Nepal 2017

Expanded Programme on Immunization (EPI)

FACT SHEET

World Health Organization

Regional Office for South-East Asia

Acronyms

AD	Auto disable
AEFI	Adverse events following immunization
AFP	Acute flaccid paralysis
BCG	Bacillus Calmette-Guérin vaccine
CES	Coverage evaluation survey
cMYP	Comprehensive multi-year plan
CRS	Congenital rubella syndrome
DHS	Demographic health survey
DT	Diphtheria tetanus toxoid, pediatric
DTP	Diphtheria – tetanus – pertussis vaccine
DTP-Hib-HepB	Pentavalent vaccine
DTP-Hib-HepB3	3rd dose pentavalent vaccine
EPI	Expanded programme on immunization
GDP	Gross domestic product
HCW	Health care worker
HepB	Hepatitis B vaccine
Hib	Haemophilus influenzae type b
HPV	Human papilloma virus
IgM	Immunoglobulin M
IPV	Inactivated poliovirus vaccine
JE	Japanese encephalitis
JE_Live-Atd	JE live attenuated vaccine
JRF	WHO UNICEF joint reporting form
LB	Live birth
M	Measles
MCV1	First dose measles containing vaccine
MCV2	Second dose measles containing vaccine
MICS	Multiple indicator cluster survey
MMR	Measles mumps rubella vaccine
MNT	Maternal and neonatal tetanus
MR	Measles rubella vaccine
NCIP	National committee on immunization practices
NID	National immunization day
NTAGI	National technical advisory group on immunization
NPEV	Non-polio enterovirus
NT	Neonatal tetanus
OPV	Oral poliovirus vaccine
bOPV	Bivalent OPV
tOPV	Trivalent OPV
PCV	Pneumococcal conjugate vaccine
SEAR	WHO South-East Asia Region
SIA	Supplementary immunization activities
SNID	Subnational immunization day
Td	Tetanus diphtheria toxoid; older children, adults
TT	Tetanus toxoid
TT2+	2 or more doses TT
VDPV	Vaccine derived poliovirus
VPD	Vaccine preventable diseases
WCBA	Women of child bearing age
WPV	Wild poliovirus

Contents

Impact of routine immunization		Page No.
EPI history		5
Basic information 2016	Table 1	5
Immunization schedule 2016	Table 2	5
National immunization coverage 1980 - 2016	Figure 1	6
Immunization system highlights	Table 3	6
DTP3 coverage, diphtheria and pertussis cases 1980 - 2016	Figure 2	7
Reported cases of vaccine preventable diseases 2011 - 2016	Table 4	7
DTP-Hib-HepB3 coverage by district 2015	Figure 3	7
DTP-Hib-HepB3 coverage by district 2016	Figure 4	7

Maternal and neonatal tetanus elimination is sustained		Page No.
TT2+ coverage and NT cases 1980 - 2016	Figure 5	8

Polio-free status is maintained		Page No.
AFP surveillance indicators 2011 - 2016	Table 5	9
Non-polio AFP rate by district 2015	Figure 6	9
Non-polio AFP rate by district 2016	Figure 7	9
Adequate stool specimen collection percentage by district 2015	Figure 8	10
Adequate stool specimen collection percentage by district 2016	Figure 9	10
OPV supplementary immunization activities	Table 6	10

Towards measles elimination and rubella/congenital rubella syndrome control		Page No.
MCV1 and MCV2 coverage, measles and rubella cases, 1980-2016	Figure 10	11
MCV supplementary immunization activities	Table 7	11
MCV1 coverage by district 2015	Figure 11	12
MCV1 coverage by district 2016	Figure 12	12
MCV1 coverage by district 2016	Figure 13	12
Immunity against measles – immunity profile by age in 2016	Figure 14	12
Subnational risk assessment for measles and rubella	Figure 15	12
Sporadic and outbreak associated measles cases by month 2011 - 2016	Figure 16	13
Immunization status of confirmed (laboratory and Epi linked) measles outbreak associated cases by age 2011 – 2016	Figure 17	13
Quality of field and laboratory surveillance for measles and rubella 2012 - 2016	Table 8	14
Performance of laboratory surveillance 2012 - 2016	Table 9	14
Network of WHO supported surveillance medical officers and laboratories for VPD surveillance	Figure 18	15

WHO South-East Asia Region

Nepal: region level map

Impact of routine immunization

EPI history

- EPI launched in 1979
- HepB vaccine introduced in 2002
- AD syringes introduced in 2003
- MCV SIA in 2004
- DTP-HepB vaccine introduced in 2005
- JE introduced in 2011
- DTP-Hib-HepB vaccine introduced in 2009
- MR vaccine introduced in 2013
- IPV vaccine introduced in 2014
- MR second dose introduced in late 2015
- PCV vaccine introduced in 2015
- tOPV to bOPV switched on 17 April 2016
- HPV demonstration project in 2 districts targeting school going girls of grade 6 and out of school girls of the age 11 years.

