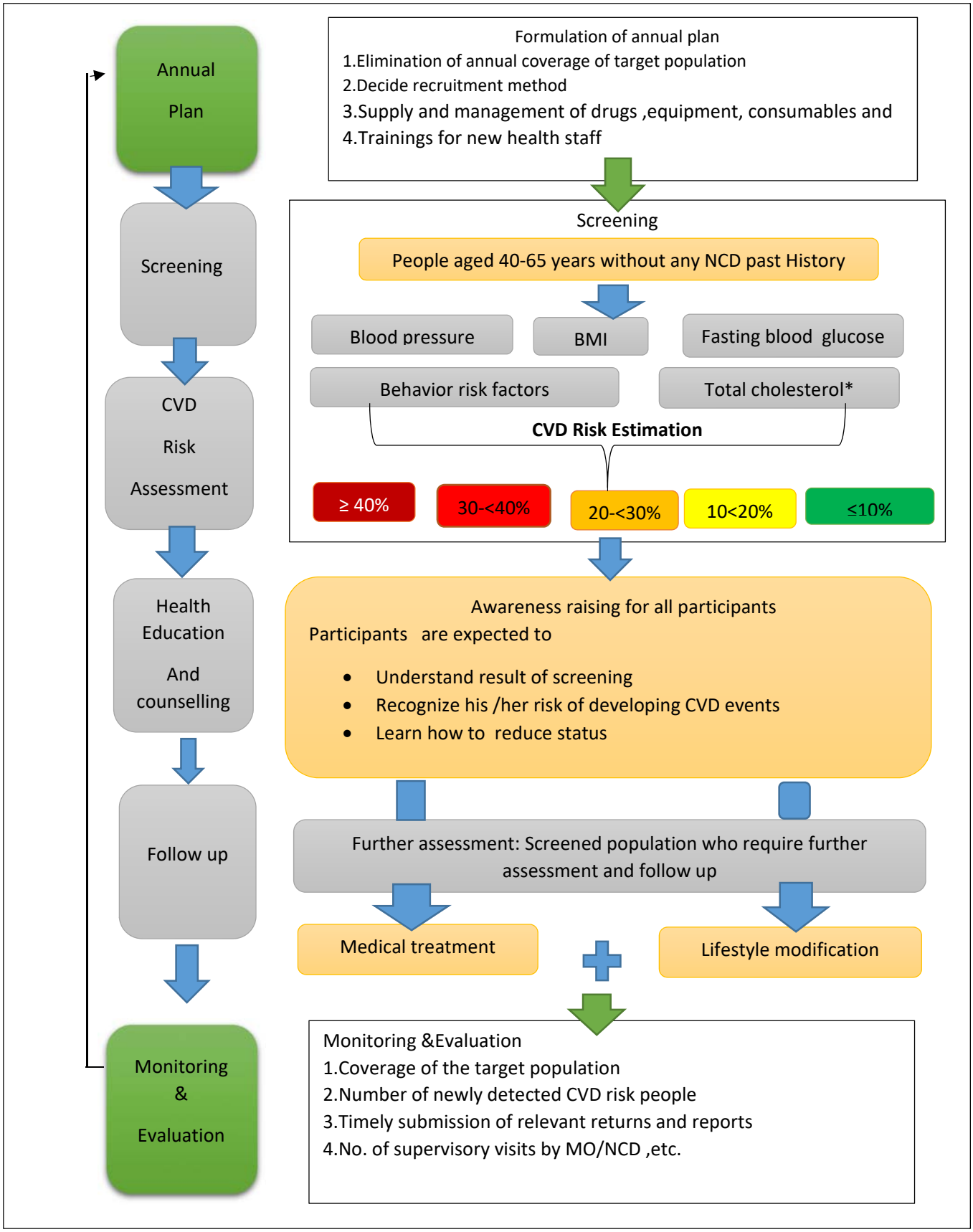
Manual for NCD Screening in Primary Health Care

