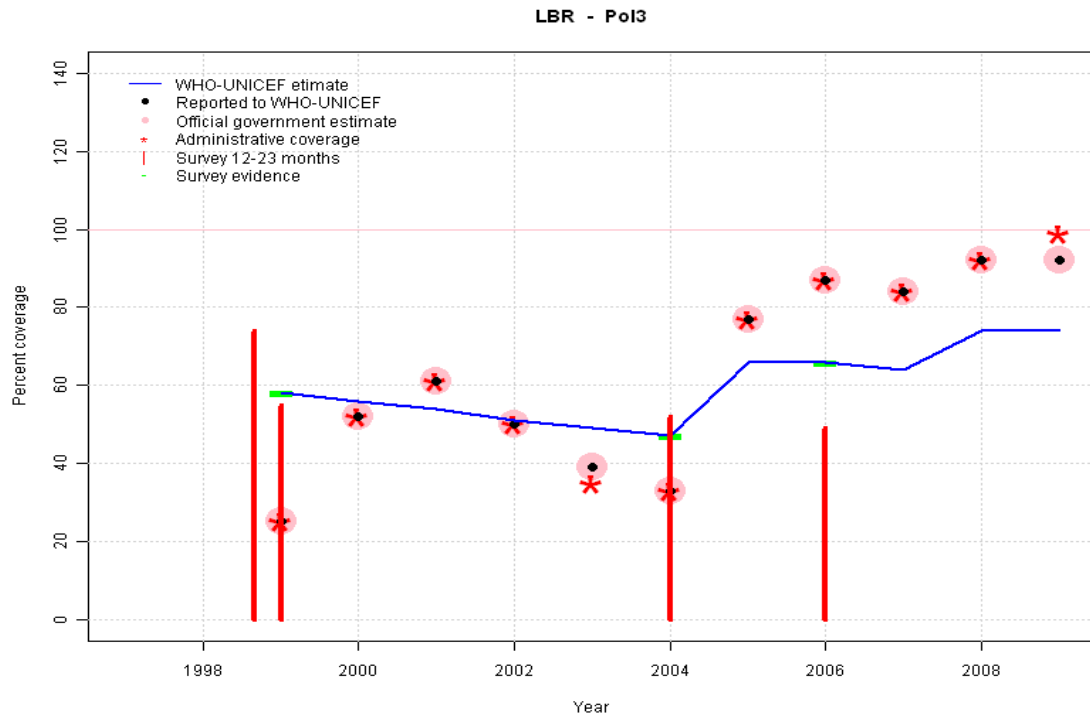
2006: Estimate based on survey results. Reported data (88 percent) not consistent with survey results (60 percent). Survey results (50 percent) adjusted for recall bias to 60 percent based on first dose card or history coverage (75 percent) and documented drop-out between first (46 percent) and third (37 percent) doses.

2007: Reported data (88 percent) calibrated to 2006 and 2008 levels.

2008:

2009: Reported data (92 percent) calibrated to 2008 level (64 percent).

Liberia - Pol3



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	58	56	54	51	49	47	66	66	64	74	74
Reported	NA	NA	25	52	61	50	39	33	77	87	84	92	92
Official	NA	NA	25	52	61	50	39	33	77	87	84	92	92
Administrative	NA	NA	25	52	61	50	35	33	77	87	84	92	99
Survey	NA	NA	58	NA	NA	NA	NA	47	NA	66	NA	NA	NA

Description:

1999: Estimate based on survey results. Reported data (25 percent) not consistent with survey results (58 percent). Survey results of 74 percent with sample size 89 ignored; sample size less than 300. Survey results (55 percent) adjusted for recall bias to 58 percent based on first dose card or history coverage (94 percent) and documented drop-out between first (50 percent) and third (31 percent) doses.

2000: Estimate interpolated between 1999 and 2004 estimates.

2001: Estimate interpolated between 1999 and 2004 estimates.

2002: Estimate interpolated between 1999 and 2004 estimates.

2003: Estimate interpolated between 1999 and 2004 estimates.

