IHCI

India Hypertension Control Initiative

TRAINING MANUAL

Contents

Introduction

India is facing the rising burden of non-communicable diseases (NCDs) in general and hypertension in specific. The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS) has given due recognition to this and has set a goal of 25% reduction in mortality due to non-communicable diseases by 2025. NPCDCS has initiated a population-based screening program (PBS) for hypertension, diabetes, and cancers of the breast, cervix and oral cavity. India Hypertension Control Initiative (IHCI), a multi-partner initiative, complements this screening program by strengthening the management of hypertension in primary health care settings. It aims to accelerate progress towards the Government of India's NCD target by supplementing and intensifying evidence-based strategies towards strengthening the building blocks of hypertension management and control. IHCI partners include the Ministry of Health & Family Welfare, Government of India, State Governments, Indian Council of Medical Research (ICMR) and World Health Organization (WHO) India. Resolve to Save Lives, an initiative of Vital Strategies, is a technical partner.

IHCI was launched in November 2017 and is currently operational across 26 districts in Punjab, Kerala, Madhya Pradesh, Telangana, and Maharashtra. The phase-2 of the project was launched in July 2019 and will cover a total of 100 districts across all Indian States.

The major aim of this module is to build competencies of health professionals at the primary health care level to treat hypertension as per the standard state-specific treatment protocol using a patient-centric approach. This module also aims to build capacity for strengthening drug logistic systems at the district and health facility levels. Additionally, this module provides strategies and guiding principles for information systems, monitoring and supervision of the hypertension control program.

This module has strived to avoid duplication of the existing modules of various cadres of health workers. It should be considered a supplement to the existing training materials for different cadres of health care providers under the NPCDCS.

States can use these modules for team-based training at the primary health care level such that all members are aware of the entire team’s roles to ensure the best outcomes for the patient as well as for control of hypertension in their areas.

This module has been jointly prepared by all partners of the India Hypertension Control Initiative.

Abbreviations

ASHA	Accredited Social Health Activist
AIDS	Acquired Immunodeficiency Syndrome
ACEI	angiotensin-converting enzyme inhibitor
ARB	angiotensin receptor blocker
App	application
ANM	auxiliary nurse midwife
BP	blood pressure
CCB	calcium channel blocker
CHEP	Canada Hypertension Education Project
CCU	cardiac care unit
CVDs	cardiovascular diseases
CKD	chronic kidney disease
CHC	community health centre
DBP	diastolic blood pressure
DH	district hospital
DLHS	District Level Health Survey
DDC	drug dispensing counter
EDL	Essential Drug List
ELM	Essential List of Medicine
FDC	fixed dose combination
FAQ	frequently asked questions
GoI	Government of India
HWC	Health and Wellness Centre
HTN	Hypertension
ID	identification details
IHCI	India Hypertension Control Initiative
LFU	loss to follow up
LMIC	Low- and Middle-income countries
MLHP	mid-level health provider
MoHFW	Ministry of Health and Family Welfare
NLEM	National Essential List of Medicine
NFHS	National Family Health Survey
NHM	National Health Mission
NPCDCS	National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke
NCDs	non-communicable diseases
OPD	outpatient department
PHC	primary health centre
Q	Quarter
RAS	Renin-Angiotensin System
RKS	Rogi Kalyan Samithi
SMS	short messaging system
SC	sub-centre
SBP	systolic blood pressure
TB	Tuberculosis

Chapter 1: Why focus on hypertension

Expected competency on completion of session: Ability to convey to patients, health care workers, and leaders the importance of treatment and control of hypertension.
Audience: Health care providers and facility managers.
In this session, you will learn about:

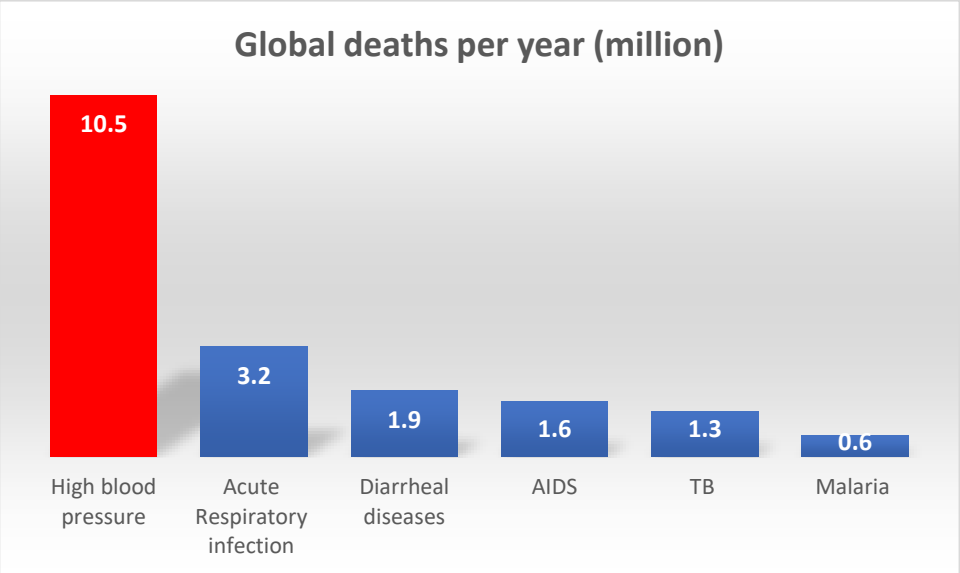
- Burden of cardiovascular disease and hypertension- global and Indian scenario
- Reasons to focus on hypertension
- Essential components of a scalable hypertension program

1.1. Reasons to focus on hypertension

a. Hypertension is the number one cause of mortality and morbidity: Cardiovascular diseases (CVDs), which include heart attacks and stroke, are the most common cause of mortality and morbidity across the world and are responsible for one-third of total deaths in India. While the deaths due to CVDs are decreasing in rich countries, they are increasing in low- and middle-income countries (LMICs).

Uncontrolled blood pressure is one of the main risk factors for CVD and is estimated to be responsible for more than 10 million deaths per year, which is more than all infectious diseases combined (*figure 1*). Hypertension contributes to an estimated 1.6 million deaths annually in India, due to ischemic heart disease and stroke.[1]

Figure 1: *High blood pressure is the world's leading killer* [2]



b. Large burden of hypertension - both globally and in India: An estimated 1.4 billion people worldwide have high blood pressure, but just 1 in 7 people have it under control.
With one in four adults detected with high blood pressure (DLHS 4 ≥18 years), it is estimated that there are more than 20 crore adults with hypertension in India. However,

less than half of them are aware of their hypertension status and less than one-tenth of all people with hypertension have their blood pressure under control (NFHS 4, 15-49 years).[3]

Repeated cross-sectional surveys have shown that the prevalence of hypertension has almost doubled in the past 20 years, with narrowing of the rural and urban gap. While the number of people with hypertension has increased over the years, the rates of blood pressure control have remained low.[4]

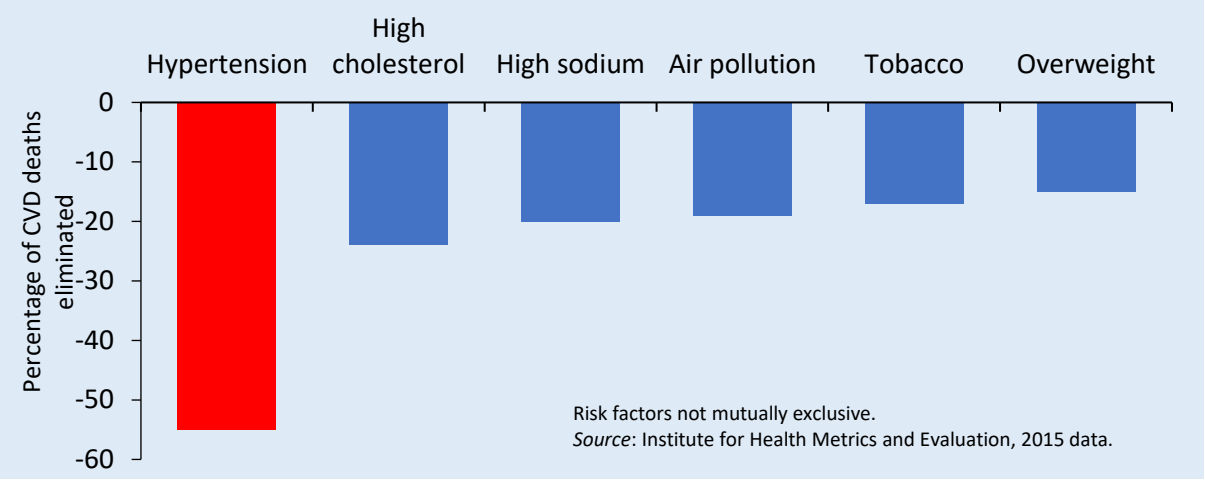
c. Hypertension control can save most lives: Hypertension is the number one cause of death. Improving blood pressure treatment will:

- Save maximum lives by preventing fatal heart attacks and strokes;
- Reduce disability, by preventing non-fatal heart attacks and strokes, and preventing dialysis;
- Reduce medical costs spent on caring for patients who are having heart attacks and strokes, and for the rehabilitation and nursing care needed in the aftermath of a stroke or heart attack;
- Improve productivity by reducing the number of people who are disabled by CVDs and are unable to work and who may require long-term nursing care.

