

**KINGDOM OF CAMBODIA**  
Nation Religion King



**Ministry of Health**

**NATIONAL  
STANDARD OPERATING PROCEDURE  
FOR HYPERTENSION AND DIABETES  
MANAGEMENT IN PRIMARY CARE**

**Preventive Medicine Department  
2024**

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## Foreword

The national standards (SOP) for the management of hypertension and diabetes at the primary health care level have been revised based on work experience and practice. The National Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2022-2030 aims to reduce the burden of non-communicable diseases and health care costs and achieve higher quality coverage.

This SOP demonstrates that the Royal Government of Cambodia is taking the issue of noncommunicable diseases seriously and shows the Government's commitment to implementing the National Strategic Plan for the Prevention and Control of Noncommunicable Diseases 2022-2030. Responding to the challenges of non-communicable diseases such as hypertension and diabetes must be integrated into the health care system by providing integrated management of diseases at the primary health care level.

The objectives of this SOP are to provide comprehensive guidance for diabetes and hypertension management at health centers (HCs) and communities. This national standard also provides the basis and clear direction for the Capital-Provincial Health Departments, ODs, Health Centers of the Ministry of Health and other relevant institutions based on their respective roles in developing training plans, mobilizing necessary resources and materials. Effective program management, including monitoring, evaluation, and delivery of these services, particularly at health centers.

The Ministry of Health calls on all stakeholders and health partners to use this national standard as a guide to provide support to health centers in order to achieve the goals of the Health Strategic Plan 2023-2030, the National Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2022-2030 and Cambodia's Sustainable Development Goals.

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**Prof. CHHEANG RA**  
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## List of Abbreviation

CVD	Cardiovascular Disease
CRD	Chronic Respiratory Disease
DBP	Diastolic Blood Pressure
DM	Diabetes Mellitus
EMR	Electronic Medical Record
HC	Health Centre
HCMC	Health Centre Management Committee
HTN	Hypertension
HEF	Health Equity Fund
GDP	Gross Domestic Product
MCH	Maternal and Child Health
MD	Medical Doctor
MoH	Ministry of Health
NCD	Noncommunicable Disease
OD	Operational District
PEN	Package of Essential Noncommunicable Diseases
PHC	Primary Health Care
RH	Referral Hospital
SBP	Systolic Blood Pressure
SOP	Standard Operating Procedure
TOT	Training of Trainer
TOD	Target Organ Damage
TIA	Transient Ischemic Attack
VHSG	Village Health Support Group
WHO	World Health Organization
WB	World Bank

# 1. Introduction

## 1.1 Background

Noncommunicable diseases (NCD), particularly cardiovascular disease (CVD), cancer, diabetes, and chronic respiratory disease (CRD), are the leading cause of morbidity and mortality globally. According to the WHO NCD Country Profile (2018), NCDs are estimated to account for 64% of all deaths in Cambodia. One in four Cambodians (23%) dies prematurely, before the age of 70, due to one of the four major non-communicable diseases. The CVDs – stroke and coronary heart disease – caused 24% of deaths, and diabetes directly contributed to 2% of deaths. NCDs share four major behavioral risk factors. These are unhealthy diets, tobacco use, physical inactivity, and harmful use of alcohol. Indoor air pollution from solid fuel use, and incense smoke is also a major contributing factor to chronic respiratory diseases and lung cancer. Unhealthy behaviors contribute to the development of intermediate biological risk factors: hypertension, high blood cholesterol, high blood glucose, and overweight and obesity, which can cause clinical disease.

These NCDs are imposing significant costs on the Cambodian economy. A total amount of USD 1.5 billion is lost every year, representing close to 7 percent of GDP. By implementing the recommended package of cost-effective policies and clinical interventions for NCDs, the Cambodian economy will gain KHR 1.7 trillion (US\$ 417 million) over 15 years. According to “Prevention and control of NCDs in Cambodia. The case for investment (2019) prepared for the MoH of Cambodia by United Nations Interagency Task Force on the Prevention and Control of NCDs, WHO Regional Office for the Western Pacific and United Nations Development Program”, the package of NCD interventions will avert 184 236 deaths and lead to 694 858 healthy life years gained over 15 years. In Cambodia, according to STEPS survey 2016, the overall prevalence of hypertension and impaired blood glucose is 14.2% and 9.6%, respectively. There has been a reduction in the prevalence of current smoking from 29.4% in 2010 to 21.3% in 2016 (37.2% for men and 2.9% for women). 6.5% respondents, mainly women, are using smokeless tobacco. Just under half of those surveyed were alcohol drinkers, with a slight reduction since STEPS 2010 (53.5% in 2010 to 45.5% in 2016), but the proportion of current drinkers is still high among men (67.2%). Only 47.8% of the population ate five or more servings of fruit and vegetables daily. Due to the increase in NCD risk factors, and disease burden, the MoH, with support of the Health Equity and Quality Improvement Project Phase 2 (H-EQIP II) and other development Partners, is strengthening the national capacity of primary health care (PHC) facilities throughout the country to provide NCD services, including prevention, diagnosis, and case management.

The National Strategic Plan for the Prevention and Control of Noncommunicable Diseases 2022-2030 outlines the Royal Government of Cambodia’s planned response to the growing challenge of cardiovascular disease, cancer, diabetes, and chronic respiratory disease in Cambodia. The National Strategic Plan demonstrated that the Royal Government of



Cambodia is taking the issue of NCDs seriously and is acting to re-orient the health system to deal with the new challenges posed by NCDs.

One of the priorities is to provide integrated management of NCDs by implementing the Package of Essential NCD Interventions in Primary Care (PEN). Alongside PEN, maintaining and expanding community-based networks for patients with hypertension and diabetes will be important for continued NCD management.

## **1.2 Public Health Services in Cambodia**

According to the Health Coverage Plan, there are 25 provincial hospitals (PHs), 95 referral hospitals (RHs) and 1,288 health centers (HCs) established in 103 operational districts (ODs) within 25 provinces in Cambodia. The HCs provide basic preventive and curative services through the Minimum Package of Activities (MPA), including screening and treatment of diabetes and hypertension cases without complications and referring cases of diabetes and hypertension with complications to be treated at the referral hospitals.

The NCD prevention and control program is one of the four health focus areas of the Health Strategic Plan 2023-2030. The National Strategic Plan for the Prevention and Control of Noncommunicable Diseases 2022-2030 outlines the broad framework for this national SOP that helps operationalize an important part of Cambodia's Primary Care system. Currently, there have been a total of 338 HCs and 76 NCD units established to provide screening and treatment of diabetes and hypertension. Under the support of the H-EQIP II, MOH will enable other 994 HCs and 44 RHs to provide screening and treatment services for diabetes and hypertension while KOFIH is supporting the roll out of screening and treatment of diabetes, and hypertension in 136 HCs and 12 referral hospitals in Battambang, Pursat, and Pailin provinces.

## **2. Package of Essential Noncommunicable Disease Interventions**

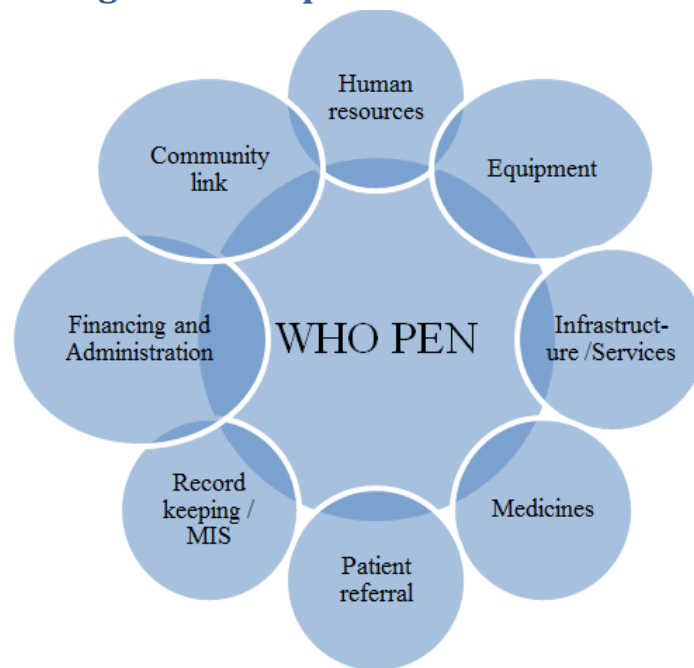
The WHO Package of Essential Noncommunicable Disease (PEN) Interventions for Primary Health Care provides a minimum standard for the control of NCDs and strengthens the national capacity to integrate and scale up care of NCDs, including CVD, diabetes, cancer, asthma, and chronic obstructive pulmonary disease in low-resource settings. It also includes the WHO Best Buys, which are cost-effective, high-impact, and feasible interventions for CVD, diabetes, and cancer.

The components of PEN include the assessment of gaps, capacity and utilization of primary care, health information, evidence-based protocols for essential NCD interventions for PHC, core lists of essential technologies and medicines, tools for cardiovascular risk prediction, financing and administration, training materials, referral criteria, and monitoring and evaluation (see Figure 1). This requires the efficient use of limited health care resources, sustainable health financing mechanisms, access to basic diagnostics and essential medicines, and organized medical information and referral systems. All of these are imperative for

providing equitable care for people with and at risk of NCDs. They require long-term care that is proactive, patient-centered, community-based, and sustainable.

The approach, based on cardiovascular risk prediction, helps shift from single risk factor management to total cardiovascular risk prediction and management, including diabetes as a major risk factor facilitating integration. This paradigm shift will enable Cambodia to better target the limited resources to those who are mostly in need and who are likely to benefit from these interventions.

**Figure 1: Components of WHO PEN**



The implementation of PEN in Cambodia includes only **health education and counseling** on healthy behaviors, and **integrated management of hypertension and diabetes**. The PEN program in Cambodia incorporates both assessment and management of total CVD risk and healthy lifestyle counseling (see Annexes 1-7).

### 3. Goal and Objectives

#### 3.1 Goal

To reduce disease burden and health care costs due to diabetes, hypertension, and cardiovascular risk by enabling all public health facilities to provide population-based screening, and management of hypertension and diabetes for achieving high coverage of essential interventions in primary care in Cambodia.

#### 3.2 Objectives

1. To improve access, patient-centeredness, effectiveness, and efficiency of care for diabetes, hypertension, and cardiovascular risk in primary care.

2. To provide access to the promotion of healthy lifestyle and screening services for early detection of diabetes and hypertension to all populations aged 40 years and above throughout the country regardless of their financial income status or geographical situation.
3. To improve the quality of care for diabetes, hypertension, and cardiovascular risk in primary care with the prevention, early diagnosis, and treatment, and strengthening the referral system and the involvement of patients in the management of their conditions.
4. To establish community engagement in the provision of key healthy lifestyle promotion messages in the community, support community education and mobilization to improve screening services and support the referral system for screening and continuum of care for patients with diabetes and hypertension.
5. To build the primary care system's capacity, including development of an Electronic Medical Record (EMR), to monitor health outcomes over time in chronic patients.
6. To have a beneficial impact on health through the prevention of acute events, complications, and reduction of NCD risk factors.

## **4. Implementation Arrangement**

The PMD, with technical support of the Sub-Technical Working Group for Cardiovascular Disease and Diabetes within the Ministry of Health's NCD Task Force, will manage the implementation of the PEN program, focusing on the integrated management of diabetes and hypertension. At the provincial level, Provincial NCD Focal Points will be established and coordinate with the ODs and Provincial Hospitals to implement the program. At the district level, non-communicable disease executives will be assigned to coordinate the implementation of the essential action plan for non-communicable diseases.

At the health center level, there is a health center management committee that supports the implementation of a set of essential action plans for non-communicable diseases.

### **4.1 National Level**

Screening for diabetes and hypertension, including health education, CVD risk assessment, and basic diagnostic procedures, will be charged according to user fees. There is a need to ensure the availability of laboratory and drug for diabetes and hypertension treatment. If patient fees are collected, they should be affordable for users and sufficient for health facilities to maintain quality of service delivery and sustainability. The Health Equity Fund (HEF) and other social health insurance schemes will pay for services used by their respective entitled beneficiaries through their respective social health protection schemes. Hypertension and diabetes do not usually cause symptoms in the early stages of the disease, but treatment is often life-long; therefore, it requires establishment of an effective system and good collaboration between HCs with PHs/RHs and village health support groups (VHSGs) for monitoring and follow-up to ensure good treatment adherence. The Preventive Medicine

Department, Ministry of Health will ensure the effective implementation of the PEN program under the strong support of the chiefs of HCMCs to activate comprehensive community engagement and in collaboration with health partners and local and international Non-Governmental Organizations (NGOs) working on NCD prevention and control (see Figure 2). The Department of Preventive Medicine will assume the following tasks:

1. Manage the implementation of diabetes and hypertension screening and management program. This will include the roll-out of diabetes and hypertension screening and management at the national scale and increase the population-based screening to at least 50 percent of the population aged 40 years and above (or approximately 2,160,000 people) by 2027.
2. Coordinate or assist in coordinating program planning and resource mobilization.
3. Build capacity of NCD focal points at provincial and OD levels to successfully manage the program's implementation.
4. Provide TOT to PHDs and ODs for conducting cascade training to HC staff to implement PEN at the primary care level.
5. Coordinate with national experts to provide training to provincial/referral hospital staff for roll out of NCD Units.
6. Liaise with the Department of Drug, Food, Medical Devices and Cosmetics, Central Medical Store, and PHDs to ensure sufficient essential medicines and equipment for NCDs are available at HCs and Referral Hospitals within each Operational District.
7. Conduct monitoring and data analysis to closely monitor the progress of program implementation and take corrective measures as required to improve the program's implementation progress.
8. Advocate with local government to support community engagement and community mobilization to improve utilization of essential health services, including diabetes and hypertension screening and treatment.
9. Develop an annual operational plan and set national targets for the PEN program, including health outcome targets that show the extent of cases of blood pressure and blood sugar control.
10. Develop, revise, and harmonize the PEN training curriculum for HCs, NCD units, and communities through a series of meetings of the Sub-Technical Working Group for Cardiovascular Diseases and Diabetes.
11. Develop and update clinical guidelines, and SOPs for diabetes and hypertension for training HCs and referral hospitals.
12. Disseminate updated NCD policies, SOP and guidelines to all relevant stakeholders, particularly NCD focal points and health facilities.
13. Monitor the implementation of the PEN program, including developing appropriate health outcome indicators, data management systems, supervision check list, HCs performance, report compilation, and managing EMR system.

14. Organize regular meetings of the Sub-Technical Working Group for Cardiovascular Disease and Diabetes.
15. Produce and share the annual progress report on the PEN program with relevant stakeholders.
16. Organize regular meetings and national workshops to review the national progress on the implementation of the national program for diabetes and hypertension screening and management and share lessons learnt.

## 4.2 Provincial Level

In each Provincial Health Department (PHD), provincial NCD focal points will serve as the PEN program coordinators and oversee the PEN program implementation in collaboration with the relevant Operational Districts. The Provincial Health Departments will assume the following tasks:

1. Manage the roll out and implementation of diabetes and hypertension screening and management program throughout the province.
2. Submit a request for essential medicines and supplies to the Ministry of Health on a regular basis.
3. Integrate the PEN program into the annual operational plan to ensure cash flow and adequate supply of medicines and medical consumables to HCs and NCD Units.
4. Conduct quarterly supervision and coaching to each OD to ensure smooth implementation of the PEN program as well as monitor progress on program implementation and its effectiveness in terms of health outcomes.
5. Conduct monitoring and data analysis to closely monitor the progress of program implementation and provide advice/recommendations to ODs, RHs, and selected HCs for taking corrective measures to improve the program's implementation progress. Conduct annual review as required.
6. In collaboration with ODs plan and conduct training on PEN, focusing on CVD prevention through integrated management of diabetes and hypertension, including health education and counseling for healthy behavior and screening, diagnostic confirmation, and treatment.
7. Build the capacity of ODs to manage and monitor program implementation and its progress.
8. Advocate and seek support from local government to support community engagement and community mobilization to improve the utilization of essential health services, including diabetes and hypertension screening and treatment.
9. Report quarterly, twice yearly, and annually on the PEN program, against the annual operational plan, to the Department of Preventive Medicine, Ministry of Health.

10. Coordinate with NGOs and relevant stakeholders working on NCD prevention and control at the provincial level to avoid overlapping catchment areas.
11. Disseminate updated NCD policies and guidelines to all relevant stakeholders particularly NCD focal points and health facilities within the province.
12. Identify bottlenecks and solve problems to ensure smooth implementation of the PEN program.

### **4.3 Operational District Level**

The Operational District plays a very important role in managing the implementation of PEN at the primary care level, and will assume the following tasks:

1. Manage the roll out and implementation of diabetes and hypertension screening and management program throughout the OD.
2. Join PHD in conducting training PEN implementation for HC staff.
3. Request to the Central Medical Store, MoH, through Provincial Health Department to ensure NCD essential medicines and supplies are readily available for HCs and referral hospitals.
4. Conduct supportive supervision of PEN implementation at HCs and RHs on a monthly basis, including supervising the implementation of community engagement activities managed by HCMC and implemented by VHSG using the checklists which are properly documented and submitted to PHDs.
5. Conduct monitoring and data analysis to closely monitor the progress of program implementation and take corrective measures as required to improve program's implementation progress. Conduct semi-annual reviews as required.
6. Advocate with local government to support community engagement and community mobilization to improve the utilization of essential health services, including diabetes and hypertension screening and treatment.
7. Submit quarterly, twice yearly, and annual progress reports on the PEN program to the Provincial Health Department retrieved from EMR system.
8. Add the review and discussion on progress of the PEN program implementation in the OD routine monthly meetings.
9. Establish referral mechanism between HCs and RHs and ensure it is functioning.

### **4.4 Referral Hospital Level**

The NCD unit at the referral hospital will assume the following tasks:

1. Diagnosis and treat complicated NCD cases which are beyond the capacity of HCs. The NCD units will only treat diabetes and hypertension cases who develop complications which cannot be treated by HCs or cases who are at very high risk of developing complications (e.g. family history and presence of other comorbidities). NCD units will be able to conduct CVD total risk assessments considering cholesterol levels.

2. Refer stable diabetes and hypertension cases whose treatment has been successfully treated at NCD units to HCs for continuation of care using referral slip and prescription to ensure continuity of care and adherence.
3. Refer diabetes and hypertension cases who have complications to specialized care at higher care level.
4. Conduct monthly coaching to the HCs to improve their knowledge and skills for managing NCD at HCs.
5. Provide technical advice to HCs on clinical management through telephone or online if needed.
6. Inform HCs about referral cases to be treated at HCs.
7. Enter data of individuals with diabetes and hypertension into the EMR system at the NCD unit.

#### 4.5 Health Center Level

The health center assumes the following tasks:

1. Participate in training, meetings, and workshop related to the implementation of PEN.
2. Prepare annual, quarterly, and monthly workplan for implementation of PEN in consultation with the chairs of Health Center Management Committee (HCMC).
3. Provide training to VHSGs with technical support from ODs and under the leadership of the Chairs of HCMC.
4. Under the leadership of the chair of HCMCs, work closely with VHSG to promote healthy lifestyles in the communities and to register the population aged 40 years and above in the communities for screening for diabetes and hypertension.
5. Coordinate with VHSG for referring to the target population for screening for diabetes and hypertension and follow-up with patients with diabetes and hypertension for the continuum of care.
6. Perform screening for early detection and treat diabetes and hypertension cases who have no complication and provide counseling on lifestyle modification and treatment.
7. Refer diabetes and hypertension cases who develop complication for diagnosis and treatment at NCD unit of Referral Hospital.
8. Provide continuum of care to people living with diabetes and hypertension.
9. Ensure the availability of essential drugs and consumables for early detection, diagnosis and treatment of diabetes and hypertension.
10. Give prescription and dispense NCD essential medicines for a period of 1-2 weeks for patients with unstable condition and 2-4 weeks for patients with stable condition respectively.
11. Provide technical support and share information on cardiovascular risks, including diabetes and hypertension, to other staff members through monthly meetings.

12. Organize outreach activities to raise awareness of diabetes, hypertension, CVD risk prevention, and treatment.
13. Conduct VHSG meeting on a monthly basis under the leadership of the Chair of HCMC to jointly manage and monitor the performance of VHSG, including monitoring the progress on utilization of essential health services, and diabetes and hypertension screening and treatment services.
14. Enter data of individuals with diabetes and hypertension into the EMR system at the HCs.
15. Report screening and treatment of diabetes and hypertension timely on a monthly, quarterly, semi-annually, and annually to ODs.
16. Submit monthly service report via EMR to PCA for review and approval from the project director for disbursement of the performance-based SDG to HCs. HCs will distribute the portion of the performance-based SDG for VHSG to them.