Source: cMYP 2011-2016 and EPI/MOH

Table 1: **Basic information[1] 2016**

Total population	28,624,299
Live births	637,263
Children <1 year	660,629
Children <5 years	2,959,177
Children <15 years	8,676,336
Pregnant women	751,490
WCBA (15-49 years)	8,202,399
Neonatal mortality rate	22.2 (per 1,000 LB)
Infant mortality rate	29.4 (per 1,000 LB)
Under-five mortality rate	35.8 (per 1,000 LB)
Maternal mortality ratio	258 (per 100,000 LB)

[1]SEAR annual EPI reporting form, 2016 and WHO, World Health Statistics, 2016

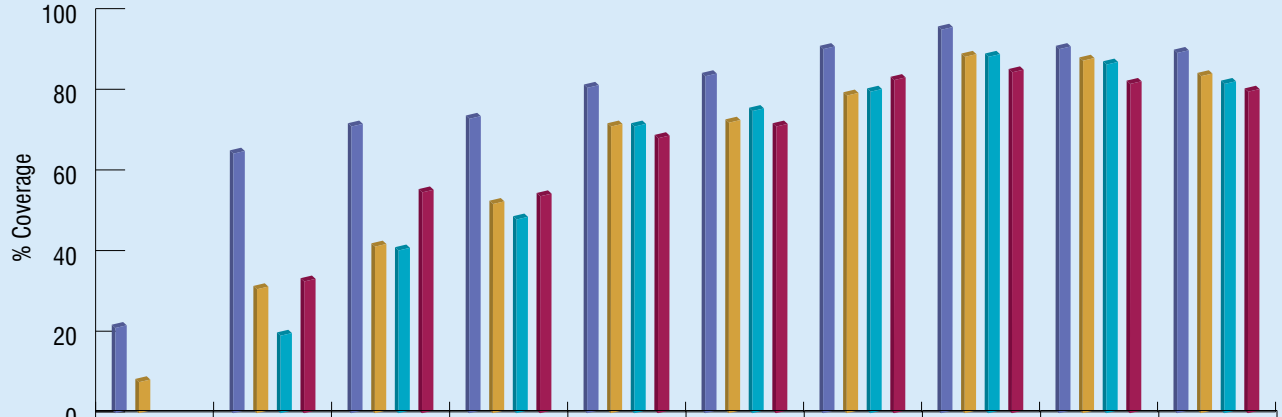
Division/Province/State/Region	5
District	75
Municipality	191
Village development committee	3,639
Ward	35,163
Population density (per sq. km)	181
Population living in urban areas	18%
Population using improved drinking-water sources	88%
Population using improved sanitation	37%
Total expenditure on health as % of GDP	5.5%
Births attended by skilled health personnel	36%
Neonates protected at birth against NT	82%

Table 2: **Immunization schedule, 2016**

Vaccine	Age of administration
BCG	Birth
DTP-Hib-HepB	6 weeks, 10 weeks and 14 weeks
OPV	6 weeks, 10 weeks and 14 weeks
IPV	14 weeks
PCV	6 weeks, 10 weeks and 9 months
MR	9 months and 15 months
JE_LiveAtd	1 year
Td	First contact in pregnancy and +1 month
Vitamin A	6 months to 5 years and +6 months

Source: WHO/UNICEF JRF, 2016

Figure 1: **National immunization coverage, 1980-2016**



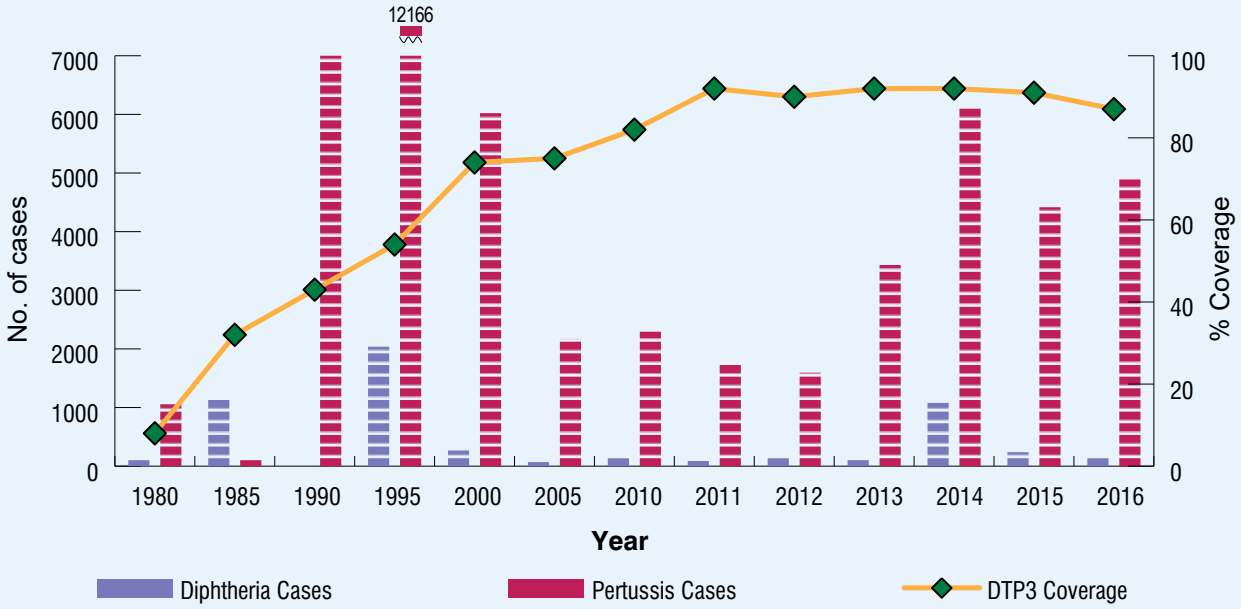
	1980	1985	1990	1995	2000	2005	2010	2014	2015	2016
BCG	22	67	74	76	84	87	94	99	94	93
DTP3	8	32	43	54	74	75	82	92	91	87
OPV		20	42	50	74	78	83	92	90	85
MCV1		34	57	56	71	74	86	88	85	83

