



Ministry of Health

**NATIONAL STANDARD OPERATING PROCEDURE FOR
DIABETES AND HYPERTENSION MANAGEMENT IN
PRIMARY CARE
2019**

Department of Preventive Medicine

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Foreword

Since 2014 the Ministry of Health has been developing the National Standard Operating Procedure (SOP) for Diabetes and Hypertension Management in Primary Care to reduce the disease burden and health care costs associated with these conditions, by achieving higher coverage of essential interventions in primary care in Cambodia.

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 2013-2020 and response to the growing challenges and burden posed by diabetes and hypertension with the alignment of its health care system to provide integrated management of NCDs at the primary health care level.

The objectives of this SOP are to provide comprehensive guidance for diabetes and hypertension management for health centers and communities. It has also served as the basis and direction for Operational Districts, Provincial Health Departments, the Ministry of Health and other institutions, according to their respective roles, for formulating training plans, mobilizing necessary resources and supplies, and the general functioning of these services at health centers.

The Ministry of Health urges all stakeholders and health partners to use this SOP as guidance when supporting health centers in Cambodia, aiming to achieve the goals of the Health Strategic Plan 2016-2020, the National Strategic Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020 and Cambodian Sustainable Development Goals.

Phnom Penh, 28 / Jan / 2019

For Minister of Health



Prof. ENG HUOT
SECRETARY OF STATE

Acknowledgments

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List of Abbreviation

AIDS	Acquired Immuno-deficiency Syndrome
BMI	Body Mass Index
BP	Blood Pressure
BPMD	Blood pressure measuring device
CPA	Complementary Package of Activities
CVD	Cardiovascular diseases
GIZ	Gesellschaft für Internationale Zusammenarbeit
HC	Health Center
HCTZ	Hydrochlorothiazide
HIV	Human Immuno-deficiency Virus
HMIS	Health Management Information System
ID	Identification Number
IEC	Information, Education and Communication
IFG	Impaired fasting glucose
LMICs	Low-and Middle-Income Countries
MoH	Ministry of Health
MPA	Minimum Package of Activities
NCD	Noncommunicable Diseases
NGO	Non-Governmental Organization
OD	Operational District
PEN	Package of Essential Noncommunicable Disease Interventions
PE	Peer Educator
PHC	Primary Health Care
PHD	Provincial Health Department
PR	Pulse Rate
PMRS	Patient Management Registration System
RH	Referral Hospital
SOP	Standard Operating Procedure
STEPS	WHO STEPwise approach to Surveillance
T	Temperature
TB	Tuberculosis
T2 DM	Type 2 Diabetes Miletus
VHSG	Village Health Support Group
WC	Waist Circumference
WHO	World Health Organization

1. Introduction

1.1. Background

Noncommunicable diseases (NCD), namely cardiovascular diseases (CVD), cancers, diabetes and chronic respiratory diseases are the leading cause of morbidity and mortality in most low-and middle-income countries (LMICs). In 2018 NCDs are estimated to account for 64% of all deaths in Cambodia according WHO NCD Country Profiles, 2018. The CVDs – stroke and coronary heart disease – caused 24% of deaths and diabetes directly 2%. NCDs share four major behavioral risk factors. These are unhealthy diet, tobacco use, physical inactivity and harmful use of alcohol. 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 the clinical diseases.

In Cambodia, prevalence of hypertension and diabetes is 14.2% and 9.6% respectively and is expected to rise. There has been a reduction in daily smokers of tobacco from 29.4% in 2010 to 22.1% in 2016. Currently, 36.2% of men and 2.6% of women are daily smokers, and 6.5% of respondents, mainly women (11.8%), are using smokeless tobacco. Just under half of those surveyed were alcohol drinkers, with a slight reduction since STEPS 2010 but the proportion of current drinkers is still high among men (71.8%). 48.1% were eating five or more servings daily of fruits and vegetables. As NCD risk factors rise, along with an increased disease burden, there is a need to strengthen the national capacity of primary health care (PHC) facilities to provide NCD services, including prevention, diagnosis and case management.

The National Strategic Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020 outlines the Royal Government of Cambodia’s response to the growing challenge of heart disease, cancer, diabetes, and chronic respiratory disease in Cambodia. The strategic plan is evidence 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.

Priority NCD strategies and strategic objectives to address each of the risk factors, and early detection and treatment were elaborated in the strategic plan. One of the priority activities is to provide integrated management of NCDs by demonstrating and implementing the Package of Essential NCD Interventions in Primary Care (PEN). Alongside PEN, maintaining and expanding community-based peer educator networks for patients with hypertension and diabetes, will be important for the continued management of NCDs.

1.2. Public Health Services in Cambodia

Currently, there are 100 operational districts (OD) in Cambodia and health facilities include 9 national hospitals, 24 provincial referral hospitals, 84 district referral hospitals, and 1,198 health centers Each OD serves 100,000-200,000 people and contains one referral hospital (RH) and several health centers (HC). Each HC covers from 8,000-12,000 people. HCs provide basic preventive and

curative services through the Minimum Package of Activities (MPA), including malaria, diarrhea, respiratory disease, sexually transmitted diseases, tuberculosis, leprosy, minor injuries, child immunization, ante and post-natal care and family planning, and refer cases to the referral hospital if necessary. The RH provides a Complementary Package of Activities (CPA), including out-patient, maternity and gynecology, pediatric, general medicine, surgery, tuberculosis and HIV/AIDS laboratory, X-ray, and ultrasound.

Aims stated in the Health Strategic Plan 2016-2020 are to develop health services, allocate financial and human resources, and to ensure that population health needs are met in an equitable way through coverage of the whole population. NCDs are one of four health program areas that the third strategic plan focuses on. The National Strategic Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020 outlines the broad framework for this national SOP that helps operationalize an important part of Cambodia's Primary Care system. Currently there are 28 NCD clinics established in provincial and district referral hospitals. So far, Peer Educator Networks for Diabetes and Hypertension have been set up in 20 OD's in 7 provinces. These networks form structured communities of diabetes patients cooperating with public health services to deliver patient-centered primary care adapted to the local situation, and with proven effectiveness. However, the capacity of most HCs to prevent, diagnose and manage major NCDs is very limited due to poor basic infrastructure, lack of equipment, and shortage of drugs and supplies. Additionally, doctors and nurses who are working at the HC level are not trained sufficiently in providing care and treatment to patients with diabetes and hypertension. Peer educator networks are only active in a minority of areas. Existing HCs have very limited capacity in diagnosing and treating the type diabetes and hypertension.

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 national capacity to integrate and scale up care of NCDs, including CVDs, 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, financial auditing and costing, training materials, referral criteria and monitoring and evaluation (Figure 1). This requires (1)-the efficient use of limited health care resources, (2)-sustainable health financing mechanisms, (3)-access to basic diagnostics and essential medicines and (4)-organized medical information and referral systems. All of which are imperative for the provision of 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 to 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.

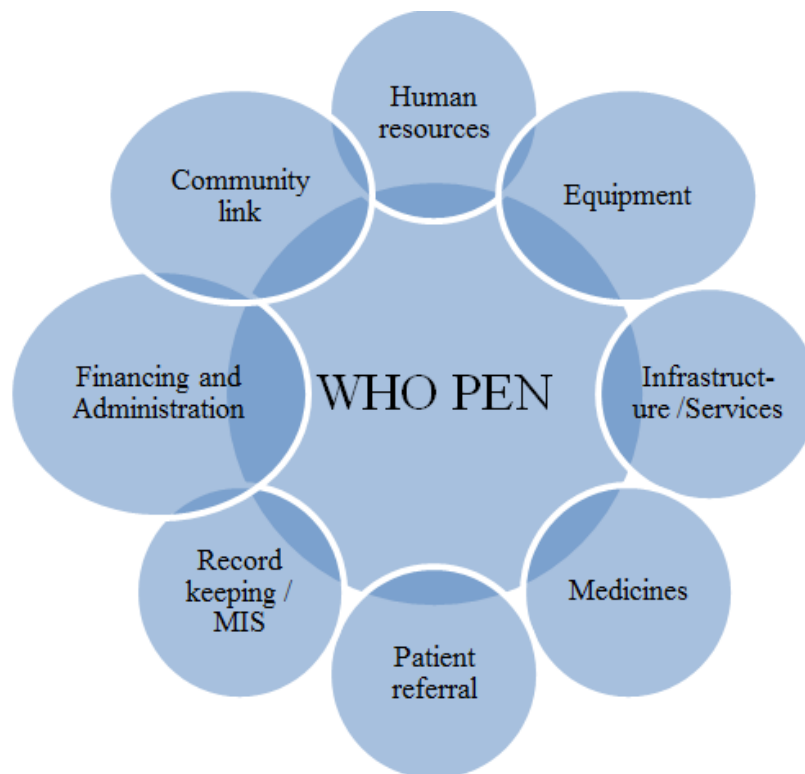


Figure 1: Components of WHO PEN

At this stage the implementation of PEN in Cambodia includes only **health education and counseling** on healthy behaviors, and **integrated management of diabetes and hypertension**. It **currently does not include** clinical management of chronic respiratory diseases or cancer. The PEN program incorporates both WHO PEN Protocol 1 and 2. WHO PEN Protocol 1 includes the prevention of heart attacks, stroke and kidney diseases through integrated management of diabetes and hypertension whereas WHO PEN Protocol 2 covers only health education and counselling on healthy behaviours (see Annex 1).

3. Goal and Objectives

3.1. Goal

To reduce disease burden and health care costs due to diabetes, hypertension, and cardiovascular risk by achieving higher 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 improve the quality of care for diabetes, hypertension, and cardiovascular risk in primary care with the prevention, early diagnosis, and treatment of diabetes and hypertension, and by strengthening the involvement of patients in the management of their conditions.
3. To build the primary care system's capacity to monitor health outcomes over time in chronic patients.
4. To have a beneficial impact on health through the prevention of acute events, complications, and reduction of NCD risk factors.

4. Target population

The main target population to be screened for diabetes and hypertension are the adult population, aged 40 years and above, living in the catchment area of the selected PEN health centers. Approximately 27% of the Cambodian population is over 40 years according to the Population Project of Cambodia 2013- 2023 (National Institute of Statistics). Thus, the target population in a selected HC is estimated to be 2,160- 3,240 people.

