



CASE STUDY

# CAMBODIA

## CAMBODIA'S EXPERIENCE OF COVID-19 VACCINATION DELIVERY WITH SCREENING FOR NON-COMMUNICABLE DISEASES

### Abstract:

This short case study illustrates how the Royal Government of Cambodia, together with partners, conducted a successful pilot study to use the opportunity of COVID-19 vaccination to increase the uptake of screening for non-communicable diseases and build on this opportunity to establish a model to detect and manage non-communicable diseases in adults linked to the delivery of booster doses of COVID-19 vaccination.

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**COVID-19 Vaccine**  
DELIVERY PARTNERSHIP



## Global challenges in COVID-19 vaccination

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Since the beginning of the COVID-19 pandemic in 2020, many countries responded well, achieving high rates of vaccination within a short space of time. Cambodia was amongst these, achieving 100% coverage of its population > 3 years of age within two years. However, for a variety of reasons, other countries were not as successful, and in some Regions of the world, coverage with the primary series of COVID-19 vaccines stagnated at less than 30% as of the end of February 2023.

Even for those countries that achieved high coverage with the primary series, achieving high coverage results with booster doses proved more challenging, and Cambodia is among these. While coverage of its target population with the primary series is 100%, coverage with booster doses is currently at 70%. As the Royal Government of Cambodia maps out its future COVID-19 vaccination policy which will likely include the provision of periodic booster shots to those at highest risk for hospitalization and death from COVID-19, the Government is looking for innovative ways to combine health services and reduce its growing disease burden due to non-communicable diseases (NCDs), which represent one of the highest risk groups for severe COVID-19.

According to the World Health Organization (WHO),<sup>1</sup> NCDs, also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental, and behavioural factors. The main types of NCDs are cardiovascular diseases, cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma), and diabetes mellitus.

NCDs disproportionately affect people in low- and middle-income countries, where more than three quarters of global NCD deaths (31.4 million) occur. The United Nation's Sustainable Development Goal 3.4 aims to reduce premature mortality by NCDs by one-third by 2030.<sup>2</sup> In Cambodia, NCDs account for 64% of all deaths every year; the National Strategic Plan (NSP) for the Prevention and Control of NCDs updated in 2022 seeks to scale up effective, efficient, and equitable interventions to prevent and control NCDs through strengthening health system and multisectoral collaboration.<sup>3</sup> Targeting at-risk people 40 years of age and older with routine check-ups can enable early detection of NCDs before they cause chronic morbidity or death or become more difficult to manage.

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1 WHO Fact Sheet on noncommunicable diseases. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>

2 NCD Countdown Collaborators, NCD Countdown. Lancet 2018. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(18\)31992-5/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)31992-5/fulltext)

3 Ministry of Health, Kingdom of Cambodia. National Strategic Plan for the Prevention and Control of Noncommunicable Diseases 2022-2030.

## Background & context: Cambodia

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### COVID-19 context:

At the beginning of the COVID-19 pandemic in 2020, the Royal Government of Cambodia moved quickly to adopt a population-wide vaccination strategy, including the provision of booster doses every four months following the primary series, which they continue to prioritise. The COVID-19 vaccine was introduced in Cambodia in early 2021 and by August 2022, 100% of those 18 years and older had completed the primary series of vaccination and by February 2023, 100% coverage with the primary series had been achieved for all those  $\geq 3$  years of age. This successful introduction was attributed to strong government leadership, vaccine availability, communication and education of the population, and community participation. However, the country was not as successful in promoting booster dose uptake, with only 70% of the population having received one or more booster doses.

Within this context, as long as there is continued community transmission of COVID-19, the main priority of the Government of Cambodia is to reduce high dropout rates between the primary series and the booster doses. The measures being planned in Cambodia present a learning opportunity for many countries.

### Non-communicable diseases context:

In Cambodia, like in most low- and middle-income countries, NCDs, such as hypertension, cancer, and diabetes mellitus, are a growing public health challenge. Over the past three decades, Cambodia has made major improvements in health, with mortality rates falling by 60 percent since 1990.<sup>4</sup> Most of this progress was driven by improvements in the prevention of communicable diseases and improving maternal and child healthcare.