Source: WHO/UNICEF estimates of national immunization coverage, July 2017 revision

Table 3: **Immunization system highlights**

cMYP for immunization	2011-2016
NTAGI	fully functional
Spending on vaccines financed by the government	22%
Spending on routine immunization programme financed by the government	24%
Updated micro-plans that include activities to improve immunization coverage	75 districts (100%)
National policy for health care waste management including waste from immunization activities	in place
National system to monitor AEFI	in place
Most recent EPI CES	Demographic Health Survey 2016
≥80% coverage for DTP-Hib-HepB3	51 districts (68%)
≥90% coverage for MCV1	9 districts (12%)
≥10% drop-out rate for DTP-Hib-HepB1 to DTP-Hib-HepB3	9 districts (12%)
Source: WHO/UNICEF JRF, 2016	

Figure 2: **DTP3 coverage[1], diphtheria and pertussis cases[2], 1980-2016**



[1]WHO/UNICEF estimates of national immunization coverage, July 2017 revision
[2]WHO vaccine-preventable diseases: monitoring system 2016

Table 4: **Reported cases of vaccine preventable diseases, 2011-2016**

Year	Polio	Diphtheria	Pertussis	NT (% of all tetanus)	Measles	Rubella	Mumps	JE	CRS
2011	0	94	1,733	95 (49%)	2,359	1,175	39,023	129	ND
2012	0	138	1,595	32 (9%)	3,362	801	35,874	75	ND
2013	0	103	3,431	87 (23%)	1,861	755	29,134	118	ND
2014	0	1,079	6,096	57 (6%)	1,279	704	34,034	1,304	16
2015	0	236	4,416	266 (30%)	1,599	626	38,858	937	50
2016	0	140	4,890	7 (0.91%)	1,269	656	30,610	98	33

Source: WHO/UNICEF JRF, (multiple years) *ND=No data*

DTP-Hib-HepB3 coverage by district

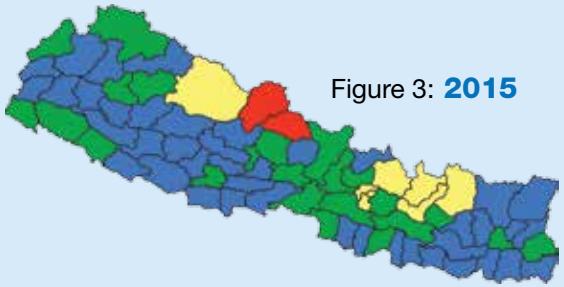


Figure 3: **2015**

Source: SEAR annual EPI reporting form, 2015 (administrative data)

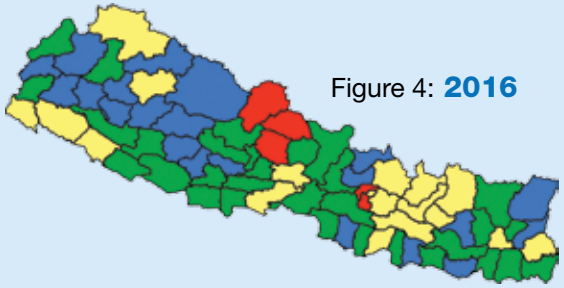
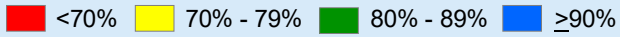