2004: Estimate based on survey results. Reported data (33 percent) not consistent with survey results (47 percent). Survey results (52 percent) adjusted for recall bias to 47 percent based on first dose card or history coverage (89 percent) and documented drop-out between first (34 percent) and third (18 percent) doses.

2005: The results of the 2006 survey are presumed to reflect accurately the coverage levels following the 2005 outreach activities. During 2005 Liberia carried out six multi-antigen immunization outreach activities.

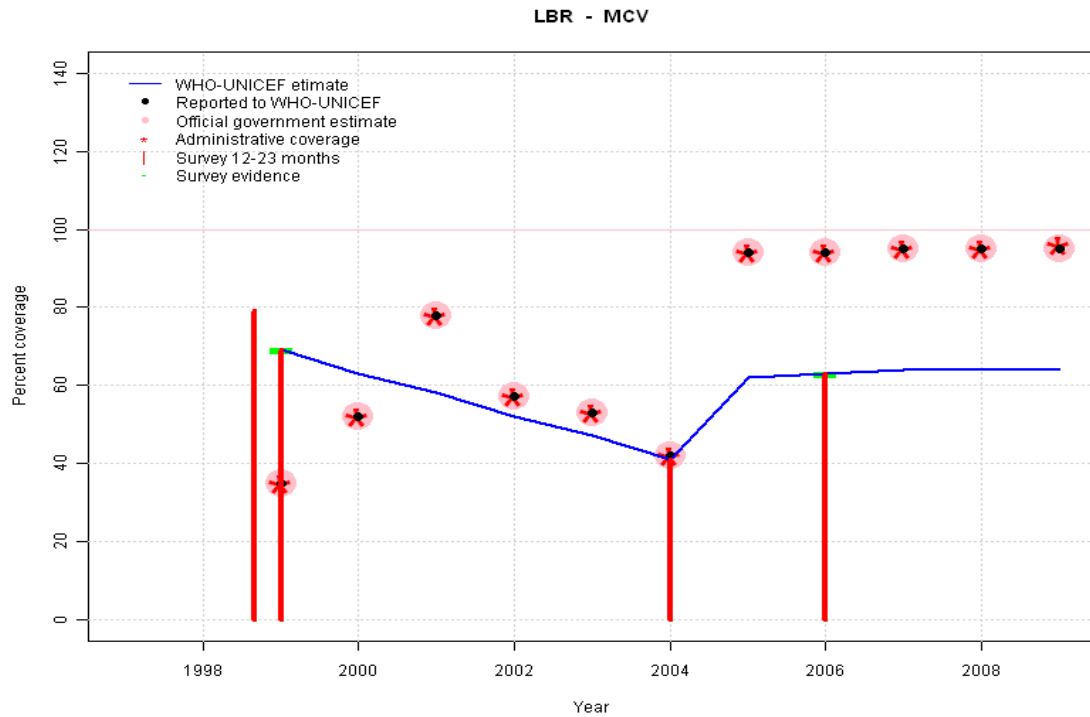
2006: Estimate based on survey results. Reported data (87 percent) not consistent with survey results (66 percent). Survey results (49 percent) adjusted for recall bias to 66 percent based on first dose card or history coverage (83 percent) and documented drop-out between first (45 percent) and third (36 percent) doses.

2007: Reported data (84 percent) calibrated to 2006 and 2008 levels.

2008:

2009: Reported data (92 percent) calibrated to 2008 level (74 percent).

