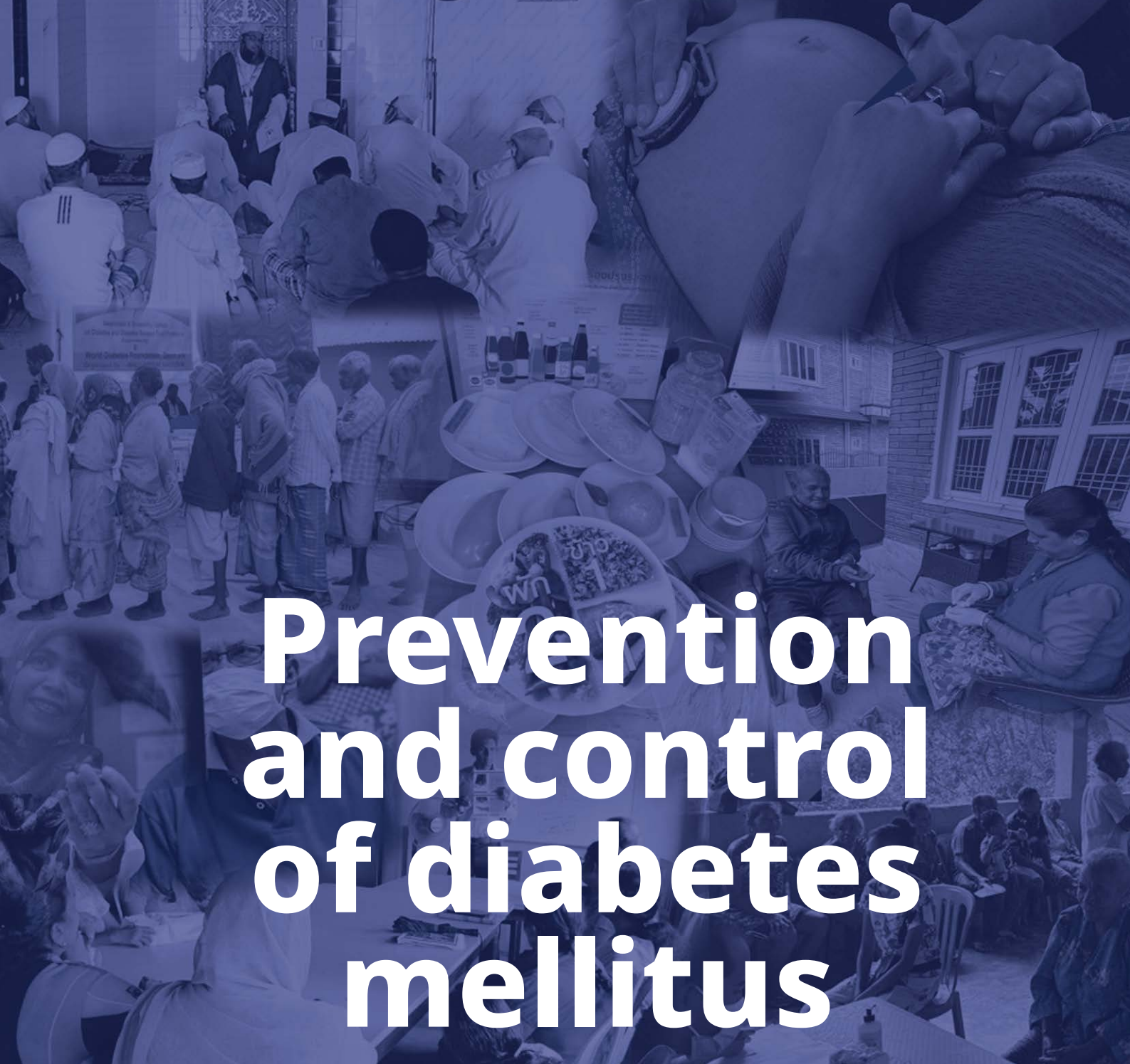




Prevention and control of diabetes mellitus

Lessons for service delivery from countries
in the WHO South-East Asia Region

WHO Global
Diabetes
Compact



SEA HE RTS

 World Health
Organization
South-East Asia Region



Prevention and control of diabetes mellitus

Lessons for service delivery from countries in the WHO South-East Asia Region

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WHO does not endorse any specific products, services, companies, foundations or models of care described in the case studies. The case studies presented in this publication are by no means the only examples of good practices; many additional good practices exist across the Region that can strengthen diabetes prevention and management. Case studies are illustrative, not exhaustive.

Case-study evidence from Bangladesh, India (GDM case study), Indonesia, Nepal, Sri Lanka drew on a WDF-funded assessment conducted by University of New South Wales, Australia; no funds were provided to WHO. Case study, facts and data pertaining to the Republic of Indonesia are included in this report as the Member State was affiliated to the World Health Organization's South-East Asia Region at the time the report was commissioned and prepared. It is to be noted here that Indonesia was reassigned to the WHO Western Pacific Region with effect from June 2025 following a resolution adopted by the Seventy-eighth World Health Assembly in Geneva in May 2025.

Prevention and control of diabetes mellitus: Lessons for service delivery from countries in the WHO South-East Asia Region

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Abbreviations and acronyms

ANC	antenatal care
ASHA	Accredited Social Health Activist
CVD	cardiovascular disease
DM	diabetes mellitus
FCHV	female community health volunteer
GDC	Global Diabetes Compact
GDM	gestational diabetes mellitus
IDF	International Diabetes Federation
LMIC	low- and middle-income countries
NCD	noncommunicable disease
NGOs	nongovernmental organizations
OGTT	oral glucose tolerance test
PHC	primary health care
SDG	Sustainable Development Goal
T2D	type 2 diabetes
TB	tuberculosis
UHC	universal health coverage
WDF	World Diabetes Foundation
WHO	World Health Organization

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Foreword



Diabetes remains a public health concern in the WHO South-East (SE) Asia Region. It is estimated that more than 279 million people aged 18 years and above are living with the condition, with approximately two-thirds remaining undiagnosed and untreated. This underscores the urgent need for collective and sustained actions to address the unmet needs in diabetes care, and to mitigate the socioeconomic impact on millions of people and families across the region.

The Resolution on “SEAHEARTS: Accelerating prevention and control of cardiovascular diseases in the South-East Asia Region” adopted at the Seventy-sixth session of the WHO Regional Committee, has provided strong impetus for scaling up diabetes prevention and management in primary health care systems across the region. Furthermore, the 2024 “Colombo Call to Action for strengthening prevention and control of diabetes in WHO SE Asia Region” serves as a concrete roadmap for translating commitments into actionable steps, aligned to the key asks of the Global Diabetes Compact.

Actions taken at both policy and programmatic levels have reduced risk factors and expanded treatment coverage, with more than 33 million people with diabetes placed on protocol-based management in public health facilities as of June 2025.

This publication reviews the burden of diabetes in the WHO SE Asia Region, along with key programmatic and health systems enablers. It also highlights real-world examples and practical solutions through case studies designed to promote cross-learning, particularly in low-resource settings. It outlines approaches adopted by countries, in partnership with stakeholders, to reduce diabetes risk and improve service coverage. The case studies included in the publication are aligned with WHO SEAHEARTS initiative and Global Diabetes Compact.

The report offers practical, actionable solutions for policymakers and programme managers, to scale up the implementation of evidence-based interventions to prevent and manage diabetes.

I invite the policymakers, programme managers, and stakeholders in the Region and beyond to make use of this publication to understand the burden, gaps, and actions required to collectively address diabetes and meet the unmet needs in diabetes care.

Dr Catharina Boehme
Officer-in-Charge
WHO South-East Asia

Foreword



The magnitude of the diabetes challenge in WHO SE Asia Region is significant. Tackling it demands more than leadership and resources — it requires alliances and partnerships built on trust, innovation, and shared purpose. This joint publication with WHO's South-East Asia Regional Office embodies that, showcasing how global partnerships can drive local impact.

The World Diabetes Foundation (WDF) is a long-standing partner of countries across the WHO SE Asia Region. Since 2010, we have supported more than 46 projects with partners ranging from ministries of health, healthcare providers, community-based organisations, academia, and NGOs to international agencies - particularly the WHO. These partnerships have underscored the importance of grounding ambition, innovation, and effort in local realities for scaled and sustained impact.

As showcased in this report, our partners have developed, tested and scaled numerous innovative solutions and approaches across the spectrum of strengthening front line health services and community-based solutions; preventing the diabetic foot and eye disease; drawing attention to the interface between diabetes and tuberculosis; and not least, shining a light on the importance of addressing gestational diabetes for safe deliveries and to avoid fuelling future generations of diabetes.

Many of these initiatives have inspired action in other countries in the region - and beyond - and have laid the ground for global attention and response to diabetes. These achievements reflect how WHO's technical leadership and guidance, combined with WDF's focus on locally anchored solutions, create strong multiplier effects to the benefit of people at risk of or living with diabetes.

The recent Colombo Call to Action and the ambitious SEAHEARTS initiative aiming to place 100 million people on protocol-based diabetes and hypertension care by 2025 signify the strong leadership and commitment to act in the region. It is time for comprehensive and scaled engagement. I hope the diverse pathways to progress reflected in this report may serve as inspiration.

Leif Fenger Jensen
Managing Director
World Diabetes Foundation

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Executive summary

Diabetes is a major and growing health challenge in the WHO South-East (SE) Asia Region, with an estimated 279 million people living with the disease. Nearly two million deaths are directly attributed to the condition each year, contributing significantly to premature mortality and hindering progress towards Sustainable Development Goal (SDG) Target 3.4, which aims to reduce deaths from noncommunicable diseases (NCDs) by one third by 2030.

Despite strong political commitments, including the Global Diabetes Compact (GDC) launched in 2021, the adoption of global diabetes coverage targets in 2022, the “SEAHEARTS: Accelerating prevention and control of cardiovascular diseases in the South-East Asia Region” resolution in 2023 and the “Colombo Call to Action: Strengthening prevention and control of diabetes in the WHO South-East Asia Region” in 2024, most countries in the Region remain off track in achieving diabetes coverage and outcome goals. This report documents the lessons learnt from diverse service delivery models implemented by governments with support from WHO, the World Diabetes Foundation (WDF) and local partners across Bangladesh, India, Indonesia, Nepal, Sri Lanka, Thailand, and Timor-Leste. Drawing on case studies, field visits and project evaluations, it highlights practical and context-specific strategies that improve diabetes prevention, early detection, treatment and long-term management in resource-limited settings.

Integrating diabetes services into primary health care is critical for improving access and outcomes. In countries such as Bangladesh, India and Sri Lanka, embedding diabetes screening and management into community and maternal health platforms has strengthened early detection and improved continuity of care. Integration with antenatal care (ANC) services has enabled timely screening for gestational diabetes mellitus (GDM) and postpartum follow-up.

Furthermore, linking diabetes care with communicable disease services such as tuberculosis programmes has expanded reach and efficiency. Strengthening health information and digital systems has also proved essential. National NCD portals and electronic health records are helping ensure continuity of care and accountability across health systems.

Community engagement proved to be a powerful lever of change as well. In Bangladesh, religious leaders mobilized large populations for awareness, screening and referral, while in Nepal, Thailand and Sri Lanka, school-based health education programmes instilled healthy behaviour in children and positioned them as community change agents. Community health workers, such as Accredited Social Health Activists (ASHAs) in India and female community health volunteers (FCHVs) in Nepal, played critical roles in bridging gaps in screening and follow-up, often serving as trusted first points of contact in their communities. Similarly, in Thailand, community-led initiatives such as diabetes remission clinics and structured community-based diabetes education

programmes leveraged local volunteers, retired teachers and support networks to sustain lifestyle modification and long-term follow-up.

The report also highlights the challenges and sustainability considerations. Across the Region, persistent barriers include limited public awareness of diabetes prevention and early detection, inconsistent implementation of standardized treatment protocols, inadequate diagnostic capacity, and shortages of trained health personal. Countries continue to face gaps in funding, shortages of trained personnel and competing health priorities that limit the scale-up of successful models.

Access to medicines and supplies remains uneven across the Region. Countries continue to face stockouts of insulin, oral antidiabetic drugs and diagnostics due to weaknesses in the supply chain. Nurse-led complication screening in Sri Lanka showed how expanding services for diabetic foot care at the primary level improves early detection and management of complications. Similarly, patient education on lifestyle modifications, diet and physical activity emerged as being central to long-term disease control.

Evidence from the case studies shows that task-sharing and capacity-building among front-line health workers can expand service coverage effectively, while community-centred approaches build trust, encourage uptake of services and strengthen adherence to treatment. Integration of services within primary health care and across disease programmes reduces missed opportunities and enhances more resilient health systems.

While the Region has demonstrated promising and scalable interventions, sustained progress requires greater investment in medicines, diagnostics, digital tools and human resources. The pragmatic lessons drawn from these country experiences provide policymakers and programme managers in the SE Asia Region with actionable strategies to accelerate progress towards the global diabetes coverage targets and SDG target 3.4. Additionally, the report is a useful resource for stakeholders, researchers and practitioners interested in scalable models of integrated diabetes care.





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1 Introduction

Globally, an estimated 830 million people are living with diabetes, while nearly two million deaths are directly attributed to the condition each year (1). Diabetes and its complications – including blindness, kidney failure, ischaemic heart disease, stroke and lower-limb amputation – cause premature mortality, significant morbidity, reduced quality of life, and substantial economic burden for individuals, families, health systems and national economies. In the WHO South-East (SE) Asia Region, an estimated 279 million adults aged 18 years and above are living with diabetes, as per 2022 Global Health Estimates. Over 50% (approximately 140 million) remain undiagnosed, and nearly 63% (177 million) are not receiving glucose-lowering treatment (2).

Target 3.4 of the United Nations (UN) Sustainable Development Goal (SDG) 3 on health and well-being aims to reduce premature mortality (occurring before the age of 70) from noncommunicable diseases (NCDs) by one third between 2015 and 2030 (SDG 3.4.1). According to WHO Global Health Estimates, diabetes contributes to 3% of mortality and is a major risk factor for cardiovascular diseases (CVD) and premature CVD mortality.

Currently, the Region is off track in achieving SDG Target 3.4.1 and urgent action is required to reverse the rising trends in premature deaths from diabetes and CVDs (3). According to WHO, high blood glucose is responsible for approximately 11% of cardiovascular deaths globally; almost half of deaths attributable to diabetes occur before the age of 70 years, highlighting the significant role of poor glycaemic control in driving premature CVD mortality and hindering achievement of SDG Target 3.4.1 (1).

In April 2021, WHO launched the Global Diabetes Compact (GDC) with the vision to reduce diabetes risk and ensure access to equitable, comprehensive and affordable care for all people living with the condition. In 2022, the Seventy-fifth World Health Assembly adopted the first-ever global diabetes coverage targets for 2030 [WHA75(11)]. It called for strengthened national NCD programmes to scale-up diabetes management and monitoring to reach the specific targets (4). WHO HEARTS D is an expansion of the WHO HEARTS technical package, with the initiative supporting countries in implementing standardized protocols for the prevention, early diagnosis, treatment and management of diabetes, particularly type 2 diabetes (T2DM). It emphasizes the use of simple, scalable and evidence-based interventions adapted to local contexts (5).



To advance this agenda, the WHO SE Asia Region adopted the resolution “SEAHEARTS: Accelerating prevention and control of cardiovascular diseases in the South-East Asia Region (SEA/76RC/R5)” with four time-bound milestones, including the milestone of placing 100 million people with hypertension and/or diabetes on protocol-based management by 2025 (6). The “Colombo Call to Action: Strengthening prevention and control of diabetes in the WHO South-East Asia Region” adopted at the Regional Commemoration of World Diabetes Day 2024 further outlines bold, catalytic actions to accelerate country-level implementation (7).



Over the past two decades, several projects and service delivery models have been implemented for diabetes prevention and management through a range of partners, including local and national governments, academic institutions, civil society organizations, international NGOs, WHO and other (UN) agencies supported through development assistance, independent foundations, and philanthropic grants and

donor funds. This report aims to document and disseminate practical solutions and good practices, presented through projects implemented through the World Diabetes Foundation (WDF) and/or WHO support, to strengthen diabetes prevention and control across the Region, considering the WDF is a leading global funder of diabetes prevention and care projects in low- and middle-income countries (LMICs). The case studies included are aligned with the WHO SEAHEARTS initiative and the Global Diabetes Compact key asks (8).

The report also reviews the burden of diabetes in the Region, along with programmatic and health system enablers, and accordingly offers practical, actionable solutions for policymakers and programme managers for implementation of evidence-based interventions to prevent and manage T2DM.

The report consists of:

1. a summary of the burden of diabetes, health systems response and strategic enablers to address the burden of diabetes in the WHO SE Asia Region;
2. case study examples of diabetes interventions and innovations from seven countries in the WHO SE Asia Region, highlighting achievements, challenges and solutions across prevention, diagnosis, management and rehabilitation;
3. overall pragmatic lessons learned and suggestions to improve diabetes prevention and control in the Region; and
4. country profiles on diabetes burden and health systems response in WHO SE Asia countries

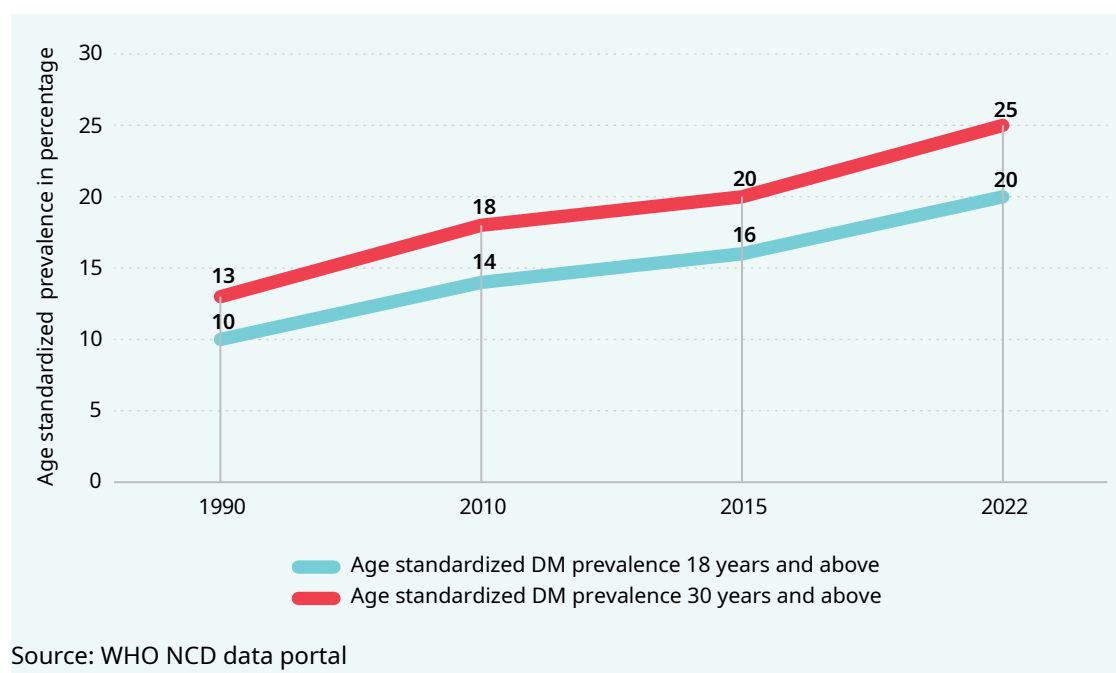


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2 Diabetes in the Region: Burden, health systems response and priorities for action

Diabetes is a major public health challenge in the WHO SE Asia Region, with over 279 million adults aged 18 years and above estimated to be living with the condition. The age-standardized prevalence has steadily increased over the past two decades, reaching ~20% (17.3%–22.9%) among adults ≥ 18 years and ~25% (21.1%–27.7%) among those aged ≥ 30 years. Importantly, the rising prevalence in younger adults indicates a shift of the epidemic towards younger age groups (Fig. 1) (9).

Fig. 1. Trends in age-standardized prevalence of diabetes in the WHO South-East Asia Region, 1990–2022

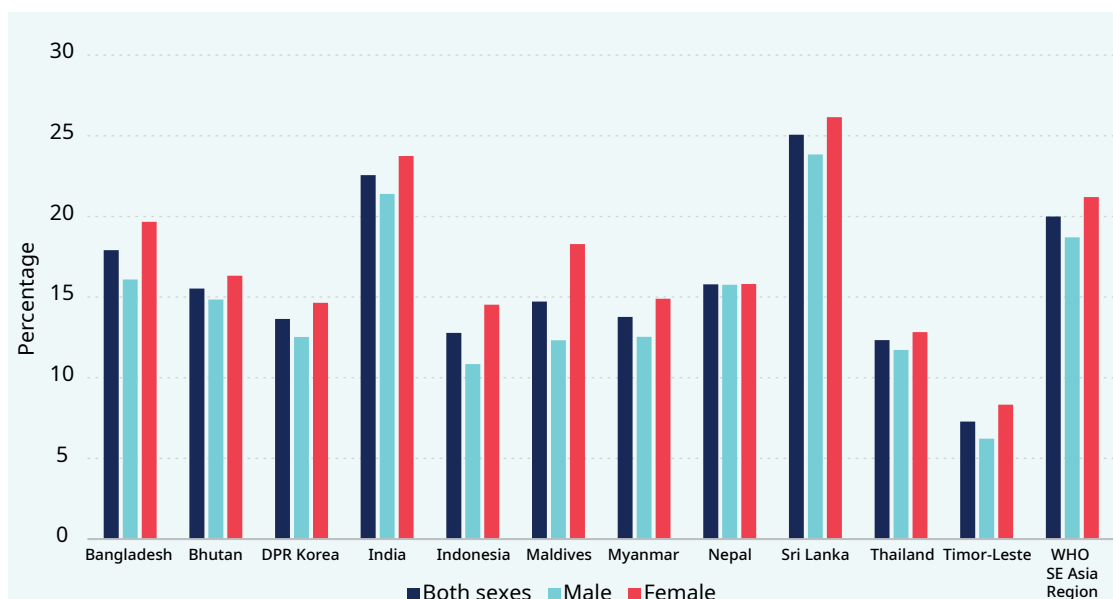


Prevalence varies substantially across countries and between sexes, with women showing higher rates (21.2%), compared with men (18.7%) (Fig. 2).

In 2021, an estimated 241 240 deaths among people aged 30–69 years in the SE Asia Region were attributable to diabetes, accounting for 2.7% of all deaths (3). Moreover, an analysis of Global Burden of Diseases 2023 ranked high fasting glucose levels as the fourth attributable risk factor for overall mortality in the Region, marking approximately 8% of total deaths, predominantly through complications such as ischaemic heart disease, chronic kidney disease and stroke (10).

