Integrating NCD case management into district health services- an implementation manual for district managers

WHO PEN- HEARTS- IMAI

Draft

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Sections of this manual draws substantially from the experience of the WHO child health and HIV departments in programme management, drawing in particular from :

- *Managing Programmes to Improve Child Health*, *Module 2 and 3 on Planning Implementation, WHO, 2012.*
- Operations manual for delivery of HIV prevention, care and treatment at primary health centres in high-prevalence, resource-constrained settings[i]

Contents

1. Introduction

Noncommunicable Diseases (NCDs) are growing as a public health challenges in all parts of the world. In many settings, the absence of systematic NCD case management within health services leads to high morbidity, premature mortality and financial hardships for the patients and their families. Although population-based prevention approaches to reduce NCD risk factors are critically important and must be given high priority, early detection, secondary prevention and good case management are an integral component of a comprehensive response. (In many low resource settings, the only substantial public health efforts to date have been population-based prevention, neglecting case management). A substantial proportion of cardiovascular premature mortality can be prevented and controlled through good case management using a structured delivery system. [2]

The WHO PEN protocols provide evidence-based, cost-effective interventions for NCD case management and many suggestions for the efficient use of limited health care resources to produce patient-centred, community-based and sustainable health care. This manual attempts to operationalize this for district manager in low-resource settings, drawing on materials and approaches to scaling up programmes for child health and HIV care/ART.

This manual, *Integrating NCD case management interventions into district health services- for district managers in low-resource settings,* suggests a service delivery and implementation planning framework for NCD management in a district in a low-resource country. A district is a defined geographic area with a specified catchment population, a number of primary health facilities and at least one hospital.

A goal is to develop a district based approach to integrated NCD case management which is capable of going to scale in phases in a district, then more districts, and eventually the entire country. The manual is focused on delivery through the primary health care system, with back-up from the district hospital and in close collaboration with the community.

The manual assumes that implementation planning for NCD case management at district level has been preceded by strategic planning at national level, using an accompanying *National strategic planning and adaptation manual for integrated NCD case management in low-resource settings*, which may also be useful for district managers. This manual summarizes the technical basis for various recommendations and decisions.

National CVD/NCD case management strategic planning and adaptation will hopefully have resulted in:

- adapted health facility survey instrument for baseline assessment of status of CVD/diabetes case management
- estimated national needs for cardiovascular/DM/other NCD case management plus relevant survey data which can be used for district estimates
- prioritized cardiovascular/DM/NCD case management interventions
- decisions on NCD services by level of health system
- decisions on human resources including task-sharing/task-shifting policy decisions
- adapted clinical guidelines
- choice and adaptation of training materials, based on cadres delivering CVD/NCD services
- adapted first-level facility operations manual

- adapted patient monitoring system. This manual should be used alongside the adapted *HEARTS monitoring guide.*
- costed national strategic NCD case management plan or addendum to the NCD national strategic plan.

These decisions and adapted tools should be available and noted in using the district manual, which often itself will be adapted (given differences in degree of decentralization and other differences).

The HEARTS approach to basic cardiovascular risk assessment and management at primary care level are similar across a range of resources. Although the manual will have relevance in some districts in upper middle income countries, it is aimed at low-resource settings including low-income and lower middle-income countries. Its planning recommendations do not address situations with first-level facility availability of ECG or defibrillation or district hospitals with intensive care units or the ability to perform fibrinolysis or angioplasty. It also does not address the training options to support more resource-intensive emergency cardiovascular or pulmonary management, although the materials could be adapted and expanded to do so perhaps on a regional basis. Much remains relevant.

The detailed service delivery organization of a health centre or hospital outpatient to deliver the HEARTS cardiovascular and diabetes interventions are laid out in the NCD operations manual (*Integrating cardiovascular and diabetes case management into your health facility- an operations manual for health centres and outpatient clinics in low-resource settings*), a companion *NCD Quality Improvement Module*, and a companion manual on essentials medicines and technologies: HANDBOOK OF NCD SUPPLY MANAGEMENT AT FIRST-LEVEL HEALTH CARE FACILITIES).

2. Scope, purpose and assumptions of the manual

The manual aims to describe in a very specific and practical way, service delivery models and system requirements to implement quality NCD case management within a district in a low resource setting. This is a global tool for regional and country adaptation.

The approach is based on key principles for a public health approach, which are relevant for tackling the large volume of patients with hypertension/ elevated cardiovascular risk /other NCDs including:
"(1) simplification by focusing on core interventions;
(2) standardisation through the adoption of a public health approach with standard regimens;
(3) decentralisation to assure treatment delivery in remote areas, including through task sharing to enable nurses, community health workers, and others to undertake specific programmatic functions and thus extend access, reduce costs, and potentially increase consistency of care;
(4) minimisation of laboratory monitoring requirements….;
(5) monitoring to appropriately track patients and outcomes, including assuring treatment effectiveness; and
(6) programme assessment to allow national and regional comparisons….. Cohort monitoring facilitates measurement of specific indicators, such as hypertension control rates, and implementation of corrective actions."[3] (These are derived from the experience scaling up HIV care/ART.)

In proposing steps to planning and managing implementation, we aim to help managers at the district (and national) level work out how:

- the interventions can be effectively delivered and what activities and resources will be required.
- explain the assumptions and calculations, so that each country/district manager can use these to customize a plan for their district.
- provide very practical, specific description of how and what is required, for district managers wishing to integrate good NCD case management within their existing district health services
- describe the governance (and national level support/interventions) requirements for successful implementation of the integrated NCD service delivery model in a district

The overall framework of this manual assumes the district health manager is adding NCD case management services to existing services:

- Integration of quality NCD case management interventions is into an existing health care delivery system.
- Service delivery is integrated, for the range of NCDs which can be cared for as well as acute care, "acute on chronic" care, and referral between levels of the district health system.
- Emphasis is on decentralized service delivery at the front lines of the health system.
- Patient-centred primary care is delivered through a team approach with community participation[4].
- The system must be both sustainable and capable of going to scale, to reach high coverage within the district.

There is an important intersection of NCD care with the core functions of primary health care: care that is longitudinal, coordinated, patient-centred, integrated, comprehensive, equitable, and accessible[5], delivered at the front lines of health systems.

The manual aims to guide integration of core NCD case management/Global HEARTS services into primary care and hospital referral care within a district. Because of the very large number of cases of NCDs or risk factors needing management and the limitation in human resources, in most low-resource countries:

- Task-shifting or -sharing is essential- basic services need to be delivered by a non-physician clinicians and nurses and various auxiliary cadres, delineating what can be done at a primary health centre and outpatient of district hospital and what requires referral. This requires training, mentoring and ongoing support for high quality NCD case management.
- Community health workers (CHW) and NCD "expert patients" will need to play a role in both screening and monitoring treatment adherence.

NCD related service delivery – like other complex health interventions– requires strong district level organization and management to support decentralized service delivery, access, and quality of care for the very large numbers of patients requiring chronic NCD care.

Why integrated service delivery within primary health care makes sense for HEARTS/NCD case management[6]

Most people have more than one risk factor and/or NCD. Therefore, it makes sense to treat their conditions and risk factors within an integrated framework of care.	Many NCDs have common primary and secondary risk factors- smoking, diet, physical inactivity. Patient often have more than one condition or risk factor, for example, hypertension and obesity, or hypertension and diabetes and/or asthma.
Most NCDs and chronic infectious diseases such as HIV care with antiretroviral therapy (ART) or TB place similar demands on health workers and health systems.	Comparable ways of organizing chronic care and managing these conditions are similarly effective regardless of aetiology. [7],[8],[9]
Patients with NCDs have other acute health problems and "acute on chronic" episodes of deterioration that lead them to acute care settings.	
There are important associations between NCDs and communicable diseases.	• Diabetes triples the likelihood of developing TB.[10] • Patients in HIV care on ART can develop metabolic syndrome characterized by high blood glucose, high cholesterol, insulin resistance, fatty liver, increased abdominal fat and increased risk of diabetes and cardiovascular disease[11] and therefore CVD morbidity and mortality, requiring treatment (and suggesting the value of an integrated management strategy with co-management of metabolic syndrome and HIV). • HPV infection leads to cervical cancer and can be prevented with adolescent immunization. • Hepatitis B immunization can prevent many liver cancers. • Group A streptococcal pharyngitis can lead to acute rheumatic fever/chronic rheumatic heart disease. • Common severe infections such as pneumonia and sepsis are common complications and causes of mortality in patients with NCDs especially diabetes.
NCDs may be discovered or cause special problems for pregnant women.	Pregnant women may • Have NCD precursors such as gestational diabetes or pre-eclamptic hypertension or • Have already established chronic NCDs (hypertension, diabetes) or • Suffer higher maternal mortality due to valvular heart disease such as rheumatic heart disease (RHD), or particular maternal problems such as peripartum cardiomyopathy.
Infants, children, adolescents and young adults may present at various times in under 5 clinic,	They may present with: • congenital heart disease • acute rheumatic fever or

adolescent clinic or acute care clinic with signs of cardiovascular disease.	• rheumatic heart disease.

General principles of good chronic care

Individuals with chronic conditions will need to interact with the health system on a regular basis, often for life; follow up with medical appointments and laboratory testing; sustain healthy behaviours, such as treatment adherence, good nutrition, physical activity, and smoking cessation.[6] This requires a good chronic care system. While acute medical problems will always require the attention of the clinical team, approaches that are oriented toward acute illnesses are inadequate to address the growing number of people with NCDs.

Chronic care of NCDs needs to be integrated across time, place, and conditions. The health system needs to provide full health care services, from clinical prevention through treatment and end of life. This needs to be done collaboratively within clinical teams and with patients and their families. These special requirements have been summarized as the general principles of good chronic care,[12] based on a framework[13] centred on the idea that optimal outcomes occur when a health-care triad is formed. This triad is a partnership among patients and families, health-care teams, and community supporters. Each is informed and motivated and communicates and collaborates with the other members of the triad. When the integration of the components is optimal, the patient and family become active participants in their care, supported by the community and by the health-care team. (Some will be familiar with this approach as it was embodied in most chronic HIV care/ART programmes.)

General principles of good chronic care

1. **Develop a treatment partnership with your patient.**

2. **Focus on your patient's concerns and priorities.**

Patient-centred care is health care that establishes a partnership among practitioners, patients, and their families (when appropriate) to ensure that decisions respect the patients' wants, needs, and preferences, and that patients have the education and support they need to make decisions and participate in their own care. Studies show that orienting health care around the preferences and needs of patients improves a range of clinical outcomes.

3. **Use the 5 A's: Assess, Advise, Agree, Assist, and Arrange[14],[15].**

The 5 A's approach is a proven behavioural strategy to guide clinical interactions.

4. **Support patient self-management.**

5. **Organize proactive follow-up.**

6. **Involve "expert patients", peer educators and support staff in your health facility.**

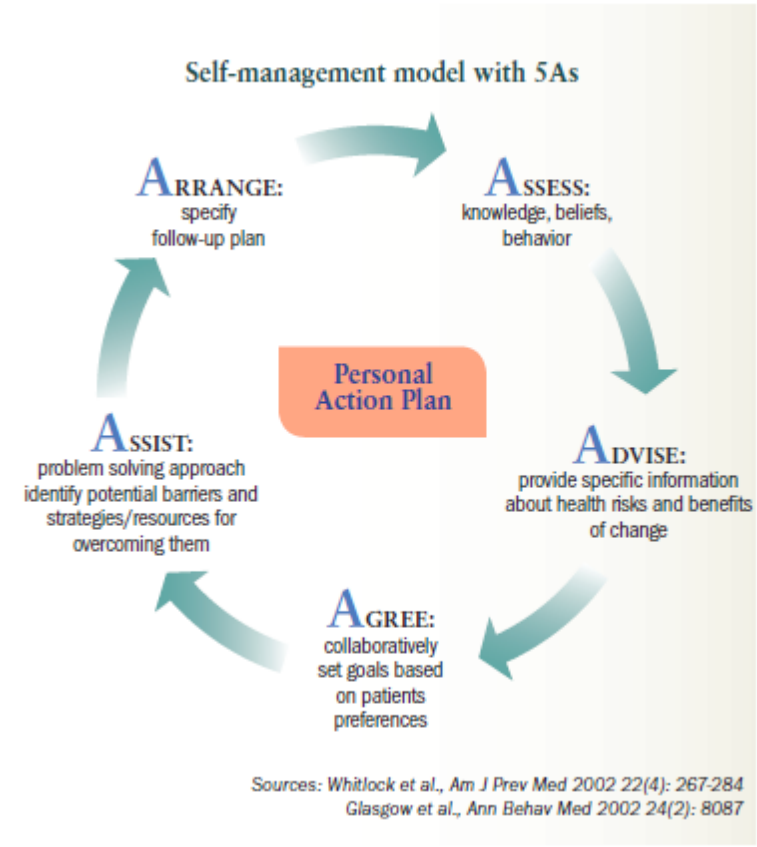
- Choose patients who:
  - understand their disease well;
  - are good communicators;
  - are respected by other patients; and
  - have time to be involved on a regular basis.
- Ensure they understand and will respect shared confidentiality.
- Ensure they do not exceed their expertise or areas of responsibility.

7. **Link the patient to community-based resources and support.**

8. Use written information – registers, treatment plan, treatment cards and written information for patients – to document, monitor and remind. **9. Work as a clinical team.** **10. Assure continuity of care.**

See *NCD national strategic planning and adaptation manual* for a summary of the evidence and technical basis for these general principles of good chronic care.

FIGURE 2. The "5As" Self-Management Model



3. District level planning

A strategic plan is needed before developing a concrete implementation plan for the next 1-2 years.

Refer to your national NCD case management strategic plan if it has been updated to address CVD/NCD case management; the National strategic planning manual may recently have been used at national level to augment or update the NCD strategic plan to more specifically address the HEARTS/WHO-PEN priority interventions.

At district level, you will need to:

- Determine district baseline readiness for NCD case management (chapter 4) or review implementation status, if activities are already in progress (chapter 16).
- Estimate need for NCD case management in your district (chapter 5).
- Review national strategic intervention recommendations in district context (chapter 6).
- Consider how to integrate core NCD case management services into primary health care within your district (chapter 7)
- Help develop linkages with the community (chapter 8)
- Establish and maintain essential laboratory and other diagnostic capacity for NCD case management (chapter 9) and essential medicines and technologies for NCD treatments (chapter 10 and WHO/PATH national/district manual when available)
- Build capacity (human resources) by hiring, training and mentoring (chapter 11)
- Support district patient and programme monitoring (chapter 12)
- Bring all these components together within a district implementation plan (chapter 13)
- Support a quality improvement system for NCD case management (chapter 14)
- Make a budget and help find financing (chapter 15)
- Review implementation status (chapter 16).

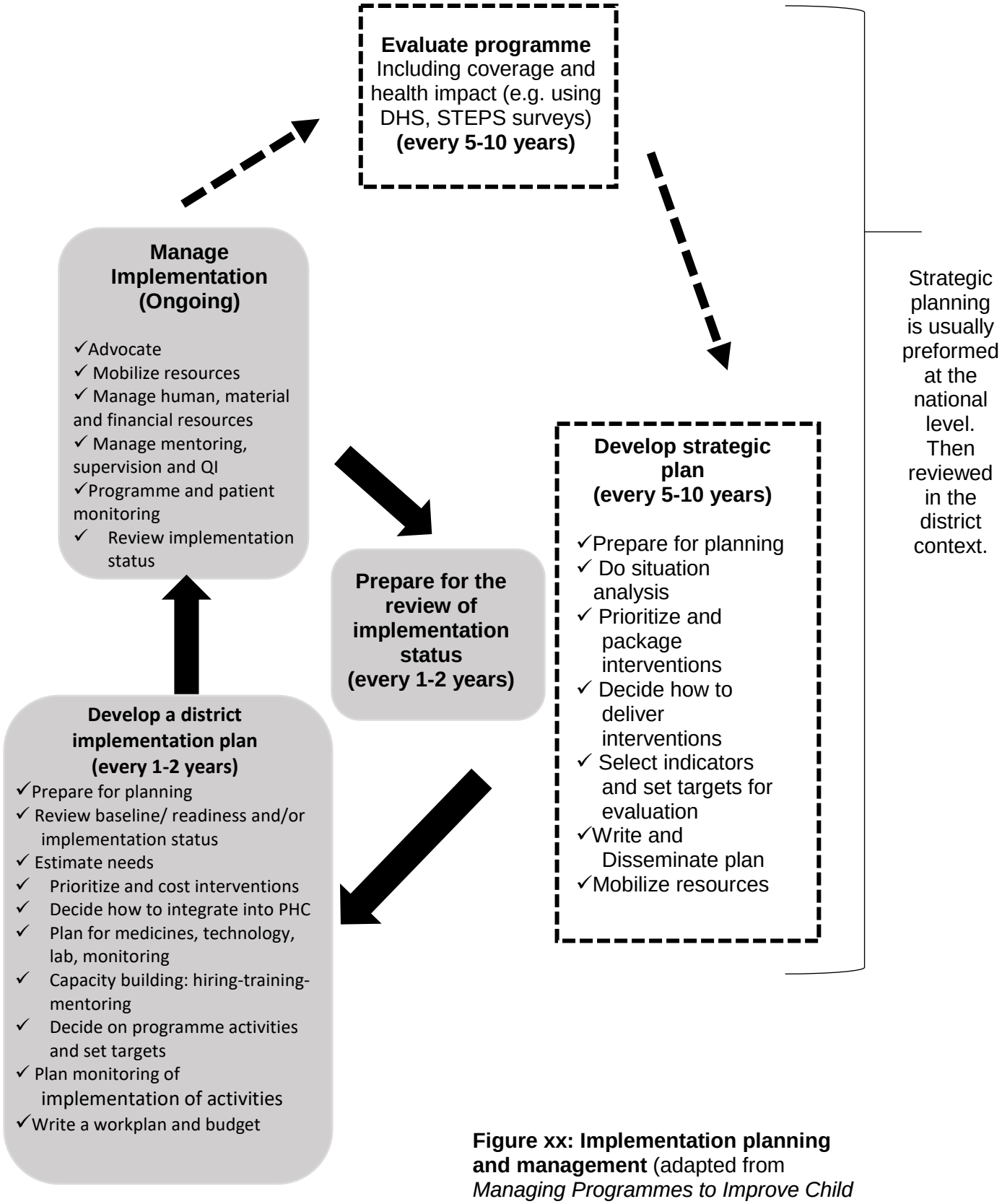


Figure xx: Implementation planning and management (adapted from *Managing Programmes to Improve Child Health*)

4. District baseline and readiness assessment for NCD case management

- ☐ Working with health facility managers in your district:
  - perform baseline facility and readiness assessment for NCD case management (working with the health facility managers)
  - estimate the numbers of patients already in chronic NCD care in each health facility
  - summarize both quantitative and descriptive data from health facilities in your district
- ☐ Map the health centres and hospitals providing various NCD case management services

It is important to assess the current baseline of NCD care and to estimate readiness of district health facilities to begin, improve or expand NCD case management.

A readiness assessment assumes that an organized NCD case management programme does not already exist; if one does, you should refer to the implementation plan and review status of indicators related to availability, access, demand and quality of health services and knowledge of the population related to NCDs (see Chapter 16).

Readiness assessments should include an estimation of the current NCD case management baseline in the district.

- Tools for readiness assessments include the HEARTS-specific health facility tool (see the *HEARTS monitoring module*) which may have been country-adapted as part of national strategic planning and adaptation. Readiness data can also be drawn from the WHO Services Available and Readiness Assessment (SARA) Tool.[16]
- On a district list of health centres and hospitals (and a map if possible), indicate the number and proportion of health centres and hospitals providing various NCD case management services.
- What are the approximate current number of patients receiving NCD case management services? (use table on next page).
- In your district, approximately what proportion of patients who are in chronic NCD care are cared for at the facility closest to their residence (or do they all travel to a hospital, etc)?
- Drawing from health facility assessments in your district, estimate:
  - Current staff availability and preparation to provide CVD risk based management, manage HTN, diabetes, asthma, COPD, cervical cancer VIA test and treat
  - Existing health facility and hospital processes for screening, diagnosing, monitoring, and caring for patients with hypertension, diabetes, asthma, COPD, breast cancer, and cervical cancer.
    - risk based approach to identifying and managing CVD risk or just screening and treatment for HTN/DM?
    - how are patients identified with elevated CVD risk?
    - What CVD risk chart is used?
    - Individual education or lifestyle counselling for main CVD risk factors (smoking, diet, physical inactivity, harmful alcohol/dependence) in clinic? By whom?
      - Specialist medical doctor
      - Non-physician clinicians
      - Nurses
      - Auxiliaries/other paramedical professionals

	Estimated number of patients currently in chronic care identified having:							
Health facilities in district	Prior CVD	CKD	High CVD risk≥ 30%	Hyper-tension (HTN)	Diabetes (DM)	Asthma	COPD	RF/RHD on secondary prophylaxis
Total								

Note: It may be difficult to determine the number of patients being cared for if return visits are recorded in the same register as acute care visits.

- HEARTS/NCD medicine and equipment availability and utilization
- Existing district processes and resources for referring patients from one level of care to another
- Flow of patients, within hospitals and through referral chains
- Observed and perceived (by health workers) factors and key barriers to the following:
  - Appropriate screening of patients for NCDs
  - Accurate diagnosis of NCDs
  - Rapid and effective referral of patients to the appropriate care level
  - Efficient supply chain of drugs and medical equipment
  - Quality of care of the NCD patient

5. Estimate the needs for NCD case management in your district

Hopefully, as part of national strategic planning for NCD case management, the national NCD case management needs estimation will have already been carried out. See the *National strategic planning manual,* Chapter 4 and the national results, estimations and recommendations. The estimates are a 2- step process- first at national, then at district level.

To estimate the needs in your district, you need to estimate the expected numbers of people with specific NCDs, cardiovascular disease, diabetes, and risk factors in the population you are responsible for. This will help you estimate the requirements for CVD/NCD health services, both clinical care and lifestyle counselling to reduce risk factors.

There are several possible sources of data to estimate the needs in the district prior to program implementation. Remember that these are only estimates for planning purposes, and to estimate current and achieved coverage of interventions. Data at the start of the programme may be inaccurate.

Data for estimating NCD needs in the district

Data source	Comments
Outpatient visit and dispensing registers and inpatient registers which also contain data from all acute conditions. These are often extracted into an HMIS on a monthly basis.	Data on NCDs such as hypertension and diabetes may be aggregated from this. The only details recorded in these registers are often the diagnosis and treatment given on that particular visit or hospitalization. No link exists to previous visits. Estimates of NCDs in HMIS data from adults seeking care in primary health care thus often have several problems. They can seriously underestimate hypertension and diabetes as many ambulatory cases are asymptomatic ("invisible" in a medical OPD[17]) prior to initiating and supporting screening for cardiovascular risk and diabetes assessment. Many health facility outpatient registers from which HMIS indicators are extracted track visits, not cases; patients returning several times are counted more than once in the absence of a longitudinal record and register.
STEPS survey results or results from DHS surveys which have added NCDs with measurements of fasting blood glucose and blood pressure.(USAID DHS 2015).	Most STEPS surveys can provide population data on hypertension, diabetes, BMI/obesity, smoking, alcohol use, physical inactivity, cholesterol, calculated cardiovascular disease risk percent over next 10 years, and cervical cancer screening. (In some countries, using the STEPs survey results for these estimation purposes may require going back to the original EpiInfo database or detailed reports; summary reports may not provide CVD risk percents).
Your district or a similar nearby district may have a demographic surveillance system which provides verbal autopsy and other specific data.	InDepth DSS sites exist in many countries.
Estimates by clinicians	Sometimes you will need to rely on a qualitative estimates by clinicians, hoping to later have better data.

National estimates of the burden of cardiovascular and chronic respiratory disease by cause; breakdown of cause of death by age groups	See the National Strategic Planning and Adaptation Manual. You may want to repeat this estimation process at district level, using district-level data and estimates by your district clinicians (see Annex A).

For other NCDs, you may need other data sources and approaches to making what may be a rough estimate at the beginning of programming.

5.1 Use the STEPS survey results to estimate NCD case management needs

Find the most recent population data from your district, with age breakdowns that match STEPS and with figures for men and women. List the population 18-29 years, 30-49 years, and 50-69 years. (When assisting health facilities with their estimates, help determine their current catchment population.)

Use the most recent STEPS survey (or other relevant survey or research data) from your country:

- It is better to use the national data rather than the limited sample from participating districts only (due to small size). However, **choose either the rural or urban estimates**, depending on the characteristics of most of your district.
- Use the detailed results with age breakdowns rather than the combined age category of 18 to 69 in the simplified fact sheets.
    - Use the fasting blood glucose threshold for diabetes (7), rather than >6.1 which includes prediabetes.

Calculate approximate number in the district by multiplying district population figure for (men+women) x disease or risk factor percent.

This will provide separate numbers for people with hypertension, diabetes, cardiovascular risk >30% in the next 10 years. STEPS data can be re-analyzed to produce CVD risk in the several categories or other sources of this data may be available.

