BHUTAN'S IMMUNIZATION JOURNEY

A Journey of Resilience, Reflection, and Progress

Vaccine Preventable Disease Program
Communicable Disease Division, Department of Public Health
Ministry of Health

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ACKNOWLEDGEMENT

The development of the *EPI Journey* book has been a collective effort, drawing on the knowledge, insights, and experiences of many individuals involved in Bhutan's immunization program over the years.

Content for this publication was collected through email correspondence, phone conversations, and in-person discussions, ensuring careful sourcing and verification of information.

We sincerely thank all contributors—particularly former EPI Managers, technical advisors, and field colleagues—for sharing their valuable perspectives that have shaped this compilation.

This book stands as a reflection of Bhutan's enduring commitment to immunization: honoring past achievements, learning from challenges, and documenting progress over time.

We are equally grateful to the individuals and institutions who generously shared photographs, adding depth and life to the story of Bhutan's immunization journey.

Finally, we extend our special appreciation to the WHO Country Office and WHO SEARO for their technical guidance and ongoing support. Their contributions have been pivotal in shaping this publication and in documenting the history of one of the Ministry's longest-standing public health programs.

CONTENT

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FROM THE HEALTH MINISTER

In the early days, healthcare workers set out on foot for hours, sometimes days, to reach a single household tucked away in the hills. With vaccine carriers on their backs and the trust of the people in their hearts, they brought not just vaccines, but hope. There were no paved roads, no mobile signal, no sophisticated systems. Yet their unwavering dedication made it possible to reach everyone.

Step by step, village by village, Bhutan built its immunization program with resilience and purpose. What began with a few essential vaccines gradually expanded as knowledge deepened, partnerships strengthened, and technology evolved. Cold chain systems were introduced. New vaccines were added. Healthcare workers were trained. And the confidence of the people grew stronger with each milestone.

Diseases that once haunted families began to fade. Mothers stopped fearing fevers that used to claim lives. Children grew stronger. Communities flourished. These were not just public health victories. They were deeply personal triumphs for families across the country.

But the journey has not been without challenges. Natural disasters, logistical hurdles, and pandemic tested the system. And yet, time and again, Bhutan responded with integrity, with science, and with compassion. Healthcare workers adapted. Communities showed willingness. Leaders prioritized.

Today, Bhutan's immunization program stands as a symbol of what can be achieved through empathy, commitment, and collective will. It protects not only young children but people across every stage of life, from adolescents to mothers, the elderly, and those most vulnerable. Immunization is more than a health intervention. It is a shared national commitment rooted in equity and trust.

And still, the journey continues.

As new health threats emerge and lives evolve, so too must our systems. Our mission remains clear: to reach every person, in every corner of our country, with timely, safe, and effective vaccines. In Bhutan, health is not a privilege. It is a right. And in this journey, no one will be left behind.

This is the story of Bhutan's immunization journey, a story still being written, one vaccine, one child, and one life at a time.

Tashi Delek

(Tandin Wangchuk)
HEALTH MINISTER
Ministry of Health

FOREWORD

The Expanded Program on Immunization (EPI), launched in 1979, has been a cornerstone of Bhutan's public health achievements. Its foundations were laid during the first Five- Year Plan in 1961, when the government prioritized children's health and the prevention of vaccine-preventable diseases. Despite Bhutan's challenging mountainous terrain and dispersed population, the country has consistently achieved immunization coverage of over 95%. This remarkable achievement has contributed to the eradication and elimination of diseases such as smallpox, polio, measles, rubella, and maternal neonatal tetanus, demonstrating Bhutan's commitment to equitable and accessible healthcare.

In 2005, the EPI transitioned into the Vaccine Preventable Disease Program (VPDP), broadening its scope to encompass all aspects of vaccines and vaccinology. Today, Bhutan's immunization schedule includes 15 antigens, including the COVID-19 vaccine, ensuring robust protection for children and communities. The success of the program highlights the seamless integration of traditional approaches with modern innovations, from healthcare workers navigating remote terrains to solar-powered cold chain safeguarding vaccines. Bhutan's dedication to overcoming challenges through resilience and collaboration is a testament to its commitment to health equity.

This book captures Bhutan's immunization journey, celebrating its milestones while acknowledging the challenges overcome along the way. More than a chronicle of achievements, this book is a testament to the enduring spirit of Bhutan— a nation where progress is measured by lives saved. We extend our gratitude to the WHO Country Office and WHO SEARO, for their support in documenting this journey. As Bhutan continues to inspire with its holistic approach to health, this record serves as both a legacy and a beacon for future generations.

Tashi Delek

(Pemba Wangchuk)
SECRETARY
Ministry of Health

MESSAGE FROM THE WHO COUNTRY OFFICE

Bhutan's immunization journey stands as a testament to courage, compassion, and an unwavering commitment to universal health. From the earliest days, when healthcare workers braved rugged mountainous terrains with vaccines carried on their backs, to today's advanced cold chain networks reaching the furthest communities, Bhutan exemplifies the extraordinary outcomes that arise when a nation wholeheartedly prioritizes its people.

This inspiring narrative is not merely one of technical achievement—it embodies the spirit of equity and collective resolve. It has been made possible by visionary leadership, the dedication of trusted health professionals, and the resilience of communities united in the belief that vaccines have the power to safeguard lives. Bhutan's remarkable success in eradicating smallpox, achieving polio-free status, and eliminating measles, rubella, and maternal and neonatal tetanus represents more than just historic milestones—it stands as an enduring legacy of good health passed from one generation to the next.

The World Health Organization is honored to have partnered with Bhutan throughout this extraordinary journey. We commend the Royal Government of Bhutan, the Ministry of Health, and each healthcare worker whose unwavering commitment continues to save lives and inspire the global community.

As we face new challenges ahead, this book serves as a powerful reminder: with vision, collaboration, and an unshakable belief that health is a fundamental right—not a privilege—we can build a future where no one is left behind.

With deepest gratitude and best wishes,

(Dr Bhupinder Kaur Aulakh)
WHO Representative
WHO Country Office in Bhutan

ABBREVIATIONS

30 DTR	30 Days Temperature Recording
ACCF	Australian Cervical Cancer Foundation
ACI	Advisory Committees for Immunization
AD	Auto-Disable Syringes
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
ASM	Advocacy and Social Mobilization
BCG	Bacillus Calmette–Guérin (Tuberculosis Vaccine)
BGTS	Bhutan Government Transport Service
BHTF	Bhutan Health Trust Fund
BHU	Basic Health Unit
bOPV	bivalent Oral Polio Vaccine
CCE	Cold Chain Equipment
CCM	Cold Chain Monitor
CHC	Child Health Card
CMO	Chief Medical Officer
Combo	Combination of an Ice-Lined Refrigerator and a Freezer
COVID	Coronavirus Disease
COVAX	COVID-19 Vaccines Global Access
DF	Deep Freezer
DS	Disease Surveillance
DHO	District Health Officer
DTP	Diphtheria Tetanus Pertussis
EPI	Expanded Program on Immunization
EVM	Effective Vaccine Management
FNPH	Faculty of Nursing and Public Health
GAVI	Global Alliance for Vaccines and Immunization
GNH	Gross National Happiness
Hep. B	Hepatitis B
Hib	Haemophilus Influenzae type b
HPV	Human Papillomavirus
HSS	Health Systems Strengthening
ILR	Ice-Lined Refrigerator
IPV	Inactivated Polio Vaccine
JCV	Japan Committee, Vaccines for the World's Children
JICA	Japan International Cooperation Agency
KGUMSB	Khesar Gyalpo University of Medical Sciences of Bhutan
MCH	Maternal and Child Health

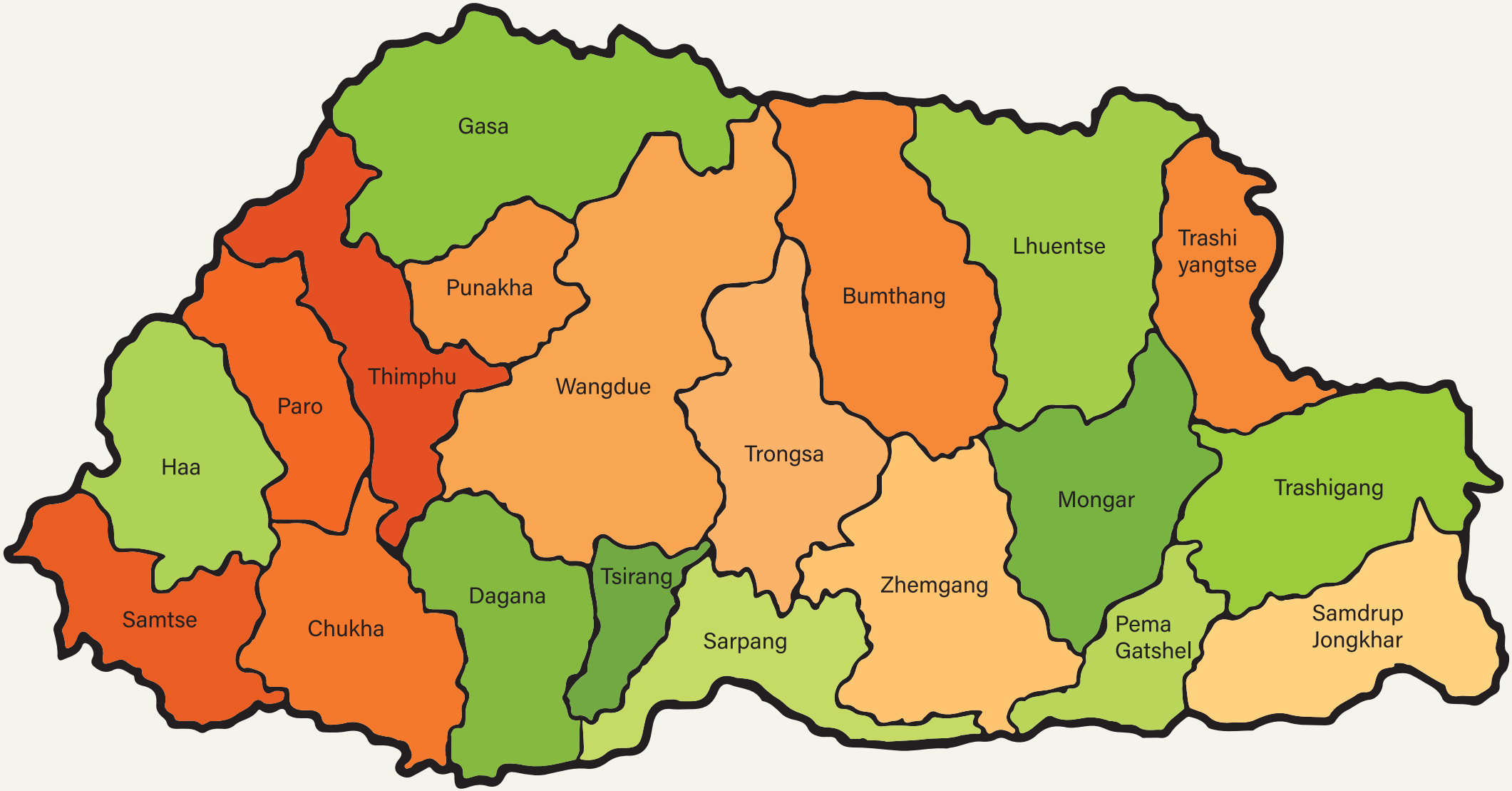
MNT	Maternal and Neonatal Tetanus
MMR	Measles Mumps and Rubella
MR	Measles and Rubella
MO	Medical Officer
MOH	Ministry of Health
MSD	Merck Sharp & Dohme
NCCPE	National Certification Commission for Polio Eradication
NEWARS	National Early Warning Alert and Response Surveillance
NHS	National Health Survey
NIFH	National Institute for Family Health
NITAG	National Immunization Technical Advisory Group
NMS	National Medical Services
NPCTF	National Poliovirus Containment Taskforce
NPEC	National Polio Expert Committee
NIDs	National Immunization Days
NVC	National Verification Committee for Measles and Rubella
ORC	Outreach Clinic
PCV	Pneumococcal Conjugate Vaccine
PHC	Primary Health Centre
Penta	Diphtheria Pertussis Tetanus Hepatitis B and Hib
PIVI	Partnership for Influenza Vaccine Introduction
RCDC	Royal Centre for Disease Control
RI	Routine Immunization
SEARO	South-East Asia Regional Office
SIAs	Supplementary Immunization Activities
SNIDs	Sub National Immunization Days
Td	Tetanus diphtheria
tOPV	trivalent Oral Polio Vaccine
TT	Tetanus Toxoid
UCI	Universal Child Immunization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
VPD	Vaccine Preventable Disease
VPDP	Vaccine Preventable Disease Program
VPSC	Vaccine Procurement and Supply Chain
VVM	Vaccine Vial Monitor
VHW	Village Health Worker
WB	World Bank
WFP	World Food Program
WHA	World Health Assembly
WHO	World Health Organization
WIC	Walk-In Cooler
WIF	Walk-In Freezer

CHAPTER 1
Introduction

> “THE CONSTITUTION OF THE KINGDOM OF BHUTAN STATES THAT, “THE STATE SHALL PROVIDE FREE ACCESS TO BASIC PUBLIC HEALTH SERVICES IN BOTH MODERN AND TRADITIONAL MEDICINES.

Nestled in the heart of the Himalayas, Bhutan is a small yet resilient kingdom bordered by India and China. With a population of around 780,000 spread across 38,394 square kilometers, it is a land of majestic mountains, rich cultural heritage, and a strong commitment to sustainability. Guided by the philosophy of Gross National Happiness (GNH), Bhutan places equal emphasis on well-being, environmental preservation, and cultural identity. Over 70% of its land is covered by forests, reflecting its dedication to environmental stewardship.

Bhutan’s development journey began with the First Five-Year Plan in 1961, marking the start of modern healthcare. The training of Bhutan’s first doctors in the late 1950s and the opening of the first allopathic hospital in Thimphu in 1961 laid the foundation for a robust healthcare system. Over time, Bhutan’s health sector flourished with the introduction of the Primary Health Care


Gasa
Punakha
Thimphu
Paro
Haa
Wangdue
Trongsa
Bumthang
Lhuentse
Trashi
yangtse
Mongar
Trashigang
Samtse
Chukha
Dagana
Tsirang
Sarpang
Zhemgang
Pema
Gatshel
Samdrup
Jongkhar

approach in 1979, which revolutionized healthcare delivery by focusing on community-based care. Today, Bhutan boasts 59 hospitals, 194 Primary Health Centres (PHCs), 51 sub-posts, and over 555 Outreach Clinics (ORCs), ensuring even the most remote areas are served.

In a unique approach, Bhutan has no private hospitals, with only a few diagnostic centers regulated by the Bhutan Qualifications and Professionals Certification Authority, ensuring high standards of care across the board.

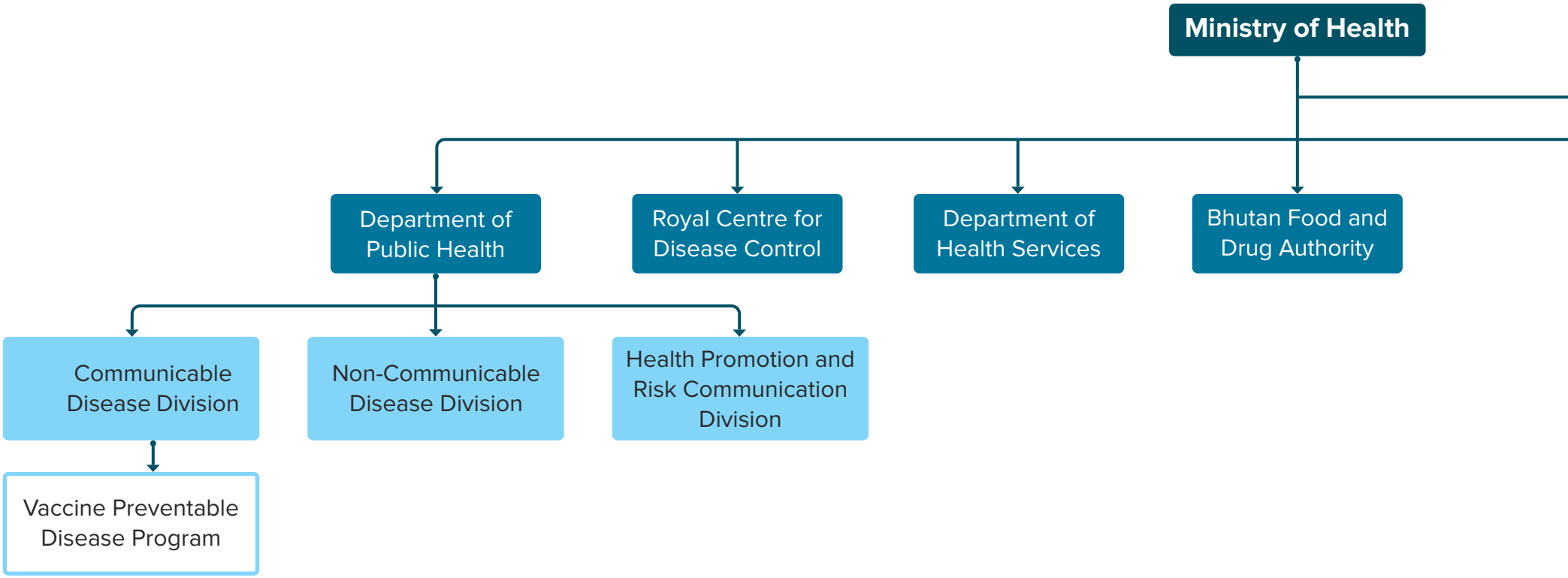
One of Bhutan's greatest public health achievements is the Expanded Program on Immunization (EPI), launched in 1979. Initially targeting six major diseases, including tuberculosis, diphtheria, and measles, the program has grown to encompass a wide array of vaccines. This growth has been propelled by a close partnership between the government, local communities, and international organizations like WHO, UNICEF and Gavi.