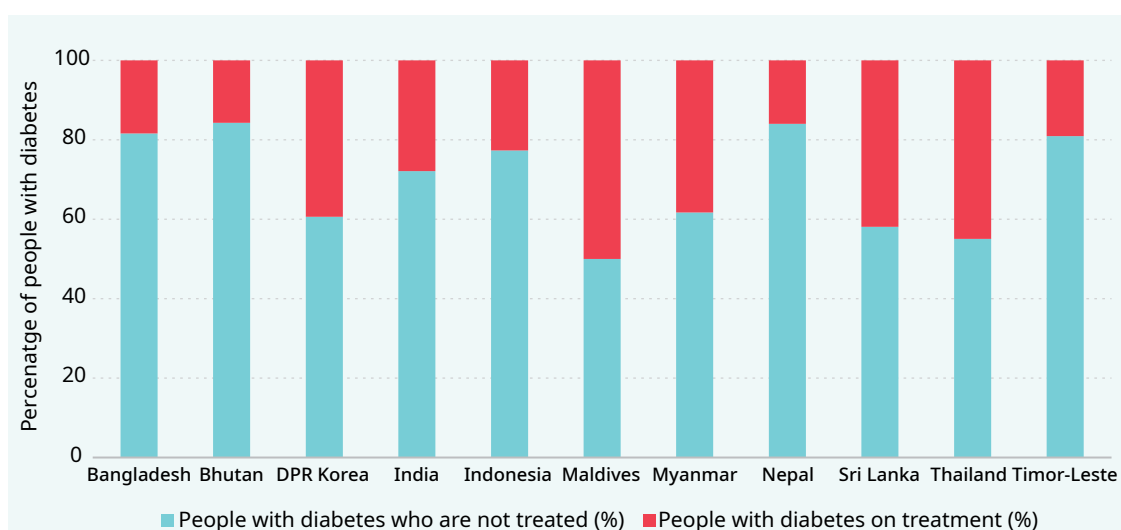
A care cascade analysis conducted in the SE Asia Region in 2022 highlighted large treatment gaps of ~246 million adults ≥ 30 years with diabetes; ~177 million were not receiving treatment. Coverage varies widely, from nearly 50% in Maldives to just 15% in Bhutan (Fig. 3) (9). The analysis shows that less than one third of people with diabetes in India are receiving treatment, in contrast to the International Diabetes Federation (IDF) Diabetes Atlas, which estimates that over 40% of people with diabetes are on treatment in India.

Fig. 2. Age-standardized prevalence of diabetes among individuals aged 18 years and above in countries of the WHO South-East Asia Region, 2022



Source: WHO NCD data portal

Fig. 3. Treatment coverage among people with diabetes (≥ 30 years) in countries of the WHO South-East Asia Region, 2022



Source: WHO Global Health Observatory

It is important to note that individuals not receiving treatment may include both those who remain undiagnosed and those who have been diagnosed but are not receiving glucose-lowering treatment. Differences across studies can be attributed to variations in data sources, definitions of treatment, survey methods and population coverage. This emphasizes the need for harmonized definitions and standardized monitoring to ensure comparability of estimates.

Obesity, physical inactivity, tobacco use and alcohol consumption remain major modifiable risk factors. In 2022, the adult obesity prevalence was 31%, with projections suggesting a further 31% increase by 2030. Women show higher rates (35%), compared with men (27%) (11).

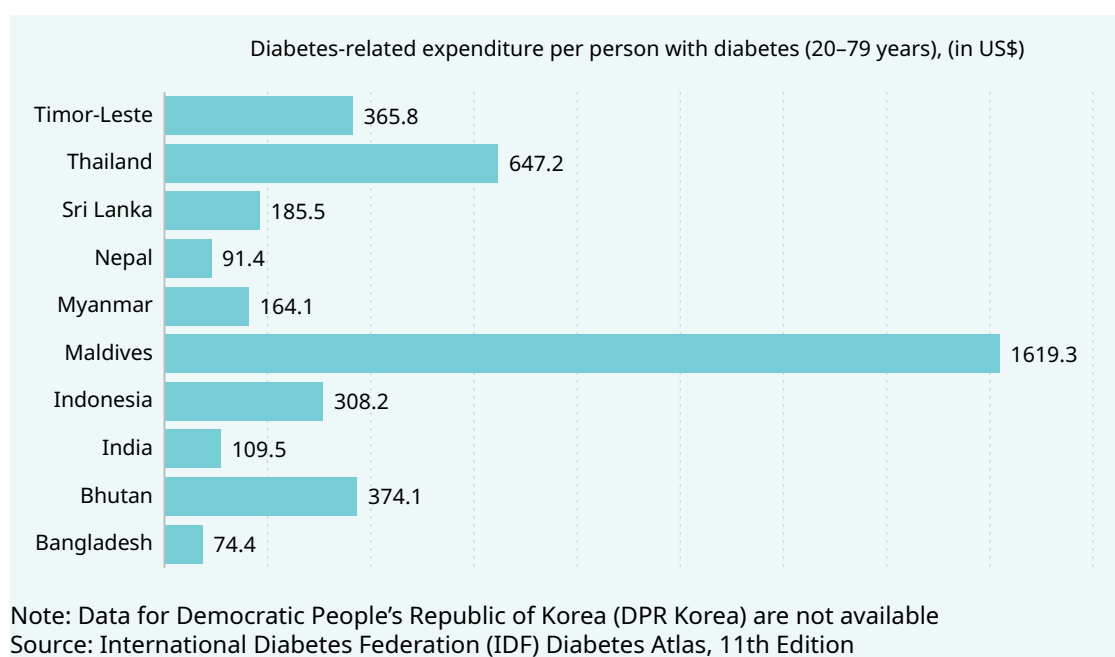
Tobacco use has declined from 37.2% in 2010 to 27% in 2022, indicating progress towards the global SDG target. However, prevalence remains high among men (44%), compared with women (9%).

Physical inactivity is also a growing concern. In 2022, 18% of adults aged 18 years and above were physically inactive, with projections showing an alarming rise to 48% by 2030. Like obesity, physical inactivity is more prevalent among women (45%) than men (36%) (11).

According to the International Diabetes Federation (IDF) Diabetes Atlas, 11th Edition, the direct costs of diabetes – encompassing health expenditures from both public and private sources – are substantial in the SE Asia Region. Diabetes is one of the major drivers of out-of-pocket health spending in the Region, with financial burdens significantly higher than those in many other parts of the world. Fig. 4 highlights the estimated per-person diabetes-related expenditure in the Region for 2024 (12).

Notably, expenditures on diabetes vary widely across countries. In Maldives, spending is more than 10 times higher than that in India, largely due to high government spending on expensive medicines and a fully subsidized health system, whereas in India, the reported figure may underestimate the true financial burden, given the predominance of out-of-pocket payments in the private sector.

Fig. 4. Estimated per-person diabetes-related expenditure in the WHO South-East Asia Region, 2024



Countries in the WHO SE Asia Region have implemented several interventions to address the growing burden of diabetes. National targets related to tobacco use, obesity, diabetes and physical activity have been set in alignment with the global NCD targets. According to the WHO Noncommunicable Diseases Country Capacity Survey 2023 (WHO NCD CCS 2023), all countries in the Region have established either integrated or standalone policies or programmes for diabetes (13).

WHO NCD CCS 2023 further reveals that while 10 countries have developed national protocols for diabetes management at the primary health care level – including drug- and dosage-specific protocols – only five countries have updated these protocols since 2020 to align with the WHO HEARTS-D technical package (Table 1).

Table 1. Availability of national management protocols for diabetes and utilization in at least 50% of health-care facilities in the WHO South-East Asia Region, 2023

Countries with drug-and dose-specific protocols	Year of last update
Bangladesh	2021
Bhutan	2022
DPR Korea	2013
India	2023
Indonesia	2020
Myanmar	2020
Nepal	2018
Sri Lanka	2018
Thailand	2023
Timor-Leste	2022

Country without drug-and dose-specific protocols: Maldives

Furthermore, all 11 countries reported that first-line oral diabetes medications – metformin and sulfonylureas – are “generally available” (available at more than 50% of public primary care facilities). However, only five countries indicated that insulin is generally available at primary care facilities of the public sector.

In terms of diagnostics, the availability of blood glucose measurement tools is relatively better. Eleven countries reported that blood glucose testing is available at both public and private primary health care facilities. However, access to advanced diagnostic tools such as HbA1c testing and dilated fundus examination remain limited,

with only three countries reporting their availability in both public and private primary care settings (Table 2).

Detailed country-specific information on health systems responses, including service availability and policy implementation, is provided at country profiles on diabetes burden and health systems response in WHO SE Asia countries (page73-94).

Table 2. Availability of diabetes medicines and technologies in primary health care in the WHO SE Asia Region

Medicines/technologies	Number of countries in 2021 (%)	Number of countries in 2023 (%)
Insulin	6 (54.5)	5 (45.5)
Metformin	11 (100)	11 (100)
Sulfonylureas	9 (81.8)	9 (81.8)
Statins	10 (90.9)	9 (81.8)
Blood glucose measurement	10 (90.9)	11 (100)
HbA1c	4 (36.4)	3 (27.3)

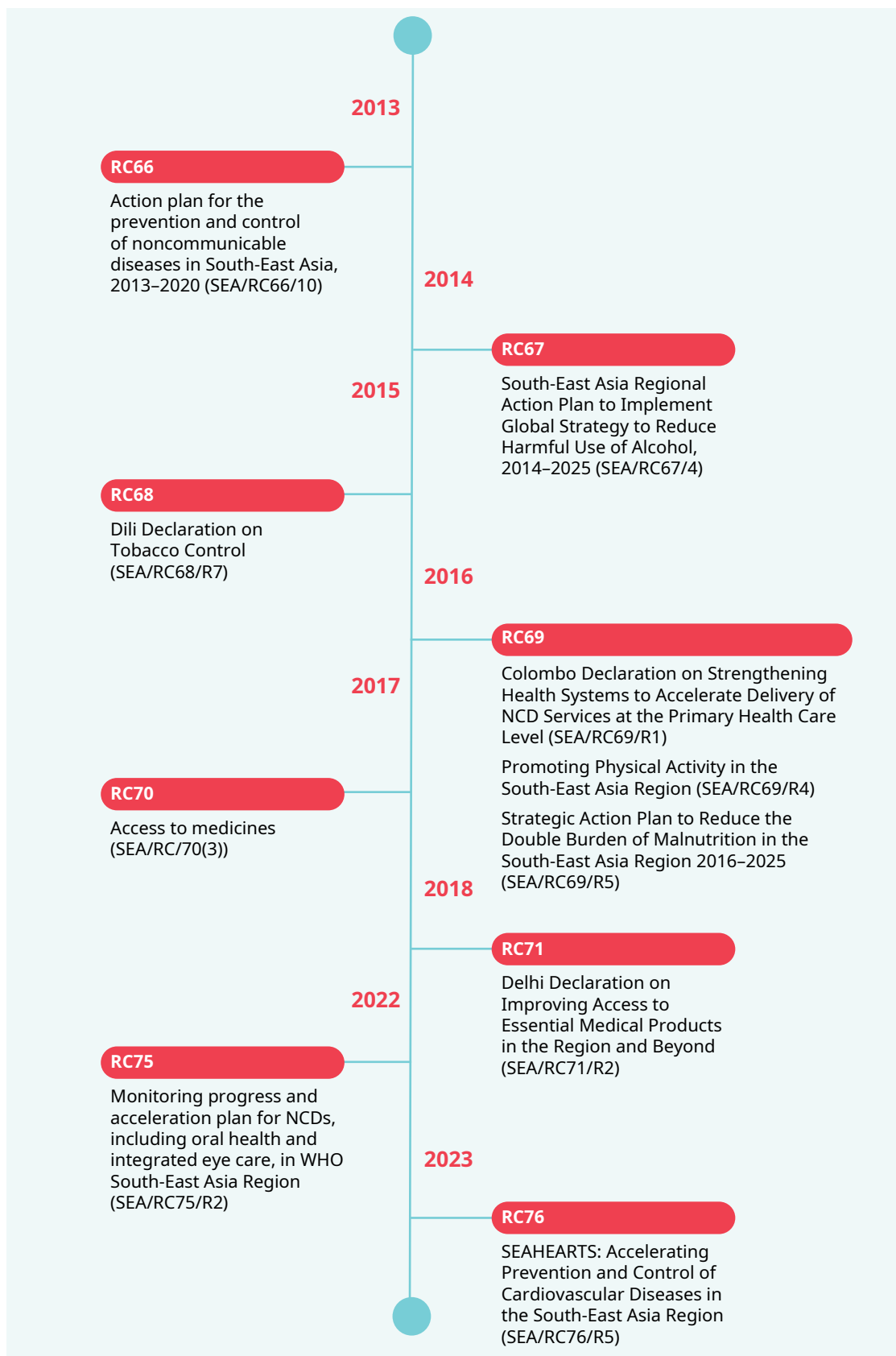
Strategic priority to address the burden of diabetes in the WHO SE Asia Region

Progress in strengthening the response to diabetes has varied across countries, but regional commitments through WHO SE Asia Region resolutions provide strategic guidance. These resolutions are aligned with global frameworks and contextualized for regional implementation.

Fig. 5 highlights the regional resolutions adopted since 2013, following the UN High-Level Political Declaration on the prevention and control of noncommunicable diseases (NCDs) in 2011. These resolutions reflect the strong commitment of Member States to address the growing burden of NCDs, which has a direct impact on diabetes prevention and control.

Countries in the Region have made commendable progress by implementing legislative, regulatory and fiscal measures to reduce tobacco use. In addition, a range of initiatives have been undertaken to promote physical activity, encourage healthy diets and improve the adoption of healthy lifestyles, all of which are essential for preventing diabetes and mitigating diabetes complications. Further details on these efforts are outlined in “Platinum Decade: Accelerating health for billions: WHO South-East Asia Region 2014–2023”, a regional report that reviews the WHO SE Asia Region’s progress and key initiatives over the past decade, including action on NCDs (14).

Fig. 5. Regional Committee resolutions with an impact on the prevention and control of diabetes



Following the COVID-19 pandemic, as part of the “building back better” agenda, Member States have demonstrated strong commitment to addressing the burden of diabetes and bridging the gaps in the care cascade, in alignment with global commitments. One of the prominent steps in this direction is the adoption of the resolution during the Seventy-sixth Session of the Regional Committee for South-East Asia on “Monitoring progress and the acceleration plan for NCDs, including oral health and integrated eye care, in the South-East Asia Region (SEA/RC75/R2)”. This resolution provides strategic guidance through the “Implementation roadmap for accelerating the prevention and control of NCDs in South-East Asia 2022–2030” (15).

The roadmap outlines key regional NCD targets for 2030, including the five global diabetes coverage targets agreed upon at the global level (Box 1). It provides Member States with strategic direction and practical tools to sustain, prioritize and accelerate high-impact interventions that are feasible within their national contexts, along with the establishment of an accountability framework (Fig. 6).

Box 1. The five global diabetes coverage targets to be reached by 2030:

80%

of people with diabetes are diagnosed.

of people with diagnosed diabetes have good control of glycaemia.

of people with diagnosed diabetes have good control of blood pressure.

60%

of people with diabetes aged 40 years or older receive statins.

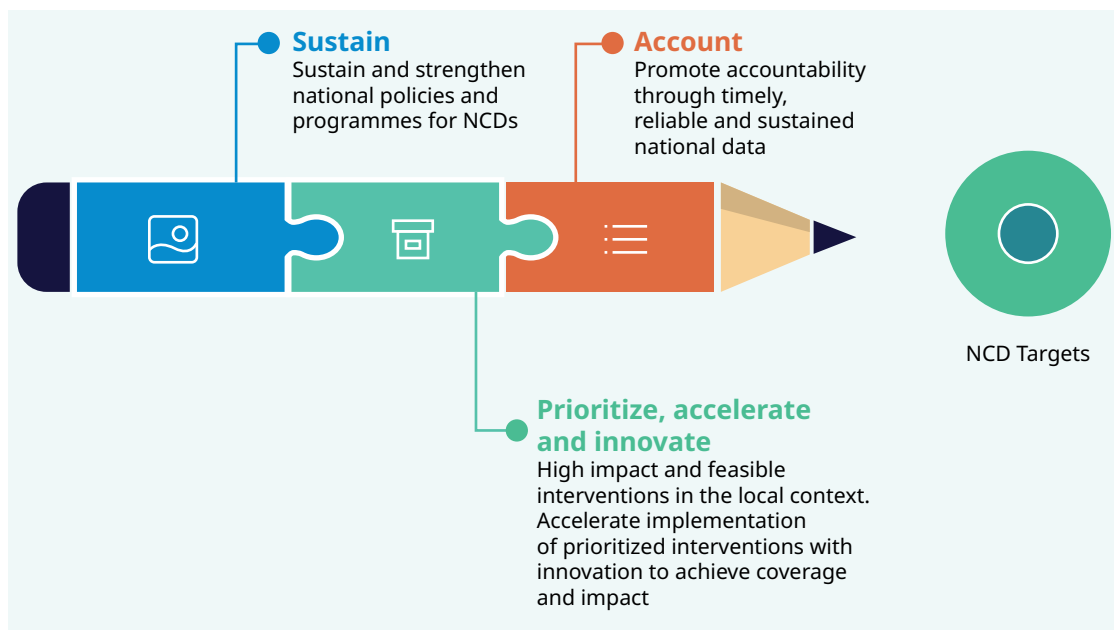
100%

of people with type 1 diabetes have access to affordable insulin and blood glucose self-monitoring.

The recommended interventions for risk factor reduction and clinical management of diabetes are aligned with the updated Appendix 3 of the Global Action Plan for the Prevention and Control of NCDs 2013–2030 (2022 update) (16). To support evidence-based decision-making, the South-East Asia Region NCD Impact Simulation Tool was developed in 2022 (17). This simplified, dynamic and interactive tool facilitates the use of data to guide the implementation of cost-effective interventions outlined in Appendix 3.

The tool focuses on promoting multisectoral policies that are critical for reducing the risk of diabetes and other NCDs, and includes guidance for both primary and advanced clinical interventions for diabetes management.

Fig. 6. Implementation roadmap for accelerating the prevention and control of NCDs in South-East Asia 2022–2030



The resolution “SEAHEARTS: Accelerating prevention and control of cardiovascular diseases in the South-East Asia Region (SEA/RC76/R5)”, endorsed by the Seventy-sixth Session of the Regional Committee for South-East Asia in 2023, urges countries to reach the following four milestones by 2025. In addition to SEAHEARTS, the resolution references other WHO technical packages that guide NCD prevention: MPOWER (a set of six evidence-based measures for tobacco control), SHAKE (a package of policy and programmatic interventions to reduce population salt intake) and REPLACE (an action framework to eliminate industrially produced trans-fatty acids). The above-mentioned milestones include:

- 100 million people with hypertension and/or diabetes are placed on protocol-based management.
- One billion people are covered by at least three WHO MPOWER measures for tobacco control.
- One billion people are covered with at least one of the WHO SHAKE package measures for reducing salt intake.
- Two billion people are protected from the harmful effects of trans-fatty acids through best practices or complementary policy measures of WHO REPLACE.

The commitment on SEAHEARTS brought together measures to reduce risk factors (tobacco control, salt reduction and trans-fatty acids), with improvements in hypertension and diabetes coverage and control in primary health care. Full achievement of the milestones is projected to avert 5.3 million deaths between 2023 and 2030, with the potential to reduce premature mortality by 9.2%, according to the South-East Asia Impact Simulation Tool.

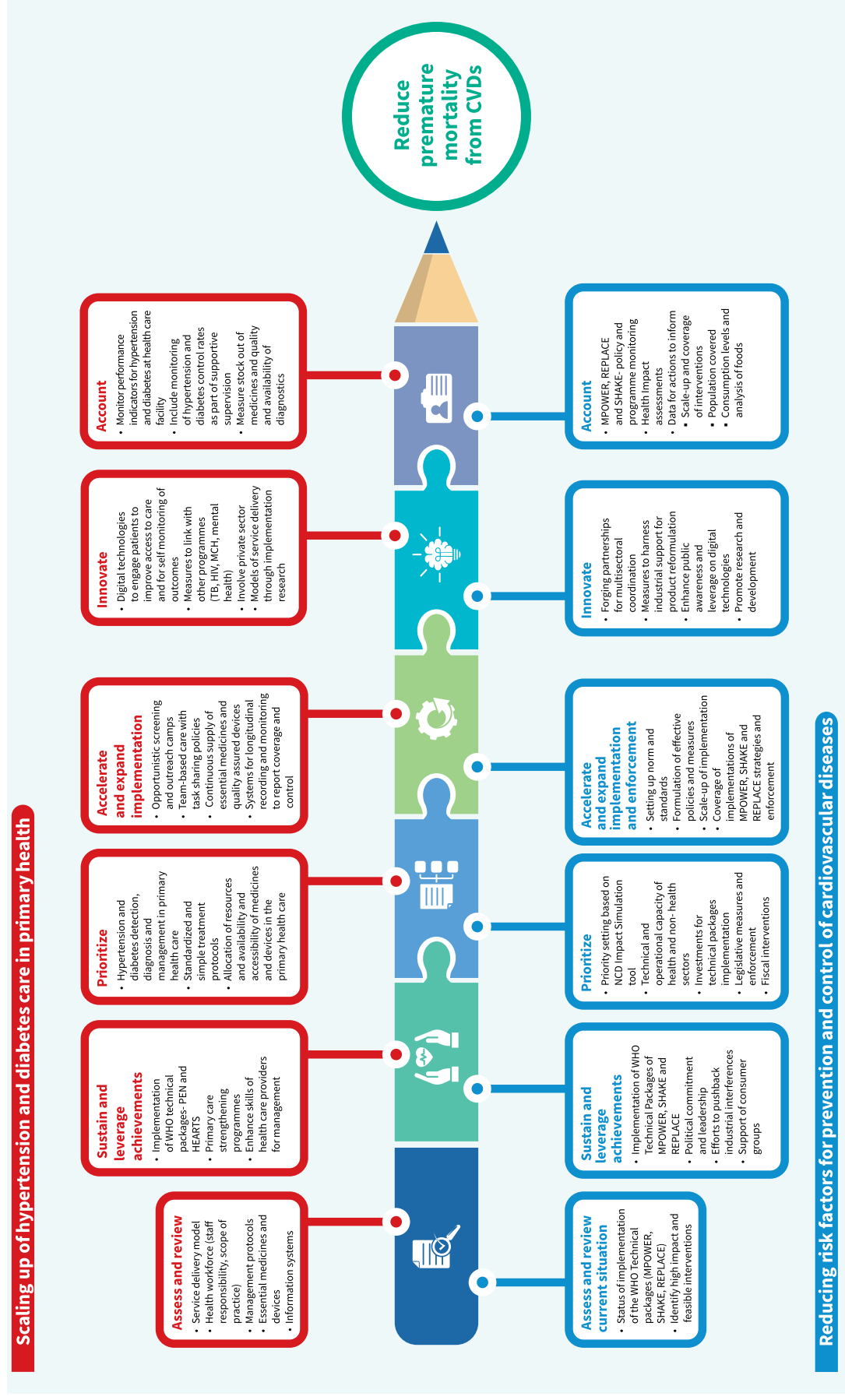
The SEAHEARTS initiative provides a comprehensive roadmap to mitigate key risk factors and scale up diabetes and hypertension coverage in primary health care settings across the Region (Fig. 7). Eight countries in the Region have set up national targets to place people with hypertension and diabetes on protocol-based management by 2025 (18). Progress on the SEAHEARTS milestones is regularly monitored and reported through the SEAHEARTS monitoring platform (19).

In November 2024, countries in the Region adopted the “Colombo Call to Action: Strengthening prevention and control of diabetes in the WHO South-East Asia Region” (7). This “Call to Action” reaffirms the Region’s strong commitment to improving diabetes prevention, expanding access to quality care for people with diabetes and ensuring the availability of essential treatment across the Region.

The “Call to Action” also outlines priority actions, including strengthening primary health care systems to scale up diabetes prevention and control; improving access to essential medicines and diagnostics, particularly insulin; and integrating diabetes care into broader health programmes. It also emphasizes the importance of investing in policies and programmes that promote healthy lifestyles and calls on countries to establish national diabetes coverage targets to be achieved by 2030.

The “Colombo Call to Action” serves as a concrete roadmap for translating commitments into actionable steps, with specific roles and expectations for governments, academic and research institutions, professional bodies, civil society organizations, donors and development partners.