**Table 1: Key Roles and Responsibilities for Health Center**

Key Roles and Responsibilities of HCs
<ul style="list-style-type: none"> <li>● Attend training on hypertension and diabetes management in PHC.</li> <li>● Receive regular coaching/on-job training to be conducted by experts from NCD unit.</li> <li>● Seeking advice from experts at NCD unit in RH for any issues related to diagnosis and treatment of diabetes patients who have no complication.</li> <li>● Perform outreach/community screening of hypertension and diabetes in community according to screening procedure.</li> <li>● Perform diagnosis of diabetes based on diagnostic criteria.</li> <li>● Provide health education and counseling for a healthy lifestyle to people with hypertension, prediabetes and diabetes.</li> <li>● Provide treatment of hypertension patients</li> <li>● Initiate treatment and diabetes without suspected complications.</li> <li>● Perform follow-up consultation of hypertension and/or diabetes patients.</li> <li>● Refer to hypertension and diabetes patients as per referral criteria.</li> <li>● Provide a continuum of care to stable patients with diabetes who are transferred back from the NCD unit.</li> <li>● Facilitate referrals of diabetes patients to the NCD unit for screening of complications according to Type 2 Diabetes Management Protocol.</li> <li>● Mobilize the HC budget and strengthen estimates of drug use needs, including supplies to ensure adequate essential medicines for NCDs and supplies at HC.</li> </ul>

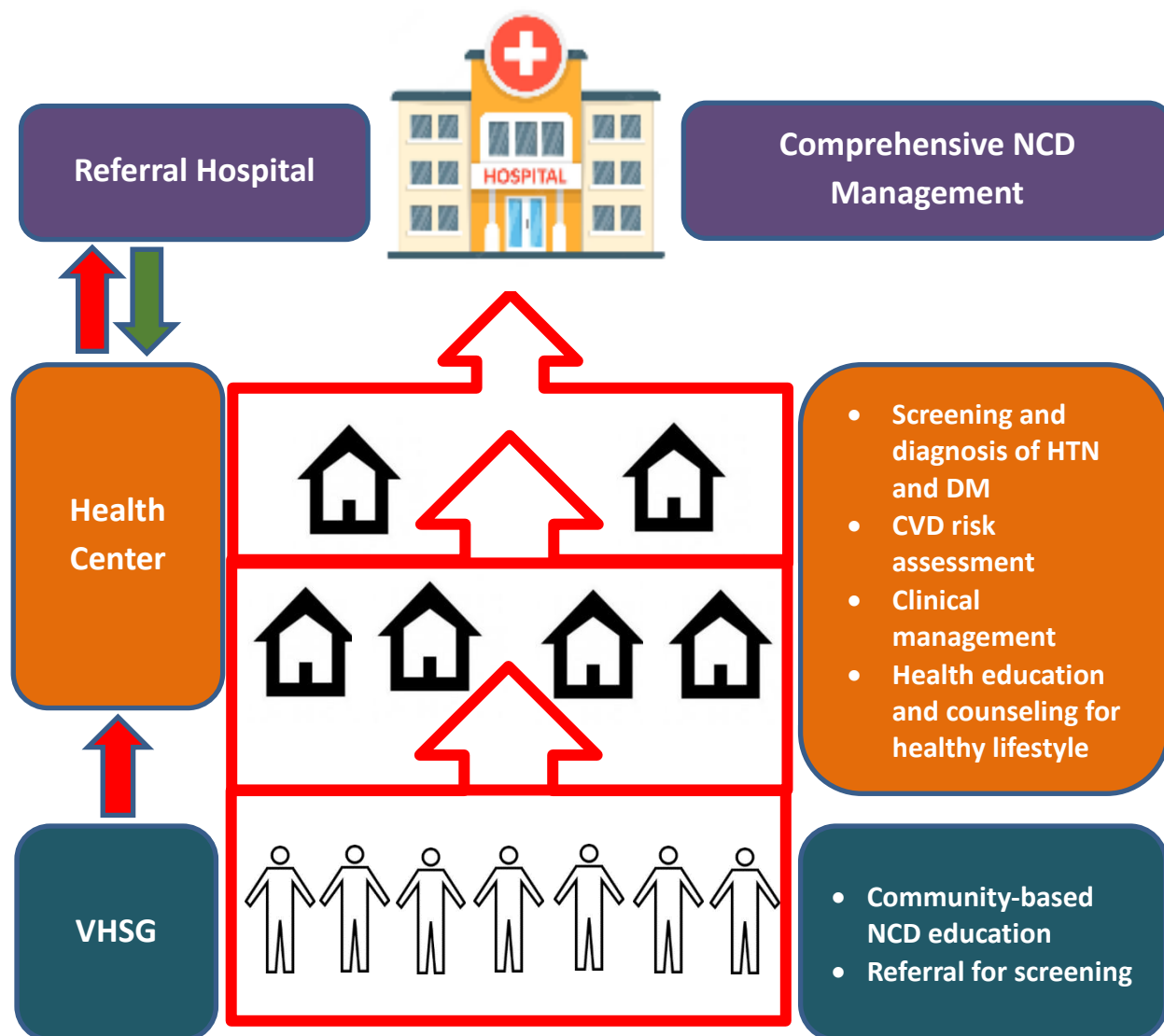
#### **4.6 Village Health Support Group**

The key function of Village Health Support Group (VHSG) is to serve as the link between community and HCs. Their roles and responsibilities are as follows:



1. Assist HCs in registration of target populations such as pregnant women, mothers, children aged under 5 years, the population in the target group aged 40 and above who need to receive essential health services, including diabetes and hypertension screening and treatment.
2. Conduct health education about healthy lifestyles in community and assist HCs for follow-up with the target population and referring them for receiving essential health services at HCs including continuum of care.
3. Assist HCs on follow-up and referral of individuals with diabetes and hypertension to receive treatment and other health checkups as required.
4. Assist HCs to raise awareness on healthcare benefits to ID-Poor cardholders and encourage poor families to request ID-Poor cards from commune/Sangkat offices through chief of villages.
5. Assist HCs in informing the communities about health outreach schedules and mobilizing the target population to receive essential health services during outreach sessions.
6. Provide feedback and report to HCs on community engagement activities, results, challenges, and solutions on a monthly basis.
7. Participate in VHSB monthly meetings and training.

Figure 2: Cambodia PEN Program Overview



#### 4.7 Referral Mechanism

Linkage Referrals between the community and HCs and between HCs and RHs are essential for facilitating interaction and communication with each other for more effectively monitoring, managing, early detection, diagnosis and continuum of care for hypertension and diabetes.

- **Referrals between community and HCs:** Through comprehensive community engagement, a referral from the community to HCs is made by VHSGs. The VHSG will place more effort into identifying the target population aged 40 years and above and refer them for screening for hypertension and diabetes at HCs using the referral form. Both HCs and VHSGs will also establish a Telegram message/call referral system for referral patients from communities and vice versa. HCs will provide feedback to VHSGs

for cases that have been referred to the community. The VHSG will assist HCs to follow up patients with hypertension and diabetes on their lifestyle modification, the need for continuum of medication and routine health check-up and remind them to visit the HCs at their next appointment.

- **Two-way referrals between HCs and RHs:** Refers to a referral of diabetes and hypertension patients from HCs to NCD Units on the condition that these patients cannot be treated at the HCs and stable patients will be referred from the NCD Units to the HCs. The referral form (see Annex 10) and prescription could facilitate interaction and communication between NCD Units and HCs. The EMR system for registration, recording screening status and individual patient data is used for tracking patient by both HCs and NCD Units to facilitate monitoring on the referral cases. In addition, two groups of Telegram message, one OD, RHs and HC call referral system will be established and functioning at each OD for referral patients from HCs to NCD Units and vice versa. Another one for each HC and its respective VHSG should be established for communicating on referrals from community for screening or treatment, reminding patients about the need for continuum of care, and VHSG to report issues with patients in the community if any. HCs and RHs will send electronic messages to each other to inform about each referral cases and provide timely health services.

#### 4.8 Procurement of Medical Equipment and Essential Medicines for NCDs

All HCs implementing the PEN program and NCD Units at RHs need to have the following equipment, essential medicines, and a reliable and continuous logistic system for replacement:

**Table 2: List of Medical Equipment, Supplies and Essential Medicines for NCDs**

Equipment and supplies	Essential medicines
1. Blood pressure measurement device	1. <b>Calcium channel blockers:</b> Amlodipine 5 mg; 10 mg
2. Glucometer	2. <b>Angiotensin receptor blockers (ARBs):</b> Losartan 50 mg
3. Blood glucose test strip	3. <b>Beta-blockers:</b> Atenolol 50 mg
4. Lancet needles	4. <b>Diuretic:</b> Hydrochlorothiazide (HCTZ) 12.5 mg; 25 mg
5. Weighing scales	5. <b>Angiotensin-converting enzyme (ACE) inhibitor:</b>
6. Measurement tape (for waist circumference and height measurement)	- Enalapril 2.5 mg; 5 mg
7. Medical stainless-steel tray	6. <b>Biguanide:</b>
8. Clean cotton swabs	- Metformin 500 mg
9. Alcohol	7. <b>Sulfonylurea:</b>
10. Protein and ketone urine test strips	
11. Safety box	
12. Non-sterile gloves	
13. IEC materials such as posters, leaflets and videos for NCD prevention	

<ul style="list-style-type: none"> <li>14. Total CVD risk charts or total CVD risk</li> <li>15. BMI calculation chart or BMI calculation from EMR</li> <li>16. Registration form (for 1<sup>st</sup> visit)</li> <li>17. Follow-up form (for 2<sup>nd</sup> visit and subsequent visits)</li> <li>18. Reporting form (can be generated from EMR)</li> <li>19. Follow-up appointment card</li> <li>20. Referral form</li> <li>21. Patient self-management book</li> <li>22. Computer</li> <li>23. EMR system</li> </ul>	<ul style="list-style-type: none"> <li>- Gliclazide 30 mg; 60 mg; 80 mg</li> <li>- Glibenclamide 5 mg</li> <li>- Glipizide 5 mg</li> <li>- Glimepiride 2 mg</li> </ul> <p>8. <b>Insulin:</b></p> <ul style="list-style-type: none"> <li>- Insulin injection (soluble) 40 IU/mL in 10 mL; 100 IU/ml in 10 mL vial</li> <li>- Intermediate-acting insulin 40 IU/mL in 10 mL vial; 100 IU/mL in 10 mL vial</li> <li>- Long-acting insulin analogues 100 IU/mL in 3 ml cartridge or pre-filled pen)</li> </ul> <p>9. <b>Statin:</b></p> <ul style="list-style-type: none"> <li>- Simvastatin 20 mg</li> </ul> <p>10. <b>Antiplatelet:</b></p> <ul style="list-style-type: none"> <li>- Acetylsalicylic Acid (75 mg; 100 mg)</li> </ul>
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The equipment, supplies, and essential medicines outlined above are to be used at HCs to diagnose and treat hypertension and type 2 diabetes. If hypertension is not controlled by the two drugs listed above (Amlodipine and Hydrochlorothiazide) or patients have any symptoms or signs of complications, they must be referred to the NCD Units.

In case of type 2 diabetes, after a repeated fasting blood glucose test to confirm the diagnosis, preferably with the same type of test, as soon as practical on a subsequent day and hence once diabetes has been diagnosed, HCs will provide treatment if the cases do not have any complications. HCs should refer diabetic patients who have complications, or are at high risk of developing complications, to be examined and treated at NCD Units. Continued treatment and follow-up of uncomplicated diabetes patients should be done at the HC level. Please refer to section 6.5 for detailed information about treatment of diabetes at HC level. All HCs implementing PEN should have a glucometer, blood glucose test strips and urine dipstick (ketone, protein, albumin). Other necessary laboratory analysis such as HbA1c, creatinine, creatinine clearance, urea, sodium, potassium, complete blood cell count (CBC), lipid profile (total cholesterol, HDL, LDL, and triglyceride) will be done in RH during the annual visits of a patient with diabetes as needed. Diagnosis of hypercholesterolemia will be made, and cholesterol-lowering drug treatment initiated in RH, but after diagnosis and start of treatment, the patient can be followed up at the HC.

## 5. Program Activities

Cambodia PEN program include 5 main activities as follows:

1. Comprehensive community engagement.
2. Screening procedure for hypertension and type 2 diabetes.
3. Assessment of cardiovascular disease risk
4. Diagnosis and management of hypertension.
5. Diagnosis and management of type 2 diabetes.

The main target population to be screened for hypertension and diabetes is an adult population aged 40 years and above, living in the catchment area of HCs. According to the 2019 General Population Census of Cambodia, 27.5% of the population is 40 years and above. Thus, the target population of an HC that covers a population of 10,000 is estimated to have 2,700 people aged 40 years and above.

**Table 3: Screening criteria for hypertension, diabetes, and CVD risk:**

<b>Target population</b>	<b>Screening criteria</b>
<b>All adults aged 40 and above</b>	<b>All adults aged 40 and above referred to or visited HC for any other purposes shall be screened for hypertension, diabetes and CVD risk.</b>
<b>People aged less than 40</b>	<b>People aged less than 40 with symptoms of diabetes or established CVD or high CVD risk (&gt;20%) or overweight or obesity (BMI &gt;23, Male waist size &gt;85cm, Female &gt;80cm) or tuberculosis or PLHA under ARV must be screened for hypertension, diabetes and CVD risk.</b>

However, NCD prevention-related activities will target the whole population and focus on four main modifiable risk factors: tobacco use, unhealthy diet, lack of physical activity, and harmful use of alcohol.

### 5.1 Comprehensive Community Engagement

To improve the utilization of essential health services including diabetes and hypertension screening, there is a need to strengthen the capacity and accountability of subnational government to plan and implement comprehensive community engagement activities for raising community awareness, triggering behavior change, and creating demand for utilization of essential health services, including screening and treatment for diabetes and hypertension. Strong community engagement will create a better relationship between HCs and the communities, which will facilitate VHSG in assisting HCs for educating communities

about healthy lifestyle practices, disease prevention and creating demand for health services, as well as discussing barriers for adopting recommended behaviors and ways to overcome them.

The content of the information can be divided into two main components: (1) information, education, and communication (IEC) on NCDs and their risk factors; and (2) general information about the program. Educational information can be delivered to the communities through IEC materials, including posters, leaflets, media, and community meetings. Social media such as Facebook has been popular, effectively, and economically disseminating information and educating the public, particularly during the COVID-19 pandemic. Therefore, social media should be used to share information and raise awareness about the program as well as educate the public about healthy lifestyles, the need for screening, and the continuum of care for diabetes and hypertension. Organizing an opening ceremony at the roll-out of the PEN program in respective HCs should be strongly considered for population information and mobilization.

**Village Health Support Group (VHSG)** will be the primary implementers for carrying out comprehensive community engagement activities in the villages. There have been two VHSGs selected from each village to support HC for delivering health education activities.

**Health Center Management Committee (HCMC)**, chaired by chiefs of commune/Sangkat, will lead VHSG to implement comprehensive community engagement activities and routinely monitor the progress of this implementation. HC will train VHSG to conduct comprehensive community engagement activities and prepare a report and data analysis on the utilization of essential health services for discussion during VHSG meetings. The Performance-based Service Delivery Grants (Performance-based SDG) for delivery of the first screening for diabetes and hypertension will be provided to support comprehensive community engagement and screening services as described in Annex 2 of Service Delivery Grants of the H-EQIP II Project Operational Manual.

The community engagement platform created under ISAF (Implementation of Social Accountability Framework) should also be used to raise awareness about healthy lifestyles, HEF benefits, and increase utilization of healthcare services, as well as to carry out health promotion activities related to diabetes and hypertension screening.

**1. Mobilization of target population at the village level by VHSG:**

- Conduct community awareness raising on NCD prevention and control in the village before the registration of target population. This can be done at the village chief's house or VHSG's house, commune hall, pagoda, or house-to-house, depending on the local situation.
- Identify potential target population aged  $\geq 40$  years for both female and male in collaboration with the village chief within villages and register them in VHSG registration form. This can be done through house-to-house registration for all

people age  $\geq 40$  years and other vulnerable groups in the registration list or the list provided by the commune council if it is available.

- Discuss with the health center staff about (date, time) and the target population of people over the age of 40 who will be sent to the health center for daily check-ups.
- Refer these target population age  $\geq 40$  years to HC for screening and management of diabetes and hypertension and CVD risk.
- Support HC to carry out outreach services in the villages by gathering the target population, providing health education, mobilizing the target population to receive essential health services during outreach sessions, and supporting HC staff in other activities as requested.
- Support HC to raise awareness on healthcare benefits to ID-Poor cardholders and encourage poor families to request ID-Poor cards through the chief of villages to the Commune/Sangkat Offices.
- Raise awareness and behavior change on diabetes and hypertension prevention and promote healthy lifestyles as well as referring people from the community to receive essential health services. This can be done through organizing small or large group meetings, home visits, and face-to-face communication. Guidelines for Healthy Lifestyles and communication tools for NCD prevention such as flipchart, poster, leaflet etc. will be used to promote healthy lifestyles in the community and explain about the benefit of screening for diabetes and hypertension.
- Link between communities, VHSG, and HC.

## **2. Follow-up at community**

- VHSG will continue to monitor and educate those targeted groups who are in the healthy stage to stay healthy by using available mechanism at HC and in the community.
- VHSG will assist HC staff in following up individuals with prediabetes in the community and emphasize following lifestyle advise and visit the HCs at their next appointment.
- Assist HC staff in following up selected target population age  $\geq 40$  years to do the second blood glucose test on day 7 as requested by HCs and follow-up with patients for continuum of care.
- Assist HCs to support the target population and refer them to HC for receiving essential health services including continuum of care.
- Assist HCs to follow-up and convince those who have been registered but have not attended a first screening as per appointment or those who have not visited the HC on day 7 to do the second blood glucose test and/or take blood pressure measurement to confirm the diagnosis and receive treatment.
- VHSGs will follow up drop-out cases to continue treatment at HCs.

## 5.2 Screening Procedure for Hypertension and Type 2 Diabetes

**Screening is “the process of using tests on a large scale to identify the presence of disease in apparently healthy people”.** Target population to be screened for hypertension, diabetes and CVD risk in Cambodia is people aged 40 and above.

HC Chief shall organize an orientation meeting of HC staff on the implementation of Cambodia PEN program, explaining on how to conduct screening at HC and community and include NCD agenda in regular HC staff meetings, HCMC, and VHSG meetings.

There are two types of screening for hypertension and diabetes, including conducting population-based screening at health centers and through outreach activities in remote/difficult to access communities. The screening objectives are to:

1. Provide early detection, diagnosis, and treatment for people with diabetes and hypertension.
2. Improve lifestyles to prevent and delay the onset of complications of diabetes and hypertension.
3. Conduct awareness raising on healthy lifestyles among target population who are unaware of their health status.

### ❖ **Delivery of Diabetes and Hypertension Screening Service at the Health Center**

Diabetes and hypertension screening for the target population aged 40 years and above, and treatment services, will be provided at health facilities as part of routine services. The VHSG will support the health center in providing education on healthy lifestyles, raising awareness of the need for screening, and the benefits of early detection of diabetes and hypertension, mobilizing and referring the population aged 40 and above for screening at the HCs, and following up the diabetes and hypertension patient for continuum of care.

#### **1. Registration:**

- All individuals visiting HC must be registered at reception before they go to the consultation room.
- All target populations that referred by VHSGs and other high-risk population will be encouraged to participate in screening program through providing health education on NCD prevention and treatment. Then, they will be registered at the OPD desk to receive NCD service delivery at the HC.

#### **2. Mobilization of eligible patients or clients for screening:**

1. HC staff at a registration and information desk identifies eligible patients or clients to receive NCD screening and inform them on availability of hypertension and diabetes treatment services at HC.
2. HC staff at the registration desk sends eligible patients or clients to OPD to get health education on NCDs and distribute IEC materials to them.



3. Other educational materials such as video and banners can be also displayed at the HCs to promote the NCD services.
4. HC staff at the other services, such as immunization, MCH, Delivery etc. can mobilize patients' families or relatives who accompany them to participate in screening programmed as well if eligible.

### **3. Screening:**

1. The screening is focused on hypertension, diabetes and CVD risk.
2. HC staff are recommended to use Automatic Blood Pressure Measurement Device for hypertension screening as it provides more accurate results. A conventional sphygmomanometer with stethoscope can be used if Automatic Blood Pressure Measurement Device is not available.
3. The glucometer will be used to measure FPS and/or RPG for screening diabetes.
4. Assess CVD risk using WHO CVD risk chart, which is also available in EMR.
5. All screened patients will receive health education and counseling for healthy lifestyles and IEC materials for NCDs will be distributed.
6. HC staff diagnose and treat hypertension and diabetes patients without complications at HC.

### **4. Recording and Reporting:**

1. After screening and managing hypertension, diabetes and CVD risk including referral, HC staff will fill out the screening form in hard copy and enter data into the EMR system. Once the EMR is fully functioning, the hard copy form will be no longer needed.
2. Then, HC staff will report indicators monthly in terms of the number and percentage of target groups screened, number of confirmed diabetes and hypertension, number of diabetes and hypertension receiving treatment, and number of patients who dropped out.

### **❖ Outreach/Community screening:**

Outreach/community screening aims to screen for hypertension, diabetes and CVD risk among population aged 40 and above living in remote/difficult to access areas and make appointment with individuals that need follow-up check-up for diagnostic confirmation and treatment to visit HCs for receiving these services. The outreach will be conducted as follows:

1. Outreach/Community screening in remote/ difficult to access areas:
  - The screening is focused on hypertension, diabetes and CVD risk.
  - The screening will be conducted by one HC staff member with support from two VHSGs. The trained VHSGs should actively assist HC staff to conduct screening.
  - Before starting the outreach/community screening, the HC staff, with support from VHSGs, will introduce the objectives of the screening followed by health

education on NCDs, its risk factors and healthy lifestyle including distribution of available educational materials to all participants.

