# Bhutan: WHO and UNICEF estimates of immunization coverage: 2014 revision



BCG

DTP1

DTP3

Pol3

MCV1

HepB3

Hib3

RotaC

No estimate for infant immunization made.
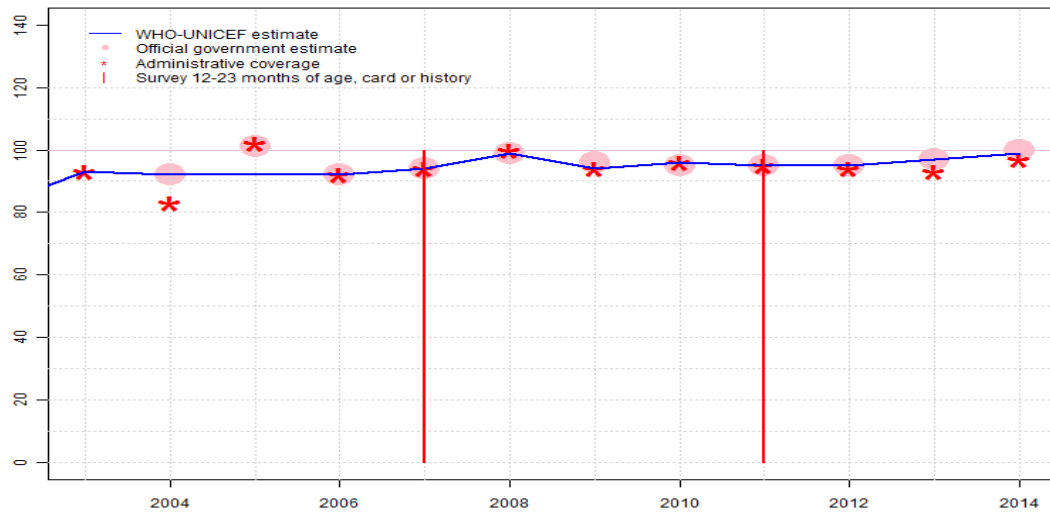
PcV3

No estimate for infant immunization made.

# Bhutan - BCG



| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | 93 | 92 | 92 | 92 | 94 | 99 | 94 | 96 | 95 | 95 | 97 | 99 |
| Estimate GoC | ●● | ●● | ●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ● |
| Official | NA | 92 | 101 | 92 | 94 | 99 | 96 | 95 | 95 | 95 | 97 | 100 |
| Administrative | 93 | 83 | 102 | 92 | 94 | 100 | 94 | 96 | 95 | 94 | 93 | 97 |
| Survey | NA | NA | NA | NA | 100 | NA | NA | NA | 100 | NA | NA | NA |

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The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.
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●●● Estimate is supported by reported data [R+], coverage recalculated with an independent
    denominator from the World Population Prospects: 2012 revision from the UN Popula-
    tion Division (D+), and at least one supporting survey within 2 years [S+]. While well
    supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source,
    [R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-];
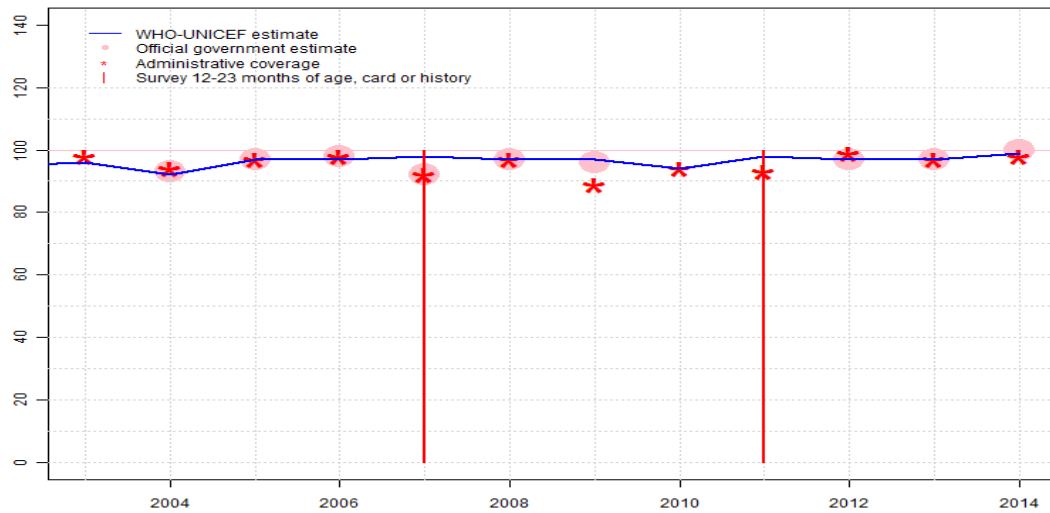    challenge the estimate.

```
In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.
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## Description:

2003: Estimate based on reported administrative data. GoC=R+ D+

2004: Estimate based on coverage reported by national government. GoC=R+ D+

2005: Estimate based on interpolation between coverage reported by national government. Reported data excluded. 101 percent greater than 100 percent. GoC=S+ D+

2006: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 100 percent based on 1 survey(s). GoC=R+ S+ D+

2008: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2009: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2010: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 100 percent based on 1 survey(s). GoC=R+ S+ D+

2012: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2014: Estimate based on coverage reported by national government. Programme reports that official government estimate is based in part on the 2012 National Health Survey. Estimate challenged by: D-

# Bhutan - DTP1



BTN - DTP1

Legend:
- WHO-UNICEF estimate
- Official government estimate
- * Administrative coverage
- | Survey 12-23 months of age, card or history

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | 96 | 92 | 97 | 97 | 98 | 97 | 97 | 94 | 98 | 97 | 97 | 99 |
| Estimate GoC | • | •• | •• | •• | • | ••• | • | ••• | • | ••• | ••• | • |
| Official | NA | 93 | 97 | 98 | 92 | 97 | 96 | NA | NA | 97 | 97 | 100 |
| Administrative | 98 | 94 | 97 | 98 | 92 | 97 | 89 | 94 | 93 | 99 | 97 | 98 |
| Survey | NA | NA | NA | NA | 100 | NA | NA | NA | 100 | NA | NA | NA |