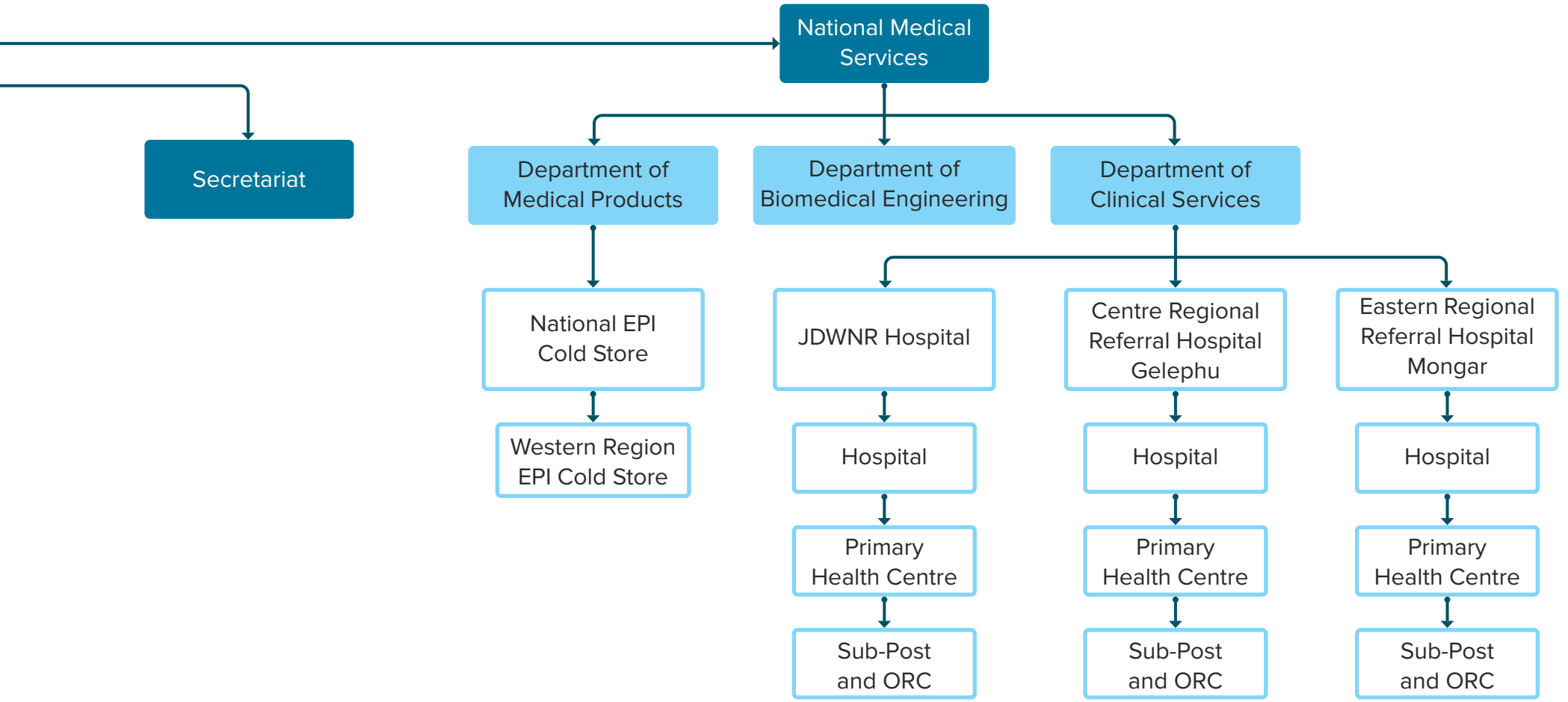
The EPI is a dynamic program that evolves to meet new health challenges. It strengthens cold chain systems, builds healthcare worker capacity, and enhances surveillance, dramatically reducing the burden of vaccine-preventable diseases (VPDs). Bhutan's success has become a model for other developing nations, showcasing how committed leadership and community collaboration can drive transformative health outcomes.

This book is a celebration of Bhutan's immunization journey—an inspiring story of progress, dedication, and resilience. It also serves as a valuable resource for future planning and evidence-based decision-making. Through eleven captivating chapters, we explore Bhutan's immunization history, the introduction of new vaccines, the challenges overcome, and the inspiring stories of those who made it all possible. Together, these narratives highlight Bhutan's steadfast commitment to safeguarding its people and ensuring a healthier, more resilient future for generations to come.

Administration of the BCG Vaccine

Organogram for
Implementation Level for National Immunization Program




National Medical Services
Secretariat
Department of Medical Products
Department of Biomedical Engineering
Department of Clinical Services
National EPI Cold Store
Western Region EPI Cold Store
JDWNR Hospital
Hospital
Primary Health Centre
Sub-Post and ORC
Centre Regional Referral Hospital Gelephu
Hospital
Primary Health Centre
Sub-Post and ORC
Eastern Regional Referral Hospital Mongar
Hospital
Primary Health Centre
Sub-Post and ORC

History of
Vaccines Introduced in Bhutan

1974
BCG Vaccine

1976
DTP Vaccine

1979
DTP, BCG, Measles and OPV Vaccines

1983
TT Vaccine

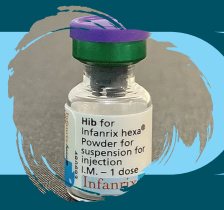
1997
Hep.B Monovalent Vaccine

2003
DTP-Hep.B Combination Vaccine

2006
Measles and Rubella Combination

MR 2nd Dose Vaccine

2009
DTP-Hep.B-Hib (Penta) Vaccine



2010
HPV vaccine for girls (the first country in the WHO SEARO)

2011
Reintroduced
DTP-Hep.B-Hib
(Penta) Vaccine

2012
TT Vaccine replaced
by Td Vaccine

Hep.B Monovalent
Pediatric Vaccine

2015
IPV Vaccine

2016
Mumps with
Measles and Rubella
Combination
(MMR Vaccine)

tOPV switched to
bOPV Vaccine

2019
PCV and Influenza
Vaccines

2020
HPV Vaccine for boys

2021
COVID-19 Vaccines

IPV 2nd dose Vaccine

CHAPTER 2
History of Vaccination in Bhutan

Bhutan's journey in immunization is a story of remarkable milestones, starting in the early 20th century and transforming into a dynamic and far-reaching public health initiative that continues to protect generations.

2.1 The Chronological Overview of Key Events and Initiatives

1903 - 1904:
The first King of Bhutan, Gongsar Ugyen Wangchuck, recognized the importance of smallpox vaccination, having personally received the vaccine, possibly while accompanying the Younghusband Expedition to Lhasa. During this time, British doctors accompanying political missions administered smallpox vaccines in Bhutan. A few Bhutanese vaccinators were also trained, both during these missions and at Charteris Hospital in Kalimpong

1906:
During his second mission to Bhutan, John Claude White, a British Political Officer, observed mass smallpox vaccination efforts. He brought a vaccinator, who administered vaccines to people in Tashigang, Tashiyangtse, and Lhuntse. White also sent a large consignment of vaccines to Trongsa Penlop Ugyen Wangchuck, who sought to introduce vaccination throughout Bhutan.

1909 - 1910:

Charles Bell succeeded John Claude White as the British Political Officer, accompanied by Captain R.S. Kennedy, a Medical Officer. During their visit to Bhutan, they noted a high demand for smallpox vaccines and Western biomedicine. Dr. Kennedy trained one of the King's men in vaccination, marking the first time a Bhutanese individual was trained to provide biomedical services.

1961:

Vaccination became a part of Bhutan's public health efforts in 1961 as part of the global initiative to eradicate smallpox. Three years later, in 1964, the Royal Government of Bhutan established 19 vaccination posts to enhance vaccination efforts. Similarly, in the early 1960s, a vertical immunization program was initiated, focusing primarily on BCG vaccination. Mr. Baling Tshering, initially a compounder, became the BCG team leader in 1964 and later transferred to Bitekha as a Dungpa (sub-district officer) in Paro Dzongkhag.

1965 - 1966:

A mass vaccination campaign was launched following a smallpox outbreak near Wangdue Phodrang, which had 74 cases. The outbreak began among foreign laborers, including road workers, and spread to the local population. The hospital in Motithang, Thimphu, served as an isolation center, where 60% of those affected died. In response, the number of vaccination posts increased to 25 by 1966.

1971:

The program was handed over to Dr. N. Goswami, a national TB officer based at Samtse Hospital.

1976:

Vaccination expanded beyond smallpox. DTP (Diphtheria, Tetanus, Pertussis), OPV (Oral Polio Vaccine), and BCG (Bacille Calmette-Guérin) vaccines were introduced in the districts of Thimphu and Paro.

1979:

Following the Alma Ata Declaration and the adoption of the Primary Health Care model, Bhutan launched the EPI Program on 15th November 1979 to reduce morbidity, disability, and mortality from target diseases, starting with six antigens: BCG, DTP, Measles, OPV. The program was led by Dr. T. B. Rana as the National Program Manager.

1980:

The EPI expanded to all districts and became fully integrated with Bhutan's general health services. During the same year, the title of BCG technician was changed to EPI technician to reflect the broader scope of the program.

1981:

The National Institute for Family Health (NIFH) was established in Gelephu to conduct refresher training courses for healthcare workers on maternal care, immunization, and IMNCI (Integrated Management of Neonatal and Childhood Illness).

1981 - 1994:

The World Food Program (WFP) played a crucial role in promoting immunization by providing milk powder and oil as incentives to encourage women to bring their children for vaccination. These incentives, popularly referred to as "Bokpi Khab," were extended to antenatal and postnatal women and children to ensure good nutrition alongside immunization.

1982:

The EPI office in Thimphu was moved to NIFH Gelephu, where Dr. Jigme Singay became the National Coordinating Officer and Program Manager. Later, he was transferred to Thimphu as Deputy Director, the Department of Health Services.

1988:

The 66th National Assembly (NA) passed a resolution mandating the full vaccination of all children and pregnant women. This led to Bhutan achieving Universal Child Immunization (UCI) in 1991, a major public health accomplishment.

Healthcare workers traveling to one of the far-flung ORCs in Punakha carrying EPI Vaccines and WFP supplies in 1987

1991:

The EPI office, along with the NIFH, was moved back to Thimphu and was headed by the late Mr. Thinley Dorji as the EPI Program Manager.

2005:

The EPI program was renamed the Vaccine Preventable Disease Program (VPDP) to encompass all VPDs, reflecting the expansion and increased scope of the national immunization effort.

These milestones illuminate Bhutan's extraordinary journey in immunization, driven by the seamless collaboration between national health authorities and global partners. Their collective efforts have not only elevated public health but also broadened vaccination coverage, reflecting a deep commitment to protecting the future of the nation and its people.

CHAPTER 3

Acts, Policies, Guidelines and Governing Bodies

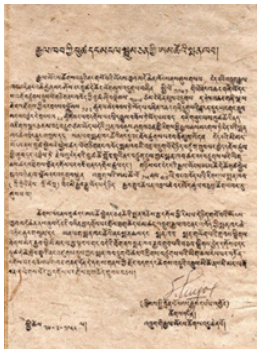
This chapter discusses the acts, policies, guidelines, manuals, and governing bodies of the EPI program in Bhutan.

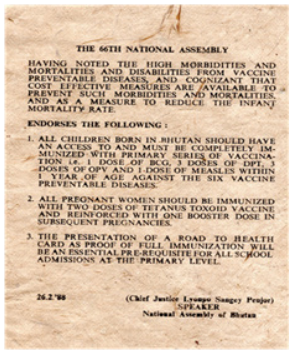
3.1 66th National Assembly (NA) Resolution

Immunization of Children and Pregnant Mothers, Resolution No. 11 adopted at the 66th Session of the National Assembly of Bhutan dated 26th February 1988. Having noted high morbidity, mortality, and disabilities from VPDs, and cognizant that cost-effective measures are available to prevent such morbidities and mortalities, and as a measure to reduce the infant mortality rate, endorsed the following:


Immunization of Children and Pregnant Mothers'

Resolution No. 11




THE 66TH NATIONAL ASSEMBLY

HAVING NOTED THE HIGH MORBIDITIES AND MORTALITIES AND DISABILITIES FROM VACCINE PREVENTABLE DISEASES, AND COGNIZANT THAT COST EFFECTIVE MEASURES ARE AVAILABLE TO PREVENT SUCH MORBIDITIES AND MORTALITIES, AND AS A MEASURE TO REDUCE THE INFANT MORTALITY RATE.

ENDORSES THE FOLLOWING :

1. ALL CHILDREN BORN IN BHUTAN SHOULD HAVE AN ACCESS TO AND MUST BE COMPLETELY IMMUNIZED WITH PRIMARY SERIES OF VACCINATION i.e. 1 DOSE OF BCG, 3 DOSES OF DPT, 3 DOSES OF OPV AND 1 DOSE OF MEASLES WITHIN 1 YEAR OF AGE AGAINST THE SIX VACCINE PREVENTABLE DISEASES.
2. ALL PREGNANT WOMEN SHOULD BE IMMUNIZED WITH TWO DOSES OF TETANUS TOXOID VACCINE AND REINFORCED WITH ONE BOOSTER DOSE IN SUBSEQUENT PREGNANCIES.
3. THE PRESENTATION OF A ROAD TO HEALTH CARD AS PROOF OF FULL IMMUNIZATION WILL BE AN ESSENTIAL PRE-REQUISITE FOR ALL SCHOOL ADMISSIONS AT THE PRIMARY LEVEL.

26.2.'88

(Chief Justice Lyonpo Sangay Penjor)
SPEAKER
National Assembly of Bhutan

National Assembly Resolution, February 1988

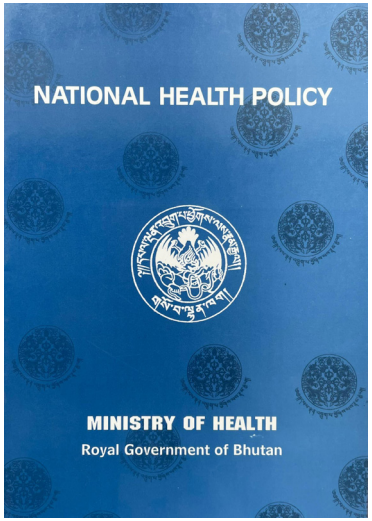
All children born in Bhutan should have access to and must be completely immunized with a primary series of vaccinations i.e. 1 dose of BCG; 3 doses of DTP; 3 doses of OPV and 1 dose of measles within one year of age against the six vaccine-preventable diseases.

All pregnant women should be immunized with two doses of Tetanus Toxoid (TT) vaccine and re-enforced with one booster dose in subsequent pregnancies.

The presentation of a road to health card as proof of full immunization will be an essential pre-requisite for all school admissions at the primary level.

3.2 National Health and EPI Policy and Strategy

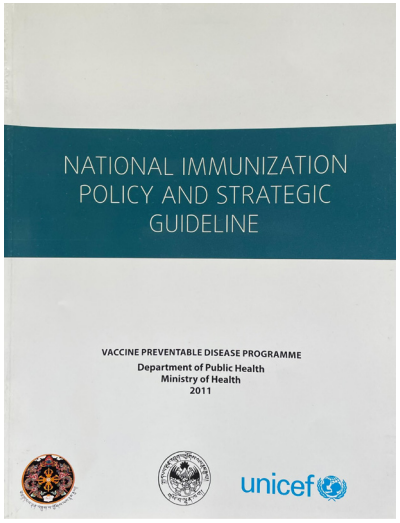
Given the importance of the immunization program, the national health policy document 2011 provides broad policy directives on immunization in Bhutan. The most pertinent clauses under this policy include:



National Health Policy, 2011

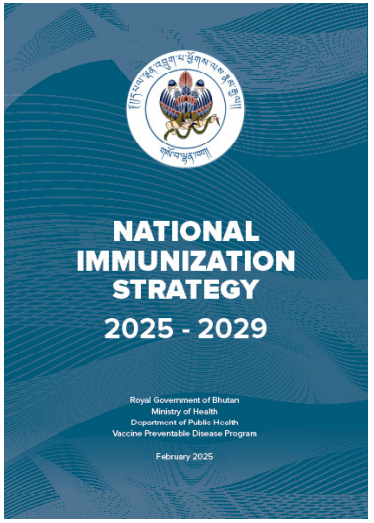
13.2 (b): Free and equitable access to safe, quality, and cost-effective vaccines for all children and pregnant women to protect against VPDs shall be provided.

13.3: The Bhutan Health Trust Fund (BHTF) shall continue to be one of the sources of health financing to provide sustainable universal access to essential drugs and vaccines.



National Immunization Policy and Strategic Guideline, 2011

The National Immunization Policy and Strategic Guidelines of 2011 was developed to strengthen Bhutan's immunization efforts and ensure widespread protection against VPDs, providing a framework for resilient immunization systems and improved population health.



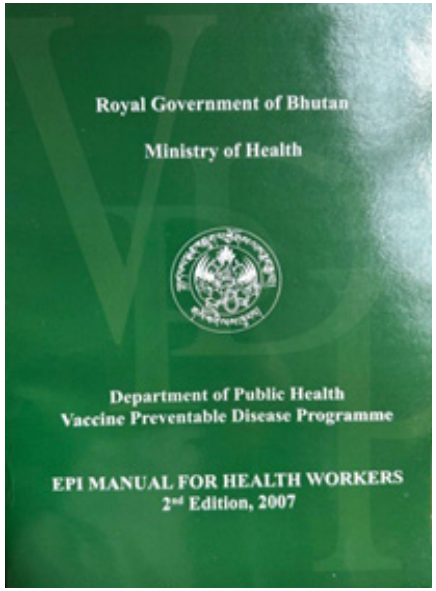
National Immunization and Strategy, 2025

The National Immunization Strategy of 2025 was formulated to sustain high coverage and equitable access to vaccines while strengthening surveillance of VPDs. This strategy offers a framework for vaccine security, new vaccine introduction, and resilient systems, advancing Bhutan's progress toward improved population health.