Use the survey data to estimate the total size of the problems as well as the current treatment rate for both hypertension and diabetes. Use the table on page 17 to summarize results which follow.

To estimate the number of women in the district that still need cervical cancer screening:

- Use only the population of women, from 30-49 years of age. This figure indicates those who have had screening; subtract this from the total population to obtain the number of women in this age bracket to obtain the number that still need screening.
- This estimate includes both women with and without HIV. To match the guidelines, add the number of women living with HIV from 18 to 29 years. If there are HIV program figures as to the proportion screened, apply these to this number or use an estimate from someone knowledgeable with this population, to calculate the additional women in this age group that need cervical cancer screening.

These calculations provide very basic population needs estimates. They are not exact numbers. *You can compare them in a general way to the current numbers in care for various conditions, to get a sense of the gap and estimated coverage in your district.*

STEPS data or other health facility patient monitoring data may allow you to estimate the proportion of the population with prior CVD, CKD, and cardiovascular risk %. These are important for subsequent estimates in the planning and costing process.

	Distribution of cardiovascular risk % in 10 years from various data sources		
CVD risk	STEPS survey	Health facility monitoring data-source:……	Health facility monitoring data-source……
PCVD			
CKD			
CVR >=30%			
CVR 20-30%			
CVR 10-20%			
CVR <10%			

(1) List district population (do this twice)				(2) STEPS results in percent-- choose rural or urban (3) calculate approximate number in district by multiplying district population figure for (men+women) times percent (except cervical cancer screening- women only)															
	Men	Women	Both	SBP ≥140 and/or DBP ≥ 90mmHG, excluding those on medi-cation for raised BP	N	SBP ≥140 and/or DBP ≥ 90 mmHg or currently on medi-cation for raised blood pressure	N	Raised fasting blood glucose >7 mmol	N	Diagnosed with diabetes, on medi-cation	N	Raised blood glucose OR currently on medi-cation for diabetes	N	Tobacco smokers	N	Total cholesterol ≥ 5.0 mmol/L or ≥ 190 mg/dl or currently on medi-cation for raised cholesterol	N	Cardio-vacular risk for 10 years ≥30%	N
18-29 years				%		%		%		%									
30-49 years				%		%		%		%									
50-69 years				%		%		%		%									
	Men	Women	Both	Obesity >30 BMI	N	Physical inactivity	N			Ever had cervical cancer screening									
18-29 years										xxxxxx									
30-49 years												women only							
50-69 years										xxxxxx									

5.2 Look at the breakdown of cause of death by age groups in your district, if available

5.3 Estimate the district burden of cardiovascular disease by cause

Refer to your national strategic plan and this section in the *NCD National Strategic Planning and Adaptation Manual*. Consult clinicians in your district to make sure these estimates match with district realities.

Estimate the relative importance of the various types of heart disease if you think it may differ from the national estimates (use table in Annex A).

Estimate the number of people potentially requiring RHD secondary prophylaxis (if relevant)

Most deaths occur in childhood or early adulthood. Screening for RHD at a population level has been most consistently carried out in children ages 5 to 15 years. See *NCD national strategic planning manual* for recommendations for estimating the number of people requiring secondary prophylaxis.

RHD is a cumulative disease such that there are more people over 15 years old with the disease than under 15 years. See the summary of screening data and estimates and suggestions for estimating the need for secondary prophylaxis in the *National strategic planning and adaptation manual.*

5.4 Estimate the burden of chronic respiratory disease: asthma and COPD

Refer to your national strategic plan and this section in NCD National Strategic Planning and Adaptation Manual. Consult clinicians in your district to make sure these estimates match with district realities.

6. Strategic planning and costing at district level- prioritize what case management interventions should be offered in your district

With appreciation for the national set of strategic priorities for case management which have been determined in the global and national analysis, the district may want to identify within these a priority set of interventions specific to their own demographics, current burden of disease, felt need by the district population and health workers for action, and feasibility of implementation, given available resources and the current state of your district health system. See the *NCD national strategic planning and adaptation manual, section …..*

If your national NCD strategic plan does not adequately address case management, you should work with national management to develop an updated strategic case management plan which can be used in your district (this may occur if your district is chosen as the first, demonstration district). Hopefully your national NCD strategy included input from "expert patients" with long experience of their conditions; this is also advisable at district level.

6.1 Estimate the cost of the interventions

The HEARTS interventions within WHO-PEN have an updated costing tool [insert title and url of WHO/RTI HEARTS costing tool] which has been designed for use at district level, but can also be used at national level. The original WHO-PEN costing tool (http://www.who.int/ncds/management/pen_tools/en/) addressed all of the WHO-PEN priority interventions. This costing tool and OneHealth are oriented to national level costing estimates.

Taking your budget into account in prioritizing and planning interventions:

Prioritizing primary health care vs hospital care: Given the likely limitations in financing, for cardiovascular disease: it is more cost-effective to invest more in services to detect and treat hypertension, diabetes and elevated cardiovascular risk early, with medicines and lifestyle counselling, than in improving the management of heart failure, stroke, kidney failure and heart attacks. Primary care interventions should happen in the context of population-based interventions to reduce smoking, salt, harmful alcohol use, and unhealthy diet and sedentary behaviour which have been estimated to be highly cost-effective/best buys.[xviii]

Chronic care is long-term: NCD chronic care requires long-term commitments to beneficiaries with costs for care for an individual often rising over time if complications develop or disease severity progresses.

Early interventions to prevent complications: Chronic NCD disease care can be expensive if delivered late in the disease course. However, it is important to realize that most patients with NCDs are still consuming health system resources even without well-organized care; this care is often more expensive and "…wasteful when patients "fall through the cracks" due to fragmented care. Poor-quality care results in health complications, poor patient outcomes, long hospitalizations and frequent hospital readmissions, decline in functional status, and increased dependency. Individuals, families, health care organizations, governments, and taxpayers collectively pay the price." [xix]

6.2 Decide how to deliver interventions; sequencing in the district

Based on the strategic case management interventions chosen to reduce morbidity and mortality from NCDs, select strategies for the delivery of each intervention.

A component of most case management interventions includes standardizing and simplifying diagnostic and treatment protocols; preparing clinical teams at primary care level; ensuring a consistent supply of essential quality-assured medicines; and systematic monitoring and evaluation of outcomes and patients.

This manual assumes that you will want to achieve broad coverage of the top priority NCD case management interventions by decentralizing interventions to health centres, close to communities, rather than limiting delivery to the district hospital (or in specialist or tertiary facilities). (See next chapter 7: How to integrate core NCD case management/ HEARTS services into primary care and hospital referral care within a district).

In selecting delivery strategies, for each intervention/intervention package review

- What is being done now and is it working?
- Should the existing delivery strategy be continued?
- If existing delivery strategy should be continued, how can they be improved?
- What new delivery strategies should be added?
- Are new policies or guidelines needed to support implementation?
- What are the cost implications of different delivery strategies?

Both the HIV/AIDS epidemic and chronic diseases like cardiovascular disease, hypertension and diabetes have many similarities in implementation planning. In both cases, millions of people are in need of diagnosis and treatment. Both HIV and NCDs require life-long chronic care delivered through a system that is capable of scaling up care to a large number of patients who are then retained in care and treatment. The community, patients and families need to be educated. There needs to be easy and wide access to screening (Chapter 7); a large increase in medicines (Chapter 10), diagnostics (Chapter 9); increase in health worker numbers and capacity, using simplified and standardized guidelines and standardized training nation-wide (see Chapter 11); and a health system able to deliver these. All this depends on policies to address a complex and large-scale public health with strong district implementation.[xx]

Pulling together the district strategic plan and considering the cost, before planning implementation

The strategic plan should provide a framework for implementation. It should state the goals, objectives, the actions- in this case priority case management interventions-, to achieve the goals, and mobilizing resources to provide the interventions. The plan should be reviewed every 3-5 years to evaluate coverage targets and impact.

A strategic plan usually last for 5-10 years. Therefore not all interventions and delivery strategies will be implemented at the same time. For each delivery strategy, identify areas for implementation in the following groupings:

- Immediate actions
- Medium term actions
- Longer term actions

A strategic plan should consider the overall cost of such a programme of work and link to the national strategic plan.

Taking all this into account, many districts within low-income countries will likely emphasize the WHO PEN-prioritized NCDs and, within them, the HEARTS cardiovascular and diabetes interventions.

An approach which emphasizes integration into primary care of screening/early disease detection and chronic care for NCDs can provide strong support for rapid scale up of a focussed choice of interventions.

An example of chosen NCD case management strategies/interventions in a hypothetical rural district of Holo, in a low-income country, [refer back to needs assessment example in Chapter 5] might be:

- At primary care level, adopt the risk-based approach to cardiovascular disease, hypertension and diabetes case management including:
    - screen individuals for cardiovascular disease risk/diabetes and prior CVD
    - categorize and treat individuals based on their level of risk
    - counsel on a heart- healthy lifestyle with targeted counselling interventions
    - interventions to reduce disease progression and prevent disease complications in at-risk individuals including antihypertensive treatment, treatment for diabetes, and statins for very high risk patients
    - systematic follow-up over time and referral when needed
    - secondary prophylaxis with statins, aspirin and antihypertensives in patients who have had an MI or stroke.
- Given that there is a new NGO providing ophthalmology care with laser treatment for diabetic retinopathy with a small co-pay, send diabetics every 2 years for examination and treatment.
- Provide secondary prophylaxis for RF/RHD and identify patients who require surgery and promote their candidacy for surgery (which now has limited availability at one specialty centre in the capital).
- Provide basic management of asthma and COPD at health centre and hospital level.
- Provide VIA test and treat for 30-49 year old women/PLHIV and early detection of breast cancer and referral to a cancer treatment service.
- Already NCD vaccines are fortunately supported by the MOH, GAVI and other partners- promote good immunization coverage against hepatitis B and HPV, which can prevent most liver and cervical cancer as well as promote decreased transmission.

If there is a not a clear national strategy already with goals and objectives, from which you can draw, your strategic choice of specific NCDs and interventions should lead to a presentation of the overall goals and objectives for the NCD case management in your district. Note that these are the NCD <u>case management</u> goals and objectives. Your district will also likely be participating in population-based programmes to discourage tobacco use, promote physical activity, reduce salt, etc. These would be in a separate set of goals and objectives and implementation plan, based on the national NCD programme. Here is a draft example, [need to updated with updated HEARTS clinical guidelines]:

Goals and Objectives of the Holo District Integrated NCD Case Management Programme: 2017- 2020

Goals:

- To prevent first or recurrent heart attacks and strokes in people with CVD risk factors
- To reduce individual cardiovascular risk levels
- To prevent premature mortality from acute MI, diabetic ketoacidosis, severe hypertension.
- To prevent progression of rheumatic fever/rheumatic heart disease to heart failure, stroke or premature death
- To prevent onset and delay progression of diabetic retinopathy, neuropathy and renal disease
- To prevent lower limb amputations
- To relieve symptoms and prevent and control exacerbations in patients with asthma and COPD
- To reduce the incidence of the cancers caused by tobacco.
- To reduce the incidence and mortality of cervical cancer
- To prevent liver cancer from hepatitis B

Objectives:

CVD/DM management:

- To increase the number of patients aged ≥40 or who smoke or have a family history of premature CVD who have their cardiovascular risk% determined
- To enroll patients with CVD risk ≥ 10%, BP ≥ 160/100, any patients started on pharmacologic treatment for CVD/DM and diabetics in chronic NC care and manage according to the updated HEARTS clinical guidelines
- To increase the proportion of people who have had a heart attack or ischemic stroke who are taking a statin, low dose aspirin, and antihypertensives
- In patients with cardiovascular risk% ≥ 30 in chronic NCD care, to reduce this risk to less than 30% by lifestyle interventions and treatment
- To increase the proportion of patients with hypertension >160/100 or 130/80 in those at high risk or diabetes who have good blood pressure control
- To increase the proportion of diabetics with good glycaemic control and blood pressure control
- To increase the proportion of diabetics referred for screening and receiving laser treatment for diabetic retinopathy
- To increase the proportion of diabetics who have annual, comprehensive foot examination and management to prevent foot complications
- To increase the proportion of smokers in care who have stopped smoking
- To reduce harmful alcohol use
- To increase the proportion of adults who achieve physical activity level of at least 150 minutes per week or 30 minutes on 5 days per week (through leisure activities, daily tasks or work-related activity)
- To reduce the proportion of adults who are obese or overweight (based on BMI)
- To increase the proportion of children and adults with RF/RHD who receive regular monthly benzathine penicillin injections
- To increase the proportion of children, adolescents and adults with advanced RHD requiring surgery who are identified and placed on waiting lists for surgery
- To increase the proportion of adults who attend a health facility who receive appropriate emergency care for acute MI, severe hypertension, DKA, or severe bronchospasm

Other NCD case management/prevention

- To increase the proportion of women aged 30 to 49 years or HIV positive who have had at least one cervical cancer screening using VIA test and treat
- To increase HPV and hepatitis B vaccine coverage
- To increase the proportion of patients with COPD and asthma who have quit smoking
- To increase the proportion of patients with COPD and asthma who have consistent access to short-acting bronchodilators by metered dose inhaler
- To reduce severe exacerbations requiring hospitalization in patients with COPD and asthma with appropriate use of long-acting bronchodilators and inhaled corticosteroids

7. How to integrate core NCD case management services into primary care within your district

Based on national strategic decisions, policies and adapted tools, for your district decide and plan:

- How to increase screening to detect patients with high CVD risk, diabetes or early disease detection
  - Screening and risk factor identification at primary health care facilities
    - During acute care visits
    - In antenatal/postpartum clinic- to identify hypertension and diabetes
    - In gynecology/reproductive health clinics
    - In TB clinic (high yield for diabetes)
    - In HIV care/ART clinic
  - Screening and risk factor identification in the community?
    - By CHWs or health extension workers
- Establish collaborations with other health care services in your district- to identify at risk individuals and to consider co-management
  - Link with antenatal and postpartum clinics
  - Link with HIV care/ART programme and clinics if decentralized to health centres [skip if HIV low prevalence, less than 1%]
  - Link with TB programme and clinics [?skip if low TB burden]
- Plan how to introduce increase the availability of NCD chronic care integrated within facility-based primary health care
  - If high patient volumes and low human resources- establish NCD chronic care clinics within PHC several mornings per week, integrated within PHC
  - If lower patient volumes, consider a family practice or private care model, integrating NCD return visits by appointment with acute care and other patient appointments
- Plan screening and risk factor identification in the community (when appropriate) by:
  - CHWs
  - Organized community gatherings/health campaigns
  - Outreach from the health centre

Cost-effective and feasible integration of the core NCD case management interventions into your district health system requires careful attention to who can do what and national policies and plans for task-sharing/task-shifting.

An important component of national strategic planning is to consider and make policy decisions which specify:

- which CVD risk management and other NCD services should be performed at different levels of the health system
- which tasks that can be performed by different levels of health workers, with clear definition of the roles and responsibilities of health staff at each level
- what tasks can be performed by lay providers/expert patients/auxiliaries and how they should be supervised and supported.
- the supervisory/mentoring/quality improvement system that sustains this
- guidance or options for how to collaborate with other disease control programmes.

The technical descriptions of these options and summaries of international experience can be found in the *NCD National Strategic Planning and Adaptation Manual.* Policy decisions and adapted implementation tools will be provided from the NCD national programme or, if you are one of the initial pilot or demonstration districts, your district may have participated actively in this work.

At district level, this framework needs practical operationalization, working with the in-charge and clinical teams at the health centres and outpatient clinics chosen for initial implementation and the district or regional hospital teams receiving their patients in referral.

Sample framework:

Screening, risk factor identification, early disease detection	NCD chronic care	Acute care for NCDs/ emergency management

Screening for cardiovascular risk, hypertension, diabetes, obesity and identifying risk factors (smoking, physical inactivity, poor diet, obesity):
 	
<u>In the community by</u>
• Trained CHWs (choose expert patients where possible)
• Community health campaigns, camps, mobile units, other approaches to screening in the community
<u>In primary care (health centre and district outpatient) by</u>
• Trained auxiliaries and expert patients in the health centre
• Health workers- nurses, clinical officers
 	
Where to screen in primary care:
• Acute care/general medical clinic
• Chronic NCD clinic
• Antenatal/postpartum clinic
• TB clinic (high yield diabetes)
• HIV care/ART clinic*
 	
By clinicians: screening for cervical cancer, early disease detection for breast cancer
	NCD chronic care clinic
	
	In high volume settings, establish an NCD chronic care clinic, usually several times per week. This should be able to handle CVD risk and diabetes management in a substantial number of patients.
	
	If lower patient volumes or private care, consider a family practice model, integrating NCD return visits by appointment with acute care and other patient appointments.
	
	In countries with a substantial HIV burden, in facilities which provide HIV care/ART, also establish CVD risk/diabetes management within the HIV clinic for PLHIV on ART with high CVD risk or diabetes (if such co-management has been agreed between the relevant national or regional programmes/partners- see Chapter … in National strategic planning).
		Acute care
		First-level health facilities:
		• Emergency triage, refer with pre-referral treatment for-
		  • Suspect acute MI
		  • Hypertensive emergency
		  • Diabetic with sepsis, DKA, hypoglycaemia
		  • Neurological – stroke
		  • Acute heart failure
		• Acute on chronic-
		  • exacerbations asthma, COPD
		  • pneumonia
		
		Hospital: manage these severely ill patients, complications.
		
		Define referral and back-referral processes.

7.1 Screening to detect patients with high CVD risk or early disease

An important decision is where to screen patients: in primary health care facilities (in which clinics) or in the community (see section 6.1.2) or in both. Both health workers and auxiliaries/expert patients trained as lay providers, and CHWs working either in the community or in a primary health care clinic can be trained to do cardiovascular risk and diabetes assessments. The HEARTS toolkit currently assumes you will start with screening in PHC facilities (personal communication Wendy Venter).

However, there is growing experience with CHWs and several countries have created large cadres of well-supported CHWs for example, the health extension workers (HEWs) in Ethiopia, the health surveillance assistant (HSAs) in Malawi and the Behvarzs in Iran. These cadres are government employed and receive basic training ranging from 3 months (HSA) to 1 year (HEW) and 2 years (Behvarz).

Screening by CHWs in the community or in primary health care clinics: CHWs can identify and treat asymptomatic persons for NCDs at multiple sites. Because persons carrying NCD diagnoses such as hypertension and diabetes (like persons living with HIV) are often asymptomatic, they may not visit health clinics and therefore must be contacted and screened elsewhere.

Work to date demonstrates CHWs can reliably diagnose NCDs and their risk factors via door-to-door campaigns; organized community gatherings (such as “community health campaigns”) and at clinic sites. Each approach has advantages and drawbacks.

7.1.1 Screening and risk factor identification at primary health care facilities

Most adults visit a primary care health facility for acute problems. This is an important opportunity to detect unrecognized and untreated NCDs such as hypertension, diabetes, elevated cardiovascular risk, or lumps that may be cancer. One can suspect diabetes based on a number of patient complaints (polyuria, polydipsia, weight loss, blurry vision). Acute care also affords an opportunity for screening for asymptomatic risk conditions and diseases, as health worker time permits. However, because patients come sick to acute care clinics, the health worker and clinical team need to prioritize attention to presenting complaints and may not have time to do the cardiovascular risk assessment. They may also fail to arrange follow-up of suspected NCD diagnoses if they are not the patient’s main acute problem.

In such a busy acute care clinic, enhancing CVD/DM screening would benefit from, and perhaps require, additional auxiliary staff or lay providers/CHWs to take the time to carry out the initial screening (sometimes called “pre-assessment”) including BP, BMI, RBG; arrange for additional lab such as a FBG, and link the patient with appropriate follow-up services. This might happen in a corner near the queue of patients waiting to be seen. Ideally the patients would already have been triaged for severity (and have been judged not to have emergency signs requiring immediate attention).

Example of a screening/preassessment form for auxiliary/expert patient/CHW with further lab then health worker verification can be found in Annex B of this manual and the *HEARTS monitoring manual* and in Annex B; this example assumes use of CVD risk table based on BMI, without laboratory, and diabetes screening using fasting blood glucose. Other versions are available which substitute HbA1c for FBG; include cholesterol; etc., depending on their availability and what risk chart is being used.

7.1.2 Screening and risk factor identification in other clinics

Besides the adult acute care/general medical care outpatient clinic, other clinics at primary care level (often on different days of the week or in different sections in large health facilities) can be a fruitful location for CVD risk/DM screening. Also, linking with other disease control programmes to identify at-risk individuals participating in other health-care services may not only facilitate in NCD case detection but also provide opportunities to integrate care for the patient. These collaborations with other services/disease control programmes will hopefully already been negotiated and agreed at national level.

This could include screening in:

- Antenatal/postpartum clinic
  - check BP; recheck BP at 6 weeks postpartum,[xxiii] especially if elevated earlier
  - screen for hyperglycaemia, gestational diabetes
- Chronic NCD clinic
  - Patients may also come directly to the Chronic NCD Clinic (when they hear care is available); or be referred from CHWs, pharmacists, family or others; or based on screening in the community.
- Gynaecology/reproductive health clinics
  - In many locations, most screening with VIA test and treat will occur here.
- TB clinic (high yield diabetes)
- HIV care/ART clinic
  - in health centres or hospital outpatients which have a HIV care/ART clinic- either contiguous or on one to several days/week in same space

7.1.3 Screening and risk factor identification in the community

CHWs can screen for NCDs such as CVD both en masse - at stationary or portable mass screening sites, for example – and through one-by-one campaigns such as household visits. Examples of these approaches are summarized in the *National Strategic Planning and Adaptation Manual* (section ….). These examples show that substantial numbers can be screened in the community. However, successful linkages with the health facilities can be low to moderate and ability to absorb new patients into chronic care will often be a limiting factor. *It is crucial to establish the NCD chronic care capacity before screening and referring a large number of patients to an already busy system.*

7.2 NCD chronic care

7.2 NCD chronic care within facility-based primary health care

Integrating NCD screening/early disease detection and management of a very large number of patients with NCDs within primary health care requires:

- basic services delivered by a nurse or non-physician clinician, often on nurse-led teams
- adding auxiliaries, CHWs and “expert patient” lay providers to the clinical team to help manage the enlarging numbers of patients in chronic care
- specific NCD clinic dates (organized within PHC, using the same staff)
- active follow-up system including appointment books, both for “demand management” and to track lost patients
- clear delineation of what can be done at a primary health centre/outpatient clinic and what requires referral to hospital for a treatment plan (first- referral care within the district)

- strong capacity building efforts followed by mentoring and ongoing quality improvement (see Chapters 11 and 14), organized at district level. (see the general principles of good chronic care, Chapter 2).

Chronic care can be made more efficient (and therefore more feasible), acceptable, and effective a by: identifying opportunities for task shifting and task sharing; attending to the needs of families as well as individuals; and ensuring access to both clinical and psychosocial care.

Decisions on delivery of services by level of care and task-shifting or task-sharing of specific tasks should have been made during national strategic planning for CVD/NCD case management.

There are several ways of organizing the delivery of NCD chronic care.

One approach is the "family practice model" with one (or several providers) responsible for a panel of patients that they see repeatedly, facilitating individualized, longitudinal follow-up. NCD return visits are made by appointment and are integrated with acute care and other patient appointments. Although this is ideal, it may only be feasible in settings with adequate number of clinicians and nurses assigned a manageable volume of patients. This is a common model in private practice.

An alternative is organizing an NCD chronic care clinic within PHC services at a health centre or hospital outpatient. This is not "stand-alone" or separate from PHC and is not a specialty clinic (there are no clinical specialists, rather trained clinical health workers who also do other PHC work at other times). Rather it is a way of organizing chronic care within PHC- making sure that returning chronic care patients are not waiting in the queue with acute care patients. The same staff and supply chain are used, although staff receive additional training. The NCD chronic care clinic is run by PHC clinical staff, with augmentation by auxiliaries and expert patient lay providers as required. It could accommodate all chronic NCDs, not just vertical HEARTS. This approach facilitates building an effective clinical team for chronic care with task-sharing with auxiliaries added to the team, especially trained diabetes or hypertension expert patients.

This approach is useful or essential in a high volume health centre with health workforce limitations even before the introduction of chronic NCD care. It is not feasible to expect chronic patients to wait in queue with all acute/new problem patients- there needs to be a way to organize their care several days per week (preferably early morning to make FBGs easy). The clinic also facilitates peer support between patients with the same disease.

Besides these key modifications in the health workforce and organizationally, the PHC facility must have an adequate supply of essential NCD medicines, equipment and laboratory consummables (see chapters 9 and 10 and the first level facility drug supply manual) and a patient monitoring system (see chapter 12 and the *HEARTS monitoring module*).

A public health approach to the large scale up required for elevated cardiovascular risk and diabetes management within a cardiovascular risk approach requires simplified monitoring and treatment regimens, point-of-care tests, decentralization of care to health centre level, task-shifting, use of adherence counsellors/treatment supporters rather than directly observed treatment. These are the same requirements for the public health scale up of HIV care and ART in the large response to HIV/AIDS from 2003.[xxi] These approaches are relevant whether or not HIV is highly prevalent. See the general principles of good chronic care the chronic care approach described in Chapter 2.