Liberia - MCV

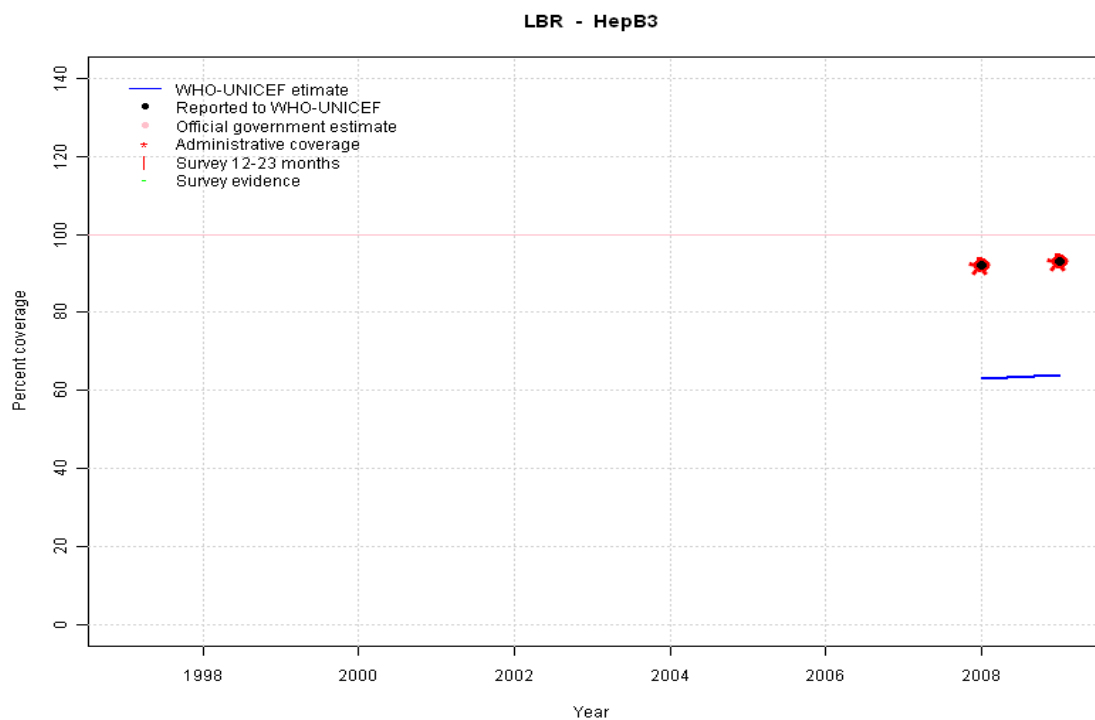


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	69	63	58	52	47	41	62	63	64	64	64
Reported	NA	NA	35	52	78	57	53	42	94	94	95	95	95
Official	NA	NA	35	52	78	57	53	42	94	94	95	95	95
Administrative	NA	NA	35	52	78	57	53	42	94	94	95	95	96
Survey	NA	NA	69	NA	NA	NA	NA	41	NA	63	NA	NA	NA

Description:

- 1999: Estimate based on survey results. Reported data (35 percent) not consistent with survey results (69 percent). Survey results of 79 percent with sample size 89 ignored; sample size less than 300.
- 2000: Estimate interpolated between 1999 and 2004 estimates.
- 2001: Estimate interpolated between 1999 and 2004 estimates. 2001 reported data (78 percent) inconsistent with data from other years.
- 2002: Estimate interpolated between 1999 and 2004 estimates.
- 2003: Estimate interpolated between 1999 and 2004 estimates.
- 2004: Estimate based on survey results. Reported data (74 percent) not consistent with survey results (41 percent). 2004 reported data (42 percent) inconsistent with data from other years.
- 2005: Reported data (94 percent) calibrated to 2004 and 2006 levels. During 2005 Liberia carried out six multi-antigen immunization outreach activities.
- 2006: Estimate based on survey results. Reported data (94 percent) not consistent with survey results (63 percent).
- 2007: Reported data (95 percent) calibrated to 2006 level (63 percent).
- 2008: Reported data (95 percent) calibrated to 2006 level (63 percent).
- 2009: Reported data (95 percent) calibrated to 2006 level (63 percent).

Liberia - HepB3



Description:

2008: Estimate calibrated to 2009 level (64 percent) and reported coverage (92 percent). HepB introduced in 2008 Vaccine presentation is DTP-HepB-Hib.