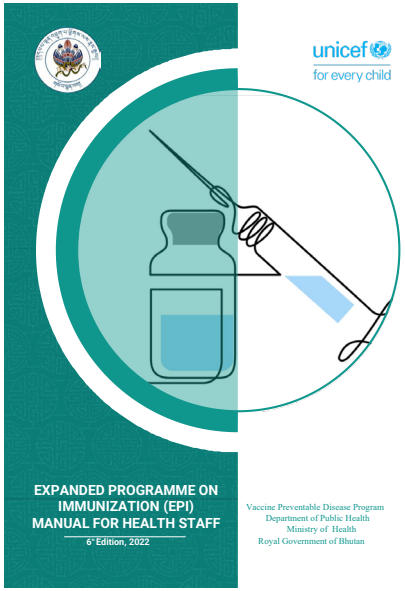
3.3 EPI Manual for Healthcare Workers

The following manual serves as a comprehensive resource designed to guide healthcare professionals in Bhutan in delivering efficient immunization services.

National EPI services manual, 2002



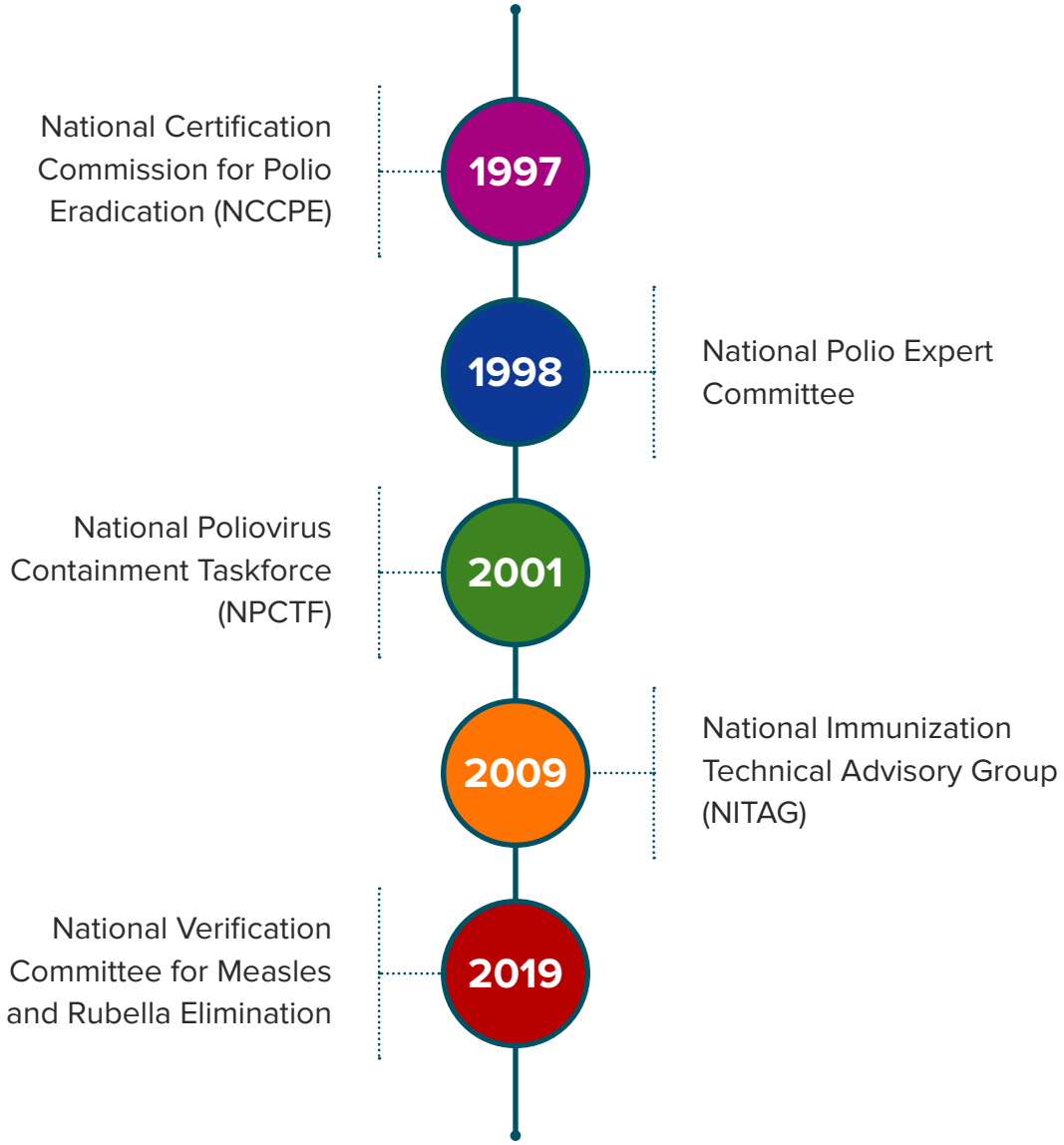
EPI manual for healthcare workers, 2007



Expanded programme on immunization (EPI) manual for health staff, 2022

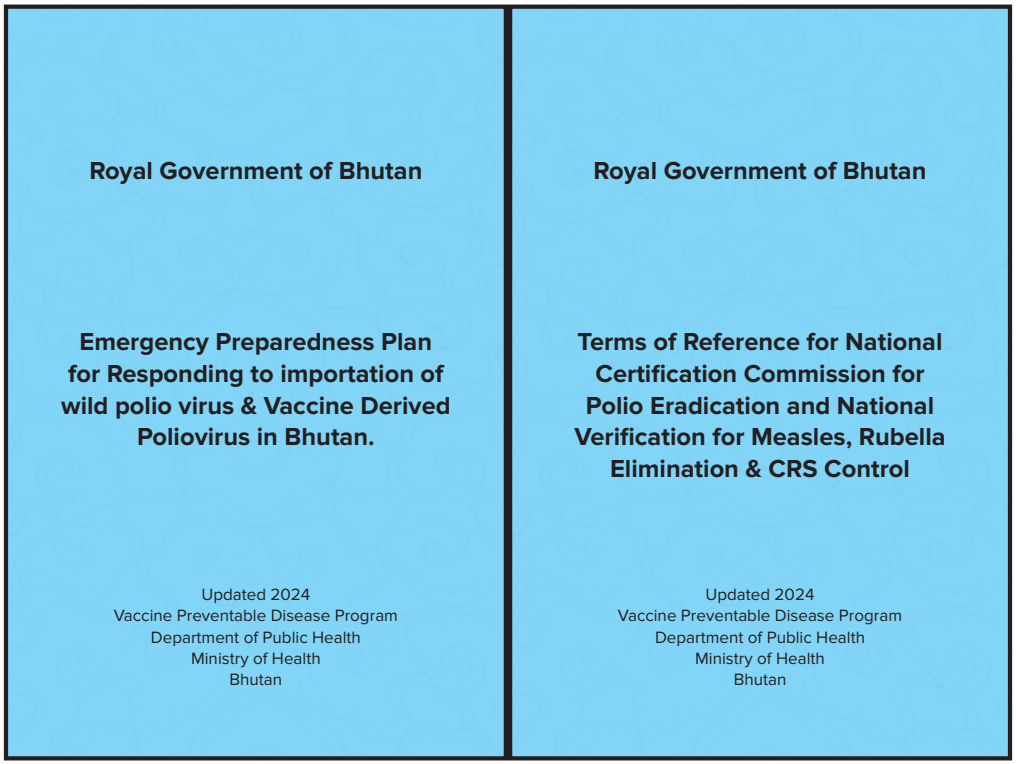
3.4 Advisory Committees for Immunization

The governing committee on immunization in Bhutan comprises key bodies. These entities strengthen immunization programs by providing evidence-based recommendations, guiding the introduction of new vaccines and campaigns, and ensuring the implementation of robust surveillance systems. Their collective efforts drive progress toward eliminating diseases while sustaining the elimination status of those already eliminated.



National Commission for Certification of Polio Eradication (NCCPE)

The NCCPE oversees the verification and documentation process to confirm the interruption of polio transmission and sustain polio-free status.

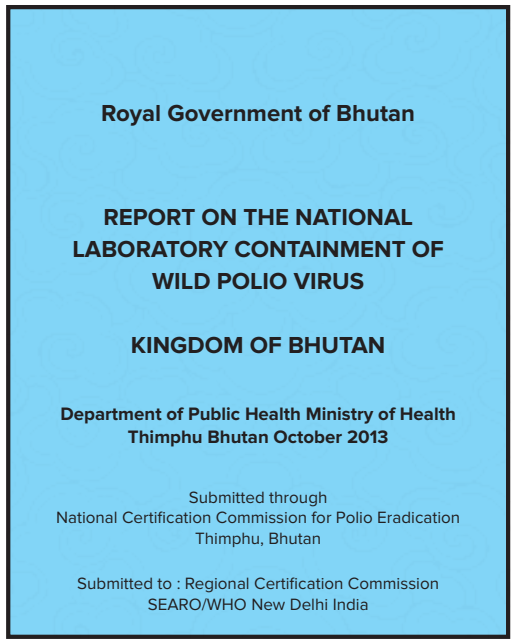


National Polio Expert Committee

The Committee is entrusted for reviewing AFP cases and making the final classification of each case.

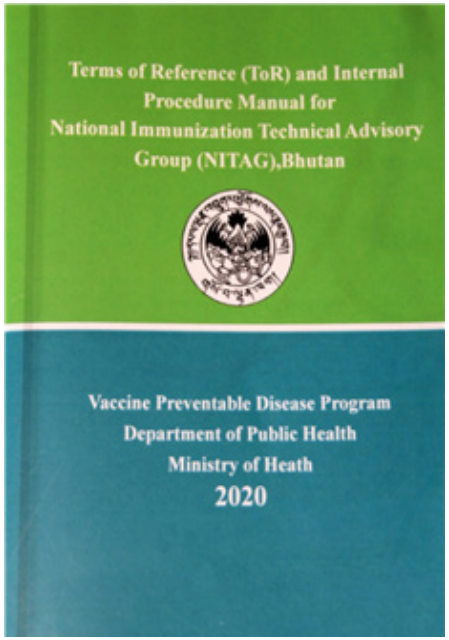
National Poliovirus Containment Taskforce (NPCTF)

The NPCTF oversees and coordinates all polio containment activities in the country, including the safe handling, storage, and destruction of IM/PIM, while also providing guidance and training to stakeholders.



National Immunization Technical Advisory Group (NITAG)

The NITAG provides independent, evidence-based guidance on immunization policies and programs to support decision-making. Its role includes advising on vaccine introduction, scheduling, prioritization, and strategies to improve immunization coverage, ensure vaccine safety, and enhance public health outcomes.



ToR for NITAG, Bhutan, 2020

NITAG Meeting on COVID-19 Vaccination Strategy During Lockdown, 21st April 2020, Thimphu

NITAG members deliberating on the switch from two doses of the HPV vaccine to a single dose, 2024, Thimphu

National Verification Committee (NVC) for Measles and Rubella

The NVC supports progress toward elimination of measles and rubella by providing guidance, monitoring progress, reviewing data, conducting assessments, and advocating for alignment with regional and global health goals.

2nd NCCPE/NVC meeting, November 2024, Thimphu

CHAPTER 4

Vaccine-Preventable Disease (VPD) and Adverse Events Following Immunization (AEFI) Surveillance

4.1 Vaccine-Preventable Disease (VPD) Surveillance

The chronological order of events and initiatives related to VPDs surveillance are as follows:

1988:
The VPDs surveillance in Bhutan was initiated, with reporting conducted through the Annual Health Bulletin for diseases such as poliomyelitis, diphtheria, pertussis, measles, tuberculosis, and neonatal tetanus.

1980s:
The Public Health Laboratory (PHL) was established under the Department of Medical Health Services within the Ministry of Social Service.

1997:
Acute Flaccid Paralysis (AFP) surveillance for polio began in 28 hospitals and 199 Basic Health Units (BHUs).

2003:

The measles and rubella laboratory at the Public Health Laboratory in Thimphu was established, enabling timely testing for these diseases and immediate control measures.

2010:

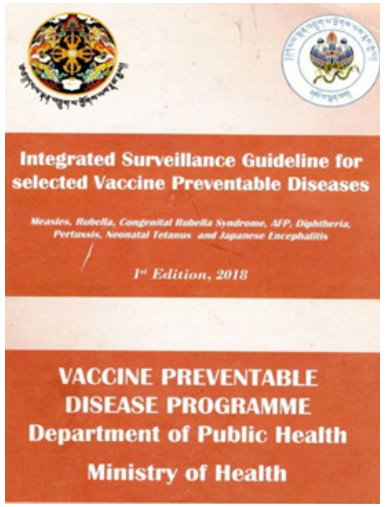
The scope of surveillance expanded to include measles, diphtheria, pertussis, and neonatal tetanus alongside AFP surveillance, increasing the number of reporting sites to 299 PHCs and 54 hospitals.

2015:

The Public Health Laboratory was upgraded to the Royal Centre for Disease Control (RCDC), expanding its capabilities to include both infectious and non-infectious disease laboratory services, as well as disease surveillance and epidemiology services. The establishment of the RCDC significantly enhanced the surveillance system in Bhutan, notably through the launch of the online National Early Warning, Alert, Response Surveillance, and Information System (NEWARSIS), enabling health centers to quickly identify and respond to outbreaks. All VPDs are immediately notifiable.

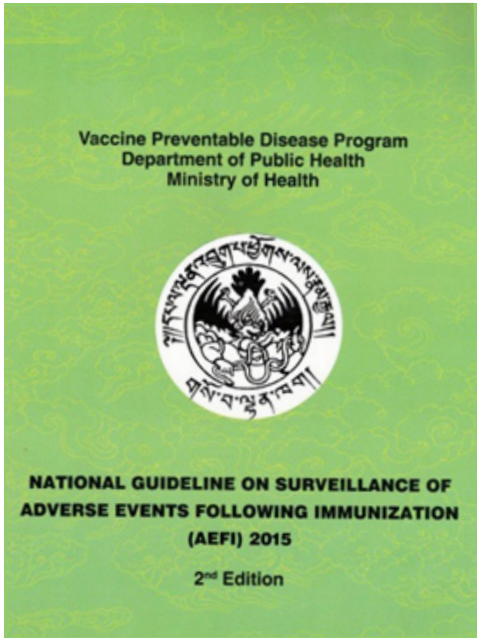
Despite these advancements, Bhutan currently lacks a dedicated polio laboratory, and all AFP samples are sent to the WHO National Reference Laboratory in Bangkok, Thailand, for testing.

Vaccine-preventable disease Surveillance Guidelines

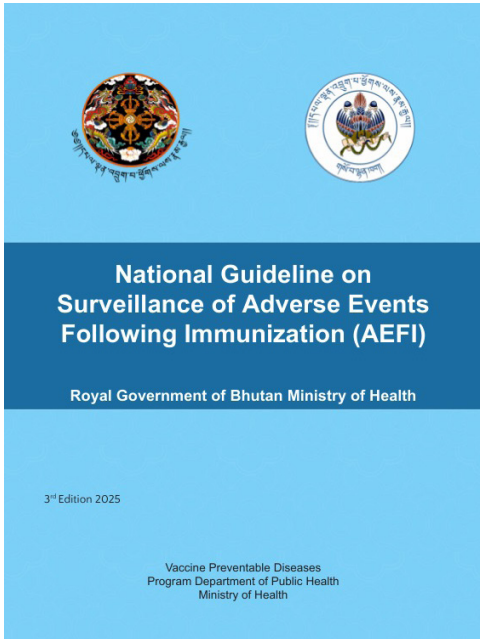


Integrated Surveillance Guideline for selected VPDs

4.2 Adverse Events Following Immunization (AEFI) Surveillance



National Guideline on Surveillance of AEFI, 2015



National Guideline on Surveillance of AEFI, 2025

Adverse Events Following Immunization (AEFI) surveillance in Bhutan has been a critical component of the EPI since its inception and the reporting system was strengthened in 2003 across the 20 districts.

The reporting sites include district hospitals and PHCs. The number of reported AEFIs has increased due to enhanced awareness and training among healthcare providers, with causality assessments conducted for serious AEFIs. Bhutan's commitment to AEFI monitoring has strengthened its immunization safety framework, although ongoing efforts are needed to maintain high vaccine safety standards and public confidence.

The chronological order of events and initiatives undertaken are as follows:

2003:

The establishment of a dedicated AEFI reporting system was implemented to enhance the monitoring of vaccine safety and initiation of training.

2010:

The first AEFI surveillance system was developed, and a comprehensive training program for healthcare workers was launched to improve skills in detecting, reporting, and managing AEFI.

2015:

Updated guidelines on AEFI detection and reporting, ensuring that healthcare workers had clear protocols to follow in case of adverse events.

2020:

The Bhutan Vaccine System (BVS) was developed to facilitate real-time monitoring of AEFI during the COVID-19 vaccination campaign. This system allowed for efficient data collection and management.

2025:

The AEFI guideline was revised to incorporate new changes, especially for the new vaccines introduced, and practices according to the latest WHO recommendations

Continuous trainings are provided to healthcare workers on AEFI.

VPD and AEFI surveillance conducted at border hospitals: in 2018 at Samdrup Jongkhar Hospital by Dr. Bhim Nath, CMO of Pemagatshel, and in 2023 at Samdrup Choling Hospital by Dr. Kezang Dorji, CMO of Samdrup Jongkhar. Both hospitals are located near the borders with neighboring countries.

CHAPTER 5
Immunization Supply Chain and Cold Chain System

5.1 Evolution of EPI Cold Stores

1980s:
Only one EPI cold store in Thimphu.

1982:
The Regional EPI cold store was established in Gelephu.

1982:
The EPI cold store in Thimphu was relocated to Phuntsholing.

The Regional EPI cold store was established in Samdrup Jongkhar.

1998:
The Phuntsholing cold store was moved back to Thimphu.

2004:
The Samdrup Jongkhar cold store was relocated to Mongar.