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

5. Implementation arrangement

The Sub-Technical Working Group for Cardiovascular Disease and Diabetes under the Ministry of Health's NCD Task Force will oversee the PEN program, focusing on the integrated management of diabetes and hypertension. At the provincial level, Provincial NCD Focal Points will coordinate with the ODs to implement the program. At the OD level, a management committee for the PEN program will be established. This committee consists of a coordinator, referral hospital representatives, an NCD clinic, responsible persons for drug distribution and supplies, health center representatives, an administrative district representative, community representatives and relevant NGOs.

Screening for diabetes and hypertension including health education, CVD risk assessment and basic diagnostic procedures will be charged according to user fees. The coverage of laboratory and drug treatment cost needs particular consideration. If patient fees are collected, they should be minimal and the poor and eligible population will be paid by 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, creating good adherence for treatment is particularly challenging. The cost of treatment is an important factor affecting the adherence that should be taken into account.

Prior to the initiation of the PEN program, the Department of Preventive Medicine, Ministry of Health, in collaboration with relevant stakeholders, shall complete the following activities:

1. Health facility assessments
2. Stakeholder meetings with PEN management committee (community leaders, health centers and NCD clinic staff, representatives of civil society and relevant NGOs, and traditional healers if appropriate).
3. In-service training on PEN focusing on CVD prevention in primary care for health professionals from health centers and district referral hospitals, including OD representatives, Village Health Support Group (VHSG), and Peer Educators (PE).
4. Procurement and distribution of essential medicines and equipment for NCDs.
5. Community campaigns to inform the population about the PEN program.

5.1. National level

The Department of Preventive Medicine, Ministry of Health will ensure the implementation of the PEN program in collaboration with health partners, and local and international Non-Governmental Organizations (NGOs) working on NCD prevention and control. The Department of Preventive Medicine will assume the following tasks:

1. Coordinate in program planning and resource mobilization.
2. Facilitate with the Department of Drug, Food, Medical Devices, and Cosmetic especially Central Medical Store to ensure sufficient essential medicines and equipment for NCDs are available at Health Centers and Referral Hospitals within each Operational District.
3. Provide capacity building on PEN-related activities at the provincial, operational district, health center and community levels, involving peer educators where they are available.
4. 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.

5. Develop, revise and harmonize the PEN training curriculum for health centers and communities through a series of meetings of the Sub-Technical Working Group for Cardiovascular Diseases and Diabetes.
6. Develop clinical guidelines for diabetes and hypertension for health centers and referral hospitals.
7. Disseminate updated NCD policies and guidelines to all stakeholders including VHSG.
8. Monitor the PEN program implementation, including the development of appropriate health outcome indicators, data management systems, supervision check list, health center performance, and report compilation.
9. Organize regular meetings of the Sub-Technical Working Group for Cardiovascular Disease and Diabetes.
10. Produce and share annual progress report on the PEN program with relevant stakeholders.
11. Organize regular meetings or national workshops to share lessons learnt.
12. Conduct health center capacity assessments in collaboration with the relevant Operational Districts and Provincial Health Departments.

5.2. Provincial level

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

1. Submit a request for essential medicines and supplies to the Ministry of Health.
2. Integrate the PEN program into the annual operational plan to ensure cash flow and adequate supply of medical consumables to health centers.
3. Conduct quarterly supervision to each OD to ensure smooth coordination and implementation of the PEN program as well as monitoring of its effectiveness in terms of health outcomes.
4. Plan and organize the training on PEN, focusing on CVD prevention through integrated management of diabetes and hypertension, including health education and counseling for healthy behavior.
5. Report quarterly, twice yearly, and annually on the PEN program, against annual operational plan, to the Department of Preventive Medicine, Ministry of Health.
6. Coordinate with NGOs and relevant stakeholders working on NCD prevention and control at the provincial level to avoid overlapping catchment areas.
7. Disseminate updated NCD policies and guidelines to all stakeholders at the provincial level.

8. Identify bottlenecks and solve problems to ensure smooth implementation of the PEN program.
9. Facilitate and participate in health center capacity assessments conducted by the Department of Preventive Medicine, Ministry of Health.

5.3. Operational district level

The Operational District plays a very important role to support health centers implementing the PEN program, in collaboration with NGOs and other relevant stakeholders working at the sub-national level. Directors of each Operational District will assume the following tasks:

1. Request the Central Medical Store, MoH, through Provincial Health Department to ensure NCD essential medicines and supplies are readily available for health centers and referral hospitals.
2. Supervise PEN implementation at HCs on a monthly basis including their supportive supervision of peer educators where they are present
3. Submit quarterly, twice yearly, and annual progress reports on the PEN program to the Provincial Health Department.
4. Organize a monthly meeting on the PEN program with the relevant health centers to address bottlenecks and problem solving.
5. Facilitate a referral system of patients between the health center and referral hospital.
6. Facilitate and participate in health center capacity assessments conducted by the Department of Preventive Medicine, MoH.
7. Collaborate with relevant stakeholders and local authorities in support of PEN program.

5.4. Referral hospital

The referral hospital and NCD clinics shall work closely with health centers in order to strengthen referral systems for chronic care. The NCD clinics will assume the following tasks:

1. Perform further investigation to confirm diagnosis, address complications of diabetes and initiate treatment for new cases.
2. Refer diabetes cases without complication to health centers for continuum of care, if appropriate. The NCD clinic only treats complicated cases of diabetes and hypertension.
3. Manage the complicated cases of diabetes and hypertension referred from the health center.
4. Provide technical support to the health center for follow-up of cases by coaching on a quarterly basis and with mentoring visits to health centers. For follow-up cases referred from the hospital to health center, the NCD clinic needs to complete a referral form with prescription for the continued care and treatment at relevant health centers.

5. Provide feedback to the health center on the referred cases with filing out the referral form and prescription.
6. Enter data of diabetes and hypertension patients into database management system at the NCD clinic.

5.5. Health center and community level

The implementation of the PEN program in health centers and communities living in the catchment areas should support greater involvement of the local population as people become more aware of CVD risk and the importance of prevention. Relevant NGOs can also assist health centers to provide health education and treatment to people living with diabetes, hypertension, and/or cardiovascular risk. The PEN team will be established in each health center consisting of health professionals and volunteers. The volunteers should be members of Village Health Support Groups (VHSG), Peer Educators (PE), village leaders or other representatives in communities. The PEN team should be based at the health center and will assume the following tasks:

Roles and Responsibilities	
Health Center Staff	Community Volunteers
<ol style="list-style-type: none"> 1. Perform routine consultations for early detection, diagnosis (where appropriate), and treatment for people living with hypertension, and/or CVD risk, including lifestyle modification and counseling. 2. Perform routine consultations for early detection and provisional diagnosis and follow up treatment of diabetes. 3. Refer suspected cases of diabetes, and complicated hypertension cases to NCD clinic for diagnosis and treatment. 4. Provide a continuum of care to people living with diabetes and hypertension. 5. Facilitate referrals of complicated cases to NCD clinics at the referral hospital for confirmed diagnosis and treatment. 6. Organize outreach activities to raise awareness of diabetes, hypertension, CVD risk prevention and treatment. 7. Provide technical support and share information on CVD risk, including diabetes and hypertension, to other team members. 	<ol style="list-style-type: none"> 1. Participate in educational outreach campaigns to inform communities about the PEN program every month in support of health center. 2. Refer people aged above 40 to health centers for CVD risk screening. 3. Provide education on lifestyle, counseling and self-management to patients with diabetes and hypertension. 4. Follow up patients with diabetes and hypertension in communities. 5. Participate in outreach activities to raise awareness of NCD prevention and screening for diabetes and hypertension in the communities. 6. Participate in a series of Village Health Support Group or Peer Educator meetings organized by health center. 7. Report to Health Center on their activities and results.

<p>8. Submit monthly, quarterly, twice yearly, and annual progress reports on PEN program to the OD.</p> <p>9. Request essential medicines and supplies for NCDs to the OD.</p> <p>10. Integrate regular VSHG or peer educator meetings on PEN into HCMC meeting.</p>	
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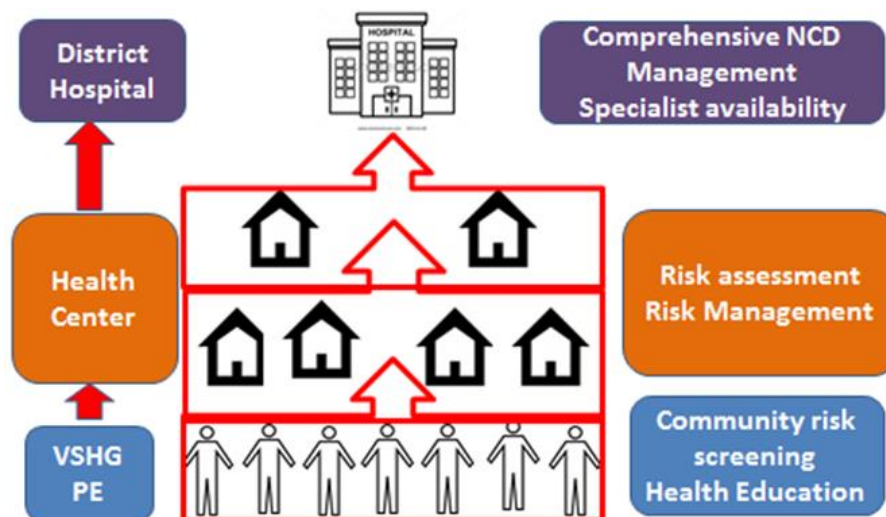


Figure 2: PEN Program Overview

5.6. Health center capacity assessments

Prior to initiation of the PEN program in each Operational District, the Department of Preventive Medicine, Ministry of Health will conduct health center capacity assessments in relevant Operational Districts.

The health center capacity assessments focus on the following aspects (see Annex 2):

- Estimated number of diabetes and hypertension patients in the catchment area based on population age structure and STEPS survey data.
- Human resources, in terms of number of nurses and other health staff, level of knowledge on NCDs, training needs, and non-health staff such as Village Health Support Group, Peer Educator, and relevant community representatives.
- Equipment and supplies needed for prevention, diagnosis and treatment of diabetes and hypertension at primary health level.
- Quantity and type of medicines required for the treatment of diabetes and hypertension at the primary health level.
- Patient management record system for the follow-up of individual patients, and monitoring and evaluation.