Fig. 7. SEAHARTS roadmap for reducing risk factors and scaling up hypertension and diabetes coverage







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3 Diabetes interventions and innovations in the WHO SE Asia Region: Case studies on prevention, diagnosis and management

Approach for selecting and developing case studies

WHO and the World Diabetes Foundation (WDF) jointly reviewed projects implemented in the SE Asia Region that were supported by one of both organizations, in close coordination with governments.

A broader pool of 82 purposefully sampled projects, implemented between 2010 and 2024, was reviewed with the support of an independent research institute, University of New South Wales (UNSW), Australia based on the following criteria:

- projects implemented between 2010–2024;
- diverse country representation;
- only projects that are completed, near completed or represent a phase in a long-term partnership;
- focus on type 2 diabetes interventions and those demonstrating integration and convergence with infectious diseases and maternal and child health programmes –however, case studies also included interventions addressing gestational diabetes mellitus (GDM), diabetic foot care and other diabetes-related complications;
- assessment of impact and sustainability, including on service delivery, partnership and government involvement and policy; and
- assessment of relevance and interest to Member States in terms of learnings and inspiration.

A total of 47 projects in seven countries – Bangladesh, India, Indonesia, Nepal, Sri Lanka, Thailand, and Timor-Leste – met the selection criteria and were included for review.

As the second step, Robert Yin's Approach was applied to gain an understanding of the projects (20). The goal was to focus on specific sites and have a purposive sample.

Literature review: This step included reviewing both grey and peer-reviewed literature on the health policy and programmes for the prevention and management of diabetes in the country context. Government websites were scanned to understand the national policy for diabetes (or NCDs) and programmes to prevent and manage diabetes.

Detailed review of projects: The project completion reports and related documents for all the chosen projects were analysed by the UNSW. The enablers and challenges for the prevention, diagnosis, management and rehabilitation of diabetes in the WHO SE Asia Region were intensively reviewed. This assessment explored the role of government and partner organizations (implementors) and how they collaborate to deliver interventions. The different service delivery models – protocol development and use, access to medicines and technology, monitoring mechanisms, capacity-building, people reached, care cascade data as available, expansion and adaptation into the system, sustainability and partnerships – were reviewed.

Field visits and interviews of stakeholders: To gain a deeper understanding of the context, the implementation partners were interviewed through face-to-face conversations. Furthermore, visits to health centres and communities were undertaken in India (Madhya Pradesh), Indonesia (Jakarta and West Java), Nepal (Taplejung, Pokhara and Dhulikhel), Bangladesh (Dhaka) and Timor-Leste (Aileu and Dilli), along with online discussions with policymakers.

As the third step, findings from the reviews, site visits and interviews were triangulated, summarized and consolidated in the form of eight case studies.

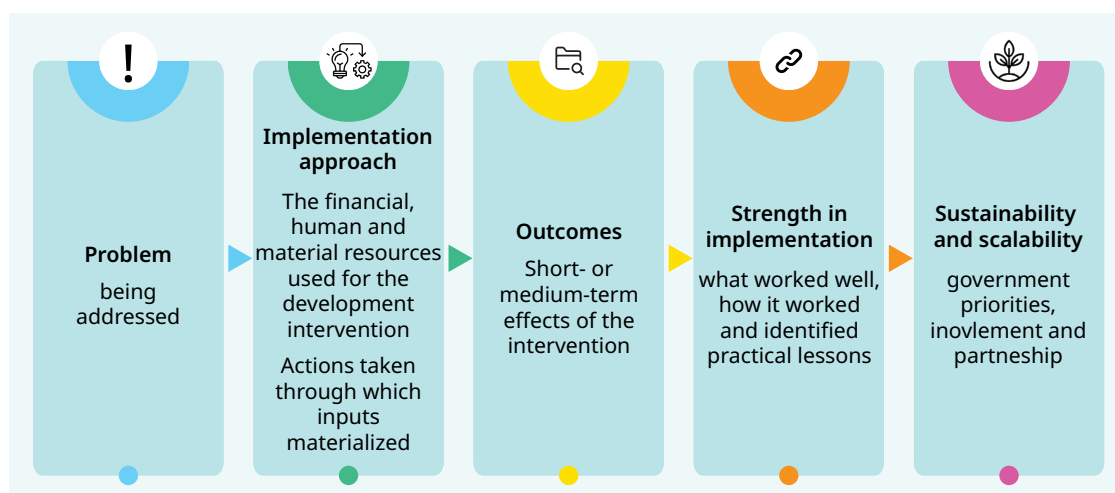
To ensure clarity and comparability, each case study followed a standardized structure consisting of the background and rationale, objectives, study setting, target population and timeline, implementation approach, outcomes, strengths of implementation, challenges, and sustainability and scalability.

The logic framework is used for the case studies wherein:

- process or implementation is primary to describe timelines, approach taken to implement key activities;
- outcomes refer to how the projects' activities and outputs have helped in the improvement of indicators such as control of diabetes, objective assessment of diabetes-related knowledge among communities and/or patients, reduction in proportion of undiagnosed individuals with diabetes in communities, etc.;
- strengths of implementation were analysed – what worked well, how it worked and identification of practical lessons that can be learnt from the implementation;
- sustainability and scalability were assessed, considering the involvement of government and key partners and conducive environment; and
- challenges were documented, highlighting the barriers that have impacted the process, output and outcomes of planned activities in the selected project.

Fig. 8 below explains the logic framework used for this analysis.

Fig. 8. Logic framework and definitions used for analysis



As the fourth step, case studies were reviewed against the eight key asks of the Global Diabetes Compact (GDC) (8) to illustrate how project interventions can add impetus to fulfilling these asks. The review also provides learnings for countries worldwide, showing how specific interventions can support the diabetes-related key asks and contribute to achieving the global diabetes coverage targets on the ground (Fig. 9). This was essentially a retrospective assessment, as most of the projects have been implemented before the launch of the GDC. The analysis was, therefore, conducted considering the objectives and framework of the GDC.

Fig. 9. Eight key asks of WHO Global Diabetes Compact



Limitations

- The analysis was primarily a retrospective analysis of projects that had largely been implemented before the launch of the GDC. As a result, some elements such as the three key asks – Fund, Power Ahead and Track – could not be assessed.
- Challenges identified in the case studies were not presented as a separate domain in the logic framework, but they cut across multiple areas, including background and rationale, objectives, implementation, outcomes, strengths, and sustainability and scalability.
- The diagnostic and health system capacity varied significantly across countries and sites, limiting comparability.
- The reliance on secondary data, project reports and limited field visits means that findings depend on the availability and quality of existing documentation and stakeholder recall, which may introduce reporting bias.
- Contextual barriers such as funding gaps, human resource shortages and supply chain issues influenced implementation and outcomes.
- Although 47 projects were reviewed in detail, many of which were WDF-supported, only eight case studies are presented in this report. This purposive selection was necessary to ensure diversity across countries, intervention types and health system levels, but it also means that the report could not capture the full breadth of experiences and practices from all projects.



Community health awareness at a mosque

© World Diabetes Foundation

BANGLADESH

Improving diabetes prevention and management through involvement of religious leaders

Background and rationale: In Bangladesh, the age-standardized prevalence of diabetes among adults aged 18 years and above was estimated at 17.9 % in 2022 (21). This equates to approximately 18 million people, a figure projected to rise significantly in the coming years. Delayed diagnosis constitutes a challenge as only an estimated 20% of those with diabetes are on treatment. Furthermore, in rural Bangladesh, access to health care remains limited and NCD risk factors are highly prevalent. Several challenges, including poor community awareness regarding healthy lifestyles and the consequent high prevalence of NCD risk factors – with reports indicating that 98% of the population has at least one risk factor (22) – are key drivers of the rising prevalence of diabetes.

Objectives: The main objective was to prevent diabetes and other NCDs by enhancing awareness and promoting healthy lifestyle choices through a culturally relevant community-based platform – religious leaders. It focused on capacity-

building of imams and female assistants, establishment of diabetes corners at local mosques, formalized referral pathways, and introduction of patient registers to facilitate early detection and care at the community level.

Project setting, population and timeline:

The project was implemented in two divisions, Dhaka and Mymensingh, out of eight in total in Bangladesh, with a special focus on low-resource rural and semi-urban areas. The initiative covered a total target population of approximately 11 million, with a special focus on people living in vulnerable situations. The project addressed subdistricts, through collaboration with 100 religious leaders (imams) at local mosques. By the end of the project, 50 000 individuals had been reached through direct screening and education, and an estimated five million people were reached through awareness-raising activities. Initially implemented between 2018 and 2020, the project was extended by one year, until 2021, due to delays caused by COVID-19.

The project has since been scaled up with domestic funding.

Implementation approach: By focusing on diabetes education and enhancing knowledge regarding the importance of early diagnosis and regular screening, the initiative sought to empower communities and encourage engagement in healthier lifestyle choices, ultimately leading to improved health outcomes for individuals at risk of diabetes.

The initiative addressed the pressing need for awareness raising and early diagnosis in Bangladesh by training 100 imams and their female assistants and establishing 100 diabetes corners at local mosques. These corners serve as dedicated spaces for screening and counselling, fostering an environment where health messages can be effectively disseminated, and basic services received. Imams and their female assistants were trained to deliver the services, and essential equipment were deployed.

Culturally and socially responsive messages were developed to advocate for positive lifestyle changes among community members. A referral network was established between the diabetes corner at the community level and public NCD clinics (*upazila*) at the subdistrict level or Diabetic Association of Bangladesh (BADAS) clinics for relevant care. Referral guidelines were developed for imams and female assistants to facilitate referrals, making it easier for individuals identified through screening to access further care.

Guidance from the Islamic Foundation was taken to improve community acceptance.

A religious sermon (*khutba*) was developed in collaboration with the government to ensure that crucial health information reached a broader audience during Friday prayers.

The project developed a digital application designed for collecting essential patient data, including sociodemographic, clinical and biochemical information. This app aimed to improve patient tracking and monitoring and was connected to a nationwide diabetes registry established by BADAS.

Partners: A public-private partnership (PPP) was established between the Noncommunicable Disease Control (NCDC) Programme of the Directorate General of Health Services (DGHS), Ministry of Health and Family Welfare (MoHFW), the Islamic Foundation under the Ministry of Religious Affairs, the Centre for Global Health Research (CGHR) and BADAS. The project focuses on primary prevention strategies that leverage the influential platform of religious leaders to promote diabetes awareness and lifestyle changes.

This PPP model was led by BADAS, which is the largest national diabetes network in the country providing diabetes care to nearly 60% of the diabetic population in the country. Technical support, oversight and coordination were provided by public authorities. The World Diabetes Foundation (WDF) funded the project and provided technical support.

Alignment of project implementation with Global Diabetes Compact key asks



EDUCATE



INNOVATE



UNITE

Outcomes: The project accomplished remarkable results, with 50 000 individuals benefiting directly from screenings and educational initiatives, while awareness-raising efforts reached an estimated five million people with information on healthy lifestyle. The awareness-raising component has been further disseminated outside Bangladesh, as the specially crafted *khutba* was circulated by the International Diabetes Federation (IDF) to its Muslim-majority member countries. Together with the Ministry of Foreign Affairs, BADAS aims to circulate the religious sermons to the 57 member states of the Organisation of Islamic Cooperation (OIC), further extending the project's impact.

Financial support from the MoHFW enabled a 12-month cluster randomized controlled trial (RCT) (April 2022–April 2023) across eight mosques in five rural districts, involving 799 adults with intermediate hyperglycaemia. The intervention group (n = 396) received monthly mosque-based lifestyle sessions with dietary and physical activity counselling integrated into faith-based sermons, while the control group (n = 403) received standard health advice and referral. At 12 months, the incidence of type 2 diabetes was 9.8% in the intervention group vs 17.1% in controls, yielding an absolute risk reduction of 7.3 percentage points, a relative risk reduction of 42.5% and a number needed to treat of 14.

Importantly, 62.9% of intervention participants reverted to normoglycaemia, compared with 38.5% of controls, alongside improvements in weight, blood glucose, cholesterol, blood pressure and diabetes knowledge. While these outcomes apply to high-risk individuals, scaling this culturally tailored model could substantially reduce diabetes burden nationally, where prevalence is 10% (STEPS 2022). The trial has been peer-reviewed and is published in JAMA Network Open (<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2840359>)

A digital application was deployed to track and monitor patient data and referrals. The established diabetes corners collect data via an app that connects to the nationwide diabetes registry through BADAS. The integration of digital record-keeping allows for enhanced tracking and monitoring of both patients and individual sites, ensuring that data are collected in real time, and facilitates better management and oversight by the project team. The app includes features for checking participant referrals to government or BADAS facilities, ensuring continuity of care for individuals requiring additional support.

Subsequently, the partnership has engaged nearly 300 000 mosques across the country to disseminate prevention messages. The innovative approach of engaging trusted and respected members in the community, such as religious leaders, to disseminate health awareness and provide basic services holds the potential of creating sustainable changes in risk factor profile and healthy behaviour.

Strengths of implementation: The success of the diabetes prevention initiative in Bangladesh is largely due to its robust partnerships and collaborative engagement

with government entities. This project exemplifies a model of PPP designed specifically to prevent diabetes and related NCDs by providing culturally and

religiously acceptable health promotion. The establishment of diabetes corners at mosques, situated on community-donated land, is a testament to effective collaboration. BADAS, along with key governmental partners, has played a crucial role in providing logistic support and facilitating the operational aspects of the project.

The active involvement of the Islamic Foundation under the Ministry of Religious Affairs ensured that project activities were culturally sensitive and widely accepted within the community. These partners were integrated into an advisory committee at the project's inception, thus giving them distinct roles in shaping its development. Guidance from the Islamic Foundation improved community acceptance by advising against the use of images in information, education and communication (IEC) materials and suggesting training female assistants who could specifically reach out to the female population within mosques. This emphasis on inclusivity has enhanced the project's impact.

The project has expanded from its initial focus on 100 subdistricts (*upazila*) of two divisions to having the Ministry of Religious Affairs and the MoHFW endorsing the project model and the *khutba* for its nationwide application.

Imams in Bangladesh are not normally paid for their religious activities. In most cases, the local management committee bears the lodging expense and gives them a monthly honorarium (on average, US\$ 30-40). In

this project, the imams charged a small fee for conducting screening. The centre (NCD screening corners) charges 40 BDT (less than US\$ 0.50) for counselling and screening tests. This fee helps cover the costs of the strips and lancets, religious leader and assistant, mosque development, SMS notifications to the central office, maintenance of diabetes corners and overall project costs, thereby ensuring that the project model is self-sustaining. Those who cannot afford the fee have access to screening free of charge, on three days of the year (e.g. on World Diabetes Day). The model received strong support from imams and the broader community.

Building the capacity of lay health workers, such as imams and female assistants, has been a key factor in the project's successful implementation. This approach has not only enhanced health literacy in the community but has also ensured that the messages are culturally and socially responsive. Imams have gained greater community esteem and recognition as guardians of community health, empowering them to advocate positive lifestyle changes within their congregations.

The project effectively leveraged resources and insights from other projects, incorporating successful training materials from previous initiatives focused on promoting community awareness of preconception care and prevention of NCDs, particularly hyperglycaemia, into the training programmes for imams and female assistants.

Challenges

Initially, there were delays in recruiting imams because of communication difficulties. In the early stages, delays were also encountered in securing approvals, including permission from the NGO Affairs Bureau. However, BADAS leveraged its existing partnerships and long-standing reputation in Bangladesh to resolve these issues swiftly. Environmental barriers including COVID-19 and an election caused minor interruptions to the timeline.

Sustainability and scalability: The emphasis on community ownership and integration with public health systems has been critical for maintaining progress. As part of scaling efforts, an additional 100 imams were trained in June 2024, followed by another 100 in November 2024, as part of a new initiative called “Country Changing Diabetes and Mobile Diabetes Care”, with aspirations to broaden training to cover an additional 100 000 Imams through an online platform (23). BADAS is considering integration of diabetes training into the mandatory curriculum for imams, which would ensure that future leaders are equipped with the necessary skills to promote diabetes prevention within their communities.

Building on its demonstrated success, the imam model has been incorporated into the Core Team Intervention, a new initiative of the NCDC Programme and the Community-Based Health Care (CBHC) under the DGHS, MoHFW. Funded by the Japan International Cooperation Agency (JICA), this initiative

targets prevention of NCDs at the community level in 26 subdistricts across three divisions of Bangladesh.

A 12-month impact evaluation, funded by the MoHFW, has generated compelling evidence to support the continued scale-up and long-term endorsement of the project. Given its effectiveness in the Bangladeshi context, the model holds significant promise for adaptation in other settings, particularly across the member states of The Organisation of Islamic Cooperation (OIC).

As a culturally sensitive and scalable approach, it offers a powerful framework for global NCD prevention through religious platforms. Faith-based strategies can effectively leverage existing community networks to overcome structural and cultural barriers to health care. This initiative has the potential to extend diabetes care and prevention to the grassroots level, generate vital public health data and contribute meaningfully to the achievement of the SDGs.





Routine prenatal abdominal examination to monitor the healthy development of baby and ensure a safe pregnancy

© WHO / Pallava Bagla

INDIA

Mainstreaming quality care for gestational diabetes mellitus in Indian public primary health care

Background and rationale: Gestational diabetes mellitus (GDM) presents a considerable public health challenge across India, affecting an estimated five million women annually, which translates to roughly one in every six pregnancies. National GDM prevalence estimates range from 10% to 14% (24), with pooled data indicating approximately 12% prevalence among pregnant women in the state of Madhya Pradesh.

Despite a clear government mandate for universal GDM screening for all women during their antenatal care (ANC), the implementation of these guidelines has not been effective. Undiagnosed or inadequately managed GDM can lead to significant maternal and fetal complications. Furthermore, women with GDM and their offspring are at increased risk of developing type 2 diabetes later in life. Addressing GDM through a life-course approach ensures that preventive and curative interventions during pregnancy not only improve maternal and

neonatal outcomes but also reduce the long-term risk of NCDs across generations.

Key impediments include scarcity of trained health-care personnel at state and district levels; inadequate procurement and supply chain systems for essential testing materials such as 75 g glucose packets for oral glucose tolerance test (OGTT); limited availability of essential drugs including insulin at primary health care facilities; lack of systematic reporting on hyperglycaemia in pregnancy (HIP) in the existing reporting systems; and poor community engagement. These factors collectively contribute to an incomplete programme rollout and low screening uptake across the country.

Objectives: The project aims to strengthen health system planning and surveillance for GDM in the states of Madhya Pradesh and Maharashtra, enhance the capacity of health-care providers through digital solutions and training, and promote national-level adoption of successful state-level practices. It focuses on supporting operational planning,

improving data systems and advocating for GDM budget allocations. Additionally, it empowers front-line health workers to promote self-care and facilitate community engagement.

Project setting, population and timeline:

The targets involve selected districts of two states of India, namely Madhya Pradesh (10 districts) and Maharashtra (four districts), with an estimated total population of 28.74 million. The project targets health-care providers in the public health system that includes 15 298 primary-level clinics in the first project phase. Special efforts are made to reach pregnant women availing ANC in the public health system.

The initiative is structured in two phases with a timeline of 2018–2025. The first phase of the project (2017–2021) piloted a GDM care model in two districts of Madhya Pradesh. The second phase (2021–2025) of the partnership focused on implementing a robust design for GDM care in 10 districts of Madhya Pradesh and four districts of Maharashtra with strong advocacy and programmatic enhancement at the state level.

Due to the strong ownership and collaboration among the partners, by June 2025, GDM services reached 7202 health facilities and its catering outreach sessions across 39 districts in Madhya Pradesh and 7542 facilities and catering outreach sessions in 22 districts in Maharashtra.

Implementation approach: The project's approach is based on the fundamentals of the life-course approach and promotion of timely screening for early diagnosis and treatment. It employs a multipronged strategy centred on the health systems strengthening approach guided by the WHO health system building blocks. Through this project, screening of GDM has percolated down to the community level through the Village Health and Sanitation Day (VHSND) Programme, instead of screening being

limited only to secondary- and tertiary-level facilities as before.

Extensive training programmes were implemented for various health-care cadres [including auxiliary nurse midwives (ANMs), Accredited Social Health Activists (ASHAs), community health officers (CHOs)], enhancing their understanding, knowledge and skills for effective GDM diagnosis and management. Front-line health workers are trained to counsel women and their families on medical nutrition therapy, exercise and medication adherence and to facilitate monthly support group meetings.

The project also built a pool of master trainers within states to support ongoing capacity-building, develop guidance notes and standard operating procedures (SOPs), and conduct readiness assessments to ensure facilities can sustainably support GDM activities. Robust data management systems guide effective decision-making, while supply chain improvements ensure availability of essential materials such as glucose packets and insulin. Regular monitoring, technical support and the in-house trainer pool have provided states with the confidence to scale the programme. Experience-sharing workshops at interdistrict, state and national levels further facilitate cross-learning and dissemination of best practices, while consultancy support to other states has helped extend the impact beyond the initial intervention sites.

Partners: The project has been implemented through a partnership between Jhpiego, the National Health Mission of Madhya Pradesh, Government of Madhya Pradesh, and the National Health Mission of Maharashtra, Government of Maharashtra. Jhpiego has led the implementation at ground level in close collaboration with and under the guidance and support of the National Health Mission of both states. The WDF has provided financial support to Jhpiego for providing technical guidance to the state governments.

Alignment of project implementation with Global Diabetes Compact key asks



TREAT



TRACK



INTEGRATE

Outcomes: The project has achieved significant progress in expanding access to GDM services in the two states through effective collaboration with the state National Health Missions. It has surpassed the majority of the key targets by a large margin, as reflected by key indicators: clinics strengthened to provide hyperglycaemia in pregnancy (HIP) care (3891 achieved vs 1010 targeted), nurses trained (14 631 vs 1843), pregnant women screened for HIP (640 057 vs 146 884) and pregnant women diagnosed with HIP (47 176 vs 10 280).

By June 2025, GDM services were initiated across 7202 facilities in 39 districts in Madhya Pradesh and 742 facilities in 22 districts in Maharashtra, much beyond the original scope of the project. Roadmap for scale-up of GDM services in all 51 districts of Madhya Pradesh and 34 districts of Maharashtra is approved by state and national governments. More than 23 600 health-care workers have been trained, encompassing doctors, nurses (ANMs, nursing officers, CHOs) and other health-care providers (ASHAs, supervisors).

In both states combined, 274 702 women had been screened using OGTT during their antenatal check-ups and 25 378 were diagnosed with GDM; 20 924 women with GDM had been managed through medical nutrition therapy (MNT) and physical exercise and 885 women not managed on lifestyle modification were provided with medical management at referral centres. Cumulatively after scale-up, more than 2 160 000 women had been screened using OGTT during their antenatal check-ups; around 69 000 had been diagnosed to have GDM; and around 17 900 had been initiated on medical treatment.

In the scale-up districts, data availability on continuum of care was a challenge, as reflected in the number of women being initiated on medical treatment after diagnosis.

The Maa Swasthya Sangini app for GDM self-care was rolled out in nine districts of Madhya Pradesh and five districts of Maharashtra, with 1917 users having installed it. The app supports clients with GDM through self-care tools essential for medical nutrition therapy, lifestyle management and follow-up, and also offers digital guidance to ASHAs, ANMs and CHOs on client mobilization, counselling and referrals.

Strengths of implementation: The project's success is rooted in several key strengths. The foremost was ownership of the National Health Mission and state health authorities. The collaboration with and strategic guidance

to implementation partner Jhpiego ensures alignment with existing health system reform agendas and enables systematic planning and execution. The first phase pilot in two districts of Madhya Pradesh generated encouraging

results and resulted in the second phase with extended coverage to 10 districts in Madhya Pradesh and four in Maharashtra.