Treatment of hypertension among adults in primary care can save more lives than any other primary care program. Deaths due to hypertension are largely preventable. In comparison to other evidence-based interventions for non-communicable diseases, control of hypertension has the largest potential to save lives *(figure 2)*.[5]

It is estimated that increasing coverage of antihypertensive medications to 70% of people with raised blood pressure alone can delay 39.4 million deaths globally over 25 years.[6]

Figure 2: *Hypertension control is key to reducing CVD deaths*



d. Hypertension control is simple, affordable and essential

- Easy to diagnose: Hypertension is easy to diagnose and requires only a well-functioning BP measuring device.
- Simple: Treatment of hypertension need not be complicated. Practical, precise, and simplified protocols such as those adopted by the India Hypertension Control Initiative (IHCI) are based on evidence generated from thousands of clinical trials over several decades. The protocol medications are safe and effective in lowering blood pressure and preventing CVDs.

- Affordable: The medicines to treat hypertension are inexpensive and available in generic form. Patients in all countries have access to the same medications, which are safe and effective. Further, the bulk purchase of medications for a single standard protocol-based treatment will reduce the cost further.
- Essential: Just as we give vaccines to children to prevent the development of illnesses against which we are vaccinating, we treat people with hypertension because there is, at present, no way to predict which patients will have a heart attack or stroke or other complications. And although many heart attacks and strokes occur among older people, death or disability from CVDs at a younger age is particularly tragic and preventable.

e. **Hypertension control program can be easily integrated in primary health systems:** More than 90% of hypertension cases can be managed by a primary care physician. The use of practical protocols and effective generic medications further simplify hypertension management. Further, most tasks related to hypertension management can be carried out by non-physicians – nurse, pharmacist, auxiliary nurse midwife (ANM). These tasks include and are not limited to blood pressure measurement, refilling medication for patients with controlled blood pressure, sending reminders to patients for follow up and recording and reporting.

   A well-functioning hypertension control program can impart discipline in management of non-communicable diseases (NCDs) in the primary health care system, thus increasing the system's confidence in managing NCDs.

f. **International experiences suggest high hypertension control rates are achievable:** In the early 1990s, hypertension control rates in **Canada** were low. The Canada Hypertension Education Project (CHEP) identified the gaps in awareness, treatment, and control of hypertension and focused on linking every individual to a primary health care system for screening, treatment and follow up of high blood pressure. As a result, the population-level control of hypertension improved from 13% in 1985-92 to 68% in 2012-13.[7] CHEP also demonstrated a reduction in rates of stroke, myocardial infarction, and cardiac failure. **Thailand** used a team-based approach to the management of hypertension in primary health care. Subsequent surveys showed significant improvements in hypertension control rates. From 2004 to 2014, the hypertension control rates increased by more three-folds (8.6% to 29.7%).[8,9]

1.2. Government of India's initiatives on hypertension control

The Government of India (GOI) has adopted a National Action Plan for the prevention and control of non-communicable diseases with specific targets to be achieved by 2025. These targets include:

- 25% relative reduction in overall mortality from cardiovascular diseases,
- 30% relative reduction in mean population intake of salt/sodium, and
- 25% relative reduction in the prevalence of raised blood pressure.

In order to achieve a 25% relative reduction in the prevalence of raised blood pressure by 2025, approximately 4.5 crore additional people with hypertension will need to have their blood pressure effectively treated.

The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) was launched in 2010 to address the rising burden of non-

communicable diseases in India. Under NPCDCS, a population-based screening program (PBS) has been initiated - for hypertension, diabetes, and cancers of breast, cervix and oral cavity. The India Hypertension Control Initiative (IHCI), a multi-partner initiative, complements this screening program by strengthening the management of hypertension in primary health care settings. IHCI provides a continuum of care to those diagnosed with hypertension during screening, by ensuring treatment, control, and documentation.

1.3. Essential components of scalable treatment of hypertension

Most patients with hypertension can be successfully managed by ensuring provision of five key components of care:

These 5 components are based on the Global Hearts Initiative and complement the NPCDCS.

The Global Hearts Initiative comprises five technical packages that provide a set of evidence-based interventions that, when used together, can potentially have a major impact on improving global heart health: (1) HEARTS for the treatment of hypertension in primary care services, (2) MPOWER for the reduction in tobacco use, (3) SHAKE for reduction in population salt consumption, (4) REPLACE action package to eliminate industrially-produced trans fats from the global food supply, and (5) Active technical package for increasing physical activity.

Key Messages

- More than 20 crore Indians have hypertension
- Less than half of those with raised blood pressure in India are aware of their status
- Less than one-tenth people with hypertension in India have their blood pressure under control.

Exercise 1: Estimate the number of persons with hypertension in your state/district

To do this exercise, we need information on (1) adult population of the state/district and (2) hypertension prevalence rate

(1) Adult Population of the state/district:

- Use the most recent census data for your state or district. Age disaggregated data for a district from 2011 census are available at http://www.censusindia.gov.in/2011census/C-series/C-13.html
- Get the total adults aged ≥ 30 years in the state/district

(2) Prevalence of hypertension: Use the most recent, comprehensive, population-level estimate of hypertension of the state/district.

- District Level Household Survey 4 (DLHS-4) conducting during 2012-13 provides hypertension prevalence estimates for states and most districts and can be accessed at http://rchiips.org/DLHS-4.html
- If your district prevalence is missing, assume the average rate of the state and if the state value is missing, use the national average (25%)
- If there is a more recent and reliable regional data available, please use that information

Calculate the total number of adults with hypertension:

Multiply the adult population (aged ≥30 years) & hypertension prevalence

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Chapter 2: Hypertension diagnosis & treatment using practical treatment procotols

Expected competency on completion of session:

- Ability to correctly measure blood pressure and diagnose hypertension.
- Ability to treat hypertension patients using a standardized protocol, follow up for adherence to treatment and manage associated co-morbidities to achieve target blood pressure control.

Audience: Healthcare providers, facility managers, supervisors

In this session you will learn about:

- Whose blood pressure should be measured?
- How to measure blood pressure?
- Diagnosis of hypertension
- Who should receive treatment?
- Medications used for treating hypertension (class, dose, side effects)
- Treatment goal for hypertension
- Standardized protocol adopted by the state
- Ensuring adherence to medication
- Lifestyle advices

2.1. Measurement of blood pressure

2.1.1. Whose blood pressure should be measured

Population-based screening: Under the population-based screening (PBS) program of NPCDCS, all adults in the population ≥30 years are to be screened for hypertension at least once every year.

Opportunistic screening at health facilities: High blood pressure can occur in young adults. About 12% of adults between 18-30 years have hypertension.[1] Therefore, it is recommended that all the adults aged ≥ 18 years visiting a health facility should undergo blood pressure measurement.

Most people with raised blood pressure have no symptoms and measurement of blood pressure is the only way to identify persons with high blood pressure. Therefore, it is important to measure the blood pressure of all adults attending out-patient clinics irrespective of their symptoms. Accurate measurement and recording of BP are essential for diagnosis and management of hypertension. Strategies to improve opportunistic screening at public health facilities are detailed in *chapter 4*.

Measure blood pressure of all adults ≥ 18 years visiting the outpatient clinic.

2.1.2. How to measure blood pressure

Preparation of the patient

- The patient should avoid tea/coffee, exercise, and tobacco use for at least 30 min before measurement.
- The patient should have rested for at least 5 minutes before measurement.
- Ensure s/he has emptied his/her bladder.

- When taking blood pressure, the patient should be seated, with back supported and both feet resting on the ground.
- The patient should not speak while blood pressure is being measured.

Choosing the cuff: The ideal cuff bladder length and width are ≥80 percent and ≥40 percent of the patient's arm circumference, respectively.

Arm circumference (cm)	**Recommended cuff size** (width x length in cm)
22-26	12x22 (small)
27-34	16x30 (medium)
35-44	16x36 (large)
45-52	45x52 (extra-large)

Applying the cuff

- Explain the procedure to the patient.
- If the patient is wearing a thick-sleeved garment, ask the patient to uncover the arm by either removing the top garment or rolling up the sleeve. If the cuff is tied over the clothing, ensure that it is tied snugly and evenly.
- The patient's arm should be supported on the table and relaxed.
- Make sure the arm cuff is properly deflated (air is out) before placing it around the patient's upper arm.
- Wrap the cuff comfortably or snugly above the elbow, about 2 cm (or 2 finger breadths) from the elbow and secure the Velcro tape.
- Keep the cuff at the heart level during measurement.