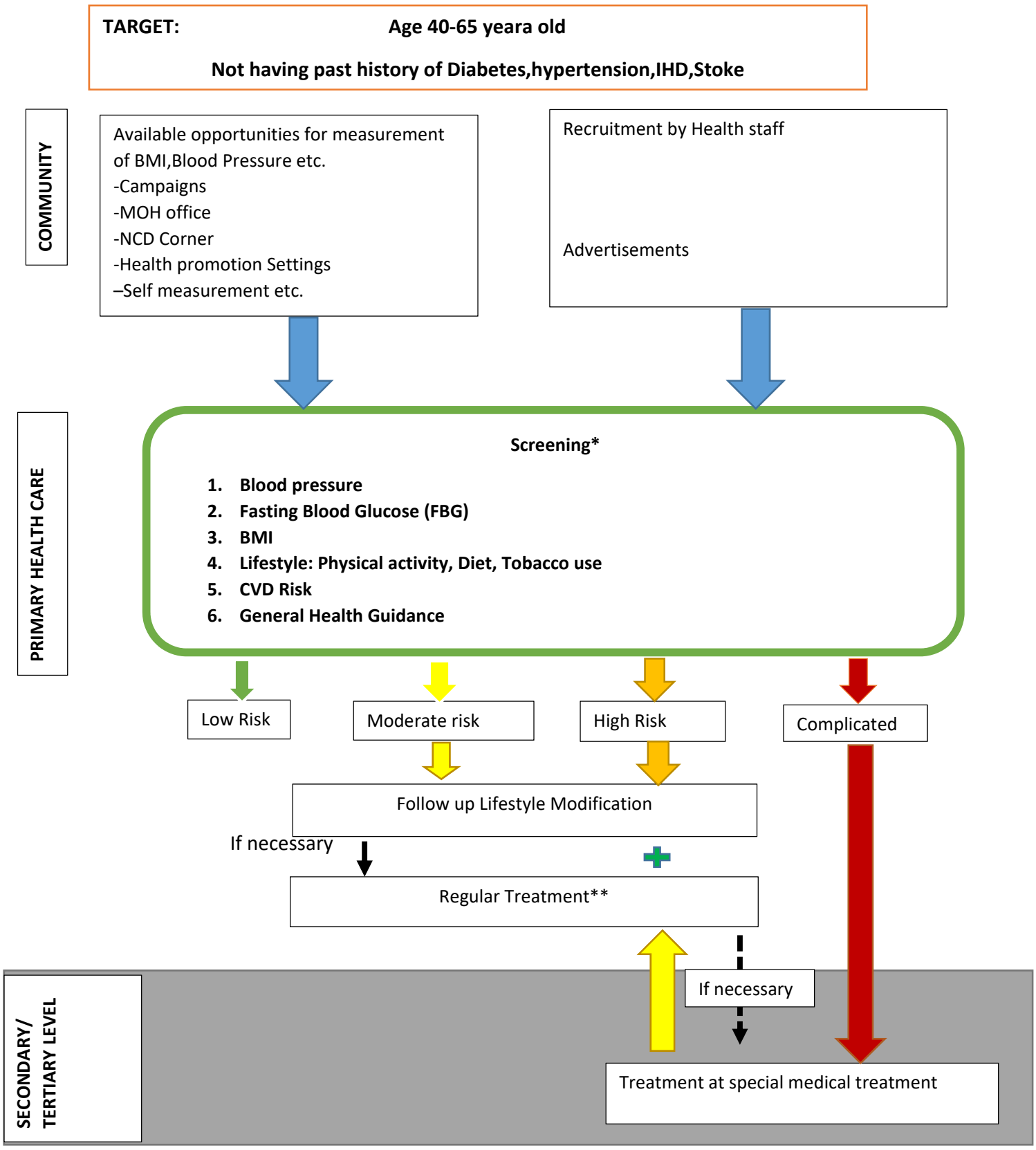
Contents

Figure1:Outline of Standard Screening Programme



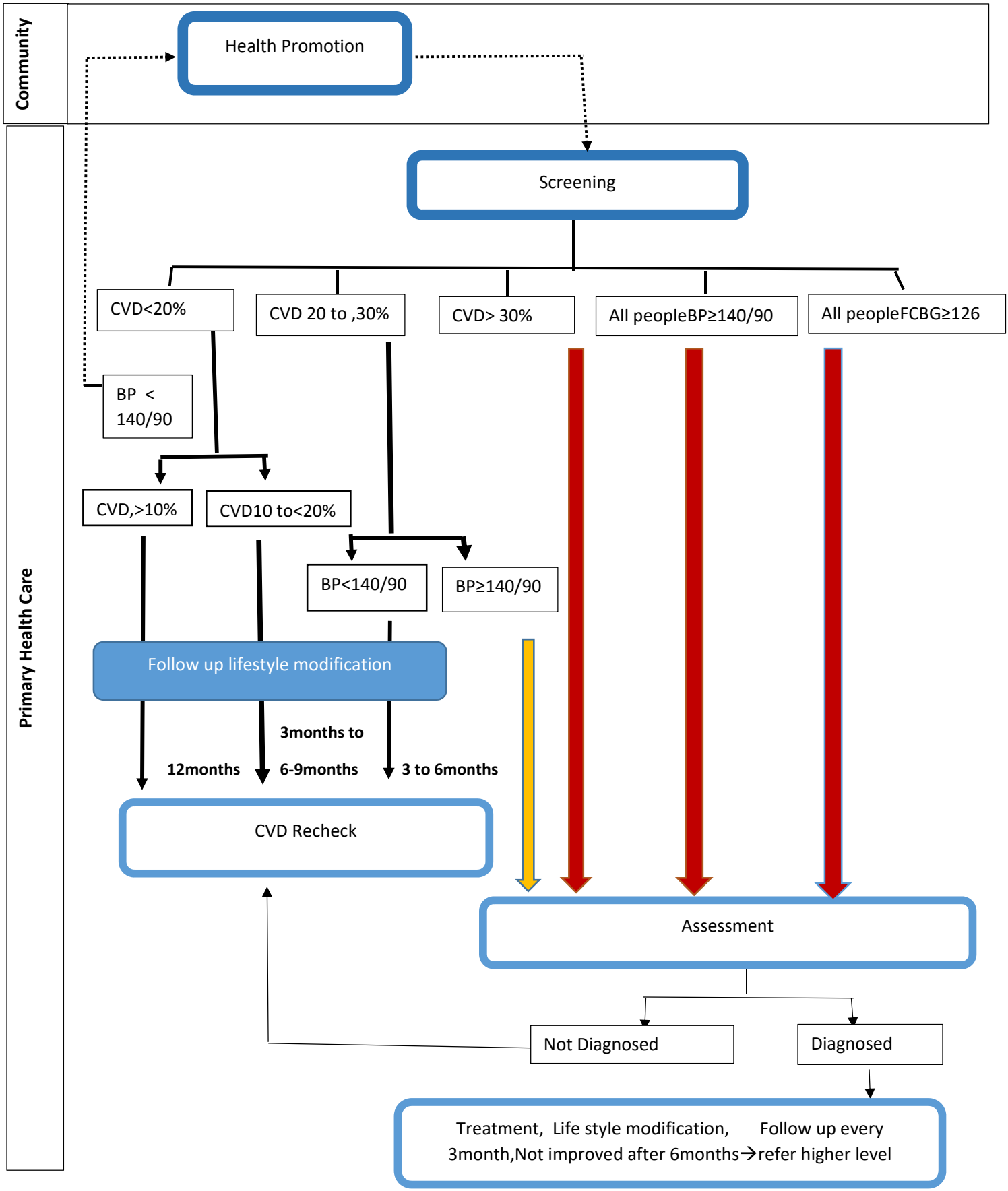
*Optional

Figure 2:NCD Screening Programme Flow Chart



*Total Cholesterol & Urine test can be optional.
**Follow the guidelines for Management of NCDs in Primary Health Care Approach

Figure3-Intervention Flow following the NCD screening



1.Introduction

- This manual is primarily intended to Health staff working at primary health centers in respective township. Main purpose is to improve the quality of NCDs screening capacity of health staff those conducting PEN intervention with methods for early detection of NCDs and their diagnoses using inexpensive technologies, non pharmaco-logical and pharmacological approach. It emphasizes on screening for total cardiovascular risk by using hypertension, diabetes protocol of the PEN intervention and appropriate counseling of the adoption of the healthy lifestyle(Lifestyle modification) conducted in respective health centers . Appropriate treatment for hypertension, diabetes were provided according to the set protocol. Checking for the adherence to the advice on healthy lifestyle and treatment are crucial. Proper recording of demographic data, risk factors for NCDs management given and regular checking of these data and data entry into the database of the respective township would be done by TMO/TPHO/ MOs and basic health staff from respective township..

1.1Development of Action plan at Primary Care Centre

Each facility is expected to adhere to township micro-plan and develop action plan in accordance with the health facility level such as District/ Township/ Station Hospitl, Rural health centre/Sub Rural health centre/Diabetes Clinic etc.(Refer to Training of trainer manual for medical officer)

Points that need to be considered listed below.

<table>
<tr><td>Methodology</td><td rowspan="2">Frequency of screening programmes per month
Number of participants per screening
Recruitment methodology
Logistics(Materials, equipment ,drugs)
Training by Trainers for doctors about the total risk assessment approach
Training for health staff about effective screening implementation including data management
Training for health staff about health education and counselling</td></tr>
<tr><td>Training Schedule</td></tr>
<tr><td>Monitoring and Evaluation</td><td>Frequency of monitoring and evaluation
-Participation rate
-Quality improvement activities in health institutions
-Coverage of the target population
-Number of newly detected CVD risk people
-Timely submission of relevant returns and reports
-No. of supervisory visits by MO/NCD ,etc.</td></tr>
<tr><td>Cost</td><td>Calculation of all necessary consumables</td></tr>
</table>

2.Brief on NCD Screening

Emphasize the following points to participants before starting the screening so that the screening programme is smoothly conducted and avoids trouble for both health staff and participants.

- Importance of NCD screening
- Procedures for NCD screening
- Special points requiring attention

2.1 Importance of NCD Screening

Briefly explain current situation of NCDs in Myanmar and purpose of the screening progrrramme to participants based on the following information in simple words.

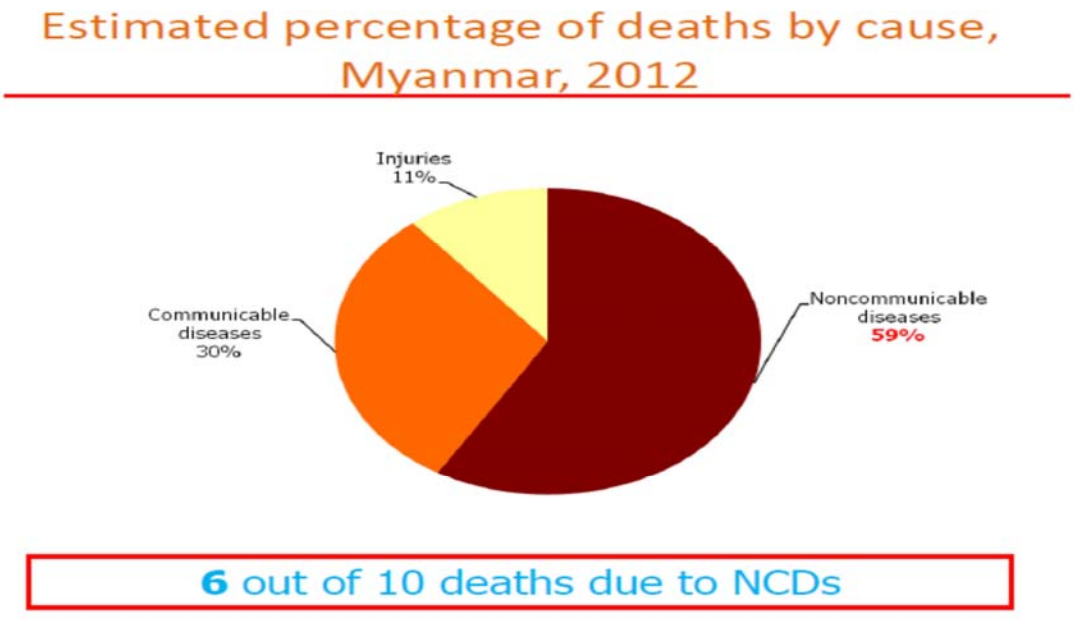
2.1.1Current situation of NCDs in Myanmar

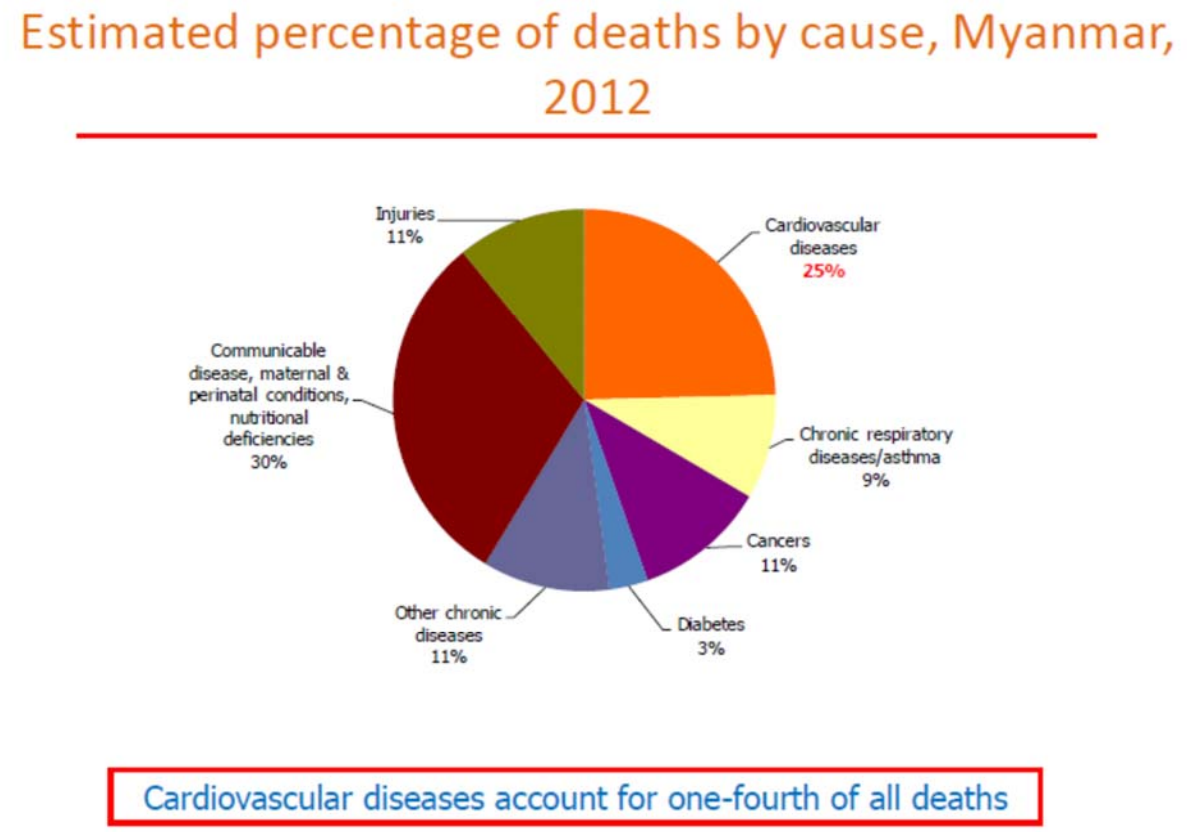
In Myanmar estimated percentage of deaths by NCDs in 2012 is 59% and cardiovascular diseases account for one-fourth of all deaths. Fifty four percent of all NCD deaths are among those aged less than 70 years , In case of cancer top 3 sites in women are breast, cervix and lung and in man are lung,liver and stomach. Commonest risk factors that cause NCDs are smoking (26.8%), overweight (male 16%, female 31%), high blood pressure (27%), raised blood cholesterol (35%), and alcohol drinking (12.8%).