Figure 4: **2016**

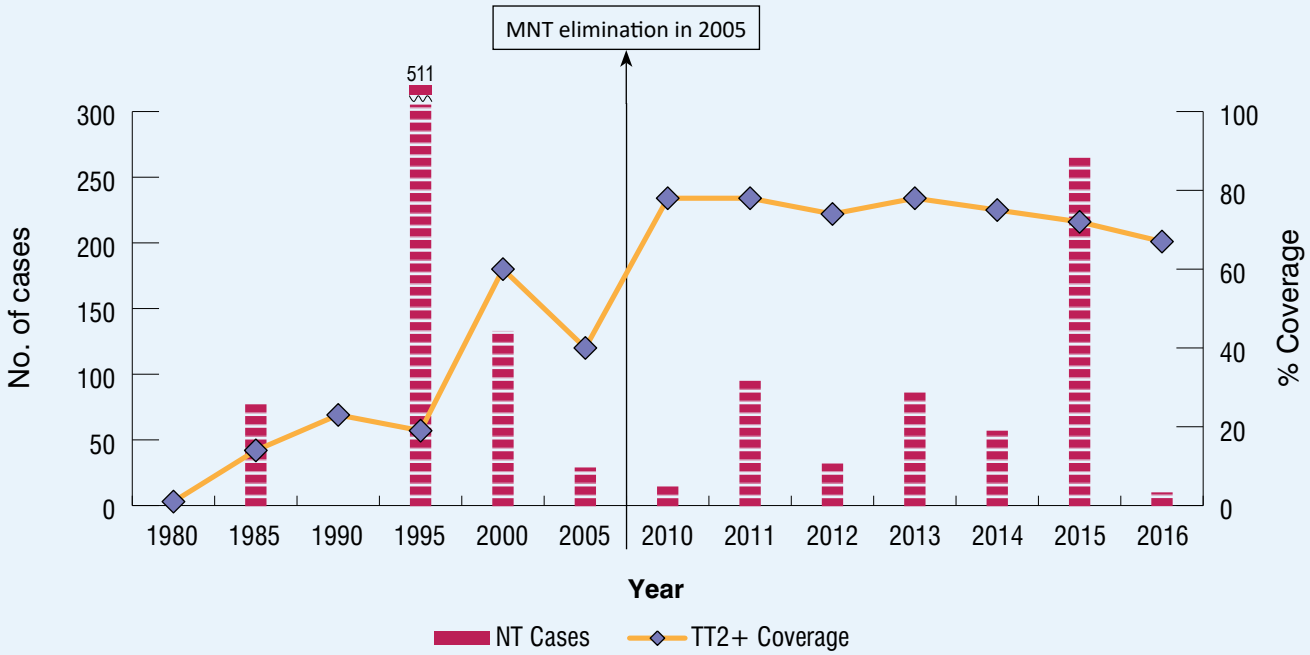
Source: SEAR annual EPI reporting form, 2016 (administrative data)



Maternal and neonatal tetanus elimination is sustained

© WHO/Nepal/U Kiran

Figure 5: **TT2+ coverage[1] and NT cases[2], 1980-2016**



[1] WHO/UNICEF JRF, Country official estimates, 1980-2016

[2] WHO vaccine-preventable diseases: monitoring system 2016 & JRF 2016

Polio-free status is maintained

Table 5: **AFP surveillance performance indicators, 2011-2016**

- Last polio case due to indigenous WPV2 reported from Saptrai district in 1999.
- Last polio case due to indigenous WPV3 reported from Siraha district in November 2000.
- Last polio case due to imported WPV1 was reported from Rautahat district in August 2010.

Indicator	2011	2012	2013	2014	2015	2016
AFP cases	568	640	576	486	394	455
Wild poliovirus confirmed cases	0	0	0	0	0	0
Compatible cases	0	0	0	0	0	0
Non-polio AFP rate[1]	5.11	6.12	5.76	4.85	3.87	5.15
Adequate stool specimen collection percentage[2]	89%	95%	94%	95%	94%	96%
Total stool samples collected	1,102	1,366	1,121	997	791	904
% NPEV isolation	17	20	15	15	18	20
% Timeliness of primary result reported[3]	100	100	100	100	100	100

[1]Number of discarded AFP cases per 100,000 children under 15 years of age.
[2]Percent with 2 specimens at least 24 hours apart and within 14 days of paralysis onset.
[3]Results reported within 14 days of sample received at laboratory.