Taking a blood pressure measurement

a. Using a digital blood pressure device

- Turn the monitor on from the on/off button.
- Ask the individual to stay still, breathing normally, without talking or laughing.
- Press the START/STOP button to begin the measurement.
- The BP cuff will automatically start to inflate. This might be uncomfortable for some. Reassure the patient that the discomfort is temporary.
- The cuff will slowly deflate to take the measurement.
- When the reading is complete, the systolic (SBP) and diastolic blood pressure (DBP) readings and pulse rate will appear on the screen.
- Note the BP readings exactly as seen in the device in the patient record. Please do not round off.
- If the monitor/machine does not record the reading, re-position the cuff and try again after 1-2 minutes and repeat the above-mentioned steps.
- Turn the machine off and remove the cuff.

b. Using a manual instrument

- The cuff has a bulb at one end of the tube that you will squeeze to inflate the cuff.
- Apply the cuff on the individual's arm and place your stethoscope where you will be able to hear the sounds of blood flowing. The place is where you can feel the pulse. You can find the place by placing your index and middle fingers of one hand in the crease of a relaxed elbow.
- Put your stethoscope on and hold the head of the stethoscope in place.
- Screw the valve tight and inflate the cuff to 200 mmHg. Keep holding the stethoscope at the right spot.
- Slowly let the air out of the cuff while listening for the sounds of blood flowing. Keep a rate of deflation 2−3 mmHg per second (equals one line on the dial every second).
- When you start letting the air out, you should not hear any distinct sounds at first. You will then hear a thump, which will be followed by several other similar thumping sounds. The number on the dial when you heard the first thump is the patient's systolic blood pressure. The thumping sounds will eventually stop. The number on the dial when you heard the last sound is the patient's diastolic pressure.

Additional blood pressure readings

Although many guidelines recommend measuring multiple blood pressures at each visit, this may not be practical in a primary care setting.[2] These guidelines also frequently recommend discarding certain results and averaging others, a complex computational task that may be difficult, if not impossible, to do consistently and accurately in busy clinics and primary care health delivery systems.

A practical approach:

1. **If the first blood pressure (BP) is <140/90 mmHg, then no other blood pressure measurement is needed during that encounter**.
- There is a 95% chance that second BP will be lower than the first, so if the first BP is <140/90 mmHg, the mean blood pressure would be <140/90 mmHg.[3]

2. **If the first BP is >140/90 mmHg, perform a second BP and use the second reading as the recorded BP for the encounter.**
- Averaging the two measurements to determine mean BP in a busy primary care setting is a time-consuming exercise and is potentially prone to errors.
- The second BP is likely closer to the actual average than the first because the first BP measurement in a series is usually the highest. Subsequent repeated measurements have a tendency to be closer to the actual BP.

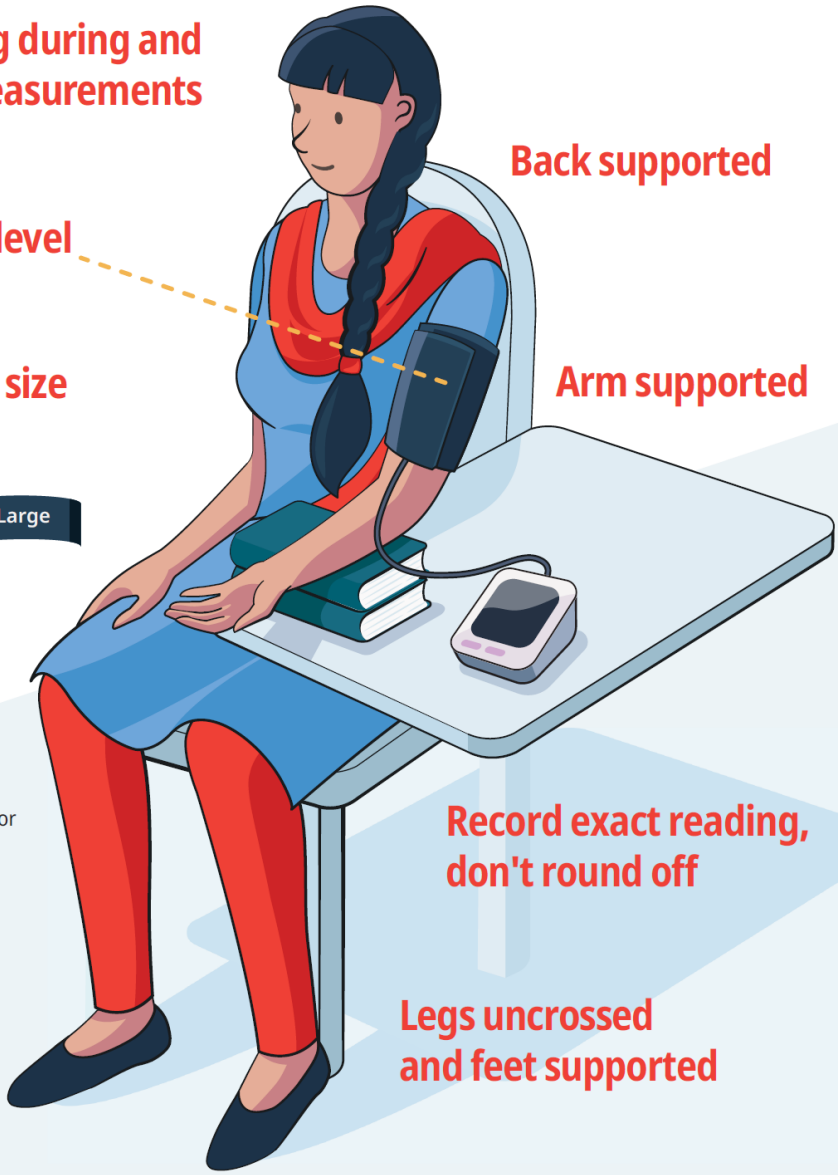
3. **If there is a large difference between the first and second reading (>5 mmHg), it is reasonable to do a third measurement and use the third BP as the recorded BP.**
- A third BP is often much closer to the second BP than to the first BP, moving the mean closer to the second and third BP measurements.

Table 1: *Common errors during BP measurement and their impact on measured BP* [4,5,6]

Error in Measurement	Variation in BP (mmHg)
Unsupported back/feet	6
Unsupported arm	10
Wrapping the cuff over clothing	5-50
Incorrect cuff size	2-10
Sitting with crossed legs	2-8
Talking	10
Full bladder	10

BP Measurement Checklist

Measure blood pressure of all adults ≥ 30 years



Ensure the person has not exercised, had tea/coffee, or used tobacco in the last 30 minutes
Person should rest comfortably and quietly for 5 minutes before the reading

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2.2. Diagnosis of hypertension

- Hypertension diagnosis is established if the **systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg, on two different days**.
- However, if the blood pressure is ≥160 mmHg or ≥100 mmHg at the first reading, second reading should be taken on the same day to establish the diagnosis.
- If the patient has other symptoms requiring immediate treatment in addition to high blood pressure, the diagnosis and treatment of hypertension are at the discretion of the medical officer.
- If the patient had the blood pressure measurement done during the screening program at the community level, then the BP reading during clinic visit can be considered as the second reading.
- If only the systolic, or only the diastolic blood pressure is raised, manage according to the higher number.

Key Messages

- Measure blood pressure of all adults visiting the out-patient clinic.
- Diagnosis of hypertension is made if the systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg, on two visits on different days.

Exercise 2: Practice measuring blood pressure

2.3. Treatment of hypertension

2.3.1. Who should receive hypertension treatment?

Hypertension treatment is indicated for all adults diagnosed with hypertension as defined in the previous section (**SBP ≥140 mmHg** and/or **DBP ≥90 mmHg**, on two different days). Patients with SBP ≥160 mmHg or DBP ≥100 mmHg may be indicated for immediate treatment.

2.3.2. The goal of hypertension treatment

The goal of hypertension treatment is to keep blood pressure under control. BP is considered under control when the systolic blood pressure is <140 mmHg **AND** diastolic blood pressure is <90 mmHg.

2.3.3. Available medications for treating hypertension

Three main classes of medications are recommended for the first-line treatment of hypertension - calcium channel blockers, renin-angiotensin system (**RAS**) inhibitors (Angiotensin receptor blockers and Angiotensin-converting enzyme inhibitors), and thiazide/thiazide-like diuretics. **Amlodipine, telmisartan, and chlorthalidone are the medications of choice in the standardized treatment protocols being followed in most States**.

Other medications can be added as substitutes and in special cases. The various medications used for the treatment of hypertension are mentioned below:

Table 2: *Common medications used in the management of hypertension*

Class	Medication	Starting dose	Intensification dose	Important notes
Calcium channel blocker	Amlodipine	5 mg	10 mg	○ Doesn't require any metabolic monitoring. Therefore, a good first choice for primary health centers ○ Can be given to women in childbearing age who may become pregnant Ankle oedema ~10% cases (particularly at 10 mg dose and absence of ACEI/ARB)
Angiotensin receptor blocker (ARB)	Telmisartan	40 mg	80 mg	○ **Should not be given to women who are or may become pregnant** ○ Benefits some patients with kidney disease, prior heart attack, and low ejection fraction ○ Addition of ARB to CCB reduces the incidence of ankle oedema ○ ARB and ACE-I should not be combined together Risk of hyperkalemia especially if the patient has CKD – consider checking serum creatinine and potassium before initiating treatment and thereafter at least once a year.
	Losartan	50 mg	100 mg	
Angiotensin converting enzyme (ACE) inhibitor	Enalapril	5 mg	10 mg	○ **Should not be given to women who are or may become pregnant** ○ Benefits some patients with kidney disease, prior heart attack, and low ejection fraction ○ Addition of ACE inhibitors to CCB reduces the incidence of ankle oedema ○ Can cause persistent cough ~ 10% cases ○ ARB and ACE-I should not be combined together Risk of hyperkalemia especially if patient has CKD – consider checking serum creatinine and potassium before initiating treatment and thereafter at least once a year
Thiazide or thiazide-like diuretics	Hydrochlorothiazide	25 mg	50 mg	○ **Should not be given to women who are or may become pregnant** ○ Risk of hypokalemia – consider checking serum creatinine and potassium before initiating treatment and thereafter at least once a year. Using along with ACE Inhibitor/ARB will reduce the risk of hypokalemia
	Chlorthalidone	12.5 mg	25 mg	
Beta-Blocker	Atenolol	50 mg	100 mg	○ N**ot the first choice of drug** for the treatment of hypertension ○ Recommended to be added to initial treatment of patients with a history of a heart attack within the last 3 years or atrial fibrillation or heart failure **Should not be stopped abruptly** as withdrawal may worsen symptoms of angina. Should be tapered over 5-10 days.