- The outreach/community screening can be conducted at the village chief's house or VHSG's house, commune hall, pagoda, or house-to-house, depending on the local situation. HC staff will provide health education on healthy lifestyles, the need for screening, the benefits of early detection of diabetes and hypertension.
- HCs should aim to reach **at least 80% screening coverage of target population**.

## **2. Counselling and referral:**

- After the screening, those who are suspected of having diabetes and/or hypertension will receive individual counselling and explanation, and an appointment will be made to visit HC for another blood glucose test and/or blood pressure measurement to confirm diagnosis and for treatment.
- Those who are at low risk without diabetes and/or hypertension will be advised to follow a healthy lifestyle and have another screening in the next one year.

## **3. Follow-up:**

- The VHSGs will follow-up with those who were registered but did not attend the screening and those who are suspected of having diabetes to visit HC for another blood glucose test and/or blood pressure measurement to confirm diagnosis and convince them to join the next screening session.
- The VHSGs will assist the HC to follow-up cases with confirmed hypertension and/or diabetes but did not seek treatment, those who dropped out from treatment, and those who need to have a health check-up.

## **4. Recording and reporting:**

- After screening each person, the HC staff or VHSGs will record all relevant information of the screening in "registration form for hypertension, diabetes and CVD risk" or enter data into the EMR if more computers are available.
- HC staff will then report on a monthly basis in terms of the number and percentage of target population screened, number of patients confirmed as having diabetes and hypertension, number of diabetes and hypertension cases receiving treatment regularly, and number of drop-out cases.

## **5. Monitoring of screening coverage:**

The HC staff should monitor screening coverage and follow up active cases and drop-out patients under treatment through preparing and reviewing a monthly report of screening coverage in comparison with the total target population and registration data at HC. The monitoring of screening coverage of hypertension diabetes in community includes a total number of target population screened and referred to HCs.

### 5.3 Assessment of Cardiovascular Disease Risk

At the HCs, trained health professionals will assess total cardiovascular risk based on data on a few selected risk factors. The approach helps to shift from single risk factor management to total cardiovascular risk prediction and management, including diabetes as a major risk factor. This paradigm shift will enable Cambodia to better target limited resources to those at high-risk who are most likely to benefit from these interventions. Assessment of total CVD risk can be used for routine management of hypertension (HTN) and diabetes mellitus (DM), and for targeting the following categories of people:

- age >40 years
- smokers
- obesity
- known to have HTN
- known to have DM
- history of premature CVD in first-degree relative
- history of DM or kidney disease in first-degree relative.

Total CVD risk can be assessed to predict 10-year risk of a fatal or non-fatal CVD event by using the WHO CVD risk charts (see Annex 1 and Annex 2).

The CVD risk charts are divided into:

- **CVD risk non-laboratory-based chart:** CVD risk is assessed by using WHO cardiovascular disease risk non-laboratory-based chart for South-East Asia without information on total cholesterol and diabetes. Only age, sex, smoking status, systolic blood pressure and body mass index (BMI) will be needed to predict cardiovascular risk.
- **CVD risk laboratory-based chart:** CVD risk is assessed by using WHO cardiovascular disease risk laboratory-based chart for South-East Asia with information on age, sex, smoking status, systolic blood pressure, history or evidence of diabetes, and the total cholesterol value.

The CVD risk laboratory-based chart is further divided into:

- **For people without diabetes**
- **For people with diabetes**

The CVD risk levels are categorized according to color codes as follows:

1. Green: Less than 5%
2. Yellow: 5% to <10%
3. Orange: 10% to <20%

4. Red: 20 to <30%: very high
5. Dark red:  $\geq 30\%$ : extremely high

The CVD risk charts can be also used to motivate people to change their lifestyles and to assess the need for drug therapy.

**Table 4: Management guidance for total CVD risk**

<b>Management of total CVD risk</b>	
<b>Risk &lt;10</b>	Counsel on diet, physical activity, smoking cessation and avoid harmful use of alcohol. <b>If risk &lt;5%, follow up in 12 months.</b> <b>If risk 5% to &lt;10%, follow up every 3 months until targets are met, then 6–9 months thereafter.</b>
<b>Risk 10% to 20%</b>	Counsel on diet, physical activity, smoking cessation and avoid harmful use of alcohol. Persistent BP $\geq 140/90$ mmHg considers drug therapy. <b>Follow up every 3–6 months.</b>
<b>Risk &gt;20%</b>	Counsel on diet, physical activity, smoking cessation and avoid harmful use of alcohol. Persistent BP $\geq 130/80$ , consider drug therapy. Give a statin. <b>Follow up every 3 months. If there is no reduction in cardiovascular risk after six months of follow-up refer to RH.</b>
<b>Risk <math>\geq 30\%</math></b>	<b>Refer to RH</b>
<b>Important practical points</b>	Management of hypertension and diabetes
	Consider drug therapy for the following categories: <ul style="list-style-type: none"> <li>• All patients with established DM and CVD (coronary heart disease, myocardial infarction, transient ischemic attacks, cerebrovascular disease or peripheral vascular disease), renal disease. If stable, should continue the treatment already prescribed and be considered as having risk &gt;20%.</li> <li>• People with albuminuria, retinopathy, left ventricular hypertrophy.</li> <li>• All individuals with persistence raised BP <math>\geq 160/100</math> mmHg.</li> <li>• All individuals with total cholesterol at or above 320 mg/dL.</li> </ul>
	Follow-up visits: <ul style="list-style-type: none"> <li>• Ask about: new symptoms, adherence to advice on tobacco and alcohol use, physical activity, healthy diet, medications etc.</li> <li>• Assess (physical exam).</li> <li>• Estimate cardiovascular risk.</li> <li>• Refer to RH if necessary.</li> <li>• Counsel all and treat as shown in protocol.</li> </ul>

## 5.4 Diagnosis and Management of Hypertension

Hypertension is a common condition seen in primary care and remains one of the most important preventable contributors to diseases and death. It plays a major etiological role in

the development of cerebrovascular disease, ischemic heart disease, cardiac and renal failure. In addition, hypertension often coexists with other cardiovascular risk factors, such as tobacco use, diabetes, hyperlipidemia, and obesity, which compound the cardiovascular attributable to hypertension.

HCs staff will be trained in how to screen and make a diagnosis and provide treatment to patients with hypertension. The management of hypertension includes the following:

#### **5.4.1. Screening for hypertension**

Majority of people with hypertension are unaware of the fact that they have raised blood pressure. Screening is the first step in a stepwise approach to supporting linkage to care, retention in care, and adherence to treatment for hypertension. All adults who attend PHC facilities at routine visits must be screened for hypertension by routine blood pressure measurement. Special attention should be given to individuals who are at risk, which must be seen within the context of the multiple risk factors for cardiovascular disease regardless of age. There are physiological factors such as age, high cholesterol, or blood glucose as well as behavioral risks such as smoking or lack of physical activity.

Blood pressure can be measured either by a conventional sphygmomanometer, using a stethoscope, or by an automated electronic device. The electronic device, if available, is preferred because it provides more reproducible results and is not influenced by variations in technique or by the bias of the observers.

#### **5.4.2 Diagnostic criteria for hypertension**

Hypertension is defined as a systolic blood pressure [SBP] of 140 mmHg or more or a diastolic blood pressure [DBP] of 90 mmHg or more (Hypertension =  $BP \geq 140/90$ ). The diagnosis should not be made on a single visit. Usually, 2 separate visits at 1–4-week intervals (If BP is 140–<160 systolic and 80–<100 diastolic) are required to confirm the diagnosis of hypertension.

In each visit, 2 BP measurements are to be made 1 minute apart, and the second reading will be used. BP should be measured in both arms and if the difference is consistently more than 10 mmHg it should be repeated and if still more than 10 mmHg should be referred. All the conditions in terms of relaxation for 5 minutes and no coffee or smoking 30 minutes prior to the measurement and seated position should be followed (Patient should be sitting with back supported, legs uncrossed, empty bladder and not talking). A correct blood pressure measurement is key to the correct diagnosis of hypertension. Technical errors can lead to inaccurate readings of the patient's true BP.

**Table 5: Classification of Hypertension**

Category	SBP (mmHg)		DBP (mmHg)
Optimal	<120	and	<80
Normal	120-129	and/or	80-84
High normal	130-139	and/or	85-89
Hypertension Grade 1 (Mild)	140-159	and/or	90-99
Hypertension Grade 2 (Moderate)	160-179	and/or	100-109
Hypertension Grade 3 (Severe)	≥180	and/or	≥110
Isolated systolic hypertension	≥140	and	<90

#### 5.4.3 Clinical management

Since hypertension is a chronic disease, HC staff shall spend enough time explaining hypertension patients on lifestyle modification, treatment adherence and regular follow-up.

The management of hypertension includes the following:

#### ❖ **Non-pharmacological therapy:**

##### **Healthy lifestyle counseling (see Annex 3-7)**

- Maintaining a healthy lifestyle is necessary for patients with hypertension. It is mandatory.
- Healthy lifestyle for patients with hypertension includes dietary management, exercise, smoking, drinking and stress management.

##### **1. Eat healthy (low-salt diet)**

- A balanced diet is very important for people with hypertension. It is also vital to eat less salt.
- For example, instead of drinking the soup broth, eat only the ingredients in the soup.
- Also cut back on pickled and processed foods like ketchup, sausage and ham.
- It is highly recommended to eat fresh and healthy local food.

##### **2. Eat healthy (low-fat diet)**

- It is important to cut down on fat because many patients with hypertension have dyslipidaemia and need to control their weight.
- When you eat meat, trim the fat.
- Reduce liver, intestine and processed meats consumption.

- Choose low-fat or fat-free dairy products.

### **3. Eat healthy (high-fiber diet)**

- Fiber also prevents absorption and production of cholesterol and has the positive effect of reducing the absorption rate of carbohydrates, as well as the incidence of constipation and cancer.
- Foods high in fiber are fruits, vegetables, oats, dry beans, seaweed and grains.
- Eating fiber has benefits, such as aiding weight loss, even if it does not reduce blood pressure directly.
- Some studies report a decrease in blood pressure because of eating more dietary fiber, but this needs more research.

### **4. Choose healthy carbohydrates**

- Moderate intake of carbohydrates is recommended because they can increase serum triglyceride, obesity and arteriosclerosis.
- It is recommended to eat brown rice and whole grain bread rather than carbohydrates with a high glycemic index such as white rice, instant noodles and white bread.

### **5. Dietary management**

- Caffeine is abundant in most teas, caffeinated sodas, energy drinks and chocolate.
- Caffeine temporarily increases blood pressure, so it is better to reduce consumption.
- It is normally recommended to drink no more than two cups of coffee per day.
- Caffeine intake should be avoided before exercising because it raises blood pressure dramatically in a short time.
- This can result in light-headedness, dizziness or fainting, and these effects can be much worse if a person already has high blood pressure or another heart condition.

### **6. Effect of physical activity on hypertension**

- Adequate exercise is helpful in reducing blood pressure, weight reduction and stress relief, and reduces risk of cardiovascular disease.
- Therefore, regular exercise is as important as antihypertensive drugs.
- **Before starting physical activity:**
  - If you have been diagnosed with heart disease or musculoskeletal disorder (such as injuries or pain in your tendons or joints), consult your doctor before beginning any exercise.
  - If you have chest pain or frequent dizziness, or if you are over 65, you should also discuss this with your doctor.
  - If you have uncontrolled hypertension and any other reasons why you should not engage in physical activity, please consult your doctor.
- **Good exercises for patients with hypertension:**
  - There are exercises that are recommended for patients with hypertension.



- Aerobic exercise, such as brisk walking, jogging, running, cycling, swimming or other simple physical exercises are beneficial.
- Exercise 5–7 days a week for at least 30 minutes each day.
- Aerobic exercise help strengthen heart and lung function, joints, bones and muscles, and increases body flexibility.
- **Exercises to avoid:**
  - Avoid weightlifting that requires explosive strength, or rowing and diving requiring the head to be positioned low because these could be harmful to patients with uncontrolled hypertension.
  - Sudden straining is hazardous.

## **7. Smoking and hypertension**

- It is best to stop smoking.
- Smoking increases the risk of lung diseases, cancer and cardiovascular diseases such as angina and stroke.
- If you quit smoking, antihypertensive drugs become more effective, the risk of cardiovascular disease halves after a year of not smoking, and the risk of cardiovascular disease becomes similar to non-smokers after 15 years of not smoking.

## **8. Alcohol and hypertension**

- Drinking alcohol lowers the effect of antihypertensive drugs and causes more side-effects.
- Alcohol also supplies many calories without any nutrition, disturbing body-weight management, so cutting alcohol intake is important.
- Level of alcohol: One “standard drink” is equal to 10 grams of pure alcohol.
- Men are recommended to limit consumption to less than two drinks (20 grams) of alcohol and women less than one drink (10 grams) of alcohol per day.
- **How to stop harmful use of alcohol:**
  - It is best to drink no more than twice a week and to choose lower-calorie drinks (those with less sugar) wine or beer rather than champagne and cocktails.
  - Avoid strong liquor (drinks with high alcohol level) and drinking on an empty stomach.

## **9. Managing your stress**

- Stress is harmful to those living with hypertension. It increases blood pressure and the risk of cardiovascular disease.
- Avoid stressful situations.
- Exercising regularly and adequate sleep.
- Regular 10-minute meditation is helpful in managing stress.
- It is also a good idea to find a friend you can talk over any issues with.

## ❖ Pharmacological therapy:

### Starting drug therapy for uncomplicated patients:

1. Drug therapy may be needed if systolic blood pressure is  $\geq 140$ mmHg and/or diastolic blood pressure is  $\geq 90$ mmHg in repeated measurements.
2. Lifestyle counselling (healthy diet, physical activity, tobacco use, and harmful use of alcohol) is a critical component of good hypertension management and is often recommended as a first step for patients with blood pressure of SBP 130–139 mmHg and/or DBP 80–89 mmHg who do not have other CVD risk factors.
3. Amlodipine 5mg (*starting 5 mg, increasing to 10 mg per day*) and HCTZ 12.5mg (*starting 12.5 mg, increasing to 25 mg per day*) can be started at HC.
4. Drug therapy is not an alternative to lifestyle changes.
5. Complicated cases and patients whose blood pressure is not controlled by amlodipine (max dose 10mg/day) and/or HCTZ 25mg/day needs to be sent to the referral hospital.
6. Adalat (Nifedipine) must not be used.

**Table 6: Blood pressure screening protocol and thresholds for intervention by level of blood pressure**

SBP (mmHg)		DBP (mmHg)	Follow-up
<120	and	<80	Repeat measurement in 1 year
120-139	and/or	80-89	Lifestyle advice Re-evaluation in 1 year
140-159	and/or	90-99	Lifestyle advice Re-evaluation in 1- 4 weeks
$\geq 160$	and/or	$\geq 100$	Lifestyle advice Re-evaluation in 1-2 weeks* <b>Note:</b> *If hypertensive emergency, immediate treatment, and refer to referral hospital.  *If the patient is taking ACE inhibitors, electrolytes and creatinine must be controlled before and during the drug treatment. These tests are recommended also for users of HCTZ in doses above 12.5mg/day.

**Table 7: When to start hypertension treatment**

Blood pressure level on repeated measurements			Action
SBP (mmHg)	Or	DBP (mmHg)	
≥140	Or	≥90	<p><b>Consider starting drug therapy *</b></p> <p><b>Note:</b> * Refer to referral hospital if the patient has:</p> <ul style="list-style-type: none"> <li>▪ CVD risk &gt;30%</li> <li>▪ established CVD</li> <li>▪ renal disease</li> <li>▪ type 1 diabetes</li> <li>▪ gestational diabetes</li> <li>▪ target organ damage (clinical or subclinical)</li> </ul>
≥160	Or	≥100	<p><b>Start drug therapy *</b></p> <p><b>Note:</b> * Refer to referral hospital if the patient has:</p> <ul style="list-style-type: none"> <li>▪ CVD risk &gt;30%</li> <li>▪ established CVD</li> <li>▪ renal disease</li> <li>▪ type 1 diabetes</li> <li>▪ gestational diabetes</li> <li>▪ target organ damage (clinical or subclinical)</li> </ul>
≥180	Or	≥110	<p><b>Refer to referral hospital urgently if BP &gt;180/110mmHg with severe headache, chest pain, shortness of breath, blurred vision, mental status changes, reduced urine output, nausea, vomiting, lethargy, seizures, papilloedema, focal neurologic signs or signs of heart failure.</b></p>
≥200	Or	≥120	<p><b>Refer to referral hospital urgently.</b></p>

**Table 8: How to start hypertension treatment**

Blood pressure level (mmHg)	Treatment plan and Counseling on lifestyle modification and importance to take medicine regularly
<p>SBP<math>\geq</math>140 or DBP<math>\geq</math>90</p>	<p><b>Step 1: Screening all adults aged 40 and above</b></p> <p><b>Step 2: Consider starting drug therapy</b></p> <ul style="list-style-type: none"> <li>• Amlodipine 5mg/day</li> </ul> <p><b>Note:</b> Refer to referral hospital if the patient has:</p> <ul style="list-style-type: none"> <li>▪ CVD risk &gt;30%</li> <li>▪ established CVD</li> <li>▪ renal disease</li> <li>▪ type 1 diabetes</li> <li>▪ gestational diabetes</li> <li>▪ target organ damage (clinical or subclinical)</li> </ul> <p><b>Step 3: After one month</b></p> <ul style="list-style-type: none"> <li>• If SBP &lt;140mmHg, and the patient tolerates the drug, continue Amlodipine 5mg/day.</li> <li>• If SBP still <math>\geq</math> 140mmHg or DBP <math>\geq</math> 90mmHg and patient is tolerating amlodipine well, increase dose to 10mg/day.</li> <li>• If the patient is tolerating amlodipine but has mild edema, continue to drink amlodipine 5mg/day and add HCTZ 12.5mg/day.</li> <li>• If the patient is not tolerating amlodipine, change to HCTZ 12.5mg/day.</li> </ul> <p><b>Note:</b> Good adherence should be ensured first before changing the treatment plan.</p> <p><b>Step 4: After one month</b></p> <ul style="list-style-type: none"> <li>• If SBP &lt;140mmHg, continue treatment.</li> <li>• If SBP <math>\geq</math>140-159mmHg, continue treatment and follow-up in one month.</li> </ul> <p><b>Step 5: After one month</b></p> <ul style="list-style-type: none"> <li>• If SBP <math>\geq</math>160mmHg <b>and/or</b> DBP <math>\geq</math>100mmHg refer the patient to referral hospital.</li> </ul> <p><b>Note:</b> Continue the treatment until the patient can go to the referral hospital.</p>

<p><b>SPB<math>\geq</math>160</b></p> <p>or</p> <p><b>DBP <math>\geq</math>100</b></p>	<p><b>Start drug therapy:</b></p> <ul style="list-style-type: none"> <li>• Amlodipine 10mg/day or</li> <li>• Amlodipine 5mg/day + HCTZ 12.5mg/day.</li> <li>• Follow-up in one month</li> </ul> <p><b>Note:</b> Refer to referral hospital if the patient has:</p> <ul style="list-style-type: none"> <li>▪ CVD risk &gt;30%</li> <li>▪ established CVD</li> <li>▪ renal disease</li> <li>▪ type 1 diabetes</li> <li>▪ gestational diabetes</li> <li>▪ target organ damage (dyspnea, angina, palpitation, severe headache, hemiplegia, facial paraplegia...)</li> </ul> <p><b>After one month:</b></p> <ul style="list-style-type: none"> <li>• If SBP &lt;140mmHg, prescribe drugs for 1-3 months.</li> <li>• If SBP <math>\geq</math>140-159mmHg, continue treatment and follow-up in one month.</li> <li>• If SBP <math>\geq</math>160mmHg <b>and/or</b> DBP <math>\geq</math>100mmHg, refer the patient to referral hospital.</li> <li>• Continue the treatment until the patient can go to the referral hospital.</li> </ul>
<p><b>SBP <math>\geq</math>180</b></p> <p>or</p> <p><b>DPB <math>\geq</math>110</b></p>	<ul style="list-style-type: none"> <li>• <b>Refer to referral hospital.</b></li> </ul>

**Table 9: Core list of antihypertensive drugs for health center:**

Drug type (Generic name)	Dose per day		Contraindications
	Initial	Maximum	
Calcium channel blocker (CCB): <b>Amlodipine</b>	5 mg	10 mg	Recent myocardial infarction
Diuretic: <b>Hydrochlorothiazide (HCTZ)</b>	12.5 mg	25 mg	Gout (hyperuricemia)

Beta-blocker: <b>Atenolol</b>	50 mg	100 mg	Asthma, AV- block
Angiotensin converting enzyme (ACE) inhibitor: <b>Enalapril</b>	2.5 mg	2.5 mg	Pregnancy Angioneurotic edema Hyperkalaemia Bilateral renal artery stenosis

**a. Follow-up of a hypertension patient:**

- The goal for BP treatment is SBP < 140 mm Hg and DBP <90 mmHg.
- For patients with diabetes or proteinuria and renal disease, the goal is SBP <130 mmHg and DBP <80 mmHg.
- When the blood pressure is at the goal level, organize a follow-up visit of the patients and prescribe medicines every 2 to 4 weeks.
- Blood pressure should be measured whenever patients visit the health center.
- **Advise the patient to contact health services, if**
  - The patient gets new symptoms, particularly those related to heart, brain or kidney diseases.
  - Blood pressure is higher than the target level in repeated measurements.