5.2 Vaccine Transportation

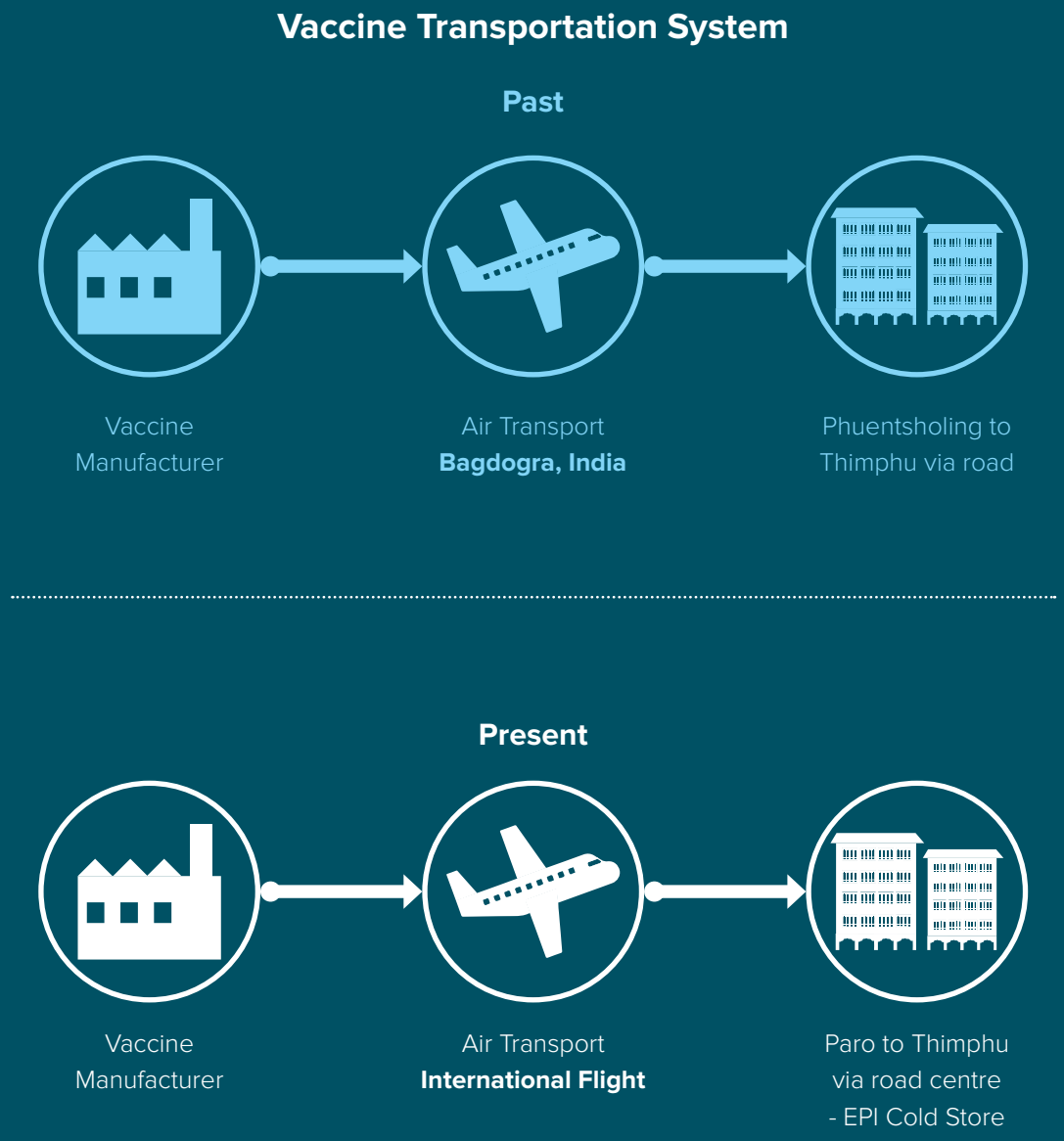
» In the 1980s, Bhutan had just one EPI cold store, located in Thimphu, where vaccines were stored in deep freezers and refrigerators.

» With no air service to Bhutan, vaccines had to be collected from Bagdogra Airport in West Bengal, India, and transported by road in cold boxes.

» They were stored overnight at the Medical Supply Depot in Phuntsholing before being sent to the Thimphu cold store the next day through MSD vehicle.

» Lacking refrigerated vans, vaccines were packed in cold boxes or carriers and transported to districts by public buses, Bhutan Government Transport Service (BGTS) by an EPI technician in the 1980s.

» It wasn't until 1997 that vaccines were directly delivered to Paro International Airport.



Transport of EPI Vaccines via Bhutan Government Transport Service (BGTS) in the 1980s

First EPI Refrigerated Van used for vaccine transport, 1985

5.3 Cold Chain Equipment

» Early vaccination efforts in Bhutan lacked a robust cold chain system, relying on simple ice boxes for storage. Without advanced equipment, healthcare workers struggled to maintain vaccine potency during transport, leading to wastage and limited coverage, especially in remote areas. Despite their dedication, the absence of proper equipment hindered their impact.

> *In the past, there was no cold chain system in place as we have today. We transported the BCG vaccine in our pockets or in leather bags, which weighed about 5 kilograms, including the Tuberculin testing kits. The vaccine was administered to children after heating the needle with a spirit lamp. Additionally, there was no established reporting mechanism for AEFI related to the BCG vaccine during that period.*
>
> *- Mr. Kalu Drukpa, BCG Technician (1975),*
> *(Retired Deputy Chief District Health Officer, 2016).*

However, the evolution of Bhutan's cold chain system began in earnest with international support and recognition of the need for enhanced vaccine storage capabilities. Key developments include:

2005:
An assessment of the cold chain system was initiated, leading to updated inventories and a focus on modernizing equipment.

2011:
A comprehensive inventory of cold chain equipment was updated, which included an evaluation of the existing infrastructure across various health facilities.

2012:
A detailed assessment by a UNICEF consultant highlighted areas for improvement, including supply chain management and maintenance training for cold chain technicians.

2021:
The Government of Japan provided financial support to the Ministry of Health, Bhutan to procure vaccine cold chain equipment worth USD 1.5 million to support COVID-19 Vaccination program and upgrade the cold chain system for routine vaccines in the country. The equipment was procured through UNICEF procurement system to ensure quality of the equipment. All healthcare facilities are equipped with WHO pre-qualified cold chain equipment capable of storing vaccines at the recommended temperature.

2022:
An effective vaccine management assessment was conducted through UNICEF support, which highlighted improvements in cold chain capacity; however, there were other areas to improve, such as vaccine waste management.

Ms. Kyoko Hokugo, Minister of Economic Cooperation, Embassy of Japan in India handed over vaccine cold chain equipment to Mr. Pemba Wangchuk, Secretary, Ministry of Health, in the presence of Ms. Marie-Consolée Mukangendo, UNICEF Representative, October 2022, Bhutan

The Government of Japan, JCV, GAVI, ADB, and other development partners, through UNICEF, have significantly bolstered Bhutan's cold chain capacity by increasing its storage capacity more than threefold between 2020 and 2023.

This support has been instrumental in enabling Bhutan to effectively store COVID-19 and routine vaccines across all healthcare facilities.

Bhutan's healthcare facilities use a range of specialized cold chain equipment including solar-powered refrigerators, to ensure the effective storage and transportation of vaccines.

Service with compassion: Our dedicated healthcare workers providing home based vaccination service

Cold Chain Equipment used

1. **Refrigerators:** These storage units safely store vaccines at the required temperatures, preserving their potency and ensuring they remain effective until administration.

Refrigerators used in the past

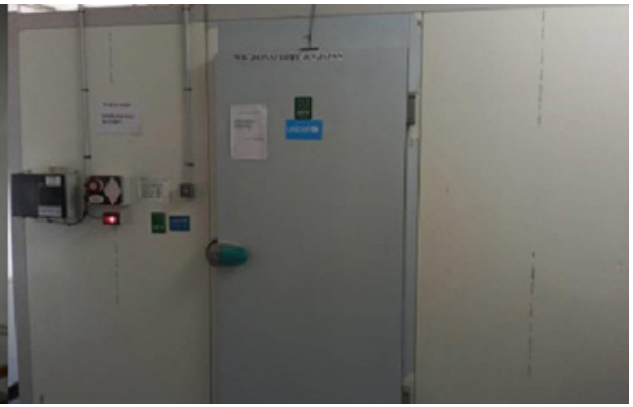
Kerosene Electric Refrigerator

Domestic Electric Refrigerator

Ice-Lined Refrigerator (ILR)

Refrigerators used at Present

Walk-In Cooler, Central EPI Store, Thimphu Bhutan



Walk-In Freezer

ILR and Combo Refrigerators

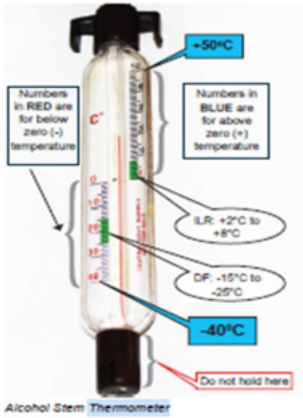
2. **Cold Boxes and Vaccine Carriers:** These portable storage devices are used to transport vaccines while maintaining required temperatures, ensuring that vaccines remain potent and safe from the point of storage to the point of administration.

Vaccine Carriers and Cold Boxes used in the past

Vaccine Carriers and Cold Boxes used at present

3. **Temperature Monitoring Devices:** These devices are essential for tracking conditions within storage units, alerting health workers to any temperature deviations and ensuring vaccines remain potent and safe.

Temperature monitoring devices used in the past

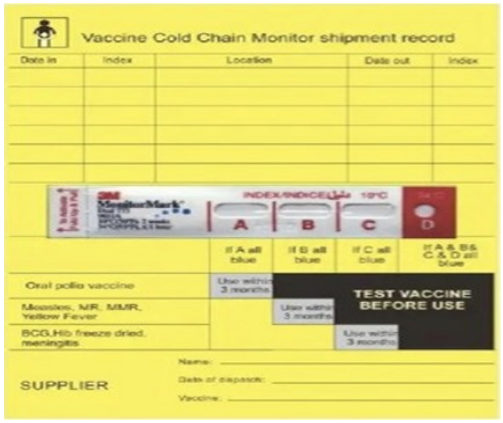


Mercury Thermometer

Dial Thermometer

Freeze-tag

Temperature recording paper with a pen (inkless) used in the past



Vaccine Cold Chain Monitor Shipment used in the past

Temperature monitoring devices used at present

FreezeAlert

Temperature Excursion Device

4. **Generators:** To ensure the continuous operation of refrigeration units during power outages, generators are essential for maintaining the integrity of stored vaccines.

Generator used in EPI cold stores

Installation of solar-powered refrigerators at Laya PHC, Gasa, September, 2024

5.4 Vaccine Temperature Monitoring Devices

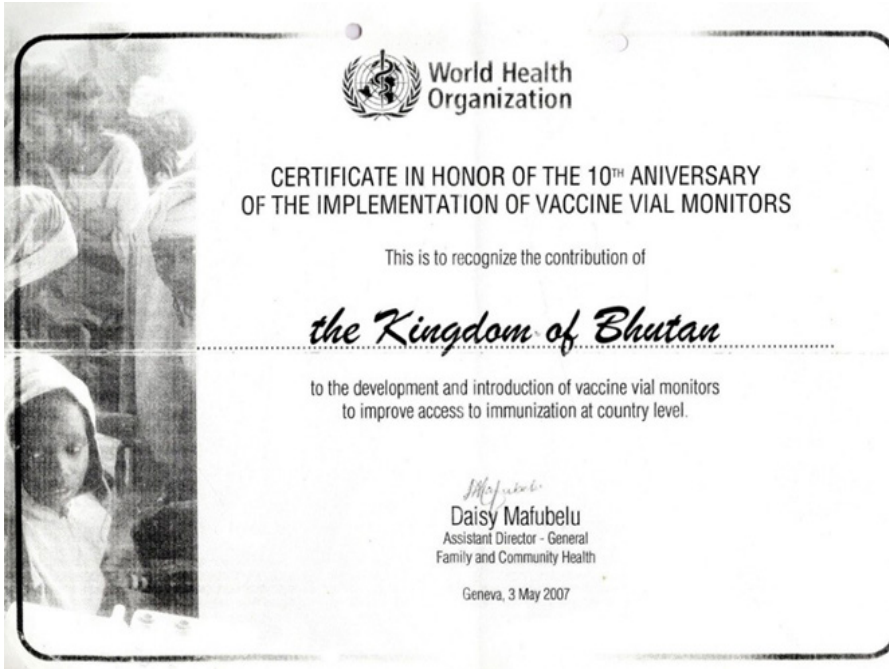
» At the inception of the program, basic monitoring tools such as dial thermometers, paper records, and cold chain monitors were used to ensure vaccine temperature integrity, as Vaccine Vial Monitors (VVMs) were not yet available.

» Bhutan introduced VVMs in 1999, significantly improving the detection of vaccine exposure to heat and enhancing overall vaccine safety. For freeze-sensitive vaccines, freeze tags identified any freezing incidents, and shake tests were conducted whenever vaccine viability was in question.

» Technological advancements have transformed vaccine temperature monitoring. Devices such as log tags and 30-DTRs have been integrated into the cold chain system, enabling healthcare workers to track vaccine conditions more accurately and efficiently.

» Recent innovations include remote sensing devices installed in all cold chain equipment, providing immediate alerts to staff in case of temperature excursions and allowing for prompt corrective action.

» Today, all health facilities in Bhutan are equipped with real-time monitoring devices, supporting centralized data tracking, quick resolution of storage issues, and ensuring vaccine efficacy. This approach strengthens program reliability and helps maintain high vaccination coverage, contributing to improved public health outcomes.


World Health Organization

CERTIFICATE IN HONOR OF THE 10TH ANIVERSARY OF THE IMPLEMENTATION OF VACCINE VIAL MONITORS

This is to recognize the contribution of

the Kingdom of Bhutan

to the development and introduction of vaccine vial monitors to improve access to immunization at country level.

Daisy Mafubelu
Assistant Director - General
Family and Community Health

Geneva, 3 May 2007

WHO certificate for the impact study on VVMs and new vaccine handling practices from July 1997 to November 1998, Bhutan

CHAPTER 6
Introduction of New and Underutilized Vaccines and Injection Devices

In 1979, there were only 6 antigens; however, the program now includes 15 antigens including influenza, HPV and COVID-19 vaccines in routine immunization.

6.1 Introduction of Pentavalent Vaccine

» In 2009, Bhutan introduced the pentavalent vaccine to protect children from five serious diseases: diphtheria, tetanus, pertussis (DTP), hepatitis B, and Hib. This move aimed to reduce the incidence of VPDs, especially Hib, which was a major cause of bacterial meningitis and pneumonia in young children, contributing to high mortality rates.

» Supported by GAVI funding, the introduction of the pentavalent vaccine was crucial for strengthening Bhutan's immunization program. However, the initial rollout faced setbacks when reports of serious AEFI cases led to the suspension of the program just a month after its launch. This prompted investigations by both national health authorities and the WHO, ultimately leading to a temporary halt of the program.

» Despite these challenges, the pentavalent vaccine was

successfully reintroduced in 2011, regaining public confidence and achieving high coverage, thereby ensuring lasting protection for Bhutan's children.

Launch of the DTP-HepB-Hib (Pentavalent) vaccine into the routine immunization schedule by the Health Minister Zanglay Dukpa, on 1st September 2009 at JDWNRH, Thimphu

Launch of the nationwide HPV vaccination campaign for girls by Her Majesty the Grand Queen Mother Ashi Kesang Choden Wangchuck on 5th May 2010 at Motithang High School

6.2 Introduction of HPV Vaccine for girls

» In 2010, under the esteemed patronage of Her Majesty Gyalyum Kesang Choden Wangchuck, the Ministry of Health launched three nationwide HPV vaccination campaigns for girls aged 12 to 18, addressing the high burden of cervical cancer. This initiative was supported by Merck Sharp and Dohme (MSD) and the Australian Cervical Cancer Foundation (ACCF), highlighting international collaboration to advance women's health in Bhutan.

» In 2011, the vaccine was added to the routine immunization schedule for all 12-year-old girls.

» However, the original three-dose schedule, requiring long intervals between doses, made it difficult to monitor coverage through routine health facilities. As a result, vaccination rates in 2011-2013 were lower than those achieved through the school-based approach of 2010.

» To improve coverage, the strategy was revised in 2014 to focus on school-based vaccinations for all Grade VI girls, leveraging Bhutan's 95% primary school enrollment rate while keeping the 12-year age limit for out-of-school girls.

» Based on recommendations from the NITAG, the HPV vaccination schedule for girls under 15 years of age was changed to a two-dose regimen in 2016.

» Later, in 2025, following NITAG recommendations, it was further switched to a single-dose regimen.

6.3 H1N1 Vaccination

» In April 2009, a new H1N1 influenza virus emerged in Mexico and rapidly spread worldwide, sparking the first influenza pandemic since 1968.

» In Bhutan, schools experienced outbreaks in 2010, prompting urgent action. In response, the WHO intervened, providing the H1N1 vaccine to all member countries, including Bhutan.

» The priority groups included individuals with medical conditions, the elderly, young children, healthcare workers, and pregnant women. By the end of 2010, Bhutan had successfully vaccinated 48,633 people, reaching 75.4% of the target population.

6.4 Introduction of Influenza Vaccine

In 2019, Bhutan introduced influenza vaccination for five high-risk groups: individuals with medical conditions, the elderly (65+), children (6–23 months), healthcare workers, and pregnant women. In 2021, as part of the COVID-19 response, the program was expanded to cover the general population to reduce the risk of co-infection. Currently, the influenza vaccine is again provided to the initial high-risk groups, ensuring targeted protection for the most vulnerable.

Launch of the seasonal influenza vaccine on 6th November 2019

Launch of the HPV vaccination program for boys by the Health Minister Dechen Wangmo, and attended by Dasho Paljor Dorji (Dasho Benji) on 28th September 2020 at Changangkha Lhakhang, Thimphu

6.5 Introduction of HPV Vaccine for boys

In 2020, HPV vaccination for boys was introduced into the routine immunization schedule, despite the challenges of the COVID-19 pandemic. The program initially targeted boys aged 11 to 14 years in schools and monasteries. Starting in 2021, it expanded to include boys in Class Six and out-of-school 12-year-olds, with support from MSD. This initiative aims to reduce the risk of HPV-related infections among boys.