Non-polio AFP rate by district

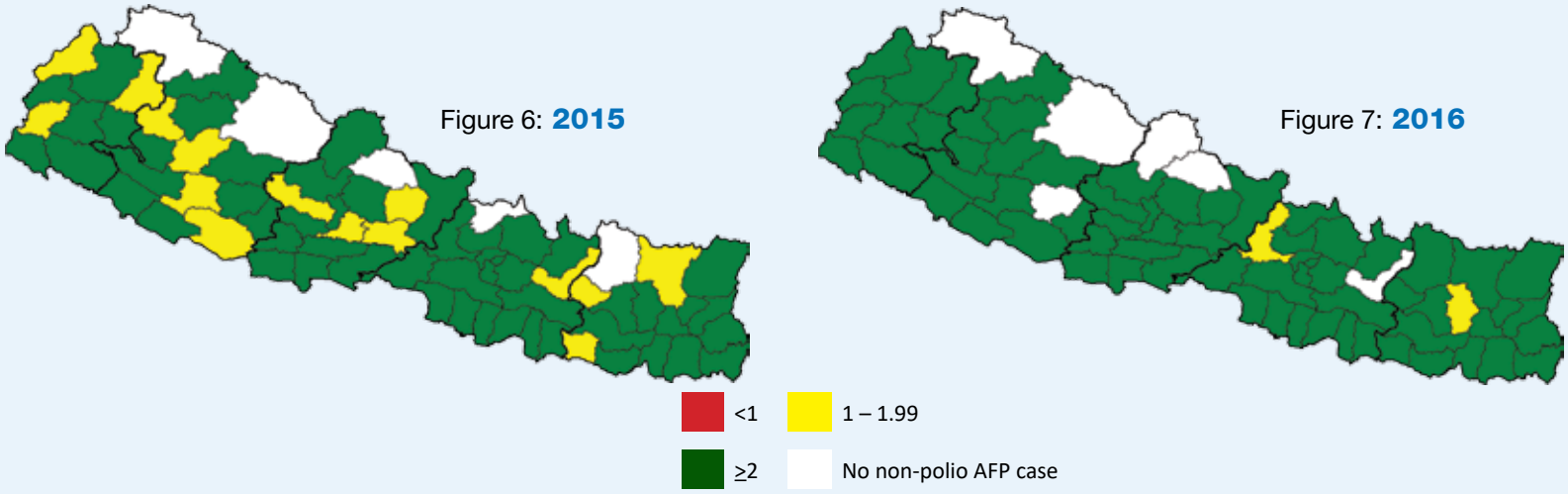


Figure 6: **2015**

Figure 7: **2016**

Adequate stool specimen collection % by district

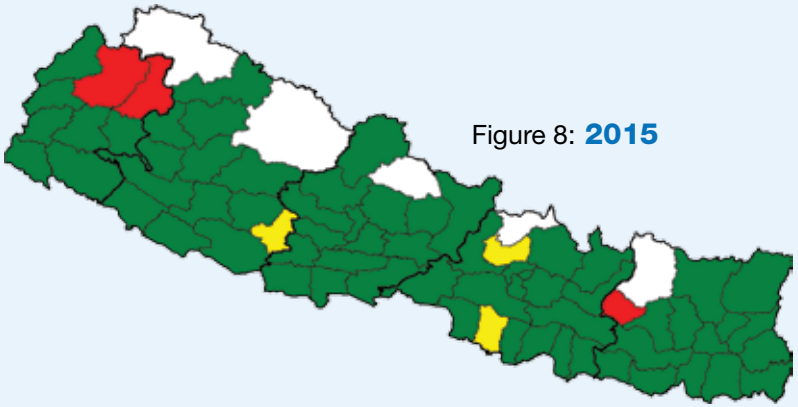


Figure 8: **2015**

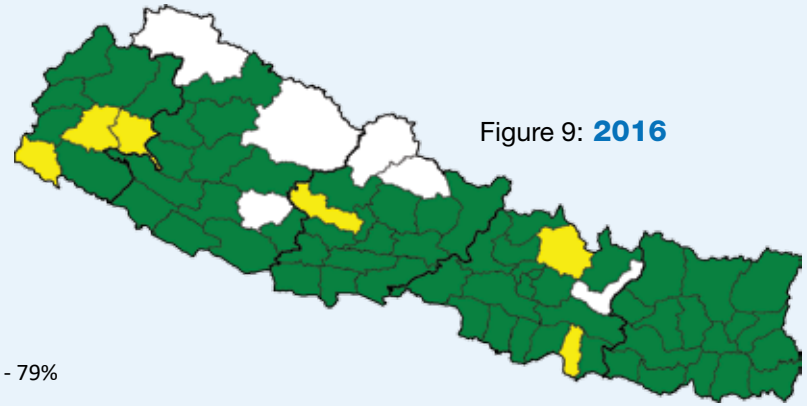


Figure 9: **2016**

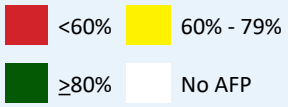


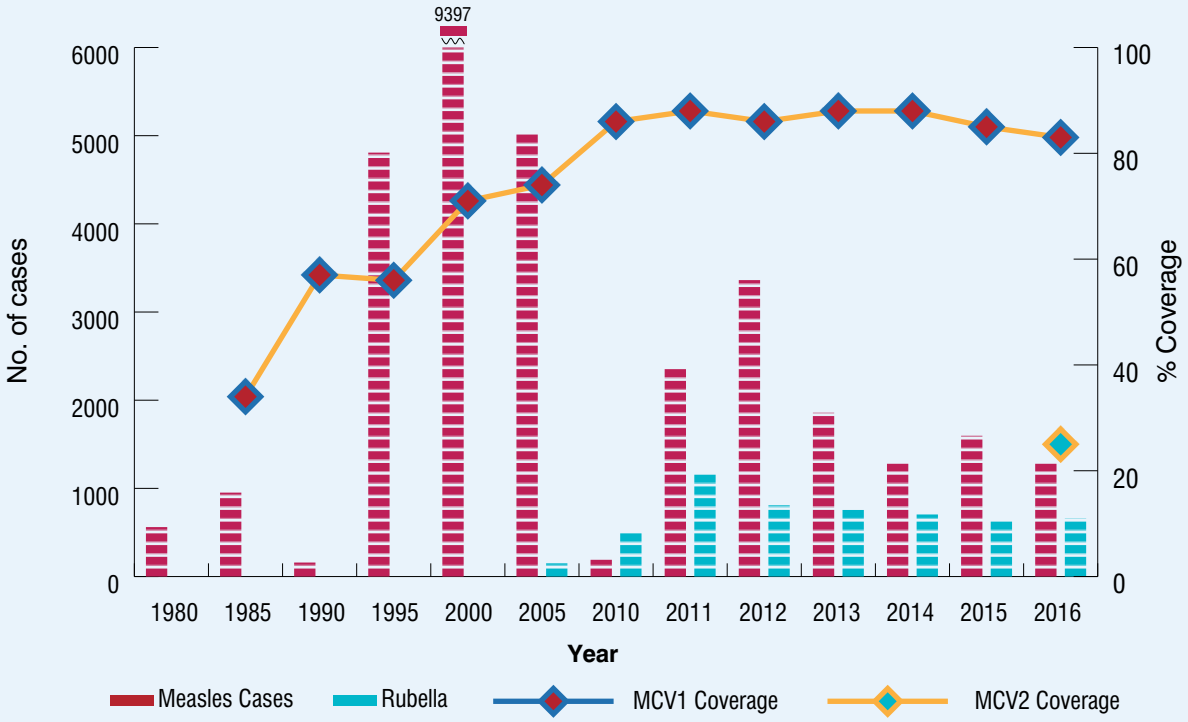
Table 6: **OPV SIAs**

Year	Vaccine	Geographic coverage	Target age	Target population		Coverage (%)	
				Round 1	Round 2	Round 1	Round 2
2010	OPV	NID	<5 years	4,466,960		88	89
2011	OPV	NID	<5 years	4,466,960		91	92
2011	OPV	SNID	<5 years	1,110,222		98	99
2012	OPV	NID	<5 years	4,226,966	-	94	-
2013	OPV	NID	<5 years	4,165,094	-	90	-
2014	OPV	NID	<5 years	-	4,226,966	-	91
2015	OPV	SNID*	<5 years	2,427,411	559,511	91	90
2016	OPV	SNID	<5 years	2,915,641	-	97	-

Source: WHO/UNICEF JRF ** with MR campaign as a part of emergency health response in 14 severely affected districts by earthquake*

Towards measles elimination and rubella/CRS control