National Survey on the prevalence of diabetes and risk factors for non-communicable conducted in 2013-2014 reported the prevalence of diabetes as 10.5% for the adult population aged between 25 and 65 years. It also reported the prevalence of risk factors for major non-communicable diseases. The prevalence of hypertension for both sexes was 26.4%. Percentage who currently smokes tobacco was 26.1% whereas percentage who currently drinks alcohol was 19.8%. The prevalence of overweight (BMI >25 kg/m2) and obesity (BMI >30 kg/m2) were 22.4% and 5.5% respectively. This survey was an extensive survey showing the magnitude of the problem of diabetes and risk factors for major NCDs for the whole country. The survey showed the higher prevalence of diabetes than the estimated prevalence of diabetes by the IDF. Based on this prevalence the total number of diabetes can be more than 2.5 million in Myanmar.

National Survey on the prevalence of diabetes and risk factors for non-communicable diseases(2014) in Myanmar

Risk Factors	Male	Female	Both sex
Raised Blood Pressure	24.7%	28%	26.4%
Raised Blood Cholesterol (more than 5.mmol/L or 190mm/dl)	30.9%	42.5%	36.7%
Raised Blood Glucose (FBS≥7mmol/L or 126mg/dl 2HPP≥ 11.1 mmol/L or 200mg/dl)	9.1%	11.8%	10.5%
Overweight(BMI ≥25g/m^2)	14.1%	30.8%	22.4%
Obesity (BMI≥30kg/m^2)	2.6%	8.4%	5.5%
Smoking	43.8%	8.4%	26.1%
Smokeless Tobacco(Betel nut chewing)	62.2%	24.1%	43.2%
Current Alcohol Drinkers	38.1%	1.5%	19.8%
Heavy Episodic Drinkers	20.3%	0.3%	10.3%
Insufficient Physical Activity	12.5%	18.8%	15.7%
≥ 3 Risk factors	18.3%	20.9%	19.6%
10 year CVD risk	8.5%	15.7%	12.12%





2.1.2 Purpose of NCD screening

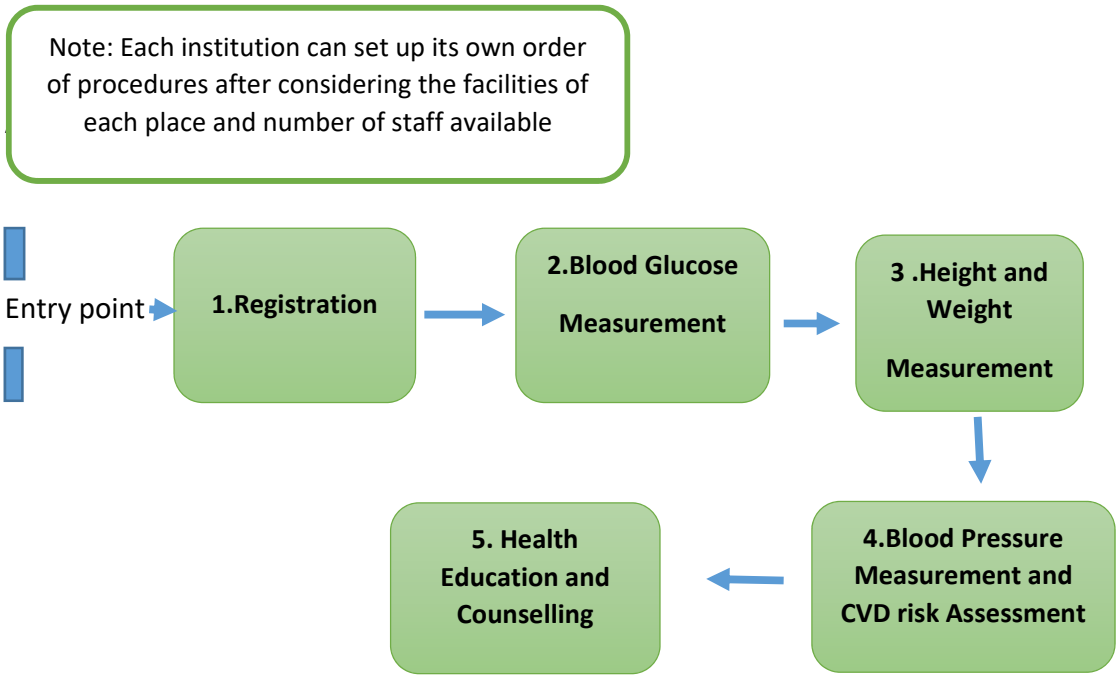
The purpose of this NCD screening is to evaluate an individual's CVD risk when they are symptom free. The screening allows us to do early diagnosis and provide treatment for underlying diseases such as hypertension, diabetes, and dyslipidaemia to avoid more serious health problems as well as to reduce CVD risk. Even if the person feels they are in best shape of their life, a serious condition with no signs or symptoms may put their health at risk

1. Occlusion of a vessel in the brain results in paralysis.

2. Occlusion of a vessel in the heart results in heart attack

2.2 Procedure of NCD Screening

Explain the order of procedures to all the participants. It is ideal to use a notice board to explain the screening process.



<u>2.3 Materials required(Special points required attention)</u>

1.Personal medical record

2.Health Message chart for reading at screening program area

3. Registration and Recording

3.1 Material and Equipment Required

Type	Item
Documents	Registry, Which needs to be kept in the institution Personal Medical records,which wil be provided to each participant at the end of the programme Reception Number Cards NCD Checkup Report Area code List
Stationary	Ruler Pen
Furniture	Table Chair

3.2 Preparation

2.Keep all the reception number cards in ascending order. Place the registry file and personal medical record on the table.

3.Write down township name, health center /sub-health center name and the date of the screening on registry.

4.Provide a reception number card to each participant in order of arrival.

3.3 Registration at the Beginning of the Screening

1.Call each participant in order of reception number card.

2.Warmly welcome the participant and ask them to take a seat

3.Check participant's invitation letter and area. Area is not on the letter ask them an find the area from the list of township areas.

4.Check whether participant is eligible to participate in the NCD checkup or not

- Check the age of each participant .Although the main target age is 40 – 65years,you may screen all attendees.

- Check the medical history of each participant. If they have suffered from hypertension, diabetes, dislipdaemia, stroke, or ischemic heart disease ,the participant is not eligible.
- If they have a medical history, ask them whether they are under treatment. If they are, praise them and encourage them to continue. In this case they do not need to participate in this programme.
- If the participant has a medical history and does not regularly see a doctor, recommend that they are re-start treatment. Inform them of a date when can see a doctor at the healthcare center or a nearby hospital.

5.After checking the eligibility of a participant. Fill out the registry form the left side(Serial NO. Area name .AGE,NRC number, Address, telephone number; and gender)

5.1 The serial numbers continue from previous checkup.

Example: If the last serial number in the previous checkup was 25,the first serial number starts from 26 this time.

5.2 The name of areas can be abbreviated with Myanmar township code .

5.3 Write down the age of the participant, address, and telephone number.

5.4 Fill out NRC number. If the NRC card is not available, keep it blank.

5.5 Put tick(✓) in the appropriate column for gender.

6 After filling in the basic information on registry, health staff start writing the same information on their personal medical record(or alternative format record)

7.Give the personal medical record to participant.

8.Ask the participant to keep the reception number card until they finish all the examinations. Also, tell them to read health massage on the reception number card while they are waiting for the examinations.

9.Ask the participant to come back to the registry station after they finish all the examination after they finish all the examination so that health staff can record their results on their registry.

Be aware of when the first participant finishes all the examinations.

1.Collection the reception number card.

2.Check the participant's registration number and copy the results of the examinations from their personal medical record to the registry.

3.After finishing the data entry, instruct the participant to participate in the general health guidance. Return the personal medical record to participant and remind them to keep it safe. If a participant is requested to attend the follow up clinic, ask them to bring their personal medical record with them.

4.After filling out all the records, tick off(✓)results in the columns of"BMI≥25 kgm"BP≥140/90mmHg" and FBG≥126Mg/dl" if the results of these measurement are applicable.

NOTE

1. Exclude the participants who are not in a fasting state.?

2. "BP≥140/90mmHg" means that either systolic is the same as or over 140mmHg 0r diastolic is the same as or over 90mmHg or both are same as over 140/90mmHg

5 .File the registry and make the daily summary activity report. Count only the eligible participants.

6. After filling out all columns and finishing the programme, submit the daily summary report to the person responsible in your institution and obtain their signature for approval. File the report in screening programme file.

7. Once you finish all programmes for each month, develop a monthly report and obtain a signature of approval from the person in-charge. The report is expected to be submitted to MO/NCD office by 3monthly.

4.Measurement of Height, Weight and calculation of BMI

4.1Materials and equipment required

Type	Item
Equipment	Stadiometer or Measurement Tape. Weighing scale Extra battery for Digital Scale
Documents/Stationary	BMI Chart Ruler Calculator PENS
Furniture	Stool Table

4.2 Preparation

4.2 1. Height

For the first time

1.Select a wall for the stadiometer /Measurement tape. A flat and smooth wall is suitable.
2.Place the stadiometer on the floor.
3.Put up the tape until"0" the red line, keep the position. and the stadiometer/Measurement tape on the wall with a screw. Don't remove the stadiometer/Measurement tape at the end of every screening in order to minimize the damage to the wall.

4.Draw a line on the floor underneath the fixed stadiometer/measurement tape so that participant can keep their on either side of the line correctly.

5.Check your height to treat the set up.

For the second time

Measure your height to check the accuracy of the installation position of the stadiometer/Measurement tape.

4.2.2 Weight

1.Check whether the weighting scale properly works. BMI on each personal medical record.

4.3 Procedure

4.3.1 Measurement of height

1.Call each participant in order of reception number cards.

2.Ask the participant to take off their shoes.

3.Raise the headpiece of stadiometer/measurement tape to a point above the participant's height.

4.Ask the participant to stand with their feet on either side of the line that has been drawn on the floor.

5.Ask the participant to straighten their legs.

6.Check whether the back of head, buttocks, the calves and the heels are touching the wall.