6.6 Introduction of COVID-19 Vaccine

» Bhutan's first COVID-19 case was reported in March 2020 when a 76-year-old tourist tested positive, prompting swift action from the Ministry of Health.

» By January 2021, preparations for the national vaccination campaign were underway, with guidelines and healthcare worker training completed by March. To ensure no one was left behind, vaccines were delivered to remote areas by helicopter, reaching hard-to-access regions like Lhuentse, Samdrup Jongkhar, Samtse, and Gasa.

» The campaign was supported by the launch of the Bhutan Vaccine System (BVS), an innovative web-based platform for real-time monitoring of vaccine distribution, coverage, and AEFIs.

» Initially designed for COVID-19, BVS now tracks vaccinations for HPV and influenza in high-risk groups, enhancing the country's vaccination efforts.

» Through meticulous planning and resourceful strategies, Bhutan's vaccination campaign achieved over 90% coverage among all target groups. The country's success, even in the face of geographic challenges, is a testament to the power of technology, community engagement, and strategic planning, setting an inspiring example for global health campaigns.

Launch of the COVID-19 vaccination program by the Health Minister Dechen Wangmo, on 27th March 2021 in Thimphu, in the presence of the Indian Ambassador, Her Excellency Ruchiro Kambo

Transportation of COVID-19 vaccines to far-flung health facilities

Hon'ble Prime Minister Dr. Lotay Tshering receiving the second dose of the COVID-19 vaccine, 2021, Thimphu, Bhutan

The table below shows COVID-19 vaccination coverage in 2022.

Vaccine	Age Groups	1st dose coverage (%)	2nd dose coverage (%)	3rd dose coverage (%)	4th dose coverage (%)	5th dose coverage (%)
AstraZeneca	>18 years	99.9	-	-	-	-
Moderna	>18 years	-	97.4	89.1	71.0	60.0
Pfizer	12 - 17 years	100	97.0	83.9		
Pfizer	>5 – 11years	100	94.0	97.7		

6.7 Injection Devices for Immunization Program

1960s:
For BCG vaccinations, needles had to be sterilized by flaming them with a spirit lamp before administering the vaccine to children.

1990s:
Glass syringes and reusable needles were the standard for administering EPI vaccines. These syringes and needles required boiling in a pot sterilizer for 30 minutes, followed by a cooling period of at least 15 minutes before use.

Eventually, they were replaced by reusable plastic syringes, which were later sterilized using a steam sterilizer.

1997:
Steam sterilizers were replaced by disposable syringes, streamlining the routine immunization program and improving safety.

2003:
Disposable syringes were replaced with Auto-Disable (AD) syringes for routine immunization. This innovation significantly reduced the workload for healthcare workers by eliminating the need to sterilize syringes and needles, while also enhancing injection safety and reducing the incidence of AEFIs.

BCG vaccine was administered to the children after the needle was flamed with a spirit lamp

Steam sterilizer used in 1996 (for boiling reusable syringes and needles for vaccination)

Auto-Disable Syringes currently in used: 0.05 Ml and 0.5 Ml

CHAPTER 7
Vaccination Coverage

7.1 Universal Child Immunization (UCI)

» In February 1991, Bhutan declared Universal Child Immunization (UCI) following a joint Government/WHO/UNICEF EPI survey and review conducted from January 25 to February 13, 1991.

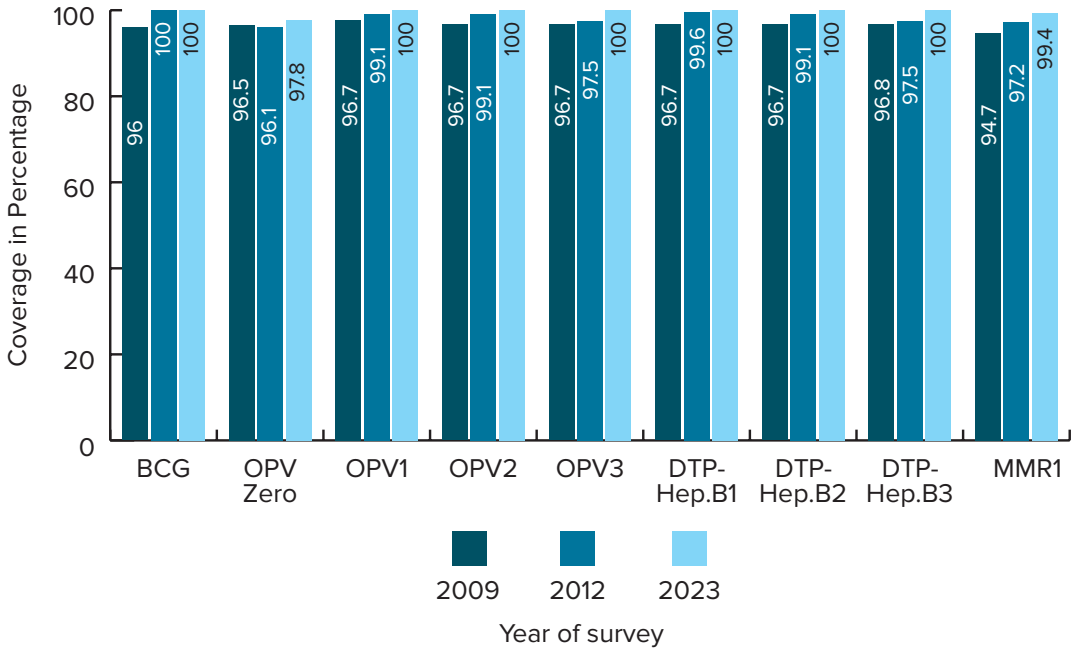
» According to WHO criteria, achieving UCI required an immunization coverage rate of over 80%. Bhutan surpassed this benchmark, achieving 84% full immunization coverage for children under one year of age. Since then, the country has consistently maintained high routine immunization coverage.

Lyonpo D. Tshering, Finance Minister declaring UCI, Seated from left are Ms. Eva Nisseus (UNICEF), Lyonpo (Dr.) Tobgyel (Minister for Health) Dr. A E Kawengian (WHO) and Mr. Terence Jones (UNDP) in 1991, Thimphu

Bhutan received the Gavi Certification Award for Best Performance in Routine Immunization Services during the Gavi International Conference in 2009, Hanoi, Vietnam

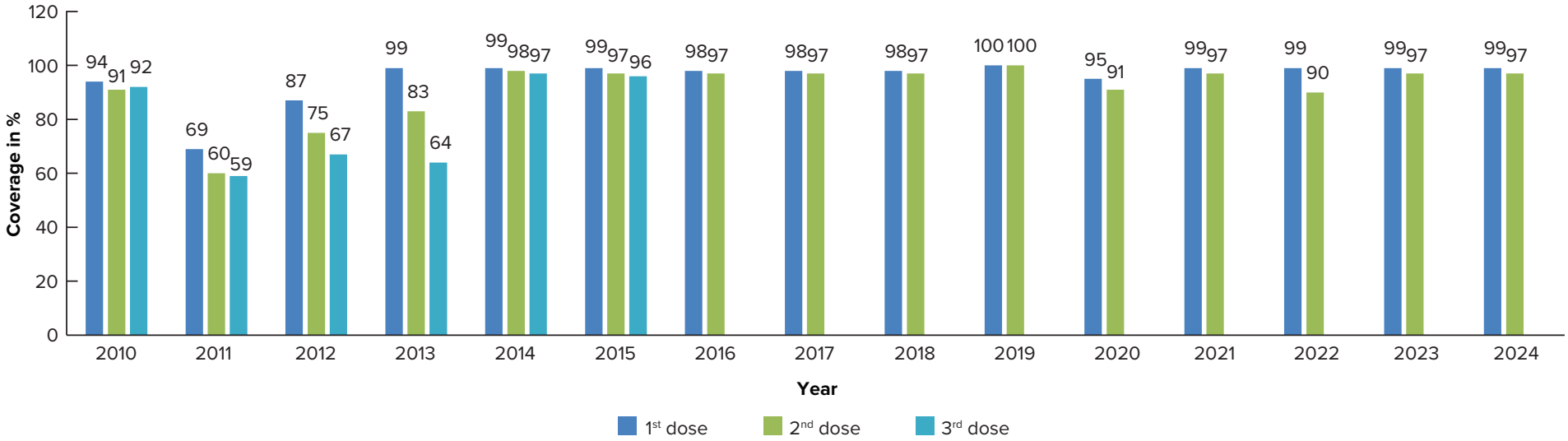
7.2 National Vaccination Coverage through Periodic Surveys

The national vaccination coverage has been periodically assessed through EPI coverage surveys. The coverage based on different surveys are as follows:

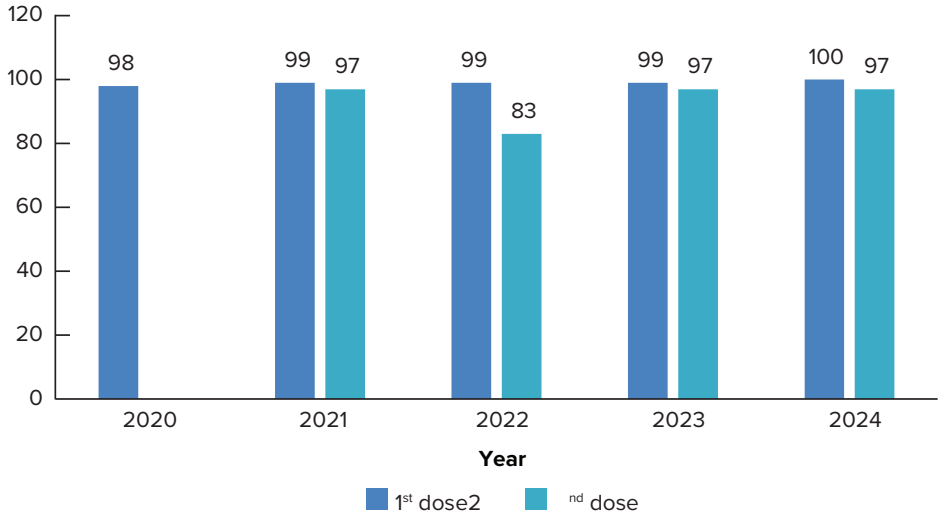


National Health Survey Immunization coverage 2009, 2012 and 2023

HPV Vaccination Coverage for Girls



HPV Vaccination Coverage for boys



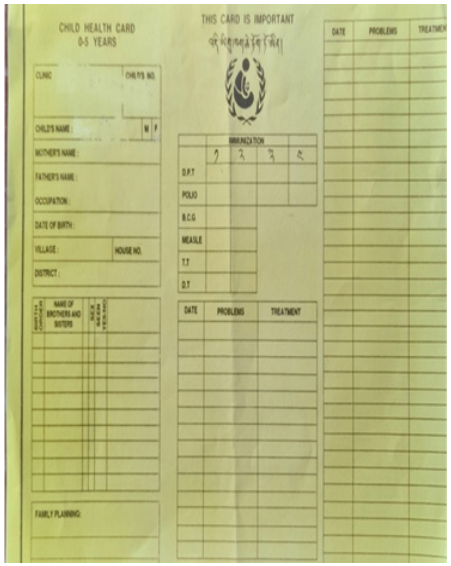
7.3 Vaccine Procurement

The routine vaccines are procured through UNICEF to ensure quality, safety, and timely delivery. All routine vaccines are WHO-prequalified. This partnership guarantees that Bhutan's immunization program relies on trusted, safe vaccines, supporting the health and well-being of the population.

7.4 Evolution of Data Reporting System

» In the early days of the immunization program, data was recorded manually on paper, with handwritten collection and compilation initiated in 1984.

- In 2014, Bhutan adopted the DHIS2 system, which enabled the collection of aggregated immunization data and greatly improved data management and accessibility.
- Initially, caregivers were provided with a yellow Maternal and Child Health (MCH) card to record vaccination dates and details.
- Today, they receive an MCH handbook that includes the complete vaccination schedule, offering a more comprehensive and organized record-keeping system.
- Vaccination data is now also integrated into the electronic Patient Information System (e-PIS).



Child Health Card used in the past Current MCH handbook

7.5 Measles Vaccination Campaign

1979:

The measles vaccine was introduced.

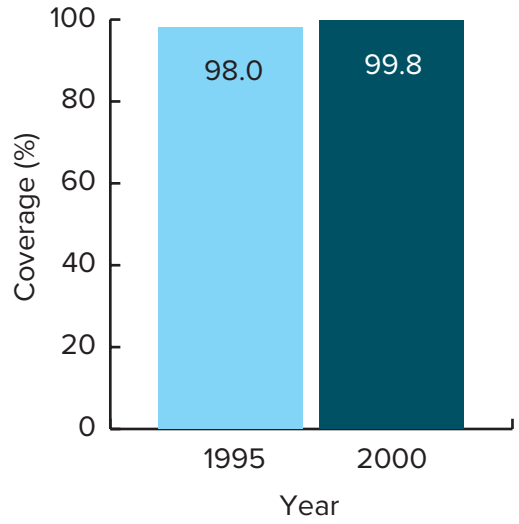
1995:

To improve immunization coverage, a nationwide measles vaccination campaign targeting children aged 9 months to 15 years was conducted. Despite these efforts, measles outbreaks continued in some districts.

2000:

In response, another nationwide campaign was conducted for the same age group. This initiative aimed to further enhance vaccination coverage and reduce the risk of future outbreaks. As part of the 2000 campaign, vitamin A supplements were also provided to children aged 6 months to 5 years to support overall child health.

Nationwide Measles Vaccination Campaign Coverage 1995 and 2000



7.6 Measles and Rubella (MR) Vaccination Campaign

2006:

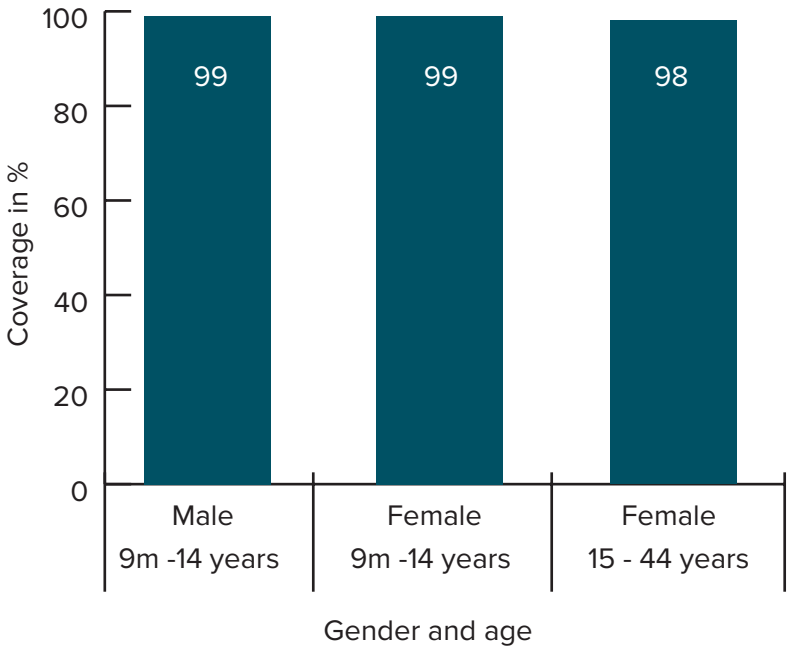
Bhutan launched a nationwide Measles and Rubella (MR) vaccination campaign targeting children aged 9 months to 14 years and women of childbearing age (15–45 years). The goal was to eliminate measles by maintaining high immunization coverage and reducing measles-related morbidity and mortality across all age groups. In the same year, the measles vaccine was replaced with the MR vaccine.

2016:

In response to an increase in mumps cases, the Measles, Mumps, and Rubella (MMR) vaccine was introduced into the routine immunization schedule to provide protection against all three diseases.

Her Majesty the Queen Mother Gyalyum Sangay Choden Wangchuck, UNFPA Goodwill Ambassador, Bhutan, with UNICEF Country Representative Anjoa, observing the MR campaign at Kabesa Village, Dechencholing, Thimphu, 17th March 2006

National Rubella and Measles Vaccination Campaign Coverage, 2006, by Age Group and Gender



The MR campaign vaccination coverage in 2006 is as indicated in the above bar graph.

Launch of the MR campaign by the Health Minister (Dr.) Jigme Singay on 16th March 2006 at Tsakaling Primary School, Mongar

A team of International Observers during MR campaign, 2006

Vaccination Catch-up Campaigns (High-Risk and Hard-to-Reach Areas)

Bhutan has consistently reached high-risk and hard-to-reach areas through targeted catch-up vaccination campaigns to enhance vaccination coverage. The following two case studies highlight Bhutan's steadfast commitment to improving vaccination rates and ensuring that no one is left behind.

Case Study 1: Vaccination Catch-Up Campaign in Khelephu Village, Tashigang District, 2015

Khelephu Village, under Merak Gewog, Tashigang District, is one of the most remote areas, inhabited by a nomadic population. It is a two-day walk from the nearest health facility, Zangthi Primary Health Center, which falls under Samdrup Jongkhar District.

As part of the World Immunization Week celebration in 2015, a catch-up vaccination campaign was conducted in Khelephu Village. In addition to providing vaccines to unvaccinated children and adolescents, advocacy and awareness programs were implemented to highlight the importance of immunization and generate demand for vaccination in this hard-to-reach area.

The total number of children vaccinated during the catch-up campaign is as follows:

Sl. No	Vaccine	Total children vaccinated
1	BCG	2
2	OPV0	2
3	OPV1	1
4	OPV2	2
5	OPV3	4
6	Pentavalent 1	1
7	Pentavalent 2	2
8	Pentavalent 3	4
9	MR1	1
10	MR2	2

Mr. Jampel Dorji, Health Assistant from Zangthi PHC, and Dr. Nayaran Rizal from Jomotshangkha Hospital conducting health education and a vaccination campaign with the nomadic population in Khelephu Village in April 2015, during World Immunization Week

Case Study 2: Vaccination Catch-Up Campaign in Laya Gewog, Gasa District, 2019

Laya Gewog is one of the most remote areas under Gasa District. The gewog is located a two-day walk from the Gasa district administration.