```
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.
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••• Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

•• Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

• There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.
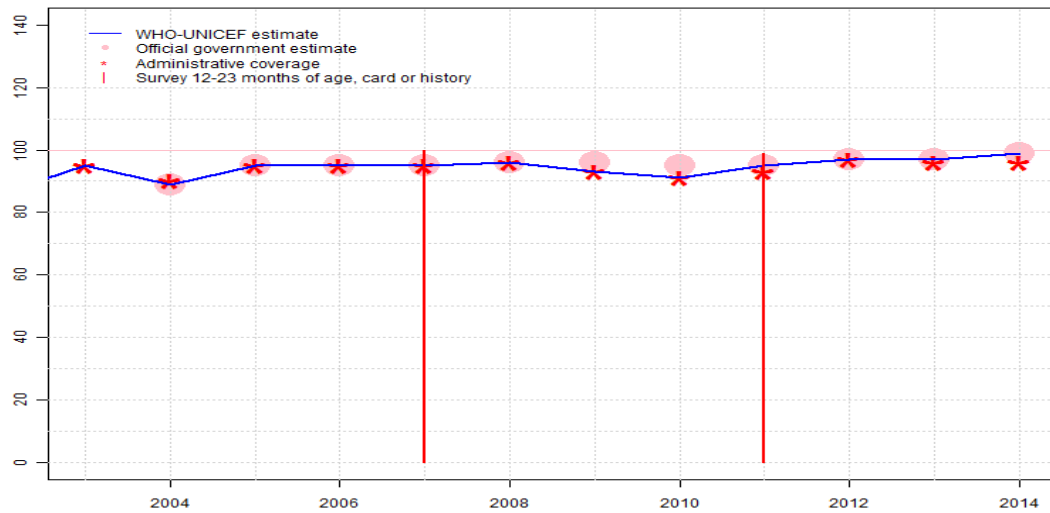
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In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.
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Description:

2003: Reported data calibrated to 1997 and 2007 levels. GoC=No accepted empirical data

2004: Reported data calibrated to 1997 and 2007 levels. GoC=D+

2005: Reported data calibrated to 1997 and 2007 levels. GoC=S+ D+

2006: Reported data calibrated to 1997 and 2007 levels. GoC=S+ D+

2007: DTP1 coverage estimated based on DTP3 coverage of 95. Estimate challenged by: D-R-

2008: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2009: DTP1 coverage estimated based on DTP3 coverage of 93. DTP-HepB-Hib combination introduced in 2009 and withdrawn following an adverse event and replaced with DTP-HepB combination vaccine. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. Estimate challenged by: R-

2010: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2011: DTP1 coverage estimated based on DTP3 coverage of 95. DTP-HepB-Hib combination vaccine re-introduced in July 2011. Estimate challenged by: R-

2012: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2014: Estimate based on coverage reported by national government. Programme reports that official government estimate is based in part on the 2012 National Health Survey. Estimate challenged by: D-

# Bhutan - DTP3



BTN - DTP3

- —— WHO-UNICEF estimate
- ● Official government estimate
- * Administrative coverage
- | Survey 12-23 months of age, card or history

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | 95 | 89 | 95 | 95 | 95 | 96 | 93 | 91 | 95 | 97 | 97 | 99 |
| Estimate GoC | ●● | ●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ● |
| Official | NA | 89 | 95 | 95 | 95 | 96 | 96 | 95 | 95 | 97 | 97 | 99 |
| Administrative | 95 | 90 | 95 | 95 | 95 | 96 | 93 | 91 | 93 | 97 | 96 | 96 |
| Survey | NA | NA | NA | NA | 100 | NA | NA | NA | 99 | NA | NA | NA |