**b. Treatment targets:**

- For most patients, blood pressure is controlled when **SBP <140 mmHg and DBP <90 mmHg.**
- However, for patients with diabetes or a high risk of CVD, **recommend lower targets: SBP <130 mmHg and DBP <80 mmHg.**

**c. Referral:**

The following patients must be referred to the NCD Unit:

1. Hypertension: SBP>180 mmHg or/and DPB>110 mmHg
2. Hypertensive emergency: SBP>180 mmHg or/and DPB>110 mmHg with TOD (kidney disease, heart disease, stroke or TIA): **Need urgent referral.**
3. Pregnant women with hypertension
4. Blood pressure cannot be controlled by the two drugs available in health center: Amlodipine (max 10mg/day) and HCTZ (max 12.5 mg/day)
5. Young adult (below 40 years) hypertension patient.

**d. Treatment adherence:**

Adherence to treatment is critical for blood pressure control. If antihypertensive medication is being prescribed, the following are critical to ensuring adherence:

- Teach the patient how to take the medications at home.
- Explain the difference between medicines for long-term control (for example, of blood pressure) and medicines for quick relief (such as for headaches)
- Explain the reason for prescribing the medicine(s)

- Explain the diagnosis of hypertension.
- Discuss the asymptomatic nature of hypertension and explain that medications must be taken even if there are no symptoms.
- Inform patient of the complications of untreated hypertension, including stroke, heart attack, kidney failure
- Explain the disability and economic, and family burden these preventable complications cause.
- Show the patient the appropriate dose.
- Explain how many times a day the patient should take the medication and at what time, and adopt the following simple steps to help them to adhere to the guidelines:
  - Label and package the tablets.
  - Check the patient's understanding before the patient leaves the health center.
  - Wherever possible, use once-daily dosages of all medications, to be given at the same time each day.
- Explain how important it is for the patient to:
  - Keep an adequate supply of medications safely at home.
  - Take the medicines regularly as advised, even if there are no symptoms.
- Explain potential adverse effects of the medications and what to do if the patient experiences them.

## 5.5 Diagnosis and Management of Type 2 Diabetes

Diabetes is a chronic disease caused by a metabolic disorder characterized by prolonged high blood sugar level damaging the heart, blood vessels, eyes, kidneys and nerves. The disease requires lifelong treatment.

According to “WHO Diagnosis and Management of Type 2 Diabetes Guideline 2020”, diagnosis of diabetes is made by using Glucometer (point of care device/finger stick) to measure capillary plasma glucose (FPG or RPG) considering other diagnostic tests such as HbA<sub>1c</sub> and 2-hour plasma glucose test is costly and not currently available at health center.

Therefore, HCs are permitted to diagnose diabetes by using Glucometer and initiate treatment of diabetes without complications (for HC with medical doctor). The HC staff will be trained to diagnose and treat diabetes patients without complications.

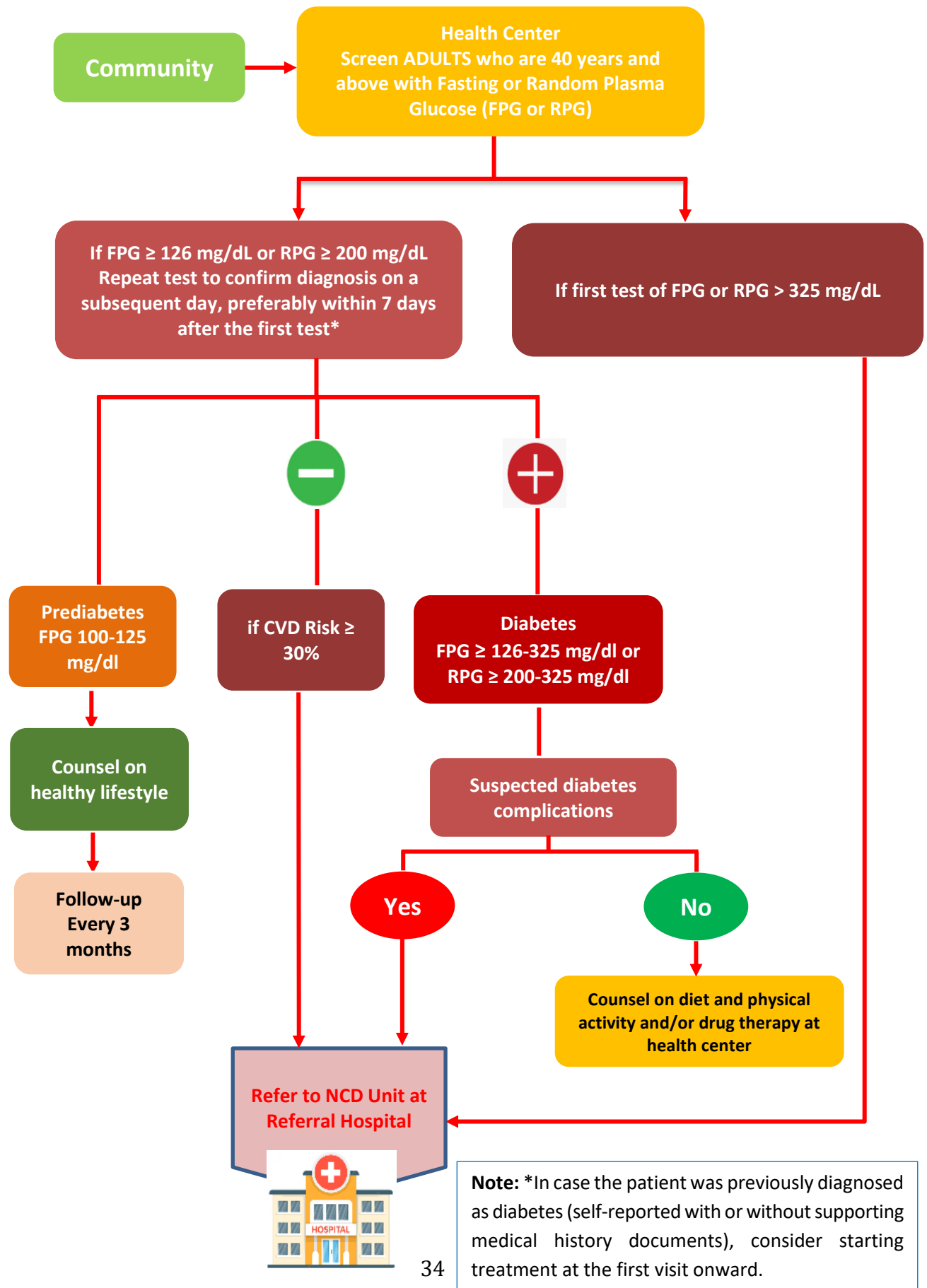
**Table 10: How to make diagnosis of diabetes at health center level:**

Diagnosis of diabetes at health center is based on values of plasma glucose as follows:

Test	Test condition	Cut-off	Diagnosis criteria
<b>Fasting Plasma Glucose (FPG)</b>	FPG is done after the patient doesn't eat or drink anything (no caloric intake) for at least 8 hours but can drink water.	<100 mg/dl	Normal
		<b>100-125 mg/dl</b>	<b>Impaired fasting glucose (Prediabetes)</b>
		<b>≥ 126 mg/dl</b>	<b>Diabetes</b>
<b>Random Plasma Glucose (RPG)</b>	RPG test can be done at any time. It doesn't matter when the patient last ate. Patients with classic symptoms of diabetes (polydipsia, polyuria, unexplained weight loss)	<b>≥ 200 mg/dl</b>	<b>Diabetes</b>



**Figure 3: Overview of Diabetes Screening and Management in Primary Care**



## ❖ **Non-pharmacological management:**

Effective management of type 2 diabetes cannot be achieved without proper attention to diet and nutrition. These include healthy eating, being physically active, quitting smoking and stopping harmful use of alcohol.

A healthy diet to achieve or maintain normal body weight and regular physical activity are the mainstay of diabetes management.

- People with diabetes should be advised to eat a healthy balanced diet that is applicable to the general population.
- Overweight patients should be advised to reduce weight by reducing their food (calorie) intake.
- All patients should be advised to practice regular daily physical activity appropriate for their physical capabilities (e.g. walking). Most adults should engage in at least 150 minutes of moderate or vigorous-intensity aerobic activity per week, spread over at least 3 days.
- All patients should be advised on avoidance of tobacco use and harmful use of alcohol.

## **Principles of nutrition in diabetes patients:**

- Nutrition is an integral part of the management of diabetes.
- The goals of nutritional management are to achieve and maintain optimal blood glucose levels, reduce cardiovascular risk factors, including dyslipidemia and hypertension and provide a balanced, nutritional diet.
- **All diabetic and pre-diabetic patients should receive individual counseling on healthy eating:**
  - Generally, it is recommended that **50–60% of total caloric intake** should be **carbohydrates, 15–20% protein and 25% fat**.
  - However, the proportion of each nutrition group can be individualized depending on the patient's eating habits, preference and goal of treatment.
  - **For carbohydrates, a low glycemic index is preferred.**
  - **Carbohydrates** include grains, beans, fruit, vegetables and dairy products. Some carbohydrates like polished rice increase the glucose level very quickly, others are slower acting and do not cause the blood glucose to rise so much, for examples brown rice, grains, beans, most vegetables except potatoes, tofu.

- Try and replace white rice with slower absorbed carbohydrates and increase protein in the diet.
  - Patients can see how particular foods influence their sugar levels themselves if they measure their blood sugar level before and 2 hours after they start eating a meal.
  - **This is an excellent way for people to understand how different foods can affect their glucose control.**
  - Try and spread the carbohydrates throughout the day by having smaller portions at each meal and snacks between if necessary.
- Foods high in unsaturated fats are recommended, while saturated fats or trans-fats are not recommended.

### Patient education:

- For diabetic patients, healthy eating does not mean restricting certain types of food.
- Plan a healthy, balanced meal, eat regularly and consume a proper number of calories:
  - **Eating balanced meals is important:** The food exchange table divides food into six categories: carbohydrates, proteins, vegetables, fats, dairy and fruit. It is important to eat a wide variety of food groups, and to eat different foods in the same group.
  - **Eat a reasonable number of calories:** Reduce the amount of your main source of carbohydrates to two thirds. Every person differs in their physical state and activity level. Therefore, the optimal amount of calorie intake depends on the individual. If you overeat, blood sugar levels rise abnormally, while skipping a meal result in hypoglycemia. If you are overweight, you can reduce your total caloric intake by reducing the amount of rice, bread, and meat on your plate. For example, 600 kcal meal plans is for a person consuming a total of 1800 kcal per day. If reducing a full bowl of rice by one third will result in 500 kcal per meal, and 1500 kcal per day.
  - **Eat regularly at the right time** (do not skip meals to keep your blood sugar level down): Eat 3–5 times a day, at set times. Take your time and eat **slowly** at regular mealtimes. First, eat three meals every day at the same time. Many people, especially busy professionals, tend to skip breakfast and eat excessively during lunch or dinner. However, you should be aware that overeating raises blood sugar levels. It is important to eat breakfast, lunch and dinner every day. It is recommended that snacks be taken at least two hours after a meal, when blood sugar level is no longer increasing.

## How many calories does a patient need a day?

There are 3 steps that will be followed to know how many calories a day are needed for everyone. These include (1)- calculate body mass index (BMI), (2)- know physical activity level, and (3)- calculate daily calorie intake based on body mass index and physical activity.

### Step 1: Calculate BMI

Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. People who are obese are at increased risk for noncommunicable diseases such as hypertension, type 2 diabetes and even some cancers.

$$\text{BMI} = \text{Weight (kg)} / [\text{Height (m)}]^2$$

### Step 2: Understand physical activity level

Healthy caloric intake differs depending on how intense your regular physical activities are.

- If you are an office worker in an urban area not engaged in regular physical activities, your physical activity level is sedentary.
- If you are an office worker who occasionally performs exercise, your physical activity level is moderately active.
- If you are a construction worker or an office worker who exercises vigorously for an hour every day, you are categorized as vigorously active.

Category	Example
Sedentary/Lightly active	Office workers who do <b>not exercise regularly</b> or who only <b>occasionally</b> engage in physically demanding activities
Active/Moderately active	Construction workers or office workers who perform 1 hour of <b>moderate to vigorous</b> exercise <b>daily</b> such as jogging/cycling
Vigorous/Vigorously active	Non-mechanized agricultural laborers or people with non-sedentary occupations who engage in <b>strenuous activities</b> such as swimming/dancing an average of two hours <b>daily</b>

### Step 3: Calculate daily calorie intake

➤ For male:

If BMI= 18.5-25 kg/m<sup>2</sup>, apply equation as follows:

$$[661.8 - (9.53 \times \text{Age})] + [A \times 1 \text{ if sedentary}]$$

$$[661.8 - (9.53 \times \text{Age})] + [A \times 1.11 \text{ if moderately active}]$$

$$[661.8 - (9.53 \times \text{Age})] + [A \times 1.25 \text{ active}]$$

Note: A = 15.91 × weight (kg) + 539.6 × height (m)

**If BMI= 25 kg/m<sup>2</sup> and over**, apply equation as follows:

$$[1085.6 - (10.08 \times \text{Age})] + [B \times 1 \text{ if sedentary}]$$

$$[1085.6 - (10.08 \times \text{Age})] + [B \times 1.12 \text{ if moderately active}]$$

$$[1085.6 - (10.08 \times \text{Age})] + [B \times 1.29 \text{ if active}]$$

Note:  $B = 13.7 \times \text{weight (kg)} + 416 \times \text{height (m)}$

➤ **For female:**

**If BMI= 18.5-25 kg/m<sup>2</sup>**, apply equation as follows:

$$[354.1 - (6.91 \times \text{Age})] + [C \times 1 \text{ if sedentary}]$$

$$[354.1 - (6.91 \times \text{Age})] + [C \times 1.12 \text{ if moderately active}]$$

$$[354.1 - (6.91 \times \text{Age})] + [C \times 1.27 \text{ if active}]$$

Note:  $C = 9.36 \times \text{weight (kg)} + 726 \times \text{height (m)}$

**If BMI= 25 kg/m<sup>2</sup> and over**, apply equation as follows:

$$[447.6 - (7.95 \times \text{Age})] + [D \times 1 \text{ if sedentary}]$$

$$[447.6 - (7.95 \times \text{Age})] + [D \times 1.16 \text{ if moderately active}]$$

$$[447.6 - (7.95 \times \text{Age})] + [D \times 1.27 \text{ if active}]$$

Note:  $D = 11.4 \times \text{weight (kg)} + 619 \times \text{height (m)}$

**For example:**

If you are a 30-year-old male whose BMI is 22.5, first, put your age into the first part of the equation:  $661.8 - 9.53 \times 30 = 375.9$

Next, choose the best category that matches your daily physical activity patterns in the second part of the equation. If you work in an office and do not engage in any regular physical activity, the second part of the equation will be:  $1951.5 \times 1 = 1951.5$

You can add these two values to estimate your recommended daily calorie intake:  $375.9 + 1951.5 = 2327.4$  kcal/day. This calculation is based on a fixed weight and height (1.70 m and 65.0 kg for males; 1.60 m and 60.0 kg for female).

If you want to calculate your exact recommended daily calorie intake based on your own weight and height, ask your health provider for additional information.

According to the IOM report on dietary report, the recommended caloric intake is calculated based on hypothetically fixed weight and height and may vary by individual. The table shows

examples of how much the recommended caloric intake would be according to gender, age group, BMI and physical activity level:

Male	BMI: 18.5–25 kg/m <sup>2</sup>			BMI: >25 kg/m <sup>2</sup>		
	Physical activity level			Physical activity level		
Age (years)	Sedentary	Moderately active	Vigorously active	Sedentary	Moderately active	Vigorously active
30-39	2330	2540	2820	2590	2800	3110
40-49	2230	2450	2720	2490	2700	3010
50-59	2140	2350	2620	2380	2600	2910
60-69	2040	2260	2530	2280	2500	2810
70+	1950	2160	2430	2180	2400	2710

Female	BMI: 18.5–25 kg/m <sup>2</sup>			BMI: >25 kg/m <sup>2</sup>		
	Physical activity level			Physical activity level		
Age (years)	Sedentary	Moderately active	Vigorously active	Sedentary	Moderately active	Vigorously active
30-39	1870	2080	2340	1930	2210	2400
40-49	1800	2010	2270	1850	2130	2320
50-59	1730	1940	2200	1770	2050	2240
60-69	1660	1870	2130	1690	1970	2160
70+	1590	1800	2060	1610	1890	2080

In summary, a healthy diet helps protect against malnutrition in all its forms, as well as noncommunicable diseases, including diabetes, cardiovascular disease, stroke and cancer.

### Some tips for a healthy diet are as follows:

- **Eat a variety of foods.**

Eating a variety of foods every day helps to obtain the right amounts of essential nutrients. Eat plenty of iron-rich foods such as meat, eggs, liver, oysters, clams, anchovy, shrimps, salmon and tuna. Choose white meat, such as poultry, and fish, which are both generally low in fats, over red meat. Avoid processed meats because these are high in fat and salt.

Eating a healthy balanced diet is important for healthier and more active lives. Meat, poultry and fish in the diet improves iron absorption and prevents anemia. However, people who eat too much processed foods, which are high in saturated fat and trans-fat, are at higher risk of heart disease and stroke.

- **Eat plenty of vegetables and fruits at least 400 g (5 handfuls) of fruits and vegetables a day.**

Eat more vegetables and fruits by always including vegetables in your meals; eating fresh fruits and raw vegetables as snacks; eating fresh local fruits and vegetables in season; and adding fruits and vegetables of at least three colors to your plate, such as red, yellow, green, purple and white.

Vegetables and fruits are important sources of vitamins, minerals, dietary fiber, plant protein and antioxidants. People whose diets are rich in vegetables and fruit have a significantly lower risk of obesity, heart disease, stroke, diabetes and certain types of cancer.

- **Eat moderate amounts of fats and oils; and eat less sugar and salt.**

Eat less than 67 g (19 teaspoons) of total fats and oils a day (**One teaspoon** holds about **3.5 g** of oil). Reduce fat intake by choosing healthier cooking oils, such as sunflowers, canola, olive oil; removing visible fats from all types of meat; boiling, steaming or baking rather than frying; avoiding foods high in saturated fats, such as cheese, ice cream and fatty meat; and choosing foods high in unsaturated fats (for example, salmon, fish, avocados, natural peanut butter and nuts).

Fats and oils are concentrated sources of energy, and eating too much fat, particularly the wrong kinds of fat (saturate fat and trans-fat), can be harmful to health.

Evidence indicates that total fat should not exceed 30% of total energy intake to avoid unhealthy weight gain, with a shift in fat consumption away from saturated fats to unsaturated fats, and towards the elimination of industrial trans-fats.

Eat less than 50 g (12 teaspoons) of sugars a day. Reducing sugar intake can help prevent overweight, obesity and related diseases such as cardiovascular disease and type 2 diabetes. This can also reduce the risk of dental caries and other dental diseases. Reduce the amount of sugar intake by: watching out for hidden sugars in processed foods and drinks, such as breads, sauces, dressing, soups and alcohol; choosing water and limiting intake of soft drinks or soda and other drinks that are high in sugar, such as fruit juices, cordials and syrup, flavored milks and yogurt drinks; and choosing fresh fruits instead of sweet snacks, such as cookies, cakes and chocolates.

Sugar is one of the main contributors to excess calories in a diet. People whose diets are high in sugar have a greater risk of becoming overweight or obese, and an increased risk of tooth decay. People who reduce the number of sugars in their diet may also reduce their risk of

noncommunicable diseases, such as heart disease and stroke. Limiting the intake of free sugar to less than 10% of total energy intake is part of a healthy diet. A further

reduction to less than 5% of total energy intake is suggested for additional health benefits.

Eat less than 5 g of salt (2 g sodium/1 teaspoon) a day. Limiting salt (sodium) can help reduce the risk of hypertension, which in turn reduces the risk of cardiovascular disease and stroke. People whose diets are high in sodium (including salt) have a greater risk of high blood pressure, which can increase their risk of cardiovascular disease and stroke. Reduce your salt intake by using herbs, and other flavors (e.g. lemon juice and pepper) instead of salt, soy sauce or fish sauce for seasoning; choosing fresh food rather than processed foods; and removing the saltshaker from the dining table. Limit intake of prahok, MSG, fish sauce, soy sauce and salted meat or fish.

❖ **How to measure serving size in real life:** You can use your hand to estimate serving size as follows:

**A FIST** = 1 serving of cooked rice  
= 1 serving of cooked noodle  
= 1 serving of fruit/vegetables

**A PALM**= 1 serving of lean meat  
= 1 serving of fish

**THUMB TIP**= 1 teaspoon

**3× THUMB**= 1 tablespoon (= 3 teaspoons)

### **Principles of physical activity in diabetes patients:**

Effects of physical activity on patients with diabetes are to help maintain healthy body weight, decrease risk factors (such as reduce blood pressure, blood cholesterol levels and enable better blood sugar level control), prevent diabetes complications, and improve quality of life and relieve stress.