The Madhya Pradesh government, based on the cumulative learnings and successes of the two phases, is planning to extend the project to other districts of the state. Both state governments have now approved budgets and programmatic resources for the entire states of Madhya Pradesh and Maharashtra, with the objective of integrating GDM care into the routine ANC package of the states and strengthening the health system to provide the same.

Persistent advocacy efforts have successfully secured funding from the state governments, including substantial allocations for capacity-building initiatives, integration of GDM test

supplies and treatment into public budgets, and inclusion of GDM-specific indicators in public health information systems. This demonstrates the governments' increasing recognition of GDM as a priority.

Another key strength of the project has been the effective deployment of village health workers or ASHAs, who serve as vital links between health facilities and the communities they support. ASHAs have played a pivotal role in promoting GDM services, delivering essential education on screening and management and dispelling common misconceptions about glucose intake during pregnancy. Their engagement has improved awareness and created a supportive ecosystem, wherein families actively participate in GDM management.

Challenges

Despite significant achievements, the project faces several challenges. Pregnant women exhibit low compliance with the OGTT due to the long waiting time and the nature of the test. This leads to loss to follow-up. Similarly, ensuring sufficient follow-up care for women diagnosed with GDM, particularly postpartum, remains a significant challenge, leading to missed opportunities for diabetes management post childbirth. In addition, treatment initiation remains suboptimal, with only a fraction of diagnosed women receiving timely therapy.

While efforts are made to include GDM care in electronic health records, inconsistencies in data reporting persist. The fragmented nature of health information systems complicates patient tracking, especially for follow-up care. Integration of all GDM data points, from testing to follow-up, into the state-owned software ANMOL 2.0 is still ongoing and requires further advocacy.

Health-care providers sometimes show inconsistent adherence to clinical protocols, which the implementation team addresses through supportive supervision and on-site monitoring. The uptake of the Maa Swasthya Sangini app remains low due to cultural and technological barriers to the adoption of digital intervention.

Linkage of GDM-positive pregnant women with the National Programme for Prevention and Control of Noncommunicable Diseases (NPNCD) for long-term follow-up and care remains a challenge. This is partly due to the above-mentioned reasons and to the limited scope of population-based screening under the NCD programme, which targets individuals aged 30 years and above. Consequently, many women who test positive for GDM and are lost to follow-up in the postpartum period fall below the age of 30. Overcoming these challenges would likely yield important benefits for women's health, both in terms of long-term outcomes outside of pregnancy and reducing risks during any subsequent pregnancies.

Sustainability and scalability: The project incorporates several strategies to ensure its sustainability and potential for broader scale-up. It is deeply integrated into India's existing public health system, particularly the National Health Mission. All resources for GDM programming scale-up are eventually intended to be provided by the government, with the project grant acting as a catalyst, ensuring continuity beyond the project period.

Ongoing training, mentoring and supportive supervision for health-care providers and programme managers are a crucial aspect of this project. These intend to build state-level capacity to maintain efficient systems and continuously improve GDM services.

The project creates a repository of GDM resource materials and develops human-centric digital solutions for self-care and provider mentoring. These resources can be adopted and replicated by other states.





Community-based NCD screening and awareness at the front-line of primary health care

© World Diabetes Foundation

INDIA

Strengthening service delivery for hypertension and diabetes management in primary health care

Background and rationale: India faces a rising burden of diabetes. The age-standardized prevalence of diabetes among individuals aged 18 years and above, based on both glycated haemoglobin (HbA1c) and fasting blood glucose (FBG), was estimated at 23% in 2022. As per the ICMR-INDIAB study (phase III) – based on FBG measurements – there is a wide disparity in the prevalence of diabetes among states [Goa 26.4% (highest), Uttar Pradesh 4.8% (lowest)]. Nearly one in four individuals with diabetes in India remains undiagnosed, with 24.8% unaware of their condition (25).

The dual burden of diabetes and hypertension is becoming more common – 43% of people with diabetes also have hypertension and 25% of those with hypertension are also diabetic, reinforcing the need for integrated care (26). These trends call for stronger efforts in prevention, early diagnosis and long-term management of diabetes as part of India's broader NCD strategy.

In pursuit of India's commitment to the global NCD agenda and in alignment with the National Programme for Prevention and Control of Noncommunicable Diseases (NPNCD), the country aims to significantly strengthen the identification, treatment and management of hypertension and diabetes through its extensive network of primary health care facilities, "Ayushman Arogya Mandirs" (AAMs), formally called health and wellness centres. Building on the momentum of ongoing initiatives, India launched a renewed national effort in 2023 under the "75 by 25" Roadmap, with the target of placing 75 million individuals living with hypertension and diabetes on protocol-based treatment by 2025 (27).

The project is designed to support the rollout of the NPNCD by addressing persistent gaps in NCD service delivery, including low screening coverage, poor treatment adherence, frequent stockouts of essential medicines and inadequate follow-up mechanisms, particularly at the primary health care level.

Objectives: The overarching goal is to expand and integrate quality diabetes and hypertension care at the primary health care level through the AAMs. Key objectives include implementing simplified, protocol-based treatment across all facilities; ensuring consistent supply of diagnostics and essential medicines; strengthening human resource capacity through training and task-sharing; improving screening and follow-up; and leveraging digital technologies for continuity of care, data management and monitoring.

Project setting, population and timeline: Initially implemented successfully in selected high-burden districts, the project focuses on integrating NCD services into routine primary health care and strengthening the system's capacity to provide continuous, high-quality care across all levels of care and across India. With over 170 000 operational AAMs, India is well-positioned to deliver integrated NCD services in primary health care – synchronized delivery of NCD services through AAMs, ensuring infrastructure, human resources and use of digital systems. The original timeframe of the project stretches from 2024 to 2026; however, extension is expected to facilitate continued scaling and sustainability.

Implementation approach: The NCD Division of the Ministry of Health and Family Welfare (MoHFW) is strengthening diabetes care at the primary health care level through a package of high-impact, scalable interventions. The project provides technical support to scale up diabetes and hypertension services, contributing to the national “75 by 25” target. It focuses on building core health system capacities to improve screening coverage, treatment access and quality of care.

The project supports the strengthening of primary health care settings for hypertension and diabetes management through dose-specific hypertension and diabetes treatment

protocols, uninterrupted supply of drugs, task-sharing and capacity-building, patient-centred care, and a robust data management and information system.

States have developed standardized dose-specific diabetes and hypertension treatment protocols. These protocols were developed through expert consultative processes led by the states.

The implementation of standardized treatment protocols enables uninterrupted supply of essential medicines at primary health care facilities. Morbidity-based forecasting, aligned with these protocols, supports more accurate annual budgeting and planning. WHO staff at the state level facilitate the drug forecasting tool to streamline this process. Additionally, training in inventory management and supply chain monitoring helps reduce the risk of stockouts and ensure consistent drug availability at the primary care level.

The project continues to strengthen the human resource ecosystem by supporting training, capacity-building and strategic task-sharing among health-care providers. It reinforced community-level engagement by enhancing the capacity of ASHAs, ANMs and CHOs to conduct patient screenings and provide follow-up care, reminders, and counselling for treatment adherence and lifestyle modifications.

Capacity-building for medical officers focused on diagnosis and treatment protocols, while staff nurses were trained in monitoring blood pressure and blood glucose as well as in data entry and patient tracking. Pharmacists contributed by dispensing medicines and providing follow-up reminders. A team-based model facilitated coordinated task-sharing at health facilities, improving patient-centred care and access to timely screening, diagnosis, treatment and follow-up services, ensuring continuum of care.

The project significantly leverages India's digital health ecosystem. It strengthens the use of the national NCD portal, patient longitudinal cohort monitoring, informed decision-making and review meetings. Integration with Ayushman Bharat Health Account (ABHA) IDs enables longitudinal patient tracking across the health-care system. WHO is providing ongoing technical and training support to ensure the utilization of the NCD portal at health facilities.

Partners: The project was developed as a response to the government's call to action

for the realization of the "75 by 25" Roadmap. The MoHFW provides national-level policy direction, coordination, monitoring and integration into health systems. State governments lead on-ground implementation in primary health care, aligning resources and infrastructure based on programme requirements. The WHO Country Office for India offers technical expertise in planning, capacity-building and monitoring of activities under the Roadmap. The programme is further supported through funding from the WDF, enabling a collaborative approach to ensure effective scale-up and sustainability.

Alignment of project implementation with Global Diabetes Compact key asks



INTEGRATE



POWER AHEAD



TREAT



TRACK

Outcomes: The project has completed its first year of implementation with encouraging results. Five states and Union Territories developed or revised their diabetes treatment protocol in 2024 and 2025, bringing the total to 29 states and Union Territories (out of 36) with protocols that provide guidance for the screening, early detection and management of diabetes and hypertension.

Health-care providers' skills were strengthened through capacity-building initiatives, with more than 53 419 workers trained across 301 districts. Training and refresher courses were instrumental in implementing team-based care, reducing treatment inertia, improving follow-up visits and, most importantly, ensuring the correct use of diagnostics for both blood pressure and blood sugar measurement. The standardized treatment protocol improved clinical decision-making among physicians.

In 301 districts, project support streamlined drug forecasting through the implementation of a forecasting tool for diabetes and hypertension, which improved the availability of essential medicines. The project also promoted the use of telemedicine in primary health care, increasing the uptake of e-Sanjeevni (the national teleconsultation service) for NCD patients, particularly those with hypertension and diabetes. This has brought services closer to people's homes.

Through supportive supervision, the quality of diabetes and hypertension data improved significantly. A national-level review was conducted to identify key challenges in monitoring NCD indicators at the facility level. Supportive supervision in 301 districts empowered health-care workers to enhance facility-level performance for diabetes and hypertension. Monthly reviews at facility and district levels further boosted health facility performance.

Through the capacity-building and quality improvement efforts, the project has contributed to the efforts of the NPNCD in placing 22.8 million people living with hypertension and 12.8 million people living with diabetes on protocol-based care.

Under the leadership of the MoHFW, significant improvements were made in monitoring tools and dashboards to track treatment adherence, follow-up status and control of blood pressure and blood sugar levels. By December 2024, the national NCD portal had enrolled over 60 million individuals under standard treatment of care for diabetes and hypertension across all states. Additionally, project monitoring facilitated the creation and linkage of more than 100 million beneficiaries with ABHA ID numbers, thereby strengthening continuity of care.

This achievement reflects the leadership of the MoHFW and the tireless commitment of programme managers and health-care providers at all levels, complemented by WHO NCD teams' support at the subnational level. This has significantly contributed to the achievement of India's "75 by 25" Roadmap targets.

Strengths of implementation: A key strength of implementation has been the strong commitment demonstrated by the MoHFW through its Ayushman Bharat programme. The technical support from WHO played a catalytic role in scaling across multiple districts and states, demonstrating a replicable model for strengthening diabetes care within the public health system. WHO NCD consultants positioned in states played a vital role in providing continuous field-level support, mentoring and troubleshooting during implementation and scale-up.

The WHO India national NCD team, together with the NCD consultant network at the state and district levels, has continued to

provide technical guidance to the MoHFW and state governments across various aspects of programme implementation. Their contributions include technical support, capacity-building, hands-on training, supportive supervision, monitoring and evaluation and regular feedback at all levels. These strategies have led to improvements in data reporting, strengthening of the drug supply chain, promotion of patient-centred care at AAMs and enhanced adherence to treatment regimens. Additionally, the team has played a pivotal role in generating and disseminating knowledge to address implementation challenges, sharing best practices and lessons learnt across India and beyond.

Challenges

Despite increased enrolment of patients with diabetes and hypertension on treatment, a significant proportion of the patients did not return for follow-up visits or had uncontrolled blood pressure, highlighting ongoing challenges in patient retention and continuum of care.

While the use of the NCD portal and state specific NCD health information systems has improved, documentation and data quality remain key concerns. Inadequate recording of follow-up visits may be contributing to underreported follow-up and control rates. Strengthening supportive supervision and conducting regular review meetings at the national, state and district levels are essential to improve data quality and reporting, in addition to ensuring a continuous supply of protocol drugs and other logistics.

Sustainability and scalability: The initiative leverages and strengthens India's existing health-care delivery infrastructure, particularly through the NPNCN and AAMs. This integration supports long-term sustainability by embedding hypertension and diabetes control into routine primary care and public health systems.

The WDF provided critical financial support to WHO, enabling technical assistance at national and state levels and contributing to improvements in implementation of early detection, management and linkages for diabetes and hypertension.

The tools and products developed through the project have been an integral part of the NPNCN; with state government support, this will be scaled to remaining districts of India.

The use of digital tools (NCD portal and other state-specific health information systems) for monitoring and follow-up enhances

programme management and data-driven decision-making, which are vital for sustained impact. Health facilities are progressing towards improved service quality by shifting from merely initiating treatment for people with hypertension and diabetes to enhancing control rates among registered patients, thereby upgrading the overall quality of care. Support has also ensured inclusion of quality-assured devices in national and state programme implementation plans, guaranteeing that future procurement adheres to established quality standards.

The initiative exemplifies scalable impact. What began as the India Hypertension Control Initiative in a few districts had expanded in a phased and systematic manner, with diabetes management integrated in 2022. The programme is operational in more than 300 districts nationwide, demonstrating its adaptability and scalability across diverse health system contexts.





Bringing diabetes care home: A community health volunteer conducting doorstep screening

© World Diabetes Foundation

NEPAL

Strengthening health services for diabetes through community-centred approaches

Background and rationale: Nepal has a diabetes prevalence of 6.3%. This translates to 1 133 500 Nepalese adults (28). Diabetes and other NCDs represent a growing public health challenge for the country, particularly in underserved and rural communities. A significant barrier to effective diabetes management is the limited community awareness regarding healthy lifestyles that could prevent and manage diabetes (29). Furthermore, limited health-seeking behaviour and shortage of trained health professionals, especially at the community level, restrict access to essential health services.

Objectives: The project aims to strengthen community-level care and outreach for diabetes and hypertension control, enhance the capacity of primary-level health-care providers, and raise awareness of NCD prevention and management within communities. It focuses on empowering female community health volunteers (FCHVs) to deliver essential care, improving early detection and continuity of care. It also

seeks to strengthen information sharing and advocacy to promote sustainable integration of NCD services into national health systems.

Project setting, population and timeline: The first phase (2017–2022) of the project was implemented in urban and semi-urban areas of Pokhara, Kaski District. The ongoing second phase (2024–2027) extends the model to rural areas within the same district, aiming to directly and indirectly reach at least 30 800 people. The initiative aims to reach both general and high-risk adult population, with a strong focus on community engagement, health system integration into rural municipalities, advocacy and supply chain management.

Upon completion of the first phase, 168 community health volunteers (FCHVs) were trained, reaching 10 179 community members through home visits, while a total of 62 858 community members were reached with awareness-raising activities. While FCHVs have played a remarkable role in improving maternal and child health, this marks the first

time they have been engaged in diabetes screening, glucose monitoring and providing lifestyle counselling through home visits.

Implementation approach: The project's approach is based on a community intervention designed to introduce diabetes and NCD awareness, prevention and care in western Nepal. The intervention leverages the role of community health volunteers (FCHVs) to bridge the gap between communities and primary health services. The project brings NCD services closer to communities by mobilizing lay FCHVs, who have traditionally focused on maternal and child health, to take on expanded roles in screening, blood glucose and blood pressure monitoring, referral, lifestyle counselling and treatment adherence support.

FCHVs receive targeted training in risk factor identification, screening methods, community-based management strategies and using essential equipment such as glucometers, blood pressure devices and anthropometric tools. They conduct household-level risk assessments and screenings, provide tailored health education to all family members, maintain patient registers, refer high-risk individuals to primary health care centres (PHCs) and carry out follow-up visits to ensure continuity of care.

In parallel, health-care providers at PHCs undergo comprehensive training aligned with the protocols of the WHO package of essential noncommunicable (PEN) disease interventions for primary health care

in low-resource settings, strengthening their capacity for integrated diabetes and hypertension management. Selected PHCs have been equipped with HbA1c analysers to enhance diagnostic and management capabilities at the primary level, while health post-based workers have been trained to handle prescription refills, reducing the need for higher-level referrals and improving adherence.

The awareness component of the first project phase included a school health programme training teachers at 43 schools to promote healthy lifestyles among students; community outreach events such as screening camps with HbA1c testing; and public activities such as bicycle races and running events, complemented by newspaper and radio campaigns. The ongoing phase continues to support local health authorities in rolling out and integrating NCDs into various community awareness programmes, including supporting home visits and celebration of community events, such as World Diabetes Day commemoration.

A steering committee comprising health authorities and academic partners guides implementation and advocacy, facilitating documentation of best practices and continuous engagement with local and national policymakers to ensure sustainability and policy integration of NCD prevention and management efforts.

Partners: Nepal Development Society (NeDS), a local multidisciplinary development and research NGO, leads the project,

Alignment of project implementation with Global Diabetes Compact key asks



EDUCATE



INTEGRATE



INNOVATE

leveraging its long-term experience in implementing community-driven health and NCD programmes in close collaboration and alignment with local health authorities (Provincial Health Directorate, District Health Office and rural municipalities). Through

NeDS' international network, academic institutions such as the Bloomberg School of Public Health, Johns Hopkins University and Aarhus University have been involved throughout the project cycle.

Outcomes: In the first phase of the project, a total of 168 FCHVs (125% of the target) covering the entire target population received in-depth training and supportive supervision, establishing the skills to deliver integrated diabetes and hypertension services effectively. All FCHVs trained were mobilised to perform comprehensive counselling, community education and risk assessment, and FCHVs passing competency tests were also eligible to perform comprehensive services involving screening and blood glucose monitoring (41%).

The first phase of the project successfully reached 10 179 individuals through FCHV home visits, with over half (5487) assessed as high-risk and screened. In total, 11 797 people (157% of the target) were screened for diabetes, including opportunistic screening conducted at five screening camps. The project effectively raised awareness about diabetes and its complications, reaching over 62 858 individuals in the community. The evaluation showed improvements in awareness, treatment, and control of diabetes and hypertension among participants.

The trained teachers conducted educational sessions for diabetes and cardiovascular diseases prevention for students across 43 different schools, reaching a total of 7079 participants. The initiative aimed to integrate health education into both private and public school settings, fostering awareness and healthy practices among students and their families. By positioning children as agents of change and engaging communities through school-based activities, including community events, the project sought to extend its impact beyond the classroom.

A cluster randomized controlled trial demonstrated that mobilizing FCHVs successfully reduced the burden of diabetes and NCDs, showing a mean fasting blood glucose reduction of 22.86 mg/dL in the intervention group, while the control group experienced an increase of 7.38 mg/dL (30). There were significant reductions in systolic blood pressure and adherence to antihyperglycaemic medications in the intervention group as well. Research from the Copenhagen School of Global Health indicated that community acceptance of the intervention was dependent on two key factors: awareness-raising efforts and the provision of supportive supervision by health authorities and NeDS. FCHVs exhibited high capability and accepted additional tasks without financial incentives, valuing the social capital and status gained within their communities (31).

It is envisioned that the ongoing project phase can demonstrate the feasibility of introducing the project model in rural areas. With the learnings and outcomes of the first phase targeting urban and semi-urban areas, the project holds the potential to showcase an evidence-based, low-cost, community-centred approach applicable in urban and rural areas to improve community-level care. Similar models are being scaled up

in Pokhara Metropolitan City, Kaski (~50 000 population), Madhyanepal Municipality (~21 000 population), Changunarayan Municipality (~55 000 population) and Kageshwori Manohara Municipality (~130 000 population), in collaboration with Johns Hopkins University and Monash University.

NeDS is also providing technical support to other organizations and municipalities to expand similar models in different areas, such as Ruby Valley Rural Municipality of Dhading District. It is also receiving requests to expand these models in other rural municipalities, including Ishma Rural Municipality of Gulmi District and Bethanchowk Rural Municipality of Dhading District.

Strengths of implementation: Both phases of the project have demonstrated considerable strengths, including effective community involvement through the mobilization of FCHVs. This approach fosters trust and rapport within communities and facilitates the delivery of health-care services at the doorstep, thereby reducing barriers to access to care. The task-shifting model has leveraged existing community resources and enhanced the role of FCHVs in managing chronic conditions such as diabetes and hypertension. Empowering FCHVs in this manner has proven successful in previous public health initiatives in Nepal, particularly in addressing infectious diseases and maternal and child health (32, 33).

Furthermore, with improved trust, patients can readily turn to FCHVs for questions or complications, helping to overcome the time constraints of clinic settings and the opportunity costs associated with long travel times. FCHVs have undergone comprehensive training and pre- and post-testing to qualify for delivering the complete basic NCD care package (over 60% competence), which includes both blood pressure measurement and blood glucose monitoring. While basic FCHV services have historically focused on maternal, neonatal and child health, the inclusion of diabetes and hypertension management has enhanced their authority

and earned them respect from all members in the communities.

The formation of a steering committee comprising various stakeholders (including NeDS, health authorities, universities and district health offices) has helped ensure effective governance and advocacy for the scale-up of the project model. The first phase of the project surpassed many of its targets, including those related to the number of health workers trained, the number of individuals screened, and community awareness raised. The health workers trained under the initiative have continued to provide services and maintain a high degree of professional satisfaction, resulting from their ability to address the growing community health needs.

The strong collaboration with local health authorities has facilitated better integration of NCDs into the broader health-care system. This collaboration has been instrumental in improving the delivery of health services and ensuring a continued focus on health literacy and lifestyle modifications within the community. Through collaborations with academic institutions, NeDS has significantly enhanced its capacity to assess the impact of its interventions and disseminate valuable insights. These partnerships have also facilitated rigorous evaluation methodologies,

allowing NeDS to monitor the effectiveness of diabetes and NCD management programmes comprehensively.

The resulting data and findings not only contribute to the continuous improvement of local health initiatives but also inform broader public health strategies at both provincial and national levels. By leveraging

academic expertise, NeDS has been able to share successful practices and innovative approaches with health authorities, fostering a culture of learning and adaptation. This collaborative framework enhances the project's implementation, as it ensures that interventions are built on evidence-based practices, ultimately leading to better health outcomes for communities in need.

Challenges

Ongoing transitions within the government and restructuring of the health system have presented challenges for continuity and resource allocation. The shift towards a federal governance structure has generated uncertainty about health access and delivery, ultimately impacting sustainability and scalability efforts. Additionally, the COVID-19 pandemic and associated lockdowns posed obstacles, influencing project timelines and evaluation processes.

Regarding service delivery, interruptions in the supply chain and stockouts of essential consumables, such as blood glucose monitoring strips, are notable challenges in ensuring consistent access to care. While NeDS has successfully addressed some supply needs post completion of the first phase, there is an ongoing effort to develop sustainable solutions together with health authorities that guarantee the availability of essential supplies at health facilities. However, at present, only physicians can prescribe antihypertensive and antidiabetic medicines and as these health workers are not necessarily present at the health post, ensuring sustainable access to medicines will continue to be a challenge.

Furthermore, staff turnover, including rotations of health personnel, emphasizes the importance of retaining capacity within the health system. To address this, strategies such as establishing routine refresher training and creating a pool of trainers are being implemented to reinforce knowledge retention and support ongoing capacity-building.

Sustainability and scalability: The sustainability of this initiative relies on several key factors rooted in the project's design and implementation. Ongoing support from local health authorities has been instrumental in sustaining the integration of the NCD intervention model, particularly as local governments actively request assistance from NeDS to expand these efforts. Additionally, through continued advocacy with health authorities at different levels, all efforts are being made to integrate NCDs into the FCHV

training curriculum at the national level. In addition, NeDS is working to link targeted health facilities to the government health insurance scheme to improve financial access to essential medicines and reduce the risk of catastrophic health expenditures for people with NCDs.