The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

●●● Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.
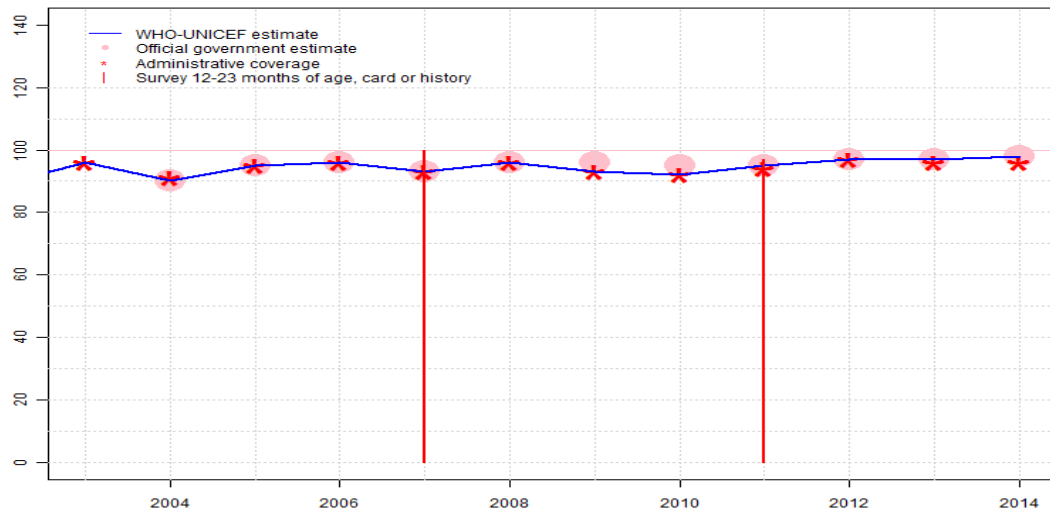
In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

## Description:

2003: Estimate based on reported administrative data. GoC=R+

2004: Estimate based on coverage reported by national government. GoC=R+ D+

2005: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2006: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). The National EPI Coverage Survey, 2009 card or history results of 100 percent modifed for recall bias to 99 percent based on 1st dose card or history coverage of 100 percent, 1st dose card only coverage of 97 percent and 3d dose card only coverage of 97 percent. GoC=R+ S+ D+

2008: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2009: Estimate based on reported administrative data. DTP-HepB-Hib combination introduced in 2009 and withdrawn following an adverse event and replaced with DTP-HepB combination vaccine. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2010: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). DTP-HepB-Hib combination vaccine re-introduced in July 2011. GoC=R+ S+ D+

2012: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2014: Estimate based on coverage reported by national government. Programme reports that official government estimate is based in part on the 2012 National Health Survey. Estimate challenged by: D-

BTN - Pol3

Legend:
- WHO-UNICEF estimate
- Official government estimate
- * Administrative coverage
- | Survey 12-23 months of age, card or history

|  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | 96 | 90 | 95 | 96 | 93 | 96 | 93 | 92 | 95 | 97 | 97 | 98 |
| Estimate GoC | •• | •• | ••• | ••• | ••• | ••• | ••• | ••• | ••• | ••• | ••• | • |
| Official | NA | 90 | 95 | 96 | 93 | 96 | 96 | 95 | 95 | 97 | 97 | 98 |
| Administrative | 96 | 91 | 95 | 96 | 93 | 96 | 93 | 92 | 94 | 97 | 97 | 96 |
| Survey | NA | NA | NA | NA | 100 | NA | NA | NA | 97 | NA | NA | NA |

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The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.
```

••• Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

•• Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

• There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.
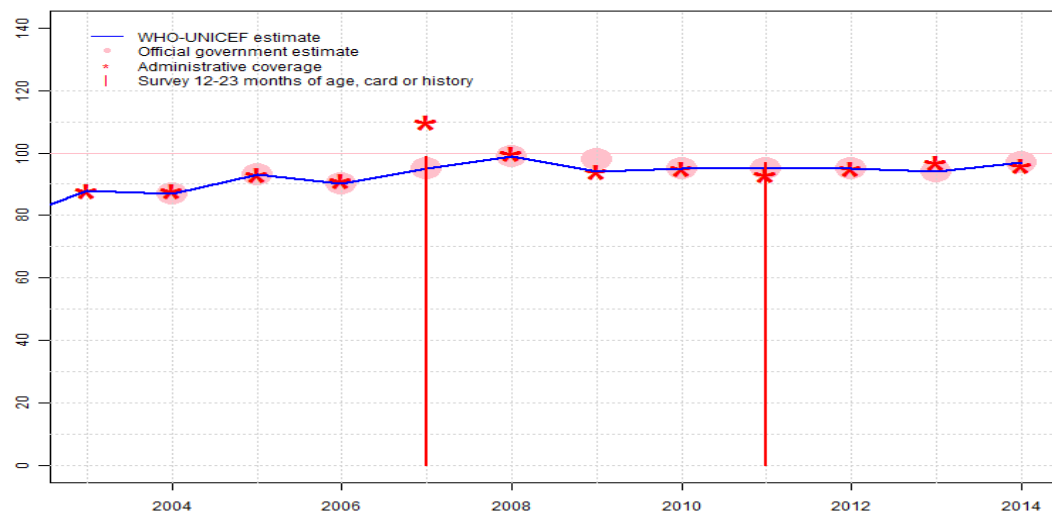
```
In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.
```

## Description:

2003: Estimate based on reported administrative data. GoC=R+ D+

2004: Estimate based on coverage reported by national government. GoC=R+ D+

2005: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2006: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). The National EPI Coverage Survey, 2009 card or history results of 100 percent modifed for recall bias to 99 percent based on 1st dose card or history coverage of 100 percent, 1st dose card only coverage of 97 percent and 3d dose card only coverage of 97 percent. GoC=R+ S+ D+

2008: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2009: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2010: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 97 percent based on 1 survey(s). GoC=R+ S+ D+

2012: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2014: Estimate based on coverage reported by national government. Programme reports that official government estimate is based in part on the 2012 National Health Survey. Estimate challenged by: D-

# Bhutan - MCV1



**BTN - MCV1**

Legend:
- — WHO-UNICEF estimate
- ● Official government estimate
- \* Administrative coverage
- | Survey 12-23 months of age, card or history

|  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | 88 | 87 | 93 | 90 | 95 | 99 | 94 | 95 | 95 | 95 | 94 | 97 |
| Estimate GoC | ●● | ●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ● |
| Official | NA | 87 | 93 | 90 | 95 | 99 | 98 | 95 | 95 | 95 | 94 | 97 |
| Administrative | 88 | 88 | 93 | 91 | 110 | 100 | 94 | 95 | 93 | 95 | 97 | 96 |
| Survey | NA | NA | NA | NA | 99 | NA | NA | NA | 97 | NA | NA | NA |