- Referral system to confirm the diagnosis of diabetes and to record number of patients initiating drug treatment and complicated hypertension and diabetes cases.
- Collaboration with the community which consists of NGOs, VHSG and Peer Educator.
- Communication between health centers and district referral hospitals.
- Administration, supervision and financing.

Criteria for selecting health center to start PEN program include the following:

1. Three health center staff allocated for implementation of PEN program.
2. NCD clinic is functioning within the same Operational District for case referral.
3. Distance between health center and NCD clinic is less than 50 km.
4. HCMC is functioning with meeting taking place every 2 months, with a minimum of 75% of participants in attendance (HCMC, VHSG and/or other community links).

5.7. Procurement of supplies and equipment

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

Equipment and supplies	Essential medicines
1. Health education materials related to major NCDs and their risk factors, including posters and leaflets	1. Amlodipine 5mg
2. WHO risk charts for total CVD risk assessment	2. Hydrochlorothiazide (HCTZ) 12.5mg
3. Stethoscope	3. Enalapril 10mg
4. Blood Pressure Measurement Device (BPMD)	4. Metformin 500mg/850mg
5. Measurement tape	5. Sulphonylurea (Glibenclamide 5mg or Gliclazide 80mg)
6. Glucometer	6. Insulin and standard insulin syringe 100 IU/ml if applicable
7. Blood glucose test strip	7. Simvastatin 20mg
8. Lancet needle	8. Acetylsalicylic Acid (75-100mg)
9. Cholesterol test strip if feasible	9. Other prescribed medications for routine maintenance care for cases living in catchment area of the health center
10. Urine protein and ketone test strip	
11. Patient card	
12. Patient registration form	
13. Patient's self-management book	

Note that the equipment, supplies and essential medicines outlined above for use at the health center are for diagnosis and treatment of uncomplicated hypertension and type 2 diabetes cases. If hypertension is not controlled by the two drugs listed above (Amlodipine and Hydrochlorothiazide)

or the patient has any symptom or sign of complication, the patient must be referred to the RH. In case of type 2 diabetes, after preliminary diagnosis in HC, the diagnosis needs to be confirmed in the RH. A continued treatment and follow-up of uncomplicated diabetes patients should be done at the HC level. All HCs implementing PEN should have a glucometer and blood glucose test strips. Other necessary laboratory analysis will be done in RH. Diagnosis of hypercholesterolemia is done and cholesterol lowering drug treatment is initiated in RH, but after diagnosis and start of treatment, the patient can be followed up at the HC.

6. Program activities

The main activities of the PEN program include:

1. Awareness campaigns
2. Outreach activities
3. Assessment of total cardiovascular risk
4. Diagnosis and clinical management of hypertension
5. Diagnosis and clinical management of type 2 diabetes

6.1. Campaign organization

The populations of the selected catchment areas need to be informed about the PEN program and its purpose. The content of the information can be divided into two main components: (1) general information about the program, and (2) information, education and communication (IEC) on NCDs and their risk factors. Educational information can be delivered to the communities through IEC materials; including posters, leaflets, media, and community meetings. Organizing an opening ceremony at the beginning of the PEN program in respective health centers should be strongly considered for population information and mobilization.

The campaign will be conducted once a year, such as during World Diabetes Day with participation from relevant stakeholders and population in the catchment area of the HC, OD, and provinces. In addition, twice a year PHD and OD will organize the campaign on PEN and NCD risk factors to the publics.

6.2. Outreach activities

Health center staff in collaboration with VHSG, PE and the commune council will organize outreach activities in accordance with the outreach activity guidelines. The outreach activities are to provide health information and services, including active screening on diabetes and hypertension in communities (see annex 3). The VHSG and PE will also follow up diabetes and hypertension patients during the outreach activities.

6.3. Assessment of total cardiovascular risk

At the health center, 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 facilitating integration. 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.

Total CVD risk can be assessed by using a simple risk chart and data on: age and sex, smoking status, blood pressure, serum cholesterol (if available) and diagnosed diabetes or measured blood glucose.

Total CVD risk = Risk of dying due to stroke or heart disease during the next 10 years.

The following 4 different risk charts are needed (see Annex 4):

- **For people without diabetes:** With or without data on serum cholesterol and
- **For people with diabetes:** With or without data on serum cholesterol

If the risk is:

1. Below 10%, it can be considered as low
2. 10 to <20%: medium level risk
3. 20 to <30%: high risk
4. 30 to 40%: very high
5. Over 40%: extremely high (4 of 10 people in this risk category will die due to CVD in the next 10 years)

Risk charts can be used to motivate people to change their lifestyle and also to assess the need for drug treatment.

6.4. Diagnosis and clinical management of hypertension

Health center staff will be trained on how to make a diagnosis and provide treatment to patients with hypertension. The management of hypertension includes the following:

Lifestyle counseling:

1. Salt/sodium reduction in particular
2. Smoking cessation for smokers
3. Avoid harmful use of alcohol
4. Increase physical activity progressively to moderate level such as brisk walking at least 30 minutes per day on 5 days of the week if appropriate and avoid overweight.

Early detection and diagnosis:

1. Using standardized protocol
2. Mild hypertension usually does not cause any symptoms

Total CVD risk assessment:

1. Using the CVD risk chart (see annex 4)
2. Patient motivation to lifestyle changes
3. Assessment of the need for drug treatment

Starting drug treatment for uncomplicated patients

1. If systolic blood pressure is 140mmHg or over in repeated measurements, drug treatment may be needed.
2. Amlodipine 5mg and HCTZ 12.5mg (*starting 12.5 mg, increasing to 25 mg per day*) can be started at HC.
3. Drug treatment is not an alternative for lifestyle changes.
4. 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.

Follow-up of the patients

1. Lifestyles
2. Blood pressure level
3. Prescription or distribution of drugs and treatment adherence
4. **Drug treatment for hypertension is long-lasting, often life-long: never only a few days or weeks!**

Detailed clinical guidelines for management of hypertension patients in HC are given in the Minimum Package of Activities (MPA) guidelines.

6.5. Diagnosis and clinical management of type 2 diabetes

Health center staff will be trained on how to make provisional diagnoses and provide continued care and treatment to type 2 diabetes patients. The type 2 diabetes (T2DM) management includes the following:

Lifestyle counseling

1. Healthy diet
2. Weight control and physical activity
3. Smoking cessation for smokers

Early detection and preliminary diagnosis

1. Using standardized protocol
2. In its early state, T2DM usually does not cause any symptoms

3. Early detection is needed to prevent complications, such as cardiovascular and kidney diseases, foot amputations, and retinopathy.

Assessment of total CVD risk

1. Using the CVD risk chart (see annex 4)
2. Motivation of the patient to lifestyle changes
3. Assessment of the need for drug treatment

Refer to NCD clinic at RH for confirmation of the diagnosis and further management if fasting blood glucose values are over 126mg/dl or random blood glucose values are over 200mg/dl. If patient is diagnosed with diabetes, lifestyle modification and/or drug treatment will be initiated at the NCD clinic.

***Note:** If a fasting blood glucose value is 110-125mg/dl, the patient has impaired fasting glucose (IFG) or “pre-diabetes”, and patient needs a strict adherence of lifestyle changes – to avoid T2DM – and close follow-up.*

Follow-up of the patients

1. All people having IFG
2. T2DM patients after initiation of drug treatment
3. Lifestyles
4. Blood glucose level
5. Prescription or distribution of drugs and treatment adherence
6. Complications
7. Basic food care
8. Close collaboration and consultation with NCD clinic
9. **Drug treatment for diabetes is life-long: never only a few days or weeks**

Detailed clinical guidelines for management of T2DM patients in HC are given in MPA guideline.

7. 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 health care 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 have an impact on its management. In addition to cardiovascular disease, ageing-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-disease and drug interactions.

8. Monitoring and evaluation

8.1. Monitoring

The Department of Preventive Medicine, MoH will organize supervision visits to PHDs, ODs, NCD clinics, and HCs to monitor PEN program implementation once every month for the first 3 months when services started and then once every 3 months. The Provincial Health Department will supervise each OD and HC on a quarterly basis while the OD will conduct monthly integrated supervision with other program. A standard monitoring checklist will be used for monitoring to ensure effective functioning of NCD services, including clinical management, operational administrative and community links (see annex 5).

8.2. Evaluation

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

Indicator		Method of calculation
1	Proportion of population aged over 40 years whose total CVD risk assessed at least once during the reporting period.	<ul style="list-style-type: none"> ▪ Numerator: Total number of people aged over 40 years registered and screened for CVD risk at the health centers. ▪ Denominator: Total estimated number of adults aged over 40 years covered by health center ▪ Data sources: HeartCare Software, Patient Registration Book or PMRS, and the latest General population census of Cambodia (using population projections)
2	Number (%) of identified raised blood glucose cases among the estimated prevalence of diabetes aged over 40 years in	<ul style="list-style-type: none"> ▪ Numerator: Total number of identified raised blood glucose cases at health center ▪ Denominator: Estimated number of adult aged over 40 years with raised blood glucose in general population

	catchment area of health center.	<p>years (Total population aged over 40 of OD x national prevalence of raised blood glucose from STEPS survey)</p> <ul style="list-style-type: none"> ▪ Data sources: HeartCare Software, Patient Registration Book or PMRS, and the latest General population census of Cambodia (using population projections)
3	Proportion of diabetes cases aged over 40 years in the population treated at the health center.	<ul style="list-style-type: none"> ▪ Numerator: Total number of individuals with diabetes receiving treatment in the health centers. ▪ Denominator: Estimated number of adult aged over 40 years with diabetes in general population years (Total population aged over 40 of OD x national prevalence of diabetes from STEPS survey) ▪ Data sources: HeartCare Software, Patient Registration Book or PMRS, HIS, the latest General population census of Cambodia (using population projections).
4	Proportion of hypertensive cases aged over 40 years in the population treated at the health center.	<ul style="list-style-type: none"> ▪ Numerator: Total number of people aged over 40 years with hypertension receiving treatment in health centers. ▪ Denominator: Estimated number of people with hypertension in general population aged 40 years (total population aged 40 years of OD x national prevalence of hypertension from STEPS survey) ▪ Data sources: HeartCare Software, Patient Registration Book or PMRS HIS, and the latest General population census of Cambodia (using population projections).
5	Percentage of diabetes patients lost to follow up during the reporting period.	<ul style="list-style-type: none"> ▪ Numerator: Total number of diabetes patients who have not shown up at the health center over the last 12 months. ▪ Denominator: Total number of people aged over 40 years with diabetes receiving treatment in health centers. ▪ Data sources: HeartCare Software, Patient Registration Book or PMRS/HIS.
6	Percentage of hypertension patients lost to follow up during the reporting period.	<ul style="list-style-type: none"> ▪ Numerator: Total number of hypertension patients who have not shown up at the health center over the last 12 months. ▪ Denominator: Total number of individual aged over 40 years with hypertension receiving treatment in health centers. ▪ Data sources: HeartCare Software, Patient Registration Book or PMRS HIS.