In addition to above anti-hypertensive medications, below medicines can be used in specific cases:

- **Low dose aspirin**: 75 mg aspirin once a day is recommended to be given to patients with a history of heart attack or stroke.
- **Statins:** Atorvastatin 10 mg is recommended in patients with a history of heart attack or stroke. Should not be given to women who are or may become pregnant.

Fixed-dose combinations

A high proportion of people with hypertension require two or more drugs to achieve BP control. Fixed-dose combinations (FDC) medication includes two or more classes of anti-hypertensives in a single pill. FDC initial treatment compared to initial single drug treatment provides:

- Reduced number of pills resulting in less burden on the patient
- Improved adherence to therapy
- Greater and more rapid blood pressure reduction
- Reduced CVD in observational data
- Drug combinations with single drugs in clinical practice are often suboptimal

Potential disadvantages of FDCs include a lesser ability to individualize drug titration and to identify adverse drug effects. In addition, there must be no contraindication for both drug components.

In July 2019, the World Health Organization included four FDCs for hypertension management in its Essential medical list (EML)[7].

Table 3: *Fixed-dose combinations of antihypertensive drugs in WHO's essential medicines list* [7]

Classes	Combination drugs	Doses
ACEI+ CCB	lisinopril + amlodipine	10 mg + 5 mg; 20 mg + 5 mg; 20 mg + 10 mg
ACE+ thiazide diuretic	lisinopril + hydrochlorothiazide	10 mg + 12.5 mg; 20 mg + 12.5 mg; 20 mg + 25 mg
ARB+CCB	telmisartan + amlodipine	40 mg + 5 mg; 80 mg + 5 mg; 80 mg + 10 mg
ARB+ thiazide diuretic	telmisartan + hydrochlorothiazide	40 mg + 12.5 mg; 80 mg + 12.5 mg; 80 mg + 25 mg

2.3.4. Use a standardized protocol

The ability to rigorously follow a standardized hypertension protocol is an important step to achieve a target BP control. The standardized protocol defines short specific steps to achieve treatment goals and is different from clinical guidelines provided by professional bodies. Table 4 provides the differences between a standardized protocol and clinical guidelines.

Table 4: *Differences between protocol and guidelines*

	Protocol	Guidelines
Scope	Specific for a local setting (district/state/hospital)	Summary of evidence-based practices issued by professional bodies
Complexity	Low	High
Length	One page	50-500 page
Specificity	High- specific information such as Drug name and dose	Low- Drug classes and many drug options
Dose	Dose titration with specific drug and dose	Overall titration approach
Use in primary care	Easy to understand and implement at primary care level	Better understood by experts
Public health context	Easy to implement at scale	Challenging to implement at scale

Benefits of using standardized, evidence-based protocols:

- Reduces unwarranted clinical variability and inappropriate therapeutic inertia
- Enables the health care team to advance patients safely and efficiently along the treatment pathway
- Sends a strong signal to clinical staff that hypertension control is a priority
- Results in a more efficient and cost-effective selection of medications and treatment approaches
- Facilitates logistics, training, supervision, evaluation, and overall program implementation and increases the impact of treatment programs
- Can potentially be incorporated into electronic health records through clinical decision support tools, registry functions, and measurement to facilitate quality improvement.

Common strategies used for escalation of antihypertensive drugs [13]

- Start with one drug, titrate to the maximum dose, and then add a second drug
- Start with one drug and then add a second drug before achieving the maximum dose of the initial drug
- Begin with 2 drugs at the same time, either as 2 separate pills or as a single pill combination

This module provides two commonly used protocols in India *(see page no 20 & 21)* and the protocol of your state may be slightly different. However, the goals and principles of the standardized protocol remain the same.

Please note that:

- Medical Officers should follow the state-specific standardized protocols.
- It is important to be familiar with the side effects of the different protocol medications in order to make an informed decision and be able to recognize them on follow up.
- In any protocol, the health care provider must consider the treatment targets and be familiar with the medications.

The goal of the hypertension treatment is to reach systolic BP <140 **AND** diastolic BP <90 mmHg.

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Hypertension Protocol

Measure blood pressure of **all adults** over 30 years

High BP: **SBP ≥ 140** or **DBP ≥ 90** mmHg

Check for compliance at each visit before titration of dose or addition of drugs .

Step 1 — If BP is high:*
Prescribe Amlodipine 5mg

Step 2 — After 30 days measure BP again. If still high:
Increase to Amlodipine 10mg

Step 3 — After 30 days measure BP again. If still high:
Add Telmisartan 40mg

Step 4 — After 30 days measure BP again. If still high:
Increase to Telmisartan 80mg

Step 5 — After 30 days measure BP again. If still high:
Add Chlorthalidone 12.5mg**

Step 6 — After 30 days# measure BP again. If still high:
Increase to Chlorthalidone 25mg**

... After 30 days measure BP again. If still high:
Check if the patient has been taking medications regularly and correctly. If yes, refer to a specialist.

* If SBP ≥ 180 or DBP ≥ 110, refer patient to a specialist after starting treatment.
If SBP 160-179 or DBP 100-109, start treatment on the same day.
If SBP 140-159 or DBP 90-99, check on a different day and if still elevated, start treatment.

** Hydrochlorothiazide can be used if Chlorthalidone is not available (25 mg starting dose, 50 mg intensification dose).

Pregnant women and women who may become pregnant

⚠ DO NOT give Telmisartan or Chlorthalidone.
- Statins, ACE inhibitors, angiotensin receptor blockers (ARBs), and thiazide/thiazide-like diuretics should not be given to pregnant women or to women of childbearing age not on effective contraception.
- Calcium channel blocker (CCB) can be used. If not controlled with intensification dose, refer to a specialist.

Diabetic patients
- Treat diabetes according to protocol.
- Aim for a BP target of < 140/90 mmHg.

Heart attack in last 3 years
- Add beta blocker to Amlodipine with initial treatment.

Heart attack or stroke, ever
- Begin low-dose aspirin (75mg) and statin.

People with high CVD risk
- Consider aspirin and statin.

Chronic kidney disease
- ACEI or ARB preferred if close clinical and biochemical monitoring is possible.

Lifestyle advice for all patients

Avoid tobacco and alcohol | Exercise 2.5 hr/week | Reduce salt, under 1 tsp/day | Eat less fried foods

Eat 5 servings of fruits and vegetables per day.

Avoid papads, chips, chutneys, dips, and pickles.

Use healthy oils:
E.g. sunflower, mustard, or groundnut.

Limit consumption of foods containing high amounts of saturated fats.

Reduce weight if overweight.

Reduce fat intake by changing how you cook:
- Remove the fatty part of meat
- Use vegetable oil
- Boil, steam, or bake instead of fry
- Limit reuse of oil for frying

Avoid processed foods containing trans fats.

Avoid added sugar.

Standardized treatment protocol -ATTACC

India Hypertension Control Initiative

Hypertension Protocol

Measure blood pressure of **all adults** over 30 years

High BP: **SBP ≥ 140** or **DBP ≥ 90** mmHg

Check for compliance at each visit before titration of dose or addition of drugs .

Step 1 If BP is high:*
Prescribe Amlodipine 5mg

Step 2 After 30 days measure BP again. If still high:
Add Telmisartan 40mg**

Step 3 After 30 days measure BP again. If still high:
Increase to Telmisartan 80mg

Step 4 After 30 days measure BP again. If still high:
Increase to Amlodipine 10mg

Step 5 After 30 days measure BP again. If still high:
Add Chlorthalidone 12.5mg**

Step 6 After 30 days# measure BP again. If still high:
Increase to Chlorthalidone 25mg**

... After 30 days measure BP again. If still high:
Check if the patient has been taking medications regularly and correctly. If yes, refer to a specialist.

* If SBP ≥ 180 or DBP ≥ 110, refer patient to a specialist after starting treatment.
If SBP 160-179 or DBP 100-109, start treatment on the same day.
If SBP 140-159 or DBP 90-99, check on a different day and if still elevated, start treatment.