7.2.2 Establish collaborations with other health care services in your district- to identify at risk individuals and to consider co-management

Decisions on these collaborations between disease control programmes will usually have been made at national level, with involvement of stakeholders. Further consultation is then needed at district level to implement them.

Link with antenatal and postpartum clinics to identify:

Diabetes

If hyperglycaemia that is first detected in pregnancy should be classified as GDM or diabetes mellitus according to WHO criteria.[xxii] For ongoing care if these problems persist after delivery, it is important that the woman returns for her postpartum follow-up, ideally at 6 weeks after delivery.[xxiii] Many women with gestational diabetes will have normal blood glucose levels after delivery, but they are at higher risk for recurrent gestational diabetes, intermediate hyperglycaemia or "prediabetes," and overt type 2 diabetes over the next 5 years.

If hyperglycaemia persists postpartum and is diagnostic for diabetes, it is important to link with chronic NCD care for ongoing management. If the results are borderline or normal, then she may be counselled on lifestyle modifications and to consider checking glucose every 1-3 years.[xxiv]

Hypertension

Similarly, for hypertension in pregnancy, postpartum follow-up is important. For a woman with pre-eclampsia or eclampsia in pregnancy, during delivery or after delivery, if there is continued hypertension at the postpartum visit, she should be referred then followed and started on treatment according to protocol.

Other cardiovascular problems

Although systematic cardiac screening is not a routine antenatal recommendation, during pregnancy or postpartum, women may be identified as having rheumatic heart disease or cardiomyopathies.

In countries or districts with a substantial HIV burden (skip this box if HIV is low prevalence, less than 1%), HIV care/ART will be available in hospital outpatient clinics and decentralized to some health centres. In PHC facilities which also provide HIV care/ART, establish CVD risk/diabetes assessment and management within the HIV clinic for PLHIV on ART if such co-management has been agreed between the relevant national or regional programmes/partners. See Chapter … in the *NCD national strategic planning manual* for a summary of experience and options for integrated HIV-NCD care in these settings. These options should have been discussed during national strategic planning. The decision then needs to be operationalized at the district, particularly where there are motivated implementing partners for such collaboration.

- Establish or strengthen collaboration with HIV care services in your district
- Estimate how many patients in your district would benefit from "one-stop-shop" co-management of their HIV/ART and an elevated CVD risk/DM/HTN co-management or established CVD/CKD.
- Calculate what percent of the estimated total burden of elevated CVD risk/DM/HTN this represents.
- Discuss with health facility managers and HIV implementing partners to identify feasible sites for initial experience with co-management.

In countries or districts with a substantial TB burden (? Can skip this box if low TB burden/TB prevalence is less than 100 per 100000 population)

Recommendation from STB 2016 report is clear on screening diabetics but not threshold for when to screen TB patients for diabetes. “People with DM should be considered for systematic TB screening only in countries with a TB prevalence of over 100 per 100 000 population, as the number needed to screen to detect a new case of TB can be very high when TB prevalence is low.” Approaches to screening vary- the most basic and is just asking about prolonged cough; algorithms can also start with any TB symptom. Subsequent investigations can be chest radiography and either sputum-smear microscopy (SSM) or Xpert MTB/RIF (XP).[xxv]

TB patients should be screened for diabetes. Some countries have established agreements for “bidirectional screening” – screening for TB in diabetics and for diabetes in TB patients.

Given the significant association of DM with TB, health-care facilities, including NCD clinics at health centres and in the outpatient of hospitals, should have in place an infection control plan that includes administrative and environmental control measures to reduce transmission of TB (adhering to WHO’s international guidelines for TB infection control). [should this be skipped even if low TB burden?]

7.2.3 Extending NCD chronic care using CHWs linked with health facilities

Community health workers (CHWs) can potentially monitor patients more frequently in their community if provided with adequate tools for reporting, supervision and strong linkages with the health facility team. This linkage with the health facility needs to be particularly strong and frequent if they are dispensing and/or refilling medications.

Review the national strategic decisions on CHW role in chronic NCD care and what is happening already within your district.

7.3 Acute care for NCDs/ emergency management

At health centre level Most patients with NCDs still require periodic acute care, sometimes referred to as “acute on chronic”. An NCD patient with an acute exacerbation or other complication may attend the general medical/acute care clinic for adults. Those working in the general medical/acute care clinic will benefit from integrated guidelines that support their recognition, triage and correct treatment of complicating conditions, as well as screening and early disease detection. Or an NCD patient may come to his or her follow-up appointment in NCD Chronic Care clinic, complaining of new symptoms or showing signs of an acute problem. Basic acute care (They can be treated here, rather than requiring these patients to wait in the medical OPD queue. Provision of basic acute care can also occur here, rather than requiring these patients to wait in the medical OPD queue. Health workers should be trained in both acute and chronic care.

Whenever a patient arrives at either an acute care clinic or at the Chronic NCD clinic, it is important to do a rapid “ABCD” triage for emergency signs then the rapid provision of emergency treatments.

Some interventions to avert mortality in severely ill patients require initial detection and referral from the primary care facility to hospital, after lifesaving pre-referral treatments such as aspirin for suspect acute MI; glucose for hypoglycaemia; hydralazine to lower BP in severe hypertension; furosemide for acute heart failure/pulmonary oedema; saline infusion in suspected DKA. The hospital team needs to be prepared to manage these conditions.

Role of the district hospital in acute and emergency care

Skilled management of severe illness can avert many deaths. These include the management of severe hypertension, acute myocardial infarction, arrhythmias, stroke, diabetic ketoacidosis, sepsis and severe pneumonia (which can complicate diabetes and COPD). To strengthen these interventions may require improved provision of specific medicines (see Chapter 10), laboratory tests (such as potassium and creatinine) (see Chapter 9), diagnostic equipment (such as an ECG machine) (see Chapter 9), updated and country-adapted guidelines, mentoring from the central or referral hospital to the district hospital, and support for quality improvement of the management of these severely ill patients (see Chapters 11 and 14). Most primary care NCD case management interventions assume back-up and supportive supervision and mentoring from the hospital level.

7.4 Establish an effective referral and back-referral system

Within your district, you are very familiar with the various referral facilities and their capacities. Decisions need to be made on how to establish or strengthen the relationship between PHC health centres and these hospitals for the purpose of CVD/NCD chronic care. If well-defined referral and back referral process do not already exist, one needs to be establish. Often the referral system is focused exclusively on acute and emergency care and back-referral/coordination with the referring health facility is weak.

A referral and back-referral system is important for both:

- Urgent referral of seriously ill patients who require hospital management, then back-referral (with record of their hospitalization) to the health centre for ongoing follow-up.
- Routine referral of patients, according to guidelines, to hospital for consultation with a more experienced clinician. These include:
    - Patient with prior CVD or kidney disease, for a treatment plan.
    - Patients with diabetes for fundoscopic examination, every 2 years

7.4.1 Urgent referral of severely ill patients, after pre-referral treatment, requires great care and good communication with the receiving hospital. Urgent referral of a severely ill patient is a very hazardous time for the patient.

In patients with cardiovascular disease, acute myocardial infarction, stroke, TIA, and limb ischemia can all occur unpredictably. Good outcomes requires patients who have been made aware of when and how to seek medical attention and a health system that provides rapid clinical responses, accessible facilities, functional transportation networks, and health workers prepared to treat cases that present at all hours.

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How to refer the severely ill patient to a higher level of care

Severely ill patients may require referral to a higher level of care for access to personnel, diagnostic testing, equipment or specialty services not available at the referring health facility. Patients should only be transported if the receiving hospital has the necessary and appropriate resources to care for the patient and is in agreement. Transport is a very hazardous time for a severely ill patient. In many settings, transport may occur over long distances and is of a significant cost to the family. A standard approach to referral in your hospital will help ensure appropriate referrals and minimize patient harm.

- Communicate with the receiving hospital. Make a clear agreement that the receiving hospital has the necessary and available resources to care for your patient and will admit the patient for this care.
- Prepare a short written report that includes the following: vital signs, including those on admission, a brief physical examination, treatments given (e.g. IV fluids, blood transfusion, medications, antimicrobials) and all laboratory and radiographic results. Send this with the patient.
- Decide what accompanying caregiver is necessary.
- Keep patient comfortable. Treat patient anxiety and pain. Cover patient and keep warm.

Modified from *WHO IMAI District Clinician Manual*[xxvi]

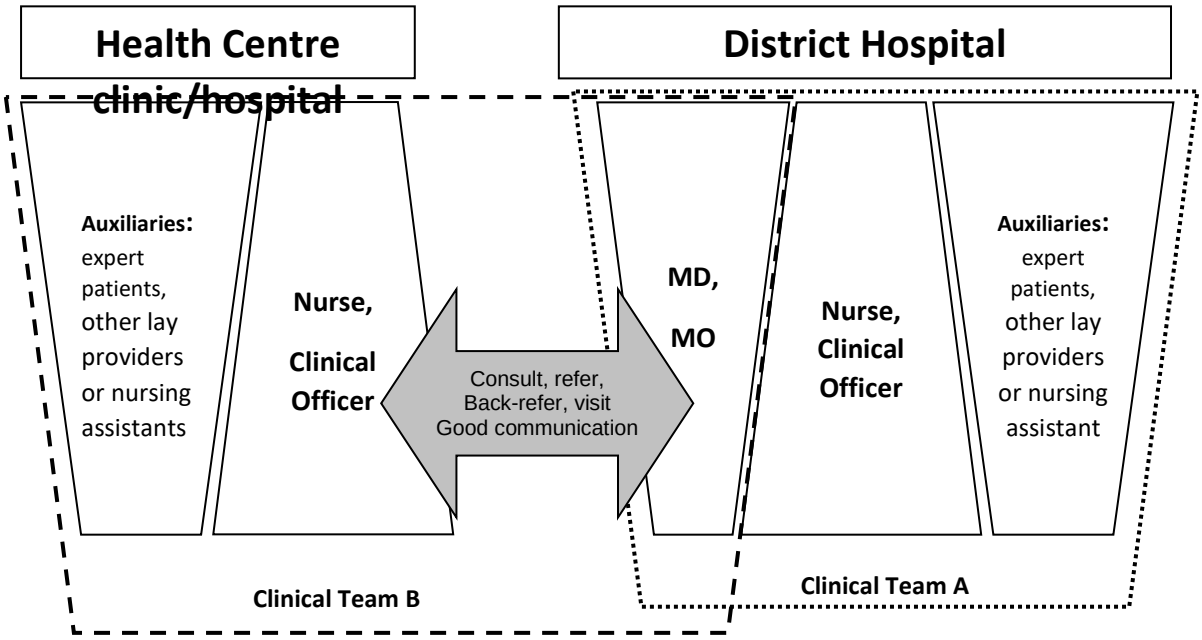
The first-level facility referring the patient should also be provided with a back-referral note with a treatment plan. The record of the hospitalization and treatment plan should be noted in the patient's NCD record. If there is no back-referral note, proactive follow- up to find out what happened is required.

7.4.2 Routine referral

The second, routine referral, must be done with a referral and back-referral note and an appointment where possible. The results of the referral- diagnosis and treatment plan- should be noted in the patient's NCD record (or PHC record if facility-held and well organized).

Some of these routine referrals can be replaced by scheduled visits by the experienced clinician or specialist to the health centre – a roster of patients are scheduled for this day. This can be more efficient and saves on burden on the patients and family. These clinicians will usually also serve as clinical mentors for the health centre clinical team (see Chapter 11).

Use of routine referrals should be complemented by consultation by phone or email. Keep track of referrals in a section of the NCD appointment book.



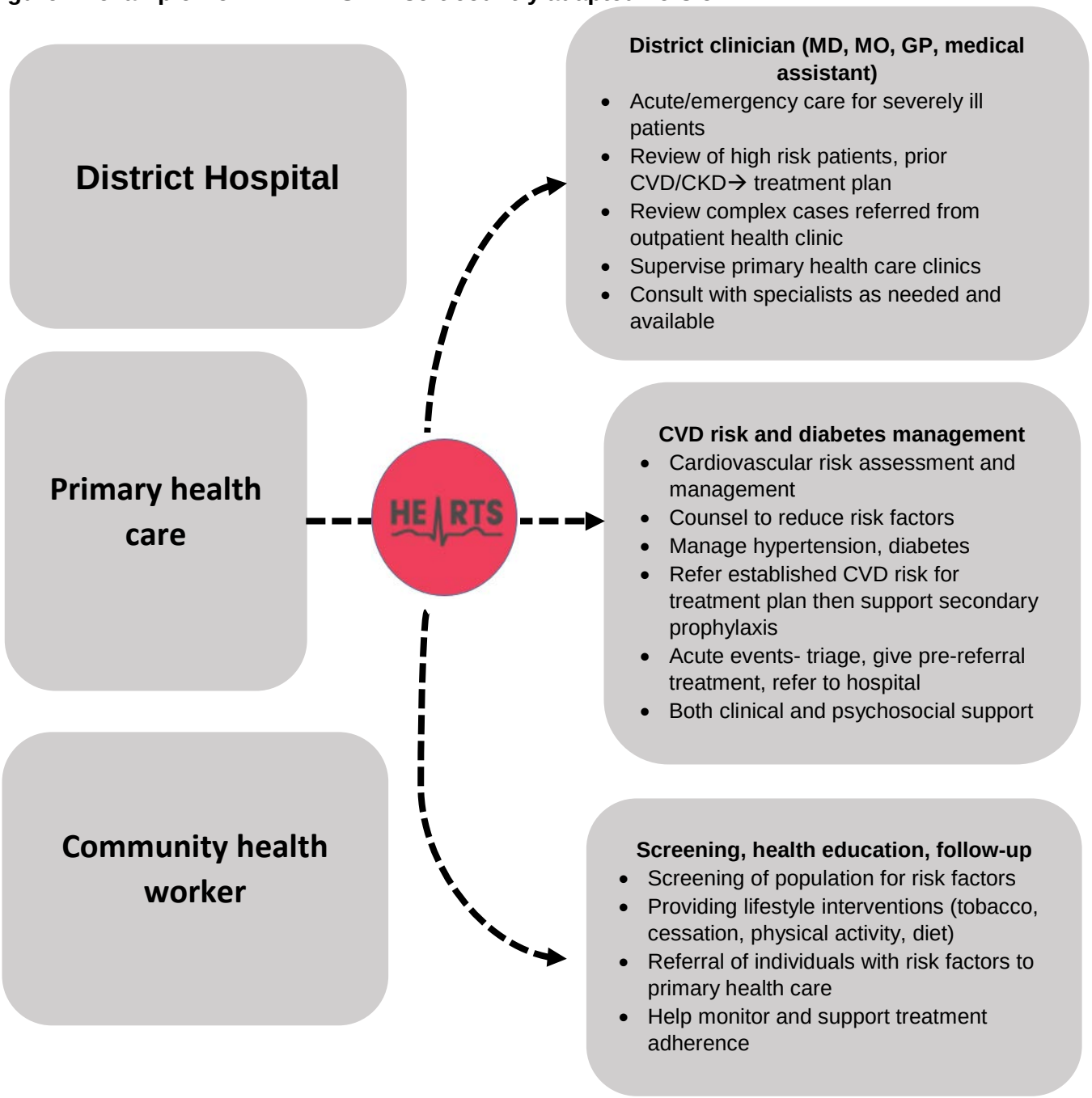
In this example, Clinical Team A works in the outpatient clinic at a second-level facility. The doctor works in the hospital and does not see every outpatient NCD patient but is available to consult on any of them and reviews the patient cards and register regularly. She has received second-level NCD clinical training and is always available to manage cases with severe illness and to review and decide on treatment plans for those with established cardiovascular disease or chronic kidney diseases, etc.[xxvii]

Clinical Team B is at one of the satellite health centres in the catchment area of the district hospital. In this case, the doctor is off-site and visits the facility once every 3 – 4 weeks to help manage and review complicated and high risk cases.

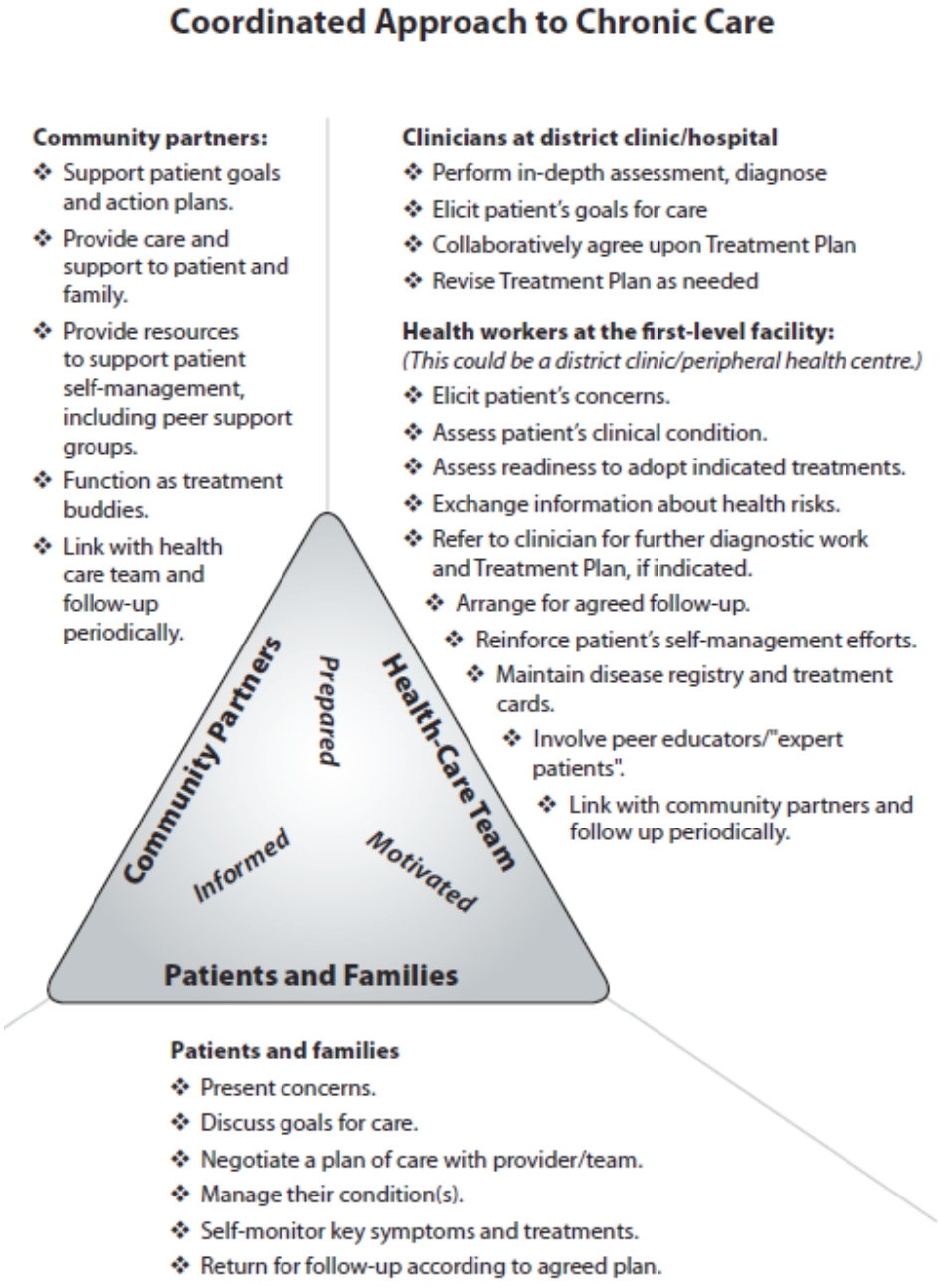
See Chapter 11 on clinical mentoring and supportive supervision; clinical mentors will often be from the first referral hospital whereas supervisors may be from the district team or hospital.

Establish on a map the referral agreements between health centres and hospitals within the district and arrange agreed protocols and documentation to guide referral and back-referral.

Figure A: example from HEARTS – insert country adapted version



8. Linkages with the community



The district team should work to foster linkages between community partners, patients and their families, and the health-care team are important for effective care. Peer support by well-informed ‘expert patients’ can help patients in their self-management. Treatment supporters can help with ongoing connections with the health care team. Periodic follow-up should be promoted to retain patients in care. .

Trained CHWs, especially those who are NCD expert patients, can play a key role in advocacy; screening, referral, adherence support and follow-up (see Chapter 6); as well as broadly informing the public about the importance of cardiovascular risk reduction by changes in lifestyle, as well as the benefits and implications of NCD case management interventions.

9. Establishing and maintaining essential laboratory and other diagnostic capacity for NCD case management

NCD laboratory tests by level will vary depending on choice on NCD interventions and decisions on where care will be provided. The district management needs to plan for how essential laboratory tests are provided most efficiently:

- on site- in the lab or point-of-care
- off site- how to send samples or the patient for other lab or diagnoses. This requires a system to reliably send back the results to PHC. These systems may already exist and should not be specific for NCD case management tests.

9.1 Health centre essential laboratory and other diagnostic capacity

Decentralizing diagnostic capacity to health centres using rapid point-of-care testing where possible is essential to scaling up NCD services at primary care level. Essential tests not available at health centre level should be made available if possible at district hospital level, rather than requiring transport to central or specialized laboratories. With geographically dispersed populations, relying on distant laboratories is often stymied by transport, procurement, and communication issues.

Blood glucose measurement Every primary care facility should have the capacity to do fasting blood glucose (FBG) by glucometer on site. Assuring an adequate supply of test strips is crucial but an ongoing challenge in many health facilities.

- A system needs to be set up to efficiently do FBGs early each morning, for both the initial assessment of CVD risk and the diagnosis of diabetes, as well as to monitor diabetes patients returning that day for care. [once HEARTS clinical guidelines final, clarify frequency of FBG determination among non-insulin dependent individuals]

> **Example:** In Masaka, Uganda, NCD clinics are established on Wednesdays and Thursdays at Masaka Regional Referral Hospital for diabetics and hypertensive patients. Established diabetic patients know to go to the laboratory first to obtain their FBG prior to coming to the clinic. If for some reason, the patient is new or forgot to get the FBG, he or she is sent to the lab automatically after registering at the NCD clinic.

- For some screening or an acute visit in clinic or for some screening in the community (during mobile lab outreach or camps), a casual (random) blood glucose (RBG) by glucometer with strips will be necessary, using the higher threshold (>11.0 mmol/l (200 mg/dl)).

HbA1c If possible, HbA1c should be measured every 6 months in diabetics.

Whether to monitor glycaemic control with FBG or glycosylated haemoglobin (HbA1c) depends on availability and cost. Point of care HbA1c laboratory testing is now available; although more expensive than blood glucose monitoring, it is very useful clinically to monitor glycaemic control.[xxviii] Other alternatives are to send yearly HbA1c samples to a district, regional or central laboratory or send the patient or sample to a fee-for-service laboratory which may be available within the district or region.

For CVD risk assessments (in addition to tests to diagnose diabetes above and sending out blood for cholesterol determination, if available. If cholesterol is not available, use the non-lab based CVD risk charts based on BMI, or use the population mean cholesterol): **[clarify once new charts released]**

Charts: country-adapted WHO/ISH cardiovascular risk prediction chart and BMI chart- if possible, enlarged and laminated.

Set up to determine BMI and waist circumference (this area should be run by an auxiliary, trained lay provider/expert patient or nursing assistant)

- Body mass index (BMI) measurement:
  - adult beam scale
  - height board
  - BMI tables
- For waist circumference: nonstretchable measurement tape

See *HEARTS/NCD essential medicines and technologies manual* for instructions on:
Setting up adult beam scale on a firm flat surface
Setting up height board or tape
Calibration of the scale

Equipment for blood pressure measurement

Note: BP equipment needs to be available in several locations:

- for use by nurses and other health workers providing emergency/acute clinical care and NCD chronic care (where they may need to recheck a BP)
- for use by auxiliaries/lay providers for initial screening of patients who come for other reasons for acute care and during return visits for HEARTS/NCD chronic care

- Blood pressure (BP) measurement: BP machine* with several cuff sizes. Either:
  - Using auscultation with stethoscope and a cuff or
  - For auxiliaries/lay provider expert patients/CHWs: a validated BP measurement device with digital reading is preferable.

See HEARTS/NCD essential medicines and technologies manual for instructions on:
Choice, validation and maintenance of digital BP machines
Specification of cuff sizes

Organizing urine samples and dipsticks for:

- **Urine test strips for protein and ketones** (and urine microalbuminuria, although these test strips may only be available at district hospital level) *Although not recommended for screening, urine glucose, if done and positive, should result patient referral for an FBG.*
- **Rapid pregnancy test**

For clinical care by health worker

- **Pulse oximeter** to measure oxygen saturation (SpO_2)

- **10-g monofilament** to test sensation
- **Timer to measure respiratory rate** (clock or watch with second hand, timer)

Collection, labelling and preparation for transport of specimens sent to district hospital or other laboratories for:

- **HbA1c** if point-of-care test not available for health centre use
- **Serum creatinine and potassium**
- **Total cholesterol with or without lipid profile**
- **INR/PT, aPTT** if monitoring patients on anticoagulation (for atrial fibrillation or after valvular surgery). (Note: point-of-care portable monitoring of anticoagulant status is feasible and has been shown to improve clinical care. Relying on central laboratory testing can result in suboptimal therapeutic monitoring of anticoagulation with potentially catastrophic outcomes such as embolic and haemorrhagic stroke.)