As of 2020, 23 percent of all premature deaths (below age 70) in Cambodia are attributable to NCDs.<sup>5</sup> NCDs are estimated to result in an economic burden of US\$ 1.5 billion in Cambodia, equal to seven percent of the Gross Domestic Product (GDP), largely driven by indirect costs of premature death and reduced work capacity. In particular, the prevalence of diabetes mellitus in Cambodia is high, possibly due to high rates of maternal and childhood malnutrition during the Khmer Rouge era.<sup>6</sup>

Early stages of diabetes and hypertension are commonly asymptomatic, with hypertension sometimes referred to as the “silent killer,” leaving many unaware of any medical concerns. Recent data shows that over 14 percent of all Cambodian adults suffer from hypertension and nearly 10 percent have diabetes mellitus, including 20 percent of people between the ages of 60 and 69.<sup>7</sup> Yet, there is still a large gap in screening Cambodian adults for these diseases: of those surveyed in 2016, 43.1 percent had never been screened for blood pressure and 76.5 percent had never been screened for diabetes mellitus. In one study in Cambodia’s Takeo province, over half of patients with diabetes mellitus had kidney dysfunction at the time of diagnosis, emphasizing the need for increased screening to diagnose the disease before progression.<sup>8</sup>

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4 Institute of Health Metrics and Evaluation: Global Burden of Disease Compare. Downloaded on 14 February 2021 from <https://vizhub.healthdata.org/gbd-compare/>

5 WHO, Prevention and Control of NCDs in Cambodia: the Case for Investment, 2019 <https://www.who.int/nmh/ncd-cambodia/en/>

6 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3425424/>  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3876901/#B125>

7 STEPS Surveys, Cambodia Ministry of Health and WHO, 2016 and 2010

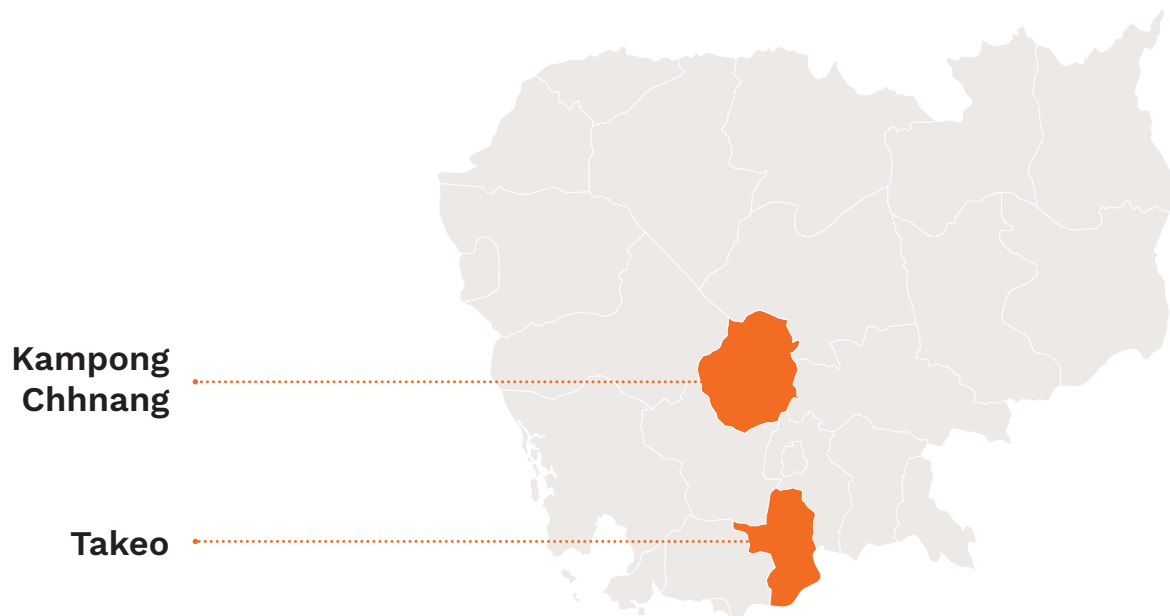
8 Thomas et al. An Estimation of the Prevalence and Progression of Chronic Kidney Disease in a Rural Diabetic Cambodian Population. PLoS One. 2014. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3899115/>

With decreases in the initial high funding envelope for COVID-19 vaccination, the Government of Cambodia plans to integrate COVID-19 vaccination within the existing health system. Particularly, the government recognized the untapped opportunity that COVID-19 vaccination presented in reaching older adult populations with NCD screening for hypertension and diabetes<sup>9</sup> and other primary health care (PHC) services.

This approach is in line with one of the major health investments in the Cambodia Health Equity and Quality Improvement Project Phase 2 (H-EQIP2)<sup>10</sup>, a \$114M World Bank co-financed investment, which aims to improve health facility readiness and capability to provide quality NCD treatment. Leveraging the H-EQIP2 project, COVID-19 vaccination could increase NCD screening of at-risk adult population and link them to necessary care. Similarly, individuals coming to receive NCD care could be linked to COVID-19 vaccination boosters.