As part of the World Immunization Week celebration in 2019, a catch-up vaccination campaign was conducted in Laya Gewog. In addition to providing vaccinations, advocacy and awareness programs were carried out to highlight the importance of immunization and generate demand for vaccines.

The total number of people vaccinated during the catch-up campaign is as follows:

Sl. No	Antigen	Total population vaccinated
1	MR (9 months -45 years)	658
2	OPV (0-5 years)	92

Mrs. Migma Dolma Tamang, Health Assistant, providing vaccination services to the people of Laya Gewog during World Immunization Week, 2019

7.7 Outreach Clinic (ORC)

» The Outreach Clinic (ORC) is a key component of Bhutan's primary healthcare system, established in 1979 to provide essential services to remote areas. Aligned with the Alma-Ata Declaration of 1978, which emphasized universal health coverage, ORCs have expanded from 350 in 1989 to 555 in 2024, addressing the challenges of rugged terrain and limited access.

» ORCs offer services such as Maternal and Child Health, immunization, basic care, and disease surveillance. Their efforts have significantly contributed to high immunization rates and disease elimination initiatives.

» As Bhutan strives for universal health coverage, ORCs remain critical in ensuring healthcare access for rural populations.

Administration of the Tetanus-diphtheria (Td) vaccine during ORC, Thrisa, Zhemgang, 2023

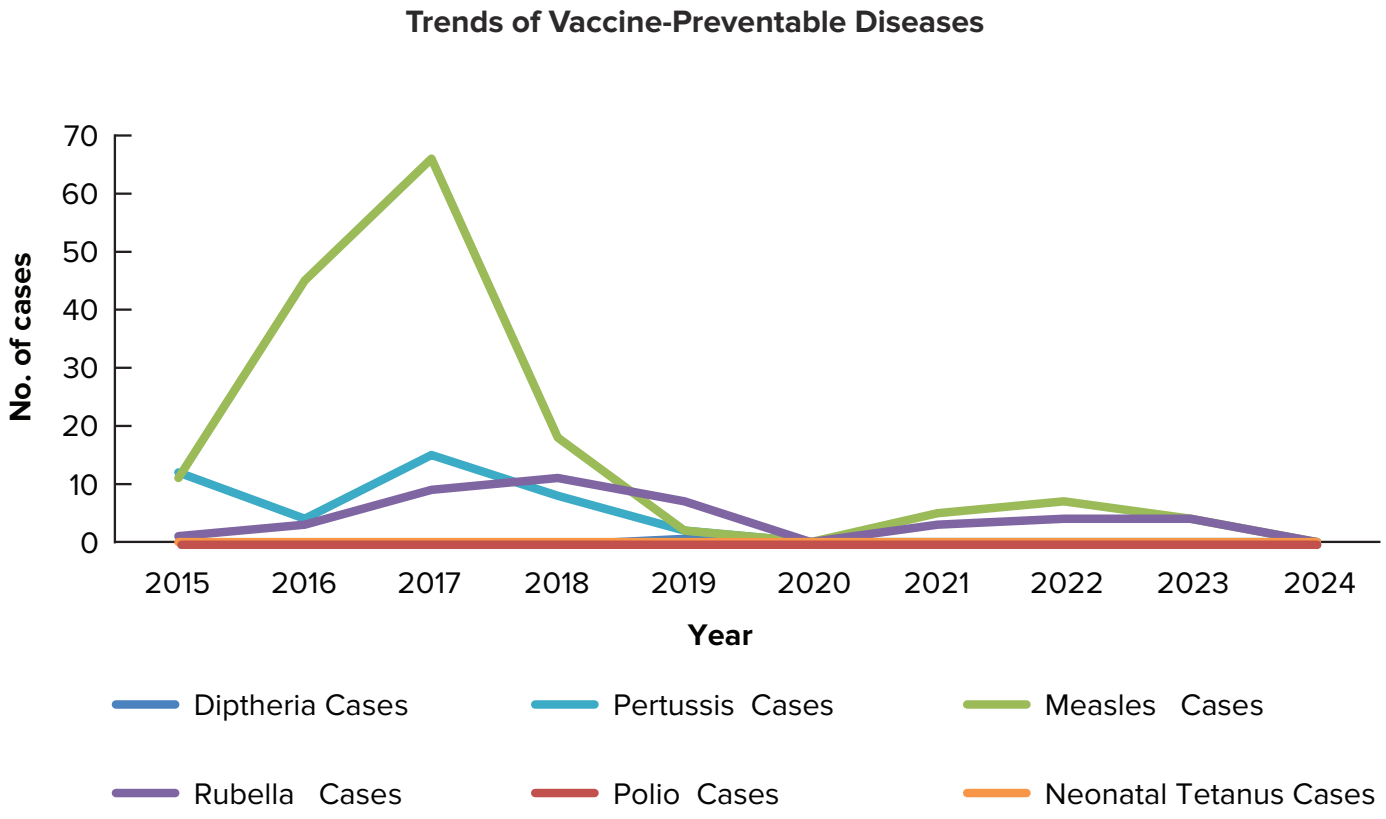
CHAPTER 8
Impact of Immunization Program in Bhutan

8.1 Prevalence of Diseases

» As a result of a robust vaccination drive, Bhutan reported its last case of smallpox in Kalikhola, Dagana, linked to outbreaks in Assam in 1974.

» Similarly, the country achieved polio-free certification in 2014 (with no polio cases since 1986), Maternal and Neonatal Tetanus (MNT) elimination in 2016, measles elimination in 2017, Hepatitis B control in children in 2018, and rubella elimination in 2023.

» Furthermore, Bhutan has successfully reduced the burden of VPDs affecting infants and children through its strong vaccination program over the years.


Trends of Vaccine-Preventable Diseases
No. of cases
70
60
50
40
30
20
10
0
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Diptheria Cases
Pertussis Cases
Measles Cases
Rubella Cases
Polio Cases
Neonatal Tetanus Cases

The trends of vaccine-preventable diseases from 2015 to 2024 are shown below:

Year	Diphtheria		Pertussis		Measles		Rubella		Polio		Neonatal Tetanus	
	Cases	Death	Cases	Death	Cases	Death	Cases	Death	Cases	Death	Cases	Death
2015	0	0	12	0	11	0	1	0	0	0	0	0
2016	0	0	4	0	45	0	3	0	0	0	0	0
2017	0	0	15	0	66	0	9	0	0	0	0	0
2018	0	0	8	0	18	0	11	0	0	0	0	0
2019	1	0	2	0	2	0	7	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	5	0	3	0	0	0	0	0
2022	0	0	0	0	7	0	4	0	0	0	0	0
2023	0	0	0	0	4	0	4	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0

8.2 Disease Eradication and Elimination

Bhutan has made significant strides in disease eradication and elimination. Some diseases, such as polio, measles, and rubella, were eliminated long before the regional target dates.

8.2.1 Smallpox Free Certification

1906:
Bhutan's first-ever vaccine was administered against smallpox, which was spreading globally.

1961:
Bhutan joined the global fight against smallpox with mass immunization, integrating the program into all health facilities.

1954 - 1965:
No cases of smallpox were reported.

1966:
A smallpox outbreak resulted in 40 cases and 20 deaths, traced to imported infections among newly recruited laborers from across the border. A mass vaccination campaign began in the Samtse District and later expanded nationwide. Smallpox vaccination was provided by compounders, moving from village to village and institution to institution to achieve 100% coverage.

1967 - 1975:
Aside from one importation in 1974, Bhutan remained free of smallpox.

1976:
Bhutan declared there was no evidence of smallpox in the country, as confirmed by the WHO expert group, following the last reported case in Phuentsholing in February 1974.

Vol. XII No. 18 MAY 2-8, 1977

KUENSEL

A WEEKLY OFFICIAL BULLETIN OF THE ROYAL GOVERNMENT OF BHUTAN

BHUTAN DECLARED SMALLPOX FREE ZONE

An international commission, constituted by the World Health Organisation, has declared Bhutan a smallpox free country. The decision was taken at a plenary session of the Commission held on April 22, 1977.

On April 24, the Secretary of the International Commission, Prof. J. Kostrzewski, presented a copy of the final report to His Majesty King Jigme Singye Wangchuck. Dr. V. T. H. Gunaratne, WHO Regional Director for South East Asia and Lt. General R. S. Hoon, WHO Expert, were also present.

According to the final report of the Commission the last known case of small pox occured in the Phuntsholing zone in the last week of February 1974 and had resulted from an importation from Goalpara in Assam. Since the requirements for small pox eradication as defined by the WHO Expert Committee on Smallpox Eradication 1972, have been met, smallpox has been eradicated from Bhutan, the report says.

The Commission has recommended that work on the prevention of the disease should continue. The report indicates that primary vaccination should continue to be provided by the various health services until the last known focus of smallpox has been eliminated.

According to the Commission's report experience elsewhere has demonstrated that, after the eradication of smallpox, suspected cases continue to be reported and new diseases that resemble smallpox may be recognised. Effective surveillance should, therefore, be provided within the public health structure of the kingdom. It has recommended that special smallpox expertise should be maintained with the capacity to respond immediately to reports of suspected smallpox. The Commission has emphasised the need for WHO to ensure that the existing international diagnostic reference system is available to Bhutan.

The fight against smallpox in Bhutan effectively began in 1961 with the integration of the smallpox programme with all the health activities within the country. In 1964, 19 posts of vaccinators were created and appointed to 17 institutions. By 1977 the number of vaccinators was increased to 25.

In February, 1966 a mass vaccination campaign was started in the Samchi zone. It was gradually extended to other zones. Freeze dried smallpox vaccine was introduced and vaccinators and compounders were directed to tour villages to provide 100 per cent coverage.

In June, 1976 Health officials of the Government of Bhutan held discussions with the Director General of Health Services, Government of India, on smallpox surveillance in Bhutan. As a result of these discussions the "Operation Smallpox Zero" report was prepared. This report was approved by the Royal Government of Bhutan in July 1976.

Following the government's approval intensive surveillance to detect cases of smallpox was launched. Despite the intensive and extensive search no case of smallpox was discovered.

In March end this year, Lt. General R. S. Hoon, Director General, Armed Forces Medical Services and a member of the International Commission, accompanied by Dr. R. N. Basu, Assistant Director General of Health Services, Government of India visited Bhutan to assess the claim of Bhutan to be declared a smallpox free zone. The team visited several parts of the country and made on the spot inquiries.

The team made a detailed study of area reports, connected documents and cross-checked records, interviewed civil and army health staff and visited various institutions. On the basis of this study the team indicated that "it is concluded with confidence that the claim of the Royal Government of Bhutan that there has been no evidence of smallpox in their Kingdom since the last reported case in February 1974 is sound, justified and acceptable."

National News coverage on Bhutan declaring small pox free in 1977

National Newspaper Coverage on Bhutan declaring Smallpox Free, May 28, 1977

8.2.2 Polio-Free Certification from WHO SEARO

1986:

The last case of clinically compatible polio was reported from Damphu Hospital. A seven-month-old child with fever and flaccid paralysis of the right lower limb was admitted, and the case was clinically diagnosed as poliomyelitis by Dr. Christoph, a German doctor.

1988:

The World Health Assembly (WHA) resolution on polio eradication was adopted by member states with the goal of polio eradication by 2000.

1993:

The birth dose of OPV was introduced into the routine immunization schedule.

1995:

Bhutan conducted its first National Immunization Days (NIDs) using OPV for children under five years.

AFP surveillance was also introduced, with the training of surveillance officers in all hospitals and selected BHUs.

1996 – 2002:
SNIDs were conducted in six southern districts. Sub-NIDs for OPV were also carried out in southern districts, including Panbang Dungkhag in Zhemgang District, to prevent the importation of wild poliovirus from endemic countries and support long-term polio eradication efforts.

1997:
The NCCPE was established to monitor, advise, and support the EPI program's polio eradication initiatives.

2014:
By maintaining high OPV3 coverage and a strong AFP surveillance system, Bhutan received polio-free certification from the WHO, along with other WHO member countries in the SEARO region.

2015:
In line with the polio endgame strategy, a single dose of IPV was introduced into the routine immunization schedule.

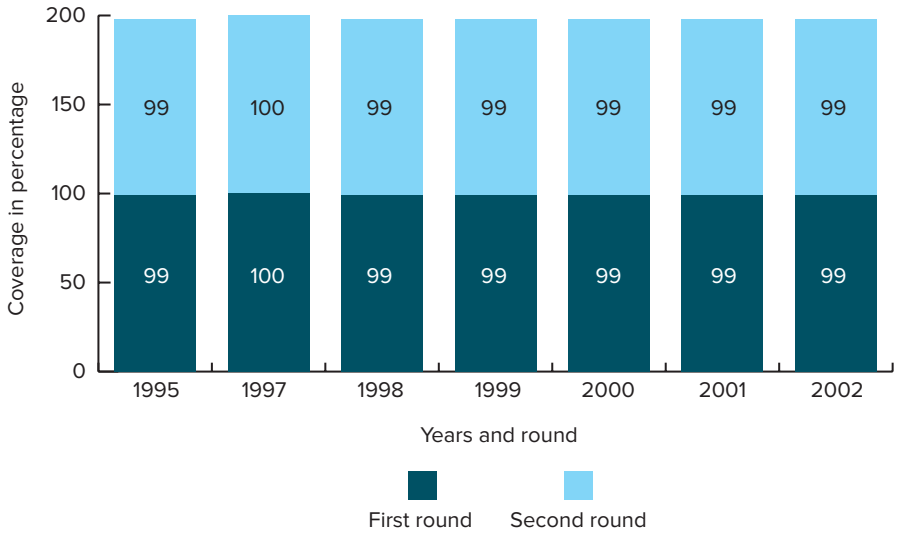
2016:
tOPV was switched to bOPV.

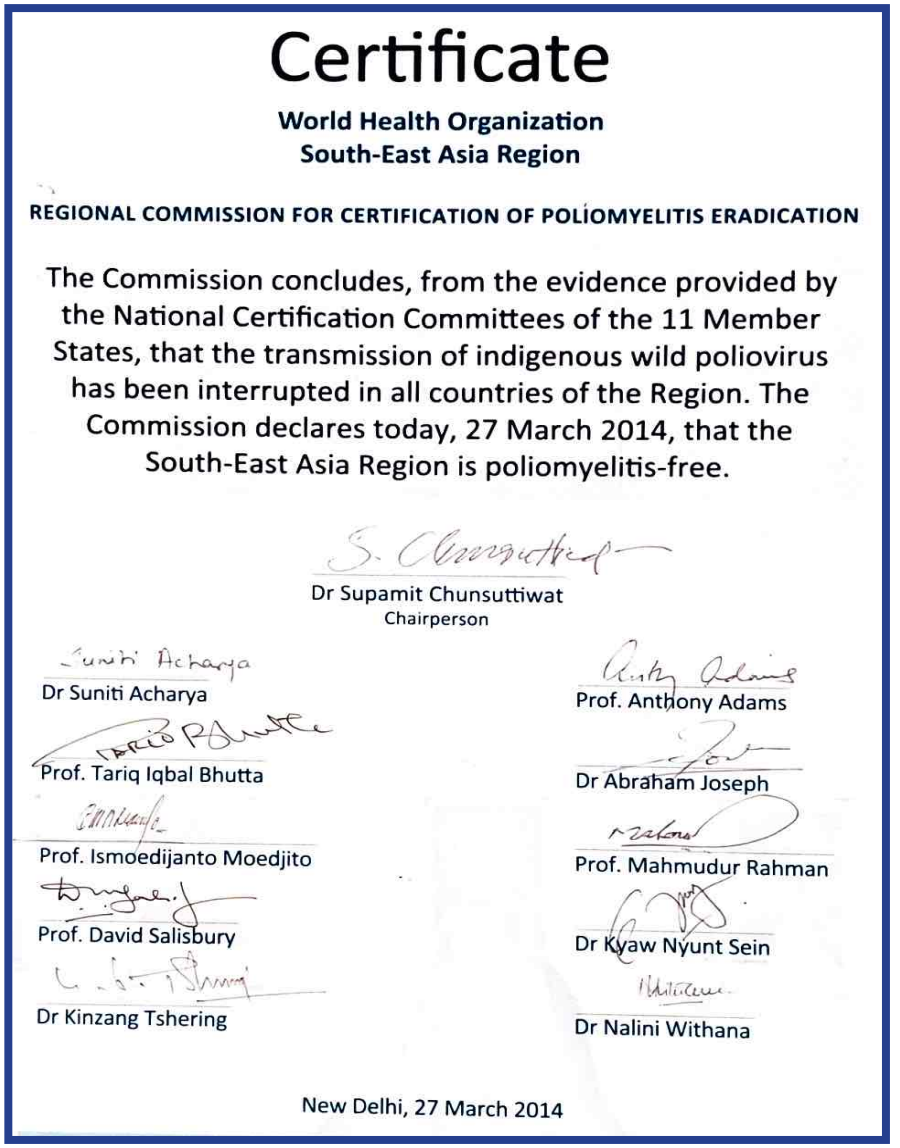
2021:
The second dose of IPV was added to the routine immunization schedule.

National Immunization Days in 1995:
Polio drops were administered
by UNICEF Representative
Mr. Stewart McNab

NIDs and SNIDs OPV Coverage (%)

OPV coverage of NID & SNID over the years





Certificate

World Health Organization
South-East Asia Region

REGIONAL COMMISSION FOR CERTIFICATION OF POLIOMYELITIS ERADICATION

The Commission concludes, from the evidence provided by the National Certification Committees of the 11 Member States, that the transmission of indigenous wild poliovirus has been interrupted in all countries of the Region. The Commission declares today, 27 March 2014, that the South-East Asia Region is poliomyelitis-free.