The project has established effective linkages between community-level primary health facilities and referral hospitals, making it easier for at-risk individuals identified by

FCHVs to receive necessary care. Additionally, the commitment at both provincial and federal levels towards prioritizing NCDs presents an opportunity to embed these initiatives into broader health systems.

To address persistent challenges, particularly those related to the supply chain and availability of essential consumables, the partners recognize the need for a reliable influx of supplies. The recent efforts to develop forecasting tools and conduct capacity gap assessments for local supply chain management are critical steps towards ensuring consistent service delivery.

As the federal government moves towards implementing comprehensive health insurance coverage from 2025, this will provide additional support and resources vital for sustaining these community-driven health initiatives. The new federal constitution stipulates the right to free basic health services and emergency care. To address the financial challenges associated with medication costs, NeDS is working on linking targeted health facilities to this insurance scheme to ensure financial access to medicines and avoid catastrophic expenditures.





Integrated TB and diabetes screening at a community health centre in Indonesia

© Department of Pulmonology and Respiratory Medicine, Universitas Indonesia

INDONESIA

Improving integrated screening and management of tuberculosis and diabetes

Background and rationale: Like many other countries, Indonesia is in an epidemiological transition with a high burden of infectious diseases, including tuberculosis (TB), and a rising NCD burden. The country has an estimated diabetes prevalence of 10.8%, accounting for 19 465 102 adults (28). In 2022, the estimated prevalence of TB in Indonesia was approximately 312 cases per 100 000 population. Both TB and diabetes prevalence places Indonesia among the seven countries with the highest burden of these two diseases (34).

Indonesian Family Life Survey (IFLS) 2014 data show that only 54% of public health centres (*puskesmas*) can test blood glucose and only 47% reported the ability to test urine. The capacity of primary care to undertake diagnostic testing also varies among urban and rural areas and across provinces. Urban capacity was higher than rural capacity, while the eastern provinces demonstrated lower capacity compared with the western provinces.

Objectives: The main objective of the project was to strengthen bidirectional screening and integrated management of TB and diabetes, as bidirectional screening and treatment is vital to control both conditions. It focused on developing practical guidelines and training modules, tailored for doctors, nurses and community health workers, and facilitated training of health-care professionals and community health workers in co-management protocols. The project also promoted early identification of TB and diabetes by introducing diabetes checks among TB patients and TB screening for individuals with diabetes. It also strengthened health-seeking behaviour through community education and patient awareness activities.

Project setting, population and timeline: Building on earlier work in North Moluccas, East Kalimantan and Jakarta, this project extended the scope across five provinces: North Moluccas (North Maluku), North Celebes (now North Sulawesi), Jakarta, West Java and East Nusa Tenggara, with a

total target population of 9.8 million. The project strengthened integrated DM/TB service delivery by collaborating closely with provincial and district health authorities, reaching both urban and rural populations through 33 public health centres. The project was implemented between 2012 and 2016.

Implementation approach: The project approach was aligned with WHO and International Union Against Tuberculosis and Lung Disease (the Union)'s framework for collaborative activities to address the dual burden of TB and diabetes. The approach was based on the establishment of a collaborative framework for diabetes and TB detection, management and care at provincial and district levels, created through roundtable discussions between the existing TB and diabetes programmes. TB and diabetes services are provided at different facilities and by different health workers. Patients diagnosed with one condition are screened for the other and cross-referred between the two programmes to ensure continuity of care and follow-up.

Training guidelines were developed for primary care providers (programme coordinator of TB and NCD at primary care level, usually a doctor or a nurse) on early detection and management of TB and diabetes, along with a module for training of trainers. Specific modules for community health workers were designed to support early detection and health education efforts at the community level. The materials developed were aligned with national guidelines to facilitate consistent and quality care delivery across different levels of the health system and also to ensure sustainability beyond the project.

In-facility and community health workers were trained in TB and diabetes. Educational materials were developed for patients and their families, and health education and awareness training were delivered

to the primary-level health-care staff and community health workers to strengthen community-level understanding.

Government laboratories in primary care were used for bidirectional screening and the capability of primary health care clinics to conduct sputum examination was strengthened. Interventions such as establishment of sputum booths outside primary care facilities to reduce the risk of nosocomial transmission within the health facility and administration of expectorants to patients with dry cough to facilitate the production of sputum were initiated.

The project sought to ensure continuity of care and management, not just screening. Strong referral systems were established for persons with diabetes who screened positive for TB symptoms at the primary level; they were referred to the hospital for X-ray and back to the primary care centre for continuation of treatment. Similarly, TB patients were offered blood glucose testing and when diabetes was detected, treatment was initiated in line with national guidelines. Some asymptomatic patients were lost to follow-up during the X-ray stage; however, the referral algorithm was refined to strengthen tracking and communication between facilities.

For TB–diabetes collaborative activities, the screening was conducted as follows: among people with diabetes, all individuals aged 40 years and above attending NCD or diabetes clinics were screened for TB; and among people with TB, all patients, regardless of age, were screened for diabetes.

The project leveraged Indonesia's national health insurance scheme, which provides an annual blood glucose screening free of charge in the public sector to minimize financial hardship and encourage uptake. The learnings have been incorporated into the current national guidelines.

Partners: This multipartner project was led by the Department of Community Medicine, Universitas Indonesia, in collaboration the Indonesian Society of Endocrinology (PERKENI)

and the Department of Pulmonology and Respiratory Medicine, Universitas Indonesia. The other stakeholders consisted of the provincial and district health offices.

Alignment of project implementation with Global Diabetes Compact key asks



INTEGRATE



INNOVATE



EDUCATE



TREAT

Outcomes: Pivotal milestones were achieved through this project, seeking to institutionalize the integration of service delivery for communicable and noncommunicable diseases into the public health system. Over time, the work evolved from a project-based initiative to a nationally recognized and scaled-up approach for TB–diabetes mellitus (DM) co-management in Indonesia.

The signing of the consensus of TB–DM management in Indonesia (September 2015) by the Ministry of Health, the Indonesian Medical Association, the Indonesian Society of Internal Medicine, the Indonesian Society of Respiriology, the Indonesian Society of Endocrinology and the Indonesian Association of Family Physicians was an important milestone, as it involved establishing a mechanism for bidirectional screening. During the project, 2657 TB patients were screened and 569 (21.4%) were identified to have DM. Additionally, 670 diabetes patients were screened for TB, while 62 (9.2%) tuberculosis cases were identified.

The health workforce was trained in the new TB and DM co-management guidelines; 465 primary care workers (doctors = 157; nurses = 133; paramedics, educators and others = 175) were trained in the management of DM and TB. Furthermore, 2338 community health workers were trained in primary prevention and early identification of diabetes and TB. Approximately 7000 patients and family and community members were educated about diabetes and TB. Three training modules and one set of education materials were developed and used during the project.

Guidelines on the management of TB–DM in primary care were developed and are still being used. This allows standardization and implementation of quality health care for patients. SOPs were developed and used at laboratories leading to better access to diagnostics.

Strengths of implementation: This project was anchored by a strong university and public sector partnership to ensure that technical project inputs were practical for

implementation in the public health system. The project further partnered with a similar initiative that was being implemented in the same area around the same time to achieve the best outcomes for the communities.

Training of in-facility and community health workers broadened their scope and enabled them to integrate care for infectious and noncommunicable diseases. To ensure that the training programmes would be ongoing beyond the project's lifespan, a module for training of trainers on early detection of diabetes and TB in primary care was developed.

Bidirectional screening of TB and diabetes fostered service integration of primary care services as well as a strong referral and back referral system. This strategy encourages continuity of care of patients screened through different programmes.

Although the use of national health insurance to cover the cost of diabetes screening was already in place, its effective linkage to TB-DM services demonstrated strong government buy-in and provided a foundation for sustainability. By integrating *Jaminan Kesehatan Nasional* (JKN) coverage,

the programme helped motivate people to undergo bidirectional TB and DM screening without facing financial hardship.

From a health system perspective, the project has contributed to improving capacity and awareness of bidirectional screening of TB and diabetes in Indonesia. Guidelines, training materials and educational materials were also developed, which were endorsed by the Indonesian government.

A national consensus on TB-DM management was reached in 2015 and formally documented by all professional societies in pulmonology, endocrinology and primary care. The consensus contained chapters on screening, diagnosis, treatment and referral mechanisms for TB-DM patients. Based on the consensus, a TB-DM management guide as well as a national policy for TB and diabetes bidirectional screening at all health-care facilities were developed.

Challenges

There were shortages of internists (internal medicine doctors) at hospitals, which meant that those who were available were overworked and TB screening was thus not a priority. High staff turnover (often every five years) meant that those who were present during the project's implementation had all left for other health facilities. However, the capacity has not been completely lost. The national guidelines developed through the project have since been adopted for the national programme and new health workers have continued to receive training based on these guidelines, continuing activities beyond the project period.

A common challenge was that TB care tends to be relatively acute, while diabetes care is chronic, posing difficulties in ensuring follow-up and continuity of care across the two programmes. Lack of X-ray resources at primary care facilities meant that individuals suspected of TB but without cough or other clear symptoms had to be referred for further diagnostic work-up. Furthermore, GeneXpert facilities were available only at hospitals, with turnaround times of about two weeks, further delaying diagnosis and contributing to dropouts along the care pathway.

NCDs and TB each have their own independent information system for reporting. As a result, the project needed to assign personnel to visit the PHCs regularly to collect the necessary data for reporting. This is not limited to NCDs and infectious diseases; there

are, generally, multiple non-operational interoperable information systems in the clinical platform.

Patients incur indirect costs (transport costs, absence from work and possibly loss of income, meals, etc.) due to referral to hospitals for X-ray. This consequently discouraged some patients presenting themselves at hospitals.

The project did not have the capacity to screen for TB among the contacts of those who tested positive. Similarly, the project did not have the capacity to monitor glucose control or response to TB treatment.

Sustainability and scalability: Following the project, national guidelines and SOPs were adopted for the screening of individuals aged 15+ for both TB and DM in primary care (2021) and hospitals (2023) (35, 36). Educational and training materials developed through the project were also adopted nationally.

The project contributed significantly to the 2016 Bali Declaration, which was later endorsed by the Ministry of Health, Indonesia. This was the first international document addressing the growing challenge of TB–diabetes comorbidity (37).

However, while guidelines and SOPs provide a strong framework for scaling bidirectional screening, sustainability will ultimately depend on the availability of resources and systems to provide treatment and long-term care for both conditions. Screening without adequate diagnostic capacity, treatment access and continuity of care risks limiting the overall impact of integration. Strengthening these capacities is, therefore, essential to ensure that integrated TB–diabetes services are both effective and sustainable in the long term.





Community engagement for integrated diabetic foot and gestational diabetes care in Sri Lanka

© Ministry of Health, Sri Lanka

SRI LANKA

Integrating diabetic foot care and gestational diabetes management in the diabetes care model

Background and rationale: Sri Lanka faces a significant NCD burden, with age-standardized prevalence of diabetes among individuals aged 18 years and above estimated to be 25% in 2022 (38) and NCDs among the top 10 causes of death. Challenges include fragmented care pathways, limited access to diabetic foot care and low participation of men in preventive screenings. The NCD Unit of the Ministry of Health (MoH) has established over 1000 healthy lifestyle clinics (HLCs) for early detection of diabetes and cardiovascular risks. Yet the percentage of the eligible population screened has remained low, at around 25% of the target population each year.

Diabetes-related complications further strain the health system. In 2006, around 40% of hospital admissions among people with diabetes were due to diabetic foot complications. Yet the availability of health workers trained in diabetic foot management remains limited. Similarly, competencies for managing type 2 diabetes, GDM and

diabetes-related complications are unevenly distributed across the health workforce. At the same time, GDM has emerged as one of the most common medical complications in pregnancy.

Objectives: The project aimed to develop a comprehensive, cost-effective and holistic national model for the prevention and control of diabetes and CVD risk factors, which would further strengthen and support the existing primary health care systems of the country. It focused on capacity-building for early diagnosis and cost-effective management of diabetes and NCDs in primary health care settings and to improve public awareness of healthy lifestyle. Special emphasis was placed on building capacity for diabetes-related foot complications and strengthening services for GDM to introduce early-life interventions that promote healthy dietary behaviours.

Project setting, population and timeline: The project was developed as an integrated model of the public health system and was

an expansion of earlier projects related to diabetes. The collaborative effort led by the MoH in Sri Lanka targeted all 25 districts of the country, with particular emphasis on expanding services in underserved areas, ensuring comprehensive coverage for all populations, especially vulnerable groups. The project targeted both the health workforce and the broader community.

The original timeframe of the project was 2016–2019. However, the project was extended to 2021 due to COVID-19. The intervention spanned a five-year period, from 2016 to 2021.

By the end of the project, 216 000 diabetes screenings were conducted and more than 666 000 teachers, students and parents were reached through targeted health promotion interventions at schools.

Implementation approach: The project approach was based on a combination of health systems strengthening and population-based behaviour change interventions, focusing on health promotion, early detection and diabetes care at all levels of the health system. The intervention was designed to strengthen the existing primary health care system while mobilizing communities to take proactive roles in managing their health.

Comprehensive trainings were provided for health-care providers, including doctors, nurses and community health workers, to improve early diagnosis and management of diabetes and cardiovascular diseases and ensure delivery of quality NCD services. In addition to general diabetes management and care, the trainings specifically addressed diabetic foot care and GDM. Health-care workers were trained to recognize and manage foot complications, with established protocols for routine screening.

Specialized clinics were established for patients with foot issues, while partnerships with local cobblers facilitated production of affordable diabetic footwear. Midwives were trained in GDM detection, management and care to integrate routine GDM screening during antenatal visits. Protocols for early detection using OGTT were implemented, referring women with GDM to specialized clinics for comprehensive care, including dietary counselling and monitoring.

Community outreach programmes, screening camps and lifestyle modification workshops were key components of the health promotion intervention implemented to raise public awareness regarding healthy lifestyles. A Health Promotion Officer (HPO) who is a graduate in “health promotion” was trained and enrolled in the project to lead the health promotion activities at the district level. The health promotion model engaged families through educational interventions at schools, where teachers promoted healthy practices among students, utilizing the culturally tailored storybook, *My Family Health Book* (Tamil and Sinhala), to facilitate discussions about health with students and their families.

Partners: The partnership was led by the Ministry of Health, Nutrition and Indigenous Medicine (MoH), Sri Lanka. The Sri Lanka College of Endocrinologists (SLCE) and the Sri Lanka Medical Association (SLMA) served as key implementing partners, managing clinical training, health promotion activities and fund coordination. Additional collaborators include the Ceylon College of Physicians, the College of Surgeons of Sri Lanka, the Health Promotion Bureau (HPB), the Ministry of Education, WHO and various community organizations such as the Lanka Mahila Samiti (women’s volunteer group) and the Lion’s Club. Several orthotists were trained under WDF funding at the Christian Medical College (CMC), Vellore, India.

Alignment of project implementation with Global Diabetes Compact key asks



EDUCATE



INTEGRATE



UNITE

Outcomes: The project achieved significant outcomes that reflect its effectiveness and systemic impact. A total of 8787 health-care providers from all levels of health care were trained, significantly exceeding the initial target of 4825. This extensive training not only improved individual capacity but also strengthened the overall functionality of the health-care system.

The project conducted 216 000 diabetes screenings, addressing critical gaps in early detection and care. Approximately 100 000 pairs of diabetic footwear were distributed to prevent complications related to diabetes.

A total of 666 352 teachers, students and parents were reached – 246% above the target of 2700 – by integrating diabetes and health education into schools.

On a systemic level, the establishment of 25 regional diabetes centres and five shared care centres for GDM significantly improved health care accessibility. These centres were integrated into the broader health system and serve as critical referral points for specialized care, enhancing continuity of care.

The integration of GDM management into existing maternal and child health services reflects a significant shift towards a more comprehensive approach to managing chronic diseases. This has transformed the landscape of diabetes care, emphasizing the importance of early detection, education and coordinated management.

The project aligned with the National Multisectoral Action Plan for NCDs (2016–2020), resulting in increased awareness and responsiveness among health-care providers and the community regarding diabetes and its complications. By actively involving local communities and aligning interventions with national health strategies, the project has reinforced the government's commitment to addressing the NCD burden.

Through diligent training, effective resource distribution and a focus on community engagement, the project has established a more informed and capable health workforce. The initiative's lasting impact includes improved individual health outcomes and a strengthened health-care system that prioritizes chronic disease management and prevention, including the establishment of the Health Promotion Officer as a new job cadre within the National Health Service.

Strengths of implementation: A notable benefit was the effective engagement of various stakeholders, including the MoH, the Sri Lanka College of Endocrinologists and the Sri Lanka Medical Association. This collaborative governance structure ensured strategic oversight, facilitating a coordinated approach to tackling diabetes and NCDs while enabling efficient use of resources.

Following the conclusion of the project phase, several components of the project have continued. The storybook remains in use in classrooms and is now part of early-grade health education as the HPB has taken over improving the storybook and rolling it out nationally. In 2025, it is expected that 900 pre-schools will use the storybook in their routine education, helping to sustain awareness, knowledge and practices related to healthy lifestyle among children and their families. The availability of diabetic footwear has been maintained through local production, while GDM screening continues to be delivered through strengthened primary care services.

The project's emphasis on capacity-building at the primary health care level proved crucial.

The extensive training equipped health-care workers with essential skills in diabetes management and prevention, fostering a proactive approach to care. The training strategy directly addressed the pressing need for improved expertise in local health-care settings.

Additionally, the establishment of specialized clinics and regional diabetes centres significantly enhanced the health-care system's ability to manage diabetes effectively. These facilities created clear pathways for individuals to access comprehensive care, ensuring timely and appropriate responses to diabetes complications.

Moreover, the focus on diabetic foot care through specific training and established protocols addressed an often-neglected aspect of diabetes complication management—routine foot assessment and early detection of foot problems. The efforts to implement preventive measures indicate a commitment to reducing the incidence of foot-related issues.

Challenges

One significant challenge was the high turnover among trained health-care personnel, leading to disruptions in the provision of skilled staff to manage diabetes-related services effectively, affecting consistency and quality of care at clinics. Logistic hurdles also played a role, with interruptions in the supply chain resulting in stockouts of essential consumables, such as blood glucose monitoring strips. These interruptions hindered continuous patient care and limited the effectiveness of screening initiatives.

The COVID-19 pandemic introduced additional obstacles that significantly affected project timelines. Lockdowns and restrictions limited the ability to conduct outreach activities and in-person training sessions, delaying critical components of the initiative.

The lack of established data systems for monitoring and evaluating the effectiveness of interventions posed a significant challenge. While there were practices in place at the primary care level, the absence of formal registries at tertiary hospitals complicated the tracking of patient outcomes and the overall impact of the initiative.

Sustainability and scalability: The governance structure and community-oriented design contributed to the sustainability of the project model. The ongoing support from local health authorities has been instrumental in integrating the NCD intervention model into the public health system.

The establishment of regional diabetes centres and shared care centres for GDM has created a strong infrastructure that improves access to essential services. These centres are integrated into the national health-care

system, ensuring that successful practices are maintained and expanded over time.

As the Government of Sri Lanka continues to prioritize NCDs within health policies and programmes, including the anticipated introduction of comprehensive health insurance coverage for community health workers, new opportunities for sustainable financial support are expected to emerge. This alignment with health insurance initiatives that legally mandate the provision of essential health services, including chronic disease management, creates a favourable context for the initiative's continuation.





Training material on healthy Diet Eating at Ban Ta Khun Hospital, Thailand

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THAILAND

Advancing diabetes remission through structured lifestyle modification programmes

Background and rationale: Thailand is experiencing a steady rise in the diabetes burden. Thai National Health Exam Surveys data show that the prevalence of diabetes among individuals aged 15 years and above increased from 7.1% in 2004 to 10.6% in 2025 (39). According to the Thailand Ministry of Public Health Data Center, the number of registered people living with diabetes increased from 2.6 million in 2017 to 3.7 million in 2025, with approximately 70% of patients having uncontrolled glycaemia (40). Despite universal access to screening and treatment, lifestyle-related risk factors continue to shape the diabetes epidemic. In response, Thailand's National Diabetes Programme prioritizes prevention, access to essential medicines and long-term disease management, given the high prevalence of metabolic risk factors, with 46% adults aged 18 years and above classified as overweight and 15% as obese, both which substantially increase the risk of type 2 diabetes. Within this framework, type 2 diabetes remission

programmes have been introduced as a complementary strategy, offering an additional pathway for some people living with diabetes while reinforcing diabetes care. Thailand's diabetes remission strategy is underpinned by national policy efforts to strengthen people's capacity for self-care and long-term behaviour change. These priorities reflect a shift from purely clinical diabetes management towards integrated, behaviour-centred and digitally supported models of care.

Objectives: In Thailand, diabetes remission is defined as achieving and maintaining glycated haemoglobin (HbA1c) below 6.5% (48 mmol/mol) for at least three months without glucose-lowering medication. National clinical guidelines further emphasize that even after remission is achieved, patients must remain under continuous follow-up, with HbA1c monitored at least annually and more frequently if abnormalities are detected, as remission does not imply permanent disease reversal. Remission initiatives are directed

towards adults with recently diagnosed type 2 diabetes, particularly those who are overweight or obese and who are not on insulin therapy.

The type 2 diabetes remission programmes are designed to complement, rather than replace, standard diabetes management. They strengthen comprehensive care by improving metabolic management through intensive lifestyle modification, supported by continuity of care, structured follow-up and long-term monitoring.

Project setting, population and timeline:

Thailand's National Diabetes Remission Programme evolved from local innovations initiated in hospital and community settings. Early pilot initiatives were implemented at Bangrakam Hospital, Ban Ta Khun Hospital, Kranuan Hospital and the Phimai District Health Office between 2018 and 2023. These pilots demonstrated the feasibility of remission services across both clinical and community-based platforms.

Building on these experiences, national diabetes remission guidelines were developed by partner organizations together with the Ministry of Public Health (MoPH) in 2023. This was followed by detailed operational guidance in 2024 to support standardized scale-up across the country. The guidelines were designed to equip health personnel with key principles and practices for holistic care in supporting DM patients to achieve remission stage. The following topics were included in the guidelines: basic knowledge of DM remission management, dietary control, physical activity, behavioural change counselling, monitoring treatment outcomes and self-management, behavioural modification and long-term weight management, management of DM remission clinics, and best practices and lessons learnt from pilot hospitals.

Implementation approach: Thailand's Type 2 Diabetes Remission Programme operates through multiple entry points within the health system.

- Community hospitals operate multi-disciplinary clinics, where doctors, nurses and dietitians deliver intensive lifestyle counselling and follow-up.
- Primary health centres extend support through regular visits and home-based follow-up by community health volunteers, ensuring continuity of care at the household level.
- Community-led education initiatives, such as DM schools, mobilize local resources, including retired teachers, to deliver structured group education, practical skills and peer support for sustained lifestyle change.

These approaches reflect national guidance emphasizing the importance of achieving 10%–15% weight reduction, structured behaviour change support, trained providers, and regular follow-up using digital tools and shared decision-making pathways.

Partners: The guidelines and operational guidance for the implementation of Thailand's DM Remission Programme were jointly developed by the following partner organizations:

- Diabetes Association of Thailand;
- The General Practitioners/Family Physicians Association of Thailand;
- The Association of Diabetes Educators;
- Thai Dietetic Association;
- The Association of Thai NCD Alliance;
- Department of Disease Control, Ministry of Public Health;
- WHO Country Office for Thailand .