## Cambodia's innovative response

In June 2021, with support from partners, including the Clinton Health Access Initiative (CHAI), the Cambodian Ministry of Health (MOH) implemented a pilot in 8 large vaccination sites in 2 provinces, Kampong Chhnang, and Takeo, to integrate NCD screening for adults 40 years and older during COVID-19 vaccination visits.



The objective of the project was to train health workers to screen adults >40 years for diabetes and hypertension, as well as provide education on NCD prevention, before administering COVID-19 vaccination.

9 NCD prevalence in Cambodia: Hypertension (14.2%) and Diabetes (9.6%), and expected to rise in coming years; Responsible for 64% of deaths in Cambodia in 2019

10 World Bank, Preparing Cambodia's Health Equity and Equality Improvement Project H-EQIP2 Under the Pandemic, [link](#).

**Phase 1:**

Phase 1 provided training in NCD screening and testing supplies and technical assistance to health workers in these 8 large vaccination sites in the 2 provinces.

The health workers screened adults aged  $\geq 40$  years coming for a COVID-19 vaccination for diabetes mellitus and/or hypertension and provided information, education and communication (IEC) materials and counselling on NCD risk factors and the importance of early detection at no charge to the individual.

**Phase 2:**

Phase 2 focused on providing integrated screening at health facilities thus offering a path to sustainability and facilitating better data recording. The team also engaged with community health workers - Village Health Support Group (VHSG) in Cambodia- in health promotion and follow up.

At the end of Phase 2, 11 health facility staff had been trained in the WHO Package of Essential Non-communicable (PEN) interventions for PHC resulting in increased capacity for screening/diagnosis and management of NCD patients.<sup>11</sup> The VHSG workers were trained to support education in communities and conduct follow up.

Later, the pilot was adapted to be delivered during the administration of COVID-19 booster doses at health facilities. Adjustments were made to match the new model of COVID-19 booster vaccine delivery and in response to feedback received from the Provincial Health Departments (PHDs) and the Technical Working Group of the Preventable Medicine Department (PMD TWG).

## Outcomes

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A survey conducted in July 2021 showed the pilot's high acceptability among healthcare workers. Only 28 percent of the health care workers had previous experience screening patients for NCDs, yet 100 percent supported the provision of NCD screening during COVID-19 vaccination. The average screening time was quick at less than two minutes for blood glucose testing and less than three minutes for checking blood pressure. When designing the operating model, particular care was given to ensure that the screenings did not slow down COVID-19 vaccination rates, and both Takeo and Kampong Chhnang provinces fully vaccinated their target populations at the same rapid speed as other Cambodian provinces.

The beneficiaries also appreciated the service. Ninety-four percent of the adults surveyed that received screening stated that they would pay more attention to their health in the future and would go for routine check-ups.

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<sup>11</sup> WHO package of essential noncommunicable (PEN) interventions for Primary Health Care. <https://www.who.int/publications/i/item/9789240009226>

## IMPACT

From the pilot study the following results were obtained:

- 7,500 individuals (40% of eligible 19,000 adults) were screened for diabetes mellitus and hypertension. None of them were aware that they were at risk of one of these conditions.
- Of these, 38% (2,700 individuals) were detected to have abnormal findings on the screening tests and were referred for follow-up visits at a nearby medical facility.
- During delivery of COVID-19 booster doses at the health facilities, VHSG support was enlisted; as a result, 45% people accessed follow-up care after referral.

## BENEFITS

The COVID-19 vaccination platform represents a unique opportunity to reach at-risk adult populations with additional PHC services. High acceptability among HCWs and communities suggests NCD services integrated into COVID-19 vaccination is a good opportunity (requiring little additional financial and HCW time investment) to improve access to primary healthcare.

## CHALLENGES

### **Limited provincial funding for procurement of NCD commodities.**

In a decentralized health system, provinces are responsible for their health budget yet to date, no province has allocated funds for NCD testing and treatment (limited funding provided for national level procurement) and data analysis and forecasting capacity at lower levels is limited. The pilot project provided funding for commodities which is not sustainable in the long term. Under the H-EQIP2 project, the MOH aims to improve availability NCD screening and treatment commodities.

### **Ambitious COVID-19 vaccination targets limited daily screening numbers.**

Data showed sometimes screening for NCDs was low because HCWs prioritized achieving ambitious COVID-19 vaccine targets. Depending on how health workers prioritize screening versus COVID-19 vaccination in the future may determine the uptake of one or the other intervention.