  Health centres need specifications for type of blood collection tube, labelling, packaging and transport schedule- see *HEARTS/NCD essential medicines and technologies manual.*

9.2 District hospital essential laboratory and other diagnostic capacity (in addition to those available at health centre level)

NCD laboratory tests*
• Serum potassium and other electrolytes • Serum creatinine and blood urea nitrogen (BUN) • Urine microalbuminuria test strips • Hepatitis B enzyme immunoassay (EIA) If possible: • HbA1c • Total cholesterol, lipid profile • Troponin test strips • Serum alanine aminotransferase (ALT) If monitoring patients on anticoagulation: • INR/PT, aPTT to monitor anticoagulation
Additional investigations or screening that require special equipment- adolescents, adults*
• Ultrasound • ECG • Ophthalmoscopy: ophthalmoscope • Snellen eye chart • Tuning fork • Speculum, light source, colposcope if available • Spirometer • Peak flow meter (with a supply of disposable mouth pieces)

* These are in addition to those required for all causes: laboratory tests- haemoglobin, full blood count with differential, type and cross match for transfusion, amylase etc; equipment: thermometer.

10. Medicines and technologies for NCD treatments

Insert from national/district PATH manual—I have not completed this section

A consistent supply of essential quality-assured NCD medicines at district level is required to support scale of CVD/NCD case management.

Expanding access to priority CVD/NCD case management interventions usually requires acquiring a larger supply of these essential medicines. See the *HEARTS national/district essential medicines and technologies* manual for guidance on this [or insert excerpts for district here].

What can to be done at the district level:

The district can help support a secure supply chain for NCD essential drugs and basic technologies, integrated within a strong, national drug supply system. This requires monitoring, reporting, and alerts for stock outs.

The specific roles of the district health management team in supply management include:

- On-site training and quality improvement around supply management
- Ensure consistent availability and supply of all necessary NCD-related medications
    - Monitor whether medicines are getting to health facilities and that there are no stock-outs of essential NCD medicines. Use the CVD FACILITY ASSESSMENT TOOL, country adapted from the *HEARTS monitoring module.*
    - Work with the essential medicines programme and local staff to solve problems.
- Facilitate inter-facility transfers of stock if NCD products are moving slowly and nearing expiration
- Provide accurate and timely estimates of total medicine needs based on service and local epidemiological data. These can be summarized from the patient monitoring system and the facility dispensing registers.
- Site based supportive supervision and monitoring of:
    - compliance with national supply management guidelines.
    - appropriate use of medicines.
      Use the HEARTS and PEN standard case management guidelines and regular supervision with observation of practice will help to improve practices.

See table in Annex D for lists of essential medicines for NCD case management and the new HEARTS costing tool, which focusses on HEARTS chronic care medications, for updated costs of these medicines.

11. Capacity building: hiring- training- mentoring

A district-wide approach to human resource development for CVD/NCD management is required. In limited-resource countries which have only concentrated on communicable disease services in the past, there will often be a large need to train then mentor several cadres of health workers and to augment clinical teams with auxiliary staff/expert patients in order to deliver NCD case management at primary care level. Human resources are the essential ingredient for all care delivery. Whether you are delivering basic primary care, HIV services, or NCD services, your health centres and hospitals need an adequate supply of trained and motivated staff to provide quality services. Managing human resources is a complex task that requires national level policy and planning for long-term sustainable impact.

During national strategic planning and adaptation, policy decisions should have been made on task-shifting/task-sharing and, in general, which NCD case management services can be delivered at the several levels of the district health system. At the national level, adaptation of guidelines, training curricula, and other tools to support implementation should have been carried out.

This chapter discusses key requirements for planning and managing human resources for CVD/NCD case management at a primary health centre. It will outline steps staff the district team (working with the in- charge of primary health centres and district hospital outpatient) need to take to augment the health workforce to take on the additional CVD/NCD case management work:

Steps the district team (working with the in- charge of primary health centres and district hospital outpatient) need to take to augment the health workforce to take on the additional CVD/NCD case management work:

- estimate the numbers required by cadre to strengthen CVD/NCD case management
- ensure an adequate number of staff
- make task-shifting and task-sharing effective
- make sure staff have appropriate training
- set up and ensure ongoing supportive supervision and mentorship
- improve staff motivation and retention

11.1 Estimate the numbers required by cadre to strengthen CVD/NCD case management

The tables below need to be adapted to estimate the "additional" staffing required to scale up CVD/NCD screening, early disease detection and chronic care at your health centres. If you provide HEARTS/NCD services, you should add the "additional" staff below to the "basic" staffing.

How many additional trained auxiliaries/expert patients, health workers are needed to scale up NCD case management?

First, estimate the number of patients each cadre can manage.

Example: Clinic sessions: 0800–1400 (6 hours)

Estimate time required to see each patient. Based on national or district experience in providing NCD services, substitute real time estimates. Use right columns to estimate patient load a worker can handle in a day

TASK	HEALTH WORKE CADRE	ESTIMATED TIME (MINUTES) [data needed!!]		
Acute care visit by health worker expanded by integrated cardiovascular risk and other screening/early disease detection	Clinical health worker- MD, CO, RN	20 minutes		
Cardiovascular disease risk screening	Auxiliary	If all information available: 5 minutes If need to arrange for FBS or repeat visits: 25 minutes for encounter, explanation of lab/scheduling and follow-up encounter after lab		
New NCD patient visit -triage, cardiovascular risk, record on patient card	Auxiliary	15 min		
New NCD patient visit -assessment, management, initial counselling, fill out patient card	Health worker	30 min		
Return NCD patient visits -assessment, counselling (what percent will need to see health worker)	Auxiliary	10 min		
Return NCD patient visits -assessment, management, counselling	Clinical health worker	15 min		

Second, estimate number of visits and routine referrals required for CVD risk/DM care in first year (A= estimated number in catchment population ≥40 or other risk factors)

CVD risk	Requires routine referral to district hospital	Initial follow-up interval in PHC: *monitor response to treatment and counselling as needed,* ***plus***	Once stable (targets met)	Estimated distribution amongst all active CVR patients in your district- see examples below-	Total number potential CVD risk patients in district- multiply column 5 times A	If 5% coverage of A	If 10% coverage of A	Estimated number of patient visits in a year	Estimate number of referrals in a year
PCVD or CKD	At start		3 months						
CVR >=30%	At start	Monthly until targets met then q 3 months	3-6 months						
CVR 20-30% with DM	No	"	3 months						
CVR 20-30% without DM	No	"	3-6 months						
CVR 10-20%	No	"	6-9 months						
CVR <10%	No	Monthly until targets met if DM or BP ≥160/ 100	12 months						

	Estimated distribution amongst all active CVR patients- see examples below		
CVD risk	Example country X	Example country Y	Example country Z
PCVD or CKD	5%	10%	1%
CVR >=30%	10%	30%	4%
CVR 20-30% with DM	4%	8%	3%
CVR 20-30% without DM	19%	15%	18%
CVR 10-20%	12%	12%	20%
CVR <10%	50%	16%	44%

Third, use estimates in 1 and 2 and an estimate of number needing screening in OPD/acute care to fill out the table which follows, working with the health centre in-charge/ managers.

Note that NCD days are often limited to just one or two days a week regardless of patient load so the health worker is swamped with clients unnecessarily. Patient visits can be distributed during the other days of the week rather than hiring additional staff to attend to patients during NCD clinic days.

• **Determine "additional" staff needed for screening/early disease detection and for chronic NCD care and treatment – these numbers need to be adapted to your district circumstances, early experience**				
	Estimated number of patient who need to be screened	**Number of NCD chronic care patients**	**Clinical staff to be added**	**Auxiliary staff to be added**
Small or large health centre		Up to 100 patients	• Zero to one	• Two to three lay providers
		101-250 patients	• One additional clinical provider	• One clerk/triage officer • 3-4 lay providers
		251-500 patients	• One to two additional clinical providers	• One clerk/triage officer • 4-5 lay providers
		500-750 patients	• Two additional clinical providers	• One clerk/triage officer • 6 lay providers

11.2 Ensure an adequate number of staff by cadre, by health centre or outpatient clinic

Generally, recruitment and hiring are carried out by the district health office, working with the in-charge managers at health facilities.

11.2.1Review the number of positions (number and cadre) assigned to each health centre and hospital outpatient which has been chosen for initial expansion of NCD case management service

- How does the number and cadre of positions actually assigned compare with recommended staffing (see next page)?
- Are any assigned positions unfilled at the health centres, especially those targeted to start or strengthen NCD case management?
    a. If so, how many?
    b. Which positions are vacant, and for how long have they been vacant?

The chart below presents the "basic" staffing – adapt this to reflect the recommendations of your Ministry of Health. "Basic" staffing refers to staff required to provide primary care services not including NCD case management, and is based on the population served. Adapt this table to reflect your country or district policies and the local situation. It is important that adequate 'basic' staff, which are covered by the district operational budget, are filled first.

Adapt this to your updated MOH staffing plan then review the status of recommended "basic" staffing for primary health centres in your own district		
Small health centre (catchment population of 3,000-7,000 people)	**Clinical staff** • One clinical assistant • Two nurses; one nurse/midwife (N/M) and one emergency nurse • One nurse assistant	**Support staff** • One cleaner • One watchman
Large health centre (catchment population of 7,000-20,000)	**Clinical staff** • One clinical officer • One clinical assistant • Five nurses - one registered N/M, two EN/M, two EN • Two nurse assistants • One pharmacy technician/assistant • One laboratory technician/assistant	**Support staff** • Two cleaners • One watchman

Adapt these staffing recommendations to your local situation. If you have a larger catchment population, add more staff. If you have an additional number of patients during some periods of the year, such as during malaria or harvest seasons, add more staff during these seasons, or make sure your staff does not take leave during these peak periods.

11.2.2. Update job descriptions for each position assigned to each health centre

Job descriptions will help you determine the qualifications and positions for clinical providers needed to be recruited to adequately staff the health centres. These job descriptions are usually standardized across health facilities, and should be on file at the district health office. Based on national strategic planning for NCD case management, these may have recently been revised to reflect these requirements. Once staff are hired, job descriptions can be used to help assess employee performance.

11.2.3. Hire additional health workers and auxiliaries if required

Hiring is usually carried out by the district health office, working with the health centre in-charge. Once the position and its budget have been approved, the district service commission or an equivalent body can advertise it, form a selection committee, and recruit candidates.

11.2.4. Provide support to health centre recruitment of auxiliaries and expert patient lay providers to expand the clinical team for NCD care (if needed)

Recruiting lay providers can help increase the number of staff at your health centre. *Lay providers are non-professional workers who can serve as counsellors, triage officers, data clerks, community health workers, nursing, laboratory and pharmacy assistants, and more*. Depending on their training and experience, lay providers can work in non-clinical and clinical roles as paid staff or volunteers. See examples of how to include lay providers in the health centre team at the end of this section.

Consider expanding the workforce through use of expert patients lay providers—see descriptions in National NCD strategic planning and adaptation manual
Expert Patients (EPs) are patients with long-term health conditions who have gained valuable experience in controlling and managing their conditions and are living a meaningful and productive life.

Based on national policy decisions, identify the tasks that could be performed by expert patient lay providers. Discuss these with the health centre/outpatient managers and plan for their recruitment, capacity building and retention.

Expert patient lay providers, with training, can perform a range of tasks including helping with triage, taking patients' vital signs, estimating CVD risk, pulling their charts, data keeping, treatment adherence counselling, treatment literacy and education, pill counting and stock management, tracking patients who are lost to follow-up, community outreach, home-based care and follow-up, managing support groups, counselling, basic laboratory testing, and more.

See National strategic planning manual for examples of including lay providers/expert patients in the health centre team for NCD case management.

11.3 Make task-shifting and task-sharing effective

Decisions on task-shifting policy are usually made at national level.

See the *NCD national strategic planning and adaptation manual section …. and updated national plan for policy decisions on task-shifting and task-sharing.*

Examples of key task-shifting or task-sharing to make scale-up/decentralization CVD risk/DM management feasible. This list should be modified based on the national decisions on task-sharing, task-shifting.

- CVD risk screening: from clinical health workers→ auxiliary staff, CHW, expert patients or peer educators
- Triage of patients arriving in chronic care clinic: from nurse → auxiliary staff, CHW, expert patients or peer educators
- Assessing, initiating treatment and management of hypertension and diabetes: from doctor/GP → nurses using a CVD-risk based and an algorithmic treatment approach and referring as appropriate.
- Laboratory referral can be done by different cadres following an algorithmic approach to screening and CVD-risk based case management.
- Decentralising laboratory services by making more POC testing available-shifting glucose testing from lab personnel→ trained auxiliary staff, CHW, expert patients or peer educators
- Diabetes-specific management such as eye and foot screening can be done with task-shifting to specialty trained non-physician clinicians (funduscopic eye exam, orthopaedic assistants) or nurses (foot exam) with system improvement for patient flow and referral through patient advocates.
- Patient education and support by auxiliary staff, CHW, expert patients or peer educators
- Patient monitoring (patient card, registers, reports) can be done by different members of health team- nurses, auxiliary staff, trained expert patients, data clerks.

Consider the district team role in task- shifting or task-sharing:

- Task shifting or task-sharing needs to be accompanied by strengthening of referral (and back-referral) pathway and clinical back-up for health centre providers.

The district team has a key role in making referral and mentoring arrangements and mapping them (see section 7.4).

- Identify the health centre provider's 'clinical back-up' at district hospital and make sure they have regular communications with this back-up staff. Health

centre providers need district counterparts who will supervise and act as their mentors, and who will ensure that patients are being adequately referred to the district and returning to the health centre for services. For example, nurses handling hypertension, diabetes and elevated cardiovascular risk diagnosis and treatment need mentoring and back-up for questions from an NCD clinician at the hospital. This will ensure that referrals are made correctly for patients with complications and that consultations take place on challenging cases. ”Back-up” at district level is also needed for laboratory, pharmacy, and supply management staff.

•Task shifting or task-sharing can be done successfully with proper health worker education and training, organized clinical team structure, and well-defined supervision after training

The district team has a key role in arranging training and assuring adequate supervision after training, working with the health facility managers/in-charge.

- Clarify job descriptions and supervisory structure then provide adequate training and mentoring. Task-shifting or task-sharing often entails cadres carrying out new tasks-requiring skills training and mentoring after training.

- Make sure that lay providers taking on new tasks are closely supervised, mentored and supported by experienced health centre staff. For example, if lay providers are performing screening for cardiovascular risk, the health centre nurse needs to establish regular meeting times with the lay provider so she/he can observe, supervise, and act as a mentor to that person. Their observations should be verified by a health worker.

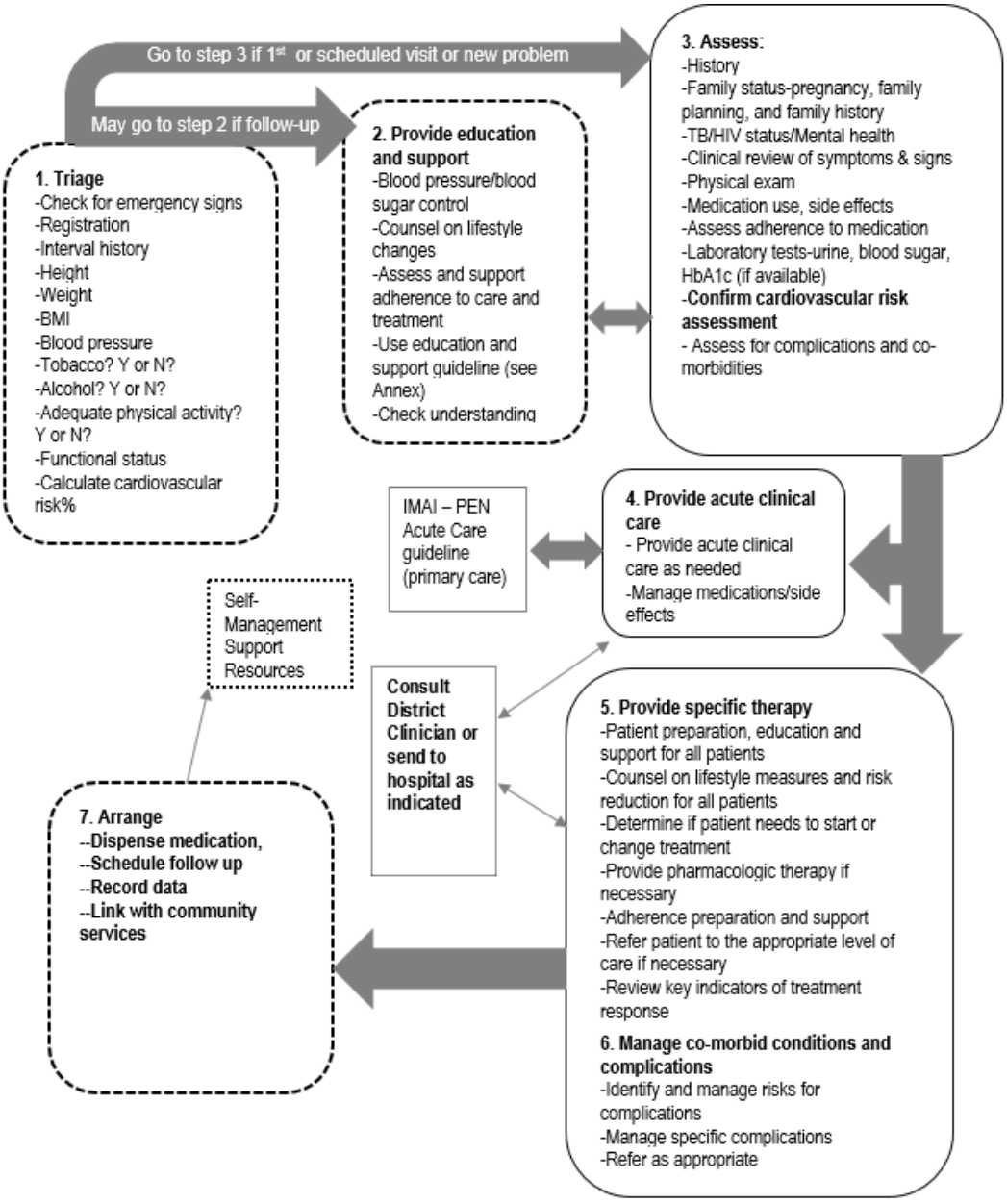
- Establish regular performance measurements to assure adherence to clinical and other standards (see Chapters 12 and 14 and the *HEARTS monitoring module*).

Task-sharing and task-shifting can be a real asset in your health centres or hospital outpatient, but it takes teamwork, supervision and good communication!

An example of task-sharing follows. For low-income countries with human resource constraints, a clinical team led by a nurse or clinical officer with the addition of auxiliaries, CHWs and/or lay providers may be necessary. For this circumstance, an adaptation of the HEARTS clinical guidelines that is fully technically compatible with it, the WHO *IMAI-PEN Integrated NCD Chronic Care,*[xxix] lays out a sequence of care that clarifies what tasks can be done by non-clinical auxiliary staff and those which need to be done by clinical staff. Such task-sharing divides the work to relieve the burden on the clinicians and allows patients coming for follow-up who are stable and do not have a new problem to be monitored and counselled by auxiliary staff and to have their medicines refilled without seeing the clinician on that visit.

CLINICAL ASSESSMENT AND MANAGEMENT FOR HYPERTENSION, DIABETES OR HIGH CARDIOVASCULAR RISK

Sequence of care[xxx]



Tasks that can be done by non-clinical staff

Tasks for clinical staff, such as nurses.

11.3 PROVIDE APPROPRIATE TRAINING TO CLINICAL STAFF AND AUXILIARIES/EXPERT PATIENT LAY PROVIDERS

The district team has the lead role in planning and implementing effective training, working with the managers at the health facilities chosen for training.

There may be a plan for an initial national level training of trainers to develop a cadre of trainer-facilitators. This is often best done in the first pilot or demonstration district but involving experienced trainers from national (and sometimes international level). This would mean that starting a HEARTS/ NCD training program in a district could then draw from a pool of experienced facilitators.

You should ensure that health centre staff have the right training at the right time to provide the quality NCD services outlined in this manual. You also should ensure that training opportunities are provided fairly and do not interfere with service delivery. By helping your staff access training opportunities in an equitable way, you also help promote their career development and improve motivation and morale.

NCD case management training at primary health care level (health centre and hospital outpatient)

On top of basic training in primary health care, to provide HEARTS/NCD case management, additional training is usually required to prepare the clinical team to carry out the 3 essential components of CVD/NCD case management at primary care level:

Screening, risk factor identification, early disease detection	NCD chronic care	Acute care for NCDs/ emergency management

The several cadres on the clinical team needs training in their roles in, NCD/CVD risk screening/early disease detection, NCD chronic care, and NCD acute/emergency care. Keep in mind the ability of the clinical team as a whole to provide the NCD services you have planned!

Adapt these estimates to your national decisions on task-shifting/task sharing and your district realities of staffing:

To provide quality **NCD care, additional training is usually required. Adapt these estimates to your district**:

Example: recommended training for staff to provide <u>NCD</u> services in small *and large health centres*		
Estimated number of NCD patients	**Trained staff needed**	**Should be trained in…**
• Under 100 patients	• At least two clinical providers	• Clinical training in NCD care, including how to fill the patient monitoring card, support clinical team • Quality improvement
	• At least one lay provider- expert patient	• Screening, triage • Counselling training
	• Lab technician/assistant	• NCD-related laboratory services
• 101-250 patients	• At least three clinical providers;	• Clinical training in NCD care • Quality improvement
	• At least two lay providers	• Screening, triage • Counselling training • Patient monitoring
	• Lab technician/assistant	• NCD-related laboratory services
• 250-500 patients	• At least three to four clinical providers	• Clinical training in NCD care • Quality improvement
	• At least three lay providers	• Screening, triage • Counselling training • Patient monitoring
	• Lab technician/assistant	• NCD-related laboratory services
• 500-750 patients	• At least four clinical providers	• Clinical training in NCD care • Quality improvement
	• At least four lay providers	• Screening, triage • Counselling training • Patient monitoring
	• Lab technician/assistant	• NCD-related laboratory services

CVD/NCD TRAINING for primary care staff

Training needs to take into account the several cadres on the clinical team and their level of basic education and current clinical expertise after years on the job as frontline providers, often with skills acquired in managing communicable diseases and maternal and child health conditions. The cadres often include:

- doctors working as primary care clinicians in countries with adequate numbers of doctors
- non-physician clinicians such as medical and clinical officers;
- nurses and midwives; and
- auxiliaries- nursing assistants, health educators, community health workers and expert patient lay providers.

These cadres can be trained separately. The WHO HEARTS clinician training provides a 3 day clinical training for doctors, clinical officers or nurses working at primary care level- see the sample agenda on the next page.[xxxi]

Sample agenda for WHO HEARTS training for clinicians (doctors, nurses and clinical officers) using the WHO/McMaster curriculum

Day 1	Day 2	Day 3
Module 1: Introduction • Introduction/Objectives • Burden of CVD • Local context/plans • Health, disease, risk Factors • Communication skills	*Module 3a: Risk-based management of CVD* • Risk-based Management of CVD o Case study • Risk-based management pathway o Ask o Assess o Refer o Estimate o Counsel • Case study for context of current management of CVD • Drug treatment and follow up o Total CVD risk ▪ HTN ▪ DM ▪ High cholesterol o Secondary prevention	*Module 4: CVD counselling and self-care* • Role play of typical scene in busy PHC • Techniques used in behavioural risk counselling o Motivational interviewing o Readiness to change • Specific risk factor counselling o tobacco use o unhealthy diet o physical inactivity o harmful alcohol use • Disease related counselling • Self-care • Medication and treatment adherence
Module 2a: CV system/diseases • Introduction/Objectives *Module 2b: CVD risk factors* • Modifiable vs non-modifiable • Behavioral risk factors o Tobacco use o Diet o Physical inactivity o Harmful use of alcohol • Physiologic risk factors o High blood pressure o High cholesterol o High blood glucose o Obesity	Module 3b: Practicum Medical management and technologies • BP measurement • BMI measurement • Blood glucose measurement • Blood cholesterol measurement Role play in CVD management	*Module 5: Clinical exam*

Any training curricula should use adult learning techniques and include a mixture of group discussion, didactics, drills and cased-based exercises and skills-based sessions in the classroom and on-site in the clinic.

Best practices in training
Training will be more effective when appropriate technical guidelines are used, when the time allocated to training is adequate, when training involves practice, and when there is follow-up after training.

Experience has shown that the best forms of training:
- Utilize adult learning techniques
- Are participatory and integrate practice of skills, rather than only didactic training[xxxii].