Alignment of project implementation with Global Diabetes Compact key asks



PREVENT



TREAT



TRACK

Outcome: Early outcomes from the pilot sites indicate promising results for diabetes remission in Thailand. At Bangrakam Hospital, 106 participants were enrolled in the Diabetes Remission Programme between 2020 and 2021. Among them, 53 participants (50%) achieved remission, while among those achieving remission, 42 (80%) were able to sustain remission at one year. Participants also reported reduced medicine use and associated cost savings, highlighting the broader value of structured lifestyle interventions integrated into routine hospital care.

In the Phimai District in Nakhon Ratchasima Province, the DM School Programme, launched in 2021 across 21 schools and expanded to cover the entire province by 2023, enrolled a total of 1513 participants by December 2023. Among them, 107 participants (7%) achieved remission, while a substantially larger group, comprising 804 participants (53%), achieved improved glycaemic control with reduced medication use. These findings highlight that although only a subset of participants achieves full remission, a much larger proportion derives clinically meaningful metabolic benefits from structured lifestyle interventions, and that community-led education and peer support can play an important role in complementing facility-based services to improve diabetes outcomes.

Strengths of implementation: The successful implementation of diabetes remission in Thailand has been supported by several key enabling factors, including strong political commitment and effective multisectoral collaboration. The integration of remission services into existing diabetes management system has ensured continuity and alignment with routine service delivery. High levels of community engagement, particularly through DM schools and community health volunteers, have strengthened outreach and sustained lifestyle modification at the local level. The availability of standardized national operational guidance has ensured consistency in programme delivery, while

structured capacity-building initiatives have strengthened the skills of health professionals. In addition, monitoring systems to support follow-up and performance tracking have contributed to improved programme oversight and accountability.

A key innovation supporting programme success in Thailand has been the use of digital tools for patient tracking and behavioural reinforcement. Multidisciplinary teams conduct monthly follow-ups during the first three months and repeat clinical evaluations at 3, 6 and 12 months using self-monitored blood glucose data, online reporting systems and mobile platforms.

Challenges

Despite encouraging progress, several challenges affect the implementation and scale-up of diabetes remission services in Thailand. The implementation and scale-up of remission programmes are inherently resource-intensive, requiring substantial investment in the health workforce, infrastructure, and robust monitoring and follow-up systems. Enabling environments that support long-term healthy lifestyle behaviour remain limited in many settings, which can undermine sustained behaviour change. Service delivery capacity varies across regions. In addition, there is currently no dedicated financing mechanism for remission services. Fragmented health information systems further limit the ability to track patients and outcomes in an integrated and systematic manner.

Sustainability and scalability: To strengthen long-term sustainability and building on these pilot experiences, the MoPH, in collaboration with professional associations, translated local lessons into national action. In 2023, national guidelines on diabetes remission were issued, followed by detailed operational guidance in 2024. These documents provide a common framework to help ensure diabetes remission programmes are delivered safely and consistently across the country.

A national training curriculum has been developed with an online training and certification platform operated by professional partner organizations. The Diabetes Remission Programme is being integrated into the Ministry of Public Health

Service Plan for chronic diseases, enabling national expansion.

Ongoing clinical evaluations and cost-effectiveness studies are assessing the health and economic impact of remission interventions. Embedding remission into routine diabetes care pathways helps ensure that services are accessible and sustainable. Early experiences show that remission programmes improve both clinical outcomes and health system efficiency, even among participants who do not achieve remission. Scaling remission services nationally offers an opportunity to strengthen Thailand's comprehensive diabetes response while keeping long-term management a priority.





Expanding access to diabetes screening and follow-ups at the community level in Timor-Leste

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TIMOR-LESTE

Improving diabetes treatment coverage in primary health care

Background and rationale: Timor-Leste is facing a growing burden of NCDs, with an estimated 35% of adults aged 30–79 years living with hypertension and 7% of adults aged 18 years and older living with diabetes (41). As part of the SEAHEARTS initiative to accelerate the prevention and control of CVDs and diabetes, in 2023, Timor-Leste committed to placing 50 000 people with hypertension and diabetes on protocol-based management by 2025 – a target referred to as “50x25”. The intervention addresses significant gaps in detection, treatment and control of NCDs, which pose a growing public health challenge in the country.

Objectives: The primary objectives were to improve treatment coverage and control of diabetes and hypertension by enhancing the quality and reach of primary health care services. This involved addressing key system-level gaps such as the availability of medicines and diagnostics, the use of standardized treatment protocols and the capacity of health-care workers. Additionally, the project

aimed to integrate NCD care with other public health services, including maternal, child and communicable disease programmes, and to develop robust monitoring systems for tracking patient outcomes and service performance.

The objectives were framed based on findings from the 2023 Integrated NCD Survey, which highlighted the unavailability of screening and management services for hypertension and diabetes in primary health care; lack of updated drug- and dose-specific protocols; inconsistent use of protocol by health-care providers; unavailability of medicines and diagnostics; inefficient referral and follow-up systems; and limited facility capacity to measure and track progress on key performance indicators of NCDs.

Project setting, population and timeline:

The pilot was implemented in two of the country’s 14 municipalities, Aileu and Dili, which together cover approximately 360 000 people, representing 28% of Timor-Leste’s

total population. The project targeted 54 health facilities, including treatment posts and community health centres. Aileu was strategically selected due to its proximity to the national capital, Dili, allowing for better referral management of diabetes complications, improved monitoring and enhanced supervision by the Ministry of Health (MoH). The first phase of implementation was conducted during 2024 and early 2025, establishing the foundation for a nationwide scale-up.

Implementation approach: The intervention introduced a revised, simplified service delivery model across treatment posts, community health centres and referral hospitals.

Key focus areas included improving coverage and control of diabetes and hypertension; enhancing availability of medicines and diagnostics; strengthening workforce skills; and integrating services for communicable diseases and maternal and child health. Opportunistic screening was introduced for all individuals aged 30 years and above, with triage counters set up to reduce missed opportunities.

Training was a cornerstone of the initiative – over 250 health-care workers, including doctors and nurses, were trained in the new model. Patient empowerment tools such as the NCD Passport were introduced, while facility-level recording formats were redesigned to include unique patient identifiers for longitudinal tracking. Outreach efforts under the Government’s Integrated Health Programme [Programa Integrado ba Saúde (PIS)] brought services closer to communities; diabetes screening among TB patients was initiated. A drug quantification tool was developed to forecast medicine needs, helping optimize supply chains. Throughout implementation, supportive supervision from the MoH and WHO ensured that training was translated into effective practice.

Partners: The project was led by the MoH, Timor-Leste, with technical and operational support from the WHO Country Office. Local implementation was carried out in coordination with the health departments of Aileu and Dili municipalities. The WDF provided financial and technical support, helping operationalize the project’s interventions in line with global best practices for diabetes care.

Alignment of project implementation with Global Diabetes Compact key asks



INTEGRATE



TREAT



TRACK



INNOVATE



UNITE

Outcomes: The project achieved core milestones in improving diabetes care in Timor-Leste during its first year of implementation. A revised, comprehensive service delivery model for all three levels of care – treatment posts, community health centres and referral hospitals – was jointly developed through extensive consultations. These involved health-care providers, specialists, and municipal and national-level health programme managers.

The consultations also enabled the establishment of facility-specific quarterly and annual targets based on population coverage, prevalence of hypertension and diabetes, and the

health system's capacity to increase treatment coverage by 25%, compared with baseline data. A key feature introduced was opportunistic screening for all individuals aged 30 years and above who visit health facilities. This included patient navigation from entry to exit points and follow-up at the community level. A triage counter was placed near the registration desk to minimize missed opportunities for screening.

Simplified, drug- and dose-specific treatment protocols were developed in collaboration with health specialists and pilot tested with front-line health-care providers before integration into the National Standard Management Guidelines. This new protocol reduced the requirement of antihypertensive and diabetes medicines used at the primary care level from 10 different types to four types of medicine, simplifying procurement and distribution processes.

A drug quantification tool was also developed to support the procurement and pharmacy departments by estimating the needs for drugs and diagnostics based on the mixed method (using both morbidity and consumption). This tool has helped the Procurement Division [Instituto Nacional de Farmácia e Produtos Médicos (INFPM)] to streamline product selection for procurement, improve drug availability at the health facility level within the same budget and prioritize the supply of essential medicines.

Several tools were introduced to empower both patients and providers. The NCD Passport allowed patients to track their medication, blood pressure and blood sugar levels, and served as a reminder for forthcoming facility visits. Dispensing 30 days' worth of medication further improved treatment adherence by reducing the frequency of facility visits required. Facility NCD registers were revised to include unique patient IDs, enabling longitudinal tracking, which in turn improved follow-up and reduced loss to follow-up.

Implementation guides and operational manuals (Participants Handbook) were developed in the local language for each level of care to assist health-care workers in implementing the service delivery model. Job aids were developed to assist health-care providers in accurately measuring blood pressure and glucose levels, counselling patients on healthy lifestyles and supporting treatment adherence.

A total of 54 doctors, 134 nurses and 68 other health-care providers were trained within the first year, exceeding the original target of 100. Team-based care was also introduced, wherein nurses supported doctors in screening and measurements. Awareness campaigns aligned with the MoH's National Health Day theme were conducted to raise public awareness of the diabetes care cascade.

The recording and reporting formats were simplified and are currently in the process of digitization. This has helped providers monitor their coverage and control targets effectively. Coverage- and control-based indicators were piloted. There are plans to integrate them into the national DHIS-2 platform via the e-Tracker system.

Linkages between treatment posts and community health centres have been strengthened to bring services, including medicine availability, closer to patients' homes. Under the Integrated Health Programme (PIS), community outreach efforts were made to integrate services with other health programmes. Additionally, diabetes screening among all TB

patients has been initiated in select municipalities. A framework is now being developed to ensure systematic linkage and follow-up for suspected diabetes cases.

Regular supportive supervision by the MoH, municipal health directors and WHO helped close the implementation gap between training and real-world practice of service delivery model. A total of 4125 new people were screened for diabetes; 13 500 people were screened for hypertension during October 2024–February 2025; and 571 new people with diabetes and 2783 new people with hypertension were put on protocol-based treatment (an increase of more than 27% from baseline of 2023).

In addition, 3422 people in Aileu and 26 802 in Dili Municipality (new and old registered patients) were receiving protocol-based treatment for hypertension and diabetes – a success attributed to the integrated interventions outlined above. More than one million doses of hypertension and diabetes drugs (two types of antihypertensive medicine and two types of diabetic medicines) were distributed to health facilities, with an average increase in availability of 56%–90% from the preceding year.

Strengths of implementation: Timor-Leste's flagship initiative PIS is at the forefront of bridging these gaps, linking community care and streamlining referral pathways to address key health priorities. Community health volunteers under PIS are playing a vital role in community mobilization, tracking and follow-ups.

A coordinated approach brought together multiple departments of the MoH–NCD Division, Instituto Nacional de Farmácia e Produtos Médicos (INFPM), Direção Nacional de Farmácia e Produtos Médicos (DNFPM) and Direção Nacional de Equipamentos Médicos (DNEM) to sort out the challenges of forecasting procurement, distribution and storage of protocol medicines at the primary health care level.

The predominance of public health sector service delivery, combined with the availability of free drugs and diagnostics and clearly defined roles within the essential health service package, has facilitated introduction of new interventions. In Dili Municipality,

the earlier implementation of the WHO PEN package accelerated progress by sensitizing health-care providers in advance.

Rationalization of medicine procurement has improved the availability and accessibility of medicines and diagnostics within the same budget. Supportive supervision by the MoH and WHO, using a simple supervisory checklist, has helped identify gaps and develop local solutions through discussions with patients and care providers. The involvement of village heads, religious leaders and traditional healers has strengthened community awareness and treatment adherence.

Local leadership and ownership, particularly by municipal authorities, have facilitated the repurposing of the health workforce and ensured the presence of doctors at treatment posts. The inclusion of management protocols in the National Standard Management Guidelines and the listing of protocol drugs in the National Essential Medicines List have further ensured sustainability and scalability.

Challenges

The NCD Division has limited human resources, making it difficult to coordinate activities effectively. This leads to reliance on other divisions and departments for NCD service delivery, requiring frequent coordination and follow-ups.

Despite forecasting and national-level commitment, health facilities continue to suffer stockouts of drugs and diagnostics. The shortage of glucose strips reflects dependency on imports and supply chain challenges in procuring drugs and diagnostics. Limited financial resources for the health sector, compounded by the triple burden of diseases, further intensify competition for prioritization within limited resources a general challenge seen across many countries, but here compounded by being a small island nation. Additionally, there is limited adherence to management protocols by doctors at referral hospitals.

The NCD Programme faces funding difficulties when introducing new interventions, restricting the expansion of initiatives to additional municipalities. Advocacy is necessary to secure increased funding for essential medicines and diagnostic tools.

There are limited options for tracking and following up on patients, as internet and call services are expensive. Moreover, the incentive plan for community health volunteers does not cover NCD follow-ups. There is a shortage of diagnostic equipment, such as semi-auto analysers, essential for comprehensive testing of blood glucose and lipid profiles. This shortage hampers the ability to fully assess complications related to diabetes and hypertension.

The geographical terrain and patient reluctance to continue treatment pose challenges. Referrals to higher levels for confirmation of suspected cases have also added financial burdens.

Sustainability and scalability: The progress of the project has been reviewed both at the highest national level and at the local level, contributing to enhanced accountability across all tiers. Given the project's demonstrated potential to deliver impactful results, there is a strong demand to scale its learnings and interventions to the remaining municipalities across the country. The initiative has laid a solid foundation for integrating other NCDs, starting with chronic obstructive pulmonary disease (COPD).

The country is also preparing to introduce point-of-care testing in alignment with the National Essential Diagnostics List. This will improve access to HbA1c testing at the primary health care level, enabling better

monitoring of treatment outcomes for people with diabetes.

The simple treatment protocols have now been formally incorporated into the National Standard Management Guidelines, allowing for streamlined scale-up to other municipalities through structured health-care worker training.

The new service delivery model has been tested, and the learnings from the two-year implementation period will guide refinements and address existing gaps. Job aids, training manuals, and standardized recording and reporting formats developed during the project could be rapidly introduced in other municipalities to ensure consistency and efficiency.

The NCD e-Tracker is currently being integrated into the national DHIS-2 system. Once operational, it will enable longitudinal patient tracking and provide a real-time dashboard for monitoring progress against key performance indicators, easing the workload of health-care providers.

Screening for diabetes complications, especially cardiac and retinal conditions, is being introduced, strengthening the foundation for integrated NCD management.

Additionally, the drug forecasting tool will undergo further testing over the next year, transitioning from a mixed method to a

morbidity-based forecasting approach. This will support more accurate procurement planning for antihypertensive and antidiabetic medicines across all 391 primary health care facilities in the country. Successful implementation of the quantification tool will help expand the practice for insulin and other NCD drugs.

However, sustaining these advances will require addressing persistent gaps in funding, drug availability and human resources. These remain critical components of the health system; without strengthening them, the long-term sustainability of integrated NCD services will be difficult to achieve.





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4 Pragmatic lessons and suggestions to improve diabetes prevention and control in the WHO SE Asia Region

In the broader context of universal health coverage (UHC) and reducing premature mortality from NCDs, prevention and management of diabetes at the primary health care level faces significant gaps and barriers across the countries of the WHO South-East (SE) Asia Region. These case studies offer valuable insights into diverse implementation models in real-world settings, helping address key challenges in diabetes prevention and management. The key features included in the case studies create a learning environment and highlight effective practices that can inform practical, context-specific solutions.

The learnings from the projects highlighted the limited awareness of diabetes within the communities; unavailability of essential medicines and diagnostics; lack of use of standard management protocols; poor health information systems; untrained staff; and shortage of workforce. Together, these factors impact diabetes care significantly.

Given the broad scope and variety of strategies involved in strengthening diabetes care, the selection of case studies was intentionally focused on type 2 diabetes interventions, with an emphasis on evaluating their impact, sustainability, service delivery and partnerships.

While the case studies offer valuable insights from diverse implementation settings, most outcomes documented are process-oriented and primarily qualitative. Therefore, the findings are presented as practical suggestions rather than formal recommendations, since generating evidence through experimental or quasi-experimental designs or structured surveys was beyond the scope of the report. Nonetheless, these suggestions reinforce the catalytic actions of the “Colombo Call to Action”. It is important to note that the suggestions do not include multisectoral interventions for reducing common risk factors. Their importance is fully recognized but lie outside the focus of this set of case studies.

Primary prevention – reducing exposure to modifiable risk factors such as unhealthy diet, physical inactivity, tobacco and alcohol use, and overweight/obesity – requires policies well beyond the health sector. While several projects incorporated elements of primary prevention (e.g. mobilizing schools, engaging mosques and leveraging antenatal care platforms), most initiatives primarily focused on improving access to care and management of diabetes. However, emerging evidence and policy direction can be drawn from Child Nutrition Report 2025 (Feeding Profit), which highlights the critical role of early-life nutrition and whole-of-society action in preventing NCDs, including diabetes.

To reiterate, the lessons drawn from these case studies align with the catalytic actions outlined in the “Colombo Call to Action: Strengthening prevention and control of diabetes in the WHO South-East Asia Region”.

The case studies primarily explore areas such as education and awareness, health systems strengthening and integration of diabetes care with maternal health and communicable disease services. The focus remains on interventions suitable for primary health care settings, providing countries with concrete, real-world examples for translating the call to action into practice. Key learnings drawn from the case studies are:

1. Community participation and engagement:

- Engaging religious leaders (e.g. imams in Bangladesh) effectively improves community trust, awareness and participation in diabetes screening and prevention. In Thailand, community-led initiatives have strengthened engagement and sustained participation in diabetes prevention and remission programmes.
- Mobilizing key cadres of community health workers, such as FCHVs (Nepal) and ASHAs (India), proved essential in bridging gaps in awareness, screening and referrals in resource-limited settings.
- Educating school children (Nepal, Sri Lanka, Thailand) helps inculcate healthy habits early and promotes community awareness by empowering children and youths as agents of change.

2. Team-based care and task-sharing:

- Improving skills and competencies of health care providers through trainings (all case studies) and creating new cadres (e.g. health promotion officers in Sri Lanka, using lay health providers such as religious leaders in Bangladesh or FCHVs in Nepal, or community health volunteers supporting follow-up and lifestyle counselling in Thailand) enhances service delivery despite workforce shortages.
- Team-based care and well-tested, context-specific models of task shifting – such as nurses performing prescription refill at the PHC level in Nepal – are essential for empowering primary care and have proved important to ensure patient adherence (India, Nepal).

3. Integration of services:

- Integration of basic diabetes detection, management and care within the PHC context increases access to care and improves patient outcomes (Bangladesh, India, Sri Lanka, Nepal, Thailand, and Timor-Leste).
- Integrating NCD and infectious disease screening (Indonesia, Timor-Leste) is feasible and cost-effective in dual-burden contexts.
- Integrating detection and management of GDM and ANC is essential for early detection and management. Ensuring postpartum follow-up and care can reduce future risks for both mother and child (India, Sri Lanka).

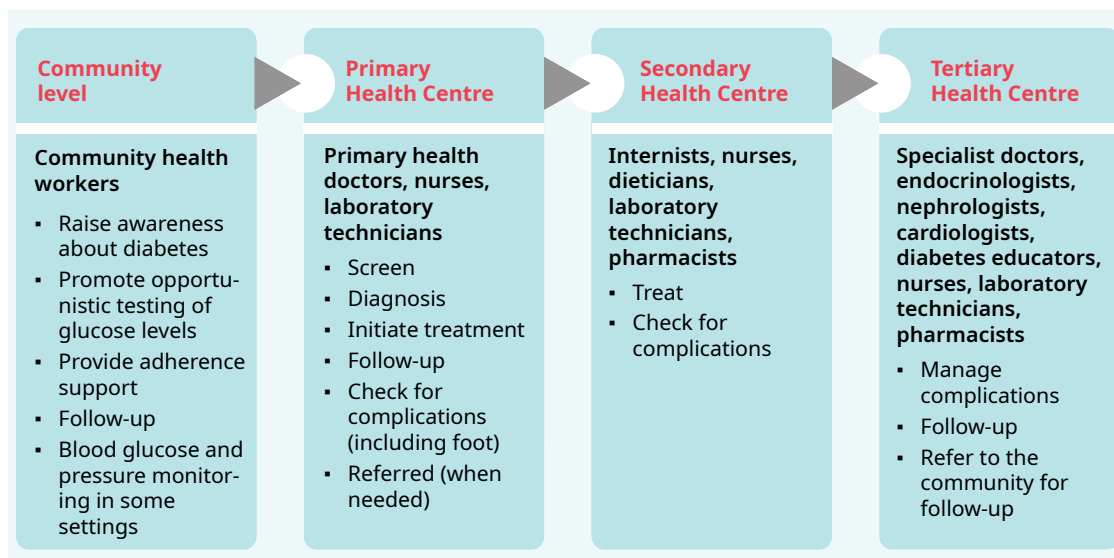
4. Health information and digital systems:

- Simplified tools (treatment protocol with algorithm, simplified patient-tracking tool) have demonstrated improvements in treatment outcomes (Thailand, Timor-Leste, Bangladesh, India).
- Mobile apps and digital tools facilitate real-time data collection, self-care, follow-up and scalability (Bangladesh, India, Sri Lanka).

- Maintaining an electronic (or paper-based) health record would support future check-ups and comprehensive health care assessments. Ensure that clear pathways and referral systems are in place to facilitate continuity of care.
5. Essential medicines and supplies:
 - Use of a drug forecasting tool, based on a mixed or morbidity-based method aligned with treatment protocols, has improved the availability and accessibility of essential medicines (India, Timor-Leste).
 6. Comprehensive diabetes and complications management:
 - Emphasis on diabetic foot led to increased screening of people living with diabetes for complications affecting the feet (Sri Lanka). Addressing multimorbidity and complications of diabetes is essential for comprehensive diabetes management; screening of diabetes complications by nurses had shown positive results (Sri Lanka).
 - Comprehensive diabetes management models that integrate lifestyle modification, continuous follow-up and long-term monitoring, such as Thailand's diabetes remission programme, shows how strengthening continuity of care beyond pharmacological treatment can improve glycaemic outcomes.
 7. Political leadership, primary prevention and multisectoral mobilization:
 - Strong political commitment is crucial for advancing diabetes prevention and control, especially in federalized or decentralized systems, where local governments play a key role. For example, Nepal's federal structure required the Ministry of Health and Population, along with partners supporting the agenda, to work with provincial and local governments to integrate diabetes screening into PHC; similarly, in Thailand, multisectoral collaboration enabled the development and scale-up of DM remission programme.
 - Whole-of-government and whole-of-society mobilization is essential to create an environment that prevents diabetes at the population level while enabling access to care.
 8. Financing and scale-up:
 - Small user fees (e.g. Bangladesh's mosque model) can support financial sustainability when designed inclusively.
 - Increasing funding for diabetes management and preventive care can encourage health systems to prioritize primary care over costly hospital-based treatments.
 - Fiscal policies and incentives, such as earmarked revenues from sugar-sweetened beverage taxes or tobacco taxation, can provide sustained funding for health promotion, screening and essential diabetes services.

- Integrating diabetes remission and lifestyle modification services into existing diabetes care pathways, as documented in Thailand, can improve efficiency and reduce medication-related costs; however, dedicated financing mechanisms are needed to support sustained scale-up.

Fig. 10. Continuum of diabetes care across health-care system levels



The lessons and suggestions drawn from the case studies also reinforce the SEAHEARTS 2030 milestones, particularly in the areas of screening, treatment and control at the primary health care level. In addition, the findings align closely with the key asks of the GDC. While most case studies predated the GDC, their retrospective assessment illustrates how context-specific innovations can operationalize the Compact's vision on the ground. Together, these experiences provide countries with concrete, real-world approaches to advance both regional and global commitments, supporting progress towards SDG Target 3.4. Suggestions that can be implemented by countries, based on insights gained from project activities implementation, are detailed below.