7.Ask the participant to keep their head straight and look forward.

8.Bring the top head of the stadiometer down until it touches the top of participant's head.

9.Make sure the headpiece is set at right angle and touches the wall.

10.Read the measurement at eye level and record it in centimeters. Round off the measured height to the closet whole number.

Note

If a participant is taller than the health care staff, it can be difficult to measure at eye level .Use a stool so that you can measure the person accurately.

11.Write down the rounded height on the personal medical record .

4.3.3Measurement of Weight

1.Stand in front of scale.

2.Ask the participant to take off their shoes and remove all items from their pockets.

3.Press the centre of the scale with your foot and wait until "00"appears on the screen.

4.Ask the participant to step on the scale and stand in the centre.

5.If the outfit of the participant covers the screen, ask them to pull it away.

6.Round off the measured weight to the nearest whole number.

(eg.45.3 Kg→45Kg, 67.8Kg→68Kg)

4.3.3 Calculation of BMI

1.Check the height of each participant and choose a relevant BMI chart.

2.Find the weight of participant and put a ruler on the row.

3.Check the number in the cell where the height and weight cross.

4.If the participant's height or/and weight are not available on any of BMI charts,use the following formula to calculate their BMI.

$$BMI = \frac{\text{Weight (Kg)}}{\text{Height(m)}\times \text{Height (m)}}$$

Example: weight=42kg,Height=142cm --> $\frac{42}{1.42 \times 1.42}$ =20,8 kgm^2

5.Write the BMI in the correct column on the participant's personal medical record.

6.Tell the participant to move on to the next station.

5.Questions about Lifestyle and Measurement of Blood Pressure.

5.1 Materials and Equipment required

Type	Item
Equipment	Blood Pressure Monitors Mercury Sphygmomanometers and stethoscopes
Necessary equipment	Pens
Office equipment	Tables Chairs

5.2 Preparation

Make sure to use a properly maintained ,calibrated and validated device

1.Check whether the sphygmomanometer works properly.

2.Check whether the digital blood pressure monitor works properly. Check the battery charge it if necessary.

Note:
Ensure that cellular phones. PCs or other electrical devices are not placed near the sphygmomanometer as measurements might be affected by strong magnet fields.

5.3.1 Questions about Lifestyle

1.Ask each participant to sit down and relax.

Ask the following four questions on lifestyle(take more than five minutes in total).If the participant does not clearly understand, explain each of the questions in detail.

- **"Do you use tobacco?"**

Ask whether the participant use any type of tobacco including cigarettes, cheroot or betel chew. Tobacco means all the products that are wholly or partially made of the leaf of the tobacco plant (cigarettes or tobacco used in betel chewing)

(Use a picture of tobacco when asking questions. If the participant occasionally used tobacco, show the pictures and advise them against using tobacco products)

If they use at least one kind of tobacco, tick(✓)"tobacco Use on their personal medical record. If the participant does not use tobacco ,keep the column blank.

- "Are you engaged in manual labour?"

This question ask whether the participant regularly does enough physical exercise at work to keep their weight at an appropriate level. If the answer is "No", ask the following questions.

- "Do you regularly do moderate exercise for more than 30 minutes on most day?"

Moderate exercise means physical activity such as brisk walking, chores and gardening for at least 30 minutes per day more than five days a week. If the

Participants says "NO", advise them to do regular exercises.

- "Do your regularly eat vegetables and fruit?"

Ask how often and how much vegetables and fruits the participant eats

.Tell them the recommended amount of vegetable and fruits per day

If the respondent does not regularly consume enough vegetable and fruits ,advise

them to eat.

5.3.2 Measurement of blood pressure

1.Ask the participant sit on chair and place their feet flat on the floor.

2.Remove any tight-fitting clothing from upper arm.

3.Place the arm of the participant on the table so that the arm cuff and the heart are at the same height. If the participant needs to raise their arm, put a cushion under their arm and keep the arm at an appropriate height.

4.Put the cuff on the upper arm without wrinkles. Make sure that there is a space of about two fingers between the cuff and arm.

The use of Mercury Blood Pressure Monitors

5.Feel for the artery and inflate the cuff 20-30 mm Hg above the estimated systolic blood pressure until the pulse disappears.

6. Gently place the stethoscope on the cubital fossa below the cuff.

7.Deflate the cuff at a speed of 2-3 mm/sec, record the blood pressure both when the sound first appears(systolic blood pressure) and when it is lost (diastolic blood pressure).Round off to the nearest 2mmHg.

8.If systolic blood pressure is greater than or equal to 90 mmHg, explain to the participant that their blood pressure is high and they need to be rechecked after a ten minute rest .Advise them to be relaxed and take a seat in the waiting areas until they are called again.

Write down the time that they will take the second measurement(after they have taken a ten- minute rest.)

The use of Digital Blood Pressure monitors

5.Confirm that the cuff is set in an appropriate position.

6.Press the start button

7.Wait until the value of blood pressure appears on the screen.

8.If systolic blood pressure is greater than or equal to 140 mmHg ,or diastolic

Blood pressure is greater than or equal to 90 mmHg, explain to the participant that their blood pressure is high and they need to be rechecked. Advise them to be relaxed and take a seat for ten minutes in the waiting area until they are called again.

Write down the time that they will take the second measurement (after they have taken a ten- minute rest)

Note:

In case the blood pressure is too high to measure with a normal digital monitor, use a mercury blood pressure monitor or use the following procedure.

8.1 Place the cuff on the arm.

8.2 Please and hold the start button to display the last measured data.

8.3 Press and hold the start button again until a number appears; the number should be 30 to 40 mmHg higher than the expected systolic pressure.

8.4.Release the start button to measure. Then ,continue measurement using the normal procedure.

Points to note: Errors in the measurement of blood pressure can occur for several reasons:

- Defective equipment.
- Using an inappropriate sized cuff.
- When the cuff and heart are not at the same level

Mercury BP monitor

- When the mercury column reading is not at "0"mm Hg at rest
- Deflating the cuff too quickly.
- Misreading of the mercury level (your eye should be at the same level as the top of the mercury column)
- Poor technique (for example: failure to record when the sound disappears)
- Tendency to round up to nearest 5 or10 mmHg.

Observation bias (for example : considering the value of blood pressure among the young to be normal).

Digital BP Monitor

- The measurement of each mercury sphygmomanometer may vary .When the difference is more than 10 mm Hg the device should be repaired.
- It is advisable to check the digital BP monitor against a mercury sphygmomanometer or another device occasionally.
- It is important to calibrate a device according to the manufacturer's instruction.
- It is generally recommended to have each device inspected every two years to maintain proper function and accuracy.

6.Measuremet of Fasting Blood Glucose Level

6.1Material and Equipment required.

Type	Item
Equipment/Consumables	Validated glucose meter device Strips with the pre-check strip Lancets or needles(one lancet for one participant) Cotton swabs Sharp disposal box(sharp bin) Extra batteries for glucose meter.

NOTE:

To reduce the chances of infection

- ALWAYS use a new and sterile lancet.
  A lancet is intended for single use only.
- ALWAYS use a new test strip.
  A test strip is intended for single use only
- Discard all the used lancets properly in accordance with local laws.

6.2 Preparation

6.2.1 Equipments

1.Carefully wash hands with soap, then rinse and dry.

2.The code number will appear on the display after inserting a pre-check strip into the test port

.Check if it matches the code number on strip bottle. If these two codes do not match, press and release ‘S”button until code match*.After press the“M”button and remove the pre-check strip.* This method is

valid for :EzSmart Glucometer".If you use another type of glucosemeter, please refer to instruction manual.

3.When you are in the following situations ,perform a control solution test to check the accuracy of equipment with one strip:

- When you use a new glucometer.
- When you use a new batch of test strips.
- When ever you want to check the accuracy of the equipment(for example, once a week)
- If the result falls in the specified range that is printed on test strip bottle, it means the glucometer works properly.

NOTE:

To ensure the accuracy of result, the confirmation window of the test strip must be completely filled with control solution.

If a result falls outside the specified range,repeat the same procedure several times.If the result still falls outside,use a new vial of strip.

Results falling outside the specified range may be caused by:

- Errors in performing the test.
- Expired or contaminated control solution.
- Expired or contaminated test strips
- Wrong coding of the meter.
- Malfunctioning of glucometer.

If the problem persists,do not use glucometer on the day of check up.

6.2.3. Participants

1.Each participant has to be in a fasting state for eight to ten hours, but this should not exceed this procedure. Ask the participant14 hours(they are alone to drink water)

2.If the participant is not in a fasting state ,check the time when they last had meal and consider conducting a check up later within the same day. Continue other screenings accordingly.

3.If it is impossible to measure the level of fasting blood glucose, skip this procedure. Ask the participant to move to next station.

6.3 Procedure

1.Ask the participant to sit on a chair comfortably.

2.Confirm whether the participant has been fasting for more than 8hours.Ask whether they have had cup of tea with or without sugar in the morning. If they answer “yes”, that means they are not in a fasting state. In such a case, do not take a glucose measurement. the person to move to next station.
3.Insert the strip into glucometer. If there are a drop mark on screen ,the glucometer is ready to use.
4.Wash hands and put on a pair of gloves.
5.Use a disposal lancet.
6.Select a place to be punctured. Choose the side of a finger, but not the tip. Also avoid the index finger and thumb.
7.Wipe the selected place with cotton swab.
8.Puncture the selected place.
9.Wipe off the first drop of blood[5]. The first drop of blood should not be used when the participant has not wash their hands with soap and water just before the measurement.
10.Do not squeeze the finger. In case it is necessary, stroke gently his/her hand and finger towards the puncture site. Firm squeezing or milking of finger should be avoided. External High pressure may lead to unreliable readings. [6,7]

---

[5].Before doing the glucose test ,it is recommended that the participants wash their hands with soap and water and dry them. The first drop of blood can then be used. However if washing hands is not possible, and the persons hands are not visibly soiled or exposed to a sugar containing product.It is acceptable to and use the second drop of blood after wiping away the first drop in order to avoid contamination with any impure substances(American Diabetes Association,the Diabetes UK Guidelines,Netherlands Study)
[6].Johanna Hortensius etc.Self-Monitoring of Blood Glucose: The use of the first or the second drop of blood 2011.
[7].Bayer,Contours User Guide,2007

11.Put the next drop of blood on the tip of the strip. Wait until the strip absorbs blood and the meter beeps.