```
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.
```

●●● Estimate is supported by reported data [R+], coverage recalculated with an independent
denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.
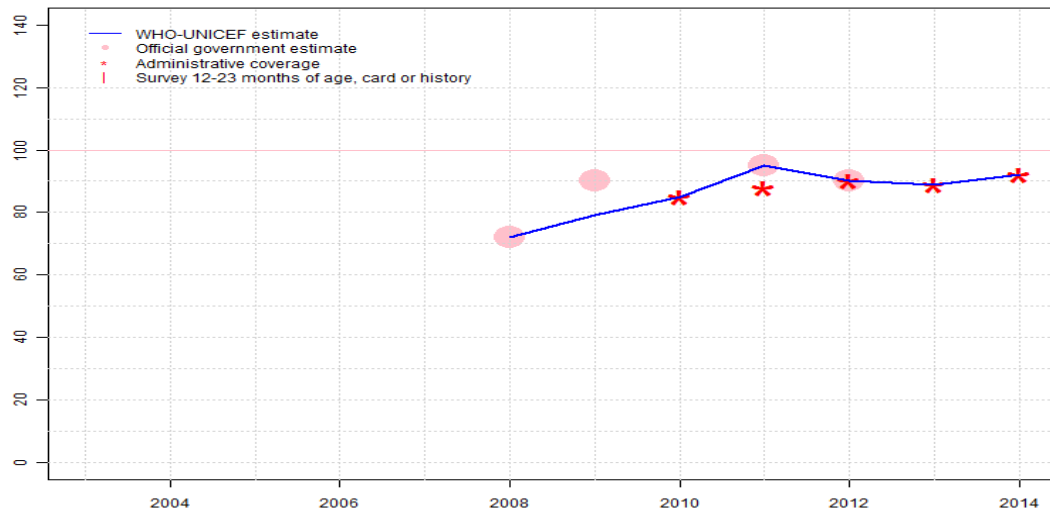
```
In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.
```

## Description:

2003: Estimate based on reported administrative data. GoC=R+ D+

2004: Estimate based on coverage reported by national government. GoC=R+ D+

2005: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2006: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). GoC=R+ S+ D+

2008: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2009: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2010: Estimate based on reported administrative data. Ministry of Health reports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 97 percent based on 1 survey(s). GoC=R+ S+ D+

2012: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2014: Estimate based on coverage reported by national government. Programme reports that official government estimate is based in part on the 2012 National Health Survey. Estimate challenged by: D-

# Bhutan - MCV2



BTN - MCV2

- —— WHO-UNICEF estimate
- ● Official government estimate
- * Administrative coverage
- | Survey 12-23 months of age, card or history

|  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | NA | NA | NA | NA | NA | 72 | 79 | 85 | 95 | 90 | 89 | 92 |
| Estimate GoC | NA | NA | NA | NA | NA | ●● | ● | ●● | ●● | ●● | ●● | ●● |
| Official | NA | NA | NA | NA | NA | 72 | 90 | NA | 95 | 90 | NA | NA |
| Administrative | NA | NA | NA | NA | NA | NA | NA | 85 | 88 | 90 | 89 | 92 |
| Survey | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.

●●● Estimate is supported by reported data [R+], coverage recalculated with an independent
denominator from the World Population Prospects: 2012 revision from the UN Popula-
tion Division (D+), and at least one supporting survey within 2 years [S+]. While well
supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source,
[R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-];
challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light
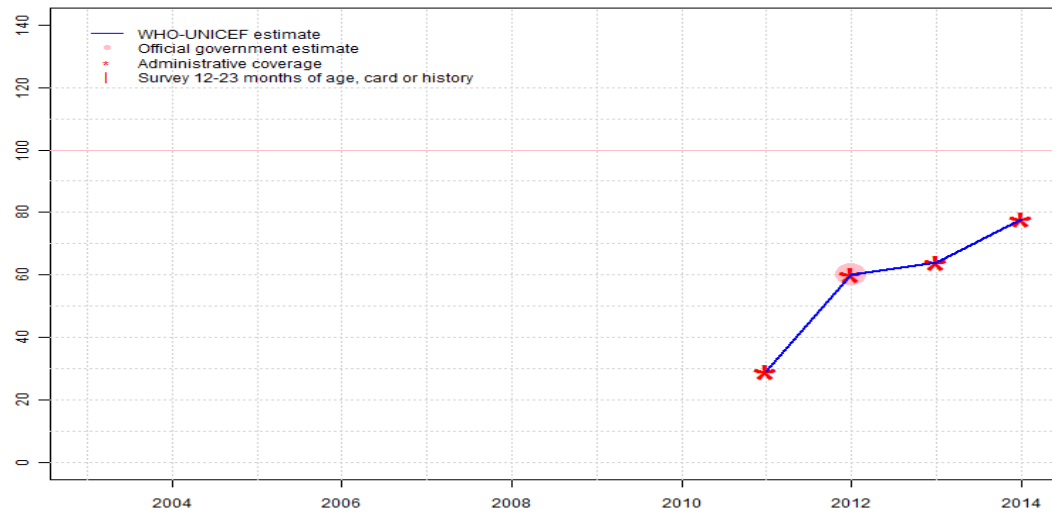of the objective for which they are being used.

## Description:

Coverage estimates for the second dose of measles containing vaccine are for chil-
dren by the nationally recommended age.

2008: Estimate based on coverage reported by national government. GoC=R+

2009: Estimate based on interpolation between reported values. Ministry of Health
reports targets set in their 2008-2013 national comprehensive multi-year
plan for immunization as their estimate of coverage levels achieved. Es-
timates based on administrative coverage. GoC=No accepted empirical
data

2010: Estimate based on reported administrative estimate. Ministry of Health re-
ports targets set in their 2008-2013 national comprehensive multi-year plan
for immunization as their estimate of coverage levels achieved. Estimates
based on administrative coverage. GoC=R+ D+