7	Number (%) of diabetes patients who died during the reporting period.	<ul style="list-style-type: none"> ▪ Numerator: Total deaths of diabetes patients followed up at the health centers. ▪ Denominator: Total number of people aged over 40 years with diabetes receiving treatment in health centers. ▪ Data sources: Health center report
8	Number (%) of hypertension patients who died during the reporting period.	<ul style="list-style-type: none"> ▪ Numerator: Total deaths of hypertension patients followed up at the health centers. ▪ Denominator: Total number of people aged over 40 years with hypertension receiving treatment in health centers. ▪ Data sources: Health center report
9	Percentage of diabetes patients with fasting or random blood glucose control after 12-month treatment.	<ul style="list-style-type: none"> ▪ Numerator: Total number of diabetes patients with fasting blood glucose less than 150 mg/dl or random blood glucose less than 180 mg/dl in the last 3 month or HbA_{1c} less than 7% if available ▪ Denominator: Total number of diabetes patients receiving treatment in health centers after 12 months. ▪ Data sources: HeartCare Software
10	Percentage of hypertension patients with blood pressure controlled after 12-month treatment.	<ul style="list-style-type: none"> ▪ Numerator: 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). ▪ Denominator: Total number of hypertension patients receiving treatment in health centers after 12 months. ▪ Data sources: HeartCare Software
11	Percentage of smokers who quit smoking.	<ul style="list-style-type: none"> ▪ Numerator: Total number of people who quit smoking for at least 12 months. ▪ Denominator: Total number of people registered in health center who smoked cigarettes. ▪ Data sources: HeartCare Software

9. Data collection and patient registration

Currently, there are no standardized reporting forms for diabetes and hypertension management in primary care in Cambodia. Health centers have been collecting data from registration forms for CVD risk. This includes the number of people screened for CVD risk, and the number of suspected diabetes and hypertension cases. This is sent to the Department of Preventive Medicine.

The Department of Preventive Medicine, Ministry of Health will develop a patient registration and data collection system for NCDs which will be either a paper-based or computer-based system. This system should be incorporated with the standard patient recording and data management system of HCs and integrated into the existing Patient Management Registration System (PMRS) of MoH.

10.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 health center and recorded in a centralized database on a monthly basis. At the health center, data will be collected manually. A simple web-based data transfer system will be developed. Data management and analysis will be conducted by the Department of Preventive Medicine, Ministry of Health. Required data and reports, such as quarterly, twice yearly and annual data will be produced and integrated into the MoH Health Management Information System (HMIS).

Annex 1: WHO PEN Protocol 1 and 2

WHO PEN PROTOCOL 1 PREVENTION OF HEART ATTACKS, STROKES AND KIDNEY DISEASE THROUGH INTEGRATED MANAGEMENT OF DIABETES AND HYPERTENSION

When could this Protocol be used?

- The protocol is for assessment and management of cardiovascular risk using hypertension, diabetes mellitus (DM) and tobacco use as entry points
- It could be used for routine management of hypertension and DM and for screening, targeting the following categories of people:
 - age > 40 years
 - smokers
 - waist circumference (≥ 90 cm in women ≥100 cm in men)
 - known hypertension
 - known DM
 - history of premature CVD in first degree relatives
 - history of DM or kidney disease in first degree relatives

Follow instruction given in Action 1 to Action 4, step by step

FIRST VISIT	Action 1. Ask about:	
	<ul style="list-style-type: none"> ■ Diagnosed heart disease, stroke, TIA, DM, kidney disease ■ Angina, breathlessness on exertion and lying flat, numbness or weakness of limbs, loss of weight, increased thirst, polyuria, puffiness of face, swelling of feet, passing blood in urine etc ■ Medicines that the patient is taking ■ Current tobacco use (yes/no) (answer yes if tobacco use during the last 12 months). 	<ul style="list-style-type: none"> ■ Alcohol consumption (yes/no) (if 'Yes', frequency and amount) ■ Occupation (sedentary or active) ■ Engaged in more than 30 minutes of physical activity at least 5 days a week (yes/no) ■ Family history of premature heart disease or stroke in first degree relatives.
	Action 2. Assess (physical exam and blood and urine test):	
	<ul style="list-style-type: none"> ■ Waist circumference ■ Measure blood pressure, look for pitting odema ■ Palpate apex beat for having and displacement ■ Auscultate heart (rhythm and murmurs) ■ Auscultate lungs (bilateral basal crepitations) ■ Examine abdomen (tender liver) ■ In DM patients examine feet; sensations, pulses, and ulcers 	<ul style="list-style-type: none"> ■ Urine ketones (in newly diagnosed DM) and protein ■ Total cholesterol ■ Fasting or random blood sugar (diabetes= fasting blood sugar ≥7 mmol/l (126 mg/dl) or random blood sugar ≥11.1 mmol/l (200 mg/dl)) (Point of care devices can be used for testing blood sugar if laboratory facilities are not available)

Action 3. Estimate cardiovascular risk (in those not referred):

- Use the WHO/ISH risk charts relevant to the WHO subregion (Annex and CD)
- Use age, gender, smoking status, systolic blood pressure, DM (and plasma cholesterol if available)
- If age 50-59 years select age group box 50, if 60-69 years select age group box 60 etc., for people age < 40 years select age group box 40
- If cholesterol assay cannot be done use the mean cholesterol level of the population or a value of 5.2 mmol/l to calculate the cardiovascular risk).
- If the person is already on treatment, use pretreatment levels of risk factors (if information is available to assess and record the pretreatment risk. Also assess the current risk using current levels of risk factors)
- Risk charts underestimate the risk in those with family history of premature vascular disease, obesity, raised triglyceride levels.

Action 4. Referral criteria for all visits:

- BP >200/>120 mm Hg (urgent referral)
- BP \geq 140 or \geq 90 mmHg in people < 40 yrs (to exclude secondary hypertension)
- Known heart disease, stroke, transient ischemic attack, DM, kidney disease (for assessment, if this has not been done)
- New chest pain or change in severity of angina or symptoms of transient ischemic attack or stroke
- Target organ damage (e.g. angina, claudication, haaving apex, cardiac failure)
- Cardiac murmurs
- Raised BP \geq 140/90 (in DM above 130/80mmHg) while on treatment with 2 or 3 agents.
- Any proteinuria
- Newly diagnosed DM with urine ketones 2+ or in lean persons of <30 years
- Total cholesterol >8mmol/l
- DM with poor control despite maximal metformin with or without sulphonylurea
- DM with severe infection and/or foot ulcers
- DM with recent deterioration of vision or no eye exam in 2 years
- High cardiovascular risk.

If referral criteria are not present, go to Action 5

Action 5. Counsel all and treat as shown:

FIRST VISIT	Risk <20#	<ul style="list-style-type: none"> ■ Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol ■ If risk < 10% follow up in 12 months ■ If risk 10 - < 20% follow up every 3 months until targets are met, then 6-9 months thereafter. 	<p>Additional actions for individuals with DM:</p> <ul style="list-style-type: none"> ■ Give an antihypertensive for those with BP ≥ 130/80 mmHg ■ Give a statin to all with type 2 DM aged ≥ 40 years ■ Give Metformin for type 2 DM if not controlled by diet only (FBS>7mmol/l), and if there is no renal insufficiency, liver disease or hypoxia. ■ Titrate metformin to target glucose value ■ Give a sulfonylurea to patients who have contraindications to metformin or if metformin does not improve glycaemia control. ■ Give advice on foot hygiene, nail cutting, treatment of calluses, appropriate footwear and assess feet at risk of ulcers using simple methods (inspection, pin-prick sensation) ■ Angiotensin converting enzyme inhibitors and/or low-dose thiazides are recommended as first-line treatment of hypertension. Beta blockers are not recommended for initial management but can be used if thiazides or angiotensin converting enzyme inhibitors are contraindicated. ■ Follow up every 3 months 	
	Risk 20% to 30%	<ul style="list-style-type: none"> ■ Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol ■ Persistent BP ≥ 140/90 mm Hg consider drugs (see below ** Antihypertensive medications) ■ Follow-up every 3-6 months. 		
	Risk > 30%	<ul style="list-style-type: none"> ■ Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol ■ Persistent BP ≥ 130/80 consider drugs (see below ** Antihypertensive medications) ■ Give a statin ■ Follow-up every 3 months, if there is no reduction in cardiovascular risk after six months of follow up refer to next level. 		
	Important practice points	<p><i>Consider drug treatment for following categories</i></p> <ul style="list-style-type: none"> ■ All patients with established DM and cardiovascular disease (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 with risk >30% ■ People with albuminuria, retinopathy, left ventricular hypertrophy ■ All individuals with persistent raised BP ≥ 160/100 mmHg; antihypertensive treatment ■ All individuals with total cholesterol at or above 8 mmol/l (320 mg/dl); lifestyle advice and statins. 		
		<p><i>** Antihypertensive medications</i></p> <ul style="list-style-type: none"> ■ If under 55 years low dose of a thiazide diuretic and/ or angiotensin converting enzyme inhibitor ■ If over 55 years calcium channel blocker and/or low dose of a thiazide diuretic ■ If intolerant to angiotensin converting enzyme inhibitor or for women in child bearing age consider a beta blocker ■ Thiazide diuretics and/or long-acting calcium channel blockers are more appropriate as initial treatment. ■ Test serum creatinine and potassium before prescribing an angiotensin converting enzyme inhibitor 		

