



The eradication of polio in Bhutan in the context of global polio eradication

Thinley Dorji¹, Tandi Dorji², Bjørn Melgaard³

¹*Kidu Medical Unit, His Majesty's Peoples' Project, Thimphu, Bhutan*

²*Centre for Research Initiatives, Thimphu, Bhutan*

³*Senior Health Consultant, Denmark*

ABSTRACT

Bhutan has made tremendous health gains in public health, particularly in vaccine-preventable diseases. Polio was eradicated two years ahead of the launch of the Global Polio Eradication Initiative and only 12 years after the introduction of oral polio vaccination nationwide. The last case of clinical poliomyelitis in Bhutan was reported in 1986. Bhutan maintains a very high coverage of polio immunisation coupled with a strong health system and surveillance network. The success story in the elimination of polio provides examples for other successful public health programmes now and in the future.

Keywords: Poliomyelitis; Primary Health Care; Public Health; Vaccination.

INTRODUCTION

The last known case of wild poliomyelitis infection in Bhutan was a seven-month-old female infant with fever and flaccid paralysis of the right lower limb admitted at the Damphu Hospital in 1986. The government realized several years later that this was indeed the last case. Bhutan had eradicated polio two years ahead of the launch of the Global Polio Eradication Initiative in 1988¹ and only 12 years after the introduction of oral polio vaccination nationwide². How did Bhutan manage to eradicate poliomyelitis more than two decades before the regional certification and just a decade after initiating its national immunization program? The lessons from Bhutan's experience may provide examples and opportunities to others for similar successful public health programs now and in the future.

The historical perspective and lessons learnt

After the Five Year Plans began in 1961³, health development focused on building of infrastructure and training of health workers. Within the next decade, there was a hospital in every district and more than fifty Basic Health Units. With the adoption of the Alma-Ata Declaration in 1978⁴, public health programmes including immunization were initiated as part of the Primary Health Care strategy^{2,5}.

The Expanded Programme on Immunization (EPI) was implemented and oral polio vaccine (OPV) was included in the national immunization schedule in 1979. However, despite providing vaccination in all health centres and organizing dedicated

days for immunization, a survey in 1987 found immunization coverage to be only around 20%. A network of outreach clinics were established and Village Health Workers trained in a project to achieve Universal Childhood Immunization by 1990 with the support of the UNICEF and the Italian government, backed by a strong political commitment.

In 1988, under the guidance of His Majesty the Fourth King, the National Assembly through a resolution, called for vaccination of all children against six diseases (tuberculosis, diphtheria, whooping cough, tetanus, polio and measles), women against tetanus and mandated the presentation of the health card with the proof of full immunization" at the time of school enrolment⁶. This gave the final impetus for all families to have their children immunized.

In the same year, the World Health Organization launched the Global Polio Eradication Initiative and intensified vaccination against polio and the target for eradication was set for 1997.

The second nationwide EPI survey in 1991 concluded that 84% of all children in Bhutan were fully immunized against the six diseases. On the basis of these findings, Universal Childhood Immunization was formally declared in February 1991 and the first National Health Survey in 1994 did not find a single case of compatible clinical poliomyelitis⁷. However, the country was still considered at risk because of the close proximity and the open border with India⁸, weak surveillance system and poor sanitation coverage. A nationwide mass supplementary immunization with OPV and measles vaccine for children and tetanus for pregnant women was conducted in 1995. Thereafter, high-risk population groups in districts bordering India were immunized from 1996 2002 with a consistently high coverage of 99% (Table 1). The EPI program has since then successfully maintained coverage above 90% (Figure 1).

Corresponding author:

Thinley Dorji
dorji.thinleydr@gmail.com

Table 1. The coverage of oral polio vaccination national and sub-national immunization days conducted by the Ministry of Health, Royal Government of Bhutan

Year	Immunisation days	Districts covered	Target population group < 5 years	First round coverage	Second round coverage
1995	NID	20 districts	80,336	99%	99%
1996	SNID	Samdrup Jongkhar, Tsirang, Sarpang, Samtse, Chukha, Dagana dzongkhags and Panbang drungkhag (under Zhemgang dzongkhag)		99%	99%
1997	SNID	-do-	37,456	99%	99%
1998	SNID	-do-	36,006	99%	99%
1999	SNID	-do-	36,541	99%	99%
2000	SNID	-do-	38,604	99%	99%
2001	SNID	-do-	36,753	99%	99%
2002	SNID	-do-	37,665	99%	99%

NID = national immunization day (all districts in the country)

SNID = sub-national immunization day (southern districts that border India)

The acute flaccid paralysis surveillance was started in 1997 in all hospitals and Basic Health Units. Stool samples collected from suspected cases were sent to the World Health Organization regional reference laboratory for polio in Bangkok for virological confirmation⁹. Today, a network of 29 hospitals and 211 Basic Health Units¹⁰ underpins an efficient surveillance system targeting a number of diseases and reporting through an integrated Health Information Management System⁹.