NOTE:

To obtain an accurate result. make sure the confirmation window of the test strip is completely filled with the blood sample

12.Place the glucometer on the table until it displays the measurement on screen.
13.Provide the participant with cotton wool .Advise them to press on the puncture site so that bleeding stop.

14.Disposed the used lancet into sharp disposable box.
15.Read the measurement and record it on the participant's personal medical record.
16.If the value is less than 50mg/dl, repeat again.
17. Direct the participant to the next station.


Optium

7. Assessment of Ten-year Cardiovascular Risk and Appropriate Treatment

7.1 Total CVD risk [8]

The total CVD risk is defined as the probability of an individual having a CVD event (eg. myocardial infarction, or stroke)over ten years. The total risk approach acknowledges that many CVD risk factors tend to appear in cluster and synergistically increase CVD risk, and therefore combining risk factors to predict CVD risk a logical approach to decide who should receive treatment. Such a risk stratification approach helps to make best use of the resources available.

Main Risk Factors for CVDs

Modifiable Risk Factors	Unmodifiable risk factors
Elevated blood sugar Elevated blood pressure Abnormal blood lipid Tobacco Use Harmful use of alcohol Unhealthy diet Physical inactivity Overweight/Obesity	Age Gender Genetic disposition

[8].The WHO strategy describes two categories of people we need to consider in order to reduce the incidence of first and recurrent clinical events due to coronary heart disease, cerebrovascular disease and peripheral vascular disease:

1. People with risk factors who have not yet developed clinically manifest cardiovascular disease (primary prevention)

2. People with established coronary heart disease, cerebrovascular disease or perivascular disease (secondary prevention)

WHO/ISH risk prediction charts enable the estimation of total cardiovascular risk of people in the first category. People in the second category have high cardiovascular risk and need intensive lifestyle interventions and appropriate drug therapy .Risk stratification using risk charts is not required when making treatment decision for them.

(Source: Pocket guidelines for Assessment and Management of cardiovascular Risk. WHO 2007)

7.2Materials Required

Type	Item
Documents	WHO/ISH Risk prediction Chart SEAR.D The guidelines for management of NCDs in Primary Health Care Referral Book

7.3 Procedures for Assessing CVD Risk

Step.1

Select the appropriate section depending on fasting blood glucose level(FBG)

In case a participant is not fasting ask him/her whether they have recently measured their fasting glucose. If they have, use that measurement and estimate the risk according to the chart.

Step .2

Select the gender

Male or Female

Step 3

Select either smoker or non-smoker.

Ask the person whether they smoke

Smoking includes cigarettes, cheroot, and pipe. If they answer “yes’ consider as a smoker.

Step.4

Select an appropriate age group

Eg. if the participant is 53,select 50-59 line.Likewise.if he /she is 67 select 60-69line etc.

For age 35-39 ,use age box 40-49

Step 5

.Check the level of systolic blood pressure and find the applicable box.

Step 6

Ask the participant whether they know their total cholesterol level.If they do,select the correct level.In case whether the participant's cholesterol level is not available,Select everage cholesterol level 5.2 mmol/l among Myanmar.

Conversion of cholesterol level in mg/l range to mmol/l

Cholesterol level (mg<dl)	Cholesterol level in the risk prediction chart (mmol/l)
More than 309	8
From 270 to309	7
From 232 to 269	6
From 193 t0 231	5
Less than 193	4

The color of a cell expresses the level of CVD risk.Write down the percentage of the CVD risk in the appropriate column on the record.

<10% 10% to <20% 20%to <30% 30% t0 <40% ≥40%

10 –year risk of cardiovascular events

Risk,10%	Individuals in this category are at low risk. Low risk does not mean "no" risk.
Risk 10 to <20%	Individual in this category are at moderate risk of fatal or non-fatal cardiovascular events.
Risk 20 %to <30%	Individual in this category are at high risk of fatal or non-fatal cardiovascular events.
Risk ≥30%	Individual in this category are at very high risk of fatal or non-fatal cardiovascular events.

7.4 Example of CVD risk assessment.

Screening Result of----------

Male/56 years/smoking 3 cigarettes a day

Blood pressure154/90mmHg/Fasting blood glucose.130 mg/dl

Total cholesterol: not available/BMI32

Step 1.

Select the appropriate section depending on fasting blood glucose level.

His FBG level is more than 126mg/dl.So select the upper table.

- Male
- 56 years
- Smoking;3 cigarettes a day
- Blood Pressure:154/90 mmHg
- Fasting blood glucose;130 mg/dl
- Total cholesterol: not available
- BMI: 32

Step 2.

Select the gender

He is male. So select the left side(the left two columns)of the upper table.

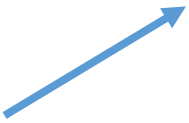
- Male
- 56 years
- Smoking;3 cigarettes a day
- Blood Pressure:154/90 mmHg
- Fasting blood glucose;
- Total cholesterol: not available
- BMI: 32

Step 3

Select either smoker or non-smoker

He smokes.So select the second column from left side of upper table.

- Male
- 56 years
- Smoking;3 cigarettes a day
- Blood Pressure:154/90 mmHg
- Fasting blood glucose;
- Total cholesterol: not available
- BMI: 32



Step 4.

Select the appropriate age group.

He is 56 years old.So select the box (second row) for those age between 50 and 59.

- Male
- 56 years
- Smoking;3 cigarettes a day
- Blood Pressure:154/90 mmHg
- Fasting blood glucose;
- Total cholesterol: not available
- BMI: 32

Step 5.

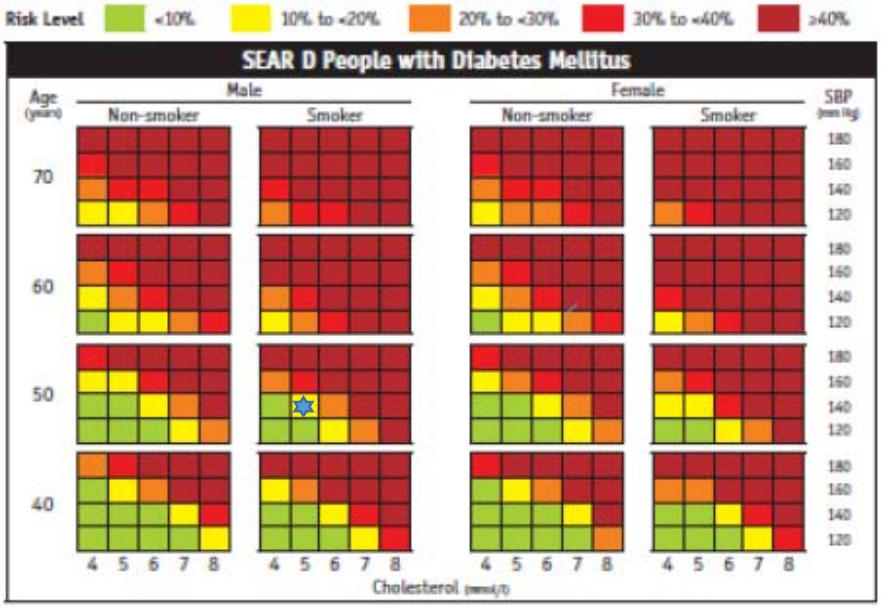
Check the level of his systolic blood pressure and find the applicable box.His systolic pressure is 154 mmHg so select the line between 140-159.(ie.second row of upper table)

- Male
- 56 years
- Smoking;3 cigarettes a day
- Blood Pressure:154/90 mmHg
- Fasting blood glucose;
- Total cholesterol: not available
- BMI: 32

Step 6 Ask the participant whether they know their cholesterol level.In cases where cholesterol level is not available .Select "5 mmol/l Total cholesterol level is not available

Risk level 10%to<20%His ten-year CVD risk s 10 %to< 20%

Figure 22. WHO/ISH risk prediction chart for SEAR D. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, total blood cholesterol, smoking status and presence or absence of diabetes mellitus.