Figure 10: **MCV1 and MCV2 coverage[1], measles and rubella cases[2], 1980-2016**



[1]WHO/UNICEF estimates of national immunization coverage, July 2017 revision
[2]WHO vaccine-preventable diseases: monitoring system 2016

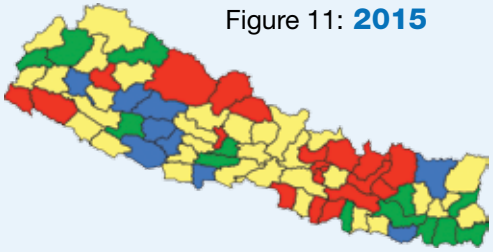
Table 7: **MCV SIAs**

Year	Antigen	Geographic coverage	Target group	Target	Coverage %
2004	M	Nationwide	9 months to 15 years	9,423,866	104
2008	M	Nationwide	9 months to 5 years	3,903,515	93
2012	MR	Nationwide	9 months to 15 years	9,579,306	101
2015*	MR	Subnational	6 months to 5 years	500,344	91
2016	MR	Subnational	6 months to 5 years	2,501,919	101

**As a part of emergency health response in 14 severely affected districts by earthquake.*
Source: WHO/UNICEF JRF (multiple years)

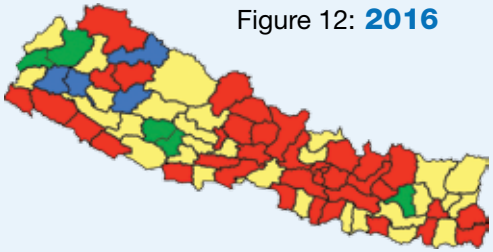
MCV1 coverage by district

Figure 11: **2015**



Source: SEAR annual EPI reporting form, 2015 (administrative data)

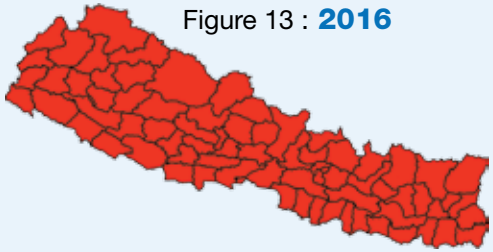
Figure 12: **2016**



Source: SEAR annual EPI reporting form, 2016 (administrative data)