Dr Supamit Chunsuttiwat
Chairperson

Dr Suniti Acharya

Prof. Anthony Adams

Prof. Tariq Iqbal Bhutta

Dr Abraham Joseph

Prof. Ismoedijanto Moedjito

Prof. Mahmudur Rahman

Prof. David Salisbury

Dr Kyaw Nyunt Sein

Dr Kinzang Tshering

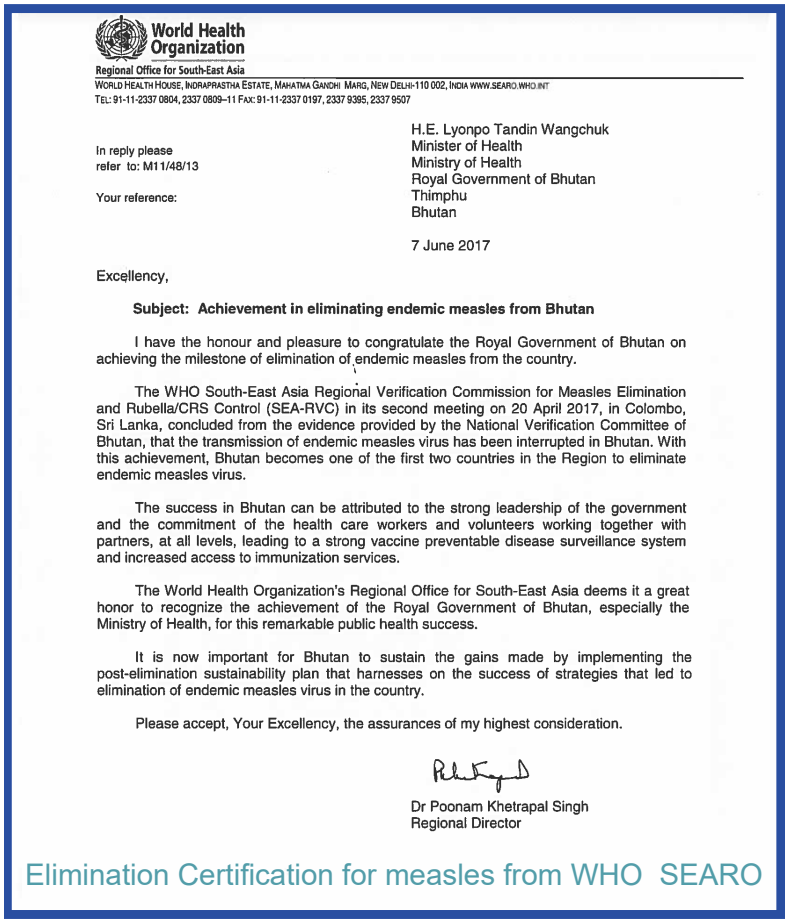
Dr Nalini Withana

New Delhi, 27 March 2014

Lyonpo Tandin Wangchuk, Minister of Health of Bhutan, and Dr. Tandi Dorji, Chairperson of NCCPE, receive polio-free certification from Dr. Poonam Khetrapal Singh, Regional Director of WHO SEARO, and Dr. Supamit Chunsuttiwat, Chairperson of RCCPE, 27th March 2014, New Delhi, India

8.2.3 Measles Elimination Certification from WHO SEARO

- In 2013, the WHO SEARO adopted ambitious goals for measles elimination and rubella control by 2020. This initiative was reinforced in 2014 when the Regional Director emphasized these goals as a flagship priority.
- In 2019, the target date was revised to 2023 to allow for more comprehensive strategies and actions.
- Bhutan's journey toward achieving measles elimination certification from WHO is a remarkable example of effective public health strategies and commitment to immunization.
- The country was officially certified for measles elimination on June 13, 2017. This achievement was part of a broader regional initiative aimed at eliminating measles and rubella across the WHO SEARO.



World Health Organization
Regional Office for South-East Asia
World Health House, Indraprastha Estate, Mahatma Gandhi Marg, New Delhi-110 002, India www.searo.who.int
Tel: 91-11-2337 0804, 2337 0809–11 Fax: 91-11-2337 0197, 2337 9395, 2337 9507

In reply please refer to: M11/48/13

Your reference:

H.E. Lyonpo Tandin Wangchuk
Minister of Health
Ministry of Health
Royal Government of Bhutan
Thimphu
Bhutan

7 June 2017

Excellency,

Subject: Achievement in eliminating endemic measles from Bhutan

I have the honour and pleasure to congratulate the Royal Government of Bhutan on achieving the milestone of elimination of endemic measles from the country.

The WHO South-East Asia Regional Verification Commission for Measles Elimination and Rubella/CRS Control (SEA-RVC) in its second meeting on 20 April 2017, in Colombo, Sri Lanka, concluded from the evidence provided by the National Verification Committee of Bhutan, that the transmission of endemic measles virus has been interrupted in Bhutan. With this achievement, Bhutan becomes one of the first two countries in the Region to eliminate endemic measles virus.

The success in Bhutan can be attributed to the strong leadership of the government and the commitment of the health care workers and volunteers working together with partners, at all levels, leading to a strong vaccine preventable disease surveillance system and increased access to immunization services.

The World Health Organization's Regional Office for South-East Asia deems it a great honor to recognize the achievement of the Royal Government of Bhutan, especially the Ministry of Health, for this remarkable public health success.

It is now important for Bhutan to sustain the gains made by implementing the post-elimination sustainability plan that harnesses on the success of strategies that led to elimination of endemic measles virus in the country.

Please accept, Your Excellency, the assurances of my highest consideration.

Dr Poonam Khetrapal Singh
Regional Director

Elimination Certification for measles from WHO SEARO

WHO SEARO Award Citation presented to Bhutan for achieving the measles elimination target in 2017

Bhutan received the WHO SEARO Award Citation
for achieving the measles elimination target in 2017

8.2.4 Rubella Elimination Certification from WHO SEARO

» Bhutan's successful certification for rubella elimination by WHO on July 21, 2023, marks a significant milestone in public health and immunization efforts.

» This achievement is part of the broader goal of eliminating both measles and rubella in the WHO South-East Asia Region by 2026.

Bhutan Received WHO SEARO Award Citation for Achieving Rubella Elimination Target by 2023 in October 2023

8.2.5 MNT Elimination Certification from WHO SEARO

1983:

The Tetanus Toxoid (TT) vaccine was first introduced for pregnant women; however, initial coverage was low.

1995:

To enhance vaccination rates, a nationwide TT vaccination campaign was launched, achieving an impressive 84% coverage among reproductive women. Over time, TT vaccination rates for pregnant women increased to over 90%, coinciding with an institutional delivery rate exceeding 95%. In addition to targeting pregnant women, the TT vaccine was later introduced for class PP and 7 through a school-based delivery approach, and for children aged 6 and 13 years who are out of school.

1995:

Bhutan achieved maternal and neonatal tetanus (MNT) elimination, ahead of the global target set for 2000.

2006:

The last reported case of neonatal tetanus in Bhutan occurred when a child was referred from Paro District Hospital to Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) in Thimphu. The infant was born in a cowshed, and the mother had no history of receiving TT vaccination.

2012:

The TT vaccine was replaced by the Td vaccine due to rising cases of diphtheria among adults.

2014:

A revalidation of this status was conducted in collaboration with UNICEF, confirming sufficient evidence that Bhutan has maintained its MNT elimination status since 1995.

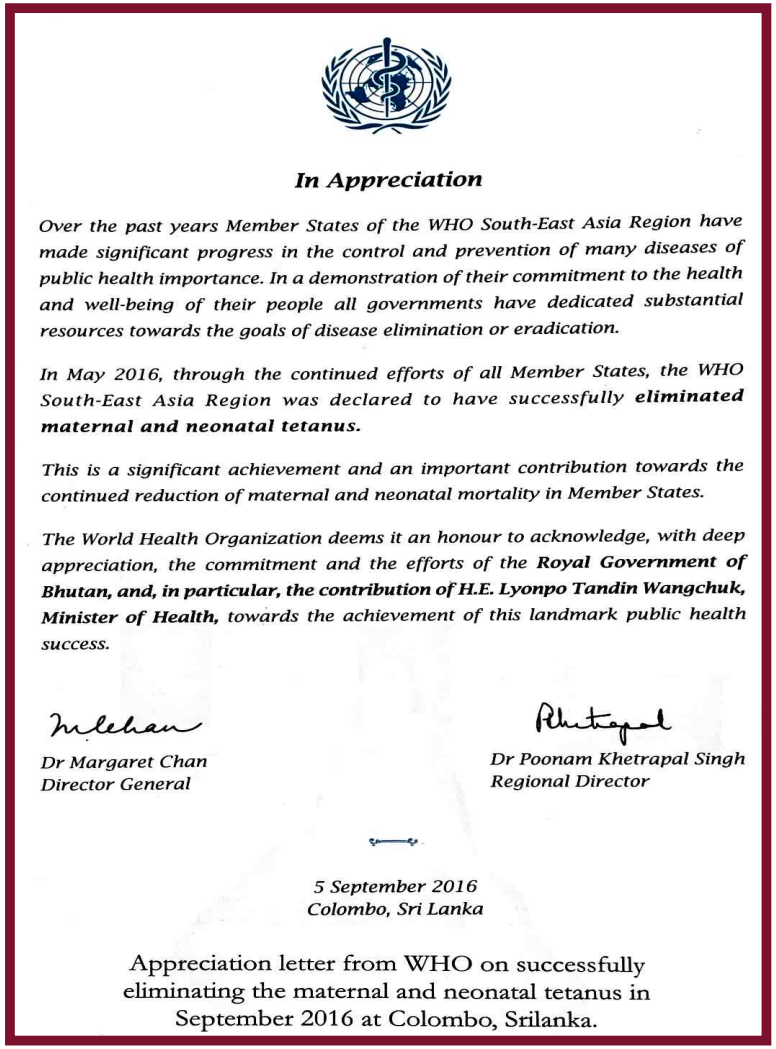
Further, to ensure the sustainability of the MNT elimination status post-2014 revalidation, Bhutan implemented several key strategies, in addition to maintaining high vaccination rates and a robust surveillance system. These strategies emphasized the importance of skilled birth attendance to ensure clean delivery practices and reduce the risk of neonatal tetanus.

8.2.6 Hepatitis B Control Certification (Child) from WHO SEARO

» Bhutan's achievement in controlling hepatitis B through immunization for children, recognized by WHO in July 2019, marks a significant public health milestone. This accomplishment reflects a series of historical initiatives and strategic actions that have effectively reduced the prevalence of hepatitis B among children under five to less than 1%.

» Bhutan introduced the hepatitis B vaccine into its national immunization program in 1997, providing three doses during the first year of life. This was crucial in preventing mother-to-child transmission of the virus.

» In 2012, Bhutan further strengthened its efforts by implementing the administration of the hepatitis B birth dose, which is critical for preventing early transmission from infected mothers.



In Appreciation

Over the past years Member States of the WHO South-East Asia Region have made significant progress in the control and prevention of many diseases of public health importance. In a demonstration of their commitment to the health and well-being of their people all governments have dedicated substantial resources towards the goals of disease elimination or eradication.

In May 2016, through the continued efforts of all Member States, the WHO South-East Asia Region was declared to have successfully ***eliminated maternal and neonatal tetanus.***

This is a significant achievement and an important contribution towards the continued reduction of maternal and neonatal mortality in Member States.

The World Health Organization deems it an honour to acknowledge, with deep appreciation, the commitment and the efforts of the ***Royal Government of Bhutan, and, in particular, the contribution of H.E. Lyonpo Tandin Wangchuk, Minister of Health,*** *towards the achievement of this landmark public health success.*

Dr Margaret Chan
Director General

Dr Poonam Khetrapal Singh
Regional Director

5 September 2016
Colombo, Sri Lanka

Appreciation letter from WHO on successfully eliminating the maternal and neonatal tetanus in September 2016 at Colombo, Srilanka.

Elimination of Maternal and Neonatal Tetanus Certification by WHO, September 2016

Hepatitis B Control Certification for Bhutan from WHO SEARO

8.3 Contributing Factors for Disease Eradication and Elimination

Bhutan's success in eradicating and eliminating VPDs has been attributed to the following:

1. **Strong Government Leadership:** The government has demonstrated unwavering commitment to public health by prioritizing immunization in national health policy and ensuring the allocation of critical resources, driving the success of the immunization program.
2. **High Immunization Coverage:** Vaccination rates consistently exceeding 95% have played a vital role in building herd immunity and safeguarding the population against potential outbreaks.
3. **Robust Surveillance Systems:** An advanced disease surveillance network has enabled rapid detection and response to emerging health threats, monitoring VPDs and organizing mass immunization campaigns when necessary.
4. **Community Engagement:** Active community participation has been pivotal in promoting vaccination. Health education initiatives have empowered local populations with knowledge about the importance of immunization, leading to increased acceptance and uptake of vaccines.

5. **Collaboration with International Organizations:** Partnerships with WHO, UNICEF, and other global health bodies have aligned immunization efforts with international standards while providing invaluable technical support and funding.

6. **Targeted Vaccination Campaigns:** Strategic mass and catch-up vaccination campaigns have ensured that high-risk populations, especially in border areas, are not left unvaccinated. These efforts have reduced the risk of disease importation and strengthened widespread immunity.

7. **EPI Fully Integrated into Primary Healthcare:** Integrating the EPI into the primary healthcare system has created a sustainable, scalable model. This approach has been instrumental in eradicating smallpox, achieving polio-free status, and eliminating maternal and neonatal tetanus, measles, and rubella.

8. **Dedicated Health Professionals:** Healthcare workers have been the backbone of disease eradication and elimination initiatives. Their tireless efforts in vaccination delivery, community outreach, disease surveillance, and crisis management have been vital to achieving public health milestones.

9. **Village Volunteer Health Workers (VVHWs):** Established in 1980, Village Health Workers have played a crucial role in supporting outreach clinics, providing first aid, treating minor illnesses, and raising awareness on health issues. In the absence of reliable communication, they ensured health messages reached communities, tracked vaccination statuses, and supported other health activities.

10. **Education and Awareness Programs:** Evolving from the National Institute for Family Health (NIFH) and the Information Education and Communication for Health Division, the Health Promotion and Risk Communication Division (HPRCD) has been crucial in public health education. By crafting health messages and engaging the public, HPD has promoted vaccination and raised awareness— even distributing radio cassette players with health messages to remote areas during the 1990s communication gap.

Together, these factors have contributed to Bhutan's exceptional achievements in disease eradication and elimination, setting a benchmark for other nations in the region.

Radio/Tape Recorder used in 1990s to raise awareness on health programs distributed by IECH

8.4 Human Resource Development

» The Health School was established in 1974 as a training institute for healthcare workers and was later renamed the Royal Institute of Health Sciences (RIHS) in 1989. It was further upgraded to the Faculty of Nursing and Public Health (FNPH) under KGUMSB in 2013.

» The FNPH offers a range of programs in nursing, public health, and allied health sciences. The National Institute of Traditional Medicine is the main institute where nurses, paramedical healthcare workers, technicians, and indigenous physicians are trained. The institute also provides continuing education for health personnel.

» The first batch of the MBBS course in Bhutan commenced in 2024.

Graduation of Health Assistant (HA) and Auxiliary Nurse and Midwife (ANM) from Health School, Thimphu, 1988

CHAPTER 9
Vaccine Financing and Development Partners

Bhutan's immunization success story owes much to the unwavering support of development partners and the commitment to sustainable vaccine financing—pillars that have shaped the EPI into the remarkable program it is today.

1979:
Bhutan's immunization program commenced with vaccines, injection devices, and cold chain equipment provided by WHO and UNICEF.

1991–2007:
JICA extended support through UNICEF, supplying vaccines, injection devices, and cold chain equipment. JICA also supported NIDs in 1995 and Supplementary Immunization Activities (SIAs) for high-risk southern districts between 1996 and 2002. In 2006, JICA supported the nationwide MR vaccination campaign.

After 2007:
The Japan Committee, Vaccines for the World's Children (JCV) assumed this role, continuing support through UNICEF.

1997–2002:
The monovalent Hepatitis B (HepB) vaccine and injection devices were funded by Danida.

2003–2008:
The DTP-HepB vaccine was introduced with support from GAVI and co-financing from the BHTF.

2009:
The Pentavalent vaccine was introduced and is now fully financed by the BHTF.

2015:
The IPV vaccine was introduced with support from GAVI, followed by the introduction of the second dose in 2021. The support is still ongoing.

2010–2017:
MSD and the ACCF supported the HPV vaccine for girls.

2018:
The BHTF began financing the procurement of the HPV vaccine for girls.

2019:
The BHTF began financing the procurement of the Pneumococcal Conjugate Vaccine (PCV) and influenza vaccines for children, the elderly (65 years and above), and people with chronic medical conditions.

The Partnership for Influenza Vaccine Introduction (PIVI) funded influenza vaccines for healthcare workers and pregnant women. Support is ongoing.

2020:
The Asian Development Bank (ADB) supported the procurement of cold chain equipment and a refrigerated van.

MSD supported the HPV vaccine for boys, and this support is still ongoing.

2022:
COVAX supported the provision of COVID-19 vaccines and syringes.

From 2026:
An agreement was signed with the Panorama Institute of Molecular Medicine, USA, to provide the HPV vaccine for girls for five years.

TASHICHHODZONG
THIMPHU, BHUTAN

The importance of providing vaccinations to children to eradicate preventable diseases cannot be overstated in any nation's goal of building a secure future. Bhutan owes the success of its immunization programs in no small measure to agencies like JCV. As JCV celebrates 20 years of carrying out this important work, I thank all the individuals who have contributed to its efforts for their commitment to the health of children across the world.

Jigme Khesar
King of Bhutan

9.1 Bhutan Health Trust Fund (BHTF)

» The BHTF was established in 1998 under Royal Charter with an initial capital of USD 24 million to ensure the sustainable supply of vaccines, essential medicines, and related items for primary healthcare.

» The fund, which was seeded by contributions from multilateral organizations, bilateral governments, NGOs, private individuals, and the Royal Government of Bhutan, has since increased its target capitalization to address the rising costs of vaccines and essential drugs.

» The BHTF's primary revenue comes from interest earned on its capital and a 1% health contribution from salaried employees. It currently funds 64% of Bhutan's annual vaccine expenditure, including vaccines like PCV, Pentavalent, HPV (for girls), and influenza.