FIRST VISIT	Advice to patients and family
	<ul style="list-style-type: none"> ■ Avoid table salt and reduce salty foods such as pickles, salty fish, fast food, processed food, canned food and stock cubes ■ Have your blood glucose level, blood pressure and urine checked regularly
	Advice specific for DM
	<ul style="list-style-type: none"> ■ Advise overweight patients to reduce weight by reducing their food intake. ■ Advise all patients to give preference to low glycemic-index foods (e.g. beans, lentils, oats and unsweetened fruit) as the source of carbohydrates in their diet ■ If you are on any DM medication that may cause your blood glucose to go down too low carry sugar or sweets with you ■ If you have DM, eyes should be screened for eye disease (diabetic retinopathy) by an ophthalmologist at the time of diagnosis and every two years thereafter, or as recommended by the ophthalmologist ■ Avoid walking barefoot or without socks ■ Wash feet in lukewarm water and dry well especially between the toes ■ Do not cut calluses or corns, and do not use chemical agents on them ■ Look at your feet every day and if you see a problem or an injury, go to your health worker

SECOND VISIT	Advice to patients and family
	<ul style="list-style-type: none"> ■ Ask about: new symptoms, adherence to advise on tobacco and alcohol use, physical activity, healthy diet, medications etc ■ Action 2 Assess (Physical exam) ■ Action 3 Estimate cardiovascular risk ■ Action 4 Refer if necessary ■ Action 5 Counsel all and treat as shown in protocol

References:

Prevention and control of noncommunicable diseases; Guidelines for primary health care, World Health Organization, 2012

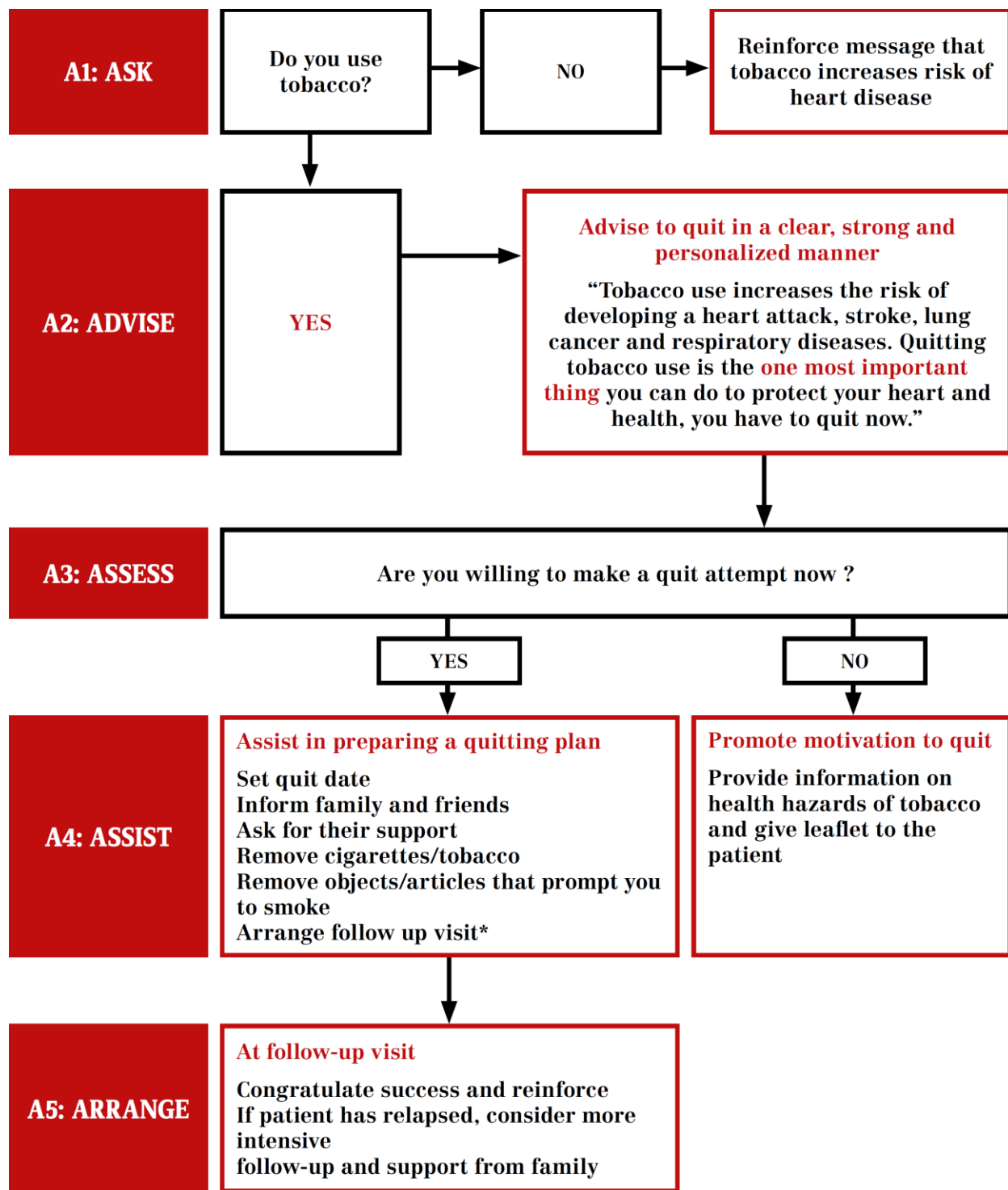
Scaling up action against noncommunicable diseases. How much will it cost?, World Health Organization, 2011

Prevention of cardiovascular diseases; Pocket guidelines for assessment and management of cardiovascular risk, World Health Organization, 2008

WHO PEN PROTOCOL 2

HEALTH EDUCATION AND COUNSELING ON HEALTHY BEHAVIOURS (TO BE APPLIED TO ALL)

Educate your patient to	Eat a heart healthy diet
<ul style="list-style-type: none"> ■ Take regular physical activity ■ Eat a “heart healthy” diet ■ Stop tobacco and avoid harmful use of alcohol ■ Attend regular medical follow-up 	<p>Salt (sodium chloride)</p> <ul style="list-style-type: none"> ■ Restrict to less than 5 grams (1 teaspoon) per day ■ Reduce salt when cooking, limit processed and fast foods <p>Fruits and vegetables</p> <ul style="list-style-type: none"> ■ 5 servings (400-500 grams) of fruits and vegetable per day ■ 1 serving is equivalent to 1 orange, apple, mango, banana or 3 tablespoons of cooked vegetables <p>Fatty food</p> <ul style="list-style-type: none"> ■ Limit fatty meat, dairy fat and cooking oil (less than two tablespoons per day) ■ Replace palm and coconut oil with olive, soya, corn, rapeseed or safflower oil ■ Replace other meat with chicken (without skin) <p>Fish</p> <ul style="list-style-type: none"> ■ Eat fish at least 3 times per week, preferably oily fish such as tuna, mackerel, salmon.
Take regular physical activity	
<ul style="list-style-type: none"> ■ Progressively increase physical activity to moderate levels (such as brisk walking); at least 150 minutes per week ■ Control body weight and avoid overweight by reducing high calorie food and taking adequate physical activity. 	
Stop Tobacco and avoid harmful use of Alcohol:	Adherence to treatment
<ul style="list-style-type: none"> ■ Encourage all non-smokers not to start smoking ■ Strongly advise all smokers to stop smoking and support them in their efforts ■ Individuals who use other forms of tobacco should be advised to quit ■ Alcohol abstinence should be reinforced. ■ People should not be advised to start taking alcohol for health reasons ■ Advise patients not to use alcohol when additional risks are present, such as: <ul style="list-style-type: none"> ■ driving or operating machinery ■ pregnant or breast feeding ■ taking medications that interact with alcohol ■ having medical conditions made worse by alcohol ■ having difficulties in controlling drinking 	<ul style="list-style-type: none"> ■ If the patient is prescribed a medicine/s: <ul style="list-style-type: none"> ■ teach the patient how to take it at home ■ explain the difference between medicines for long- term control (e.g. blood pressure) and medicines for quick relief (e.g. for wheezing) ■ tell the patient the reason for prescribing the medicine/s ■ Show the patient the appropriate dose ■ Explain how many times a day to take the medicine ■ Label and package the tablets ■ Check the patient’s understanding before the patient leaves the health centre ■ Explain the importance of: <ul style="list-style-type: none"> ■ keeping an adequate supply of the medications ■ the need to take the medicines regularly as advised even if there are no symptoms



* Ideally second follow-up visit is recommended within the same month and every month thereafter for 4 months and evaluation after 1 year. If not feasible, reinforce counseling whenever the patient is seen for blood pressure monitoring.