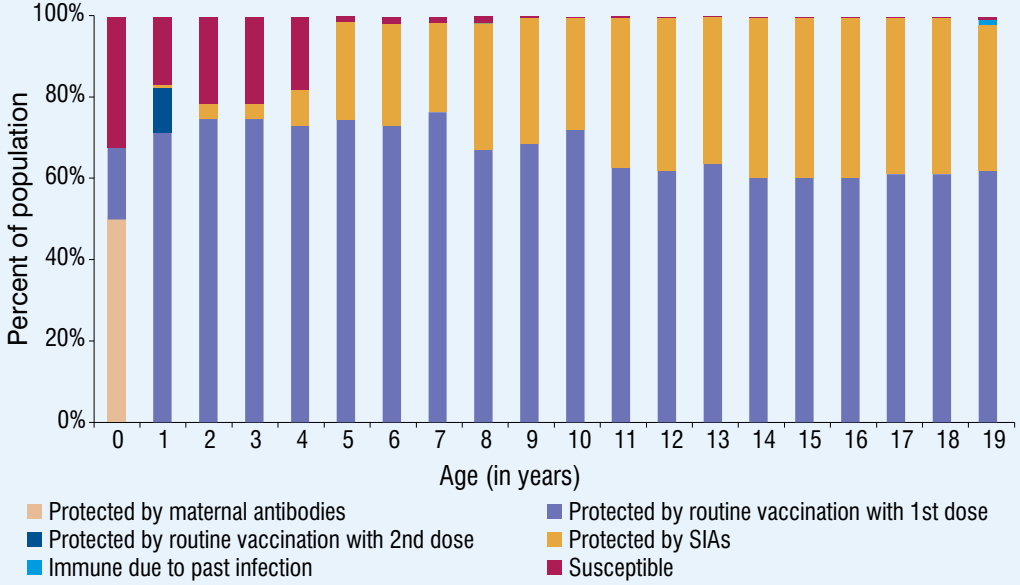
MCV2 coverage by district

Figure 13 : **2016**



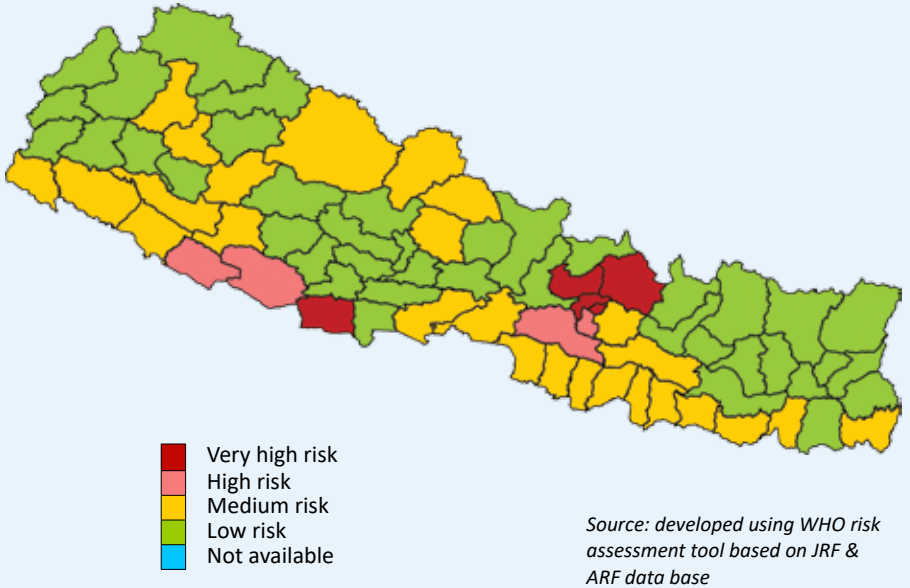
Source: SEAR annual EPI reporting form, 2016 (administrative data)

Figure 14: **Immunity against measles - immunity profile by age in 2016***



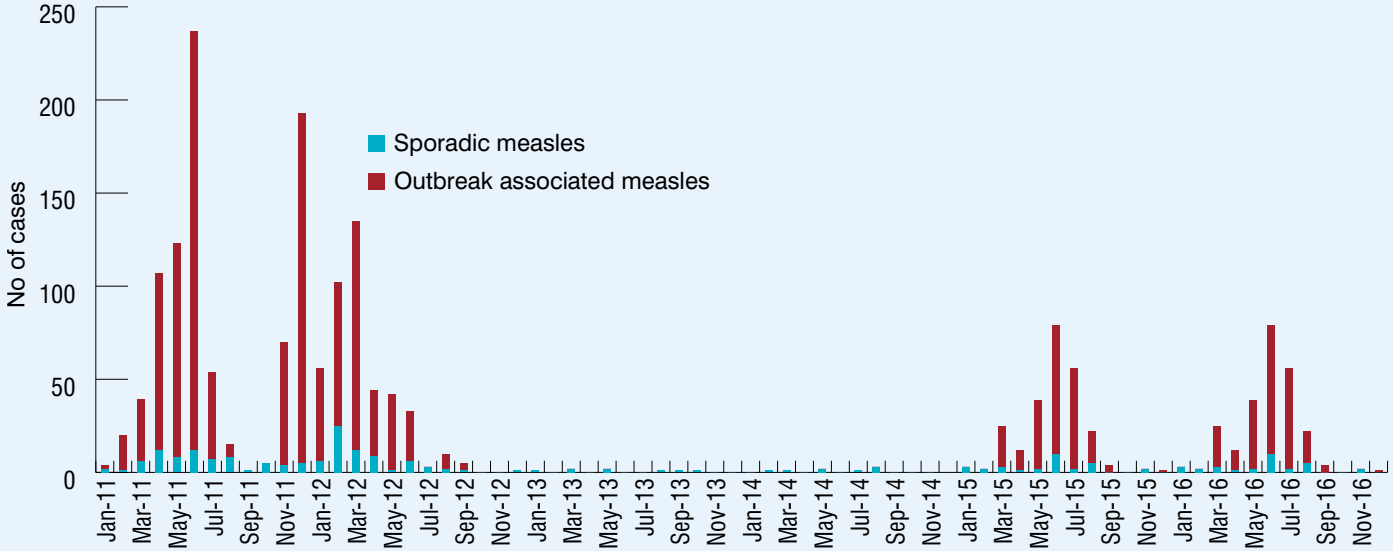
**Modeled using MSP tool ver 2 assuming routine coverage stays constant, 2nd dose introduced at age of 18 months in 2015 and one time SIA done in 2015 targeting age 9 months to 5 years reaching 95% coverage.*