- Empowering people living with diabetes, family and community:
 - Awareness of communities can be raised using a multisectoral approach by employing trained community health workers (CHWs), village/local area leaders, in partnership with civil society organizations and the health system.
 - Education and screening of at-risk populations can be ensured through household visits by community health workers. Most community health workers visit women and children to provide maternal and child health care; these visits can be strengthened to include messages for diabetes, GDM and other chronic diseases.
 - Training of CHWs and nurses, provision of education materials (flip charts) and community-based registers with information on individuals with diabetes can be useful tools to improve awareness.

- School health programmes, religious leaders and culturally responsive media could be encouraged to sustain behaviour change. Prevention at the national level also involves the education system by including primary school health education, e.g. WHO's health-promoting school programme.
- ◉ Strengthening health systems:
 - Health workforce:
 - Incorporating models of team-based care by sharing tasks between various health cadres will improve access to care, from the community (through link with CHWs) to the health centre (nurses, doctors, pharmacists and laboratory personnel). This has shown to free up physician time and increase system efficiency in the long term.
 - Adequate and trained workforce at health centres will help in the management of diabetes and enhance their capacity to manage other chronic diseases.
 - Creating specialized nursing or health educator roles, based on resource availability in the country, will address diabetes and its complications.
 - Health information systems:
 - Implementing electronic health records to track patients with diabetes can improve data collection, patient follow-up and disease surveillance. This infrastructure can be used to manage other chronic conditions, enabling more comprehensive patient care and better tracking of health outcomes for a variety of diseases.
 - Inclusion of core indicators and having a dashboard will help monitor performance, track progress and facilitate data-driven decision-making.
 - Digital tools used to support diabetes remission, such as patient tracking platforms, self-monitored glucose reporting and scheduled follow-up dashboards, have strengthened continuity of care, supported accountability and reinforced long-term monitoring in chronic disease management.
 - Improved access to medications and infrastructure:
 - Incorporating efficient procurement and supply chains is essential to ensure the availability of insulin, blood glucose monitors, and other diabetes-related medications and supplies. Using digital health systems and automation technologies will strengthen the overall pharmaceutical supply system.
 - Countries need to support local pharmaceutical manufacturing to reduce dependence on international suppliers.
 - Simply increasing local production is insufficient to improve equitable access to essential medicines or address infrastructure gaps. Countries

must strengthen regulatory systems to ensure quality assurance and develop robust supply chain capacity to effectively manage procurement, storage and distribution.

- Diagnosis and management of diabetes and complications:
 - Simplified, evidence-based, drug- and dose-specific treatment protocol with algorithm, including guidance for complications screening, can improve quality.
 - Treatment post, nursing post, subcentre and primary health centre should have adequately trained staff, guidelines and equipment (outlined in WHO HEARTS D package) to diagnose people with type 2 diabetes and initiate therapy. It could increase access to care, free up physician time and increase system efficiency in the long term.
 - Clear bidirectional referral pathways for patients would provide seamless services for them.
 - Complications such as diabetic foot are not well managed at the PHC level but PHC plays an important role in early detection, referral and education, including guidance on proper footwear and self-examination. This deserves attention as the health workforce can be trained and provided with guidelines to identify, refer and follow up on patients with early signs of this complication.
 - Convergence with other national programmes should include institutionalizing TB–DM screening protocols within PHC services in dual-burden countries and mandating universal GDM screening with clear SOPs and integration into ANC services. Coverage of gestational diabetes should be aligned with NCD programmes to ensure continuum of care beyond pregnancy.
- Support systems for prevention and control of diabetes:
 - CHWs can conduct household visits to monitor patients, assess their treatment adherence and provide individualized follow-up care.
 - CHWs would also need to be trained in referral pathways available for patients with diabetes, as well as in providing follow-up and adherence support.
- Innovations and low-cost technologies need to be leveraged to improve diabetes care. Having digital health tools for front-line health-care workers and staff at the primary health care level would make this process efficient and effective.
- Implementation research may be needed in focus domains to study the feasibility of scaling up projects executed in small settings and to explore how service delivery learnings can be adapted to specific contexts.

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A stylized illustration on the left side of the page. It shows a hand holding a finger with a small drop of blood on the tip. A vertical line connects the finger to a small rectangular screen above it. The screen displays a simple line graph with a peak and a valley. The entire illustration is in shades of blue and teal.

Country profiles on diabetes burden and health systems response in WHO SE Asia countries

Bangladesh



Total population (000s)¹
173 562



Total number of deaths
due to all NCDs²
579 000



Percentage of deaths
due to NCDs³
71%



Probability of premature
mortality from NCDs³
19%

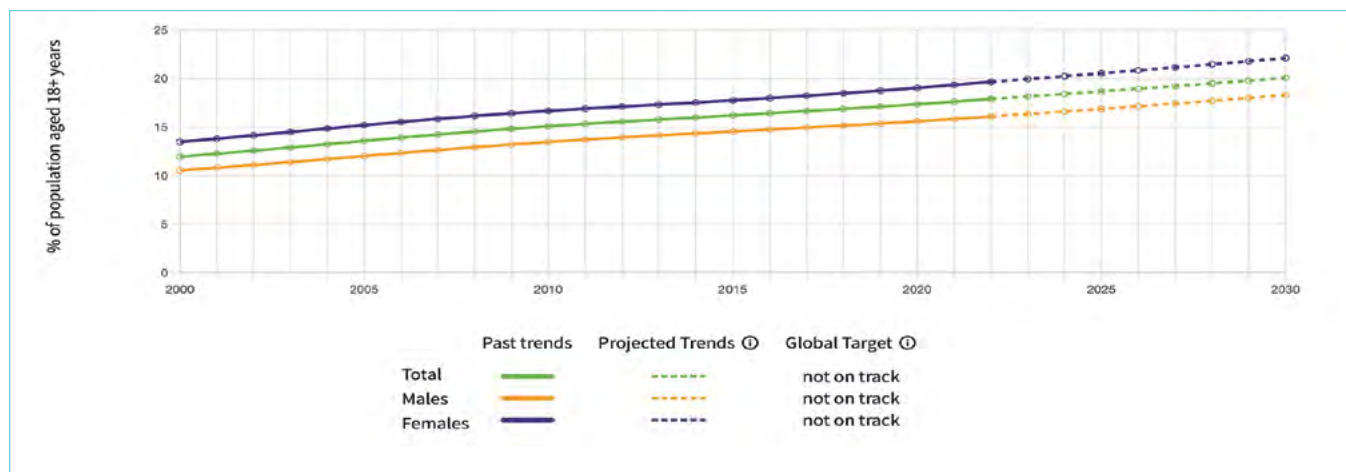
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	31 578	10 794	20 784
Age-standardized death rate for diabetes per 100 000 (2019) ³	29	22	33
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	34%	35%	34%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	18%	16%	20%
Adults aged 30+ years (2022)	22%	20%	25%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	19%	16%	21%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	27%	20%	33%
Obesity, adults aged 18+ years (%) (2022)	5%	3%	8%
Obesity, adolescents aged 10–19 years (2022)	2%	2%	2%
Current tobacco use, among those aged 15+ years (2022)	33%	51%	15%
Physical inactivity, adults aged 18+ years (2022)	20%	20%	21%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/ Don't know
Policies and targets	
 Existence of operational policy/ strategy/ action plan for diabetes*	Yes
Existence of a national target on diabetes	Yes
Surveillance	
 Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	Yes
Existence of a diabetes registry	No
Clinical management guidelines	
 Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
Basic technologies**	
 General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	No
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	No
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	Yes
Medicines***	
 General availability of insulin at primary health care facilities in the public health sector	No
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
Management and treatment services****	
 General availability of diabetic retinopathy screening in the public health system	No
General availability of retinal photocoagulation in the public health system	No
General availability of dialysis in the public health system	No
General availability of renal replacement by transplantation in the public health system	No

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

*** Indicates whether or not the country has reported that medicines for diabetes are available in 50% or more pharmacies at primary health care facilities in the public health sector.

**** Indicates whether or not the country has reported management and treatment services for diabetes that reach 50% or more patients in need.

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Bhutan



Total population (000s)¹
792



Total number of deaths
due to all NCDs²
2710



Percentage of deaths
due to NCDs³
72%



Probability of premature
mortality from NCDs³
16%

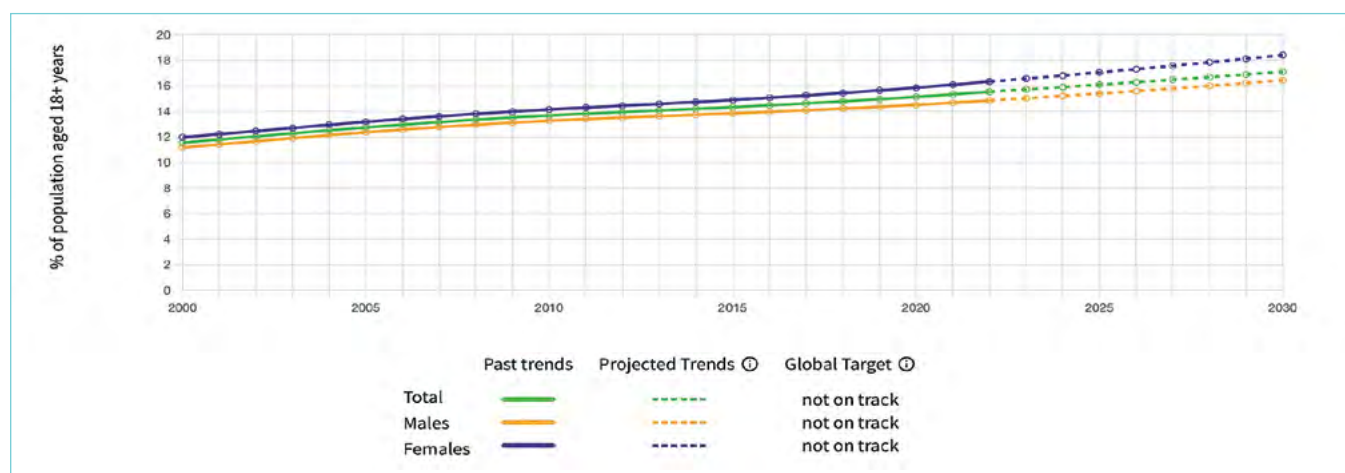
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	145	72	73
Age-standardized death rate for diabetes per 100 000 (2019) ³	25	25	25
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	39%	39%	39%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	16%	15%	16%
Adults aged 30+ years (2022)	20%	19%	21%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	16%	16%	17%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	47%	41%	53%
Obesity, adults aged 18+ years (%) (2022)	12%	9%	16%
Obesity, adolescents aged 10–19 years (2022)	5%	5%	6%
Current tobacco use, among those aged 15+ years (2022)	19%	26%	11%
Physical inactivity, adults aged 18+ years (2022)	10%	9%	11%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/ Don't know
Policies and targets	
 Existence of operational policy/ strategy/ action plan for diabetes*	No
Existence of a national target on diabetes	Yes
Surveillance	
 Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	Yes
Existence of a diabetes registry	No
Clinical management guidelines	
 Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
Basic technologies**	
 General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	No
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	No
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	Yes
Medicines***	
 General availability of insulin at primary health care facilities in the public health sector	Yes
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
Management and treatment services****	
 General availability of diabetic retinopathy screening in the public health system	Yes
General availability of retinal photocoagulation in the public health system	Yes
General availability of dialysis in the public health system	Yes
General availability of renal replacement by transplantation in the public health system	No

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

*** Indicates whether or not the country has reported that medicines for diabetes are available in 50% or more pharmacies at primary health care facilities in the public health sector.

**** Indicates whether or not the country has reported management and treatment services for diabetes that reach 50% or more patients in need.

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2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>)
3. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (<https://ncdportal.org/>)
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Democratic People's Republic of Korea (DPR Korea)



Total population (000s)¹
26 499



Total number of deaths due to all NCDs²
210 000



Percentage of deaths due to NCDs³
81%



Probability of premature mortality from NCDs³
25%

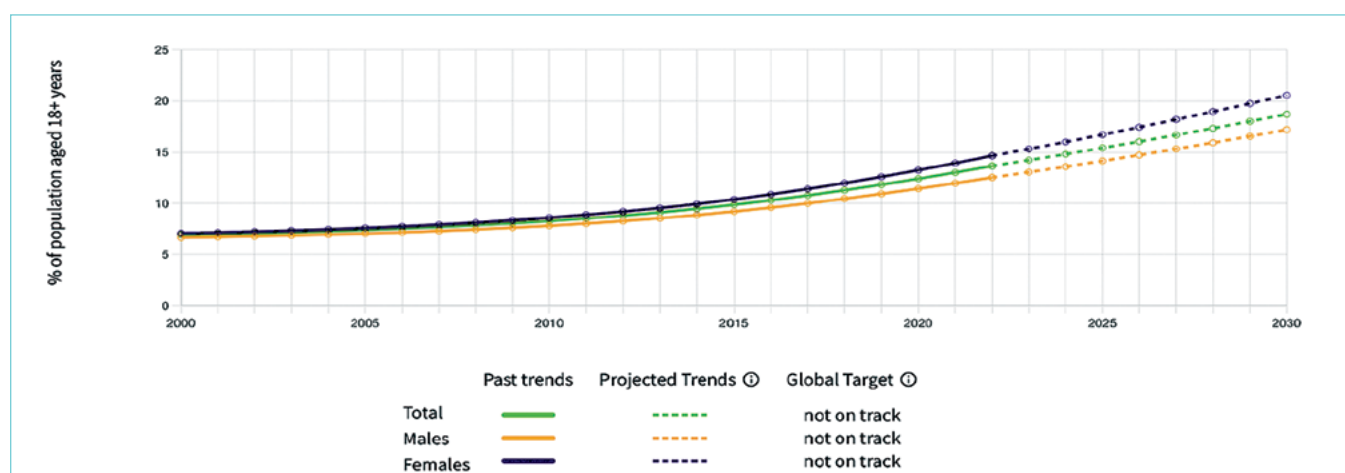
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	4 396	1 680	2 716
Age-standardized death rate for diabetes per 100 000 (2019) ³	13	12	14
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	47%	56%	42%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	14%	13%	15%
Adults aged 30+ years (2022)	18%	16%	19%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	38%	33%	41%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	37%	33%	41%
Obesity, adults aged 18+ years (%) (2022)	11%	9%	13%
Obesity, adolescents aged 10–19 years (2022)	8%	10%	6%
Current tobacco use, among those aged 15+ years (2022)	17%	33%	0%
Physical inactivity, adults aged 18+ years (2022)	27%	24%	29%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/ Don't know
 Policies and targets	
Existence of operational policy/ strategy/ action plan for diabetes*	Yes
Existence of a national target on diabetes	Yes
 Surveillance	
Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	No
Existence of a diabetes registry	Yes
 Clinical management guidelines	
Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
 Basic technologies**	
General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	Yes
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	Yes
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	No response
 Medicines***	
General availability of insulin at primary health care facilities in the public health sector	Yes
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
 Management and treatment services****	
General availability of diabetic retinopathy screening in the public health system	Yes
General availability of retinal photocoagulation in the public health system	Yes
General availability of dialysis in the public health system	Yes
General availability of renal replacement by transplantation in the public health system	Yes

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

*** Indicates whether or not the country has reported that medicines for diabetes are available in 50% or more pharmacies at primary health care facilities in the public health sector.

**** Indicates whether or not the country has reported management and treatment services for diabetes that reach 50% or more patients in need.

References

- United Nations Department of Economic and Social Affairs. World Population Prospects 2024: Revision. United Nations, 2024 (<https://population.un.org/wpp/>)
- World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>)
- World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (<https://ncdportal.org/>)
- World Health Organization (2025). Assessing national capacity for the prevention and control of noncommunicable diseases: report of the 2023 country capacity survey in the WHO South-East Asia Region. Geneva: World Health Organization (<https://iris.who.int/handle/10665/381772>)

India



Total population (000s)¹
1 450 936



Total number of deaths due to all NCDs²
6 400 000



Percentage of deaths due to NCDs³
68%



Probability of premature mortality from NCDs³
24%

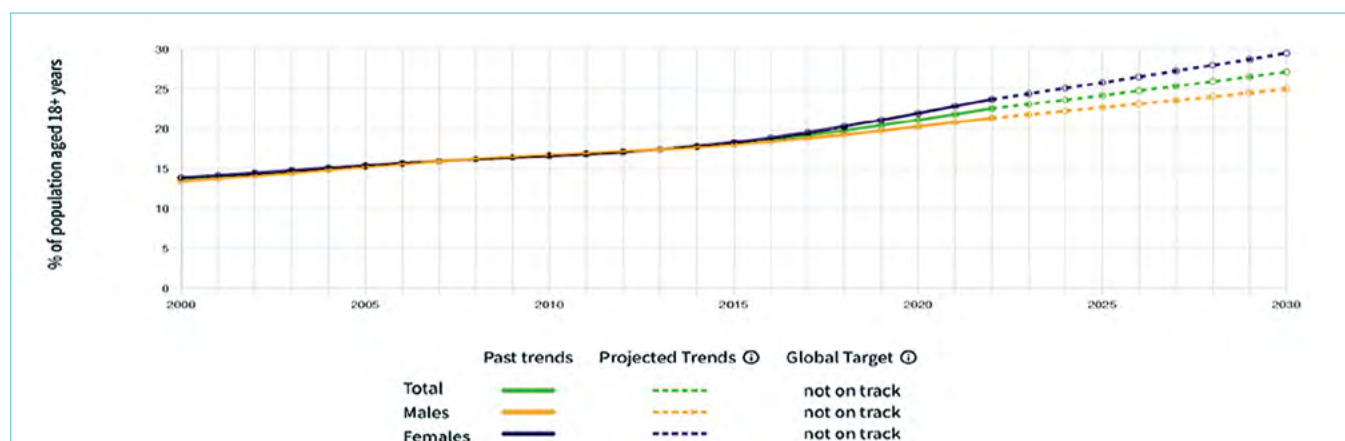
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	326 463	142 732	183 731
Age-standardized death rate for diabetes per 100 000 (2019) ³	29	31	29
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	52%	53%	51%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	23%	21%	24%
Adults aged 30+ years (2022)	28%	27%	29%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	29%	29%	28%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	29%	27%	32%
Obesity, adults aged 18+ years (%) (2022)	7%	5%	9%
Obesity, adolescents aged 10–19 years (2022)	3%	3%	2%
Current tobacco use, among those aged 15+ years (2022)	24%	38%	11%
Physical inactivity, adults aged 18+ years (2022)	49%	42%	57%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/Don't know
 Policies and targets	
Existence of operational policy/ strategy/ action plan for diabetes*	Yes
Existence of a national target on diabetes	Yes
 Surveillance	
Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	Yes
Existence of a diabetes registry	Yes [#]
 Clinical management guidelines	
Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
 Basic technologies**	
General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	Yes
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	Yes
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	Yes
 Medicines***	
General availability of insulin at primary health care facilities in the public health sector	Yes
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
 Management and treatment services****	
General availability of diabetic retinopathy screening in the public health system	Yes
General availability of retinal photocoagulation in the public health system	Yes
General availability of dialysis in the public health system	Yes
General availability of renal replacement by transplantation in the public health system	Yes

Registry is only for young diabetes; not a universal registry for diabetes in general.

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

*** Indicates whether or not the country has reported that medicines for diabetes are available in 50% or more pharmacies at primary health care facilities in the public health sector.

**** Indicates whether or not the country has reported management and treatment services for diabetes that reach 50% or more patients in need.

References

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3. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (<https://ncdportal.org/>)
4. World Health Organization (2025). Assessing national capacity for the prevention and control of noncommunicable diseases: report of the 2023 country capacity survey in the WHO South-East Asia Region. Geneva: World Health Organization (<https://iris.who.int/handle/10665/381772>)

Indonesia



Total population (000s)¹
283 488



Total number of deaths
due to all NCDs²
1 380 000



Percentage of deaths
due to NCDs³
78%



Probability of premature
mortality from NCDs³
24%

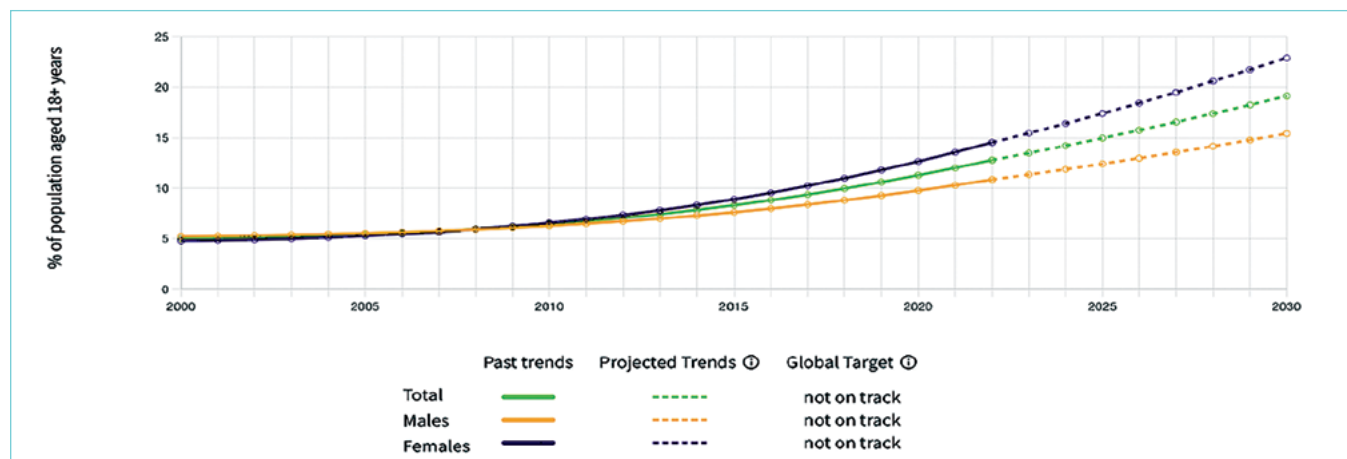
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	58 225	22 282	35 942
Age-standardized death rate for diabetes per 100 000 (2019) ³	28	26	29
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	56%	62%	51%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	13%	11%	15%
Adults aged 30+ years (2022)	17%	14%	19%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	23%	19%	25%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	38%	28%	48%
Obesity, adults aged 18+ years (%) (2022)	11%	6%	16%
Obesity, adolescents aged 10–19 years (2022)	8%	9%	8%
Current tobacco use, among those aged 15+ years (2022)	38%	73%	3%
Physical inactivity, adults aged 18+ years (2022)	19%	22%	16%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/ Don't know
 Policies and targets	
Existence of operational policy/ strategy/ action plan for diabetes*	No
Existence of a national target on diabetes	No
 Surveillance	
Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	Yes
Existence of a diabetes registry	No
 Clinical management guidelines	
Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
 Basic technologies**	
General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	No
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	Yes
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	No
 Medicines***	
General availability of insulin at primary health care facilities in the public health sector	No
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
 Management and treatment services****	
General availability of diabetic retinopathy screening in the public health system	Yes
General availability of retinal photocoagulation in the public health system	Yes
General availability of dialysis in the public health system	Yes
General availability of renal replacement by transplantation in the public health system	Yes

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

*** Indicates whether or not the country has reported that medicines for diabetes are available in 50% or more pharmacies at primary health care facilities in the public health sector.

**** Indicates whether or not the country has reported management and treatment services for diabetes that reach 50% or more patients in need.