Annex 2: Health center capacity assessment

Assessment of capacity to prevent and manage major noncommunicable diseases (NCDs) in primary care centers in low-resource settings

To be completed by NCD Bureau, Department of Preventive Medicine, Ministry of Health, PHD and OD

Thank you for taking time to respond to this questionnaire

Province: Date(dd/mm/yy):

Name of Operational District

Name of person completing the questionnaire:

Title:

Health center name:

Total population of the health center catchment area:

Human resources			
Variable	Questionnaires	Code of Answers	Skip
Q1	<i>1. Availability of human resources for managing major noncommunicable diseases(NCDs):</i>		
Q1a	Medical doctor	__ __	
Q1b	Medical assistant	__ __	
Q1c	Secondary nurse	__ __	
Q1d	Primary nurse	__ __	
Q1e	Secondary midwives	__ __	
Q1f	Primary midwives	__ __	
Q1g	Community health workers (VHSG, peer educators, etc.)	__ __	
Q1h	Other (specify: e.g. Floating staff, cleaner, Driver etc.)	__ __	
Q2	<i>2. Are doctors, nurses and/or other health workers trained on noncommunicable Disease (NCD) management?</i>		
Q2a	a. Medical Doctors/medical assistant	Yes, trained (number of times and duration:) No, not trained on NCD management (number:)	<u>1</u> 3

Q2b	b. Nurses	Yes, trained (number of times (Nurse 1):) (number of times (Nurse 2):.....) (number of times (Nurse 3).....):	1
		No, not trained on NCD management (number of times:)	3
Q2c	c. Midwives (same as above)	Yes, trained more than one time (number:)	
		No, not trained on NCD management (number:)	
Q2d	d. Community health workers (VHSG, peer educators, etc.)	Yes, trained (number:)	1
		No, not trained on NCD management (number:)	3

Equipment			
Variable	Questionnaires	Code of Answers	Skip
Q3	<i>3. Availability of basic equipment for managing major noncommunicable diseases (NCDs): (Numbers?)</i>		
Q3a1	a.1 Blood pressure measuring devices (BPMD) (Number of Functional devices available)	__ __	
Q3a2	a.1.1 Please give the breakdown (Aneroid BPMDs) (Number of Functional devices available)	__ __	
Q3a3	a.1.2 Please give the breakdown (Automatic BPMDs) (Number of Functional devices available)	__ __	
Q3b1	b.1 Oxygen cylinders (full)(Number of Functional devices available)	__ __	
Q3c1	c.1 Weighing machines(Number of Functional devices available)	__ __	
Q3e1	e.1 Measuring tape(Number of Functional devices available)	__ __	
Q3h1	h.1 Stethoscope (Number of Functional devices available)	__ __	
Q3i1	i.1 Thermometer (Number of Functional devices available)	__ __	
Q3j1	j.1 Describe Health education material leaflets, posters, brochures) (Number of copies of leaflets, posters, and brochures)	__ __	

Q3m1	m.1 Glucometer (Number of Functional devices available)	_ _ _ _	
Q4	1. Are blood pressure measuring devices (BPMDs) calibrated and checked for accuracy? Yes (How often).....and No	Yes	
		No	

Infrastructure/services			
Variable	Questionnaires	Code of Answers	Skip
Q8	8. Can the following investigations be carried out? (Check "Yes" only if the investigation can be done <u>on the day of the assessment</u>).		
Q8a	a. Urine albumin /protein testing	Yes, at this	1
		Yes, at referral facility, but not at this facility...	2
		No	0
Q8b	b. Urine glucose /sugar	Yes, at this facility	1
		Yes, at referral facility, but not at this facility...	2
		No.....	0
Q8c	c. Urine ketone bodies (same as above)	Yes, at this facility	1
		Yes, at referral facility, but not at this facility...	2
		No	0
Q8d	d. Blood sugar (same as above)	Yes, at this facility	1
		Yes, at referral facility, but not at this facility...	2
		No	0
Q8f	e. Blood cholesterol (same as above)	Yes, at this facility	1
		Yes, at referral facility, but not at this facility...	2
		No	0
Q9	9. Do you have a bed where you can stabilize a very ill patient before transferring to a referral institution?	Yes.....	1
		No.....	2
Q10	10. Is there a safety box for used needles available?	Yes,	1
		No,	2
Q11	11. Are the following services available at the facility?		
Q11a		Yes.....	1

Q11b	a. Patient counseling and education on smoking ,diet, alcohol and/or physical	No.....	2
		Don't know.....	99
	b. Counseling and education of family members on smoking, diet, alcohol and/or physical activity	Yes.....	1
		No.....	2
		Don't know.....	99
	Q11c	e. Patient counseling for diabetes self-management including psychological counseling	Yes.....
No.....			2
Don't know.....			99
Don't know.....			99

Medicine			
Variable	Questionnaires	Code of Answers	Skip
Q12a	12.a Are medicines purchased directly by the facility for distribution to patients?	Yes.....	1
		No.....	2
Q12b	12.b If “Yes”, are medicine purchases subsidized by the government?	Yes.....	1
		No.....	2
	12.c If yes, are medicines purchased by using budget from user fees?	Yes No	
Q13 14. Availability of medicines in the facility (tick only one box for each medicine)			
Q132	1. Aspirin	Always available.....	1
		Sometimes	2
		Not available at all.....	0
Q133	2. Atenolol	Always available.....	1
		Sometimes	2
		Not available at all.....	0
Q134	3. Enalapril	Always available.....	1
		Sometimes	2
		Not available at all.....	0
Q135	4. Glibenclamide	Always available.....	1
		Sometimes	2
		Not available at all.....	0
Q136	5. Hydrochlorothiazide	Always available.....	1
		Sometimes	2
		Not available at all.....	0
Q137	6. Insulin (long acting)	Always available.....	1
		Sometimes	2
		Not available at all.....	0
Q138	7. Insulin (soluble)	Always available.....	1
		Sometimes	2

		Not available at all.....	0
Q139	8. Statins (lovastatin or simvastatin)	Not available at all.....	0
		Always available.....	1
		Sometimes	2
Q1310	9. Metformin	Not available at all.....	0
		Always available.....	1
		Sometimes	2
Q1311	10. Calcium channel blockers (nifedipine retard, amlodipine)	Not available at all.....	0
		Always available.....	1
		Sometimes	2
	11. Others (please describe)	

Utilization of services

Variable	Questionnaires	Code of Answers	Skip
Q14	What is the total number of visits to the health center for out-patient services in the <u>last 3 months?</u>	_ _ _ _ _ _ _	
Q14a	Total number of visits last 3 months: 14.a This figure is based on:	Registers/record..... 1 Estimation..... 2	

Referral patients

Q15	Have you ever wanted to refer a patient with acute, severe symptoms or emergency related to heart disease, diabetes but were unable to do so?	Yes..... 1 No..... 2	
Q15txt	If yes, why?		
Q16	Does your facility have an ambulance?	Yes..... 1 No..... 2	
Q17	If the facility does NOT have an ambulance, can patient transfer by ambulance be arranged?	Yes..... 1 No..... 2 Don't know 99	
Q18	What means of transport is <u>most frequently</u> used to transfer emergency patients at your Health center (check only one)?	Ambulance.....	1
		Public	2
		Commercial vehicle	
		Private vehicle.....	4
		Other:.....	88
Q18txt	If other specify:.....	

Q19	Approximately how long does it take to transfer a patient to the nearest referral hospital?		
Q19a	Hours	_ _ _ _ _	
Q19b	Minutes or	_ _ _ _ _	
Q20c	Days	_ _ _ _ _	
Q20a	Can you refer patients with noncommunicable diseases (NCDs) for a second opinion/specialist consultation?	Yes..... 1 No 2	
Q20atxt	Why not?.....	
Q20b	If “yes”, the patients will usually be:	Referred back to you for follow-up..... 1 Followed up at the upper level (referral) facility..... 2	
Q20c	Can you refer patients with noncommunicable diseases (NCDs) to the nearest referral hospital for some additional tests?	Yes..... 1 No..... 2	
Q20ctxt	Why not?.....	

Record keeping /medical information system

Patient records

Variable	Questionnaires	Code of Answers	Skip
Q21	21. Does the health center keep a record of patient visits?	Yes, records kept for all visits..... 1	to Q 29
		Yes, records kept for certain types of visit 3	
		No records kept..... 2	
Q21txt	If records kept for certain types of visit (3) specify:.....	
Q22	22. How are records kept?	Patient files 1	to to
		Registry system..... 2	
		Other:..... 88	
Q22txt	If other, specify.....		

Q23	23. Are <i>patient files</i> retrieved and consulted each time they visit the health center?	Yes, patient files usually /always consulted.....	1
		Yes, patient files consulted, but only when necessary.	2
		No, patient files not consulted.....	3

Facility records

Q24	24. Does the health center have stock card or logbooks for:		
Q24a	24.a Medicines	Yes, but not used routinely.....	1
		Yes, used routinely and currently up to date....	2
		No.....	0
Q24b	24.b Consumables (e.g. syringes, bandages)	Yes, but not used routinely.....	1
		Yes, used routinely and currently up to date....	2
		No.....	0

Community Links			
Variable	Questionnaires	Code of Answers	Skip
Q25	25. Are there any community activities to support noncommunicable disease (NCD) services provided at the health center?	Yes..... 1 No..... 2 Don't know 9	
Q25a	If "yes", specify (Peer educator network, Disable People Organization, Old People Association etc.) Formal or informal agreement between health center and community support groups. Formal 1 Informal 2	
Q25b	Is there a functioning Health Center Management Committee (HCMC), with a regular meeting once every 2 months, with a minimum of 75% attendance?	Yes No	

Annex 3: Guide for Active Screening of Diabetes and Hypertension

Screening population for diabetes and hypertension is potential benefits of secondary prevention through early detection and treatment. Active screening is the process of using tests on a large scale to identify the presence of disease in apparently healthy people. Screening test does not usually establish a diagnosis, but rather identify the presence or absence of risk factor for further individual confirmation and treatment.

Purpose:

Active screening for hypertension and diabetes in the community is organized in order 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 due to diabetic and hypertension.
3. Raise awareness among target population who are unaware of their health status.
4. Raise community awareness on healthy lifestyle.

Target population:

Population aged 40 and above will be screened for diabetes and hypertension. Education and awareness activities in communities should also promote screening services to other vulnerable and high-risk populations including older people, people with disabilities, people with mental illness, people who are overweight or obese or other symptoms associated with diabetes.

Screening procedures:

1. Sensitization meeting on active screening:

- i) OD should organize a sensitization meeting on active screening with district governors and commune councils to obtain their support and involvement in mobilizing target population for screening and raising awareness.
- ii) HC should also organize a sensitization meeting on active screening with HCMC and village chiefs to obtain their support and involvement in mobilizing target population for screening and raising awareness.

2. Training of VHSs and Peer Educators:

A three-day training will be conducted by the OD with support from the HC. Two active VHSs/Peer Educators from each village will be invited to the training. The training curriculum will be developed and be ready before the training.

The training will cover the following contents:

- Healthy life style and risk factors of NCD
- High blood pressure
- Diabetes
- Benefits of screening

- Who are the target groups for screening
- How to register and follow-up the target groups
- How to conduct effective awareness raising on active screening in the village
- How to conduct active screening in the village
- How to use blood glucose test and high blood pressure measurement devices: theory and practice
- What to do after screening: confirmation and referral for those at risks; repeat screening in 1 year for those not at risk
- How to record and report the screening results
- How to provide educational messages after screening
- How to follow-up for those who do not participate in the screening, those who do not seek treatment and those who drop out from treatment
- Roles and responsibilities of the VHSGs/Peer Educators and HC staff:
 - One HC staff member leads the active screening process in the community and is the main person responsible for taking blood glucose test and blood pressure.
 - Two VHSGs support the HC staff member to conduct active screening, including informing and registering target groups, selection of location, gather/follow-up target population for screening, assist with blood pressure measurement and blood glucose testing etc.