2011: Estimate based on coverage reported by national government. GoC=R+
D+

2012: Estimate based on coverage reported by national government. GoC=R+
D+

2013: Estimate based on reported administrative estimate. GoC=R+ D+

2014: Estimate based on reported administrative estimate. Programme reports
that official government estimate is based in part on the 2012 National
Health Survey. GoC=R+ D+

# Bhutan - HepBB



BTN - HepBB

Legend:
- WHO-UNICEF estimate
- Official government estimate
- Administrative coverage
- Survey 12-23 months of age, card or history

**Description:**

2011: Estimate based on reported administrative estimate. GoC=R+ D+

2012: Estimate based on coverage reported by national government. GoC=R+ D+

2013: Estimate based on reported administrative estimate. GoC=R+ D+

2014: Estimate based on reported administrative estimate. Programme reports that official government estimate is based in part on the 2012 National Health Survey. Estimate is based on reported data consistent with other vaccines. GoC=R+ D+

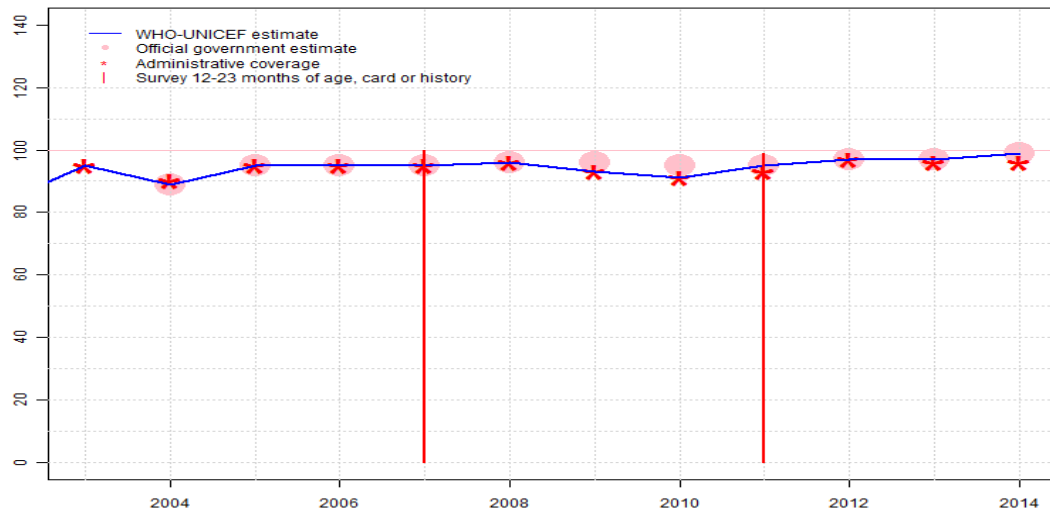| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | NA | NA | NA | NA | NA | NA | NA | NA | 29 | 60 | 64 | 78 |
| Estimate GoC | NA | NA | NA | NA | NA | NA | NA | NA | ●● | ●● | ●● | ●● |
| Official | NA | NA | NA | NA | NA | NA | NA | NA | NA | 60 | NA | NA |
| Administrative | NA | NA | NA | NA | NA | NA | NA | NA | 29 | 60 | 64 | 78 |
| Survey | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.

●●● Estimate is supported by reported data [R+], coverage recalculated with an independent
denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well
supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source,
[R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-];
challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.

# Bhutan - HepB3



BTN - HepB3

Legend:
- WHO-UNICEF estimate
- Official government estimate
- * Administrative coverage
- | Survey 12-23 months of age, card or history

|  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | 95 | 89 | 95 | 95 | 95 | 96 | 93 | 91 | 95 | 97 | 97 | 99 |
| Estimate GoC | ●● | ●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ●●● | ● |
| Official | NA | 89 | 95 | 95 | 95 | 96 | 96 | 95 | 95 | 97 | 97 | 99 |
| Administrative | 95 | 90 | 95 | 95 | 95 | 96 | 93 | 91 | 93 | 97 | 96 | 96 |
| Survey | NA | NA | NA | NA | 100 | NA | NA | NA | 99 | NA | NA | NA |

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The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.
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●●● Estimate is supported by reported data [R+], coverage recalculated with an independent
denominator from the World Population Prospects: 2012 revision from the UN Popula-
tion Division (D+), and at least one supporting survey within 2 years [S+]. While well
supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source,
[R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-];
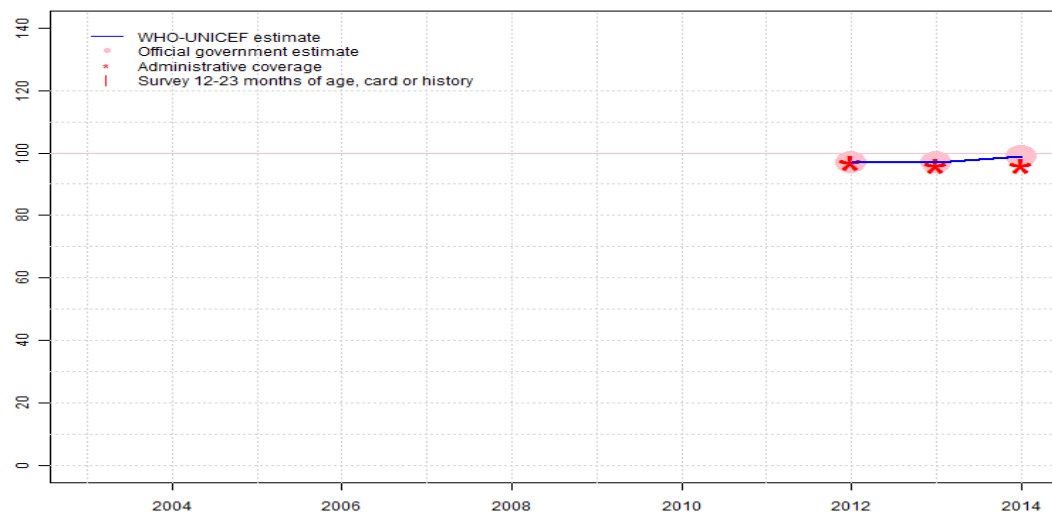challenge the estimate.