- Are followed by **on-the-job training** and **ongoing training/learning and/or support** by supervisors and mentors to trainees over time. "Once-off" training sessions that are only classroom-based do not have the same lasting improvement in skills and expertise, and require health workers to spend time away from providing services at the health centre.

For low-income settings with human resource constraints which is utilizing a clinical team augmented by auxiliaries (as described above on page. …, based on the *IMAI-PEN Integrated NCD Chronic Care*), an alternate WHO clinical training is available. This training promotes the development of a clinical team by training several cadres of the clinical team in parallel in 3 separate classrooms, then brings them together for NCD case management implementation planning as a clinical team. A sample agenda follows.

This offers a modular approach to training where one can either

- do the entire training, from acute care/NCD screening to all 3 protocols within chronic care (CVD/DM/HTN, asthma/COPD, and secondary prophylaxis for RF/RHD) plus health facility implementation planning (as summarized in the agenda below, in a 5 to 5.5 day training) OR
- do the training modularly, for example training only in CVD/NCD screening within acute care followed by only the HEARTS training (protocol 1 CVD/DM/HTN), within 3.5 days followed by implementation planning for the whole clinical team (half day).

In the example below, clinical teams from 5 to 10 health centres and/or outpatient clinics - clinician, nurses, auxiliaries - attend the training together. The 3 cadres learn in separate classrooms then work together on the last afternoon to plan CVD/NCD case management implementation when they return to their facility. In all clinical training, at least one of the clinical providers trained should be the head NCD clinical provider and supervisor from the hospital and district team.

Sample agenda for parallel training courses for NCD training in health centre clinical teams using WHO IMAI-PEN Acute Care and Integrated NCD Chronic Care

	Day 1	*Day 2*	*Day 3*	*Day 4*	*Day 5*	*Day 6 (half day)*
Training for Clinicians (doctors, clinical officers, medical asssitants) and Training for nurses (same curriculum, separate classroom)	Emergency management/ Acute Care/NCD screening: • Management of emergency NCD-related conditions prior to referral • Manage common acute conditions in OPD- when to suspect diabetes, CVD • CVD risk assessment -calculate BMI, measure BP, fingerstick glucose • Diabetes screening • Breast/cervical cancer screening/ early disease detection	Acute Care continued (half day) Chronic Care- Introduction to chronic care • General principles of good chronic care • Use the 5 A's Protocol 1: CVD/HTN/DM • Sequence of care • Triage • CVD and risk factors Practical Sessions	CVD/DM/HTN continued • Assess • Provide specific therapy- HTN, diabetes; primary/secondary prophylaxis • Manage comorbidities and complications • Patient education and support • NCD Patient Card: Diabetes, hypertension or elevated cardiovascular risk Practical Sessions	Chronic Care- Finish Protocol 1 CVD/DM/HTN (half day) Protocol 2: Asthma/COPD • Sequence of care • Assess • Provide specific therapy • Manage complications • Patient education and support • NCD Patient Card: Asthma and COPD Practical Sessions	Chronic Care- Finish Asthma/COPD (half day) Protocol 3: RHD- 2nd prophylaxis • Assess symptoms, refer as needed • Give Benzathine injection IM • Schedule follow-up • NCD patient Card: RF/RHD Review Practical Sessions	NCD Implementation Planning-for the whole clinical team
Training for Auxiliary Staff/CHW/ Expert patient lay provider	Cardiovascular disease risk screening	Cardiovascular disease risk screening Practical Sessions	Triage & Support the Clinical Team Practical Sessions	Patient education and support (counselling) Practical Sessions	Patient education and support (counselling) Review Practical Sessions	NCD Implementation Planning-for the whole clinical team

See Annex E for sample budgets

SCREENING AND COUNSELLING TRAINING for primary care staff

All auxiliary staff who help with CVD risk and diabetes screening or provide counselling services - including counsellors/ health educators, expert patient lay providers or community health workers - should receive basic counselling training. Further follow-on courses prepare the counsellor to manage other content area, building on the basic training course.

Auxiliaries who are recruited to help with screening require specific training. This training can help support the clinical team and can be done in a modular approach depending on who is being trained e.g. a triage health worker may complete the entire training whereas the health educator may do the counselling training only.

Screening and support the clinical team training	**Counselling training**
Cardiovascular risk assessment for auxiliaries/expert patient lay providers Use of CVD risk pre-assessment form or CVD assessment register	Basic NCD counselling- lifestyle interventions • Heart healthy diet • Physical activity • Reduction of risk- stop tobacco and avoid harmful use of alcohol

Other skills- blood pressure, BMI calculation, waist circumference,	NCD counselling-tobacco cessation
Support the clinical team-introduction to chronic care and using the 5A's for all patient encounters	NCD counselling- reduce harmful use of alcohol/ dependence
Triage in NCD chronic care Filling out some section of patient card	NCD counselling- weight loss if overweight/obese
	NCD counselling- NCD-focused counselling for diabetes, hypertension, high cholesterol, asthma, COPD, prevention of recurrent CVD event, RHD
	Treatment support and adherence

Screening and some counselling training should also be included in the clinical training for nurses, clinical officers and doctors. They also need to know how to supervise and interact effectively with the auxiliaries on their clinical team.

NCD CHRONIC CARE PATIENT MONITORING TRAINING – see detailed description of training in the *HEARTS monitoring manual* [move details to there]

Monitoring patients from initiation of care and treatment to outcomes is important to provide quality, chronic care for an individual patient and to evaluate the impact of your implementation activities. . Training in how to obtain this valuable information in a systematic way is therefore important. Clinical providers should receive training on how to fill out the patient form or card during their NCD chronic care training. If not, they will need this training. If using an auxiliary or data clerk, they will also require training to manage the records and transferring data as well as a dedicated nurse or records assistant who may be responsible for summarizing data and reporting (see *HEARTS Monitoring Manua*l).

The in-charge or another staff with interest or skills in analysis should receive further training so they can play a lead role in using the data.

NCD SUPPLY MANAGEMENT TRAINING

Someone needs to manage the store. If there is not pharmacy assistant, a nurse or other staff already assigned and trained to do this, a health worker needs to be identified in each facility to take on the responsibility of managing drug and resource supplies. A draft *Handbook on NCD Supply Management at First Level Health Care Facilities*[xxxiii] and training are available that emphasize NCD supply management, with inventory registration, distribution and restocking protocols, and documentation for monitoring and evaluation.

Basic and NCD supply management training includes the following skills:	
How the drug store is prepared	How supplies are ordered
How supplies are organized	How supplies are received
How records are kept	

NCD LABORATORY TRAINING

All staff performing laboratory services- including lab technicians and lab assistants, and clinical providers using point-of-care testing- should have receive training on each essential

lab test which they will provide that is new to them, including adequate infection prevention and control precautions.

Basic NCD-related laboratory services- training to perform and quality assure tests:	
Glucose testing using glucometer	Serum creatinine and potassium (if available)
HbA1c point of care testing, if available	Urine dipstick for protein and ketones (also for microalbuminuria if available)
Rapid pregnancy test	
Cholesterol (if available)	Preparing samples to send to district hospital laboratory

LEADERSHIP AND MANAGEMENT TRAINING FOR BOTH THE IN-CHARGE AT HEALTH FACILITIES AND THE DISTRICT TEAM

In most resource-constrained health centres, a clinical provider is also responsible for overseeing the daily operations of the health centre. So in addition to clinical training, the staff in charge of the health centre (large or small) and clinicians assigned to the district team should receive training in leadership and management skills, such as:

Leadership and management training can include these skills:	
Programme planning	Monitoring and evaluation, how to use data
Financial management	Supply management
Mentoring, supervision, staff appraisal	Facility management

QUALITY MANAGEMENT TRAINING

Quality management training is ideal for all staff of the health centre, so that your whole team can work together to improve the day-to-day operations of the health centre. This is support by the draft NCD QI module. This training should also be provided as part of a new employees' orientation to assure their participation in quality management from the start. The head NCD clinical provider or in-charge of the health centre could also benefit from more comprehensive follow-on quality management training that is provided by your district health office, regional hospital, or area donors. See QI Chapter 14.

Refresher training and continuing education

Refresher training and continuing education helps keep staff aware of new developments and policies, helps promote career development, and improves motivation and morale. Each health facility should have a training log to determine when a staff member could benefit from refresher training and continuing education. However, make sure these balance this need for training with the need for the staff member to provide services.

Other Learning Opportunities

Your staff can also learn through many opportunities that occur outside of formal training. These 'ongoing learning opportunities' can take place in or out of the health centre, and can be managed by you or other members of the centre team, and by non-governmental organizations, district or national health offices or other external groups.

Example of ongoing learning opportunities provided at the health centre	Example of ongoing learning opportunities provided away from the health centre
Review of patient cases	Educational presentations
Staff / local experience-sharing	Conferences
Review of latest information and journal clubs	Regional experience-sharing
Clinical mentoring	Cross-site visits

HOSPITAL CLINICAL TEAM TRAINING AND ONGOING LEARNING

CVD care at the health centre needs support from the hospital clinical team which needs to include staff:

- Trained, equipped and ready to handle severe, acute issues in NCD patients such as heart failure, heart attack, stroke, severe hypertension, or diabetic ketoacidosis (DKA).[1], [xxxiv]
- With sufficient experience and training to make treatment plans for patients at high risk of heart attack or stroke- patients with prior cardiovascular disease or chronic kidney disease or with an estimated CVD risk >=30% or patients with diabetes requiring insulin.

  The WHO draft PREVENTION OF CARDIOVASCULAR DISEASE: WHO Pocket Guide for Assessment & Management of Cardiovascular Risk advises referral for 'specialist review' and a treatment plan for patients with prior CVD/CKD then back-referral to PHC level for ongoing follow-up.

  In some limited-resource settings, this will need to be done at the district hospital level, requiring preparation of the senior NCD district clinicians asked to carry out these tasks (who are often not specialists), thus limiting the number of patients who are referred on to a regional or central hospital with a cardiologist. In addition to decisions on giving a statin and aspirin, this requires decisions on whether to give an ACE inhibitor (treatment benefit particularly great among individuals with impaired left ventricular function), beta-blocker (in all individuals with a history of heart attack and those with coronary heart disease who have developed major left ventricular dysfunction leading to heart failure; probably beneficial in angina) and/or anticoagulation therapy (for individuals with a history of stroke or TIA who are in atrial fibrillation, at low risk of bleeding and in whom treatment with anticoagulants can be safely monitored.)

  Further training would often be required to support ECG and echocardiography use and interpretation. [xxxv]

[1] Clinical guidelines and support for ongoing learning for the district hospital clinical team is also supported through provision of the generic or country -adapted WHO *IMAI District Clinician's Manual: Hospital Care for Adolescents and Adult.* This includes management of DKA, respiratory distress, pulmonary oedema, and the initial management of suspected MI with aspirin. Country adaptations have included management of arrhythmias and initial management of acute coronary syndrome/myocardial infarction, relying on urgent referral for thrombolysis or primary percutaneous coronary intervention. This manual is available as a smartphone app and is accompanied by the IMAI second level learning programme for health workers working in the district hospital.

11.4 HOW TO SUPPORT CLINICAL MENTORING AND SUPPORTIVE SUPERVISION IN YOUR DISTRICT

Clinical Mentoring

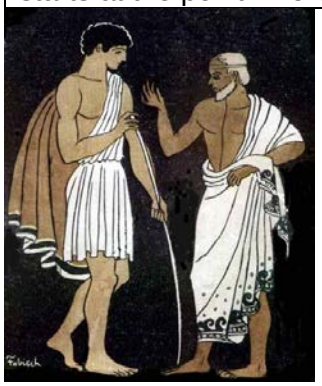
A clinical mentor is a clinician with experience and expertise that provides ongoing training and advice to clinical providers with less experience or expertise. The goal is to help the less experienced provider develop skills and experience, grow professionally, and provide higher quality care. Mentors meet regularly with the providers they are mentoring, to review clinical cases, answer questions, problem-solve, and provide feedback and assist with case management. Mentors can be formally assigned to a staff member or they can volunteer based on their personal interest.

A clinical mentor is different from a supervisor, who has formal authority over a staff member and is responsible for evaluating performance. Mentors are instead more like a 'coach', who focuses on improving staff expertise, motivation, and confidence. Clinical mentors should be supportive of the staff person and their growth as a person and a professional.

In a network model of care, clinical mentoring at the heath centre will be conducted through visits by clinical providers from the district hospital, and through ongoing phone and e-mail correspondence where available.

Definition of a clinical mentor
Clinical mentorship is a system of practical training and consultation that fosters ongoing professional development to yield sustainable high-quality clinical care outcomes. Clinical mentors need to be experienced, practising clinicians in their own right, with strong teaching skills.

Mentoring should be seen as part of the continuum of education required to create competent health care providers. As such, mentoring is an integral part of the continuing education process taking place at the facilities where health workers manage patients. It starts at the point where initial training ends.[xxxvi]



Telemachus and Mentor

(The term "mentor" has a long history rooted in Greek mythology. During the Trojan war, King Odysseus left Telemachus, his son and heir to the throne in the care of his friend, Mentor.)

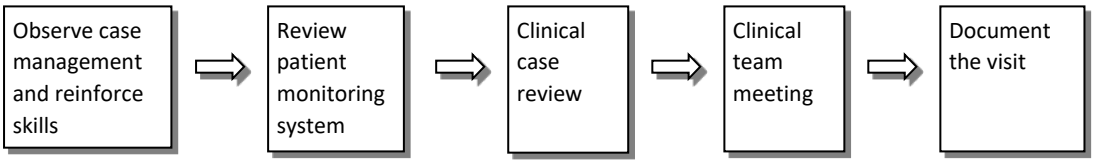
A **clinical mentor helps a provider with:**

- Building relationships
- Identifying areas for improvement
- Responsive coaching and modelling of best practices
- Advocating for work environments that improve patient care and provider development and
- Data collection, reporting and use of data to improve services

What you should know about clinical mentoring visits:

When a primary health centre begins providing chronic NCD care and treatment, it will require at least one mentoring visit from a district hospital clinical provider every month for the first six months, then less frequently thereafter. These mentoring visits and supportive supervision visits should include the patient monitoring system.

Sequence of steps in the clinical mentoring visit



The health centre clinical team should prepare for these visits by reserving the dates and selecting patient cases for review (such as cases of people recently initiated on treatment, patients that have developed complications, challenging or difficult cases, or deaths, as well as routine cases). In some instances, inviting the patient back to the clinic when the clinical mentor is scheduled to be there can facilitate consultation and avoid referral.

The MD, medical officer, medical assistant or GP who leads the NCD clinical team at the district hospital will also benefit from mentoring from specialists in cardiology and diabetes (for HEARTS cardiovascular risk and diabetes management and for management of patients with rheumatic heart disease), in pulmonary (for asthma and COPD), etc. These might come from the regional referral hospital, from regional or national teaching hospitals, or from NGOs committed to improving cardiovascular, diabetes or pulmonary care (either national or international).

See also Chapter 13 on quality improvement. Mentoring should be integrated with quality management/ improvement activities at the health centre.

Supervision

Supervision is a formal relationship of authority between a more senior ranking health worker and his or her subordinates. Supervisors can be located at the primary health centre or at a higher level facility such as the district hospital. A health centre supervisor is responsible for helping ensure that each staff member is providing adequate service delivery and is following health centre rules and policies. The following chart outlines possible supervisory structure at primary health centre level.

Supervision is often more hierarchical and managerially oriented. Supervision is mandatory in many organizational settings, and the goals may be pre-determined by the system. The relationship with a supervisor is more hierarchical. Supervision may be more critical and evaluative than the more non-judgmental approach associated with mentorship. Making sure supervision is 'supportive supervision' may moderate this.[xxxvii]

Recommended supervision at large and small primary health centres	
Level	**Supervisor**
Auxiliaries/lay providers	Nurse/ midwife/clinical officer/clinical assistant
Laboratory personnel/laboratory assistants	In-charge; district or sub-district laboratory personnel
Pharmacy assistants	In-charge; district or sub-district pharmacy personnel
Nurse/midwife	In-charge; district, sub-district or nursing officer or clinical officer
Clinical officer	In-charge; district or sub-district or first-referral hospital medical officer

Effective supervision is especially important to provide quality NCD services. Quality chronic NCD care benefits from health workers to be engaged in continuous learning and problem-solving which demand regular consultations with an engaged and *supportive* supervisor.

Supportive supervision
Supervision does not mean finding 'fault' in your staff's work. Instead, supportive supervisors focus on making sure their staff has the training, mentorship, guidelines and tools, equipment and supplies, and working conditions they need to perform the job effectively. It means assisting your junior staff to achieve goals, identify problems and challenges, and together find solutions to problems. The supervisory relationship should be compassionate, supportive, and helpful. Good supervisors learn from their subordinates, adapt to their needs, and should be open to suggestions.

A supervisory checklist is an easy way to prepare for your supervisory meeting with staff, because it identifies the issues you need to address during the session and reminds the supervisors during the session of issues that might be overlooked.

Preparation of mentors, supervisors and district management team:
Potential clinical mentors, supervisors from district hospitals and management team need themselves to become thoroughly familiar both with

- the country-adapted simplified, standardized guidelines
- the patient monitoring system and how to efficiently support it on health centre visits
- their logic and expected prevalence of risk groups and diseases in your district population
- how to support introduction of new or revised interventions at primary care level, with the required task-sharing and -shifting. Many tasks will be new or modified for the cadre performing them.
- how to support quality improvement

This may require orientation or training, before they can become trainers and mentors.

Clinicians may be expert and experienced in their own clinical practice, but not yet on board with decentralization of interventions to primary care level and their role as back-up (for severe illness, complications; for review and initiation of certain treatments which will then be monitored at the first-level facility; consultation) and as a mentor and/or supportive supervisor.

Adapt (or develop) and provide tools to support mentoring and supportive supervision. These can include self-review tools; graphic presentation of the NCD care cascade (see Chapter 16); or casebooks, to support ongoing learning.

12. Patient and programme monitoring

See *HEARTS Monitoring Manual* [to be updated after patient monitoring systems finalized]

This section assumes adaptations of the monitoring system has already been done at national level-see*HEARTS monitoring manual* - for monitoring CVD/NCD chronic care.

This should have been adapted to your country. If not, an immediate activity is to work with national staff to adapt the NCD chronic care patient monitoring system to the country-chosen interventions, choice of lab tests (FBG or HBA1c; cholesterol or not) then print the patient monitoring cards, registers and reports. All are based on the HEARTS clinical guidelines, measure the HEARTS minimum and additional indicators, and would use the same health facility assessment tools and reports.

12.1 Organization structure for patient monitoring by level

Level	Structure
Central/National	• Central health management team • HMIS/M&E point person
Regional	• Regional health management team • HMIS/M&E point person
District	• District health management team • HMIS/M&E point person

Health centre or hospital outpatient	• Health facility in-charge
	• Clinical staff
	• Non-clinical staff
	  • Counsellors, Expert patients, Auxiliaries/triage worker
	  • Lab, pharmacy techs/assistants
	  • Data clerks
	  • Secretaries, receptionists
	• Patients

Community	• Community health workers • Treatment supporters • Patients and their families

12.2 Integration with existing systems

A successful NCD patient monitoring system is founded on the collaborative work and cooperation of various partners who may already be working in health within your district:

- The CVD/DM patient monitoring system should be interlinked with other patient monitoring systems. The key indicators from the system should flow into the district information system- the setting-specific DHIS2 or other HMIS or strategic information platforms. This will be important for the success of the NCD case management activities.
- Collaboration between other related national programmes, including in particular HIV, TB, MNCH (RCH), and other communicable and chronic diseasesThis may entail integrating service delivery at the facility (e.g. a PLHIV can receive both HIV care/ART and diabetes care at the same place). Recommended patient monitoring activities might include:
    - Using NCD patient cards and registers at other programme sites; for example, if the HIV chronic care clinic will also provide diabetes, hypertension, high cardiovascular risk treatments to patients on ART, they

might additionally start an NCD patient card for each patient with these NCD complications and enter into an interlinked electronic register
- o Reconcile programme registers
- o Standardizing NCD indicators across programme areas

- **Collaboration with other institutions**
  Collaboration between the NCD programme and institutions at district level (e.g. UN organizations, community-based organizations (CBO), faith-based organizations (FBO), private businesses, teaching institutions) and outside (foundations, donors, universities) may hugely benefit patient care and monitoring by providing much-needed resources and filling in gaps in care and services (e.g. psychosocial support by CBOs or sponsorship of staff involved in monitoring).

12.3 Role of the district team

The role of the district team in CVD/NCD chronic care monitoring will vary depending on whether longitudinal monitoring using Model 1 or Model 2 (in red font) or an EMR are used, as noted in the summary table on the next page from the *HEARTS monitoring manual* [update when finalized], which highlights the role of the district team in orange/bold. This decision and any country adaptations of the patient and programme monitoring system will have been done at national level (ideally this *District NCD case management implementation manual* will have been adapted to reflect this).

You will also need incorporate monitoring for other NCD interventions or link systems- for asthma/COPD; for secondary prophylaxis for RHD; etc.

Checklists for role of the district team:

12.3.1 Organize and conduct health facility assessments and household surveys

- Conduct the baseline then periodic HEARTS facility assessment (see *HEARTS monitoring manual*)
- Additional assessments including a case management observation component can assess both adherence to protocols and other important aspects of quality of care.
- Help conduct STEPS or other household surveys, in conjunction with national efforts or specific research.

  Population-based coverage indicators provide the best measure of how well interventions are reaching the target population. They must be measured in a household survey such as STEPS. They could also be measured within a demographic surveillance system, if one is run in your district, by adding variables.

Table X Tools and processes for collecting the minimum CVD indicators				
Data/indicators	**Tool**	**Who uses the tool**	**How the tool is used**	**How often**
Individual patient data				
Data about a single patient	Individual CVD record	Clinicians	Patient's clinical data recorded during CVD visit	Every CVD follow up visit
Output indicators				
1. **Assessment coverage: % Target population ≥40 years assessed for CVD risk**	CVD Assessment register ↓	Data clerk / nurse ↓	Name and subset of data from individual CVD record entered in register when patient is assessed for 1st time;	Daily: for each patient assessed for 1st time
	Monthly report ↓	Data clerk / nurse ↓	Data for all patients assessed in that month counted from register	Monthly
	District database	**District data manager**	**Reports from all PHCs entered into district database**	Quarterly
2. **Treatment coverage: % Patients** (of expected no. in target population) **that are started on treatment for: Prior CVD CVD risk ≥30% Hypertension Diabetes**	CVD Treatment register or longitudinal register ↓	Data clerk / nurse ↓	Name and subset of data from patient record entered in treatment register when patient started on treatment	Daily: for each patient started on treatment
	Monthly report ↓	Data clerk / nurse ↓	Data for all patients started on treatment in that month counted from register	Monthly
	District database	**District data manager**	**Reports from all PHCs entered into district database**	Quarterly
Quality of care and outcome indicators				
3. % Patients with prior CVD on secondary prevention treatment	Clinical audit tool or calculated from longitudinal register ↓ **District database**	**District team (in model 1) or health facility team (model 2)** ↓ **District data manager**	**In model 1: Audit done in all or sample of facilities providing CVD risk management** **Random sample of patients selected from treatment register → Audit done is on their individual CVD records** Audit tool can also be used as supervision tool Or, in model 2, tallied from longitudinal register in each health facility	6 months after start of programme, then annually
4. % Patients with CVD risk ≥30% on statin				
5. % Patients with prior CVD or CVD risk ≥30% that have BP <130/80				
6. % Patients with CVD risk <30% that have BP<140/90				
7. % Patients with CVD risk estimated correctly				
8. % Patients with BP recorded at last CVD visit				
9. % diabetes patients with blood glucose controlled				
Service availability and readiness indicators				
10. % core CVD medicines with NO stock-out in previous 3 months	Facility assessment tool ↓ **District database**	**District team** ↓ **District data manager**	**Assessment done in all or sample of facilities providing CVD risk management** Assessment tool can also be used as supervision tool	6 months after start of programme, then annually

12.3.1 Role of the district team in monitoring of CVD/DM chronic care and treatment [to adapt when patient monitoring systems finalized]

Both patient monitoring systems:
☐ Provide regular supply of all forms and registers
☐ Train staff in their roles in the patient monitoring system—see chapter 11 and the *HEARTS monitoring manual*
☐ Supervise collection, correct estimation and interpretation of coverage of CVD screening in patients attending facilities for acute care
☐ Provide supportive supervision, on-the-spot training and technical review of patient monitoring system for quality of data, for key outcomes, and for quality of care and treatment. Integrate patient monitoring into clinical mentoring and supervision visits (at least once a quarter);
☐ On supervision and mentoring visits, monitor function of the referral and back-referral system—this requires assessments both at the primary care health facility and hospital; check referral records in patient records and appointment books
☐ Reports from all PHCs entered into district database.
☐ Assist staff with analysis and compilation of data for routine reporting; interpret and use the data, working with health facility clinical teams!
☐ Provide feedback from previous reports, data quality audits and other data analysis or evaluations
☐ Enter facility data into the district data base.
☐ Interlink CVD/DM patient monitoring system with other patient monitoring systems. Integrate CVD/DM monitoring with the district information system/ setting-specific DHIS2 or other HMIS. (see section 12.2)
☐ Provide a link between the health centre and central level to ensure all patient monitoring needs are met (adequate staff, tools and other resources as relevant), and convey any changes to national standards or norms.