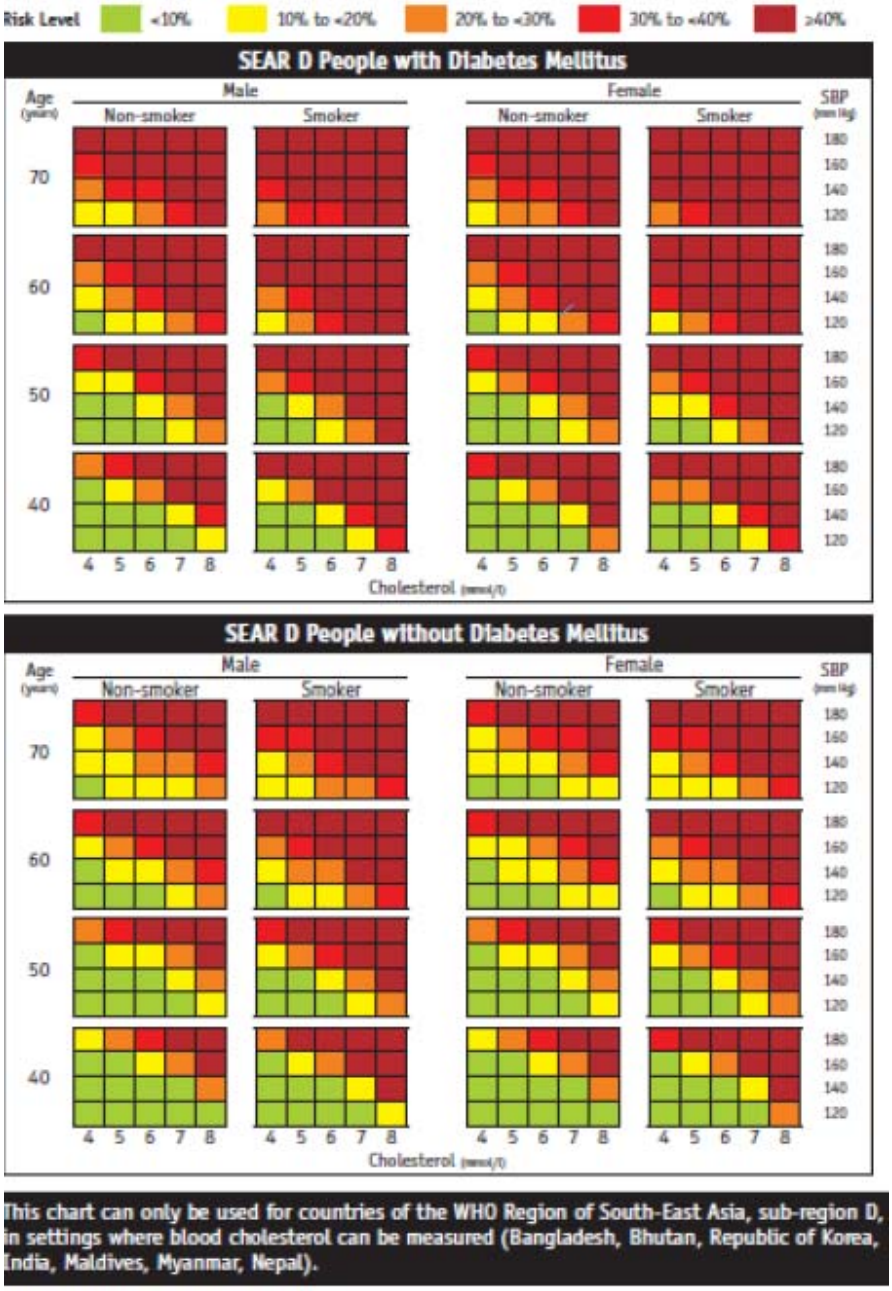


Diabetes,male,smoker, age,56yrs SBP154mmHg,Total cholesterol5mmol/l→ 10% to <20%

CVD/ISH risk prediction chart(with Cholesterol)

Another examples mentioned below are for those who had to study of risk prediction in details

Figure 22. WHO/ISH risk prediction chart for SEAR D. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, total blood cholesterol, smoking status and presence or absence of diabetes mellitus.



Risk Prediction chart

DIABETES MELLITUS DIAGNOSIS

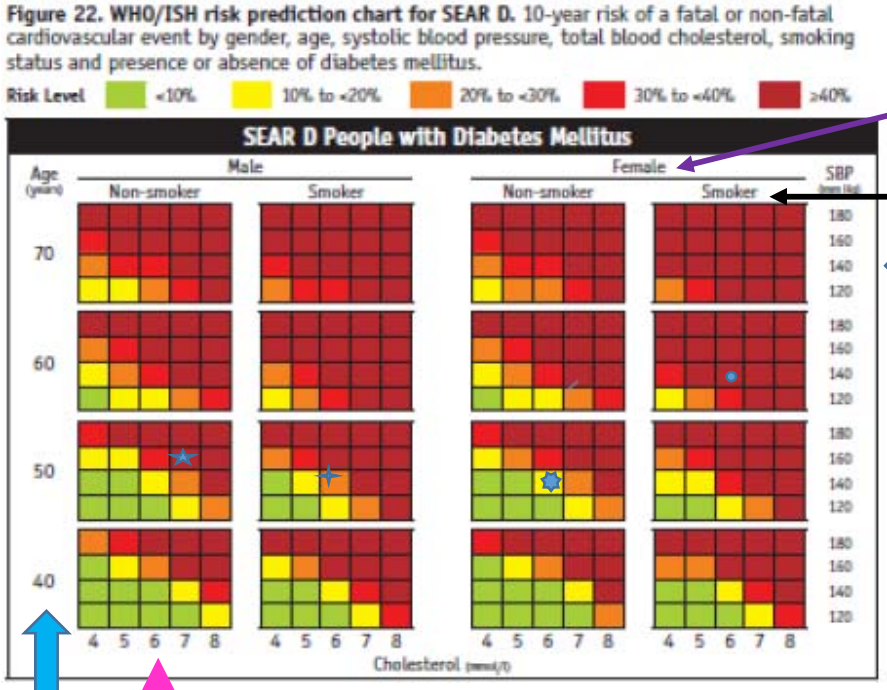
Clinical symptoms

- Polyuria
- Polydipsia
- Weight loss

- FBS > 126 mg%(7mmol/l)
- RBS > 200 mg%(11mmol/l)
- HbA1C > 6.5 %

If symptoms (+) -----one time-----Diagnosis

If symptoms (-) ------2 times-------Diagnosis



Gender (Male or Female)

Smoker /NON-smoker

SBP 140-159mmHg

Age 40 - 59 yrs

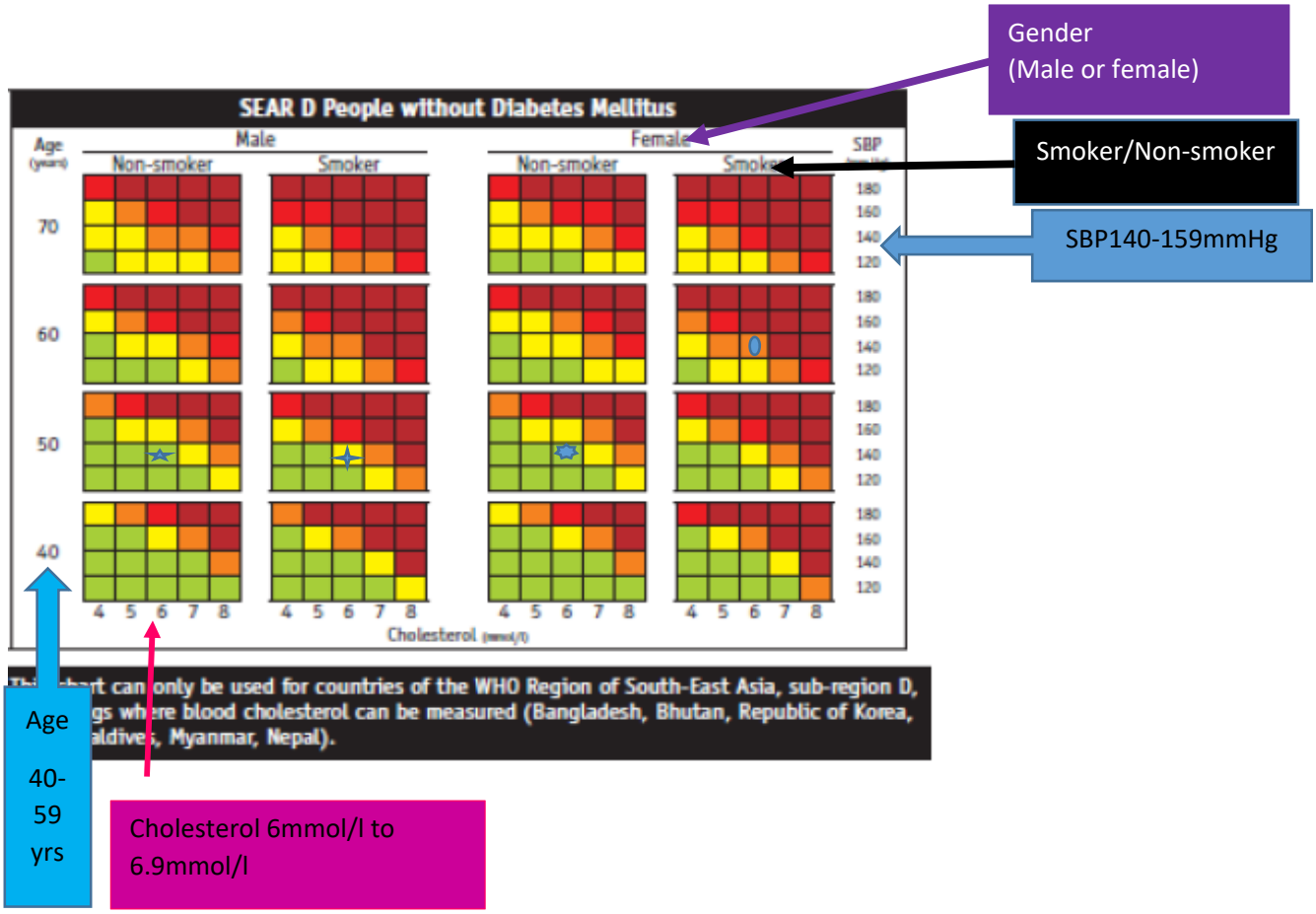
Cholesterol 6mmol/l to 6.9mmol/l

Diabetes, male, smoker, age 54,SBP154mmHg,total cholesterol 6mmol/l→ 20%to,30%

Female, age 66 yrs,SBP155mg Hg diabetes, smoker, total cholesterol 6mmol/l→>40%

Male, age 58 yrs, SBP 170mmHg ,diabetes, nonsmoker ,total cholesterol 6 mmol/l→>40%

Female age 56 yrs, SBP 155mm Hg, Diabetes, non-smoker, total cholesterol 6 mmol/l→10 %to<20%



Eg.✦ Male, age 56 yrs, SBP 154 mmHg ,Non-diabetes, smoker, total cholesterol6mmol/l→10%to<20%