```
In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.
```

## Description:

2003: Estimate based on reported administrative data. GoC=R+

2004: Estimate based on coverage reported by national government. GoC=R+ D+

2005: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2006: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2007: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). The National EPI Coverage Survey, 2009 card or history results of 100 percent modifed for recall bias to 99 percent based on 1st dose card or history coverage of 100 percent, 1st dose card only coverage of 97 percent and 3d dose card only coverage of 97 percent. GoC=R+ S+ D+

2008: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2009: Estimate based on reported administrative data. DTP-HepB-Hib combi-nation introduced in 2009 and withdrawn following an adverse event and replaced with DTP-HepB combination vaccine. Ministry of Health re-ports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2010: Estimate based on reported administrative data. Ministry of Health re-ports targets set in their 2008-2013 national comprehensive multi-year plan for immunization as their estimate of coverage levels achieved. Estimates based on administrative coverage. GoC=R+ S+ D+

2011: Estimate based on coverage reported by national government supported by survey. Survey evidence of 99 percent based on 1 survey(s). DTP-HepB-Hib combination vaccine re-introduced in July 2011. GoC=R+ S+ D+

2012: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ S+ D+

2014: Estimate based on coverage reported by national government. Programme reports that official government estimate is based in part on the 2012 Na-tional Health Survey. Estimate challenged by: D-

BTN - Hib3

WHO-UNICEF estimate
Official government estimate
* Administrative coverage
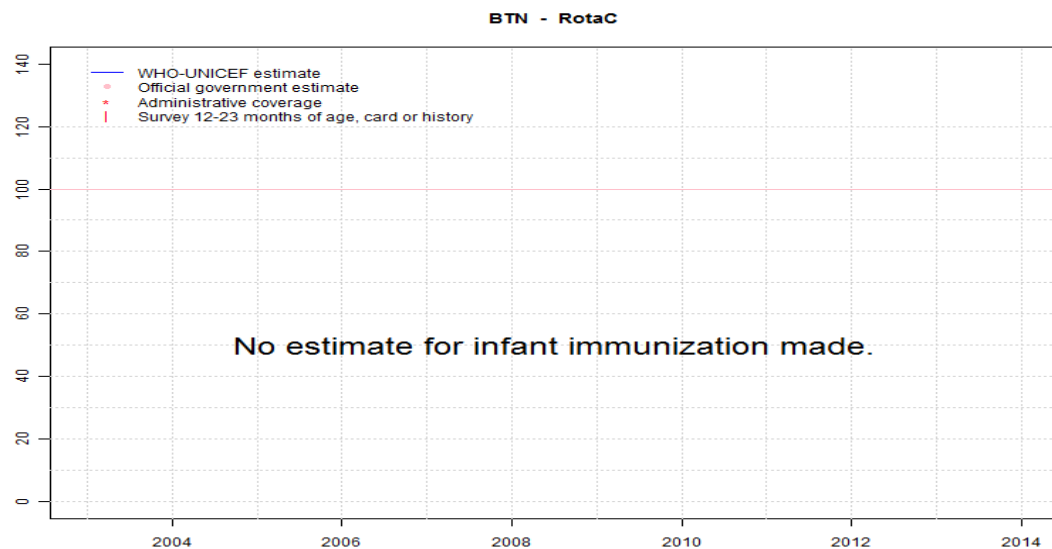| Survey 12-23 months of age, card or history

**Description:**

2012: Estimate based on coverage reported by national government. DTP-HepB-Hib combination vaccine re-introduced in July 2011. Reporting began in 2012. GoC=R+ D+

2013: Estimate based on coverage reported by national government. GoC=R+ D+

2014: Estimate based on coverage reported by national government. Programme reports that official government estimate is based in part on the 2012 National Health Survey. Estimate challenged by: D-

|  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | NA | NA | NA | NA | NA | NA | NA | NA | NA | 97 | 97 | 99 |
| Estimate GoC | NA | NA | NA | NA | NA | NA | NA | NA | NA | •• | •• | • |
| Official | NA | NA | NA | NA | NA | NA | NA | NA | NA | 97 | 97 | 99 |
| Administrative | NA | NA | NA | NA | NA | NA | NA | NA | NA | 97 | 96 | 96 |
| Survey | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information that are of varying, and, in some instances, unknown quality. Beginning with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

••• Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.

•• Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.

• There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.
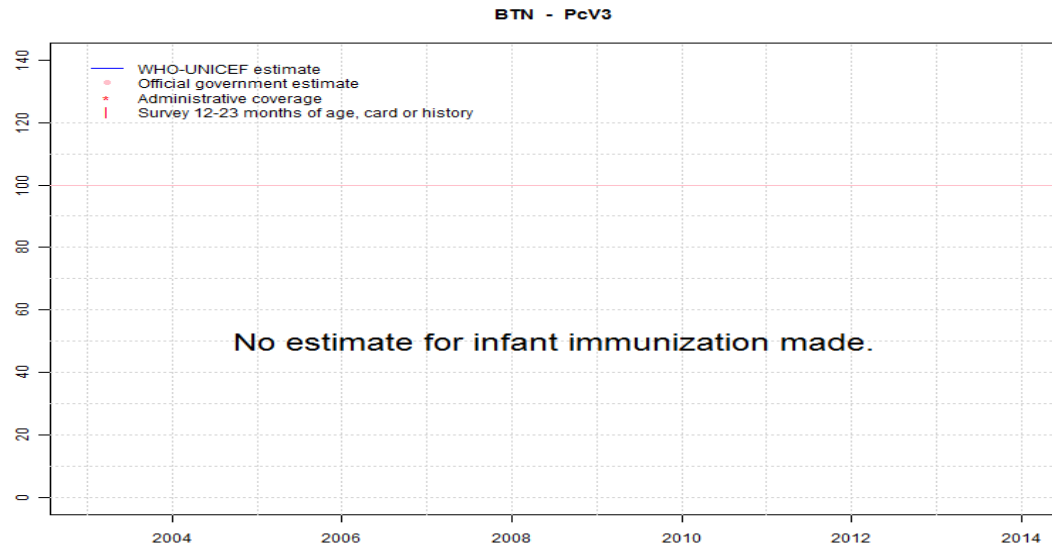
BTN - RotaC



| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Estimate GoC | 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 |
| Administrative | 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 |