Before providing education on physical activity to patients with diabetes, health professional or diabetes educator should know if the patients have the following:

- Cardiovascular disease
- Bone or joint diseases that will be worsened by physical activity.
- Pain in your chest when doing any activity.
- Dizziness
- Aged over 65 and have not done any intense activity recently.
- Uncontrollable hypertension
- Any other physical problems that prevent from exercising.



## **Principles of physical activity in patients with diabetes:**

It is recommended to start exercising at low intensity, for a short duration. Gradually increasing the intensity and duration of exercise is important. If there is any reason to restrict physical activity (uncontrolled hypertension, severe autonomic nerve dysfunction, severe peripheral neuropathy, history of foot problems, severe proliferative retinopathy), light to moderate intensity physical activity is recommended.

## **Types of physical activity:**

There are two kinds of physical activity: aerobics and muscle-strengthening.

- Aerobic exercises include walking, swimming and cycling.
- Muscle-strengthening exercises include weight-bearing exercises such as weightlifting and dumbbells. If the patient does not have uncontrolled diabetes or severe complications, it is recommended to conduct muscle-strengthening exercises like any healthy adult.

## **Moderate-intensity aerobic physical activity:**

- It means while doing physical activity, people can talk while I do them, but they cannot sing. People breathe harder than usual. For example, they are doing brisk walking, hand mopping, and other leisure activities such as badminton, cycling, and swimming.
- It is recommended to do at least 30 minutes of moderate-intensity aerobic exercise a day, 5–7 days a week.
- Alternatively, you may do 150 minutes of moderate-intensity aerobic exercise a week.
- Do not rest for more than two consecutive days.

## **Vigorous-intensity aerobic physical activity:**

- It means while doing physical activity, people can only say a few words without stopping to catch my breath. For example, they are doing Jogging/running, playing football, basketball/tennis, digging with a shovel.
- The simplest way to describe the intensity of physical activity is how hard it is to breathe. How much you sweat is not a good indicator since sweating depends on other factors, such as temperature, humidity and the individual. Heart rate and pulse rate can also be used to know if it is vigorous-intensity aerobic physical activity, but they can be difficult to use.
- One minute of vigorous-intensity aerobic physical activity is equivalent to two minutes of moderate-intensity aerobic physical activity.
- It is recommended to do at least 75 minutes per week.

## **Muscle-strengthening exercises:**

- Muscle-strengthening exercises enhance body flexibility, reducing the risk of injury during exercise. It also increases the basal metabolic rate, thus helping with weight control.
- Types of muscle-strengthening exercises include lifting weights, dumbbell exercises, pull-up bar, sit-ups, pushups, lifting objects, weight training equipment in gyms, and resistance bands.
- Muscle-strengthening activities should be done two to four days a week.
- If these exercises are done every day, there is a higher risk of injury, and insufficient recovery time for minor muscle injuries sustained in the course of weight-bearing exercise.
- Do some types of muscle-strengthening exercise at least two days per week, using 8–10 major muscles.
- Repeat each move 8–12 times per set, repeat sets once or twice.
- Free weights such as dumbbells, weights, resistance bands, or medicine balls and weight training equipment can be used.

## **Physical activity for 65+ year old patients:**

- If you are fit enough, do physical activities just as a healthy adult would. Include exercises that enhance body balance and prevent falls, three times a week.
- Examples of balance exercises are standing on one foot, standing on heels, standing with eyes closed, or standing on a sloped surface.
- Lower extremity and flexibility exercises are needed to prevent falls.
- Adjust to your current physical status.

## **What can patients do if they have high blood sugar?**

High blood sugar itself is generally not a contraindication of physical activity.

- High blood sugar can be a problem for patients with diabetes.
- Patients can exercise if you do not have any accompanying symptoms or ketosis. When they cannot take their insulin injections according to the regular schedule, ketones can accumulate in your body.
- When patients are not feeling well or urine and/or blood ketones are positive, avoid vigorous physical activity.
- A high blood sugar level does not mean you cannot exercise. They can do moderate exercises, such as walking or brisk walking. However, if they have ketosis, avoid vigorous physical activity.

- If patients are on insulin, or prescribed medications that put them at greater risk of hypoglycemia. Eat biscuits, yoghurt or sweetened drinks before exercising if your blood sugar level is under 100 mg/dl.

### **Beware of hypoglycemia (low blood sugar):**

- Those on insulin injections may experience hypoglycemia while exercising.
- Inform patients to check their blood sugar level before and after exercise to see how it changes.
- If the patient is at high risk of hypoglycemia, educate how to reduce the dose of insulin/medication or eat a light snack before exercise.
- If the patient's glucose level is lower than 100mg/dL (or 5.5 mmol/L) before starting exercise, it is safe to eat a light snack to prevent blood sugar from falling too low.

### **Warm-up and cold-down exercises:**

Warm-up and cool-down exercises are done before and after the main exercise, at half the intensity of the main exercise. Stretching should be included to enhance body flexibility and to prevent injury.

**Absolute contraindications:** heart disease, and acute infectious disease: high fever, and pain

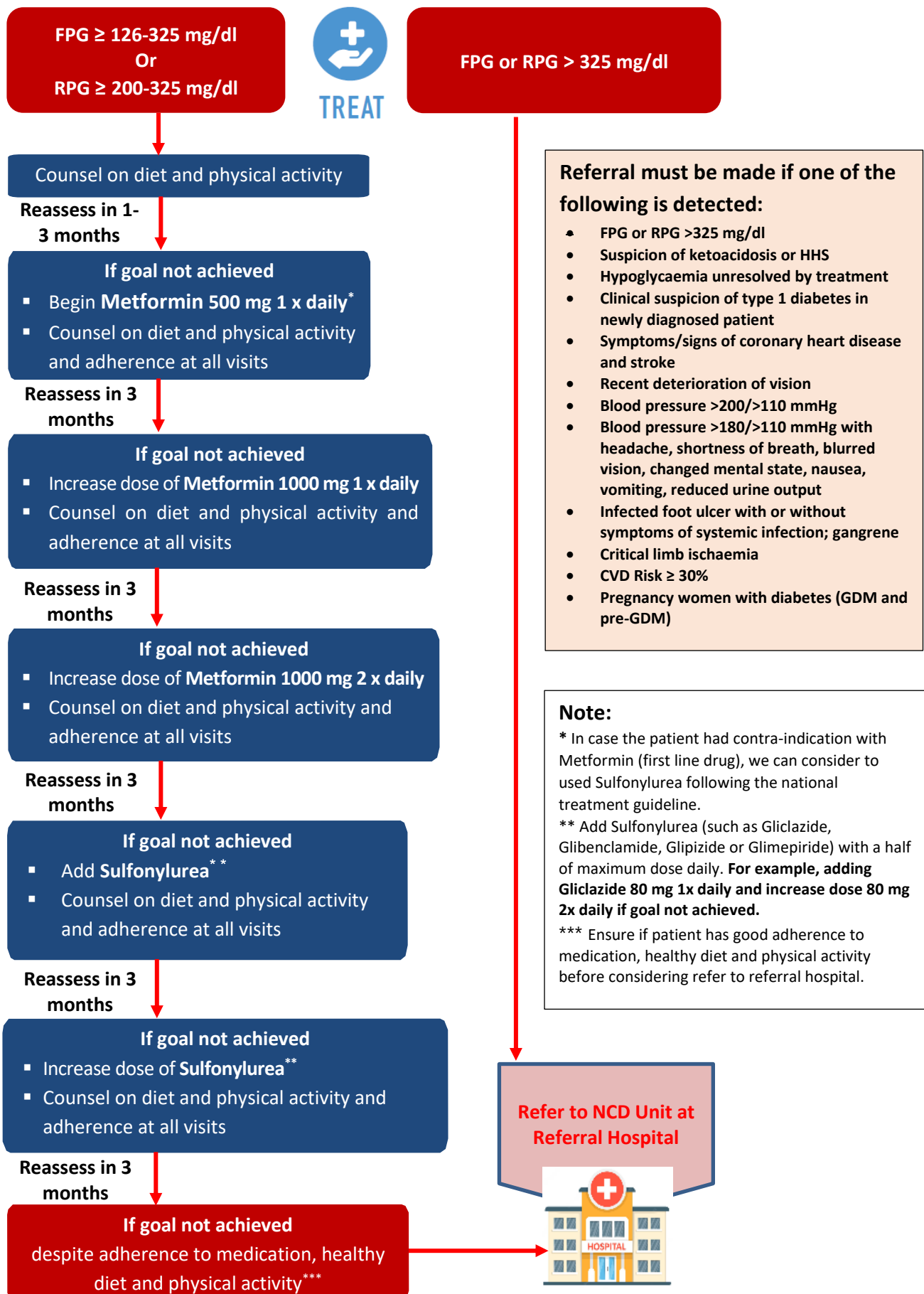
**Relative contraindications:** Other heart disease, blood pressure over 180/110 mmHg, severe physical or mental disability.

In summary, exercise time and intensity may vary depending on what type of physical activity you choose to do. First of all, you will start with a 5–20-minute light warm up, such as stretching or walking slowly. For the main exercise, a combination of aerobic and muscle-strengthening exercises is recommended. Between 20–40 minutes of aerobic exercise followed by 20–30 minutes of muscle strengthening is ideal. To end your exercise schedule, stretch the muscles you used for about 10 minutes.

### **❖ Pharmacological management:**

- Metformin does not cause weight gain or hypoglycaemia and is the recommended initial treatment for people who do not achieve the desired glycaemic control with diet and physical activity. Increase the dosage gradually according to the diabetes protocol.
- A second-generation sulfonylurea (preferably gliclazide) can be used as initial (first- line) treatment when metformin is contraindicated or not tolerated (see Flow chart 2). Sulfonylurea may cause weight gain or hypoglycemia.
- Other pharmacological agents have not been shown to be superior to metformin or sulfonylurea for glycaemic control and long-term outcomes as initial treatment.

## Flow chart 1: Type 2 Diabetes Management at Health Center



**Referral must be made if one of the following is detected:**

- FPG or RPG >325 mg/dl
- Suspicion of ketoacidosis or HHS
- Hypoglycaemia unresolved by treatment
- Clinical suspicion of type 1 diabetes in newly diagnosed patient
- Symptoms/signs of coronary heart disease and stroke
- Recent deterioration of vision
- Blood pressure >200/>110 mmHg
- Blood pressure >180/>110 mmHg with headache, shortness of breath, blurred vision, changed mental state, nausea, vomiting, reduced urine output
- Infected foot ulcer with or without symptoms of systemic infection; gangrene
- Critical limb ischaemia
- CVD Risk  $\geq$  30%
- Pregnancy women with diabetes (GDM and pre-GDM)

**Table 11: Core list of antidiabetic drugs at health center**

Hypoglycemic drugs	Drug	Daily dosage
<b>Metformin</b>	Metformin 500mg	<i>Starting at 0.5 g increasing to 1 g three times daily with or after meals.</i>
<b>Sulfonylurea</b>	Gliclazide 80 mg	<i>Starting at 40 mg increasing to 320 mg daily. Frequency of administration is 2 times daily with or after meals.</i>
	Glibenclamide 5 mg	<i>Starting at 2.5-5 mg once daily before meals and adjusted according to response to a maximum of 20 mg daily. The frequency of administration is 2 times daily with or after meals.</i>
	Glipizide 5mg	<i>Start at 5 mg once daily before meals and adjust according to response to a maximum dose of 20 mg per day. The frequency of use is 2 times daily with or after meals.</i>
	Glimepiride 2mg	<i>Start at 1 mg and increase according to the response to the maximum dose of 6 mg/day. The frequency of use is 1-2 times daily with or after meals.</i>
<b>Insulin</b>	Intermediate-acting insulin (NPH)	<i>Start with 10 units intermediate-acting insulin (NPH) at bedtime and continue increasing dosage by 1-2 units at 3-day intervals until FBG control. Do not</i>

		<i>increase insulin if nocturnal hypoglycaemia occurs.</i>
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### ❖ Follow-up:

- **When antidiabetic drug treatment has started, it is a life-long treatment. Drug treatment for diabetes is never only a few days or weeks!**
- **At every follow-up visit of DM patients, HC staff provide continuum of care as follows:**
  - **Prescribe antidiabetic drug for patients without complications for 2-4 weeks.**
  - Provide lifestyle modification advice including adherence to treatment.
  - Perform basic clinical examination: weight and height including BMI, waist circumference, **blood pressure**, and foot examination.
  - **Assess and manage CVD risk to prevent heart attack and stroke.**
  - Advise patients to see HC staff frequently during initial visit depending on blood glucose level and if taking insulin.
  - Advise patients to contact health center when needed.
  - FPG or RPG test needs to be done every follow-up visit.
  - Follow up other laboratory tests at RH every 3-6 months depending on clinical condition of the patients.
- **Monitoring patients to reach treatment target:**  
 HC staff should monitor blood glucose values of “follow-up patient” at every visit to know if target of glycemic control is reached. Blood glucose values closer to normal substantially reduce the risk of microvascular complications. Meanwhile, the HC staff should also pay attention of a potentially dangerous hypoglycemia if patient has tight blood glucose control.

Setting treatment target for glycemic control can be made based on individual patient. In this regard, HC staff should seek advice from experts at NCD unit in RH if needed, noting that patients with a short life expectancy and those with advanced complications or serious co-morbidities are unlikely to benefit from efforts to achieve near-normal glycaemia.

- Most patients can expect to aim for an HbA1c of 7%. The HbA1c target can be relaxed (e.g. to <8%) in people with frequent severe hypoglycemia, advanced complications or low life-expectancy.
- Patients treated with diet, physical activity and metformin (very low risk of hypoglycemia) should be encouraged to achieve a lower HbA1c target.

- Glycated hemoglobin (HbA1c) is commonly used in clinical practice to monitor glycemic control, as it provides a measure of average plasma glucose over the preceding 8 to 12 weeks.
- If HbA1c is not available:
  - Fasting plasma glucose (FPG) values can be used to assess glycemic control and inform treatment.
  - More informative is a combination of FPG and postprandial plasma glucose (2 hours after breakfast).
  - Most informative is a glucose profile with several pre- and postprandial measurements throughout the day.
  - The least informative is random plasma glucose (RPG).

**Table 12: Target for glycemic control in diabetes patient**

Parameter	Targets
FPG	<b>80-130 mg/dl</b>
2 hours postprandial PG	<b>&lt;180 mg/dl</b>
HbA1c	<b>&lt;7%</b>
BP	<b>&lt;130/80 mmHg</b>
Smoking	None
Physical activity	150 min/week
Body weight	Normal

- **Self-management education:**
  - Diabetes self-management education improves metabolic control of the disease, motivation, and self-image of the patient.
  - People with type 2 diabetes should know the nature of their disease:
    - A lifelong disorder
    - regular controls are needed
    - Complications can be avoided through lifestyle and other treatments.
    - importance of lifestyles as core part of treatment
    - symptoms, particularly hypoglycemia if the patient is taking insulin or sulfonylurea.
    - complications, and how to prevent them.
    - importance of foot care
    - how to use medicines, self-monitoring (to be encouraged)
    - interactions between food, physical activity and medicines
    - How to cope with emergencies and need to seek medical care in case of hypoglycemia, infections, and complications

**❖ Screening for diabetes complications:**

- **Measure blood pressure at every scheduled visit and review medication as per hypertension protocol.**
- **Refer to RH for dilated-pupil retinal exam upon diagnosis, and every two years thereafter, or as per ophthalmologist recommendation.**
- **Examine feet for ulcers at every visit and refer to RH if ulcer is present.**
- **Assess the risk of lower limb amputation annually (foot pulses, sensory neuropathy by monofilament, presence of healed or open ulcers, calluses) and refer to RH if ulcer present or pulse absent.**
- **Test for proteinuria annually and refer to RH if positive.**

### ❖ **Treatment Adherence:**

HC nurses play very important roles in the treatment of diabetes patients once people have been diagnosed as diabetes and started treatment. **The treatment adherence is focused on both non-pharmacologic and pharmacological management.**

Nurses must ensure treatment adherence through the following:

- Explain the diagnosis of diabetes.
- Inform patient of the complications of untreated diabetes.
- Discuss the possible symptoms of diabetes.
- Show the patient the appropriate dose.
- Prescribe once-daily medications, less expensive generics, and longer-lasting supplies of medicine whenever possible.
- Explain potential adverse effects of the medications and what to do if the patient experiences them.
- Explain how many times a day the patient should take the medication and at what time, and adopt the following simple steps to help them adhere to the guidelines:
  - Label and package the tablets.
  - Check the patient's understanding before the patient leaves the HC.
- Explain to patient how important it is to:
  - Keep an adequate supply of medications safely at home.
  - Take the medicine regularly as advised, even if there are no symptoms.
  - Provide tools such as pill boxes and medication logs to help patients remember to take their medications.
- Assess adherence and discuss barriers at every visit.



## 6. Linkage with other programs

An organized and integrated health system is necessary to deliver optimal diabetes and hypertension care. Relatively simple measures can be implemented, including standard protocols and clear referral pathways between different healthcare providers and different levels of care. Any existing collaborative frameworks with other health programs should be implemented and strengthened. For example, there is an existing collaborative arrangement for active bi-directional screening between TB and diabetes.

In Cambodia, diabetes and hypertension management has been linked and integrated with the management of other programs such as Tuberculosis, HIV/AIDS, Hepatitis C, MCH, and Mental Health. Diabetes is frequently comorbid with a range of other diseases and conditions, the interactions of which impact its management. In addition to cardiovascular disease, aging-related conditions such as cognitive and functional decline and physical disability have emerged as frequent comorbid conditions with diabetes. Cambodia is experiencing an epidemiological transition characterized by the co-existence of established infectious diseases (HIV/AIDS, and TB) alongside emerging NCD epidemics. Some of these diseases interact, mediated by shared risk factors, and their management may be complicated by drug interactions.

## 7. Monitoring and Evaluation

### 7.1 Monitoring

A standard monitoring checklist will be used for monitoring to ensure functioning and effective NCD services (see Annex 11)

#### 7.1.1 Health Center Level

- a. The Chief of HC together with nurses and midwives who implement PEN program should review the progress on community engagement activities, coverage of screening and treatment services on a weekly basis to ensure that they will reach target set by the MoH. In particular, the target shall screen 50% of the population aged 40 years and above by 30 June 2027, under H-EQIP Phase 2 project.
- b. HC should conduct a monthly meeting with VHSG under the leadership of the chair of HCMC to discuss progress and challenges on the implementation of PEN program as well as other essential health services, need for strong support from them, and to set targets and activities for improving service coverage in the coming months. HC should also report about this implementation progress during the monthly meeting to OD level, and at the Commune Council Offices and seek support from concerned entities to support community mobilization as well.

- c. To reach the target set for screening coverage, HC should screen at least 50 peoples aged 40 and above per month for hypertension, diabetes and CVD risk.

### **7.1.2 Operational District Level**

- a. OD should conduct data analysis and make a breakdown analysis by HC monthly to review progress on implementation of PEN program and bring the findings from this review to discuss with HCs during the monthly supportive supervision and during the routine monthly meeting at OD offices.
- b. OD should conduct supportive supervision to every HC and RH monthly to observe operation and discuss service coverage; technical, operational and logistic aspects and community engagement activities as well as problem solving for ensuring that implementation will be progressing well. OD should coach HC staff on technical knowledge on screening, treatment, data entry in EMR system, and guide them to work with VHSG for improving community education and mobilization as well as support for referral.
- c. Every OD should include the review and discussion on implementation progress of NCD services as well as other essential health services in the routine monthly meeting at OD Offices. In addition, OD should report progress on implementation of PEN program along with other essential health services during the monthly meeting at the district governor offices and seek support from concerned departments for improving knowledge as well as utilization of healthcare services.
- d. OD will conduct semi-annual review programs, annual review implementation progress of PEN program and set actions and targets for improving screening and treatment services to reach annual targets.

### **7.1.3 Provincial Health Department Level**

- a. PHD should review and conduct data analysis monthly to closely monitor progress on implementation of PEN program at ODs, HCs and RHs to understand the followings:
  - Progress of PEN program implementation
  - Identify coverage areas with slow or no progress and bring them to discuss with ODs and concerned health facilities during supportive supervision and monthly meetings at PHD.
- b. Report the implementation progress and challenges during monthly meeting at the provincial governor offices and seek support from relevant provincial departments for improving community knowledge and utilization of services.

- c. PHD should conduct supportive supervision to all ODs, HCs and RHs in the first quarter after training, and selected ODs, HCs and RHs on a quarterly basis from the subsequent quarters to discuss implementation progress as well as issues/barriers that HCs and RHs faced and recommendations for improvement.
- d. PHD should assist and participate in semi-annual review of PEN programme conducted at every OD in order to strengthen the capacity of OD on implementation of the National SOP for Hypertension and Diabetes Management in Primary Care.
- e. PHD should conduct annual review on progress of PEN programme implementation and set actions and target in order to improve screening and treatment coverage in the following years.