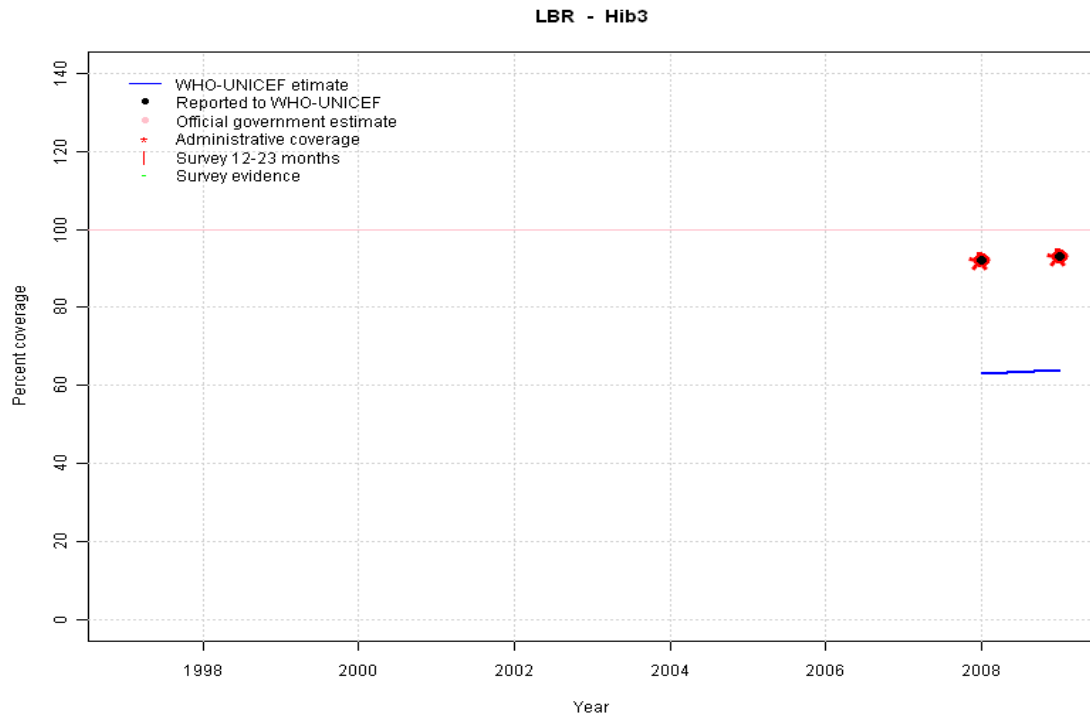
2009: Estimate follows the DTP3 levels of coverage.

	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	63	64
Reported	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	92	93
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	92	93
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Liberia - Hib3

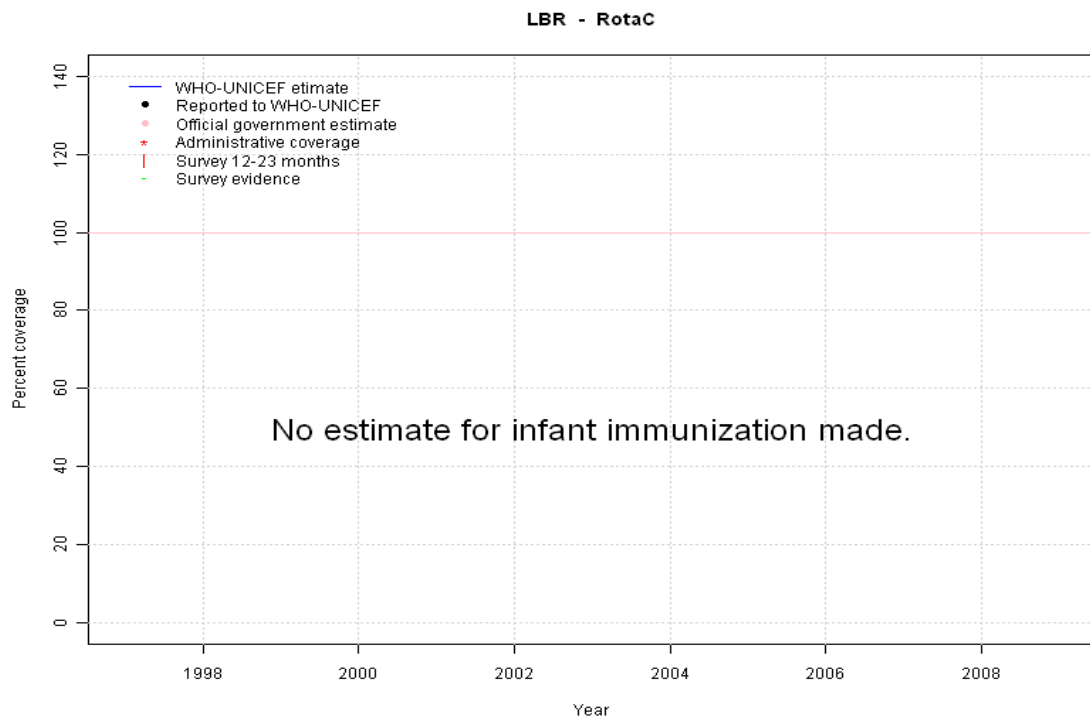
Description:

2008: Estimate calibrated to 2009 level (64 percent) and reported coverage (92 percent). Hib introduced in 2008 Vaccine presentation is DTP-HepB-Hib.
 2009: Estimate follows the DTP3 levels of coverage.



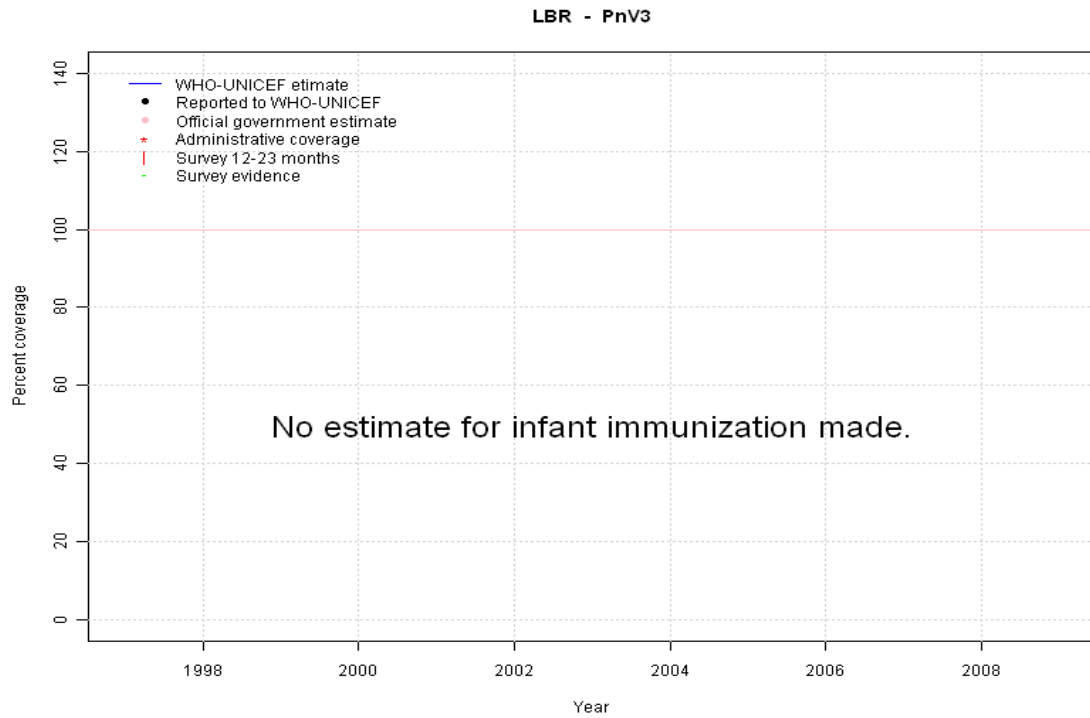
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63	64
Reported	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	92	93
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	92	93
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Liberia - RotaC