HC staff should perform the screening and at the same time provide coaching to VHSGs/Peer Educators until the VHSGs/Peer Educators are confident in conducting the screening by themselves. To be effective, the training should use adult learning methodology such as group discussion, plenary discussion, role play, demonstration, and practice etc.

3. Screening process

i) Mapping and Registration:

- After the training, the two VHSGs/Peer Educators, in collaboration with the village chief, will do mapping in their village. This means that they will conduct house-to-house registration for all people aged 40 and above and other vulnerable groups in the registration list (a registration template will be provided at the training; see sample below). Through this process, they will know the target screening population in their village. The list should also be used after screening for follow-up purposes of those screened and for those who did not attend the screening.

ii) Awareness Raising:

- During house-to-house registration, the VHSG/Peer Educators will also raise awareness in their community about the benefit of active screening for diabetes and hypertension, and about healthy lifestyle.
- Depending on the local situation, awareness raising can be done in different ways using different means of communication and available educational materials,

such as large group meetings, small group meeting, home visits, face-to-face communication, flipchart, poster, leaflet, etc.

- They should inform the community of the date and the location of the screening and invite the target groups to attend the screening.
- They should also inform the target groups of the need to fast in the morning of the screening day in order to get accurate blood glucose result.

iii) Active Screening:

- The screening is focused on diabetes and hypertension.
- The screening will be conducted by one HC staff member with support from two VHSGs/Peer Educators. The VHSGs/Peer Educators should be actively involved in the screening with the HC staff. This is an opportunity for them to learn more in practice, including all the skills required for taking blood pressure and performing blood glucose testing.
- Before starting the active screening, the HC staff, with support from VHSGs/Peer Educators, will introduce the objectives of the screening followed by health education on NCDs, their risk factors and healthy lifestyle including distribution of available educational materials to all participants.
- The active screening can be conducted at the village chief's house or VHSG/Peer Educator's house, commune hall, pagoda, or house-to-house, depending on the local situation.
- HCs should aim to reach at least 80% coverage of screening target groups.

iv) Counselling and Referral:

- After the screening, those who are suspected of hypertension will receive individual counselling and explanation, and an appointment will be made to visit HC for another blood pressure measurement to confirm diagnosis and for treatment.
- Those who are suspected of diabetes will also receive individual counselling from the HC staff and referral letter to the RH for confirmed diagnosis and treatment of diabetes.
- Those who are at low risk without diabetes and hypertension will be advised to follow healthy lifestyle and have another screening in the next one year as recommended by the PEN SOP.

v) Follow-up:

- The VHSGs/Peer Educators will follow-up with those who were registered but did not attend the screening and convince them to join the next screening session.
- The VHSGs/Peer Educators will assist the HC with follow-up of those confirmed with hypertension and/or diabetes but did not seek treatment, or those who dropped out from treatment.

vi) **Recording and Reporting:**

- After screening each person the HC staff or VHSGs/Peer Educators will record all related information of the screening in the registration list (see template of the registration list below).
- HC staff will then report on a monthly basis, the number and percentage of target groups screened, number of confirmed diabetes and hypertension, number of diabetes and hypertension receiving treatment, and number who dropped-out of treatment

4. Screening fees

- i) For the purpose of sustainability and according to experience from MoPoTsyo Patient Information Center, the collection of a small fee is acceptable by the target groups. It is therefore proposed to charge a fee of 2,500 Riels for the blood glucose test. Screening for hypertension is free of charge. As the Health Equity Fund (HEF) does not pay services provided during outreach activities, pre/post ID-poor will be exempt from this 2,500 Riels charge during active screening in the community.
- ii) HCs will use collected user fees to pay the operation costs of the screening, including paying for incentives to VHSGs/Peer Educators and therefore ensuring budget sustainability of the screening.

5. Financial support

- i) Some financial incentives and transport costs should be considered for HC staff and VHSGs/Peer Educators who are involved in the mapping/registration, awareness raising, screening, counselling, follow-up and reporting. The DLI funds, user fees, HEF, and performance-based grants can be used.

6. Supply of equipment, materials and commodities

- i) Equipment
 - blood pressure measurement device
 - glucomet
- ii) Materials:
 - IEC materials
 - risk charts
 - BMI meter
 - registration form
 - referral slips
 - reporting form
- iii) Commodities
 - glucose test strip
 - needle
 - clean cotton swabs
 - alcohol
 - safety box

7. Monitoring

The HC staff should conduct monitoring in the following areas:

- i) Technique and skills of the screening of the VHSGs/Peer Educators: as the HC staff are present with VHSG/Peer Educators during the screening, this will be done during the screening in the community.
- ii) Post screening counselling
- iii) Screening coverage: the HC staff should check the monthly screening report compared to total number of target groups.
- iv) Follow-up for diagnosis confirmation with HC and RH for those who have been suspected as having high blood pressure and/or diabetes
- v) Follow-up for treatment and treatment drop-out: the HC staff should review data at HC compared to numbers of referrals made during screening in the community and communicate with RH about number of referrals for diagnosis confirmation of diabetes.

In addition, HCs should use the existing bi-monthly meeting with VHSG to include NCD screening in its meeting agenda in order to discuss challenges and find solutions.

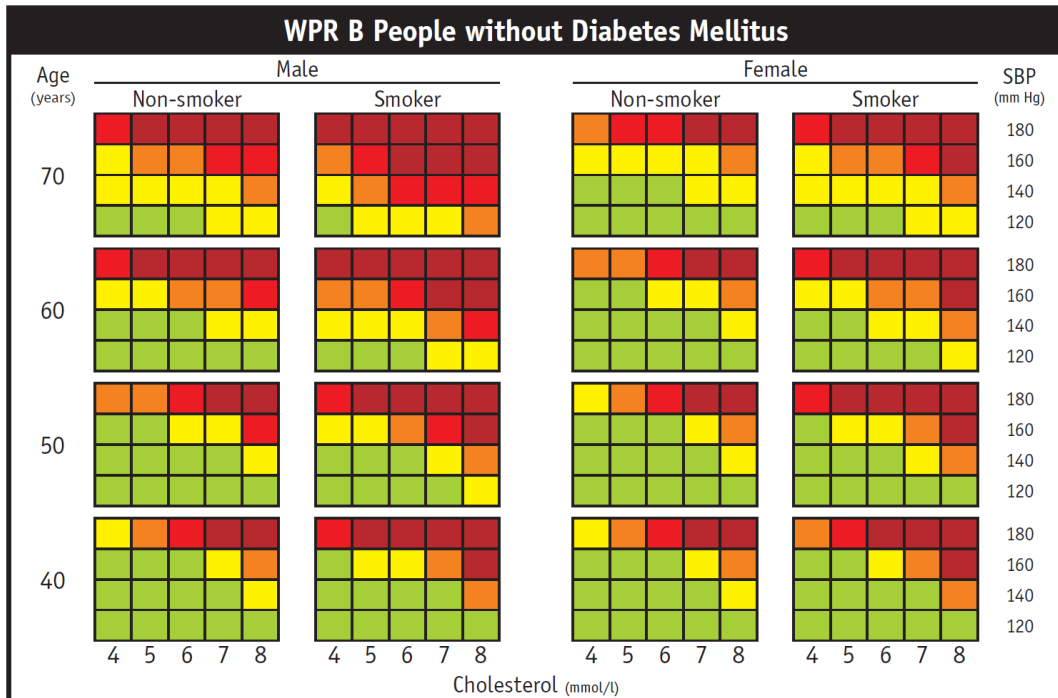
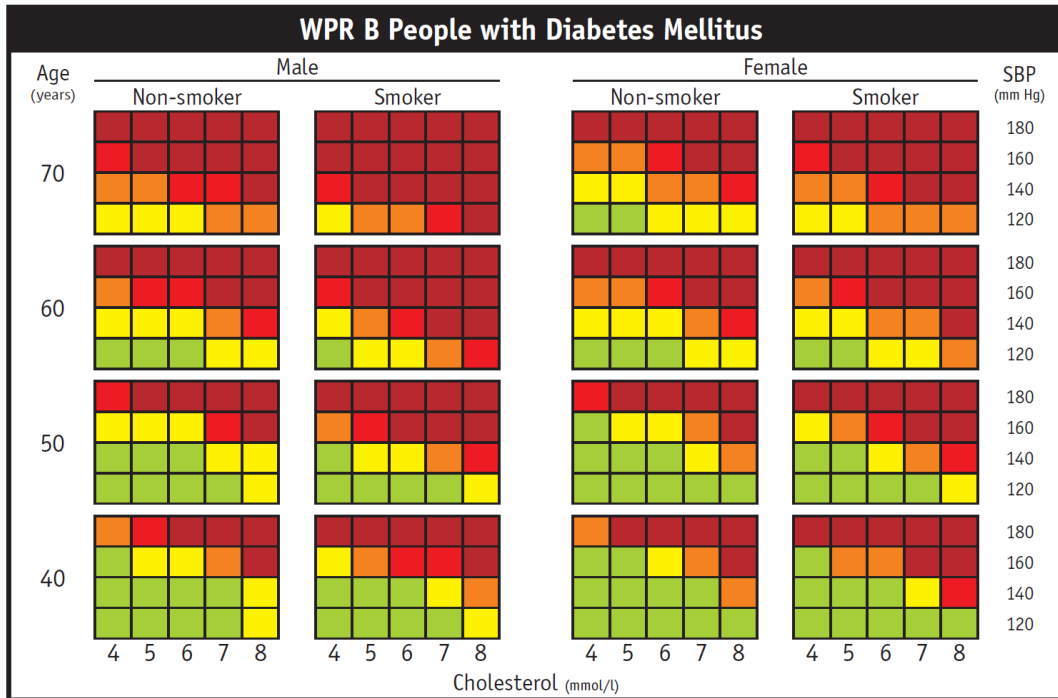
8. Annexes:

Below are templates of key materials for the screening, which need to be developed:

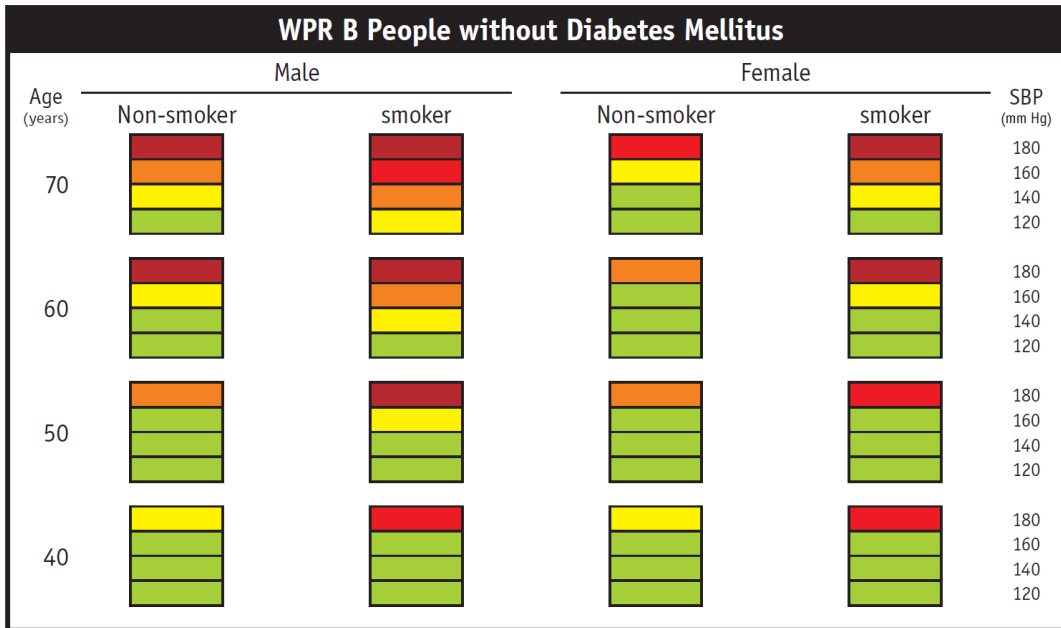
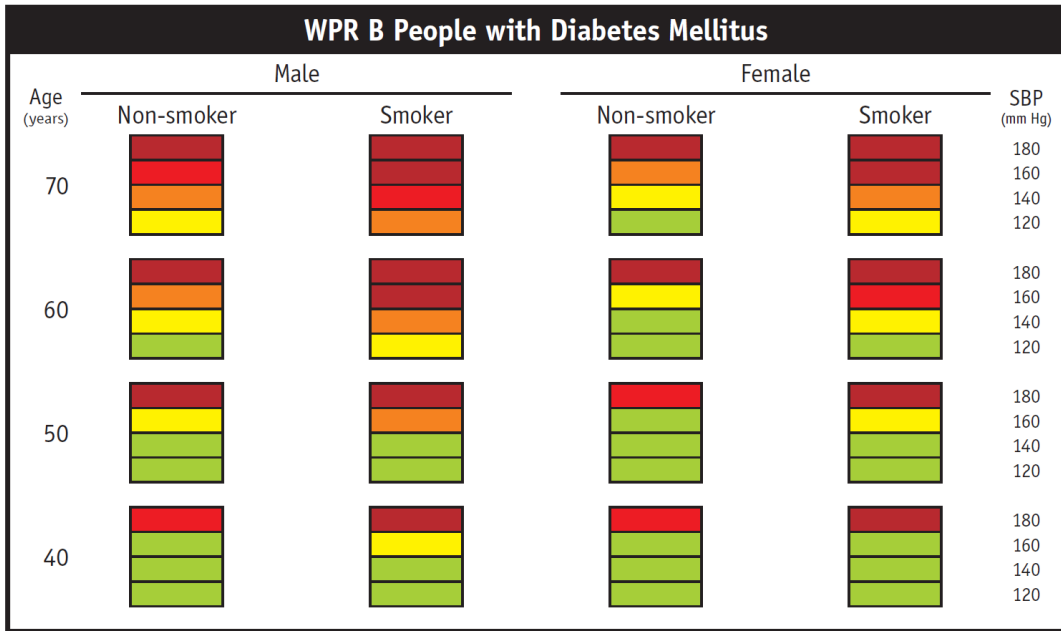
- i) Registration and screening record template
- ii) Screening reporting form template
- iii) Referral letter template

Annex 4: CVD Risk Prediction Chart

Risk Level ■ <10% ■ 10% to <20% ■ 20% to <30% ■ 30% to <40% ■ ≥40%



Risk Level ■ <10% ■ 10% to <20% ■ 20% to <30% ■ 30% to <40% ■ ≥40%



Annex 5: Monitoring checklist

Monitoring Checklist for Health Center

Monitor capability of NCD services to function at health center 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 over 40 years in the population treated at health center, time that health staff spend with patients at each visit or patient's perception of quality of services, etc. It provides evidence that the health center was well-prepared and well-functioning for delivering NCD services to the population.

To be collected by NCD focal points from PMD, PHD and OD in a quarterly basis.

Name of Health Center		Name of HC chief	
Name of Operational District		Name of NCD staff	1. 2. 3.
Name of Provincial Health Department		Date	

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

Services				Remarks
1	Are there dedicated diabetes/HBP services?	Y	N	
2	Have you seen NCD patients in the last three months?	Y	N	
3	Have you tested patient's blood glucose in the last three months?	Y	N	
4	Have you measured patient's blood pressure in the last three months?	Y	N	
5	Do you refer patients for HbA1c test and other diabetes complication screenings?	Y	N	

6	Have patients received health education and counselling on NCD risk factors?	Y	N	
7	Have all eligible patients in OPD been screened for CVD risk?	Y	N	

Record keeping/MIS				Remarks
1	Are NCD patients recorded in HC registration book?	Y	N	
2	Has the patient registration form been used appropriately?	Y	N	
3	Has the patient follow-up form been used appropriately?	Y	N	
4	Are patient's self-management books available and in use?	Y	N	

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

Medicines and materials/equipment				Remarks
1	Is the printed National SOP for Hypertension and Diabetes Management in Primary Care available?	Y	N	
2	Are glucometer and blood glucose strips available and functioning?	Y	N	
3	Are Blood Pressure Measurement Devices available and functioning?	Y	N	
4	Is the CVD risk prediction chart and IEC materials for diabetes and hypertension, and other NCDs available?	Y	N	
5	Are NCD medicines for use at the HC level available?	Y	N	
6	Has the HC experienced out-of-stock of any anti-diabetic and anti-hypertensive medicines in the last 3 months?	Y	N	

Monitoring Checklist for Operational District

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

Note: This checklist will not measure the achievement of NCD indicators. It provides evidences 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.

Name of OD		Name of OD Director	
Name of Provincial department		Name of NCD Coordinator	
		Date	

Human resources				Remarks
1	Are there any dedicated health staff members as NCD coordinator?	Y	N	
2	Have the dedicated health staff been appropriately trained?	Y	N	
3	Have there been capacity building on PEN-related activities from PMD in the last 3 months?	Y	N	

Documentation/MIS				Remarks
1	Is the printed National SOP for Hypertension and Diabetes Management in Primary Care available?	Y	N	
2	Did the OD produce a HC supervision report last month?	y	N	
3	Was there a quarterly report on PEN to PHD in the last quarter?	Y	N	
4	Did the OD produce a meeting report on PEN program with HCs last month?	Y	N	
4	Has the referral system for diabetes and hypertension patients been discussed in the OD meeting?	Y	N	
5	Is there any report of the campaign on PEN program, including NCD risk factors to the public, in the last 6 months?	Y	N	

Procurement				Remarks
1	Does PHD receive NCD medicines and supplies based on their request?	Y	N	How much percentage?

Monitoring Checklist for PHD

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

Note: This checklist will not measure the achievement of NCD indicators. It provides evidences 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.

Name of PHD				Name of NCD Focal point	
Name of PHD Director				Date	
Human resources				Remarks	
1	Does the PHD have any dedicated health staff for NCDs/an NCD focal point?	Y	N		
2	Were these dedicated health staff appropriately trained?	Y	N		
3	Have there been capacity building on PEN related activities from MoH this year?	Y	N		
Documentation/MIS				Remarks	
1	Is the printed National SOP for Hypertension and Diabetes Management in Primary Care available?	Y	N		
2	Was there a supervision report last month from PHD to ODs?	y	N		
3	Does the PHD have any evidence on NCDs to produce quarterly, semi-annual and annual reports for NCD program?	Y	N		
4	Has the PHD produced a supervision report in the last 3 months?	Y	N		
5	Has the PHD produced any training reports on NCDs in the last 3 months?	Y	N		
Procurement				Remarks	
1	Does the PHD submit a proposal for essential medicines and supplies to the MoH as indicated in the guideline?	Y	N		
2	Does PHD receive NCD medicines and supplies based on their request?	Y	N	How much percentage?	

Annex 6: Registration form for CVD risk

PACKAGE OF ESSENTIAL NCD INTERVENTIONS FOR PRIMARY CARE REGISTRATION FORM FOR CVD RISK

Health Facility Code:

Patient ID:

DATE:/...../.....

PATIENT DETAILS:

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

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

MARITAL STATUS: Married Single Widowed Divorced/separated

Address: # Street:Village:

Commune :District:

OD:Province:Telephone number:

Occupation: (Is patient working currently? if yes, tick one of the following options): Yes No

Farmer Seller/small business Businessman Civil Servant Policeman/soldier

Construction worker Housekeeping Other (specify):

LIFESTYLE FACTORS:

Current Smoking (answer yes if tobacco use during the last 12 months): Yes No

Physical Activity (engaged in more than 30 minutes of physical activity at least 5 days a week):

Yes No

Alcohol: Yes No

PAST 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

FOLLOW UP CONSULTATION

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:

- <10%
- 10% to <20%
- 20% to <30%
- 30% to <40%
- >40%

REFER TO REFERRAL HOSPITAL: Diagnose Follow up

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:

- Monitor risk profile every 1 year (<10% and 10% to <20%)**
- Monitor risk profile every 6 months (20% to <30%)**
- Monitor risk profile every 3 months (30% to <40% and >40%)**

Date of next visit:/...../.....

Leave service: Died Transfer out

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

Signature