#### **7.1.4. Preventive Medicine Department**

- a. PMD must review data on hypertension and diabetes screening and treatment on monthly basis through electronic review. The data analysis will be made quarterly to monitor the progress on PEN programme implementation in terms of NCD service delivery. The data analysis includes, but not be limited to, utilization breakdown by OD and province, gender, age group, and payment methods (Health Equity Fund, NSSF, exemption, user fee), etc. In addition, the semi-annual and annual reports for PEN programme should be prepared by PMD and discussed with relevant stakeholders.
- b. PMD will conduct monitoring and supervision visits to PHDs and selected ODs, NCD units, and HCs within 3 months after the training and then every 6 months to monitor PEN programme implementation where screening coverage is low. It should also report the implementation progress and challenges during its monitoring and supervision visit at concern health facilities and seek support from MoH leadership and relevant departments for improving service utilization as needed.
- c. PMD will develop an Annual Operational Plan (AOP) and set national targets for the PEN programme, including health outcome targets.
- d. PMD will develop appropriate health outcome indicators, data management systems, supervision check list, HCs performance, report compilation and managing the EMR system.
- e. PMD will produce and share semester, annual progress report on the PEN programme with relevant stakeholders.
- f. PMD will organize regular semi-annual and annual workshops to review and share lessons learnt the national progress on the implementation of PEN programme.

## 7.2 Evaluation

The PEN programme will be measured by using the following indicators:

Indicators	Method of calculation
<b>Output indicators</b>	
1. Number of HCs with EMR established	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> N/A</li> <li>• <b>Denominator:</b> N/A</li> <li>• <b>Disaggregation:</b> Province, OD, HC</li> <li>• <b>Data sources:</b> EMR report</li> <li>• <b>Frequency of Reporting:</b> Yearly</li> </ul>
2. Percentage of target population aged 40 years and above screened for hypertension and diabetes at least once during the reporting period.	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of people aged 40 years and above registered and screened for hypertension and diabetes at the health centres.</li> <li>• <b>Denominator:</b> Total estimated number of adults aged 40 years and above covered by HCs.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD, and the latest General population census of Cambodia (using population projection)</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
3. Percentage of individuals diagnosed with diabetes among people aged 40 years and above in catchment area of health centre.	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with diabetes at health centre.</li> <li>• <b>Denominator:</b> Number of people aged 40 years and above screened for diabetes.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
4. Percentage of individuals diagnosed with hypertension among people aged 40 years and above.	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with hypertension.</li> <li>• <b>Denominator:</b> Number of people aged 40 years and above screened for hypertension.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> </ul>

<p>5. Percentage of individuals diagnosed with hypertension and diabetes</p>	<ul style="list-style-type: none"> <li>• <b>Frequency of Reporting:</b> Monthly</li> <li>• <b>Numerator:</b> Number of individuals diagnosed with hypertension and diabetes</li> <li>• <b>Denominator:</b> Number of people aged 40 years and above screened for hypertension and diabetes.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>6. Percentage of individuals diagnosed with diabetes treated at the health centre.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with diabetes receiving treatment at the health centres</li> <li>• <b>Denominator:</b> Number of adult aged 40 years and above with diabetes</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>7. Percentage of individuals diagnosed with hypertension treated at the health centre.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with hypertension receiving treatment at health centres.</li> <li>• <b>Denominator:</b> Number of adult aged 40 years and above with hypertension</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD,</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>8 Percentage of diabetes and hypertension patients with regular follow-up at health centre.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of diabetes and hypertension patients receiving treatment in health centres</li> <li>• <b>Denominator:</b> Total number of individuals aged 40 years with diabetes and hypertension patients diagnosed with double diagnosis.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>

<p>9 Percentage of diabetes patient with regular follow-up at health centre.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals with diabetes receiving follow-up treatment in health centres on time/appointment date.</li> <li>• <b>Denominator:</b> Total number of individuals aged 40 years and above with diabetes receiving follow up treatment in health centres.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>10. Percentage of hypertension patient with regular follow-up treatment at health centre.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals with hypertension receiving follow-up treatment in health centres on time/appointment date.</li> <li>• <b>Denominator:</b> Total number of individuals aged 40 years and above with hypertension receiving follow up treatment in health centres.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>11. Percentage of diabetes patients with late follow-up treatment during the reporting period.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of diabetes patients who have not shown up at the health centre <b>over 30 days.</b></li> <li>• <b>Denominator:</b> Total number of people with diabetes registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>12. Percentage of hypertension patients with late follow-up treatment during the reporting period.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of hypertension patients who have not shown up at the HCs <b>over 30 days.</b></li> <li>• <b>Denominator:</b> Total number of individuals with hypertension registered for treatment in HCs in report period</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
13. Percentage of diabetes and hypertension patient with late follow-up treatment during the reporting period.	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of diabetes and hypertension patients who have not shown up at the health centre <b>over 30 days</b>.</li> <li>• <b>Denominator:</b> Total number of individuals with diabetes and hypertension registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD,</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
14. Percentage of diabetes patient dropped out during the reporting period.	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of hypertension patients who have not shown up at the HCs <b>over 90 days</b>.</li> <li>• <b>Denominator:</b> Total number of individuals with hypertension registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Quarterly</li> </ul>
15. Percentage of hypertension patient dropped out during the reporting period.	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of hypertension patients who have not shown up at the health centre <b>over 90 days</b>.</li> <li>• <b>Denominator:</b> Total number of individuals with hypertension registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Quarterly</li> </ul>
16. Percentage of smokers who quit smoking.	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of people who quit smoking for at least 12 months.</li> <li>• <b>Denominator:</b> Total number of people registered in HCs who smoked cigarettes.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Annually</li> </ul>

<p>17. Percentage of diabetes patients who died during the reporting period.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total deaths of diabetes patients reported by community, NCD unit and HC.</li> <li>• <b>Denominator:</b> Total number of people with diabetes aged 40 years and above receiving treatment in health centres.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD using HC and Community Reports</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>18. Percentage of hypertension patients who died during the reporting period.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total deaths of hypertension patients reported by community, NCD unit and HC.</li> <li>• <b>Denominator:</b> Total number of people with hypertension aged 40 years and above receiving treatment in HCs.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD using HC and Community Reports</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p><b>Outcome indicators</b></p>	
<p>1. Percentage of diabetes patients with FPG or 2-hour postprandial blood glucose controlled after 12-month treatment.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of diabetes patients with FPG <b>less than 126 mg/dl or 2-hour postprandial blood glucose less than 160 mg/dl</b> in the last 3 months or <b>HbA1c less than 7%</b> if available</li> <li>• <b>Denominator:</b> Total number of diabetes patients receiving treatment in HCs after 12 months.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Annually</li> </ul>
<p>2. Percentage of hypertension patients with blood pressure controlled after 12-month treatment.</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of hypertension patients with blood pressure less than 140/90 mmHg at the last clinical visit in the most recent quarter (just before the reporting quarter).</li> <li>• <b>Denominator:</b> Total number of hypertension patients receiving treatment in HCs after 12 months.</li> </ul>



	<ul style="list-style-type: none"><li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li><li>• <b>Data sources:</b> EMR System for NCD,</li><li>• <b>Frequency of Reporting:</b> Annually</li></ul>
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## **8. Data collection and Patient Registration**

The PMD, has developed an electronic medical record (EMR) system built upon the Open-MRS open-source medical record system. The EMR will support the patient registration and data collection for screening, diagnosis, and treatment for hypertension, diabetes, and cervical precancerous lesion. This system has been incorporated with the standard patient recording and data management system of HCs and Hospitals and will be integrated into the existing Patient Management Registration System (PMRS) of MoH. The HCs and Hospital is responsible for entering the data routinely in a timely manner.






## **9. Data Management**

The quality of data collected is critical to allow the PEN program to link with other programs or databases for other specific medical conditions. It will lay the basis for judging the overall performance of the program. Data will be collected at each HCs and recorded in the web-based electronic medical record system (see Section 8) on a day-to-day basis. Data management and analysis will be conducted by the PMD. The required data and reports, such as quarterly, twice yearly, and annual data, will be produced as needed from the EMR system, and the system will be interoperated with the MoH Health Management Information System (HMIS) in sharing the data. PMD will coordinate closely with the Department of Planning and Health Information (DPHI) to ensure the key indicators for the program's performance will be reflected as part of the routine HMIS report.

## Annex 1: WHO cardiovascular disease risk non-laboratory-based charts

### Instructions for using WHO CVD risk (non-laboratory-based) chart:

This chart is for the use of HC where diabetes and cholesterol cannot be measured. It can also be used to identify people at high risk who can be taken up for further investigations. Table below presents the steps to apply the non-laboratory WHO CVD risk charts.

Action			
<p><b>Select the regional chart covering your country:</b></p> <ul style="list-style-type: none"> <li>REGION NAME is printed at the top of the charts.</li> <li>Countries included in each region can be found in Annex 1.</li> </ul>			
<p><b>Have the following information ready:</b></p> <ul style="list-style-type: none"> <li>age</li> <li>sex</li> <li>smoker* or non-smoker</li> <li>systolic blood pressure</li> <li>BMI (body mass index) = weight (kg) ÷ height (m)<sup>2</sup></li> </ul>			
Using the charts			
<p><b>STEP 1:</b> Select the table for men or women, as appropriate.</p>			
<p><b>STEP 2:</b> Select smoker or non-smoker column.</p>			
<p><b>STEP 3:</b> Select age-group.</p>			
<p><b>STEP 4:</b> Within the selected box find the cell where the person's systolic blood pressure and body mass index (BMI) intersect.</p>			
<p><b>STEP 5:</b> The colour of the cell indicates the 10-year risk of a fatal or non-fatal CVD event. The value within the cell is the risk percentage. Colour coding is based on the grouping.</p>		Green	<5%
		Yellow	5% to <10%
		Orange	10% to <20%
		Red	20% to <30%
		Deep red	≥30%
<p><b>STEP 6:</b> Record CVD risk percentage in person's chart.</p>			
<p><b>STEP 7:</b> Counsel, treat and refer according to risk level</p>			

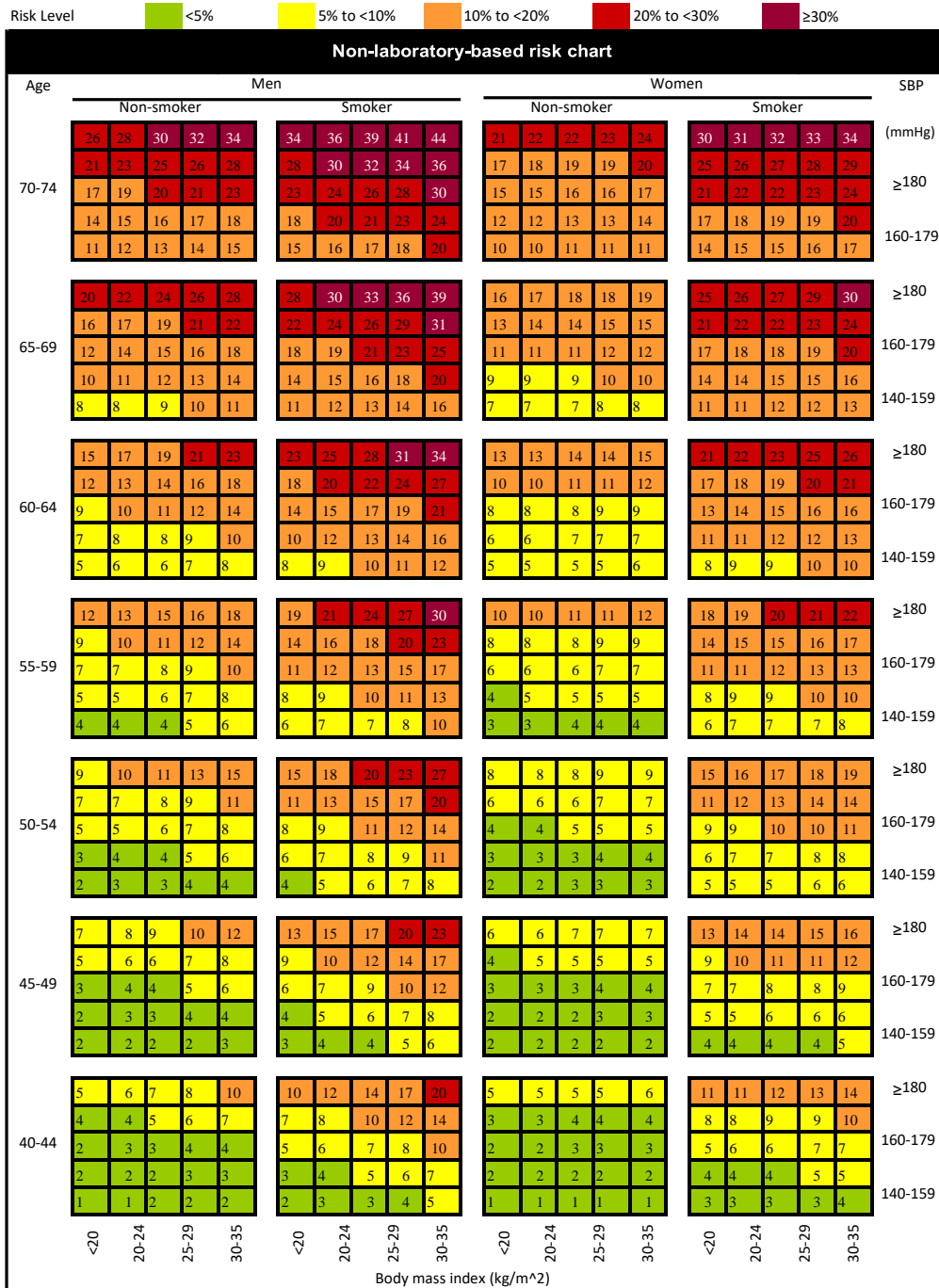
## Management guidance for total CVD risk:

Management of total CVD risk	
Risk <10	Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol. <b>If risk &lt;5%, follow up in 12 months.</b> <b>If risk 5% to &lt;10%, follow up every 3 months until targets are met, then 6–9 months thereafter.</b>
Risk 10% to 20%	Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol. Persistent BP $\geq 140/90$ mmHg consider drug therapy <b>Follow up every 3–6 months.</b>
Risk >20%	Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol. Persistent BP $\geq 130/80$ , consider drug therapy Give a statin. <b>Follow up every 3 months. If there is no reduction in cardiovascular risk after six months of follow-up refer to RH.</b>
Risk $\geq 30\%$	<b>Refer to RH</b>
Important practical points	Management of hypertension and diabetes
	<p>Consider drug therapy for following categories:</p> <ul style="list-style-type: none"> <li>• All patients with established DM and CVD (coronary heart disease, myocardial infarction, transient ischaemic attacks, cerebrovascular disease or peripheral vascular disease), renal disease. If stable, should continue the treatment already prescribed and be considered as having risk &gt;20%.</li> <li>• People with albuminuria, retinopathy, left ventricular hypertrophy.</li> <li>• All individuals with persistent raised BP <math>\geq 160/100</math> mmHg.</li> <li>• All individuals with total cholesterol at or above 320 mg/dL</li> </ul> <p>Follow-up visits:</p> <ul style="list-style-type: none"> <li>• Ask about: new symptoms, adherence to advice on tobacco and alcohol use, physical activity, healthy diet, medications etc.</li> <li>• Assess (physical exam).</li> <li>• Estimate cardiovascular risk.</li> <li>• Refer to RH if necessary.</li> <li>• Counsel all and treat as shown in protocol.</li> </ul>

# WHO cardiovascular disease risk non-laboratory-based charts

## South-East Asia

Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Maldives, Mauritius, Myanmar, Philippines, Seychelles, Sri Lanka, Thailand, Timor-Leste, Viet Nam



## Annex 2: WHO cardiovascular disease risk laboratory -based chart

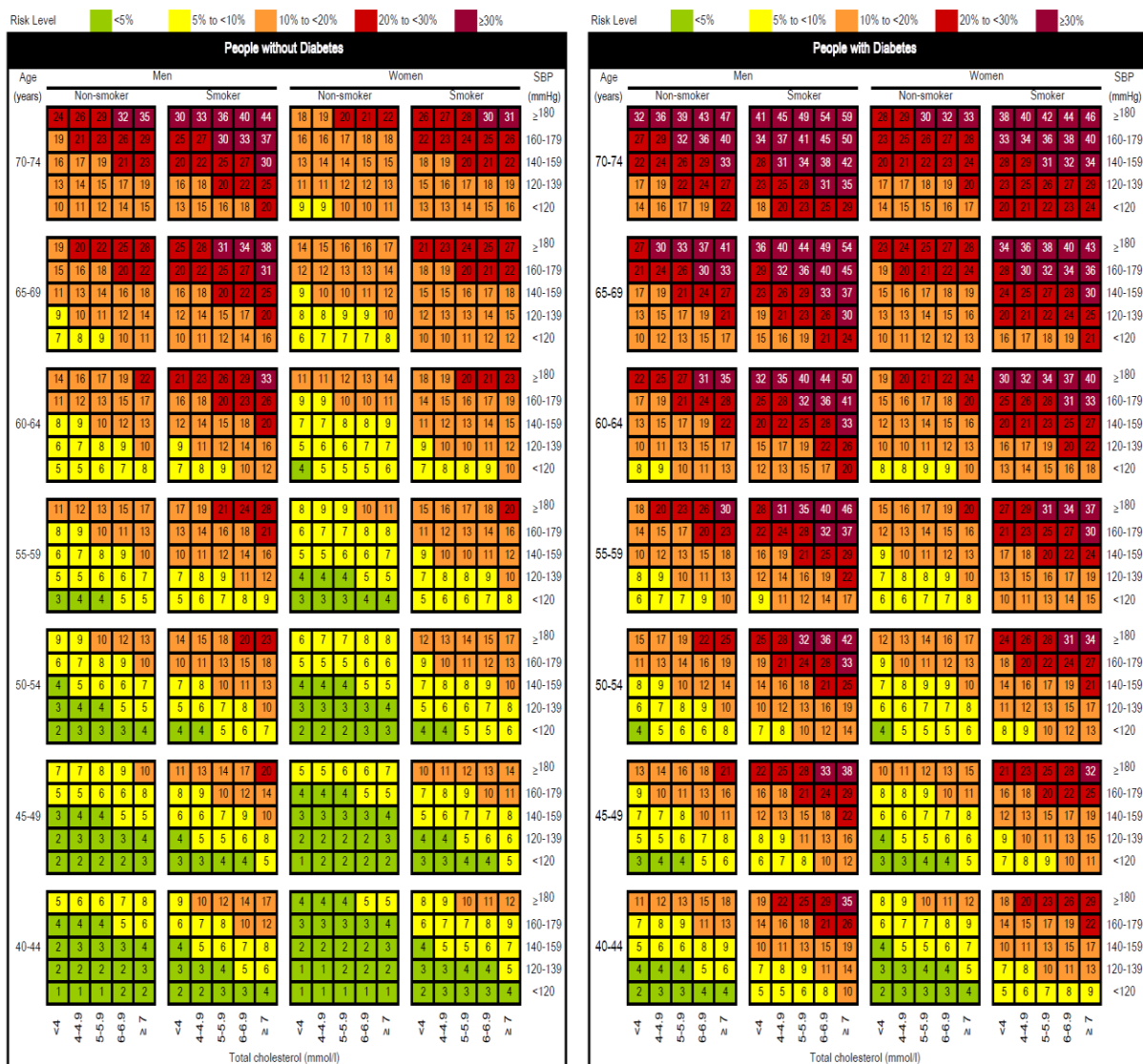
### Instructions for using the WHO CVD risk (laboratory- based) chart:

This CVD risk chart that includes measurements of total cholesterol and information on diabetes. The laboratory-based CVD risk chart should be used for treatment decisions. This is the indicated risk chart in HC where laboratory facilities, and human and financial resources are accessible. This chart will facilitate health providers to initiate an intervention and treatment regimen, and to implement an appropriate follow-up plan based on the patient's total risk status.

### WHO cardiovascular disease risk laboratory-based charts

#### South-East Asia

Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Maldives, Mauritius, Myanmar, Philippines, Seychelles, Sri Lanka, Thailand, Timor-Leste, Viet Nam



South-East Asia

### Annex 3: The 5As General theoretical framework for how to do it

5As	What to say/do and how to say/do it Ask								
<b>Ask</b>	<p><b>Ask</b> the patient about the relevant risk factor(s) at every visit.</p> <p><b>Ask</b> in a friendly way, without being judgmental.</p> <p><b>Keep</b> the questions simple.</p> <p><b>Record</b> the information in the patient’s medical record/notes.</p>								
<b>Advise</b>	<p>Health workers have special authority because of their training. Patients usually respect this expertise.</p> <p>Provide information, key messages and advice in a clear, simple, and personalized manner. Link the advice to something that is relevant for the person. For example:</p> <ul style="list-style-type: none"> <li>• a person with hypertension may be interested in the benefits of reducing salt intake.</li> <li>• people with young children may be concerned about the effects of secondhand smoke.</li> </ul>								
<b>Assess</b>	<p>Assess the patient’s readiness to start making a change by asking two questions:</p> <ol style="list-style-type: none"> <li>1. Are you ready to have a diet that includes more healthy options? Be more physically active? Be a non-smoker? Be a lower-risk drinker?</li> <li>2. Do you think you will be able to make the change?</li> </ol> <table border="1"> <tbody> <tr> <td><b>Question 1</b></td> <td>Yes</td> <td>Not sure</td> <td>No</td> </tr> <tr> <td><b>Question 2</b></td> <td>Yes</td> <td>Not sure</td> <td>No</td> </tr> </tbody> </table> <p>Any answer in the shaded area indicates that the person is not yet ready to change. In this case, effort needs to be made to increase motivation for change. Answers in the white area suggest that you and the patient can move on to the next step.</p>	<b>Question 1</b>	Yes	Not sure	No	<b>Question 2</b>	Yes	Not sure	No
<b>Question 1</b>	Yes	Not sure	No						
<b>Question 2</b>	Yes	Not sure	No						
<b>Assist</b>	<p>Help the person to develop a plan that can increase the chance of success. Provide practical counselling that focuses on:</p> <ul style="list-style-type: none"> <li>• provision of basic information about the risk factor.</li> <li>• identification of situations that could trigger relapse.</li> <li>• ways of coping with trigger situations.</li> </ul> <p>Provide social support including:</p> <ul style="list-style-type: none"> <li>• providing encouragement.</li> <li>• communicating interest and concern.</li> <li>• encouraging the person to talk about the change process with family and friends.</li> </ul> <p>Provide and ensure availability of health education materials and details about additional resources, such as support groups, quit lines, etc.</p>								
<b>Arrange</b>	<p>Arrange a follow-up contact, by phone or in person. Discuss timing of follow-up with patients. At follow-up for all patients:</p> <ul style="list-style-type: none"> <li>• identify problems already experienced as well as new ones that could arise.</li> <li>• remind them of the additional support that is available.</li> </ul>								

- schedule next follow-up visit.
- Refer to specialist services if needed and available.