```
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.
```

●●● Estimate is supported by reported data [R+], coverage recalculated with an independent
denominator from the World Population Prospects: 2012 revision from the UN Popula-
tion Division (D+), and at least one supporting survey within 2 years [S+]. While well
supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source,
[R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-];
challenge the estimate.

```
In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.
```

# Bhutan - PcV3

**BTN - PcV3**



| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimate | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Estimate GoC | 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 |
| Administrative | 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 |

```
The WHO and UNICEF estimates of national immunization coverage (wuenic) are based on data and information
that are of varying, and, in some instances, unknown quality.  Beginning with the 2011 revision we describe
the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon
which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence
intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around
the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is
not a judgment of the quality of data reported by national authorities.
```

●●● Estimate is supported by reported data [R+], coverage recalculated with an independent
denominator from the World Population Prospects: 2012 revision from the UN Popula-
tion Division (D+), and at least one supporting survey within 2 years [S+]. While well
supported, the estimate still carries a risk of being wrong.

●● Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source,
[R-], [D-], or [S-], challenges the estimate.

● There are no directly supporting data; or data from at least one source; [R-], [D-], [S-];
challenge the estimate.

```
In all cases these estimates should be used with caution and should be assessed in light
of the objective for which they are being used.
```

## 2011 Bhutan National Health Survey 2012

| Vaccine | Confirmation method | Coverage | Age cohort | Sample | Cards seen |
|---------|---------------------|----------|------------|--------|------------|
| BCG | Card | 96 | 12-23 m | 878 | 91 |
| BCG | Card or History | 100 | 12-23 m | 916 | 91 |
| BCG | History | 4 | 12-23 m | 38 | 91 |
| DTP1 | Card | 95 | 12-23 m | 878 | 91 |
| DTP1 | Card or History | 100 | 12-23 m | 916 | 91 |
| DTP1 | History | 4 | 12-23 m | 38 | 91 |
| DTP3 | Card | 94 | 12-23 m | 878 | 91 |
| DTP3 | Card or History | 99 | 12-23 m | 916 | 91 |
| DTP3 | History | 4 | 12-23 m | 38 | 91 |
| HepB1 | Card | 95 | 12-23 m | 878 | 91 |
| HepB1 | Card or History | 100 | 12-23 m | 916 | 91 |
| HepB1 | History | 4 | 12-23 m | 38 | 91 |
| HepB3 | Card | 94 | 12-23 m | 878 | 91 |
| HepB3 | Card or History | 99 | 12-23 m | 916 | 91 |
| HepB3 | History | 4 | 12-23 m | 38 | 91 |
| MCV1 | Card | 93 | 12-23 m | 878 | 91 |
| MCV1 | Card or History | 97 | 12-23 m | 916 | 91 |
| MCV1 | History | 4 | 12-23 m | 38 | 91 |
| Pol1 | Card | 95 | 12-23 m | 878 | 91 |
| Pol1 | Card or History | 99 | 12-23 m | 916 | 91 |
| Pol1 | History | 4 | 12-23 m | 38 | 91 |
| Pol3 | Card | 93 | 12-23 m | 878 | 91 |
| Pol3 | Card or History | 97 | 12-23 m | 916 | 91 |
| Pol3 | History | 4 | 12-23 m | 38 | 91 |

## 2007 The National EPI Coverage Survey, 2009

| Vaccine | Confirmation method | Coverage | Age cohort | Sample | Cards seen |