» Launched in 2002 by former Health Minister Lyonpo Sangay Ngedup, the Move for Health initiative was a groundbreaking fundraising campaign for the BHTF.

» Aligned with that year's World Health Day theme, the initiative aimed to raise awareness about healthy lifestyles and preventive healthcare through a 500-kilometer walk from Trashigang to Thimphu. Over 16 days, the walk team engaged communities, schools, and health centers, spreading messages on wellness.

» Supported by government agencies, international organizations, businesses, and individuals, the campaign raised nearly USD 2 million for the BHTF and continues through periodic events across Bhutan.

» Bhutan's immunization program has significantly benefited from the long-term partnership and support of WHO, UNICEF, and GAVI. These organizations provide complementary roles and diverse forms of assistance to ensure the sustainability and effectiveness of Bhutan's immunization efforts.

“Move for Health”:
The team gets ready to start the journey with the ceremony by the religious body, 2002

9.2 World Health Organization (WHO)

WHO has been pivotal in strengthening Bhutan’s immunization program through technical support, disease surveillance, and evidence-based planning. Their key contributions include:

1. **Policy Guidance:** Providing expert input on national immunization policies and vaccine strategies.
2. **Capacity Building:** Supporting training programs for healthcare workers on vaccine administration and safety.
3. **Disease Surveillance:** Strengthening surveillance systems and supporting outbreak responses.
4. **Verification:** Assisting in certification processes for disease eradication and elimination goals.
5. **Monitoring & Evaluation:** Supporting in designing systems to monitor immunization coverage and assess program performance.

The current BHTF team

9.3 United Nations Children's Fund (UNICEF)

UNICEF supports Bhutan's immunization through vaccine procurement, cold chain strengthening, and community engagement. Key roles include:

1. **Vaccine Procurement:** Facilitating vaccine and cold chain supply via global mechanisms.
2. **Cold Chain:** Enhancing cold chain infrastructure to maintain vaccine potency in Bhutan's rugged terrain.
3. **Advocacy:** Conducting awareness campaigns and addressing vaccine hesitancy.
4. **Technical Support:** Assisting with vaccine forecasting and stock management.

9.4 GAVI, the Vaccine Alliance

GAVI provides financial and programmatic support, enabling Bhutan to introduce new vaccines and sustain routine immunization.

Key Roles and Support includes:

1. **Financial Assistance:** Co-financing vaccine procurement eases the financial burden on the government and supports the introduction of new vaccines such as PCV and IPV.
2. **Health Systems Strengthening:** Funding infrastructure upgrades and training for healthcare workers, while investing in digital tools for better immunization tracking.
3. **Vaccine Access and Equity:** Ensuring equitable vaccine access, prioritizing marginalized populations, and supports Bhutan in achieving global immunization targets, including UHC.
4. **Sustainability Support:** Collaborating with the government to transition from GAVI funding, ensuring the long-term sustainability of Bhutan's immunization program.

9.5 The Japan Committee, Vaccines for the World's Children (JCV)

JCV has been supporting Bhutan with 6 traditional EPI vaccines and syringes and strengthening the cold chain system.

Key Roles and Support includes:

1. **Vaccine Support:** Providing six essential vaccines and syringes.
2. **Cold Chain:** Strengthening the cold chain system and temperature monitoring devices to ensure vaccine potency.
3. **Monitoring and Evaluation:** Monitoring program activities and assessing the zero- dose children

CHAPTER 10
Program Review and Assessment

2005:
The 1st Joint national/international AFP surveillance review.

1997 to 1998:
Impact Study on Vaccine Vial Monitor (VVM) and new vaccine handling practice was conducted in eleven districts.

2008:
Program review and VPD surveillance.

2011:
The 2nd EPI and VPD surveillance review and post-introduction evaluation of HPV vaccine.

2011:
Immunization financing and sustainability: GAVI graduation country transition planning.

2012:
The 1st EVM Assessment.

2015:
The 2nd EVM Assessment.

2017:
The Joint External Evaluation for International Health Regulations was conducted, which included vaccination coverage. The scores for immunization were 5 and 4, with 5 being the highest score and 4 the second highest.

2017:
The Hepatitis B serosurvey was conducted to estimate the prevalence of biomarkers of infection with hepatitis B and C viruses, and antibodies to measles and rubella.

2020:
Evaluation of the NITAG.

2021:
Assessment of cold chain equipment in all hospitals, PHCs, and sub-posts.

2022:
The 3rd EVM Assessment.

2024:
Joint national/international review of the EPI and VPD surveillance, combined with post-introduction evaluation of new vaccines (PCV, Influenza, and COVID-19).

Key Challenges for the Immunization Program

Limited supportive supervision and monitoring system

Financial sustainability for vaccines and cold chain equipment

Multiple data recording and reporting system

The Director, Chief Program Officer, and EPI Program team discussing the challenges and the way forward to improve the program

CHAPTER 11
Immunization Leaders and Personnel Stories

11.1 Personnel Stories

Dasho (Dr.) P. W. Samdup began his career in 1963 as an Assistant Medical Officer at Langpokha Hospital in Thimphu. He was one of only three Bhutanese medical doctors at the time. He also served as a personal physician to the third Druk Gyalpo, His Majesty King Jigme Dorji Wangchuck.

In 1970, he was appointed Superintendent of Health Services under the then Ministry of Development. He was awarded the Red Scarf in 1972 for advancing healthcare in the country, including the eradication of smallpox, elimination of leprosy, expansion of immunization services, and goiter control, among other achievements.

Dasho was the first Bhutanese to join the WHO in 1985. From 1985 to 1996, he served in various capacities—starting as a Technical Officer and later as a Medical Officer in the Office of the WHO Representative in Sri Lanka. Subsequently, he was reassigned to WHO SEARO as the Medical Officer for Leprosy and as the Regional Fellowship Officer until his retirement in 1996.

After retiring from WHO, from 1997 onwards, he served as Chairman of the National Certification Commission for Polio Eradication in Bhutan for over a decade. During this time, he played a pivotal role in achieving polio-free status for Bhutan and provided strategic guidance to enhance the EPI.

- Dasho (Dr.) P. W. Samdup

Reaching every child for vaccination has always been central to our efforts of protecting them from vaccine-preventable diseases. Along this journey, we have faced challenges, gained valuable insights, and drawn deep inspiration from the resilience and trust of the communities we serve. As we reflect on our progress, we take heart in knowing that we are steadily closing the immunization gap, even in the most remote and hard-to-reach areas of our country.

One such moment of reflection came during the observance of World Immunization Week in Laya, a community nestled high in the mountains in northern Bhutan, often cut off by rugged terrain and harsh weather. There, we undertook a comprehensive review of vaccination records for all children under the age of 15. A few were found to have missed their MR vaccine, and they were promptly vaccinated. Witnessing the relief and heartfelt gratitude of their parents was a powerful reminder of the life-saving value of our efforts.

We also used the opportunity to engage the community in an awareness program, emphasizing the importance of routine immunization, not only for individual protection but as a shield for the wider community from the diseases. Laya Gewog was purposefully chosen to demonstrate that equitable access to vaccines is not only a privilege, it is a fundamental right as well. A right that must never be limited by distance, weather, or geography.

This experience reaffirmed the Royal Government of Bhutan's unwavering commitment: to reach every eligible individual, in every corner of our country, with timely, complete, and life-saving immunization. Because every child matters, and every vaccine counts.

- Mr. Karma Jamtsho
Director, Department of Public Health, Ministry of Health

Although I did not serve as the Programme Manager for the Expanded Programme on Immunization (EPI) in Bhutan, I have been fortunate to contribute meaningfully and consistently to the development and strengthening of the country's immunization programme.

Some of the key areas of my involvement include:

Measles Surveillance

I contributed to the development of a national protocol for measles surveillance, which included detailed guidelines for outbreak investigation and methods for estimating vaccine efficacy. This was followed by training sessions for medical officers and healthcare workers to support effective implementation of the protocol at the field level.

Hepatitis B Vaccine Introduction

In 1995, I coordinated a WHO-supported hepatitis B prevalence survey, which identified an HBsAg prevalence of 5.9%, classifying Bhutan as a high-endemic country per WHO guidelines. Based on this evidence, and with financial support from DANIDA, Bhutan introduced the serum-derived hepatitis B vaccine in 1997.

Polio Eradication and AFP Surveillance

In 1995, I had the opportunity to represent Bhutan at a regional meeting on polio eradication, where the country reaffirmed its commitment to the World Health Assembly's resolution on global polio eradication, including the establishment of AFP surveillance. Upon my return, I supported the development of Bhutan's AFP surveillance system.

- Dr. Pem Namgyal

As we reflect on our immunization journey, one of the most transformative milestones has been the advancement in cold chain equipment through digital innovation. The introduction of digitalized cold chain systems has significantly improved how we store and safeguard vaccines across the country.

With real-time temperature monitoring and centralized digital platforms, these systems ensure that vaccines are kept within the recommended temperature range at all times. The instant alerts via SMS or email have allowed us to respond quickly to any deviations, reducing our reliance on manual checks and enhancing vaccine monitoring. Even in the most remote corners of our country, our teams are now better equipped than ever to preserve vaccine quality, where consistent cold chain maintenance has always been a challenge.

These technological improvements have not only helped us preserve vaccine potency and reduce wastage, but have also strengthened trust among our healthcare workers and the communities we serve.

This shift is more than a technological upgrade, it's a symbol of how innovation can drive equity and resilience in public health systems.

As we move forward, I remain confident that such innovations will continue to support our goal of achieving safe, effective, and equitable immunization coverage for all.

- Ms. Deki Yangzom
Chief, Communicable Disease Division
Department of Public Health, Ministry of Health

The training for the first batch of BCG vaccinators in Bhutan began in 1963, led by Dasho Balang Tshering from Paro District. The overall immunization program was under the Health Department of the Ministry of Development. In 1975, I served as a BCG technician in Samtse District under the leadership of Dr. N. K. Goswami, an Indian chest specialist. Technicians were rotated to different districts every three months to ensure the delivery of BCG vaccination. Handwritten reports detailing the number of children vaccinated had to be submitted regularly to our team leader.

There was no cold chain system like the one we have today. We used to carry the BCG vaccine in our pockets or in leather bags, which weighed around 5 kilograms, including tuberculin testing kits. The vaccine was administered after sterilizing the needle using a spirit lamp. At that time, there was no reporting mechanism for AEFI for the BCG vaccine.

- Mr. Kalu Drukpa, BCG Technician (1975)
(Retired Deputy Chief District Health Officer, 2016)

In those days, immunization services used to be packaged with the WFP nutrition supplementation of White Soya Blend (WSB) powder and Dry Skimmed Milk (DSM) program to address the burden of malnutrition issues in the country. It was a strategic approach to motivate pregnant women and mothers to come and bring their children to the health centers for immunization. Popularly known as 'Bokpi Khab' ('Bokpi' in Tshangla means flour and 'Khap' means vaccine; 'Flour Vaccine'), it made it easy to improve immunization coverage.

Parents used to get disappointed if they didn't get the nutrition supplementation but didn't mind going back home without vaccination. I feel that the current success of sustained high immunization coverage in the country is attributed to this nutrition supplementation at that time.

- Mr. Sonam Zangpo, the First HA of Orong BHU S/Jongkhar, 1987 (Currently, Program Analyst, QASD, MoH.

In the 1980s, not all villages in the country were covered by vaccination programs due to geographical constraints, as well as a limited number of BHUs and ORCs, along with insufficient refrigeration facilities.

In consultation with the District Health Officer, Gewog leaders, and village heads, a plan was developed for a catch-up vaccination campaign. Subsequently, EPI technicians were tasked with conducting this campaign in the villages as a vertical program to ensure the completion of the first, second, and third doses of the DTP vaccine, as well as the measles vaccine at nine months of age. Vaccines were transported from hospitals using cold boxes and stored in refrigerators available at the BHUs. From the BHUs, vaccines were then transported to vaccination posts, which typically required a minimum of two to three hours of travel on foot due to the lack of motorable roads in most blocks and villages.

At that time, healthcare workers lacked the knowledge necessary to identify, investigate, and report AEFI. During the catch-up campaign, I observed some children with abscesses at the injection site following DTP vaccination. These abscesses may have resulted from improper sterilization of syringes and needles or contamination due to improper vaccine handling. Currently, 100% of auto-disable syringes are utilized in the immunization program; these syringes are designed to lock after a single use, thereby enhancing safety and reducing the risk of contamination. This has also enhanced efficiency for healthcare workers in providing immunization services without having to sterilize syringes and needles

-Mr. Sha Bahadur Diyalee (Retired Sr. Health Assistant)

In one of the remote villages, Denchukha in Samtse District, EPI technicians conducted a catch-up DTP vaccination campaign in 1985.

In the early 1980s, Bhutan faced significant challenges in its healthcare delivery, particularly in the realm of immunization. The country's BHUs were few and often inaccessible due to the lack of motorable roads and electricity. During this time, the Kerosene cum Electric Refrigerator (Sibir) was the primary means of storing vaccines at hospitals and BHUs.The government allocated 30 liters of kerosene oil monthly to each facility to operate these refrigerators; however, securing this kerosene from Bhutan Oil Corporation (BoC) was frequently problematic.

Transportation of these kerosene refrigerators was labor-intensive, as porters would carry them from the nearest road access point to the BHUs, a journey that typically took 4 to 5 days. Once delivered, EPI technicians would install the refrigerators, ensuring they were operational for vaccine storage.

As Bhutan's infrastructure gradually improved, the introduction of domestic electric refrigerators marked a significant advancement in vaccine storage capabilities. This transition allowed for more reliable and efficient management of vaccines at BHUs. Additionally, district hospitals began utilizing deep freezers and ice-lined refrigerators (ILRs) alongside domestic refrigerators to safeguard EPI vaccines. EPI technicians were also responsible for basic refrigerator repair and maintenance.

- Mr. Tshewang Dorji Tamang, retired EPI Program Manager
(Served in EPI for more than 40 years)

Administration of IPV vaccine

11.2 Immunization Leaders of Bhutan

11.2.1 National Immunization Program Managers

1963

Late Dasho Balang Tshering
Team Leader
EPI

1975 - 1977

Dr. N. K. Goswami
Chest Specialist /
Team Leader EPI

1977 - 1982

Dr. T. B. Rana
Program Manager
EPI

1983 - 1988

Lyonpo Jigme Singay
Coordinating Officer
National Institute of Family Health
Gelephu

1988 - 2000

Late Mr. Thinley Dorji
Program Manager
EPI

2000 - 2006

Mr. Tshewang Dorji Tamang
Program Manager
EPI

2006-2008

Ms. Karma Tshering
Program Manager
EPI

2009 - 2021

Mr. Tshewang Dorji Tamang
Program Manager
EPI

2010 - 2022

Mr. Sangay Phuntsho
Program Manager
EPI

2022 - till date

Mr. Tashi Dawa
Program Manager
EPI

Ms. Cheten Zangmo
Assistant Program Manager
EPI

11.2.2 Chairpersons of the National Immunization Technical Advisory Group (NITAG)

2009 - 2015

Dr. K. P. Tshering
Former President
Khesar Gyalpo University of Medical Sciences of Bhutan (KGUMSB

2015 - 2022

Dr. Mimi Lhamu Mynak
President
National Medical Services (NMS)

2022 - till date

Dr. Sonam Wangchuk
Specialist
Royal Centre for Disease Control (RCDC)

11.2.3 Chairpersons of the National Certification Commission for Polio Eradication (NCCPE) and National Verification Committee (NVC) for Measles and Rubella Elimination

1997 - 2010

Dasho Dr. P. W. Samdup
Former Superintendent of
Health Services

2010 - 2013

Mr. Phub Rinchhen
Former Sr. Adm Officer
NITM

2013 - 2018

Dasho Dr. Tandi Dorji
Former Pediatrician

2019 - till date

Dr. Sangay Thinley
Former Secretary
Ministry of Health, Bhutan

Pictorial Highlights of the EPI Program

1st EPI Refrigerator Repair Technician Course, 14th – 25th November 1983, at NIFH Gelephu. Training instructor from Gauhati, Assam, India

Tuberculin testing by EPI Technician in one of the schools, Thimphu 1991

Training workshop on strengthening AEFI monitoring and causality assessment, 27th September to 1st October 2010, Paro

Workshop on Strengthening the National Committee on Immunization Practices (NCIP), 12th – 14th September 2011, Paro

Technical consultation to develop a manual for field investigation of serious AEFI, 21st - 24th April 2015, Thimphu

Supervisory visit to Trashi Yangtse Hospital by the EPI Program Officer, 2018

National Immunization Technical Group (NITAG) Capacity Development Workshop, November, 2019, Paro

Training of Trainers (ToT) for healthcare workers on COVID-19 Vaccine Introduction, March 2021, Mongar (Eastern Region)

Conduct of quarterly VPD surveillance at Wangdicholing General Hospital by Dr. Suresh C. Mothey, CMO of Trongsa Hospital

Training for EVM Assessment Assessors in Paro, 2022

Review of vaccination records in the Drugyel community by the Rubella Elimination Team, 2023

Parent Interview by Rubella Elimination Team at Drugyel PHC, Paro, 2023

Community Engagment on Importance of Timely Vaccination in April 2025

Health Assistant of Wangphu PHC under Samdrup Jongkhar District explaining to the EVMA team assessors how to conduct conditioning of ice packs

Monitoring visit by Director of DoPH, Karma Jamtsho, to Khagochen PHC in 2023

Training of Trainers (ToT) on the EPI Manual in Paro, 2023

HPV vaccination for boys in 2020

MR vaccination at Laya in April 2025

Capacity-Building Workshop on Cold Chain Management, June 2022

Sensitization on VPD surveillance for JDWNR Hospital staff in 2023, Thimphu

Validation of immunization data at Mongar Regional Referral Hospital, 2024

Debriefing of the national and international EPI and vaccine-preventable disease surveillance (VPDS) review, combined with the post-introduction evaluation (PIE) for PCV, influenza, and COVID-19 vaccines, March 2024

Polio vaccination



Annual program review meeting for three regions, March 2025

Visit of officials from the JCV to Wangdue Hospital in June 2023

Measles Vaccination at 9 months

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