For those who have made the planned changes:

- congratulate them on their success.

For those who have challenges:

- remind them to view this as a learning experience.
- review their circumstances and motivate them to re-commit
- link to more intensive support, if available.



## Annex 4: 5As brief intervention for a healthy diet – example fruit and vegetables

5As	Fruits and vegetables								
<p><b>Ask</b></p>	<p>How many portions of fruit and vegetables do you eat each day? 1 portion = 1 orange, apple, mango, banana, or 3 tablespoons of cooked vegetables*.</p> <p>Note: *Potatoes, sweet potatoes, cassava or other starchy tubers or roots do not count as one of these portions.</p>								
<p><b>Advise</b></p>	<p>Eat at least 5 portions of fruit and vegetables per day. Eat a variety of fruits, vegetables, legumes (lentils, beans), nuts and whole grains (unprocessed maize, millet, oats, wheat, brown rice), starchy tubers or roots (potato, yam, taro or cassava) and foods from animal sources (meat, fish, eggs and milk).</p> <p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>• Eating a variety of these foods every day helps you to take in the right amounts of essential nutrients.</li> <li>• Eating enough healthy food helps to avoid unhealthy foods that can lead to overweight and obesity, and diseases such as hypertension, diabetes, heart attack and stroke.</li> </ul>								
<p><b>Assess</b></p>	<p>1. Are you ready to make some changes to your diet in order to include more healthy food options? 2. Do you think you will succeed in making the changes?</p> <table border="1" data-bbox="344 1196 954 1279"> <tbody> <tr> <td data-bbox="344 1196 517 1234"><b>Question 1</b></td> <td data-bbox="517 1196 603 1234">Yes</td> <td data-bbox="603 1196 871 1234">Not sure</td> <td data-bbox="871 1196 954 1234">No</td> </tr> <tr> <td data-bbox="344 1234 517 1279"><b>Question 2</b></td> <td data-bbox="517 1234 603 1279">Yes</td> <td data-bbox="603 1234 871 1279">Not sure</td> <td data-bbox="871 1234 954 1279">No</td> </tr> </tbody> </table> <p>Any answer in the shaded area indicates that the person is not yet ready to change. In this case, effort needs to be made to increase motivation for change. Answers in the white area suggest that you and the patient can move on to the next step.</p>	<b>Question 1</b>	Yes	Not sure	No	<b>Question 2</b>	Yes	Not sure	No
<b>Question 1</b>	Yes	Not sure	No						
<b>Question 2</b>	Yes	Not sure	No						
<p><b>Assist</b></p>	<p>Help the patient to set goals and make a plan to start introducing some changes to their eating habits.</p> <p>Provide practical counselling about unhealthy foods and healthier choices. For example:</p> <ul style="list-style-type: none"> <li>• Avoid deep fried foods.</li> <li>• Eat fresh vegetables and fruit that are in season. Have fresh fruit available and in plain sight.</li> </ul> <p>Engage the patient in the conversation and allow time for them to share ideas:</p> <ul style="list-style-type: none"> <li>• Can you think of ways to increase the amount of fruit and vegetable you eat every day?</li> <li>• Can you think of healthier types of food that you enjoy and that you could eat instead of the less-healthy option?</li> </ul>								

	<p>Provide social support:</p> <ul style="list-style-type: none"> <li>• Invite the patient to bring family members to the next visit in order to discuss healthier diet options for the whole family.</li> <li>• Provide health and nutrition education materials.</li> </ul>
<b>Arrange</b>	<p>Refer to specialist support services (dietician, nutritionist) if needed and available.</p> <p>Follow-up: decide the timeline and method and schedule the next appointment.</p> <p>Ask about successes and challenges.</p> <p>For those who have made the planned changes to their eating habits: Congratulate them on their success.</p> <p>For those experiencing challenges: Remind them to view the process as a learning experience and that it takes time to establish new habits Review circumstances, discuss ways to address challenges and encourage recommitment to their plan.</p> <p>Link with more intensive support, if available. Remind all patients of any additional support and resources that are available.</p>

## Annex 5: 5As brief intervention to increase physical activity

5As	Physical activity								
<b>Ask</b>	<p>In the past week, on how many days have you been physically active for a total of 30 minutes or more?</p> <p>For example: walking, cycling, cleaning, gardening, climbing stairs, dancing or playing sport.</p>								
<b>Advise</b>	<p>All adults should do at least 2½ hours (150 minutes) of physical activity per week.</p> <p>This can be spread over short sessions throughout the day and week, starting from as little as 10 minutes per session.</p> <p>Being more active can start in small ways which are part of daily life. This can include going for a walk, playing with children, gardening and domestic chores.</p> <p><b>Advantages of physical activity:</b></p> <ul style="list-style-type: none"> <li>• Reduces the risk of heart attack and stroke or of developing hypertension, diabetes, and cancer.</li> <li>• Can help to control blood pressure, cholesterol and diabetes.</li> <li>• Helps with weight loss and weight control.</li> <li>• Helps to prevent and manage depression.</li> <li>• Some physical activity is better than none.</li> </ul>								
<b>Assess</b>	<p>1. Are you ready to start being more physically active? 2. Do you think you will be able to succeed in increasing your activity levels?</p> <table border="1" data-bbox="344 1205 954 1364"> <tbody> <tr> <td data-bbox="344 1205 520 1279"><b>Question 1</b></td> <td data-bbox="520 1205 603 1279">Yes</td> <td data-bbox="603 1205 868 1279" style="background-color: #d9ead3;">Not sure</td> <td data-bbox="868 1205 954 1279">No</td> </tr> <tr> <td data-bbox="344 1279 520 1364"><b>Question 2</b></td> <td data-bbox="520 1279 603 1364">Yes</td> <td data-bbox="603 1279 868 1364">Not sure</td> <td data-bbox="868 1279 954 1364" style="background-color: #d9ead3;">No</td> </tr> </tbody> </table> <p>Any answer in the shaded area indicates that the person is not yet ready to change. In this case, effort needs to be made to increase motivation for change. Answers in the white area suggest that you and the patient can move on to the next step.</p>	<b>Question 1</b>	Yes	Not sure	No	<b>Question 2</b>	Yes	Not sure	No
<b>Question 1</b>	Yes	Not sure	No						
<b>Question 2</b>	Yes	Not sure	No						
<b>Assist</b>	<p>Help the patient to develop a plan to start increasing physical activity. Provide practical counseling.</p> <ul style="list-style-type: none"> <li>• Help the patient to identify areas of their daily life where they could start to increase their activity levels.</li> <li>• Help to identify activities that they would enjoy doing.</li> <li>• Help to identify possible challenges and suggest how to overcome them.</li> <li>• Provide social support.</li> <li>• Encourage the patient to talk with family, friends and work colleagues about their efforts to increase activity levels.</li> <li>• Provide health education materials and information on additional resources.</li> </ul>								

	<ul style="list-style-type: none"> <li>• These could include contact details for organizations such as walking groups and activity clubs.</li> </ul> <p>Provide (if available) or advise on devices to help motivate or monitor activity e.g. a pedometer.</p>
<b>Arrange</b>	<p>Refer to specialist support services if needed and available.  Follow-up: decide the timeline and method and schedule the next appointment.  Ask about successes and challenges.</p> <p><b>For those who have become more physically active:</b></p> <ul style="list-style-type: none"> <li>• Congratulate them on their success.</li> </ul> <p><b>For those experiencing challenges:</b></p> <ul style="list-style-type: none"> <li>• Remind them to view the process as a learning experience and that it takes time to establish new habits.</li> <li>• Review circumstances, discuss ways to address challenges and encourage recommitment to their plan.</li> <li>• Link with more intensive support if available.</li> </ul> <p>Remind all patients of any additional support and resources that are available.</p>

## Annex 6: 5As brief intervention to quit tobacco

5As	Tobacco								
<p><b>Ask</b></p>	<p>Have you smoked or used any other tobacco product in the past 12 months? (for example, cigarettes (including home-made), cigars, pipe, water-pipe, chewing tobacco, snuff): Yes No</p> <p>Do you currently smoke or use any other tobacco product?: Yes No</p> <p>Does anyone smoke around you at home or at work, or do you often go to places where there is a lot of smoke such as restaurants or bars? Yes No</p> <p>If No to all these questions:</p> <ul style="list-style-type: none"> <li>• Advise not to start tobacco use smoke and to avoid secondhand exposure</li> </ul> <p>If Yes to any questions:</p> <ul style="list-style-type: none"> <li>• Advise on risks of exposure to secondhand</li> </ul>								
<p><b>Advise</b></p>	<p><b>Quitting tobacco is the most important thing you can do to protect your health now and in the future.</b></p> <p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>• Tobacco use is a major cause of heart attack and stroke, of serious lung problems and certain cancers.</li> <li>• Tobacco can damage every part of the body.</li> <li>• Secondhand smoke damages the health of your family and others around you.</li> </ul>								
<p><b>Assess</b></p>	<p>1. Are you interested in quitting tobacco use? 2. Do you think you will succeed in quitting?</p> <table border="1" data-bbox="343 1485 954 1644"> <tbody> <tr> <td data-bbox="343 1485 518 1563"><b>Question 1</b></td> <td data-bbox="518 1485 603 1563">Yes</td> <td data-bbox="603 1485 868 1563">Not sure</td> <td data-bbox="868 1485 954 1563">No</td> </tr> <tr> <td data-bbox="343 1563 518 1644"><b>Question 2</b></td> <td data-bbox="518 1563 603 1644">Yes</td> <td data-bbox="603 1563 868 1644">Not sure</td> <td data-bbox="868 1563 954 1644">No</td> </tr> </tbody> </table> <p>Any answer in the shaded area indicates that the person is not yet ready to change. In this case, effort needs to be made to increase motivation for change. Answers in the white area suggest that you and the patient can move on to the next step.</p>	<b>Question 1</b>	Yes	Not sure	No	<b>Question 2</b>	Yes	Not sure	No
<b>Question 1</b>	Yes	Not sure	No						
<b>Question 2</b>	Yes	Not sure	No						
	<p>Help the patient to develop a quit plan using the <b>STAR</b> method:</p> <p><b>Set</b> a quit date, ideally within 2 weeks.</p> <p><b>Tell</b> family and friends about quitting and ask for support.</p> <p><b>Anticipate</b> challenges in the quit attempt.</p>								

<p><b>Assist</b></p>	<p>Remove tobacco products from personal environment and make home smoke-free.</p> <p><b>Provide practical counselling:</b></p> <ul style="list-style-type: none"> <li>• Provide basic information about tobacco use and quitting.</li> <li>• Help the patient to identify situations (e.g. feelings, places, activities) that could increase the risk of smoking or relapse.</li> <li>• Help to identify and practice ways of coping with these situations.</li> </ul> <p><b>Provide social support:</b></p> <ul style="list-style-type: none"> <li>• Provide encouragement in the quit attempt by showing care and concern.</li> <li>• Encourage the patient to talk about the quitting process.</li> </ul> <p>Provide health education materials and information on additional resources, e.g. support groups, quit lines.</p> <p>Recommend the use of medications if indicated and available, e.g. nicotine replacement therapy.</p>
<p><b>Arrange</b></p>	<p>Refer to specialist support services if needed and available.</p> <p><b>Follow-up:</b></p> <ul style="list-style-type: none"> <li>• Decide the timeline and method and schedule the next appointment.</li> <li>• Ask about successes and challenges.</li> </ul> <p><b>For those who have quit:</b></p> <ul style="list-style-type: none"> <li>• Congratulate them on their success.</li> </ul> <p><b>For those who have used tobacco again:</b></p> <ul style="list-style-type: none"> <li>• Remind them to view any failures as a learning experience.</li> <li>• Review circumstances and encourage them to recommit to quitting.</li> <li>• Link with more intensive support if available.</li> </ul> <p><b>For all patients:</b></p> <ul style="list-style-type: none"> <li>• Identify problems and discuss ways to address them.</li> <li>• Remind them of additional support and resources that are available.</li> <li>• Assess use of medications and any problems experienced.</li> </ul>

## Annex 7: 5As brief intervention to screen for harmful use of alcohol

5As	Alcohol
<b>Ask</b>	<p>Do you ever drink alcohol? <span style="float: right;">Yes</span></p> <p>No</p> <p>If Yes:</p> <ul style="list-style-type: none"> <li>• How often do you have an alcoholic drink?</li> <li>• How many alcoholic drinks do you have on a usual day when you are drinking?</li> </ul>
<b>Advise</b>	<p>For people drinking fewer than 2 units (according to local drink strengths and commonly available sizes) per day and drinking on 5 or fewer days per week, inform them of the following:</p> <ul style="list-style-type: none"> <li>• Use of alcohol can increase the risk of having a heart attack or stroke.</li> <li>• It also increases the risks of getting certain cancers and can cause damage to other parts of the body.</li> <li>• Overall, the best way to avoid the health risks of alcohol use is to abstain.</li> <li>• If you do drink alcohol, keep in mind that “less is better”.</li> <li>• Avoid having more than two units on any single day and do not drink any alcohol on at least two days per week.</li> <li>• Do not drink alcohol for “health” reasons.</li> <li>• Do not use alcohol when you are: <ul style="list-style-type: none"> <li>▪ Driving</li> <li>▪ Operating machinery</li> <li>▪ Pregnant or breastfeeding</li> <li>▪ Taking medications that interact with alcohol</li> <li>▪ Living with medical conditions that are made worse by alcohol</li> <li>▪ Having difficulties controlling how much you drink</li> </ul> </li> </ul>
<b>Assess</b>	<p>For people who drink two or more units per day, who drink on more than five days per week and/or have any indication that alcohol could potentially be a problem, say:</p> <ul style="list-style-type: none"> <li>• “Your drinking habits could be harmful to your health. May I ask you a few more questions to have a better idea of the possible risks?” <span style="float: right;"><b>Yes No</b></span></li> </ul>
<b>Assist and Arrange</b>	<p>If No:</p> <ul style="list-style-type: none"> <li>• Give brief advice. End the discussion positively by saying, “This can be a difficult issue to discuss but I am here to help you.”</li> <li>• Provide health education materials and information about additional resources such as help lines, counseling, and support groups.</li> <li>• At the next visit, repeat the brief intervention.</li> </ul> <p>If Yes:</p> <ul style="list-style-type: none"> <li>• Give brief advice and refer for further counseling.</li> </ul>

## Annex 8: Registration Form for Hypertension, Diabetes and CVD Risk

### REGISTRATION FORM FOR HYPERTENSION, DIABETES AND CVD RISK (First Visit)

Health Facility Code and Name: ..... Patient ID: ..... Date:...../...../.....

#### CLIENT INFORMATION:

NAME: ..... AGE: .....years, GENDER:  Male  Female

Nationality:..... Date of Birth: ...../...../..... (DD/MM/YYYY)

Place of Birth: ..... (Province)

ID poor N:.....  National ID N:.....  PMRS ID:.....

Covid Vaccination ID N:.....  NSSF:.....  Passport N:.....

MARITAL STATUS:  Married  Single  Widowed  Divorced/separated

#### ADDRESS:

#.....Street:.....Village: ..... Commune: ..... District:

..... OD: ..... Province: .....

Telephone number: .....

#### Occupation:

Are you currently working?  YES  NO

Farmer  Seller/small business  Businessman  Civil Servant

Policeman  soldier  Construction worker  Housekeeping

Factory worker  Entertainment worker  Other (specify) .....

**Education:**  No education  Illiteracy  Primary school  Secondary school

High school  Graduate  Post Graduate  Don't know

#### Start Visit:

New NCD Screening (Never screened)

New NCD Screening (Used to screen with other places)

New NCD Screening (For diagnosis)

NCD Follow-up (1<sup>st</sup> time/month)

NCD Follow-up (2<sup>nd</sup> time/month)

NCD Follow-up (3<sup>rd</sup> time/month)

NCD Follow-up (4<sup>th</sup> time/month)

Payment type:  Full pay  Discount  Exemption  HEF-Poor

HEF-Informal  NSSF  HEF-risk HHs

Other (specify:.....)

Referral Type:  Self-presented  VHSGs  Local authority  Health Center

Referral Hospital  NGOs  Others (specify: .....

#### Appointment:

Punctuality:  On time  Late  Early



**MEDICAL HISTORY:**

- Known hypertension:  Yes  No
- Known diabetes:  Yes  No
- Currently on antihypertensive medication:  Yes  No
- Currently on anti-diabetic medication:  Yes  No
- History of premature heart disease or stroke in first degree relatives:  Yes  No
- History of diabetes or kidney disease in first degree relatives:  Yes  No

**PREVIOUS MAJOR OUTCOMES:**

Stroke  Amputation  Chronic renal failure  AMI  Blindness  Foot problem

**Other health problems:**.....  
 .....  
 .....

**Present of ALLERGIES:**  Yes  No

.....  
 .....

Height (m)	Weight	Waist Circumference	BMI	BP		P	R	T	BSL			HbA1c	Urine	
				Systolic	Diastolic				Fasting	Random	OGTT 75g		Albumin	Ketone

*\*BP: after 5 minutes rest – 2 measurements. Nurse needs to examine feet of patient also.*

**LIFESTYLE FACTORS:**

- **Smoking:**  Never smoked  Current smoker  Ex-smoker: Quit Year: .....
- **Physical Activity** (150 min/week of moderate intensity activity):  Yes  No
- **Alcohol:**  Yes  No

Consultation by:  MD  Physician  Nurse  Midwife

Consultation with NCD unit:  Yes  No

**CVD Risk Assessment:**

- <5%
- 5% to <10%
- 10% to <20%
- >20% to < 30%
- ≥30%

**Diagnosis:**  Type 1 DM,  Pre-DM,  Type 2 DM,  GDM,  
 HBP,  None  Others (specify.....)

**If None:** Skip to follow-up for CVD Risk Factors

**Physical Examination:  
suspected TB symptom:**

No  Yes: O cough O Fever O sweat at night time O lost weight  
Referred to TB ward

**Foot exam: problem**  Yes  No:  
If Yes: O numbness O Wounds O pain

**Eye Check-up: problem**  Yes  No:  
If yes, Refer to Ophthalmologist

**Dental Check-up: problem**  Yes  No:  
If yes, please specify: .....

**Other health problem:** .....

**Criteria for referral:**

- Type 1 DM  GDM
- Pregnant with HBP
- High risk CVD >30%
- Blood glucose level before meals (FPG) or after meals (RPG) > 325mg / dL
- Blood pressure > 200 / > 110 mmHg
- Blood pressure > 180 / > 110 mmHg with headache, difficulty breathing, blurred vision, mood swings, nausea, vomiting, low urination
- Blood pressure can not be controlled with two drugs available in health centers: Amlodipine (maximum 10 mg / day) and HCTZ (maximum 25 mg / day)
- Type 2 DM/HBP** (Having any of the below-suspected symptoms):
  - Dyspnea
  - PAD
  - Stroke
  - Chest pain
  - CKD
  - Anemia
  - Macular Oedema
  - Blurred vision
  - Vision impairment
  - DKA
  - HHS
  - Hypoglycemia (<70 mg/dL)
  - HbA1C > 9%
  - Foot problem
  - Other (specify:.....)
- Chronic complications need to check at least once every 12 months

**Management**

**Lifestyle:**

- Diet:  Yes  No
- Physical Activity:  Yes  No
- Quit Smoking:  Yes  No

- Quit Alcohol:  Yes  No
- Weight reduction:  Yes  No

**Treatment:**  Lifestyle change  Anti-hypertensive  OHA  Insulin  Insulin and OHA

**List of Medicine**

No	Description	Type	Use	Number/time	Number/day	Number of days	Total	Note
1								
2								
3								
4								
5								

**Follow up CVD Risk:**

- <5% (Follow up in 12 months)
- 5% to <10% (follow up every 6–9 months)
- 10% to <20% (Follow up every 3–6 months)
- >20% to < 30% (Follow up every 3 months)
- ≥ 30% (Refer to RH)

**Next Appointment:** Date: ...../..... /.....

- Follow-up for  DM  
 HTN  
 CVD Risk

**Referral:**  Yes  No      If Yes, Health Facility Name:.....

Reason: .....  
 .....  
 .....  
 .....