Data management and the production of meaningful indicators can be strengthened over time:

- By supporting a quality improvement system (see Chapter 14) and
- By incorporating review of activities and the patient monitoring systems into supervision and clinical mentoring visits. See Chapter 11 *Capacity building: hiring-training-mentoring* for descriptions of clinical mentoring and supportive supervision

13. Develop an implementation plan[2]

Key steps in developing an implementation plan are described below, based on the preceding chapters of this manual. These include:

- Prepare for planning – form a planning team, involve stakeholders, and review the timing and resources needed. (13.1)
- Review implementation status or baseline/readiness (chapter 4 and 13.2)
- Decide on programme activities
- Plan monitoring of implementation of activities
- Write the implementation and develop the accompanying budget.
- Plan for the next review of implementation status

The estimates of need (Chapter 5) and prioritization and costing of case management interventions (Chapter 6) from the prior steps in this manual form the basis of an implementation plan.

Planning implementation helps managers work out how the interventions can be effectively delivered and what activities and resources will be required. It is usually done every 1 to 2 years. Implementation planning is most effective at district level as your planning and management team can bring specific knowledge of how interventions can be implemented in the community, at first-level health facilities and at referral facilities; what the programme can do or provide to enable successful implementation; and resources required to carry out activities.

Planning implementation helps managers at the (national and) district levels work out how the interventions can be effectively delivered and what activities and resources will be required.

Challenge: Most districts in limited resource countries are faced with complex planning to improve NCD case management, facing both insufficient resources and potentially very large numbers of patients. Health facilities frequently lack key examination supplies, diagnostic tests, and medicines needed to provide essential NCD care, both at hospital and health centre level. For NCD services to be successful and sustainable, they need to be efficient and integrated within a primary care approach at health centre level, backed by a hospital clinical team able to supervise and mentor this care and provide referral care for patients with complications. Building on what already exists is important. A modular approach, to accommodate progressive implementation and various combinations of interventions by level of the district health system, may also be important.

At the same time, the essential maternal and child health must continue as well multiple interventions to address the continuing high burden of communicable diseases. In some districts, a large number of HIV patients continue in chronic care on antiretroviral therapy. Whereas chronic HIV care/ART early implementation learned from NCD chronic care experience in 2000-2003 as ART just became available in large supply in low resource countries, the experience managing ART in your district may help inform planning for NCD chronic care services.

[2] This chapter draws heavily and directly from *Managing Programmes to Improve Child Health, Module 2 Planning Implementation, WHO, 2012.*

13.1 Prepare for planning – form a planning team, involve stakeholders, and review the timing and resources needed.

Form a small planning team

This team needs the necessary technical skills and should include people who understand the chosen interventions at the several levels of the district health system, as well as key stakeholders.

Additional technical skills required include:

- Epidemiology- quantitative and qualitative data collection and interpretation; understanding and if possible experienced in the STEPS surveys
- District programme management and planning
- Health facility management
- District health systems
- Patient monitoring systems
- Quality improvement approaches
- Budgeting, excel spreadsheet skills
- Writing and editing

One person may have several technical skills. The team should be small, calling in other help as needed, and have adequate time availability to do the work. It is helpful to have a specific administrative assistant assigned to the planning team.

Involve key stakeholders in implementation planning at the district

The planning process is expected to be more effective if a wide range of stakeholders are involved in the planning process. Stakeholders can be organizations or individuals. Stakeholders should come to a common understanding of NCD key issues and priorities, to share goals and objectives as well as help support implementation.

Effective involvement of stakeholders can lead to broad ownership and support for the plan; adapted interventions and approach that responds to local needs and respects existing systems in the district; agreement on consistent guidelines and messages; assistance in identifying resources to implement the plan; and participate in supporting NCD program activities described in the plan.

Stakeholders can be involved in various ways, depending on who they are:

- within formal meetings, discussion meetings, focus groups, community meetings
- as key informants, meeting individually with one or more members of the planning team
- to collect and present data
- to review draft plans
- to participate in the core planning team responsible for developing the implementation plan.

Potential stakeholders should include:

- National NCD programme manager and staff
- Policy makers (e.g. politicians and decision makers) to ensure political commitment and consistency with government vision and national health policy & strategic plan.
- Health managers of other relevant programs- such as TB, HIV, Maternal and reproductive health, health system strengthening. This is essential for cooperation, co-management and co-supervision of NCD services, which may occur within several clinical services.

- Health professionals (medical, nursing and paramedical) and other technical health workers, both from public and private sectors as key players for provision of NCD quality case management.
- Community representatives, including NCD 'expert patients,' are key stakeholders. They can help with needs assessment and also suggest how NCD case management services can be best provided and what barriers must be addressed for optimal access and coverage.
- Civil society and non-governmental organizations (NGOs) from health- related sectors.
    - Civil society / NGOs can play an important role in providing NCD case management services at community level, complementing NCD services provided by the public & private sectors.
    - NGOs and FBOs may be active in the district in supporting health provision at certain health centres or hospitals. These may be local or international.
- Academic/research institutions.
  Medical and nursing schools and research institutions have a role to play in NCD related research for better understanding of existing issues and adequate national/district adaptation of evidence – based interventions.
- Representatives of other sectors (e.g. finance, gender, education, transport, communication sectors etc). Their optimal contribution should be provided if effective universal coverage is to be achieved.
- WHO; (for children and mothers) UNICEF; other UN multilateral organizations which have been involved in NCD case management
- Bilateral development partners for their critical role in resource mobilization and technical support for an NCD case management agenda at global, national and district levels.

13.2 Review current implementation status

If this is a new district programme, this review may be limited to a readiness and baseline assessment (see Chapter 3).
If NCD case management interventions have already been substantially implemented according to a plan, review what has been achieved in planned activities from the last implementation plan (Chapter 15)

13.3 Decide on programme activities

Decide on programme activities in the community, at first-level health facilities and at district hospital to implement your chosen priority interventions. Set activity-related targets.

Review the overall goals and objectives of the NCD case management programme. These are either found in the national NCD strategy or were formulated from your district version of the strategy. As a first step in planning implementation for the next 1-2 years, the planning team should review and affirm these. The goal and objectives provide the framework to keep in mind in planning for programme activities. See the example for Holo district at the end of Chapter 5.

Plan activities that will

- **Increase availability of services**
    - Availability means that the health services are available for those who need them. Building new infrastructure (such as a community health facility), increasing the opening hours of a health facility, or increasing the number of health workers

available to provide the service would increase the availability of services. Recruiting, training and supplying community health workers to screen for cardiovascular risk and help with patient follow-up at village level can improve the availability and access to services. However, increasing the availability of services does not guarantee that the target population will use them.

- **Increase access to services**
  - Access means that caregivers are able to reach the health services, when they are available.
  - Possible barriers to access include distance (too far away)' finances (unable to afford costs of transport, medicines or services); culture; time limitations of the patient; limited opening hours of the facilities
  - Plan activities that will remove or decrease the barriers. It is important that the health services are both available and accessible.
- **Increase demand for services**
  - Demand for services means that clients are motivated to use the health services. Activities that increase the community knowledge about cardiovascular risk and the availability of the health services and their benefits are likely to increase demand. Providing quality services including counselling is likely to increase community members' motivation to use services.
  - Reduction of fees for poor families, or insurance schemes, may be needed to increase demand and use.
- **Improve quality of services**- see Chapter 14
  - Quality means that the health services are provided according to technical standards, and in a way that is appropriate and effective for the target population. Commodities are in place. Clinical care should be provided using the country-adapted standard guidelines and tools, with technically accurate messages, consistent with WHO WHO-PEN/HEARTS. Health workers should listen and be respectful of clients.
- **Increase the community knowledge of NCDs and their prevention and control.**

Eliminate or revise activities that do not contribute to one or more of these aims.
You must plan in detail **for all activities at each level of the health system.**

In listing activities, categorize them by this or an adapted scheme:

Activity areas for implementing NCD case management interventions at district level

Major activity areas for delivering NCD case management at district level

1. Advocacy/resource mobilization
Advocacy on importance of NCD case management
Advocating for effective policies and appropriate norms and standards which match district needs
Preparing project proposals for potential donors

2. **Health workforce:** Training, ongoing learning, HR development
Conducting in-service training for health workers and auxiliaries/CHWs/expert patients as lay providers
Ensuring adequate staffing
Limiting staff turnover
Supporting on-going learning after training

3. Essential medicines, equipment and lab
Procurement and distribution of essential medicines
Procurement and distribution of essential equipment and supplies (BP machines, glucometers, lab reagents, cardiovascular risk wallcharts, adult weighing scales, etc.)

4. **Service organization:**
Health facility organization
Referral: Development of locally-supported referral pathways and schemes
Introduction of and adherence to standards for referral care
Development of hospital capacity (staff and equipment) to provide
emergency management of severely ill patients with DKA, myocardial infarction and heart failure

5. **Communication**/developing community support
Improvement in knowledge and awareness of NCDs and practices related to them- both prevention and care, through communication with individuals and groups, mass media, health workers and CHWs
Developing community supports (such as health volunteers, groups, essential infrastructure, supervision or oversight of activities)

6. **Mentoring, QI** (quality improvement), supervision, governance/coordination
Preparation of HEARTS/NCD clinical mentors
Development of integrated supervisory checklists
Conducting supervisory and mentoring visits to facility health teams
Supervision of CHWs, community volunteers
District level coordination

7.Monitoring/HIS:
- longitudinal patient monitoring system
- health facility and community assessments
- monitoring progress: regularly collecting data on activities conducted, resources used, results of activities
- analyzing data and identifying problems (so they can be solved)

8. **Planning and budgeting**

9. Other

Decide on how implementation of delivery strategies should be phased. If your NCD case management programme is new in your district (as many will be):

- Plan a staggered introduction in your health facilities.
- First phase may need to include production of country-adapted guidelines, training materials, wallcharts and other tools to support HEARTS/NCD case management (adaptation of materials should have been done at national level and adequate number of printed copies provided or available to order)
- Get initial experience in few health facilities to get experience- then adjust- then further scale up in next implementation period
- Given the large number of undiagnosed (both asymptomatic and symptomatic) patients in the community who are not yet in care but will require care after being screened:

- Plan for medicines and other supplies and decide how many new patients can be accommodated in each quarter.
- Screen to generate enough patients but not too many—to approximately match capacity in terms of human resources, equipment, test strips, medicine

- Consider starting in a "slice" of your district- several contiguous health centres and the district hospital served by them (make sure to consider and appropriately involve regional hospital staff, depending on their likely role in clinical supervision and referral).
- Emphasize improving availability of care in the first implementation plan, before interventions to broadly increase demand

Set targets for key activities:

Activity-related targets are expected changes related to improvements in availability, access, demand, or quality of services, or knowledge of NCD disease and risk factors in the community. These targets should be able to be met as the programme is implemented. For this reason activity-related targets are often short-term (e.g. 1–2 years) targets. Activity-related targets are based on the activities that are planned in a specific geographic area or the **results** that can be expected when planned activities are implemented.

A target is a quantified statement of *desired change* in a key indicator of programme implementation, such as population-based coverage with an intervention or an important activity-related indicator. A target specifies the expected level to be achieved over a given time period in a specified geographic area. The actual level of achievement after the given period of time will be compared to the target to determine whether or not the programme is being implemented effectively.

What makes a good target?

To be useful, targets need to be Specific, Measurable, Achievable, Relevant, and Time-bound (SMART). Criteria for reviewing targets:

- **S**pecific: This means clear and unambiguous. Targets should express what is expected, by what date, and at what level (e.g. 50%).
- **M**easurable: This means that it should be possible to collect data to measure achievement using available methods. Numbers and percentages are used to indicate how much change is expected.
- **A**chievable: This means that it should be possible to reach targets with available interventions and resources, in the amount of time available.
- **R**elevant: This means that they should be consistent with national objectives and priorities. They should also be appropriate for the scope of the activities planned in the geographic area.
- **T**ime-bound: This means that targets should specify a starting point and an end point. Activity-related targets are set for a relatively short period of time, such as for 1–years; coverage targets are usually set for 2–3 years; impact targets are set for 5–10 years. This encourages local planning of activities and setting of activity-related targets that are realistic and meaningful.

General Principles of target setting

- **Review indicators and select a few for which you will set targets.**
  - Activity-related targets can be set for completion of important activities, such as supervision or training, or for results of activities, such as improvements inavailability of services, access, demand, or quality of care, or knowledge of the population.

- **Set targets based on available data, tools and field experience.**
  Setting a target requires estimates. Make the following estimates as best you can:
  - An estimate of the current level of achievement for the indicator based on available data. It is important that you set a target based on a realistic starting point. Data may be available from routine reports of activities, or they may be available from survey, or an estimate from supervisory visits.
  - An estimate of how programme activities will change the current level of the indicator, based on how intensively and effectively the activities will be implemented. Consider the type of activities planned, the geographic scope of implementation, and the human, material and financial resources that will be mobilized.
  - The likelihood that the activities will lead to the desired results, that is, improved availability, access, demand, quality. This estimate is usually based on field experience, programme plans, and reports from staff.

Facility	Number of health workers caring for adults	Number of health workers already trained in integrated NCD chronic care or HEARTS	Number needing training	Health facility equipped with essential equipment?	Health facility has essential NCD medicines for chosen interventions?		

Example, one district listed activities and set the activity-related targets listed below. [see example below]

Planning activities and setting targets for Holo district

Currently there are 12 health centres, 1 government district hospital and 1 mission hospital in Holo. No one is doing cardiovascular risk assessment and there has been no HEARTS training. There are a few diabetic and hypertension patients being treated at each health centre without consistent follow-up; at the government hospital outpatient, there are 200 patient visits for hypertension and 50 for diabetes in the last year recorded in the acute care register but it is not clear how many patients this represents. Only two of these facilities have functioning adult weighing scales. The hospital clinicians are aware of very few people in the district who have had an MI while living here but there are at least 5 business men who were hospitalized and survived in the capital city and have now returned to live in their village. The same senior clinician estimates that he knows of at least 25 patients with symptomatic rheumatic heart disease; there is no systematic provision of secondary prophylaxis. There is an NGO that is proposing to bring echo screening for RHD for the middle school.

An activity plan includes:

- Human resources: Are there enough existing staff?, Are new staff needed? Do existing staff need additional in-service training? Are there other problems with staffing that need to be addressed? Supervision and mentoring. See Chapter 11 Capacity building. Make detailed plans for training various cadres on the clinical team, in the range of competencies required (see Chapter 11).
- Provision of forms and support for the patient monitoring system (Chapter 12)
- Transportation (and per diem if overnight) for mentoring and supportive supervision visits (Chapter 11 and 14)
- Provision of essential equipment, lab suppies and medicines-- are new or greater quantity of medicines needed (see Chapter 10 and the WHO/PATH manuals; laboratory support (Chapter 9)? (see WHO/PATH national/district manual)
- Requirements to support the QI system (meetings between facility clinical teams etc)
- Etc

Decide on resource implications of delivery/implementation strategies—produce a budget which follows the activity plan (see Chapter 15)

Decide on how implementation of delivery strategies should be phased

Coverage targets	**Activity-related targets for the end of 2018 in the Holo District**
None have been set by national programme and seems too early	By end of first quarter 2017, adapt then print the NCD patient monitoring system for cardiovascular risk, HTN, DM- then print and distribute the patient monitoring cards, registers and reports to the chosen health facilities after training.
	By end of first quarter 2017, adapt the RHD card then print and distribute the cards to the chosen health facilities after training.
	By the third quarter of 2017, train the clinical team in 3 health centres and the outpatient adult department of the government and district hospital in integrated NCD chronic care and Acute care/screening. (Training includes use of the patient monitoring system).
	By January 2018, each clinic with a NCD-trained clinical team would have had at least 1 post-training mentoring visits.
	By end 2018, the total number in care for prior CVD, hypertension or diabetes will be 300.
	Be end 2018, the total number patients with RHD enrolled for monthly benzathine penicillin will be 50.
	--- continue---------

13.4. Plan monitoring of implementation of activities – select monitoring indicators and plan how to monitor them. Include activity-related indicators that will be monitored and also reviewed at year-end. Review and affirm goals and objectives

- Use the country-adapted patient and programme monitoring system – see Chapter 12 and the *HEARTS monitoring manual.*
- Plan for tracking whether activities are completed
    - Activity-related indicators: how, when, where and who will monitor them

- Plan for summarizing, analyzing, interpreting monitoring data, using it, and disseminating results from monitoring

13.5 Write the implementation workplan (this section) and budget

1. Overview (from the assessment of programme status)

- Programme goals and objectives
- Current status of NCD case management- either a readiness/baseline assessment or coverage indicators as compared to targets if programming already ongoing

If NCD case management programme was already ongoing

- Current status of activity-related indicators (Chapter 16)
- Summary of how well activities in the previous plan were implemented (if there was a plan)
- Summary of the assessment of the current programme, its strengths and weaknesses and what is needed to reach targets.

2. District integrated NCD case management Implementation plan (1-2 years)

- Programme goals and objectives (certain coverage targets may be set by higher levels)
- Activities for delivery of interventions/packages in the community, first-level
- health facilities, and referral facilities with key activity-related targets
- Tasks in each activity
- Resources needed for each activity
- Plan for monitoring implementation of activities
  - Using the country-adapted patient and programme monitoring system
  - Plan for tracking whether activities are completed
    - Activity-related indicators: how, when, where and who will monitor them
  - Plan for summarizing, analysing, interpreting monitoring data, using it, and disseminating results from monitoring
- How implementation will be scaled up
- How implementation will be shared with other groups or organizations
- Schedule for activities and timetable
- Budget for this implementation plan (Chapter 15)
- Plan for the next review of implementation status
  - Specific indicators to assess, methods to collect data, how data will be summarized
  - How the review will be conducted, and how results will be used

13.6 Plan for the next review of implementation status

Plan what will be assessed, how data will be collected, who will conduct the review, and when this will occur.

14. Quality improvement system for NCD case management

What the district team can do:

- Understand the district team role in setting up a quality improvement system for NCD case management
- Work with health facility managers and staff to prepare health facilities for QI activities
- Help chose key indicators for QI, based on the patient monitoring indicators and/or other process indicators
- Initiate an NCD QI system
- Facilitate communication and meetings between facilities implementing NCD case management
- Incentivize improvement
- Support facility clinical teams

> In the context of scarce resources available to support health care in LMICs, the imperative of clinical quality improvement is to get the most out of known effective interventions within the limitations of available resources…. Clinical quality improvement can be implemented within any setting immediately, and need not be expensive.[xxxviii]

This section provides guidance for district managers to set up and manage networks of health centres and hospitals to implement quality improvement around NCD care. Practical guidance on Quality Improvement, directed at the health facility staff, is provided in the NCD Quality Improvement Module.

As a district manager, you can play an essential role in improving quality at the facilities in your district. Quality investments are one of the few things that all health system stakeholders can usually agree on: improvements in quality lead to better patient outcomes, a better environment for staff and reduced costs for payers.

There are several major barriers to implementing effective quality improvement systems, including resources, staff engagement, adequate data systems and appropriate management control. However, the basic challenge in quality improvement is straightforward: **most quality improvement activities require substantial and sustained upfront investments, primarily in staff time, that lead to benefits that accrue over a long period and are often difficult to observe.**

For most managers, this means quality improvement is a secondary priority, even given the potential to generate benefits for all stakeholders that repay costs. Investments in staff, medicines and supplies have immediate and tangible payoffs, and don't require large upfront investments. Infrastructure and equipment require large upfront investments, but also have easy to observe payoffs (more bed capacity, better imaging, etc.)

As a district manager, you can play a substantial role in facilitating quality improvement activities within the facilities in your district. In this section, we start by discussing five primary roles you can play; although not exhaustive, these are some of the key ways you can improve care for patients in your district (and maybe make your job a bit easier in the process). We then discuss some of the specific activities that district managers are well-equipped to organize on behalf of facilities.

The District Manager's Role in Quality Improvement

As a district manager, you will likely not be directly implementing quality improvement activities at facilities. However, you can play a significant role in making those activities successful, by making it easier and more palatable for health facilities to make substantial and sustained upfront investments in quality improvement, and improving the ability of health facilities to track and demonstrate progress.

- **Advocate**
  In many health facilities, quality improvement is everyone's job, and therefore no one's. Compared to more tangible aspects of care – logistics, stock management, etc. – quality improvement transcends all aspects of the health facility but seldom has any dedicated staff to ensure it happens.
  As a district manager, you can play a key role in advocating for quality improvement activities at the facility level. You know the facilities you work with. By recognizing and communicating quality as a priority to facilities, you may be able to spark improvement. You can also play a key role in advocating on behalf of your facilities. Many will require outside support to achieve their quality improvement objectives; as a district manager, you are well placed to support their efforts.

  When communicating the importance of quality improvement to health facility managers, stress that quality improvement delivers benefits for everyone. If done correctly, quality improvement should at a minimum lead to better patient outcomes. But it will also likely lead to a safer, cleaner, easier work environment for your staff and may even generate cost savings for payers. Quality can be a great motivator for staff, a strong attraction for patients and a significant stress reliever for managers.

- **Teacher**
  Health facility managers and staff often lack the time and resources to learn quality improvement methods. By mastering the technical details of quality improvement, you or a member of your district team can provide the technical know-how to make quality improvement projects successful. Health facilities will be provided with the draft WHO NCD Quality Improvement Module.[xxxix]
  Although there are many quality improvement methods, most share some basic features:

  - Defined objectives: Define what the quality improvement activities are trying to improve.
  - Measurement: A system for measuring the quality before and after quality improvement activities.
  - Continuous iteration: Most quality improvement programs include defined cycles, during which an idea is developed, implemented, measured to see if it works and then adopted, modified or discarded (typically called a Plan-Do-Study-Act cycle).
  - Data-based decision-making: Decisions – to adopt a practice, change a practice or discontinue a practice – are made based on reasonable (though often imperfect) data.

  We recommend you explore different options and frameworks for implementing NCD quality improvement in your district (A good place to start which is well suited to QI work at primary care level, is the WHO HIV Quality Improvement Guidelines: http://www.who.int/hiv/pub/imai/om_11_quality_improvement.pdf).

  Quality improvement initiatives may be ongoing, within your facilities, your district or at the regional or national level. Or there may be NGOs that provide support for quality improvement already working within your district. We recommend you start by

connecting with any national quality improvement team to receive recommendations and resources. Ultimately, you should make sure to use whatever quality improvement activities work well for you and your team.

Quality improvement succeeds or fails based on the people involved. Any institution with committed change leaders can improve the quality of its services. Find and use the framework that best enables your team to improve care.

- **Coordinator**
  Finally, district managers can serve a key role in coordinating and implementing quality improvement activities between and within facilities. The remainder of this section describes this role and provides a roadmap for how district managers can effectively implement a district-level quality improvement system.
- **Support district data production (researcher)**
  One of the most significant barriers to setting up effective quality improvement at resource-constrained settings is generating the necessary data to track improvement. The importance of tracking improvement cannot be understated: not only does it enable data-based decision-making, but it is a key factor in motivating and sustaining interest in quality improvement activities. If staff and stakeholders do not tangibly see the effects of their work, they will be quickly discouraged. Compelling data can sustain interest in quality improvement activities.
  Many district managers already collect and analyze data from their health centres and hospitals. The HEARTS monitoring guide describes the patient monitoring system and health facility surveys for NCD case management which will generate substantial data; some indicators measured by these tools may be useful for quality improvement work (these are reported in the cross-sectional and cohort reports). However, the most effective quality improvement data may not be among the standard data collected and reported by health facilities. Most data required by health management information systems and similar data schemes may not be sufficient for health facility-level quality improvement exercises.

  There are two reasons for this. First, the aggregate data tends to focus on *outcome metrics*, not *process metrics.* Outcomes – such as glycemic or hypertension control or fewer heart attacks, strokes, premature death or other serious complications– are the ultimate objective of NCD health system work, but there are often too many factors that influences these outcomes to make them good measures of quality improvement in the short run. From one month to the next, these may rise or fall – regardless if you are doing better work, the same work or worse work. In contrast, process metrics capture the direct actions taken by facility staff, and therefore can be more closely linked to quality improvement activities. If you provision all your staff with BP cuffs, and the next month the number of patients with BP recorded doubles, you can conclude that your intervention worked (at least at improving BP recording). If you provide an adult beam scale and enlarged BMI charts and the next month the number of patients with BMI measured and recorded, you can conclude that that intervention worked.

  Second, aggregate data tend to reflect national and international priorities at the time, which may not perfectly overlap with the current facility priorities for improving care step by step. Implementation of a patient monitoring system at facilities will ensure that appropriate data is collected that can also be used to inform quality improvement activities (see the minimum essential indicators in the *HEARTS monitoring modul*e) but should not be the only source of quality improvement indicators.