|---------|---------------------|----------|------------|--------|------------|
| BCG | Card | 97 | 12-23 m | 1193 | 98 |
| BCG | Card or History | 100 | 12-23 m | 1193 | 98 |
| BCG | History | 3 | 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 | Card | 97 | 12-23 m | 1193 | 98 |
| DTP3 | Card or History | 100 | 12-23 m | 1193 | 98 |
| DTP3 | History | 3 | 12-23 m | 1193 | 98 |
| HepB1 | Card | 97 | 12-23 m | 1193 | 98 |
| HepB1 | Card or History | 100 | 12-23 m | 1193 | 98 |
| HepB1 | History | 3 | 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 |
| MCV1 | Card | 95 | 12-23 m | 1193 | 98 |
| MCV1 | Card or History | 99 | 12-23 m | 1193 | 98 |
| MCV1 | 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 | Card | 97 | 12-23 m | 1193 | 98 |
| Pol3 | Card or History | 100 | 12-23 m | 1193 | 98 |
| Pol3 | History | 3 | 12-23 m | 1193 | 98 |

## 2001 Bhutan National EPI Coverage Evaluation Survey 2002

| Vaccine | Confirmation method | Coverage | Age cohort | Sample | Cards seen |
|---------|---------------------|----------|------------|--------|------------|
| BCG | Card | 95 | 12-23 m | 214 | 95 |
| BCG | Card or History | 100 | 12-23 m | 214 | 95 |
| BCG | History | 4 | 12-23 m | 214 | 95 |
| DTP1 | 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 |
| 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 | Card | 94 | 12-23 m | 214 | 95 |
| HepB1 | Card or History | 98 | 12-23 m | 214 | 95 |
| HepB1 | History | 5 | 12-23 m | 214 | 95 |
| HepB3 | Card | 92 | 12-23 m | 214 | 95 |
| HepB3 | Card or History | 96 | 12-23 m | 214 | 95 |
| HepB3 | History | 5 | 12-23 m | 214 | 95 |
| MCV1 | Card | 92 | 12-23 m | 214 | 95 |
| MCV1 | Card or History | 96 | 12-23 m | 214 | 95 |
| MCV1 | History | 5 | 12-23 m | 214 | 95 |

# Bhutan - survey details

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pol1 | Card | 95 | 12-23 m | 214 | 95 | | Pol3 | Card or History | 99 | 12-23 m | 214 | 95 |
| Pol1 | Card or History | 100 | 12-23 m | 214 | 95 | | Pol3 | History | 5 | 12-23 m | 214 | 95 |
| Pol1 | History | 5 | 12-23 m | 214 | 95 | | | | | | | |
| Pol3 | Card | 94 | 12-23 m | 214 | 95 | | | | | | | |

Further information and estimates for previous years are available at:
http://www.data.unicef.org/child-health/immunization
http://www.who.int/immunization/monitoring_surveillance/routine/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 receives 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.

The model was used in the mid to late 2000. Currently, the coverage series developed by the model is used as the baseline, and efforts are made to obtain data from all sources that include the JRF and reported trend over the years, routine PAB reporting and its trend over the years, data from surveys (DHS, MICS, EPI), whether countries have been validated for the attainment of maternal and neonatal tetanus elimination and what the TT coverage figures are from the survey etc and all the information is used to arrive at an estimate of the protection-at-birth from TT vaccination.

| Year | PAB coverage estimate (%) |
|------|---------------------------|
| 2003 | 87 |
| 2004 | 86 |
| 2005 | 85 |
| 2006 | 85 |
| 2007 | 84 |
| 2008 | 89 |
| 2009 | 89 |
| 2010 | 89 |
| 2011 | 89 |
| 2012 | 89 |
| 2013 | 83 |
| 2014 | 83 |

_____

[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.

WHO and UNICEF estimates of national immunization coverage

Data as of 7 July 2015