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2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>)
3. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (<https://ncdportal.org/>)
4. World Health Organization (2025). Assessing national capacity for the prevention and control of noncommunicable diseases: report of the 2023 country capacity survey in the WHO South-East Asia Region. Geneva: World Health Organization (<https://iris.who.int/handle/10665/381772>)

Maldives



Total population (000s)¹
528



Total number of deaths due to all NCDs²
2 170



Percentage of deaths due to NCDs³
89%



Probability of premature mortality from NCDs³
13%

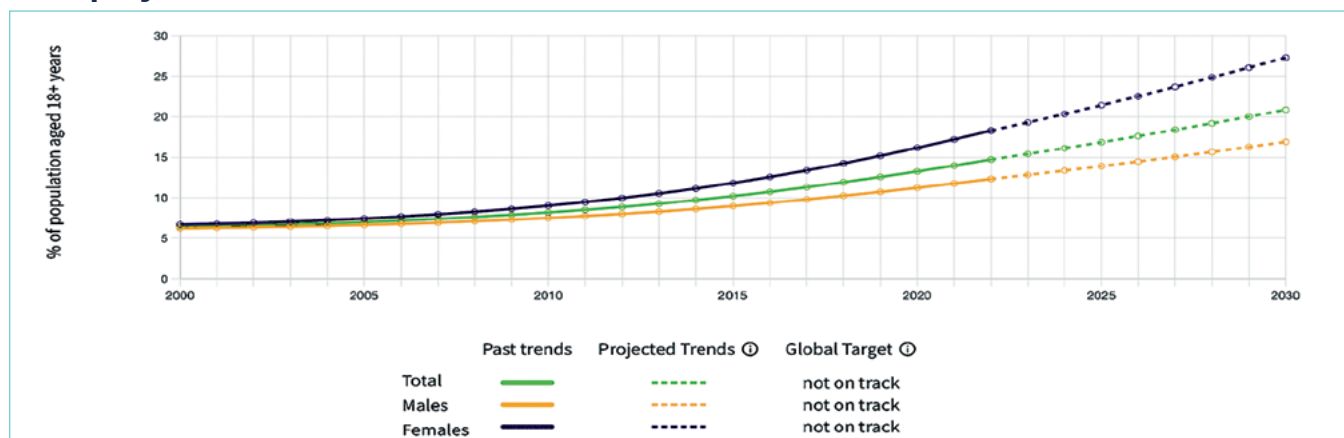
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	97	52	45
Age-standardized death rate for diabetes per 100 000 (2019) ³	42	43	40
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	18%	21%	14%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	15%	12%	18%
Adults aged 30+ years (2022)	19%	16%	24%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	55%	45%	64%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	53%	48%	59%
Obesity, adults aged 18+ years (%) (2022)	17%	13%	24%
Obesity, adolescents aged 10–19 years (2022)	12%	14%	9%
Current tobacco use, among those aged 15+ years (2022)	26%	42%	10%
Physical inactivity, adults aged 18+ years (2022)	25%	25%	24%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/Don't know
Policies and targets	
 Existence of operational policy/ strategy/ action plan for diabetes*	Yes
Existence of a national target on diabetes	Yes
Surveillance	
 Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	Yes
Existence of a diabetes registry	No
Clinical management guidelines	
 Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	No
Basic technologies**	
 General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	Yes
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	Yes
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	Yes
Medicines***	
 General availability of insulin at primary health care facilities in the public health sector	Yes
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
Management and treatment services****	
 General availability of diabetic retinopathy screening in the public health system	Yes
General availability of retinal photocoagulation in the public health system	Yes
General availability of dialysis in the public health system	Yes
General availability of renal replacement by transplantation in the public health system	Yes

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

*** Indicates whether or not the country has reported that medicines for diabetes are available in 50% or more pharmacies at primary health care facilities in the public health sector.

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2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>)
3. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (<https://ncdportal.org/>)
4. World Health Organization (2025). Assessing national capacity for the prevention and control of noncommunicable diseases: report of the 2023 country capacity survey in the WHO South-East Asia Region. Geneva: World Health Organization (<https://iris.who.int/handle/10665/381772>)

Myanmar



Total population (000s)¹
54 500



Total number of deaths
due to all NCDs²
277 000



Percentage of deaths
due to NCDs³
72%



Probability of premature
mortality from NCDs³
26%

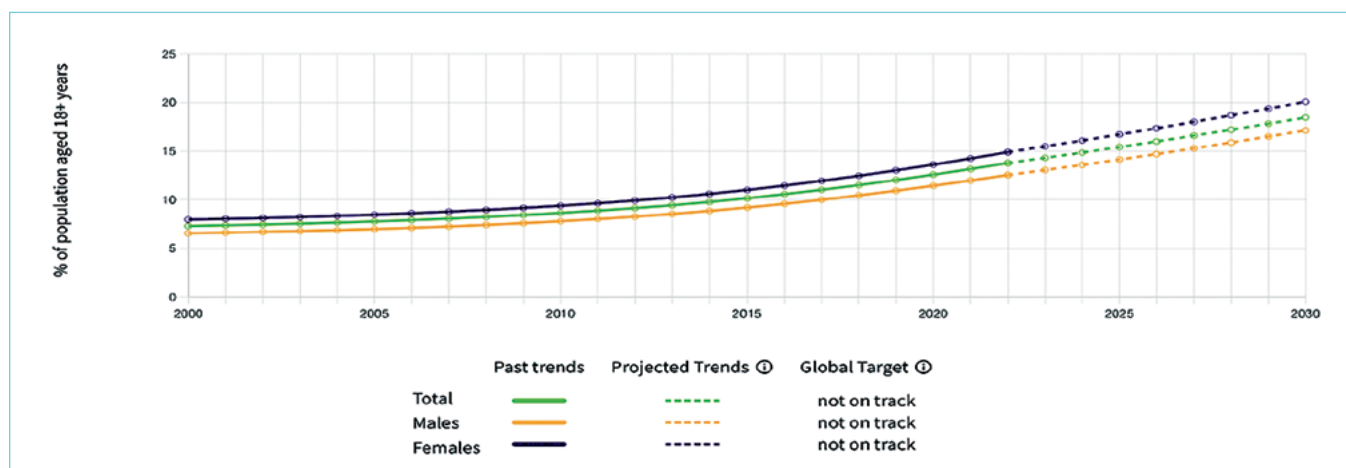
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	20 176	8 567	11 609
Age-standardized death rate for diabetes per 100 000 (2019) ³	48	49	48
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	58%	61%	56%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	14%	13%	15%
Adults aged 30+ years (2022)	18%	16%	19%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	38%	34%	41%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	27%	21%	33%
Obesity, adults aged 18+ years (%) (2022)	7%	5%	9%
Obesity, adolescents aged 10–19 years (2022)	6%	9%	3%
Current tobacco use, among those aged 15+ years (2022)	44%	70%	19%
Physical inactivity, adults aged 18+ years (2022)	22%	20%	24%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/Don't know
Policies and targets	
 Existence of operational policy/ strategy/ action plan for diabetes*	Yes
Existence of a national target on diabetes	Yes
Surveillance	
 Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	No
Existence of a diabetes registry	No
Clinical management guidelines	
 Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
Basic technologies**	
 General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	No
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	No
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	Yes
Medicines***	
 General availability of insulin at primary health care facilities in the public health sector	No
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
Management and treatment services****	
 General availability of diabetic retinopathy screening in the public health system	No
General availability of retinal photocoagulation in the public health system	No
General availability of dialysis in the public health system	No
General availability of renal replacement by transplantation in the public health system	No

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

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References

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2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>)
3. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (<https://ncdportal.org/>)
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Nepal



Total population (000s)¹
29 651



Total number of deaths
due to all NCDs²
110 000



Percentage of deaths
due to NCDs³
65%



Probability of premature
mortality from NCDs³
20%

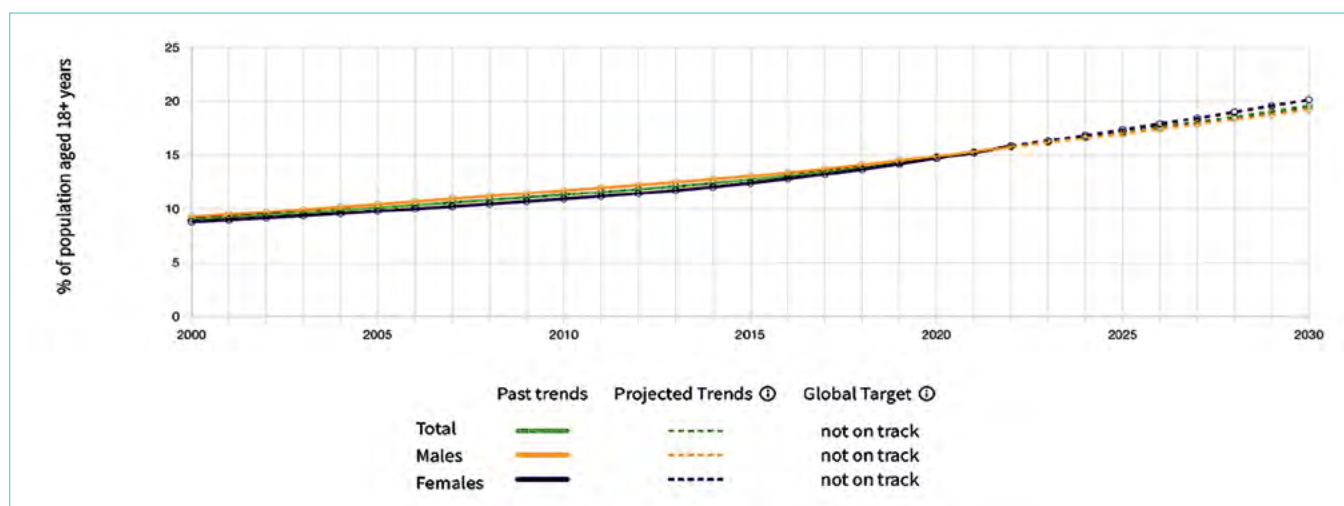
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	5 187	2 222	2 965
Age-standardized death rate for diabetes per 100 000 (2019) ³	26	26	25
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	46%	45%	46%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	16%	16%	16%
Adults aged 30+ years (2022)	20%	20%	19%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	16%	17%	16%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	31%	27%	34%
Obesity, adults aged 18+ years (%) (2022)	7%	5%	9%
Obesity, adolescents aged 10–19 years (2022)	1%	1%	2%
Current tobacco use, among those aged 15+ years (2022)	28%	46%	11%
Physical inactivity, adults aged 18+ years (2022)	8%	10%	6%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/ Don't know
Policies and targets	
 Existence of operational policy/ strategy/ action plan for diabetes*	Yes
Existence of a national target on diabetes	Yes
Surveillance	
 Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	Yes
Existence of a diabetes registry	No
Clinical management guidelines	
 Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
Basic technologies**	
 General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	No
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	Yes
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	Yes
Medicines***	
 General availability of insulin at primary health care facilities in the public health sector	No
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	No
Management and treatment services****	
 General availability of diabetic retinopathy screening in the public health system	No
General availability of retinal photocoagulation in the public health system	No
General availability of dialysis in the public health system	Yes
General availability of renal replacement by transplantation in the public health system	No

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

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**** Indicates whether or not the country has reported management and treatment services for diabetes that reach 50% or more patients in need.

References

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Sri Lanka



Total population (000s)¹
23 104



Total number of deaths
due to all NCDs²
111 000



Percentage of deaths
due to NCDs³
85%



Probability of premature
mortality from NCDs³
16%

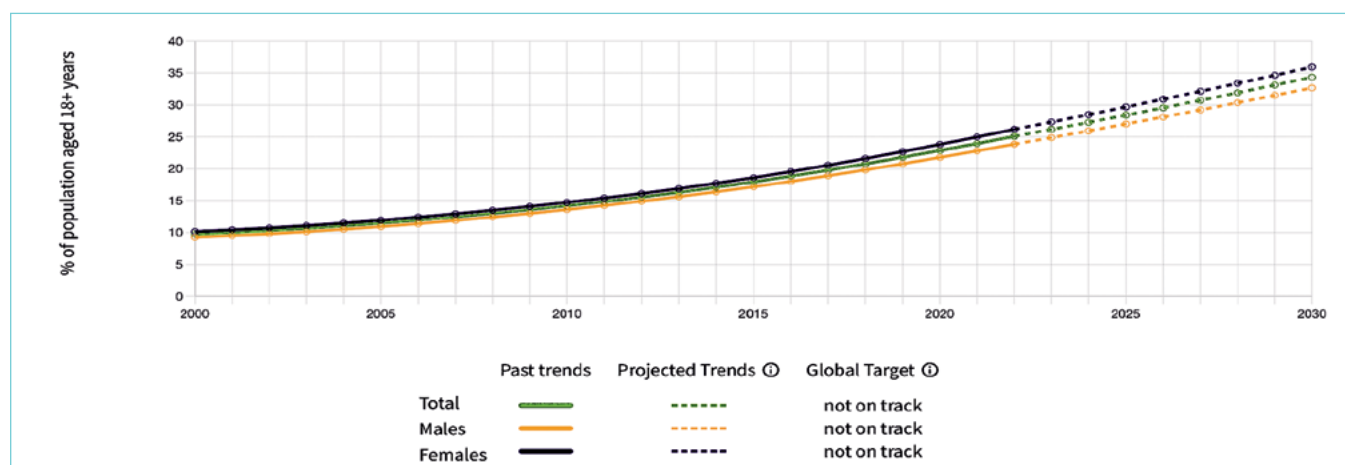
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	11 291	4 722	6 569
Age-standardized death rate for diabetes per 100 000 (2019) ³	44	46	42
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	39%	47%	33%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	25%	24%	26%
Adults aged 30+ years (2022)	32%	30%	33%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	41%	40%	42%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	39%	31%	45%
Obesity, adults aged 18+ years (%) (2022)	11%	7%	14%
Obesity, adolescents aged 10–19 years (2022)	7%	7%	8%
Current tobacco use, among those aged 15+ years (2022)	20%	37%	2%
Physical inactivity, adults aged 18+ years (2022)	37%	29%	45%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/ Don't know
	Policies and targets
	Existence of operational policy/ strategy/ action plan for diabetes*
	Existence of a national target on diabetes
	Surveillance
	Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes
	Existence of a diabetes registry
	Clinical management guidelines
	Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities
	Basic technologies**
	General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both
	General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both
	General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both
	General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both
	Medicines***
	General availability of insulin at primary health care facilities in the public health sector
	General availability of metformin at primary health care facilities in the public health sector
	General availability of sulfonylurea(s) at primary health care facilities in the public health sector
	Management and treatment services****
	General availability of diabetic retinopathy screening in the public health system
	General availability of retinal photocoagulation in the public health system
	General availability of dialysis in the public health system
	General availability of renal replacement by transplantation in the public health system

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

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2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>)
3. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (<https://ncdportal.org/>)
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Thailand



Total population (000s)¹
71 668



Total number of deaths
due to all NCDs²
430 000



Percentage of deaths
due to NCDs³
75%



Probability of premature
mortality from NCDs³
14%

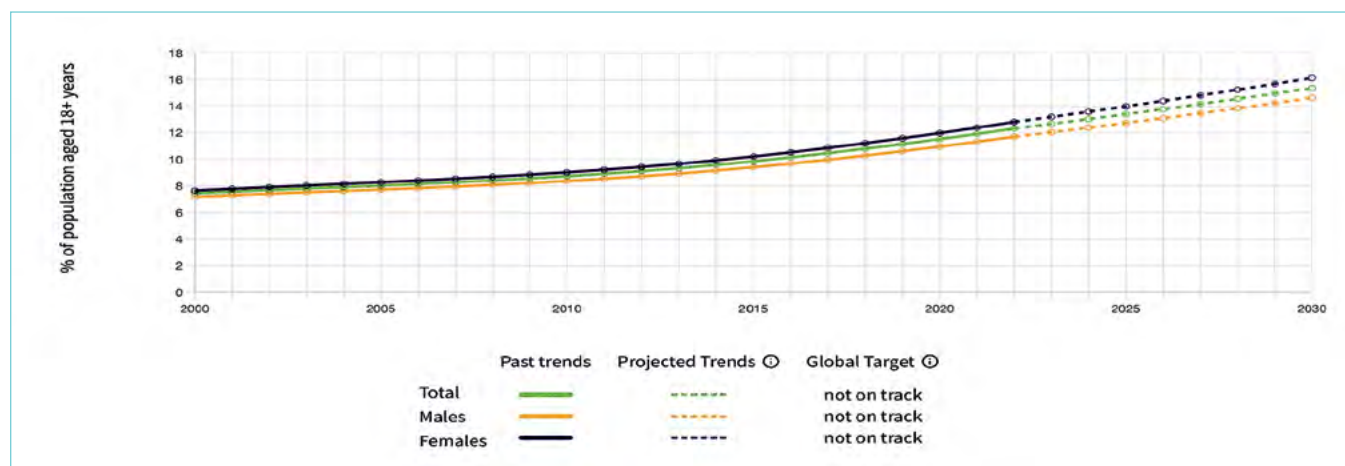
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	24 862	9 736	15 126
Age-standardized death rate for diabetes per 100 000 (2019) ³	21	20	22
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	48%	59%	40%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	12%	12%	13%
Adults aged 30+ years (2022)	16%	15%	17%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	42%	35%	47%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	46%	41%	50%
Obesity, adults aged 18+ years (%) (2022)	15%	12%	18%
Obesity, adolescents aged 10–19 years (2022)	11%	14%	8%
Current tobacco use, among those aged 15+ years (2022)	19%	37%	2%
Physical inactivity, adults aged 18+ years (2022)	29%	28%	29%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/Don't know
Policies and targets	
 Existence of operational policy/ strategy/ action plan for diabetes*	Yes
Existence of a national target on diabetes	Yes
Surveillance	
 Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes	Yes
Existence of a diabetes registry	No
Clinical management guidelines	
 Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities	Yes
Basic technologies**	
 General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both	Yes
General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both	Yes
General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both	Yes
General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both	Yes
Medicines***	
 General availability of insulin at primary health care facilities in the public health sector	Yes
General availability of metformin at primary health care facilities in the public health sector	Yes
General availability of sulfonylurea(s) at primary health care facilities in the public health sector	Yes
Management and treatment services****	
 General availability of diabetic retinopathy screening in the public health system	Yes
General availability of retinal photocoagulation in the public health system	Yes
General availability of dialysis in the public health system	Yes
General availability of renal replacement by transplantation in the public health system	Yes

* This could be either a diabetes-specific policy, strategy or action plan or the inclusion of diabetes in an integrated NCD policy, strategy or action plan.

** Indicates whether or not the country has reported that basic technologies for diabetes available in 50% or more facilities at primary health care level, either in the private or public sector or both.

*** Indicates whether or not the country has reported that medicines for diabetes are available in 50% or more pharmacies at primary health care facilities in the public health sector.

**** Indicates whether or not the country has reported management and treatment services for diabetes that reach 50% or more patients in need.

References

1. United Nations Department of Economic and Social Affairs. World Population Prospects 2024: Revision. United Nations, 2024 (<https://population.un.org/wpp/>)
2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>)
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Timor-Leste



Total population (000s)¹
1 401



Total number of deaths
due to all NCDs²
4 770



Percentage of deaths
due to NCDs³
54%



Probability of premature
mortality from NCDs³
21%

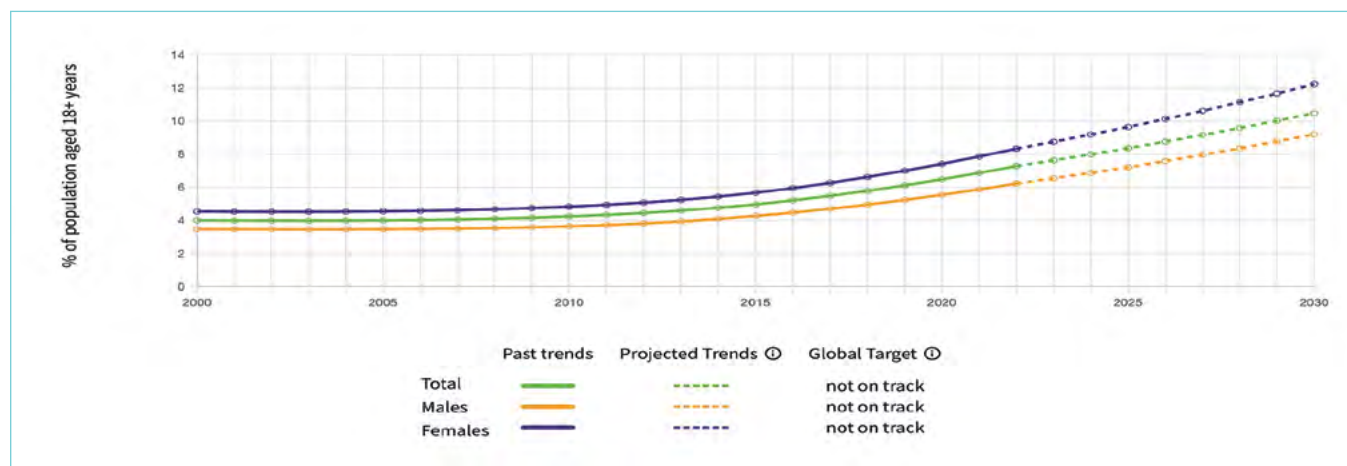
Burden: Mortality and prevalence

Indicator	Both sexes	Males	Females
Mortality			
Number of deaths due to diabetes (2021) ²	169	61	108
Age-standardized death rate for diabetes per 100 000 (2019) ³	20	16	24
Proportion of diabetes-related deaths occurring among people aged below 70 years, out of all diabetes-related deaths (%) (2019) ³	49%	53%	48%
Prevalence (age standardized)³			
Adults aged 18+ years (2022)	7%	6%	8%
Adults aged 30+ years (2022)	10%	8%	11%
Treatment coverage			
Pharmacological treatment for diabetes, among adults aged 30+ with diabetes (2022)	20%	21%	20%

Risk factors³

Indicator	Both sexes	Males	Females
Overweight, adults aged 18+ years (2022)	14%	12%	17%
Obesity, adults aged 18+ years (%) (2022)	2%	2%	3%
Obesity, adolescents aged 10–19 years (2022)	1%	1%	1%
Current tobacco use, among those aged 15+ years (2022)	39%	67%	11%
Physical inactivity, adults aged 18+ years (2022)	27%	21%	33%

Trends of diabetes prevalence among adults aged 18+ years, with projections to 2030³



Policies, services and availability for diabetes management (2023)⁴

Indicator	Yes/ No/ Don't know
	Policies and targets
	Existence of operational policy/ strategy/ action plan for diabetes*
	Existence of a national target on diabetes
	Surveillance
	Conducted a recent (i.e. in the past five years), national adult risk factor survey covering raised blood glucose/diabetes
	Existence of a diabetes registry
	Clinical management guidelines
	Existence of evidence-based national guidelines/ protocols/ standards for the management of diabetes through a primary care approach recognized/approved by government or competent authorities
	Basic technologies**
	General availability of diabetes testing [by blood glucose measurement or oral glucose tolerance test (OGTT)] at the primary health care level, either in the private or public sector or both
	General availability of dilated fundus examination at the primary health care level, either in the private or public sector or both
	General availability of foot vibration perception by tuning fork at the primary health care level, either in the private or public sector or both
	General availability of urine strips for glucose and ketone measurement at the primary health care level, either in the private or public sector or both
	Medicines***
	General availability of insulin at primary health care facilities in the public health sector
	General availability of metformin at primary health care facilities in the public health sector
	General availability of sulfonylurea(s) at primary health care facilities in the public health sector
	Management and treatment services****
	General availability of diabetic retinopathy screening in the public health system
	General availability of retinal photocoagulation in the public health system
	General availability of dialysis in the public health system
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