As a district manager, you can play a key role in ensuring the necessary data exists to track quality, through advocating for that data, directly incentivizing it or potentially mandating it (though we recommend you do so in consultation with facilities). As always, you want to weigh the burden of data collection against the benefits. However, ensuring sufficient quality data is collected at the facility level can be a central contribution to ensuring that quality improvement initiatives succeed.

Various indicators that can be used for quality improvement.

(1) The most useful may be those that you discover as barriers to progress in getting the NCD care process going. You may identify these during team meetings or during a mentoring or supervision visit.

(2) Indicators from the HEARTS indicator lists- see the *HEARTS Monitoring Manual* for details on how to measure these.

You can also choose indicators from the formal indicators in the HEARTS indicator lists- see the HEARTS Monitoring Manual for instructions on how to measure these using the longitudinal patient monitoring register or by reviewing patient records. Although some are defined as in the last 12 months, they can be reviewed earlier for purposes of quality improvement work, rather than waiting for the cross-sectional or cohort reports.
See the minimum core A and B indicators and additional indicators in the *HEARTS Monitoring Manual.*

(3) Indicators derived from the logistic management information system (see WHO-PATH national/district manual or the first-level facility essential medicines and technologies manual.

Setting up a District Quality Improvement System- objectives

Ultimately, quality improvement must be achieved at the facility and patient level. However, a district QI system can play a key role in facilitating and supporting facility staff.

Although each system will differ, at the core a district quality improvement system is essentially a collaborative network between facilities with three objectives:

1. To improve knowledge and techniques by providing a forum to share insights gained at one facility with others.
2. To provide incentives for health facility managers to invest in quality improvement by providing a forum for managers to showcase success.
3. To coordinate activities through sharing information about priorities, plans and events, such as trainings.

Quality improvement initiatives usually succeed when they are very focused. By organizing around a handful of prime objectives and associated metrics, teams can quickly drive observable changes, building momentum for future changes.

Objectives are typically set at the facility level, but it may be appropriate to set district-level objectives if there is sufficient buy-in from facilities to make achieving those objectives feasible.

One potential entry-point for quality improvement is the referral network. Referral systems involve multiple facilities, can be standardized and routinized and have fairly straightforward and measurable metrics of success. Focusing on improving referral time, documentation or communication may be a valuable first step in creating a truly collaborative network of facilities.

Initiating an NCD Quality Improvement System

With your team, plan how you will set up a quality improvement system for NCDs in your district. One of the best strategies may be to leverage existing quality improvement systems. In many districts, there may be existing quality improvement initiatives, often focused on HIV care or maternal and child health, that can serve as a platform for expanding efforts to improve quality for NCDs. We recommend you start by mapping the existing initiatives, through contacting the following health system members to see what programs are underway:

- Health facility managers within your district
- The national quality improvement unit or similar entity
- Any regional or other management structures you coordinate with
- The National NCD Alliance, if one exists
- Other development partners that you routinely work with

Leveraging an existing system can be a cheap, rapid way to improve quality without duplicating efforts or putting an undue burden on your staff.

To introduce a new quality improvement system, we recommend you take a few steps:

- Sensitization and motivation: Inform facilities of your plans to implement a new system and motivate them to see this as an opportunity to improve their hospitals.
- Focus groups: We recommend conducting initial focus groups with hospital staff, in order to understand the barriers they face in providing high-quality NCD care. There is no single solution to improving quality. Each facility will need to prioritize based on its unique situation. Focus groups can be a powerful tool for understanding that situation and developing solutions with strong buy-in from staff.
- Health facility improvement plan: Alongside focus groups, we recommend you encourage each facility to create a plan to improve quality. This plan does not have to be complex, but should list the key barriers, the key priorities and then planned changes to address those barriers and achieve those priorities.
- Training: At the district level, you should consider conducting basic training for staff in quality improvement techniques. These can be a simple way to provide staff with the knowledge and skills necessary to improve.
- Mentoring (see Chapter 10): Perhaps the most important step in setting up a functioning quality improvement system is routine mentoring. By regularly visiting facilities, surveying progress and making recommendations, you can provide strong motivation for health facility leaders and staff to make quick progress on quality improvement goals.

Funding can be challenging to secure for quality improvement, but many of the necessary activities may be currently facilitated within your budget. However, additional national or regional funding may be available to support these efforts. You may also reach out to local nonprofits or community-based organizations, which may be able to provide some funding or connect you to larger quality improvement initiatives.

Facilitating Communication
Communication is the backbone of the quality improvement system. Good communication can be challenging, particularly between facilities. We recommend using a handful of defined systems that mix ad-hoc frequent communication with regular periodic communication. Here are several recommended approaches for a district manager to enable communication:

- Chat group: An email or SMS group for members to informally communicate. There are a number of free options for setting up a group, such as Google Groups and WhatsApp. Chat groups are great for getting questions answered quickly and sharing information to keep people notified.
- Regular email update: We recommend district managers implement a simple regular update to their facilities. This can include a few highlights of progress from different facilities, an overview of upcoming activities and potentially links to interesting or valuable resources or information. Depending on capacity, this may be best done on a monthly or quarterly basis.
- Regular in-person meeting: Face-to-face meetings are essential to make the collaborative network work. We recommend at least quarterly meetings with health facility managers to share learnings, review progress and plan next steps. The district manager is in an ideal position to coordinate these meetings.
- Spotlight activities: One of the most exciting aspects of quality improvement for staff can be the potential to advance their career. We recommend you look for opportunities to spotlight and communicate the work of your facility managers, through publications or reports, meetings, trainings and conferences. There are often sources of funding available for these specific activities, and they can be a great boost to your team's morale and your quality improvement activities.

Incentivizing Improvement
People respond to incentives. As a manager, you must constantly think of the incentives you are creating for people - and whether they are pushing them to take the right actions. Incentives are at the backbone of any successful quality improvement program. However, they must be designed carefully and compassionately – the object is to steer people towards good behavior and away from bad, not to manipulate or punish. Finding the right mix of incentives is essential, and will likely require some experimentation. Incentives must be substantial and focused enough to motivate behavior, not too substantial to distort behavior (i.e. incentivize people to misreport data, etc.), and broad enough to provide everyone, not just the top performers, an incentive to improve.

At the district level, there are many incentives to consider using:

- Recognition: Recognition likely offers the greatest benefit at the least cost. Recognition can be next to free – but powerfully motivating for staff. Developing recognition programs – for managers, staff members, teams or whole facilities can drive improvement in practice.
- Opportunities: Along with recognition, opportunities can be a key motivator, particularly at the individual staff level. Combining recognition programs with defined opportunities – such as preferential placement in training programs – may further bolster quality activities.
- Access and Prioritization: You can reward facilities that improve quality through better access – through the stakeholders you are connected to – as well as prioritization for programs. However, be careful to avoid favoritism; the best way to

do so is to set clear and verifiable guidelines for rewarding facilities and then transparently report back to facilities.

- Data and Presentation: Data is often used as a tool to determine how to apply incentives. However, data can itself be a powerful motivator. As individuals, we see only a slice of the institutions we work in on a regular basis. We all also have cognitive biases that color how we think about the world. Data can cut through these biases and present us a broader picture that can surprise us, and jolt us into action.
- Financial Incentives: You may have the ability to provide financial incentives. These can be very powerful, but they must be implemented very carefully. We recommend you spend time researching financial incentives before you implement – we recommend the Word Bank's RBF Health group as a good place to start (https://www.rbfhealth.org/resources).

With all incentives, keep a close eye on their potential to distort. People can and do over-respond to incentives – for instance by misreporting data or neglecting some vital activities to focus on those that are incentivized. One natural response among managers is to police and try to punish violators, but this will likely be ineffective and costly. Instead, the best way is to calibrate incentives so that they are not too big or too small. The vast majority of staff know what is right and what they should be doing; by providing a small nudge in the right direction, particularly when combined with activities to address other barriers (inadequate supplies, overburdened staff, etc.), incentives can be very effective at producing the intended results.

Supporting Facilities

Finally, district managers can play a key role in supporting facilities. This will depend in large part on the resources available and the individual programs and priorities of the facilities. A few key activities include:

Protocol and guideline development: District managers can provide guidance and input on development of protocols to guide care processes and overall care guidelines. District managers can recommend protocols and guidelines that are locally appropriate and evidence-based, and provide guidance and mentoring to adapt or create new protocols and guidelines as necessary.

Mentoring: District managers are in an ideal position to mentor facilities, particularly facility managers. More information is provided in chapter 11.

Data systems: District managers are well positioned to recommend and support facility monitoring and other data systems (see the *HEART monitoring manual*). This will largely depend on the technical capacity of the district office, but if capacity is strong, this can be a major source of value for health centres and hospitals.

Monitoring the QI system: Quality improvement and monitoring efforts should go hand in hand. Endeavor to build a functioning quality improvement system for NCD case management that pays attention to quality of care data and institutes effective improvement activities.

QI system monitoring	☐ Internal performance review reports available per defined period
	☐ Supervision visits received per defined period
	☐ Clinical mentoring visit per defined period
	☐ The proportion of NCD health facility teams who have identified and set a performance improvement target for NCD (documentation: plan or other document describing performance improvement target approved by management and clinical staff)
	☐ The proportion of NCD health facility teams who have met a performance improvement target for NCD (documentation: data analysis report demonstrating change in performance)

Supplies: Although this will depend on the financial arrangement of the health system, districts may be well positioned to procure and provide supplies that are not routinely sourced by health centres and hospitals, such as NCD diagnostic equipment. See Chapter 8

15. Making a budget and finding financing[xl]

Use the detailed implementation plan to create a budget which estimates the additional costs for each element of the NCD case management activities and their total costs, usually by year. This will usually not be a stand-alone budget, rather an addition to or section of the district budget, using the standard format. The MOH or other relevant department normally provides templates.

Budgeting includes calculating the amount of funding required, tracking how it is spent, and accounting for having spent it. The budget should be closely linked to the implementation plan.

15.1 Make a budget

Each task and activity in the plan should have a cost allocated to it.

Budgets should include:

- A budget timeline. The length of the budget period (long-term, short-term) is determined by regulations from the Ministry of Finance or other government institutions at the national or sub-national levels. Budgets usually have to be submitted to a finance department (or other relevant unit) for approval. It is important that budgets are submitted before deadlines.
- Ongoing staff and materials costs (which occur independently of specific activities). These include staff costs for routine services; infrastructure maintenance costs (electricity, heating, mailing, office supplies, telephone); and transportation costs including fuel and vehicle maintenance.
- Costs of activities specified in the implementation plan. A budget line can be attached to each activity, which might include additional staff, transportation, and training costs.
- Estimates of medicines, equipment and other supplies and their costs. Some data are based on past experience and estimates from suppliers. Others are supplied by other staff; these need to be checked for accuracy and relevance.
- An estimate of inflation and an adjustment of budget estimates based on this figure. Estimates of inflation can often be obtained from the ministry of finance.

If there are uncertainties regarding the resources required and available for the proposed activities, it is useful to develop the budget in modules and arranged in the spreadsheet so that it is easy to break out different numbers of facilities and months of implementation.

Estimating costs of material resources

[this section should cross reference or be replaced with WHO/PATH national/district NCD medicines/technologies manual section and linked with the costing tool instructions]

Cost estimates for medicines, laboratory reagents, and equipment can be produced using specific costing tools developed for this purpose such as the specific HEARTS costing tool or the broader NCD costing tools, modified to use at district level.[xli]

For medicines and equipment, sources of prices include:

If you obtain or purchase good from central level:

- HEARTS and WHO-PEN costing tools if they have been updated with national figures for medicines and equipment.
- Price lists from government supply agencies and/or the MOH for equipment

- Essential medicine lists and in-house purchasing or ordering catalogues- you may be provided with certain medicines for free and have to budget for others (see Chapter 9).
- A list of international median generic medicine prices is included in the costing tool and Annex D- these prices should be replaced by real, current in-country prices through your central medical store or costing tools.

For local purchase:

- Estimates by suppliers in response to invitation to tender.
    - Usually only national managers/Essential medicine section/central medical store of the MOH will be tendering internationally.
    - You may need to tender some equipment locally.
- Costs of similar goods purchased recently
- Supplier catalogs
- Prices in local shops when you are able to purchase locally or where patients may need to purchase medicines or equipment if not provided free

For guidelines, participant and facilitator training manuals, wallcharts, cardiovascular risk screening forms, patient monitoring cards and registers:

- Agree with national level NCD programme which will be printed centrally and provided to the district
- For those that need to be printed in the district, obtain several estimates from printing shops. Try to make as many copies are possible. For districts using the IMAI-PEN Integrated Chronic NCD Care training curricula, see the Course Director guide for detailed estimates of page, size and printing requirements. (see Chapter 10)

The total cost is calculated by multiplying the unit price for each item by the number of items needed. The costs of material resources will appear in the overall budget.

Estimating costs of particular events

Develop a budget for:

- planned meetings
- adaptation of guidelines and training materials (usually a national activity)
- training courses (see Chapter 11; Annex E provides a template for costing training course).
- community events, and
- other special activities such as dissemination of guidelines.

Transportation

Hopefully the NCD case management programme of work or activities can rely on transportation resources already within the primary health-care programme (or you may need to include a portion of the overall costs in this budget). However, there may be special costs that NCD case management activities are expected to absorb such as costs for supportive supervision and mentoring/QI visits (although these will hopefully be integrated with other services); costs for referral of non-ambulatory patients to hospital; community health worker/expert patient transport costs; transport of certain equipment, lab and medicines; etc.

If public transport is used for certain activities, staff need money for fares.

When estimating transportation needs consider: [xlii]

- Distances
- Availability of public transportation, the schedule and cost
- Condition of roads (If roads are in poor condition, or non-existent, motor-bikes might be more useful.)

- Amount of travel (How many staff need to travel regularly? How many staff can share vehicles?)
- Renting vehicles (Renting can be cheaper if the vehicles are not needed all the time.)
- Sharing vehicles between programmes to reduce costs
- Cost of fuel

Strategic budgeting: consider having two budgets or an additional column in the spreadsheet:

- One within indicative budget
- Second plan and budget to get things done adequately- use when partners come for "unfunded priorities" or other funding possibilities.

14.2 Finding financing for district NCD case management [this will be completed/revised in light of financing section in National Strategic manual and PATH input]

At district level, finding financing for government health facilities:

- NCD medicines, equipment and laboratory reagents may be available through the essential medicines system/central medical store. However, the quantity may be very limited. If available, it is important to try to gain some priority in supply orders for these medicines from your first-level facilities and hospitals. See also the Hearts' Toolkit to improve access to essential medicines and technology.
- NCD programmes can often take advantage of general operating funds supporting primary care staff. However, support for additional auxiliaries, nursing aids or trained expert patients may need to be found to expand the human resources available for both screening and for the provision of NCD chronic care. If these cannot initially be supported from MOH human resource funds, consider asking local NGOs to sponsor (particularly those which already support CHWs).
- Advocate for CVD/NCD funding from donors active in your district, or who have national programmes with specific NCD aims (such as rheumatic heart disease control, cervical cancer VIA test and treat,

If there are severe limits in governmental funding of NCD case management services, some NCD care may needs to be financed by household spending, on an intermittent and fee-for service basis.

District level NCD implementation plans need to take into account NGO not-for-profit and for-profit private sector provision of care. Ideally the district team can provide input to improve access and help assure their delivery of quality/best care practices in NCD case management, including preventive and early case detection and treatment practices that have been shown to be effective.

- With financial and technical overseas support from various sources and links, NGO-run hospitals (including "mission hospitals") often have better infrastructure, drug supplies and other resources than their government equivalent; and many can be relied upon to provide good-quality service.
- NGOs may support services that are not available or in very limited supply through government health facilities at district level. This might include arrangements and sponsorship of valvular surgery elsewhere for advanced RHD; ophthalmology exam and laser surgery for retinopathy; colposcopy for VIA test and treat; cancer chemotherapy for certain conditions.

Integrating NCD and HIV care for people on ART can be cost-effective by adding basic measures into existing infrastructures at minimal added expense, i.e., improving access to basic functioning equipment, introducing standardized treatment guidelines, and training health workers already providing chronic care for HIV/ART to care for NCDs[xliii]

This could also save cost for an NCD program by adding these costs to HIV-specific government and international funding such as through Global Fund. **[Reference Malawi example in national strategic manual financing section]**

NGO “blended financing models” are emerging including reliance on general operating funds to support core salaries of primary care staff, crowdfunding for extraordinary and catastrophic care, and donor fundraising for certain core expenses. A Guatemalan project providing diabetes care has observed that “(1) per-patient costs vary significantly depending on disease severity; (2) human capital for service provision and not generic medicines or other consumables (including insulin) is the primary overall cost driver; and (3) program nurses provide high value for cost.”[xliv]

16. Review implementation status[xlv]

Regularly reviewing the status of implementation is crucial. This can happen in several ways:

- Use the patient and programme monitoring indicators for patients and facilities. Reports should provide regular information on the key minimum and additional indicators. See the HEARTS monitoring module and Chapter 12.
- Feedback from mentors and supervisory visits to health facilities. The district team should be directly involved in supervision. Nothing substitutes from visiting health facilities and the community to know what is going on and to help solve problems and improve care on the spot (see Chapter 11)
- Review the status of your planned implementation activities on a regular basis (desk review).

16.1 Review the cardiovascular risk and diabetes care cascade. Identify the important gaps and problems then make a plan to fix them.

Using the care cascade to understand and improve cardiovascular risk and diabetes management in your district:

The care cascade offers a visual picture of the steps in implementation that can be latched onto by both health workers and policy-makers, while also offering a common vocabulary with which to discuss large-scale efforts to achieve the universal goals that it conveys. The cascade caught on rapidly with HIV providers, policy-makers and even patients, a testament to its simplicity, then has been used for TB, diabetes and other conditions. It can be visually expressed in a bar graph, flowchart, inverted triangle and other graphics. Or expressed with fewer words, such as “find-link-treat-retain.”[xlvi]

The care cascade helps translates epidemiologic surveillance and patient monitoring data into user-friendly concepts, helping to dismantle the traditional barriers between epidemiology/monitoring and clinical care.

Step 1: **Elevated CVD risk/diabetes/hypertension in the community (prevalence at baseline)**
Step 2: **Diagnosis**
Step 3: **Link with care**
Step 4: **Effective treatment and lifestyle changes started**
Step 5: **Engaged and retained in care, with sustained control**
Step 6: **Fewer bad CVD/DM outcomes**

The challenge lies in moving from the larger facts that underpin the cascade to an understanding of what they actually mean, and what needs to happen within and between the steps in the framework to produce improved results. This is where identifying the problems or gaps relevant to each step of the cascade can help.

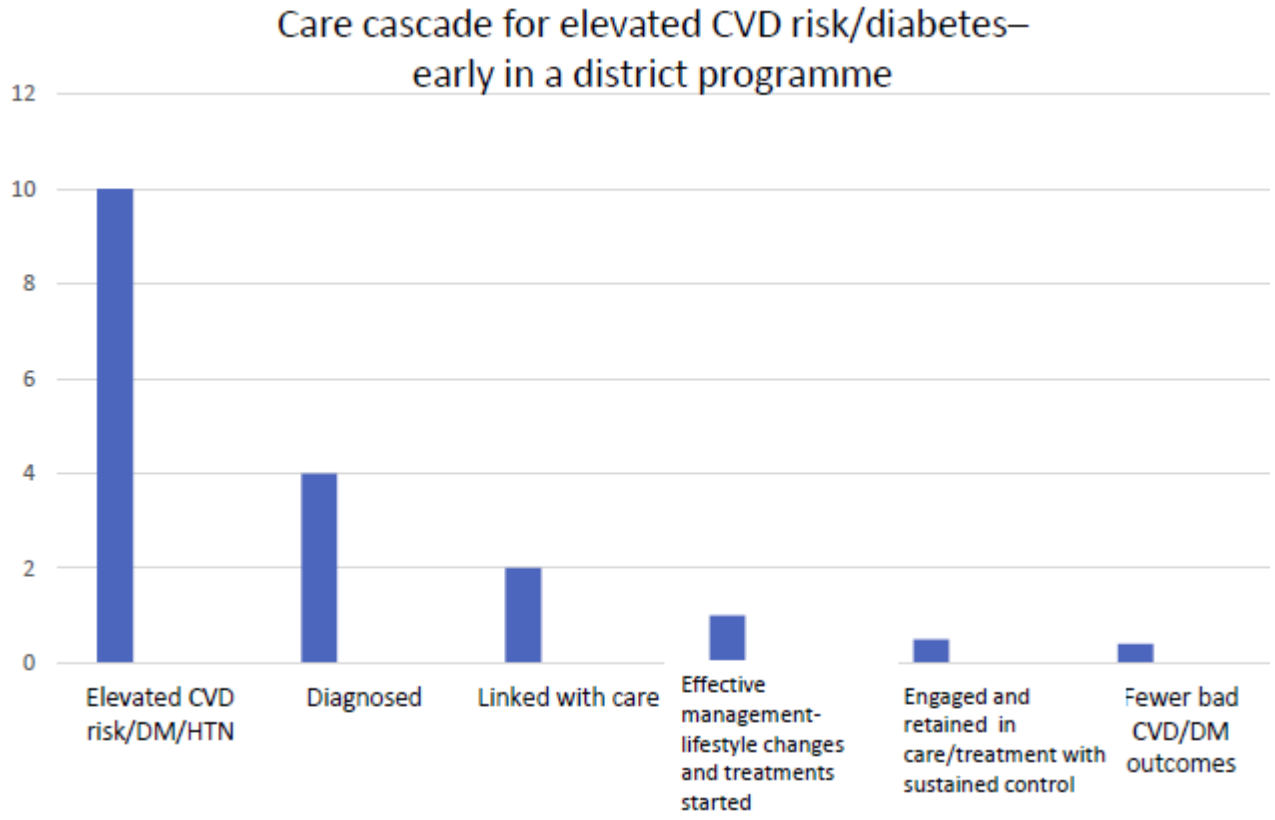
	Care cascade	Content of the step	Possible gaps/problems—do this analysis for your district!
1	**Elevated CVD risk/diabetes/ hypertension in the community (prevalence at baseline)**	All people in the community with elevated CVD risk/diabetes/hypertension. (Estimate from STEPS data- Chapter 5)	• Data not available.
2	**Diagnosis**	PHC facility has key resources available to deliver risk-based management of CVD Assess for CVD risk in the clinic or in the community. " preassessment" by auxiliary or CHW may requires further lab work to measure RBG, FBG or HbA1c Verification by health worker for history PCVD etc.	• Significant gaps between actual and identified burden of disease- "missing patients." • Early HTN, DM, elevated CVD risk often asymptomatic- no careseeking. • Patients with disabled from prior CVD years ago remain at home and are not linked with health system • People≥ 40 or family history of CVD/DM/HTN attend clinic for acute or other chronic problems but are not assessed; other people do not attend clinic at all and are not seen by a CHW with capacity to carry out assessment/screening or preassessment. • Auxiliary/CHW/expert patient lay provide do not carry out the CVD risk assessment or preassessment correctly; patient does not finish assessment- lost to follow up before getting lab test(s); lack of reagents or strips available to diagnose diabetes. • CVD risk is not clearly conveyed to patient or understood. • Lack of diagnostic equipment (adult scales, tape measure for waist circumference, glucometer with test strips or HbA1c).
3	**Link with care**	Those with elevated CVD risk, diabetes, and hypertension are successfully registered in HEARTS/NCD chronic care in PHC.	• No linkage to care (diagnosed but no registration in chronic care clinic- patient does not arrive at clinic after referral)-- either no access or those with access do not go. Problems could include few clinics able to provide NCD care, too distant for many patients;; clinics overloaded; fee for care; lack of essential equipment etc. • Poor patient understanding of risk or disease; fear; poor motivation; distrust of public clinic. • Asymptomatic disease- do not go for care/treatment even when diagnosed. • CVD risk<30% on initial lifestyle management only so not registered in the treatment register (model 1) then lost • No longitudinal patient monitoring system to keep track of patients after diagnosis.
4	**Effective management: treatment and lifestyle changes started**		• Lack of essential medicines or reliable supply • Health workers don't have adequate training • Counselling is neglected • Counsellors don't provide effective counselling.
5	**Engaged and retained in care, with sustained control**	Registered patients retained in care and adherent to treatments and lifestyle measures. Sustained control= patients in care achieve and sustain good control of glucose, hypertension, cholesterol; stop smoking;	• Lack of essential medicines or stock-out • No retention in care- lost to follow-up (LTF) or miss appointments • Patient started strong then lost motivation as no symptoms or apparent impact of treatment. • Patients cannot afford to pay for treatments • Patients cannot afford to go for care distant from home. • Patients have social or economic reasons not to change lifestyle.

		physically active with good diet etc	
6	**Fewer bad CVD/DM outcomes**	Patients with good control/ risk reduction experience less heart attacks, angina, strokes, TIAs, peripheral vascular disease, lower limb amputations, blindness, other complications, fewer premature deaths.	• Patients not retained in care long enough for impact.