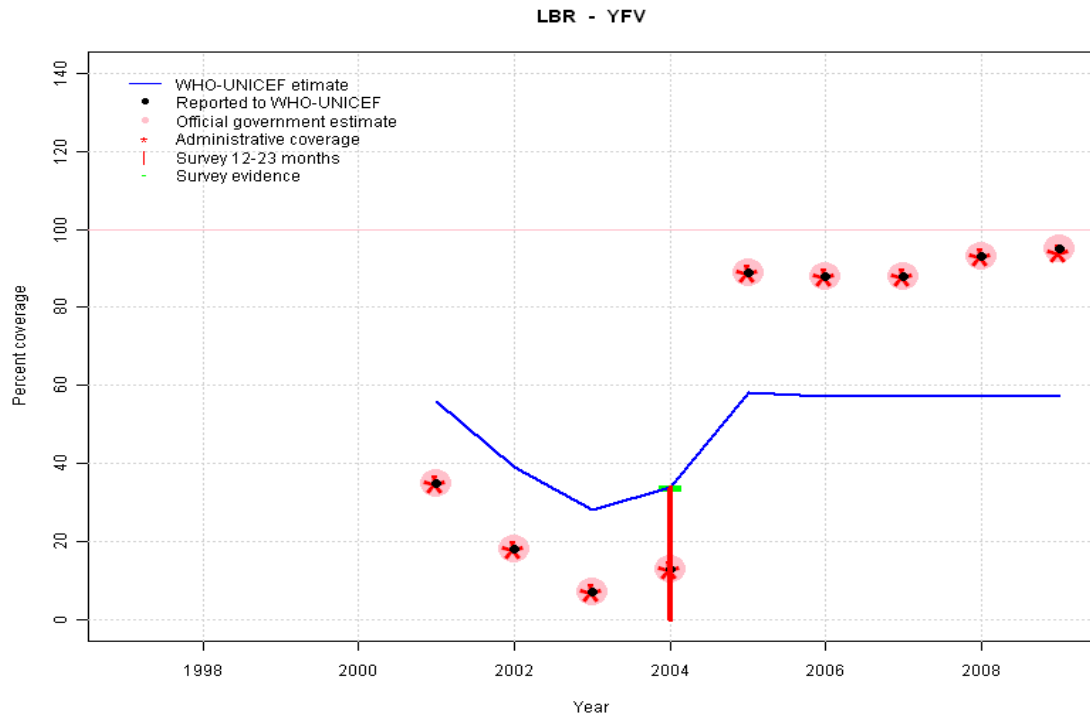
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Reported	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Official	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Administrative	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Survey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA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

Liberia - 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

Liberia - YFV



Description:

- 2001: Estimate assigned by working group. Estimate is calibrated from reported data using adjustment factor of 0.21, based on the 2005 survey. YFV introduced in 2001
- 2002: Estimate assigned by working group. Estimate is calibrated from reported data using adjustment factor of 0.21, based on the 2005 survey.
- 2003: Estimate assigned by working group. Estimate is calibrated from reported data using adjustment factor of 0.21, based on the 2005 survey.
- 2004: Estimate assigned by working group. Estimate is calibrated from reported data using adjustment factor of 0.21, based on the 2005 survey.
- 2005: Estimate assigned by working group. Estimates from 2005 onward are based on the calibration factor applied to MCV coverage levels (-0.31). During 2005 Liberia carried out six multi-antigen immunization outreach activities.
- 2006: Estimates from 2005 onward are based on the calibration factor applied to MCV coverage levels (-0.31).
- 2007: Estimate extrapolated from 2006 level (57 percent).
- 2008: Estimate extrapolated from 2006 level (57 percent).
- 2009: Estimate extrapolated from 2006 level (57 percent).

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estimate	NA	NA	NA	NA	56	39	28	34	58	57	57	57	57
Reported	NA	NA	NA	NA	35	18	7	13	89	88	88	93	95
Official	NA	NA	NA	NA	35	18	7	13	89	88	88	93	95
Administrative	NA	NA	NA	NA	35	18	7	13	89	88	88	93	94
Survey	NA	NA	NA	NA	NA	NA	NA	34	NA	NA	NA	NA	NA