In addition, the initiation of an online, immediate “National Early Warning Alert and Response Surveillance” (NEWARSIS) mechanism has enabled agencies such as the Royal Centre for Disease Control, hospitals and public health staff track a set of diseases and it can quickly identify an outbreak¹¹. These actions have enabled Bhutan to remain polio free and the surveillance system has been expanded to include other communicable diseases. The country was certified polio free with all the other countries in the South East Asia Region of World Health Organization on 27 March 2014.

The last reports of polio in Bhutan

Although coverage was low before achieving Universal Childhood Immunization, there were very few sporadic cases

of polio reported in the country. There is, however, anecdotal information of one epidemic in the village of Ura, in Bumthang in 1972. Tracing the affected people led to the identification of four individuals with residual limb paralysis who still live in Ura (S. Tenzin, personal communication, 2017). The outbreak occurred at a time when the construction of the first motor road to eastern Bhutan had reached the village. It is likely that road workers had carried the virus into the area.

A decade later, when the road had reached Pema Gatshel and many foreign workers were carrying out development work, a seven-year-old boy was struck with polio (K. Dorji, personal communication, 2017). He was carried by his father to the hospital because he could not move his left leg. He was told that he had the “tsa-kam” (nerve-withering) disease and that there was no cure. He gradually regained sufficient strength to be able to walk, but his left leg remained thinner and smaller than the right. Later he suddenly lost his vision and was told that he suffered from a disease of the optic nerve (post-polio syndrome).

The last case of polio was reported in 1986 from Damphu Hospital¹².

ACKNOWLEDGEMENTS

The authors are grateful to the Polio Department, World Health Organisation, Geneva for providing support for this research; all the health workers and individuals for sharing their stories; the Ministry of Health, in particular the Vaccine Disease Prevention Program; and all the individuals who assisted in providing data and information for this article.

REFERENCES

1. Global Polio Eradication Initiative. Accessed July 15, 2018. [Full Text]
2. Dorji T, Melgaard B. Medical History of Bhutan: A Chronicle of Health and Disease from Bon Times to Today. 2nd ed. Centre for Research Initiatives; 2018. [Full Text]

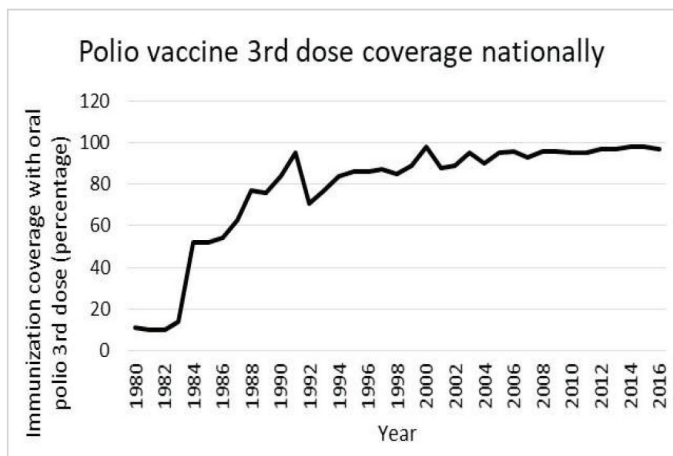


Figure 1. The trend of third dose oral polio vaccine coverage in Bhutan from 1980-2016

3. Phuntsho K. The History of Bhutan. Vintage Books; 2016. [\[Full Text\]](#)
4. Declaration of Alma-Ata. Alma-Ata, USSR: World Health Organization; 1978. [\[Full Text\]](#)
5. Yangchen S, Tobgay T, Melgaard B. Bhutanese Health and the Health Care System: Past, Present, and Future. Druk J. 2017;2(1). [\[Full Text\]](#)
6. Resolution No 11 - 66th Session of the National Assembly of Bhutan. Thimphu: National Assembly of Bhutan; 1988. [\[Full Text\]](#)
7. Report on National Health Survey 1994. Thimphu: Ministry of Health and Education, Royal Government of Bhutan; 1996. [\[Full Text\]](#)
8. Deutsch N, Singh P, Singh V, Curtis R, Siddique AR. Legacy of PolioUse of India's Social Mobilization Network for Strengthening of the Universal Immunization Program in India. J Infect Dis. 2017;216(suppl 1):S260-S266. [\[Full Text | DOI\]](#)
9. National Immunization Policy and Strategic Guidelines. Ministry of Health, Royal Government of Bhutan; 2011. [\[Full Text\]](#)
10. Ministry of Health. Annual Health Bulletin 2018. Thimphu: Ministry of Health, Royal Government of Bhutan; 2018. [\[Full Text\]](#)
11. National Early Warning Alert and Response Surveillance. Accessed July 15, 2018. [\[Full Text\]](#)
12. O'Connor PM, Allison R, Thapa A, Bahl S, Chunsuittiwat S, Hasan M, et al. Update on Polio Eradication in the World Health Organization South-East Asia Region, 2013. J Infect Dis. 2014;210(suppl_1):S216-S224. [\[Full Text | DOI\]](#)