** Hydrochlorothiazide can be used if Chlorthalidone is not available (25 mg starting dose, 50 mg intensification dose).

Pregnant women and women who may become pregnant

▲ DO NOT give Telmisartan or Chlorthalidone.
- Statins, ACE inhibitors, angiotensin receptor blockers (ARBs), and thiazide/thiazide-like diuretics should not be given to pregnant women or to women of childbearing age not on effective contraception.
- Calcium channel blocker (CCB) can be used. If not controlled with intensification dose, refer to a specialist.

Diabetic patients
- Treat diabetes according to protocol.
- Aim for a BP target of < 140/90 mmHg.

Heart attack in last 3 years
- Add beta blocker to Amlodipine with initial treatment.

Heart attack or stroke, ever
- Begin low-dose aspirin (75mg) and statin.

People with high CVD risk
- Consider aspirin and statin.

Chronic kidney disease
- ACEI or ARB preferred if close clinical and biochemical monitoring is possible.

Lifestyle advice for all patients

Avoid tobacco and alcohol | Exercise 2.5 hr/week | Reduce salt, under 1 tsp/day | Eat less fried foods

Eat 5 servings of fruits and vegetables per day.

Avoid papads, chips, chutneys, dips, and pickles.

Use healthy oils:
E.g. sunflower, mustard, or groundnut.

Limit consumption of foods containing high amounts of saturated fats.

Reduce weight if overweight.

Reduce fat intake by changing how you cook:
- Remove the fatty part of meat
- Use vegetable oil
- Boil, steam, or bake instead of fry
- Limit reuse of oil for frying

Avoid processed foods containing trans fats.

Avoid added sugar.

2.3.5. Patient education

Adherence to medication
To promote adherence to medication, the IHCI has adopted the following strategies:

1) Standardized protocol
2) Uninterrupted drug supply
3) Free drugs
4) Once a day schedule for drug intake

Additionally, patients should be counselled on the following:

- **Education- Explain**
  - The diagnosis and the need for life-long medication;
  - Difference between medicines for long-term control (as in hypertension) and medicines for quick relief (such as for headaches);
  - The damage to target organs if blood pressure is uncontrolled (i.e. the possibility of stroke, heart attack, or kidney failure);
  - How to take medications at home. Show the patient the appropriate dose;
  - Medication should be consumed every day at a fixed time when the patient can remember
  - The importance of
    - Keeping enough supply of medications at home till the next visit to the health facility;
    - Taking the medicines regularly as advised, even if there are no symptoms;
  - Potential adverse effects of the medications and what to do

  Most importantly check the patient's understanding before the patient leaves the health centre

- **Reminders:**
  - Encourage patients to use medication reminders, such as alarms and smartphone applications;
  - Implement patient reminder systems (e.g., e-mail, phone calls, text messages), where possible, to ensure patients adhere to their medication regimen.

A physician can help to increase a patient's compliance with treatment by:

- **Motivation:**
  - Good patient-health care provider relationship;
  - Positive feedback: praise adherence through positive feedback and encouragement.

Lifestyle management

Treatment of hypertension must be accompanied by healthy lifestyle choices. This will complement the treatment and address various aspects of healthy choices that aim for overall health improvement. Practical advice is as follows:

- Advise all patients against tobacco use and alcohol intake.
- Suggest ways to increase their physical activity, to improve overall health and weight control.

- Adopt a healthy diet – reduce salt intake (less than 5 g salt per day including salt in processed foods, and salt added while cooking or eating), use healthy oils, increase fruit and vegetable intake, limit red meat, prefer fish and foods rich in omega-3 fatty acids, limit consumption of fried foods, processed foods and foods high in saturated fat, and avoid added sugar.

Table 5: *Effect of changes in lifestyle on systolic blood pressure* [8]

Lifestyle changes	Dose	Approximate Reduction in SBP	
		Hypertension	Normotension
Weight loss	-1 mm Hg for every 1 kg loss	-5 mm Hg	-2/3 mm Hg
Healthy diet (DASH diet)	Rich in fruits vegetables, whole grains, and low-fat dairy products Reduced saturated and trans fat	-11 mm Hg	-3 mm Hg
Sodium reduction	<1500 mg/d is optimal goal	-5/6 mm Hg	-2/3 mm Hg
Increased Potassium	3,500-5000 mg/d, preferably through dietary sources	-4/5 mm Hg	-2 mm Hg

2.3.6. Treatment inertia

Treatment inertia is defined as a failure to increase the dose of medication or add another medication when a patient's blood pressure is not under control. The potential reasons and solutions are provided below.

a. The doctor may not notice the high BP recording due to busy crowded clinics
    - A nurse or other staff may highlight the raised BP reading for the doctor (using colour pen/highlighter or symbol)
b. BP readings are borderline high
    - Discussed in the FAQs (page 26)
c. The doctor suspects that the patient might have missed medications
    - The nurse should ask detailed history to understand the patient's adherence. How to address missed medications is discussed in FAQs (page 26-27)
d. A patient might have reported adverse effects
    - Change medications to a different class

It is difficult for a clinician to make a decision with one high BP reading. A well-maintained record (paper/electronic) with multiple BP readings can help the clinician understand the trend of blood pressure and make an informed decision.

2.3.7. Frequently asked questions (FAQs) on hypertension treatment

i. How to manage patients with borderline high blood pressure?

Anti-hypertensive medication should be escalated to the next step in the protocol if blood pressure is equal or slightly higher than systolic 140 mmHg or diastolic 90 mmHg. Evidence suggests that cardiovascular risk increases with every mmHg rise in blood pressures beyond SBP 115 mmHg and DBP 75 mmHg. [9]

A clinical trial that aimed to compare intensive blood pressure control (SBP <120 mmHg; intensive group) and standard control (SBP<140 mmHg; standard group) showed that the intensive group had 27% lesser cardiovascular events compared to the standard group. [10] Additionally, treatment adverse effects were similar between both groups. Though some **specific adverse events** (hypotension, electrolyte abnormality, acute kidney injury)[11] were higher in the intensive treatment group, most were *mild transient events;* contrast this with mortality or lifetime disability from a major stroke or heart attack.

ii. How should medications be managed when a patient on medications has lower than normal blood pressure?

If the systolic BP is below 110 mmHg: For asymptomatic patients, discontinue one medication (usually the last medication prescribed)

If systolic BP is below 90mmHg & asymptomatic:

- Stop all antihypertensive drugs until blood pressure is re-assessed (ideally within the next seven days).
- Evaluate the causes of low blood pressure - side effects from other medications, dehydration, acute inflammatory conditions, or measurement error.
- Request the patient to return for repeat blood pressure measurement

If systolic BP is below 90mmHg & symptomatic: Significant symptomatic reductions in blood pressure require immediate individualized assessment and management.

iii. How to treat a patient who is already on non-protocol drugs?

If a patient is on non-protocol drugs

- BP is <140/90:continue to use the same medication(s).
- BP is ≥ 140/90: move to/add on protocol medicines.
- Non-protocol drug is not available at facilities: replace with protocol medicines

Most patients who are on treatment in public health facilities in India are likely to be on β blockers, specifically atenolol. β blockers are no longer recommended as the primary treatment of hypertension.

If a patient has controlled blood pressure using β blockers, the same can be continued. However, if the BP is uncontrolled, s/he should be started on protocol drugs and β blockers should be tapered off. **Please note that β blockers should not be stopped suddenly**. This is because a sudden withdrawal of β blockers may exaggerate symptoms of coronary artery disease. Therefore, it is recommended that the β blocker should be tapered over 5-10 days. *For example, for a patient currently taking Atenolol 50 mg 1 tab daily, prescribe Atenolol 50 mg ½ tab daily along with amlodipine 5 mg once daily. After one week, stop Atenolol and continue Amlodipine.*

iv. What is the best practice for managing treatment interruption/missed medication doses?

"Doctor, I usually take my high blood pressure medicine every day—but not today!" This patient story is familiar to health care workers who manage blood pressure all over the world. The only solution to the missed medication dose scenario is to instruct the patient to take their medications and repeat the blood pressure measurement while on the medication, for example, one week later. Health care workers should not guess what the treated blood pressure would be, as individual patients respond differently to antihypertensive medications.

v. Is it better to take antihypertensive medications in the morning or evening?

The general advice is to take when patient is most likely to remember. Some programs recommend after brushing teeth in the morning. There is insufficient evidence to suggest that taking at any particular time is better – other than at the time when patient is most likely to remember it. It is important to take medication at the same time every day!

vi. How should amlodipine induced ankle oedema be managed?