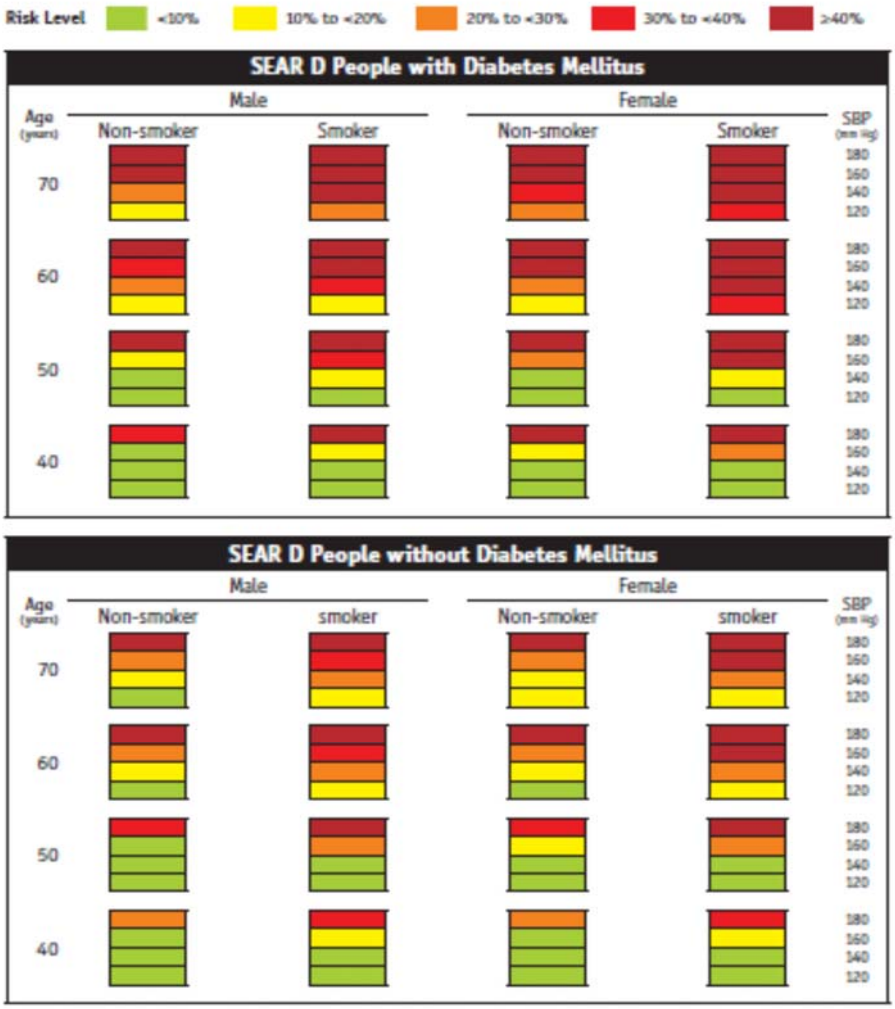
Female, age 66 yrs SBP 155mmHg,Non-diabetes,smoker,total cholesterol 6mmol/l→20 % to<30%

★ Male age 58 yrs SBP170mm Hg, Non-diabetes ,Non-smoker, total cholesterol 6mmol/l→ 10%to<20%

Female age 56 yrs SBP 155mmHg,Non-diabetes,Non-smoker,total cholesterol 6mmol/l →<10%

CVD/ISH prediction Chart(without cholesterol)

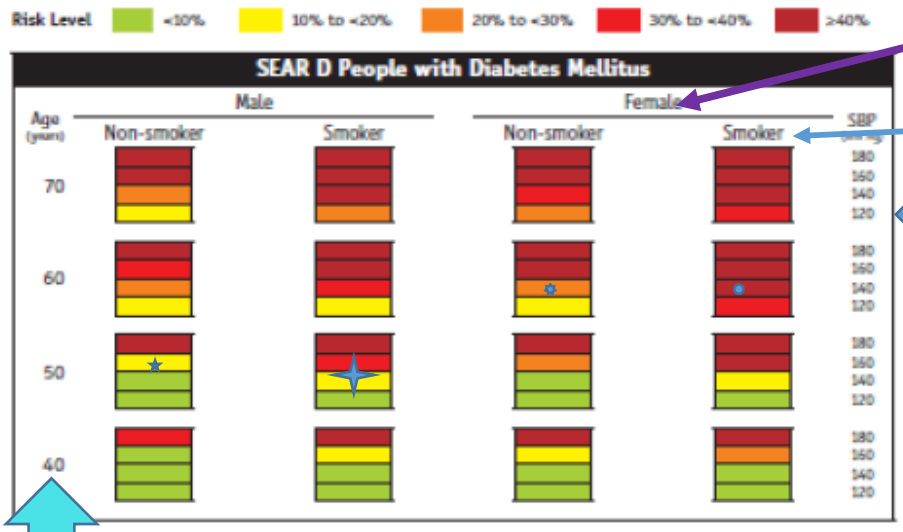
Figure 24. WHO/ISH risk prediction chart for SEAR D. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, smoking status and presence or absence of diabetes mellitus.



This chart can only be used for countries of the WHO Region of South-East Asia, sub-region D, in settings where blood cholesterol CANNOT be measured. (Bangladesh, Bhutan, Republic of Korea, India, Maldives, Myanmar, Nepal)

CVD/ISH prediction Chart

Figure 24. WHO/ISH risk prediction chart for SEAR D. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, smoking status and presence or absence of diabetes mellitus.



Gender (Male/Female)

Smoker/Non-smoker

SBP120 - 139mmHg

Age

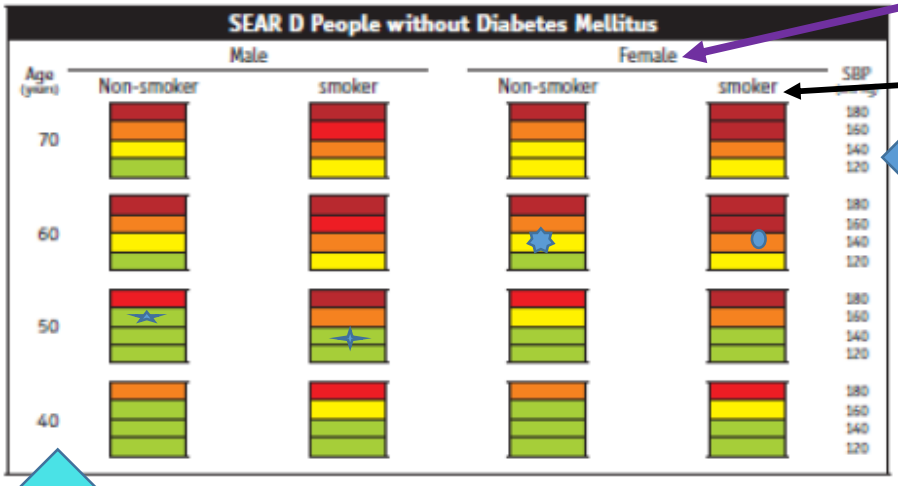
40 to 49yrs

Eg. Male,age56 yrs, SBP 154mm Hg, diabetes, Smoker→10% to <20%

Female ,age 66 yrs,SBP155mg Hg diabetes, smoker→>40%

Male, age 58 yrs, SBP 170mmHg ,diabetes ,nonsmoker→10 %to <20%

Female, age 56 yrs ,SBP 155mm Hg, Diabetes, non-smoker→20 %to<30%



Gender
Male or Female

Smoker/Non-smoker

SBP120 -139mmHg

Age 40 to 49 yrs

Eg. Male, age 56 yrs, SBP 154 mmHg ,Non-diabetes, smoker→<10%

Female, age 66 yrs SBP 155mmHg,Non-diabetes,smoker→20 % to<30%

Male age 58 yrs SBP 170mm Hg, Non-diabetes, Non-smoker→ <10%

Age Female56 yrs SBP 155mmHg,Non-diabetes,Non-smoker→<10%

7.5 Appropriate Treatment

1.Refer to the Guidelines for management of NCDs in Primary Health Care.

2.Advise all participants to make their life style much healthier.

	General Advice
Weight control	All individuals who are overweight or obese should be encouraged to lose weight through a combination of a reduced energy diet(dietary advice) and physical activity. Body mass index(BMI) 25—29.9 kg/m^2 –overweight ≥ 30 kg/m^2---------Obesity
Physical activity	All individuals should be encouraged to do at least 30 minutes of moderate physical activity (brisk walking)a day, at least 5 days of a week through leisure time, daily tasks and work related activity.
Dietary changes	All individuals should be encouraged to ❖ Gradually reduce daily salt intake by at least one third and if possible to < 5gm(one teaspoon)per day. ❖ Limit eating processed food and fast food ❖ Restrict sugar consumption ❖ Eat more fruit and vegetables (recommendation is at least 400-500gm a day) ❖ Limit fatty food and encourage consumption of lean meat and fish
Tobacco cessation	All non-smokers should be encourage not to start smoking All tobacco users should be strongly encouraged to quit all form of tobacco.(smoking and chewing tobacco)
Alcohol intake	Alcohol abstinence should be reinforced. People should be advised not to start consuming alcohol for health reasons. Individual who take more than 3 units of alcohol per day should be advised to reduce the amount of alcohol consumption.

Source: Pocket guidelines for assessment and management of cardiovascular risk,WHO2007 and guideline foe management of NCDs in Primary Health Care .

3.For the participants who have FBG≥350mg/dl or BP≥220/120 mmHg or acute chest pain or acute shortness of breath, or gangrene, refer them to the nearest secondary health facility.

8.Health Education and counselling

8.1Purpose

At the end of health education and counselling ,each participant is expected to

- Understand the meaning of the checkup results.
- Recognize their own risk of CVDs
- Learn how to reduce their potential risk and to put a strategy to practice.

Note: Health education and counselling method used to change behavioral patterns. It is a strongly recommended to it carry out not once but as a series of sessions for high risk people who will not take any medical treatment.

8.2 Preparation

1.All the health care staff who conduct health education and counselling activities are required to participate in a training session which has been organized by Health Bureau and NCD unit. The Training is aimed to develop communication skill and to learn the contents of health guidance.

2.Before starting health education and counselling activities, check the result of screening and clarify the common risk factors among participants. For example, if most participants are non-tobacco users, you can spend less time explaining the impact of tobacco and more time instructing about other common risk factors.

3.A spacious room/hall with minimal distractions will be the most suitable setting.

8.3 materials required

Type and Item

Document →Flip chart/pamphlet, leaflet/ or Powerpoint projector

Depend on the number of participants, it is recommended to use multimedia

8.4 Flip chart Guide book

8.5 Tips for the effective Use of the flip chart.

1.Stand in front of the audience when using the flip chart.