Figure 15: **Sub-national risk assessment -measles and rubella**



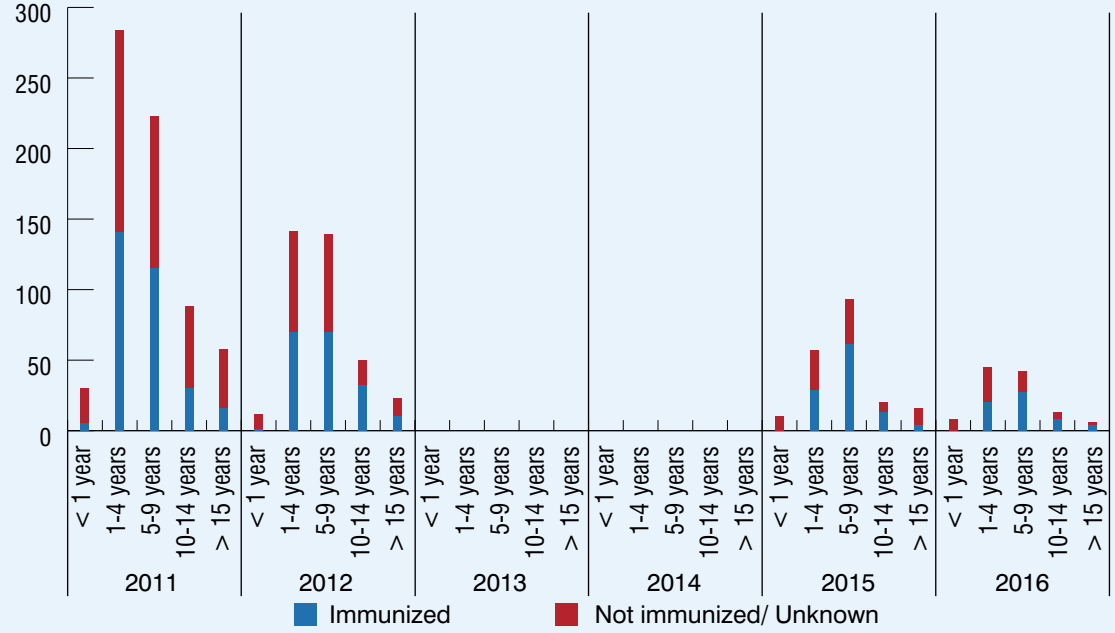
Source: developed using WHO risk assessment tool based on JRF & ARF data base

Figure 16: **Sporadic and outbreak associated measles cases* by month, 2011-2016**



**Includes laboratory confirmed and epidemiologically linked cases*
Source: SEAR Monthly VPD reports

Figure 17: **Immunization status of confirmed (laboratory and EPI linked) measles outbreak associated cases, by age, 2011-2016**



Source: SEAR annual EPI reporting form (2011-2016)

© WHO/Nepal/S Shahi

Table 8: **Surveillance performance indicators for measles and rubella, 2012-2016**

Year	No. Of suspected measles	Case classification (number)						Indicators					
		Measles			Rubella								
		Lab-confirmed	EPI-linked	Clinically-confirmed	Lab-confirmed	EPI-linked	Discarded non-measles non-rubella cases	Annual incidence of confirmed measles cases per million total population	Annual incidence of confirmed rubella cases per million total population	Proportion of all suspected measles and rubella cases that have had an adequate investigation initiated within 48 hours of notification	Discarded non-measles non-rubella incidence per 100,000 total population	Proportion of provinces reporting at least two discarded non-measles non-rubella cases per 100,000 total population	Proportion of sub-national surveillance units reporting to the national level on time
Target ➔								-	-	*80%*	*2*	*80%*	*80%*
2012	3,362	179	485	50	290	382	521	6.28	10.18	ND	1.83	64	91
2013	1,861	10	0	21	25	0	246	0.37	0.92	ND	0.90	55	92
2014	1,279	9	0	16	13	0	274	0.33	0.48	ND	1.00	45	91
2015	1,599	82	182	974	8	0	222	2.59	0.28	ND	0.8	49	89
2016	1,050	136	102	29	22	0	742	9.3	0.08	ND	2.63	90	89

Source: SEAR annual EPI reporting form (2012-2016) *ND=No data*

Table 9: **Performance of laboratory surveillance, 2012-2016**

Year	Serum specimen collected from suspected measles cases	Serum specimen received in laboratory within 5 days of collection	Specimen positive for measles IgM		Specimen positive for rubella IgM		% Results within 4 days of receipt	% confirmed cases tested for viral detection	Genotypes detected	
	No (%)	No (%)	No.	%	No.	%			Measles	Rubella
2012	978 (100)	241 (25)	201	21	310	32	27	5	D8	2B
2013	331 (100)	64 (19)	11	3	30	9	55	0	ND	ND
2014	353 (28)	56 (17)	8	2	15	5	78	0	ND	ND
2015	487 (30)	102 (23)	87	20	17	4	97	4	D4 & D8	-
2016	827 (79)	118 (14)	142	17.2	25	3	97.1	13	B8	ND

Source: SEAR annual EPI reporting form (2012-2016) *ND=No data*

Figure 18: **Network of WHO supported surveillance medical officers and laboratories for VPD surveillance**

World Health Organization
Regional Office for South-East Asia

For contact or feedback:
Expanded Programme on Immunization
National Immunization Programme, Child Health Division,
Department of Health Services, Teku, Kathmandu, Nepal
Tel +977-1-4261660, Fax +977-1-4262263
Email: chandklmd@gmail.com
www.mohp.gov.np

Immunization and Vaccine Development (IVD)
WHO-SEARO, IP Estate, MG Marg, New Delhi 110002, India
Tel: +91 11 23370804, Fax: +91 11 23370251
Email: SearEpidata@who.int
www.searo.who.int/entity/immunization