Liberia - survey details

2006 Liberia Demographic and Health Survey 2007

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	C or H <12 months	76	12-23 m	977	NA
BCG	Card	47	12-23 m	977	NA
BCG	Card or History	77	12-23 m	977	NA
BCG	History	30	12-23 m	977	NA
DTP1	C or H <12 months	75	12-23 m	977	NA
DTP1	Card	46	12-23 m	977	NA
DTP1	Card or History	75	12-23 m	977	NA
DTP1	History	29	12-23 m	977	NA
DTP3	Card or History	50	12-23 m	977	NA
DTP3	Card	37	12-23 m	977	NA
DTP3	History	13	12-23 m	977	NA
DTP3	C or H <12 months	47	12-23 m	977	NA
MCV	Card	38	12-23 m	977	NA
MCV	Card or History	63	12-23 m	977	NA
MCV	History	25	12-23 m	977	NA
MCV	C or H <12 months	53	12-23 m	977	NA
Pol1	Card	45	12-23 m	977	NA
Pol1	Card or History	83	12-23 m	977	NA
Pol1	C or H <12 months	82	12-23 m	977	NA
Pol1	History	38	12-23 m	977	NA
Pol3	History	13	12-23 m	977	NA
Pol3	C or H <12 months	47	12-23 m	977	NA
Pol3	Card	36	12-23 m	977	NA
Pol3	Card or History	49	12-23 m	977	NA

2004 Liberia 2005 EPI Cluster Survey

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card	58	12-23 m	2907	NA
BCG	Card or history	69	12-23 m	2907	NA
DTP1	Card or history	65	12-23 m	2907	NA
DTP1	Card	35	12-23 m	2907	NA
DTP3	Card or history	27	12-23 m	2907	NA
DTP3	Card	18	12-23 m	2907	NA
MCV	Card or history	41	12-23 m	2907	NA

MCV	Card	25	12-23 m	2907	NA
Pol1	Card	34	12-23 m	2907	NA
Pol1	Card or history	89	12-23 m	2907	NA
Pol3	Card	18	12-23 m	2907	NA
Pol3	Card or history	52	12-23 m	2907	NA
YFV	Card	18	12-23 m	2907	NA
YFV	Card or history	34	12-23 m	2907	NA

1999 IMCI Household Baseline, Preliminary Report, 2000

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card or History	86	12-23 m	89	NA
DTP1	Card or History	91	12-23 m	89	NA
DTP3	Card or History	64	12-23 m	89	NA
MCV	Card or History	79	12-23 m	89	NA
Pol1	Card or History	94	12-23 m	89	NA
Pol3	Card or History	74	12-23 m	89	NA

1999 Liberia National Nutrition Survey 1999-2000, 2001

Vaccine	Confirmation method	Coverage	Age cohort	Sample	Cards seen
BCG	Card	50	12-23 m	1000	NA
BCG	Card or History	82	12-23 m	1000	NA
BCG	History	33	12-23 m	1000	NA
BCG	C or H <12 months	73	12-23 m	1000	NA
DTP1	Card	50	12-23 m	1000	NA
DTP1	C or H <12 months	74	12-23 m	1000	NA
DTP1	History	34	12-23 m	1000	NA
DTP1	Card or History	84	12-23 m	1000	NA
DTP3	History	14	12-23 m	1000	NA
DTP3	Card or History	44	12-23 m	1000	NA
DTP3	Card	30	12-23 m	1000	NA
DTP3	C or H <12 months	38	12-23 m	1000	NA
MCV	Card or History	69	12-23 m	1000	NA
MCV	Card	39	12-23 m	1000	NA
MCV	History	30	12-23 m	1000	NA
MCV	C or H <12 months	50	12-23 m	1000	NA

Liberia - survey details

Pol1	C or H <12 months	84	12-23 m	1000	NA	Pol3	Card	31	12-23 m	1000	NA
Pol1	Card	50	12-23 m	1000	NA	Pol3	Card or History	55	12-23 m	1000	NA
Pol1	Card or History	94	12-23 m	1000	NA	Pol3	History	24	12-23 m	1000	NA
Pol1	History	44	12-23 m	1000	NA						
Pol3	C or H <12 months	48	12-23 m	1000	NA						

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

Liberia

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	60
1998	56
1999	44
2000	51
2001	59
2002	64
2003	56
2004	59
2005	60
2006	73
2007	90
2008	91
2009	91

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.