**Date:**...../...../.....

**Signature and name of health provider**

**Annex 9: Follow Up Form for Hypertension, Diabetes, and CVD Risk**

**FOLLOW UP FORM FOR HYPERTENSION, DIABETES AND CVD RISK (Follow-up Visits)**

Health Facility Code: ..... Patient ID: .....

VISIT (specify number of visit): ..... ■ on time ■ late ■ early: (specify reason: .....)

**INVESTIGATION:**

Height: .....cm

WC	Weight	BMI	BP	PR	T	Blood Glucose		Cholesterol	Urine	
						Fasting	Random		Albumin	Ketone

\*BP: after 5 minutes rest – 2 measurements

**ASSESSMENT** (tick as appropriate)

Hypertension:  Yes  No

Diabetes:  Yes  No

**Cardiovascular Disease Risk Level:**

<5%,  5% to <10%,  10% to <20%,  >20% to < 30%,  ≥30%

REFER TO REFERRAL HOSPITAL: .....  Diagnose  Follow up

Consultation with NCD unit:  Yes  No

**MANAGEMENT:**

Counseling tobacco cessation:  Yes  No

Counseling diet and physical activity:  Yes  No

Medicines:  Yes (if yes, write drug’s name and daily dose)  No

.....  
 .....  
 .....  
 .....

**FOLLOW UP:**

- <5% (Follow up in 12 months)
- 5% to <10% (follow up every 3 months until targets are met, then 6–9 months thereafter)
- 10% to <20% (Follow up every 3–6 months)
- >20% to < 30% (Follow up every 3 months)
- ≥ 30% (Refer to RH)

Date of next appointment: ...../...../.....

Leave service: ■ Died ■ Transfer out

Date:...../...../.....

Signature and name of health provider

## Annex 10: Referral Form



**Kingdom of Cambodia**

Ministry of Health

Nation Religion King

Receiving Facility

PHD: \_\_\_\_\_

-----

Case# \_\_\_\_\_

OD: \_\_\_\_\_

**REFERRAL SLIP**

Health ID \_\_\_\_\_

RH/HC: \_\_\_\_\_

Patient Name: \_\_\_\_\_ Sex: M / F Date of Birth/Age: \_\_\_\_\_

Caregiver Name: \_\_\_\_\_ Patient/Caregiver Phone#: \_\_\_\_\_

Address: \_\_\_\_\_ Village: \_\_\_\_\_ Commune: \_\_\_\_\_ District: \_\_\_\_\_ Province: \_\_\_\_\_

Chief Complaint: \_\_\_\_\_

Key History: \_\_\_\_\_

Abnormal Physical Exam Findings: \_\_\_\_\_

Test Results: \_\_\_\_\_  No tests run

Initial Diagnosis: \_\_\_\_\_

Medication Administered: \_\_\_\_\_  None

Other Interventions: \_\_\_\_\_

\_\_\_\_\_  None

Most Recent Vital Signs: HR: \_\_\_\_\_ BP: \_\_\_\_\_ RR: \_\_\_\_\_ Temp: \_\_\_\_\_ SpO2: \_\_\_\_\_

Reason for Referral: \_\_\_\_\_

**Pregnant/Post partum woman**  
 G: \_\_\_\_ P: \_\_\_\_ Abortions: \_\_\_\_\_  
 Gestational Age: \_\_\_\_\_  
 Estimated/Date of Delivery: \_\_\_\_\_  
 Complications: \_\_\_\_\_  
*In Labor*  
 ROM:  Yes ,Time: \_\_\_\_\_  No  
 Fetal presentation: \_\_\_\_\_  
 Peri-partum Antibiotics:  Yes  No  
 Use Dexamethasone:  Yes  No  
 Use MgSo4:  Yes  No  
 Apply NASG:  Yes  No

**Child < 5 years**  
 Current Weight: \_\_\_\_ Kg  
 Weight-for-Age: Green Orange Red  
 If RED: Height: \_\_\_\_ Weight-for Height SD: \_\_\_\_  
 Bilateral Pitting Oedema:  Yes  No  
 SAM:  Yes  No

**Neonate < 6 weeks**  
 Birth Weight: \_\_\_\_ Kg GA at Delivery: \_\_\_\_\_  
 Delivery Mode: \_\_\_\_\_  
 Current Weight: \_\_\_\_ Kg

-Mother's Pink Book -Partograph -Yellow Card -Health Book -Other Records: \_\_\_\_\_

Referring Provider: _____	Receiving Facility: _____
Phone#: _____	Receiving Provider Name: _____
Referral Date: _____	Phone # receiving provider: ____ <input type="checkbox"/> Contacted
Time: _____	Arrival Date: _____ Time: _____
Signature of referring provider: _____	Signature of receiving provider: _____

Call 119 for emergency ambulance 24 hours/day in Phnom Penh

## Annex 11: Monitoring checklist

### Monitoring Checklist for HCs

Monitor capability of NCD services to function at HCs and community level.

*Note: This questionnaire will not measure the achievement of NCD indicators or quality of services, such as proportion of diabetes cases aged 40 years and above in the population treated at HCs, time that health staff spend with patients at each visit or patient's perception of quality of services, etc. It provides evidence that the HCs was well-prepared and well-functioning for delivering NCD services to the population.*

**To be collected by NCD focal points from OD in a monthly basis. A copy of this report should be kept at HCs.**

<b>Name of HCs</b>		<b>Name of HC chief</b>	
<b>Name of Operational District</b>		Name of NCD staff	1. 2. 3.
<b>Name of Provincial Health Department</b>		Date	

Human resources				Remarks
<b>1</b>	Are there dedicated health staff to provide NCD services?	Y	N	
<b>2</b>	Have dedicated health staff been appropriately trained?	Y	N	
<b>3</b>	Is there in-service training/NCD knowledge sharing to HC team?	Y	N	
<b>4</b>	Has a doctor from RH to provided technical backup at the HC in the last 3 months?	Y	N	

Services				Remarks
<b>1</b>	Is there a service for diabetes/HBP?	Y	N	
<b>2</b>	How many people aged 40 years and above were screened for			

	diabetes and hypertension in the last month?			
<b>3</b>	Have patients received health education and counselling on NCD risk factors?	Y	N	
<b>4</b>	Are patients in the target group consulted for CVD risk?	Y	N	

<b>Record keeping/Information System</b>				<b>Remarks</b>
<b>1</b>	Are NCD patients recorded in EMR?	Y	N	
<b>2</b>	Has the patient registration form been used appropriately?	Y	N	
<b>3</b>	Has the patient follow-up form been used appropriately?	Y	N	
<b>4</b>	Do you have a daily self-care book for diabetics?	Y	N	
<b>5</b>	Follow-up appointment card	Y	N	

<b>Referral system</b>				<b>Remarks</b>
<b>1</b>	Is the referral form used in the process of referring patient from HC to RH?	Y	N	
<b>2</b>	Have any patients been referred upward to RH, according to guidelines, in the last three months?	Y	N	
<b>3</b>	Have any patients been referred from RH to the HC, according to guidelines, in the last three months?	Y	N	
<b>4</b>	Is there a mechanism (eg. Telegram) in place to follow-up the referred patient from HC to RH and RH to HC?	Y	N	

<b>Medicines and materials/equipment</b>				<b>Remarks</b>
<b>1</b>	Is the printed National SOP for Hypertension and Diabetes Management in Primary Care available?	Y	N	

<b>2</b>	Are glucometer and blood glucose strips available and functioning?	Y	N	
<b>3</b>	Are Blood Pressure Measurement Devices available and functioning?	Y	N	
<b>4</b>	Is the CVD risk prediction chart and IEC materials for diabetes and hypertension, and other NCDs available?	Y	N	
<b>5</b>	Are NCD medicines for use at the HC level available?	Y	N	
<b>6</b>	Has the HC experienced out-of-stock of any anti-diabetic and anti-hypertensive medicines in the last month?	Y	N	

<b>Community link</b>				<b>Remarks</b>
<b>1</b>	Has the HC conducted awareness raising on NCDs and screened for hypertension and diabetes in the community in the last 3 month?	Y	N	
<b>2</b>	Have VHSG reported on follow-up of patients with diabetes/HBP in the last month?	Y	N	
<b>3</b>	Are there minutes for NCD meetings in the last month?	Y	N	
<b>4</b>	Have any patients been referred by VHSG for CVD risk screening in the last month?	Y	N	

<b>Finance and administration</b>				<b>Remarks</b>
<b>1</b>	Is the PEN team established officially?	Y	N	
<b>2</b>	Are user fees set for hypertension and diabetes?	Y	N	
<b>3</b>	Do you have a monthly request for medicines and equipment for non-communicable diseases?	Y	N	
<b>4</b>	Did the HC include data on number of patients with hypertension, diabetes on HC dashboard?	Y	N	



**NOTES**

**ACTIONS TO BE TAKEN**

	Supervisor signature	
	HC chief signature	
	Date	

## Monitoring Checklist for Operational District

Monitor capability of OD to support NCD services at HCs and community level.

*Note: This checklist will not measure the achievement of NCD indicators. It provides evidence that OD was well-functioning to support HCs in delivering NCD services to the population.*

*To be completed by supervisor of NCD from PHD in a quarterly basis.*

<b>Name of OD</b>		<b>Name of OD Director</b>	
<b>Name of Provincial Health Department</b>		Name of NCD Coordinator	
		Date	

Human resources				Remarks
<b>1</b>	Are there any dedicated health staff members as NCD coordinator?	Y	N	
<b>2</b>	Have the dedicated health staff been appropriately trained?	Y	N	
<b>3</b>	Have there been capacity building on PEN-related activities provided by PMD in the last 3 months?	Y	N	
<b>4</b>	Did OD provide training to all HCs?	Y	N	
<b>5</b>	Did OD conduct supervision to HCs regularly?	Y	N	
<b>6</b>	Did OD provide feedback to HCs and prepare action plan for quality improvement plan during each HC supervision?	Y	N	

Documentation/Information System				Remarks
<b>1</b>	Is the printed National SOP for Hypertension and Diabetes Management in Primary Care available?	Y	N	
<b>2</b>	Did the OD produce a HC supervision report last month?	Y	N	
<b>3</b>	Was there a quarterly report on PEN to PHD in the last quarter?	Y	N	
<b>4</b>	Did the OD produce a meeting report on PEN program with HCs last month?	Y	N	
<b>5</b>	Has the referral system for diabetes and hypertension patients been discussed in the OD meeting?	Y	N	

<b>6</b>	Is there any report of the campaign on PEN program, including NCD risk factors to the public, in the last 6 months?			
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<b>Procurement</b>				<b>Remarks</b>
<b>1</b>	Does OD receive NCD medicines and supplies based on their request?	Y	N	
<b>2</b>	Have supplied NCD medicines been staying at OD more than 2 weeks?	Y	N	What percentage?
<b>3</b>	Has the OD made a request for NCD drugs to PHD in the last 3 months?	Y	N	
<b>4</b>	Has the OD experienced any delay of NCD medicines supply in the last 3 months?	Y	N	
<b>5</b>	Has there been any requests of NCD drugs from HCs in the last 3 months?	Y	N	

<b>Administration</b>				<b>Remarks</b>
<b>1</b>	Does the OD have an official letter indicating that the management committee for PEN has been set up?	Y	N	
<b>2</b>	Has the OD had any visits from PHD in the last 3 months?	Y	N	
<b>3</b>	Have any NCD-related issues and bottlenecks been raised at the OD monthly meeting for problem solving?	Y	N	
<b>4</b>	Are there any NCD screening activities/campaign integrated within the program? (Ex. World DM)	Y	N	

**NOTES**

**ACTIONS TO BE TAKEN**

	Supervisor signature	
	NCD coordinator signature	
	Date	

## Monitoring Checklist for PHD

Monitor capability of NCD services at HCs and community level.

*Note: This checklist will not measure the achievement of NCD indicators. It provides evidence that PHD was well-functioning to support OD and HCs in delivering NCD services to the population.*

*To be completed by supervisor of NCD from PMD.*

<b>Name of PHD</b>		<b>Name of NCD Focal point</b>	
<b>Name of PHD Director</b>		Date	

Human resources				Remarks
<b>1</b>	Does the PHD have any dedicated health staff for NCDs/an NCD focal point?	Y	N	
<b>2</b>	Were these dedicated health staff appropriately trained?	Y	N	
<b>3</b>	Have there been capacity building on PEN related activities from MoH this year?	Y	N	
<b>4.</b>	Did PHD provide training to all HC?	Y	N	
<b>5.</b>	Does PHD conduct supervision to OD ,RH and HC regularly?	Y	N	
<b>6</b>	Did PHD provide feedback to OD and RHs and prepare action for quality improvement plan during each supervision?	Y	N	

Documentation/Information System				Remarks
<b>1</b>	Is the printed National SOP for Hypertension and Diabetes Management in Primary Care available?	Y	N	
<b>2</b>	Does the PHD have any reports on NCDs to produce quarterly, semi-annual, and annual reports for NCD program?	Y	N	
<b>3</b>	Has the PHD produced a supervision report in the last 3 months?	Y	N	

<b>4</b>	Has the PHD produced any reports on NCDs in the last 3 months?	Y	N	
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<b>Procurement</b>				<b>Remarks</b>
<b>1</b>	Does the PHD submit a proposal for essential medicines and supplies to the MoH as indicated in the guideline?	Y	N	
<b>2</b>	Does PHD receive NCD medicines and supplies based on their request?	Y	N	What percentage?
<b>3</b>	Have supplied NCD medicines been staying at PHD more than 2 weeks?	Y	N	
<b>4</b>	Has PHD experienced any delay of NCD medicines/supplies in the last 3 months?	Y	N	
<b>5</b>	Has there been any request of NCD drugs from ODs in the last 3 months?	Y	N	

<b>Administration</b>				<b>Remarks</b>
<b>1</b>	Was NCD plan integrated into AOP?	Y	N	
<b>2</b>	Are there any overlapping catchment areas supported by NGOs/relevant stakeholders?	Y	N	
<b>3</b>	Did PHD meet OD in the last three months?	Y	N	
<b>4</b>	Have there been any issues or bottlenecks related to NCD program that has been solved for OD or HC?	Y	N	
<b>5</b>	Is there any NCD screening or campaign activities program, for example World Diabetes Day?	Y	N	

**NOTES**

**ACTIONS TO BE TAKEN**

	Supervisor signature	
	Focal point signature	
	Date	

## Annex 12: Additional Information for H-EQIP 2

Indicators	Targets 2023-2027	Method of calculation
<b>Output indicators</b>		
1. Number of HCs with EMR established	2023: 50 2024: 150 2025: 250 2026: 400 2027: 500  (Ref: H-EQIP II Framework)	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> N/A</li> <li>• <b>Denominator:</b> N/A</li> <li>• <b>Disaggregation:</b> Province, OD, HC</li> <li>• <b>Data sources:</b> EMR report</li> <li>• <b>Frequency of Reporting:</b> Yearly</li> </ul>
2. Percentage of target population aged 40 years and above screened for hypertension and diabetes at least once during the reporting period.	2023: 535,082 (12%) 2024: 1,070,163 (24%) 2025: 1,560,654 (35%) 2026: 2,006,556 (45%) 2027: 2,229,506 (50%)  (50% of population aged 40 years and above projected using data from Cambodia census report 2019)	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of people aged 40 years and above registered and screened for hypertension and diabetes at the health centres.</li> <li>• <b>Denominator:</b> Total estimated number of adults aged 40 years and above covered by HCs.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD, and the latest General population census of Cambodia (using population projection)</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
3. Percentage of individuals diagnosed with diabetes among people aged 40 years and above in catchment area of health centre.	2023: 6% 2024: 6% 2025: 6% 2026: 6% 2027: 6%	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with diabetes at health centre.</li> <li>• <b>Denominator:</b> Number of people aged 40 years and above screened for diabetes.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>



<p>4. Percentage of individuals diagnosed with hypertension among people aged 40 years and above.</p>	<p>2023: 16% 2024: 16% 2025: 16% 2026: 16% 2027: 16%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with hypertension.</li> <li>• <b>Denominator:</b> Number of people aged 40 years and above screened for hypertension.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>5. Percentage of individuals diagnosed with hypertension and diabetes</p>	<p>2023: 2% 2024: 2% 2025: 2% 2026: 2% 2027: 2%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with hypertension and diabetes</li> <li>• <b>Denominator:</b> Number of people aged 40 years and above screened for hypertension and diabetes.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>6. Percentage of individuals diagnosed with diabetes treated at the health centre.</p>	<p>2023: 50% 2024: 55% 2025: 60% 2026: 65% 2027: 70%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with diabetes receiving treatment at the health centres</li> <li>• <b>Denominator:</b> Number of adult aged 40 years and above with diabetes</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>7. Percentage of individuals diagnosed with hypertension treated at the health centre.</p>	<p>2023: 50% 2024: 55% 2025: 60% 2026: 65% 2027: 70%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals diagnosed with hypertension receiving treatment at health centres.</li> <li>• <b>Denominator:</b> Number of adult aged 40 years and above with hypertension</li> </ul>

		<ul style="list-style-type: none"> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
8. Percentage of diabetes and hypertension patients with regular follow-up at health centre.	2023: 50% 2024: 55% 2025: 60% 2026: 65% 2027: 70%	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of diabetes and hypertension patients receiving treatment in health centres</li> <li>• <b>Denominator:</b> Total number of individuals aged 40 years with diabetes and hypertension patients diagnosed with double diagnosis.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
9. Percentage of diabetes patient with regular follow-up at health centre.	2023: 60% 2024: 65% 2025: 70% 2026: 75% 2027: 80%	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals with diabetes receiving follow-up treatment in health centres on time/appointment date.</li> <li>• <b>Denominator:</b> Total number of individuals aged 40 years and above with diabetes receiving follow up treatment in health centres.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
10. Percentage of hypertension patient with regular follow-up	2023: 60% 2024: 65% 2025: 70% 2026: 75%	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Number of individuals with hypertension receiving follow-up treatment in health</li> </ul>

treatment at health centre.	2027: 80%	<p>centres on time/appointment date.</p> <ul style="list-style-type: none"> <li>• <b>Denominator:</b> Total number of individuals aged 40 years and above with hypertension receiving follow up treatment in health centres.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
11. Percentage of diabetes patients with late follow-up treatment during the reporting period.	2023: 2% 2024: 2% 2025: 2% 2026: 2% 2027: 2%	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of diabetes patients who have not shown up at the health centre <b>over 30 days</b>.</li> <li>• <b>Denominator:</b> Total number of people with diabetes registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
12. Percentage of hypertension patients with late follow-up treatment during the reporting period.	2023: 2% 2024: 2% 2025: 2% 2026: 2% 2027: 2%	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of hypertension patients who have not shown up at the HCs <b>over 30 days</b>.</li> <li>• <b>Denominator:</b> Total number of individuals with hypertension registered for treatment in HCs in report period</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>

<p>13. Percentage of diabetes and hypertension patient with late follow-up treatment during the reporting period.</p>	<p>2023: 2% 2024: 2% 2025: 2% 2026: 2% 2027: 2%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of diabetes and hypertension patients who have not shown up at the health centre <b>over 30 days</b>.</li> <li>• <b>Denominator:</b> Total number of individuals with diabetes and hypertension registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD,</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>14. Percentage of diabetes patient dropped out during the reporting period.</p>	<p>2023: 1% 2024: 1% 2025: 1% 2026: 1% 2027: 1%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of hypertension patients who have not shown up at the HCs <b>over 90 days</b>.</li> <li>• <b>Denominator:</b> Total number of individuals with hypertension registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Quarterly</li> </ul>
<p>15. Percentage of hypertension patient dropped out during the reporting period.</p>	<p>2023: 1% 2024: 1% 2025: 1% 2026: 1% 2027: 1%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of hypertension patients who have not shown up at the health centre <b>over 90 days</b>.</li> <li>• <b>Denominator:</b> Total number of individuals with hypertension registered for treatment in HCs in report period.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Quarterly</li> </ul>

<p>16. Percentage of smokers who quit smoking.</p>	<p>2023: 10% 2024: 15% 2025: 20% 2026: 25% 2027: 30%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total number of people who quit smoking for at least 12 months.</li> <li>• <b>Denominator:</b> Total number of people registered in HCs who smoked cigarettes.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD</li> <li>• <b>Frequency of Reporting:</b> Annually</li> </ul>
<p>17. Percentage of diabetes patients who died during the reporting period.</p>	<p>2023: 1% 2024: 1% 2025: 1% 2026: 1% 2027: 1%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total deaths of diabetes patients reported by community, NCD unit and HC.</li> <li>• <b>Denominator:</b> Total number of people with diabetes aged 40 years and above receiving treatment in health centres.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD using HC and Community Reports</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>
<p>18. Percentage of hypertension patients who died during the reporting period.</p>	<p>2023: 1% 2024: 1% 2025: 1% 2026: 1% 2027: 1%</p>	<ul style="list-style-type: none"> <li>• <b>Numerator:</b> Total deaths of hypertension patients reported by community, NCD unit and HC.</li> <li>• <b>Denominator:</b> Total number of people with hypertension aged 40 years and above receiving treatment in HCs.</li> <li>• <b>Disaggregation:</b> Province, OD, HC, Gender, Age-group, Payment method (Health Equity Fund, NSSF, exemption, user fee)</li> <li>• <b>Data sources:</b> EMR System for NCD using HC and Community Reports</li> <li>• <b>Frequency of Reporting:</b> Monthly</li> </ul>