Treatment of ankle oedema will depend on its severity and other patient factors. Mild oedema which is not troublesome to the patient does not require specific treatment. Whilst ankle oedema associated with amlodipine is rarely clinically serious, it may significantly reduce patient adherence. It is usually refractory to diuretic treatment as it is due to changes in capillary pressure leading to leakage into surrounding tissues, rather than due to water retention. Treatment strategies include:

- Non-pharmacological interventions: Elevation of legs when in a prone position, or graduated compression stockings may help in mild cases
- *Reduce dose:* For example, if on 10 mg amlodipine, reduce the dose to 5 mg.
- *Add ACEI or ARB:* Studies have shown that adding an ACEI or ARB to amlodipine reduces the incidence of ankle oedema. This may be due to the dilatation of venous vessels, which may then lead to a reduction in capillary hypertension and therefore leakage of fluid into the surrounding tissues.
- *Discontinue & switch to other medications:* If the above three options fail, discontinue amlodipine and switch to an antihypertensive from another class of drugs.

vii. If a medication in the protocol is not available, can another medication from the same drug class be substituted? *(E.g. substitute Telmisartan by Losartan or Chlorthalidone by Hydrochlorothiazide)*

Absolutely. In general, all antihypertensive medications lower blood pressure effectively. Most guideline development groups do not distinguish amongst specific drugs in a particular class based on drug efficacy.[12] Use the equivalent doses of the alternative drugs as provided in table 2. However, please note that the uninterrupted availability of protocol medications is the key strategy of IHCI. The program expects a seamless supply of protocol medications by improving drug forecasting and supply logistics *(ref chapter 3).* Therefore, it is expected that the need for substitution is required less frequently.

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Chapter 3: Drugs & Technology

Expected competency on completion of session:

- Understand medication supply chain and facility-level drug stock goals.
- Understand various types of BP devices and advantages of digital devices in public health

Audience: Program managers, health care providers, facility pharmacists

In this session, you will learn about:

- Basics of drug supply chain
- Measures to ensure continued availability medication at the health facility
- Monitoring drug availability
- Types of BP monitors
- Advantages of digital BP devices

3.1. Regular and uninterrupted availability of medication

Ensuring access to an uninterrupted supply of medications to people with hypertension is one of the key components of IHCI.

Stockouts inadequacy/shortage of drugs:

- Increases the risk of lack of adherence to treatment & loss to follow up
- Damages the credibility of the health care system/program.

Appropriate forecasting, procurement, stocking, and equitable distribution can ensure uninterrupted availability of medications. In this section, we describe basic principles of drug logistics management and focus on specific activities to be carried out at the level of health facilities to ensure adequate availability of medications.

3.1.1. Drug supply chain:

The drug supply chain cycle in the public health care system begins with the selection of drugs and ends with dispensing to patients. A typical supply chain can be outlined as below:

A. **Selection of drugs:** The first step in the drug supply chain is the selection of drugs that need to be procured. Generally, the drugs included in the National List of Essential Medicines (NLEM) or the State Essential Drug List (EDL) would be selected.

ESSENTIAL LIST OF MEDICINES (ELM) ***is a limited list of carefully selected medicines that satisfy the health care needs of the majority of a population.*** *The concept of ELM was introduced by WHO in 1975 and ELM* has been shown to improve the quality and cost-effectiveness of health care delivery when combined with proper procurement policies and good prescribing practices.
The National List of Essential Medicine (NLEM) is revised on a regular basis. Additionally, the States also have their own Essential Drug Lists based on states' disease burden. Typically, the drugs that are in the essential list would be in the State's procurement and supply chain plan.

B. **Forecasting**: Forecasting is the process of determining the quantity of medication to be required in a set timeframe (typically annually). It is the most important step in ensuring adequate drug availability. Commonly used methods of forecasting are (1) Consumption-based and (2) Morbidity-based.

B.1. The consumption-based method uses data of past consumption of individual medicines or products to project future needs. This method assumes that the previous supply was adequate and uninterrupted. Therefore, the consumption-based method can significantly underestimate the drug requirement if there were drug shortages or stock-outs in the previous year. Further, this method cannot account for changes in disease burden, treatment-seeking behaviours, and treatment protocols. This method cannot be used when a new drug is introduced as there is no data on past consumption. Typically, most states use the consumption method for forecasting annual drug requirements for various disease control programs.

B.2. The morbidity-based method estimates the need for specific medicines or products, based on the frequency of disease (using surveillance and demographic data), expected burden at the health facilities (using service delivery data), and standard treatment guidelines. This method is recommended for an evolving program such as IHCI.

The morbidity-based method is complex, time-consuming and uses several assumptions at the beginning of a program that need to be validated with programmatic data after large scale implementation of the program and revised accordingly.

Table 1: *Comparison of consumption & morbidity-based methods of forecasting*

Method	Strength	Limitation
Consumption-based method	Reliable when • A drug is been used regularly in the past • No major changes expected in demand, such as an increase in the number of cases or changes in the treatment protocol • No major shortages or stock-outs in the previous year	Is not useful when • A new drug is introduced • Changes in disease burden, treatment-seeking, and protocols of treatment • Major drug shortages or stock-outs in the previous year

Morbidity-based method	Used when • A new drug is introduced • Anticipated changes in disease burden, treatment-seeking behavior, and protocols of treatment • Major drug shortages or stock-outs in the previous year • Reliable sources of information on morbidity pattern are available	Is not useful when • Prevalence/morbidity data is not available or outdated. • No standard treatment guidelines May not be needed if the program is stabilized

Procurement: The majority of the public procurements are done through a tender process. The procurement of drugs under the public health system in the state can either be centralised (State level)or decentralised (District level). Additionally, there usually is provision for need-based emergency procurement at the district/health facility level (the proportion varies from state to state). Apart from State/NHM funds, health facilities also have their local funds such as Rogi Kalyan Samiti (RKS) funds using which drugs can be procured as a stop-gap measure in case there is a disruption in supplies.

Storage and Distribution: Drugs procured from suppliers/manufacturers are generally received and stored at regional or district-level warehouses. Supplies to health facilities are made from warehouses at a predefined frequency. The frequency of distribution and mode of last-mile delivery of drugs from the regional/ district stores to health facility stores varies between states.

Some states/districts supply directly to health facilities from the warehouses while in other states/districts, supplies are sent to block health facilities and thereafter distributed to all facilities in the block.

3.1.2 Key considerations to ensure uninterrupted drug supply under IHCI

A. State level: State Programme Managers & drug procurement corporation officials

a. Essential Drug List: Under IHCI, each state has adopted a specific treatment protocol for the management of hypertension. The treatment protocols generally consist of three classes of drugs: calcium channel blockers (Amlodipine), angiotensin receptor blockers or ACE inhibitors (Telmisartan or Enalapril), and thiazide or thiazide-like diuretics (Chlorthalidone or Hydrochlorothiazide). It is important to ensure that all the recommended treatment protocol drugs are:
   - Included in the essential drug list (EDL) of the state.
   - In the list of medicines to be procured for all levels of healthcare, i.e. primary, secondary & tertiary.

b. Annual forecasting of the drugs at the state: Under IHCI, the recommended hypertension treatment protocol may be different from the previous drug prescription patterns. In addition, with increasing registrations of patients (both through population-based screening and opportunistic screening) and strategies to ensure their return to care, it is expected that there would be a steady increase in the use of the protocol drugs.

Therefore, the ***consumption-based method is not suitable*** for drug forecasting and ***morbidity-based method should be used***. When the program reaches saturation of patient registration and uninterrupted availability of the drugs has been ensured for 2-3 years, then the consumption-based method may be used for future forecasting.

Based on the best available assumptions, tools are available for estimating drug requirements for both AATTCC and ATTACC Protocols. The officials may reach out to the IHCI officers at WHO and/or ICMR to receive the customised tools. Further, IHCI will provide technical support to states in the adoption of the tools to the states.

c. State Procurements:

- ***Rate contracts*** (fixed rate with flexibility on quantity to be procured within the duration of the contract) ***should be preferred over quantity contract*** (fixed quantity procurement under a contract) as it allows flexibility of periodic procurement and quantity correction based on actual consumption.
- ***A multi-year rate contract*** is useful in cutting down tender processes every year, enhancing supplier's confidence in the system and attaining price stability.
- ***Rate contract with multiple suppliers*** helps to have an alternate supply source in case of supply failure/noncompliance by a particular supplier.
- ***Periodic/scheduled procurement*** **(**bi-monthly/quarterly procurement based on inventory level) or procurement with scheduled supply should be preferred over one-time procurement.
- It is very important to have rate contracts in continuity. Tenders must be initiated well in advance. A practical suggestion would be at least 4 months prior to the expiry of existing rate contracts (typically it takes about 4 months for the procurement process).

B. District level: District Programme Managers & Warehouse Pharmacists

a. Drug stock goals

- Combined stock available at the facilities plus warehouse should meet at least 6 month's requirements (This includes the buffer/safety stock to cater to supply delays or an unexpected surge in drug uptake).
- If the stock is lower than 6 months requirement, then supply should be sought from the vendor (for decentralized procurement) or Follow up with the state procurement agency. (For centralized procurement)
- At any point in time, health facilities in the district should have 2-3 months stock of medicines

- ***No health facility should have less than the one-month stock*** of any protocol drug at any time.

Note*:*

- The stock levels are expressed as 'months of stock' which indicates how long the drugs will last. For example, 2 months of stock means the stock will last for another two months.
- *6 months requirement is recommended considering a minimum 2-3 month's stock at the field level, typical lead time (time taken between the purchase order placed and goods received) which is about 60 days and quarantine time (time lag for getting quality clearance of the received drugs) of 15-20 days. If orders are not placed in time, then these supplying stores can run out of stock, disrupting the supply chain.*

b. Storage and Distribution: Ensuring adequate availability of the drug at each service delivery point is more important than overall availability at the district/state level. To estimate the requirements at each health facility, a ready reckoner *(Annexure C & D)* may be used.