Effective use of a care cascade approach benefits from integrated strategic information, able to draw from both community and health facility assessments as well from as an effective longitudinal patient monitoring system. This can incorporate geospatial data on diagnostic and treatment capacity (by GPS or simple maps). Linkages between the several levels of the district health system, for mentoring, supervision and referral and back-referral, can be examined.

It is particularly important to promote both linkage with care after screening then retention in care and treatment. Given weak health systems and health-seeking behaviors which have often been primarily focused on acute care, it is common for patients to not link with chronic care following screening. Even once registered in chronic care, retention is difficult, particularly with asymptomatic disease or poorly understood NCD conditions. High rates of failure to link with care after screening and low rates of retention in care are common in many chronic care systems. These represent significant missed opportunities for reducing cardiovascular risk, morbidity and mortality. To address these problems, it is important to understand the barriers and facilitators to linkage and retention in care.[xlvii]

An early district programme might look like this:



The gaps and problems in each step can be usefully be divided and analyzed by the several important patient subgroups:

	Prior CVD or CKD	**Those with CVD risk>= 30%**	**Those with CVD risk <30%**	**All diabetics**	**All hypertensives**
Step 1: **Elevated CVD risk/diabetes/ hypertension**					
Step 2: **Diagnosis**					
Step 3: **Link with care**					
Step 4: **Effective treatment and lifestyle changes started**					
Step 5: **Engaged and retained in care with sustained control**					
Step 6: **Fewer bad CVD/DM outcomes**					

Using the care cascade can identify misalignments between patients with the highest risk and the availability of diagnostic and treatment services; gaps in provision of evidence-based clinical care and effective lifestyle counselling; disparities in care between the public, NGO and private sector; etc.

Most of the minimum essential indicators for longitudinal care can be linked with each step [update after patient monitoring systems finalized].

	Care cascade	**Minimum CVD/DM indicators which address each step** (see also additional indicators in *HEARTS monitoring manual*)
1	**Elevated CVD risk/diabetes/ hypertension in the community (prevalence at baseline)**	• Data not available.
2	**Diagnosis**	• Assessment coverage: % Target population ≥40 years assessed for CVD risk (including diabetes)
3	**Link with care**	• Treatment coverage: % Patients (of expected number in population) that are started on treatment for: Prior CVD; CVD risk ≥30%; Hypertension; Diabetes • % Patients with prior CVD on secondary prevention treatment • % Patients with CVD risk ≥30% on statin • % Patients with CVD risk estimated correctly • % Patients with blood pressure recorded at last CVD visit
4	**Effective management: treatment and lifestyle changes started**	
5	**Engaged and retained in care, with sustained control**	• % Patients with prior CVD or CVD risk ≥30% that have blood pressure <130/80 • % Patients with CVD risk <30% and hypertension that have blood pressure <140/90 • % Diabetes patients with blood glucose controlled • % core CVD medicines with NO stock-out in previous 3 months
6	**Fewer bad CVD/DM outcomes**	

It is often helpful to use a bottle-neck analysis to identify the main gaps and problems in districts, to look for solutions, then to plan/prioritize solutions within the existing resource envelope

16.2 Review the status of your planned NCD case management implementation activities.

This review should be based on your implementation plan. Your district's NCD case management implementation plan may have different technical areas or components (for example, HEARTS CVD interventions for the general population and for HIV patients on ART, secondary prophylaxis for RHD, management of asthma and COPD, cervical cancer VIA test and treat) written by different divisions or departments or implemented with the help of different projects.

The main categories of activities for implementing NCD case management are summarized in the box below, followed by matrices with examples of how to review activities for each of the three levels of the health system: community, first-level health facilities, and referral facilities.

Review the major activities <u>in the last plan</u> and assess how well they were implemented

Complete the following worksheets. These categories can be used to classify the activities:

1. Advocacy/Resource mobilization
2. Health workforce- training, ongoing learning
3. Essential medicines, equipment and lab
4. Service organization: facility, referral
5. Communication/Developing community supports
6. Mentoring, QI, supervision, coordination
7. Monitoring/HIS 8. Planning and budgeting
9.Other (specify):_____

WORKSHEET: Assess How Well the Planned Activities were Implemented[xlviii]

CVD/DM/NCD INTERVENTIONS IN THE HOME AND COMMUNITY:

Planned activity (Number indicates category of activity)	**Status of implementation**	**Geographic scope** (implemented in _% of districts/ health facilities)	**How well activity was conducted**	**Reasons for observed implementation performance**
***1**-District-level meeting with stakeholders to share plans about NCD case management*	*Completed*	*Stakeholders from 4 of 5 districts*	*Good attendance* *IEC materials provided for stakeholders*	*Invitations sent out well in advance* *Donor funding enabled printing of materials*
***1**-Meet with NGO sponsoring*	*Completed*			
***5**- Community support- add NCD sessions to 5 planned village sessions*	*Only partially implemented*	*Only 2 carried out*		*Inadequate*
***4**- Scheme for CHWs/expert patients in 10 villages*	*Partial*	*Diabetes expert patients identified from 3 villages; engaged with their health facility- will be trained*		
***5**-Raise awareness of need for CVD risk assessment, risk factors, how to prevent heart attacks and strokes*	*Completed*	*100% (5 districts)*	*New poster developed and printed* *Health facilities hung new posters*	*Donor funding for posters* *Technical support from WCO*

CVD/DM INTERVENTIONS IN FIRST LEVEL FACILITIES: HEALTH CENTRES/OUTPATIENT

Planned activity	Status of implementation	Geographic scope (implemented in	How well activity was conducted	Reasons for observed implementation performance
***2**-Appoint and train the NCD quality focal point*	*Completed*			*Donor support has brought new interest*
***2**-Organise 5-day training workshop for NCD Acute and Chronic Care for 38 health workers*	*Completed*	*38 health workers trained (4 districts)*		
***2**-Organise 2-day training for 9 health facility in-charges on management of medicines*	*Completed*	*9 health facilities as planned (3 districts)*	*Practice included; NCD Drug Supply Manual provided*	*Appropriate materials available; Trainer provided by partner*
***5**-Provide all 13 facilities with updated CV risk charts, protocols*	*Completed*	*5 districts 13 of 13 health facilities*		*New country-adapted cardiovascular risk charts finally printed!*
***3**-Set up CVR screening corners in 10 health facilities*	*Completed*	*10 out of 13 health facilities*	*Good*	*Dr Lhab facilitated process*
***3**-Procure 12 new digital BP cuffs*	*Ordered but not received*			
***5**-Provide posters for 13 health facilities on CVD risk*	*Completed*	*100% of health facilities*		*Donor funding enabled printing of materials*
***6**-Conduct monthly supportive supervision visits to 11 facilities doing*	*Partial*	*5 facilities out of 11 doing*	*Included observation*	
***7**-Monitor quarterly proper medicine management practices*	*Completed*			

CVD/DM INTERVENTIONS AT REFERRAL FACILITIES

Planned activity	Status of implement-tation	Geographic scope (implemented in	How well activity was conducted	Reasons for implementation performance
***2-** Review plans for routine and urgent referrals and back-referrals with hospital staff*				
***2**- Arrange training or mentoring/ provide guidelines for acute/ emergency care* for CVD/NCD complications/severe illness*	*Completed Partially*	*1 hospital*	*Good*	*Country-adapted IMAI DCM printed late last year*
***2**- Arrange training or mentoring/provide guidelines for management of PCVD, high CVR, DM requiring insulin etc at 3 hospitals*	*Completed*	*1 hospital*	*Good*	*International and national experts from MOH and WHO available Hands-on practice Too few trainers*
***3**-ECG machines at 3 hospitals with training in use*	*Not completed*			*Funding not released; Technical assistance not scheduled*
***7**-Monitor monthly the use of standard protocol for D K A*	*Partially*	*1 hospital*	*Good*	*Dr ... introduced and monitored use at his hospital*

Using WHO IMAI District Clinician Manual/ Quick Check+ training or other comparable.

Annexes

Annex A. Review cardiac data from various sources relevant to your district

Annex B Example of CVD risk/DM screening form- preassessment by auxiliary followed by health worker verification

Annex D Examples of international median cost of NCD medicines without tariffs, taxed or mark-ups

Annex E Generic Budget Spreadsheets for

- HEARTS training for CVD risk-based management
- Integrated NCD training

Annex A Review cardiac data from various sources relevant to your district

	Causes of heart failure	Cause of CVD death from studies within your country	InDepth verbal autopsy studies	Local clinical experts' impression-urban districts	Local clinical experts' impression-rural districts	Summary estimate of relative importance + ++ ++++ +++++
Ischemic heart disease						
Hypertensive heart disease						
Rheumatic heart disease						
Congenital heart disease						
Endomyo-cardial fibrosis						
Idiopathic dilated cardio-myopathy						
Right heart failure						
TB pericardial effusion tamponade						
Peripartum cardio-myopathy						
HIV-related cardio-myopathy						

Annex B

Cardiovascular (CVD) Risk and Diabetes Assessment for Auxiliary Staff/Lay Providers: Screening then Clinical Health Worker Verification--- for use with non-laboratory BMI CVD risk chart			
UNIT	**REGISTRATION NO:**		
NAME:	**ADDRESS or DISTRICT/SUBCOUNTY/VILLAGE**		
1. Fill what you can and send form with patient to next step. DATE:		**2. Health worker verification DATE:**	
Sex (circle)	M F	**New Results**	
Age (fill in)			
History of smoking in last year? (circle)	Yes No		
Take Blood Pressure (BP) X 2 (5 minutes between measurements)*	BP1	Repeat BP?	
	BP2		
On hypertensive medicine? (circle)	Yes No	verified?	
History of diabetes (DM)		verified?	
Or on DM medicine? (circle)	Yes No	verified?	
Measure Height	cm		
Take Weight	kg		
Calculate BMI (from table)			
Screen for DM, if status not known. Check fasting blood glucose (FBG). Repeat for DM diagnosis.	**FBG**	**FBG**	
History of heart attack, stroke, chronic kidney problem? (circle)	Yes No	Verified? Also ask re TIA, angina, PVD; CKD, including diabetes with overt nephropathy	**High risk from prior CVD chronic kidney problem (circle)**
IF YES, STOP HERE. High risk from prior CVD or chronic kidney problem (circle)			
CVD risk % (from BMI risk chart) (circle)	**< 10 %**	**< 10 %**	
	10 to < 20 %	**10 to < 20 %**	
	20 to <30%	**20 to <30%**	
	≥30%	**≥30%**	
Follow-up *If SBP>180/100, to see health worker immediately.			
NAME/SIGNATURE:		NAME/SIGNATURE:	

Annex D

Essential medicines for NCD case management in:	
Primary care- health centre and hospital outpatient *(The 9 outpatient medicines for HEARTS are indicated in italics.)*	**Hospital- requirements in addition to those in primary care**
CARDIOVASCULAR/DIABETES **Antihypertensives:** *ACE inhibitor*- captopril, enalapril, or lisinopril *Thiazide diuretic* such as hydrochlorthiazide *Beta blocker* such as atenolol *Calcium channel blocker* (long-acting) such as amlodipine Hydralazine injection for severe hypertension* Spironolactone tablets **Diabetes medicines:** *Metformin* cap/tab *Insulin regular injection* *Sulfonylurea* - gliclazide tablet and/or glibenclamide cap/tab Dextrose 50% injection* Dextrose infusion* Normal saline infusion for suspect DKA* **Secondary prevention for history MI or stroke, primary prevention of high CV risk** *Statin* such as simvastatin tablet *Aspirin low dose cap/tab* **Management of ischemic heart disease/angina** Glyceryl trinitrate sublingual tablet Isosorbide dinitrate tablet **Pre-referral treatment MI:** Aspirin* **Primary and secondary prevention rheumatic heart disease:** Benzathine benzylpenicillin powder for injection **Management heart failure (in addition to several above):** Furosemide cap/tab* **ASTHMA/COPD:** Beclomethazone inhaler Prednisolone cap/tab Hydrocortisone injection Salbutamol inhaler Betamethasone inhaler Dexamethasone injection Penicillin Amoxicillin Aminophylline **Symptom management, palliative care medicines** Paracetamol Aspirin Ibuprofen Morphine	**Additional antihypertensives:** Nifedipine Methyldopa **Management of ischemic heart disease/MI:** Atenolol Thombolytic therapy (streptokinase) **Management of DKA** IV fluids- normal saline Potassium IV Insulin IV, IM **Heart failure:** Furosemide IV Oxygen Other: **Chronic respiratory disease at hospital:** Epinephrine Magnesium sulphate Oxygen Salbutamol liquid for nebulizer
Technology required to deliver treatments in primary care	**Hospital- requirements to deliver treatments in addition to those in primary care**
IV giving equipment* Syringes/needles	Nebulizer for salbutamol Oxygen giving equipment

*** For emergency management of complications/pre-referral treatment**

Annex E Examples of international median cost of NCD medicines without tariffs, tax or mark-ups

Product	Units per month	Median Unit Cost 2014	Buyers median cost- some updates from 2015- note decrease in statin prices	Monthly cost ($)	Yearly cost (US$)
Antihypertensives:					
ACE inhibitor- long-acting (e.g. enalapril 10mg tab)	60	$ 0.02680		$1.61	
Thiazide diuretic (e.g. hydrochlorthiazide 25 mg)	30	$ 0.00430	0.0237 supplier; 0.0049 p412; median p209- 0.0043	$0.13	$1.55
Spironolactone tablets (25 mg tab)	60	$ 0.04320		$2.59	
Beta blocker (Atenolol 50 mg tab)	30	$ 0.01030		$0.31	$3.71
Calcium channel blocker (long-acting, e.g. amlodipine 10 mg tab)	30	$ 0.07650		$2.30	
Diabetes medicines:					
Metformin HCL 500 mg tab	60	$ 0.01690	0.0162	$1.01	$12.17
Insulin, Isophane NPH 100IU/ml 10ml	1	$ 8.83400	0.555/ml with 100 IU/ml	$8.83	$106.01
Sulfonylure a (e.g. gliclazide 80 mg tab)	60	$ 0.05910		$3.55	$42.55
Glibenclamide 5 mg tab	30	$ 0.00680	0.0057 but daily defined as 10 mg	$0.20	$2.45
Dextrose 50% injection (per ml)-25-50 ml	per 50 ml dose	$ 0.900			
Normal saline infusion* (sodium chloride in water (normal saline) 0.9% solution (IV) (per ml))- 1000ml	per 1000 ml dose	$ 1.0000			
Management of ischemic heart disease, pre-referral treatment MI:					
Glyceryl trinitrate (nitroglycerin) 0.5 mg tab	30	$ 0.0946		$2.84	$34.06
Isosorbide dinitrate (10 mg) tab (PO)	60	$ 0.0724		$4.34	$52.13
Aspirin (acetylsaliclic acid) 300 mg tab	30	$ 0.0020		$0.06	$0.72
Secondary prevention for history MI or stroke, primary prevention of high CV risk					
Statin (simvastatin 20 mg tablet)	30	$ 0.0531	0.0163	$1.59	$19.12
Aspirin (acetylsaliclic acid) 100 mg tab	30	$ 0.0020		$0.06	$0.72
Primary and secondary prevention rheumatic heart disease:					

Benzathine benzylpenicillin powder for injection (3 G, PEN. G) 5M IU powder (INJ)	1	$ 0.2223	0.262 but this is 1.4	$0.22	$2.67
Management heart failure (in addition to several above):					
Furosemide (40 mg cap/tab*)	30	$ 0.0067		$0.20	$2.41
Asthma, COPD medicines:					
Beclometasone inhaler (100 mcg/dose inhaler (INH)) (per dose 0.8 mg)	1	$ 0.0453		$0.05	$0.54
Prednisolone cap/tab (5 mg tab-cap (PO))	15	$ 0.0117		$0.18	$2.11
Hydrocortisone injection (sodium succinate) 100 mg vial (INJ)	per dose	$ 0.5332			
Salbutamol inhaler (100 mcg/dose inhaler) (INH)	1	$ 0.0105		$0.01	$0.13
Dexamethasone injection (4 mg/ml ampoule) (INJ)	per 4 mg dose	$ 0.6644			
Epinephrine injection (adrenaline) 1 mg/ml ampoule (INJ)	per dose	$ 0.3339			
Magnesium sulphate (50% vial) (INJ)	1	$ 0.1323		$0.13	$1.59
Amoxicillin (250 mg tab-cap) (PO)	60	$ 0.0184		$1.10	$13.25
Symptom management, palliative care medicines					
Paracetamol (100 mg tab-cap)	30	$ 0.0020		$0.06	$0.72
Aspirin (acetylsaliclic acid) 100 mg tab	30	$ 0.0020		$0.06	$0.72
Ibuprofen (200 mg tab cap (PO)	30	$ 0.0069		$0.21	$2.48
Morphine sulfate (IC) 10 mg/ml ampoule (INJ)	per dose	$ 0.6089			
*prices are median unit supplier costs from: MSH (Management Sciences for Health). 2015. International Drug Price Indicator Guide, 2014 Edition. (Updated annually.) Medford, Mass.: MSH.					

Annex F Generic Budget Spreadsheets for Integrated NCD training

5.5 day: Acute Care/Screening Plus Chronic NCD training of health workers at health centre level				
*Please fill in the number of unit cost (column B) and number of units (column D). The subtotals and total will populate automatically.				
Item	**Unit Cost***	**Unit (ie per trip/per day)**	**No. Units***	**Subtotal**
Materials				
Local production/printing of IMAI-PEN guideline modules (Chronic Care)		per book		0
Printing of Training materials		per person		0
Photocopying		per training		0
Venue				
Cost of venue		per day		0
Food				
Lunch, snacks/tea in morning/afternoon for participants and facilitators		per day		0
Participant Costs				
Local participant transport		# in course multiplied by # of days		0
Non-local participant per-diem		# in course multiplied by # of days		0
Non-local participant transport		# in course multiplied by # of days		0
Supplies		per person		0
Equipment (use total from equipment list and divide by # of participants)		per person		0
Course Director and Facilitator Transport				
Car hire		per day		0
Driver Per diem (if separate rate from car hire)		per day		0
Fuel		per litre		0
Course Director				
Per diem		per day		0
Technical Allowance		per day		0
Local Facilitators				
Per diem		# in course multiplied by # of days		0
Technical Allowance		# in course multiplied by # of days		0
International facilitators				
Daily rate		days		0
Travel		per trip		0
Lodging		per day		0
Food		per day		0
Medivac		per trip		0
Visa		per trip		0
MOH Program Manager per diem		per day		0
MOH driver per diem		per day		0
MOH driver fuel		per litre		0
Communications				
Airtime		per unit		0
TOTAL				**0**
*This is also available in Microsoft Excel, when you enter the number of units and unit cost the subtotal and total will populate automatically				

2 day training of Acute Care/NCD screening for health workers at health centre level				
*Please fill in the number of unit cost (column B) and number of units (column D). The subtotals and total will populate automatically.				
Item	**Unit Cost***	**Unit (ie per trip/per day)**	**No. Units***	**Subtotal**
Materials				
Local production/printing of IMAI-PEN guideline modules (Acute)		per book		0
Printing of Training materials		per person		0
Wallcharts		per training		
Photocopying		per training		0
Venue				
Cost of venue		per day		0
Food				
Lunch, snacks/tea in morning/afternoon for participants and facilitators		per day		0
Participant Costs				
Local participant transport		# in course multiplied by # of days		0
Non-local participant per-diem		# in course multiplied by # of days		0
Non-local participant transport		# in course multiplied by # of days		0
Supplies		per person		0
Equipment (use total from equipment list and divide by # of participants)		per person		0
Course Director and Facilitator Transport				
Car hire		per day		0
Driver Per diem (if separate rate from car hire)		per day		0
Fuel		per litre		0
Course Director				
Per diem		per day		0
Technical Allowance		per day		0
Local Facilitators				
Per diem		# in course multiplied by # of days		0
Technical Allowance		# in course multiplied by # of days		0
International facilitators				
Daily rate		days		0
Travel		per trip		0
Lodging		per day		0
Food		per day		0
Medivac		per trip		0
Visa		per trip		0
MOH Program Manager per diem		per day		0
MOH driver per diem		per day		0
MOH driver fuel		per litre		0
Communications				
Airtime		per unit		0
TOTAL				**0**
*This is also available in Microsoft Excel, when you enter the number of units and unit cost the subtotal and total will populate automatically				

2 day auxiliary/expert patient training (on-site) for cardiovascular risk assessment plus counselling				
*Please fill in the number of unit cost (column B) and number of units (column D). The subtotals and total will populate automatically.				
Item	**Unit Cost***	**Unit (ie per trip/per day)**	**No. Units***	**Subtotal**
Materials				
Local production/printing of auxiliary handouts		per book		0
Printing of Training materials		per person		0
Photocopying		per training		0
Venue				
Cost of venue		per day		0
Food				
Lunch, snacks/tea in morning/afternoon for participants and facilitators		per day		0
Participant Costs				
Local participant transport		# in course multiplied by # of days		0
Supplies		per person		0
Equipment (use total from equipment list and divide by # of participants)		per person		0
Course Director and Facilitator Transport				
Car hire		per day		0
Driver Per diem (if separate rate from car hire)		per day		0
Fuel		per litre		0
Course Director				
Per diem		per day		0
Technical Allowance		per day		0
Local Facilitators				
Per diem		# in course multiplied by # of days		0
Technical Allowance		# in course multiplied by # of days		0
Communications				
Airtime		per unit		0
TOTAL				**0**
*This is also available in Microsoft Excel, when you enter the number of units and unit cost the subtotal and total will populate automatically.				
* On-site training with limited travel for those outside town. This budget outline does not include international facilitators or non-local participants.				

Abbreviations/ abbreviations

ACE	angiotensin-converting enzyme
ALT	alanine aminotransferase
AN	autonomic neuropathy
ANC	antenatal care
Aptt	activated partial thromboplastin time
ARF	acute rheumatic fever
ART	aspartate aminotransferase
BB	beta blocker
BMI	body mass index
BP	blood pressure
BUN	blood urea nitrogen
Cap	capsule
CBO	community-based organization
CCB	calcium-channel blocker
CDOP	chronic disease outreach program
CHF	congestive heart failure
CHW	community health workers
CKD	chronic kidney disease
COPD	chronic obstructive pulmonary disease
CSF	cerebrospinal fluid
CV	cardiovascular
CVD	cardiovascular disease
CVR	cardiovascular risks
DCM	district clinician manual
DEAD	the facility has been notified patient has died
DHIS2	district health information system 2
DKA	diabetic ketoacidosis
DM	diabetes mellitus
DoB	date of birth
EC	elevated creatinine
ECG	electrocardiogram
EIA	enzyme immunoassay
EMR	electronic medical record
EP	expert patients
EPT	expert patients who assume a training role
ERD	end-stage renal disease
FBG	fasting blood glucose
FBO	faith-based organization
FBS	fasting blood sugar (=FBG)
FCTC	framework convention for tobacco control
GAVI	Global Alliance for Vaccines
HbA1c	glycosylated haemoglobin
HCR	high cardiovascular risk
HEARTS	global hearts initiative working together to beat CVDs ****
HIV	human immunodeficiency virus
HMIS	health management information system
HPV	human papillomavirus
HR	heart rate
HTN	hypertension
IARC	International Agency for Research on Cancer
IMAI	Integrated Management of Adolescent and Adult Illness
IMNCI	Integrated Management of Newborn and Childhood Illness
IMPAC	Integrated Management of Pregnancy and Childbirth
INR	international normalized ratio (to express prothrombin time)***
IV	intravenous
LFT	liver function test
LMIC	low and middle income countries
LTF	lost to follow-up
mhGAP	WHO Mental Health Gap Action Programme
MI	myocardial infarction
MISS	the patient missed an appointment or drug pick up
mmol	millimoles
MN	motor neuropathy
MNCH	maternal, newborn, and child health
MOH	Ministry of Health
NCCP	national cancer control plan
NCD	noncommunicable diseases
NGO	nongovernment organization
NMH	WHO noncommunicable diseases and mental health cluster
NPMO	non-pharmacological management only
NPR	non-proliferative retinopathy
OP	overt proteinuria
OPD	outpatient department
PA	persistent albuminuria
PCNC	primary health care nurses
PDCA	Plan-Do-Check-Act
PEN	WHO Package of Essential Noncommunicable Disease ***
PHC	primary health care
PM	****
PN	peripheral sensory neuropathy
PPV	positive predictive value
PR	proliferative retinopathy
PVD	peripheral vascular disease
PCVD	prior cardiovascular disease (MI or stroke, not RHD or congenital)
QI	quality improvement
QoC	quality of care
RBF	results based financing ****
RBG	random blood glucose
RF	rheumatic fever
RHD	rheumatic heart disease

SARA	services available and readiness assessment- a WHO survey
SBG	*****
SHAKE	*****
SpO2	oxygen saturation
STEPS	WHO Stepwise approach to surveillance
Tab	tablet
TB	tuberculosis
TI	transfer in
TIA	transient ischemic attack
TO	transfer out
UNICEF	United Nations Children's Fund
VIA	visual inspection with acetic acid
VN	***
WHO	World Health Organization

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