### **Lack of additional funding for the VHSG resulted in limited participation.**

The lack of additional funding for VHSG support resulted in limited engagement of community health workers since their role is spread across various health programmes and hence their responsibility is broad. This will be addressed in the future as the Government revises the VHSG model.

# Opportunities beyond the COVID-19 vaccine response

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## **Looking ahead: Strengthening NCD screening for integration with COVID-19 vaccine booster shots at health centre level.**

Cambodia's COVID-19 mass vaccination campaign was largely conducted at hospitals and large sites, due to the urgency of the rollout. However, Cambodia's Ministry of Health is currently planning for the probable need for annual booster shots for all Cambodians, which will be further decentralized at the local health centre level.

This new and regular touchpoint with all populations at-risk of NCDs represents a golden opportunity to save lives through early screening, scaling the gains made in the integrated pilot. If successful, this could evolve into a platform for providing health services to older adults.

Most health centres in Cambodia do not currently have the capacity to diagnose and manage major NCDs due to lack of equipment, and shortage of essential medicines and supplies. Only in a few districts have health workers at the lowest levels been trained to diagnose, refer, and care for patients living with diabetes and/or hypertension. Hence, CHAI, in collaboration with the National Department of Preventative Medication and WHO is supporting provincial health departments (PHDs) in the two focal provinces to implement integrated NCD screening when health facilities administer COVID-19 vaccine booster shots. Health workers at these facilities will concurrently receive training to provide long-term care for patients diagnosed with hypertension and diabetes as part of the H-EQIP2 project. CHAI has also supported training for community leaders and village health volunteers—essential touchpoints in communities— on the importance of NCD screening and prevention.

## **Major investment in training for Health Care Workers (HCWs) and Health Facility readiness for NCD management.**

The Government is making significant investments to strengthen the quality of NCD services in the public sector through the Health Equity and Quality Improvement Project Phase 2 (H-EQIP2) project. Through a significant investment of \$114M co-financed by MOH and the World Bank, the Government plans to improve HF readiness and capability to provide quality NCD treatment in Cambodia. All HFs will be trained and also supported with procurement, which will pave the way for the scale-up of integrated services.

At full operationalization, H-EQIP2 will bear the cost of nationwide training and set up a revolving procurement and supply system for replenishing screening and treatment commodities. As such, offering a launchpad to scale up an integrated service delivery model at a lower cost.

## **Mainstreaming of COVID-19 vaccine with routine immunization and other PHC services.**

Looking ahead, the MoH plans to mainstream COVID-19 vaccine with routine immunization and other PHC services to ensure cost effectiveness and programmatic sustainability and continued high coverage for COVID-19 vaccine while leveraging to improve diagnosis and treatment for all essential health services.

## **Partner support for scale up.**

Partners will provide technical support to scale up the NCD-COVID-19 vaccine model, as well as exploring integration with other PHC services. CHAI, along with other development partners including UNICEF and WHO, will support the MoH to scale up an integrated COVID-19 vaccine-NCD model of care to additional

geographies, learning from early lessons and findings from the pilot as part of the continued costing and testing (feasibility and impact) of life course healthcare approaches by MOH.

The implementation of the pilot project raised four main challenges regarding scale-up and sustainability of this pilot approach:

1. For scale-up, it will be important to adapt the model for facilities with higher patient volumes. Moreover, the pilot was focused on offering NCD screening at COVID-19 vaccination, but not yet vice versa.
2. Data systems used by community health workers remain paper-based, requiring a large amount of duplicative work, and limiting the ability to plan targeted outreaches in communities with lower coverage.
3. Scale-up of integrated COVID-19-NCD screening was hindered as complementary funding for NCDs was not yet in place. With several facilities untrained in the management of NCDs, individuals with abnormal test results needed to be referred to the provincial hospitals to receive confirmatory diagnosis and appropriate care.
4. At the end of the pilot, the COVID-19 vaccination patient registry was still independent from the routine national health information system (HMIS) and parallel data systems were needed to track the drop out between those eligible for COVID-19 vaccination and NCD screening.

## Lessons

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- Leveraging the COVID-19 vaccination touchpoint to screen, diagnose and link at-risk patients to appropriate NCD care is operationally feasible and results in increased NCD diagnosis and treatment.
- COVID-19 is a good opportunity to reach at-risk adults that usually do not access the healthcare system with other under-utilized services.
- The Government is committed to increasing access to all necessary services across the life course.
- Acceptance and feasibility of the pilot was high among both HCWs and the population however further training on NCD management is needed and currently being invested in by the MOH.

## Acknowledgements

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