Overstocking at some health facilities and stockout/ shortage at others are often seen in public health settings due to disproportionate requisition by a health facility or allocation by warehouses. The distribution of medications usually follows one of the following systems:

- *Requisition system (Pull system):* Person receiving the supplies calculates the required quantity. (May use ready reckoners in Annexure C & D)
- *Allocation system (Push system)*: Person supplying calculates the required quantity. (May use ready reckoners in Annexure C & D)

Drug distribution to health facilities should be based on patient load (total patients registered) and stock already available at the health facilities. It can be either through the "Pull" or "Push" system

C. Facility level: Medical Officers/ Pharmacists

a. *Drug stock goals at a health care facility:* At any point in time, health care facility should have stock in the range of 2-3 months stock

Facilities should avoid having less than the one-month stock of any protocol drug at any time.

Note: The stock levels are expressed as 'months of stock' which indicates how long the drugs will last. For example- 2 months of stock means the stock will last for another two months.

b. Inventory management at the health facility level: Maintaining optimal levels of drugs at a health facility ensures continuity of treatment of all patients and reduces wastages.

- A typical health facility that receives a once a month supplyshould maintain 2-3 months stock. (If the facility receives the supply with longer gaps (e.g. 2 to 3 months) then it should use the Min-Max inventory levels (Annexure E).

- At the beginning of the program, ensure a 3-month stock.
- Refilling quantity should be decided considering max-inventory level based on the frequency of the supply. If the stock requirement is dynamic based on patient load, ready reckoner *(Annexure C& D)* may be used to estimate the stock.
- To calculate indent, subtract the current stock from the 3- month stock requirement (If drug supply is monthly). For other supply which is longer than a month subtract from the maximum requirement as in Min-Max calculation (See Annexure E)

c. Dispensing of drugs: As per the treatment protocol, patients are called for treatment follow-up after one month. Therefore the drug should be prescribed and dispensed for at least 30 days. Dispensing should be done with a clear message on the importance of regular medication and the consequences of non-adherence.

d. Maintenance of records: In many states, in addition to supply from states, the health facilities receive drugs from other local resources such as Panchayat funds or untied funds or donations. Health facilities should maintain records of receipt and issue of all drug stocks, irrespective of the source, preferably in a single stock ledger. Health facilities should regularly update the records and report the actual status in the quarterly/monthly reports.

The following records are usually maintained:

- Drug store records
  - Stock Ledger: "Stock ledgers " should reflect both stock in hand and transaction history (receipt & issue).
  - Logistics Management Information System (LMIS): Presently, almost all states are using IT-enabled drug supply chain management systems in all transactions related to the receipt and the issue of stock should be updated.
- Drug dispensing counter records

We suggest including *two recording systems at the DDC*

  - Daily Consumption record at Drug Dispensing Counter (DDC) (See Annexure A)
  - Patient wise service uptake at drug distribution counter (Annexure B).

D. Monitoring by programme supervisors

i. Point of assessment:

- All the health facilities - Main stores and drug distribution counters (DDC)
- District level/regional level stores

ii. Source of data:

- **Stock ledger:** In general, facility-, district- and regional- stores maintain a "stock ledger" which reflects both stock in hand and transaction history (receipt & issue).

- **Physical stock verification:** Stock ledgers may not be updated regularly. Therefore, stock verification from ledgers/stock registers should be supplemented by the physical counting of available stock.
- **Logistics Management Information System (LMIS):** Presently, almost all states are using IT-enabled drug supply chain management systems in which information on drug availability at any health facility/store can be obtained from the website. Therefore, is the most convenient source of data. However, LMIS may not be updated regularly, specifically at the health facility level. Therefore, LMIS data may be outdated and not useful.

Table 2: *Monitoring of drug information at health facilities*

Particulars	Point of assessment	Datapoint	Source document	Tool/ method to be used	Utility
Stock adequacy	Health facility- main store and DDC	Stock on hand	Stock ledger and Physical count	Ready reckoner *(Annexure C & D)*	Monitoring and maintaining inventory level
The longevity of the available stock	Health facility- main store and DDC	Stock on hand Patients registered	Stock ledger and Physical count Facility register	Described below [c]	Make a decision on procurement, indent or re-distribution
Consumption pattern	Health facility level: DDC	Opening balance, receipt, closing balance for each drug for a specific period Patients registered	Stock ledger Consumption record Facility register	Correlate drug consumption and patient registration [d]	Monitor program performance and dispensing pattern Supplementary information on follow up and default

Notes:

a. Stock data should be collected and documented as a number of tablets (not strips or packs).
b. The ready reckoner tool *(Annexure C & D)* can be used by supervisors for assessing stock adequacy at a health facility at any point of time. This can also be used by health facility pharmacist for routine stock level monitoring and as a guiding document for placing monthly indent to the district/regional store from which the health facility gets medicines.
c. **The longevity of available stock:** Stock on hand data should be assessed in terms of "how long the stock would last" and not just in numeric quantities. A ready reckoner *(Annexure C & D)* provides the estimated quantity required for 90 days using AATTCC and ATTACC protocols. A practical tip based on the current assumption to calculate the stock levels in days are calculated as below:

	AATTCC	ATTACC
Amlodipine 5 mg	Stock/(N*1.4)	Stock/(N*1.12)
Telmisartan 40 mg	Stock/(N*0.37)	Stock/(N*0.65)
Chlorthalidone 12.5 mg	Stock/(N*0.06)	Stock/(N*0.06)

*N= *number of patients registered*

To have a quick and realistic assessment of drug availability status, it should be ensured that all transactions related to drug receipt and issue at all levels should be updated in the software system (if available) or in the physical registers/ledgers.

d. Consider a health facility with 130 registered patients following the AATTCC treatment protocol. In the month of assessment, 100 patients were followed up in the clinic. We expect that approximately 4200 Amlodipine 5mg tablets would have been dispensed. A significant discrepancy in the number of patients treated and the drug dispensing (in this example let us say <3000 or >6000) may prompt the supervisor to examine the following:
   - Significantly fewer drugs dispensed
     - Less than 30 days medication dispensed
     - Drug stockout
     - Patients card were wrongly updated
   - Significantly more drugs dispensed.
     - Treatment cards are not updated
     - Many unregistered patients are being treated

Exercise 1 - Estimation of Min-Max level and quantity of the drug to be issued to a health facility

Problem 1: CHC Rampur has 420 hypertension patients registered. The protocol followed in the CHC is AATTCC. The CHC collects drugs from district drug warehouse each month. The current availability of stocks at CHC is as follows. Please suggest the action to be taken by the health facility pharmacist:

1. Amlodipine 5 mg – 18,000 tablets
2. Telmisartan 40 mg – 15,000 tablets
3. Chlorthalidone 12.5 mg – 12,000 tablets

Problem 2: PHC Madhuban has 170 hypertension patients registered. The protocol followed in the PHC is ATTACC. The PHC collects drugs from the district drug warehouse once in two months. The current availability of stocks at PHC is as follows. Please suggest the action to be taken by the health facility pharmacist:

1. Amlodipine 5 mg – 80,000 tablets
2. Amlodipine 10 mg – 5000 tablets
3. Telmisartan 40 mg – 7000 tablets
4. Chlorthalidone 12.5 mg – 6000 tablets

3.2. BP Measuring devices

Several barriers to accurate and affordable blood pressure measurement, particularly in low- and middle-income countries include: [1]

- Absence of accurate, easily obtainable, inexpensive devices for BP measurement;
- Frequent marketing of non-validated BP measuring devices;
- The relatively high cost of BP devices given the limited resources available;
- Limited awareness of the problems associated with conventional BP measurement techniques;
- A general lack of trained manpower and limited training of personnel.

To fulfil the requirements related to BP measurement in low resource settings, a BP measuring device should, therefore, be affordable and simple to use, but at the same time be accurate and robust so that it can be easily used for repeated blood pressure measurements.

3.2.1. Types of devices

There are three types of commonly used devices: mercury sphygmomanometers, aneroid manometers, and digital (semiautomatic and fully automatic) devices. In a 2005 policy paper, the WHO noted that "of all the mercury instruments used in health care, the largest amount of mercury is used in mercury sphygmomanometers (80-100 g/unit)."[2]as a signatory to the Minamata Convention, India is committed to phasing out of mercury devices.