2.HOLD THE FLIP chart so that every one in the group can see the pictures. If all participants can not see it at one time ,walk around with the flip chart and show it to every one.Point at the picture when explaining.

3,Get all the participants involved in discussion. Ask the participants some question by using picture.

Annex1.Register of NCD Screening

[redacted]Register for NCDs Screening Activities

Township ---------- Health Facility----------State/Region----------Date----------

SN	Reg.NO	New/ Old	Name	Address	age	Gender	FGB	BP	Blood Choles-terol	BMI	tobacco	CVD risk	Diagnosis	Treatment	Refer	Next visit

Total Register	
Total NCDs	

Annex 2.Clinical record of NCD patient Patient or Screened participant

Figure 18. Clinical Record for NCDs Patient

Health Facility Name---------- Patient Name----------

Age---------- Registration NO:----------

Gender: Male or Female

Income per month----------

1.History/Complaint

2.Investigations

	Visit 1 Date----------		Visit 2 Date----------		Visit 3 Date----------		Visit 4 Date----------	
10years cardiovascular risk	1. <10% 2. 10 to <20% 3. 20 to <30 % 4. 30 to <40% 5. >40%		1. <10% 2. 10 to <20% 3.20 to <30 % 4. 30 to <40% 5. >40%		1. <10% 2. 10 to<20% 3. 20 to <30% 4. 30 to <40% 5. >40%		1. <10% 2. 10to<20% 3. 20to<30% 4.30 to<40% 5. >40%	
Fasting Blood Glucose								
Resting SBP(Two readings at each visit)mmHg								
Resting DBP(Two readings at each visit)mmHg								
Currently on antihypertensive medication	Yes	NO	Yes	NO	Yes	No	Yes	NO
Cholesterol								
Urine albumin								
Peak flow rate								

Food examination of diabetes	Yes	No	Yes	No	Yes	No	Yes	No
Arrangement of eye examination for diabetes in the next 24 months	Yes	No	Yes	No	Yes	No	Yes	No
Waist circumstance(cm)								
Tobacco smoking	yes	No	Yes	NO	Yes	No	Yes	No
Counselling tobacco cessation	Yes	No	Yes	NO	Yes	No	Yes	No
Counselling diet/physical activity	yes	No	Yes	No	Yes	No	Yes	No
Medicines and daily dose								
Referral reasons (within code number								
Was the feedback from higher level	Yes	No	Yes	No	Yes	No	Yes	No

Code NO:

1.High cardiovascular risk %

2.High cholesterol >320mg/dl

3.HT,SBP160 mmHg And or DB 100mmHg

4.HT 140mmHg in spite of T with 2 or 3 anti-HT agents

5.DM with 130mmHg in spite of 2 or 3 anti-HT agents

6.DM without eye examination for 2 years

7.DM with severe infection

8.DM with ulceration and numbness of leg

9.Presence of albumin in urine.

10.MI or ACS after stabilization

11.MI or ACS with heart failure

12.MI or ACS with persistent pain in limited daily life activities.

13.MI or ACF

14.uncontrol bronchial asthma

15.Suspected cancer

16.Other (please specifically)

Annex 3.Body Mass Index(BMI)Chart

Body Mass Index (BMI) Chart for Adults

Obese (>30) | Overweight (25-30) | Normal (18.5-25) | Underweight (<18.5)

HEIGHT in feet/inches and centimeters

WEIGHT		4'8"	4'9"	4'10"	4'11"	5'0"	5'1"	5'2"	5'3"	5'4"	5'5"	5'6"	5'7"	5'8"	5'9"	5'10"	5'11"	6'0"	6'1"	6'2"	6'3"	6'4"	6'5"
lbs	(kg)	142cm		147	150	152	155	157	160	163	165	168	170	173	175	178	180	183	185	188	191	193	196
260	**(117.9)**	**58**	**56**	**54**	**53**	**51**	**49**	**48**	**46**	**45**	**43**	**42**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**32**	**31**
255	(115.7)	57	55	53	51	50	48	47	45	44	42	41	40	39	38	37	36	35	34	33	32	31	30
250	**(113.4)**	**56**	**54**	**52**	**50**	**49**	**47**	**46**	**44**	**43**	**42**	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**30**
245	(111.1)	55	53	51	49	48	46	45	43	42	41	40	38	37	36	35	34	33	32	31	31	30	29
240	**(108.9)**	**54**	**52**	**50**	**48**	**47**	**45**	**44**	**43**	**41**	**40**	**39**	**38**	**36**	**35**	**34**	**33**	**33**	**32**	**31**	**30**	**29**	**28**
235	(106.6)	53	51	49	47	46	44	43	42	40	39	38	37	36	35	34	33	32	31	30	29	29	28
230	**(104.3)**	**52**	**50**	**48**	**46**	**45**	**43**	**42**	**41**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**30**	**29**	**28**	**27**
225	(102.1)	50	49	47	45	44	43	41	40	39	37	36	35	34	33	32	31	31	30	29	28	27	27
220	**(99.8)**	**49**	**48**	**46**	**44**	**43**	**42**	**40**	**39**	**38**	**37**	**36**	**34**	**33**	**32**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**
215	(97.5)	48	47	45	43	42	41	39	38	37	36	35	34	33	32	31	30	29	28	28	27	26	25
210	**(95.3)**	**47**	**45**	**44**	**42**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**28**	**27**	**26**	**26**	**25**
205	(93.0)	46	44	43	41	40	39	37	36	35	34	33	32	31	30	29	29	28	27	26	26	25	24
200	**(90.7)**	**45**	**43**	**42**	**40**	**39**	**38**	**37**	**35**	**34**	**33**	**32**	**31**	**30**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**24**
195	(88.5)	44	42	41	39	38	37	36	35	33	32	31	31	30	29	28	27	26	26	25	24	24	23
190	**(86.2)**	**43**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**24**	**23**	**23**
185	(83.9)	41	40	39	37	36	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	23	22
180	**(81.6)**	**40**	**39**	**38**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**
175	(79.4)	39	38	37	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21
170	**(77.1)**	**38**	**37**	**36**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**	**21**	**20**
165	(74.8)	37	36	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20	20
160	**(72.6)**	**36**	**35**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**	**21**	**20**	**19**	**19**
155	(70.3)	35	34	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	20	20	19	19	18
150	**(68.0)**	**34**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**23**	**23**	**22**	**22**	**21**	**20**	**20**	**19**	**19**	**18**	**18**
145	(65.8)	33	31	30	29	28	27	27	26	25	24	23	23	22	21	21	20	20	19	19	18	18	17
140	**(63.5)**	**31**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**23**	**23**	**22**	**21**	**21**	**20**	**20**	**19**	**18**	**18**	**17**	**17**	**17**
135	(61.2)	30	29	28	27	26	26	25	24	23	22	22	21	21	20	19	19	18	18	17	17	16	16
130	**(59.0)**	**29**	**28**	**27**	**26**	**25**	**25**	**24**	**23**	**22**	**22**	**21**	**20**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**
125	(56.7)	28	27	26	25	24	24	23	22	21	21	20	20	19	18	18	17	17	16	16	16	15	15
120	**(54.4)**	**27**	**26**	**25**	**24**	**23**	**23**	**22**	**21**	**21**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**15**	**14**
115	(52.2)	26	25	24	23	22	22	21	20	20	19	19	18	17	17	16	16	16	15	15	14	14	14
110	**(49.9)**	**25**	**24**	**23**	**22**	**21**	**21**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**15**	**14**	**14**	**13**	**13**
105	(47.6)	24	23	22	21	21	20	19	19	18	17	17	16	16	16	15	15	14	14	13	13	13	12
100	**(45.4)**	**22**	**22**	**21**	**20**	**20**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**14**	**14**	**14**	**13**	**13**	**12**	**12**	**12**
95	(43.1)	21	21	20	19	19	18	17	17	16	16	15	15	14	14	14	13	13	13	12	12	12	11
90	**(40.8)**	**20**	**19**	**19**	**18**	**18**	**17**	**16**	**16**	**15**	**15**	**15**	**14**	**14**	**13**	**13**	**13**	**12**	**12**	**12**	**11**	**11**	**11**
85	(38.6)	19	18	18	17	17	16	16	15	15	14	14	13	13	13	12	12	12	11	11	11	10	10
80	**(36.3)**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**14**	**14**	**13**	**13**	**13**	**12**	**12**	**11**	**11**	**11**	**11**	**10**	**10**	**10**	**9**

Note: BMI values rounded to the nearest whole number. BMI categories based on CDC (Centers for Disease Control and Prevention) criteria.

www.vertex42.com BMI = Weight[kg] / (Height[m] x Height[m]) = 703 x Weight[lb] / (Height[in] x Height[in])

Annex 4.Guideline for CVD risk prediction Chart.

Guidelines for Risk Prediction Chart

How do use the charts to assess cardiovascular risk ?

Before applying chart to estimate 10 year cardiovascular risk of , the following information is necessary.

- Presence or absence of Diabetes
- Gender
- Smoker or Non-Smoke
- Age
- Systolic Blood Pressure(SBP)
- Total blood cholesterol

(If in mg dl divided by 38 to convert to mml/l)

mmol/l	mg/l
8	≥304
7	266-303
6	228-265
5	190-227
4	≤189

Estimate the 10- year cardiovascular risk to follows;

Step 1.Select the appropriate chart depending on the presence or absence of diabetes

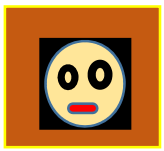
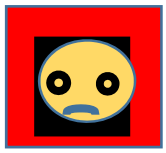
Step 2.Select male or female tables

Step 3.Select smoker or non-smoker boxes

Step 4.Select age group box(if age is 55;select 50-59,if age is 60;select 60-69)

Step 5.Within this box find the nearest cell where the individuals systolic blood pressure (mmHg) and total blood cholesterol level(mmol/l)cross.The color of this cell determines the 10 year cardiovascular risk.




<10% 10% to20% 20% to<30% 30% to<40% ≥ 40%