1) Mercury sphygmomanometer
   - The gold standard of BP devices- most accurate when used correctly
   - Relies on auscultatory technique
   - Inexpensive and most commonly used instrument in the Indian Public Health System.
   - **The government of India is committed to phasing out the use of mercury devices.**
   - Prone to observer bias and terminal digit preference

2) Aneroid sphygmomanometer
   - Uses a bellow and lever system, which is affected by everyday wear and tear, leading to false BP readings
   - Needs regular calibration (at least every 6 months)
   - Prone to observer bias and terminal digit preference

3) Digital device
   - When used correctly, automated, digital blood pressure measurement devices are highly reliable and preferable to manual blood pressure devices.[3]
     - Specifically, in busy clinics and when the measurement is done by non-physicians
   - Simplifies the measurement process
     - Eliminates errors related to hearing deficits, parallax, incorrect initial inflation pressure and rapid deflation
     - Enables multiple measurements to be taken sequentially
     - Eliminates the subjectivity of measurement by reducing observer errors and terminal digit preference
     -

Table 4: *Comparison of commonly used BP measuring devices.*

Parameter	Mercury	Aneroid	Digital
Accuracy	Considered the "gold standard"	Mechanical shocks may lead to incorrect readings Needs calibration at least every 6 months	Highly reliable when the validated instrument is used correctly
Observers skills & expertise	High	High	Low
Terminal digit preference	Yes	Yes	No
Observer bias	Yes	Yes	No
Use by field workers	Difficult	Difficult	Simple
Health & environmental effects	Yes	No	No
Availability in the near future	No	Yes	Yes

3.2.2. Maintenance and calibration

All blood pressure measuring equipment should be regularly checked and calibrated in accordance with the manufacturer's instructions. BP cuff and tubing should be regularly inspected and replaced as necessary. Excessive air leakage from damaged cuffs, tubing and tubing connectors may reduce the accuracy of BP readings.

3.2.3. Validation of blood pressure measuring devices

Accuracy is of prime importance when selecting a blood pressure measuring device. Thus, **regardless of the type of device used, standardized validation procedures are essential**. International protocols for blood pressure measuring device validation have been released by several organizations. [4]

3.2.4. How reliable are automated, digital blood pressure measurement devices?

There is a general mistrust of digital BP devices among health professionals. This is because most BP devices available in the market are not validated and do not meet the prescribed global standards. A study found that of the 500 automatic BP devices available, less than 10% were independently validated.[1,5] One important accuracy requirement is that the devices produce blood pressure measurements that are within 5±8 mmHg of an auscultatory reference standard (which is meticulously performed, standardized, simultaneous, blinded two-observer auscultation performed using a sphygmomanometer known to be accurate). It is important to use an automated device that has passed at least one of these standards and tested by an independent authority.

Another important factor to be considered in the use of automated devices is durability. Many devices available in the market are for home use and not for office use where BP is measured in larger volume. Therefore, for health facilities, professional models are recommended. Various

levels of professional models are available based on clinic patient volume- low volume, medium volume, and high volume, including arm-in BP instruments.
Annexure- F provides the specification for quality professional BP devices that can be used for tender purposes.

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Annexure A: Daily Consumption record at Drug Dispensing Counter (DDC)

Notes:

		Month:														
Sl no	**Drug name**	**Opening balance**	**Receipt during month**	**Date wise consumption**									Total consumption of the month	Losses / expired (if any)	Closing balance
				1	**2**	**3**	**4**	**5**	**6**	**..**	**..**	**31**			
1	Amlodipine 5 mg	200	2000+3000+2000	270	180	300	10	150	210			240			1200
2	Amlodipine 10 mg														
3	Telmisartan 40 mg														
4	Telmisartan 80 mg														
5	Losartan 25 mg														
6	Losartan 50 mg														
7	Hydrochlorothiazide 25 mg														
8	Chlorthalidone 6.25 mg														
9	Chlorthalidone 12.5mg														

- **Opening balance:** Enter the drug availability, at the drug dispensing counter on the first day of the month. For example, if the DDC has 200 tablets of Amlodipine 5mg on 1st September, enter '200' in the opening balance.
- **Receipt during the month:** Enter the number of drugs received during the month. For example, in the month of September if DDC received the following amount of amlodipine 5 mg

  1st September – 2000
  12th September – 3000
  25th September – 2000

  Enter this as 2000+3000+2000
- **In date wise consumption**- enter the total quantity of drugs issued by end of each day
- **Closing balance-** count the stock available on the last day of the month and enter. Note: this would be the opening balance for the next month.

Annexure B: IHCI patient tracking Matrix: drug dispensing counter (DDC)

Name of the facility:													
Sl. No.	Redg No.	Apr-19	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	…												
	…												
	N												

Notes:

- When a registered patient receives drugs (ALL PRESCRIBED IHCI DRUGS) at a DDC, the pharmacist can put a **'√'** against the registered number for the relevant month.
- If one or more prescribed drugs are not available or not dispensed, then put an **'X'**
- If a patient did not come to the clinic in a particular month, keep the cell **'blank'**
- If an unregistered patient comes to dispensing counter, (s)he can be guided to get registered.

Annexure C: Drug requirement: Ready Reckoner AATTCC protocol

No. of patients registered (Up-to)	Three month drug requirements			No. of patients registered (Up-to)	Three month drug requirements		
	Amlodipine 5 mg	Telmisartan 40 mg	Chlorthalidone 12.5 mg		Amlodipine 5 mg	Telmisartan 40 mg	Chlorthalidone 12.5 mg
20	2520	660	120	**520**	65520	17160	3120
40	5040	1320	240	**540**	68040	17820	3240
60	7560	1980	360	**560**	70560	18480	3360
80	10080	2640	480	**580**	73080	19140	3480
100	12600	3300	600	**600**	75600	19800	3600
120	15120	3960	720	**620**	78120	20460	3720
140	17640	4620	840	**640**	80640	21120	3840
160	20160	5280	960	**660**	83160	21780	3960
180	22680	5940	1080	**680**	85680	22440	4080
200	25200	6600	1200	**700**	88200	23100	4200
220	27720	7260	1320	**720**	90720	23760	4320
240	30240	7920	1440	**740**	93240	24420	4440
260	32760	8580	1560	**760**	95760	25080	4560
280	35280	9240	1680	**780**	98280	25740	4680
300	37800	9900	1800	**800**	100800	26400	4800
320	40320	10560	1920	**820**	103320	27060	4920
340	42840	11220	2040	**840**	105840	27720	5040
360	45360	11880	2160	**860**	108360	28380	5160
380	47880	12540	2280	**880**	110880	29040	5280
400	50400	13200	2400	**900**	113400	29700	5400
420	52920	13860	2520	**920**	115920	30360	5520
440	55440	14520	2640	**940**	118440	31020	5640
460	57960	15180	2760	**960**	120960	31680	5760
480	60480	15840	2880	**980**	123480	32340	5880
500	63000	16500	3000	**1000**	126000	33000	6000

Example: For a health facility with 210 patients registered, adequate stock for 3 months would be 27720 tablets of Amlodipine 5 mg, 7260 tablets of Telmisartan 40 mg & 1320 tablet of Chlorthalidone 12.5 mg

Note: If there are multiple strengths of the same medication is available, convert to the base strength mentioned in the table.

Annexure D: Drug requirement: Ready Reckoner ATTACC protocol

No. of patient registered (Up-to)	Three month drug requirements			No. of patient registered (Up-to)	Three month drug requirements		
	Amlodipine 5 mg	Telmisartan 40 mg	Chlorthalidone 12.5 mg		Amlodipine 5 mg	Telmisartan 40 mg	Chlorthalidone 12.5 mg
20	2040	1200	120	**520**	53040	31200	3120
40	4080	2400	240	**540**	55080	32400	3240
60	6120	3600	360	**560**	57120	33600	3360
80	8160	4800	480	**580**	59160	34800	3480
100	10200	6000	600	**600**	61200	36000	3600
120	12240	7200	720	**620**	63240	37200	3720
140	14280	8400	840	**640**	65280	38400	3840
160	16320	9600	960	**660**	67320	39600	3960
180	18360	10800	1080	**680**	69360	40800	4080
200	20400	12000	1200	**700**	71400	42000	4200
220	22440	13200	1320	**720**	73440	43200	4320
240	24480	14400	1440	**740**	75480	44400	4440
260	26520	15600	1560	**760**	77520	45600	4560
280	28560	16800	1680	**780**	79560	46800	4680
300	30600	18000	1800	**800**	81600	48000	4800
320	32640	19200	1920	**820**	83640	49200	4920
340	34680	20400	2040	**840**	85680	50400	5040
360	36720	21600	2160	**860**	87720	51600	5160
380	38760	22800	2280	**880**	89760	52800	5280
400	40800	24000	2400	**900**	91800	54000	5400
420	42840	25200	2520	**920**	93840	55200	5520
440	44880	26400	2640	**940**	95880	56400	5640
460	46920	27600	2760	**960**	97920	57600	5760
480	48960	28800	2880	**980**	99960	58800	5880
500	51000	30000	3000	**1000**	102000	60000	6000

Example: For a health facility with 210 patients registered, adequate stock for 3 months would be 22440 tablets of Amlodipine 5 mg, 13200 tablets of Telmisartan 40 mg & 1320 tablets of Chlorthalidone 6.25 mg;

Note: In case there are multiple strengths of the same medication is available, convert it to the base strength mentioned in the table.

Annexure E: Min-Max inventory levels

Min-Max inventory levels stand for the minimum and maximum level of the stock to be maintained at a health facility.

- *The minimum stock* level is the level of stock at which actions to replenish drugs must be ensured.
- *Buffer stock* is the quantity of stock that should be maintained in case there is a disruption or delay in the regular frequency of supply and is typically kept at one month's stock.
- Under normal circumstances, a facility should not have stock above the maximum stock level.

Min stock level = Quantity required for replenishment period + buffer/safety stock

Maximum stock level = 2 X quantity required for replenishment period + buffer stock.

The decision for minimum and maximum level is dependent upon how frequently the health facility receives the drug stock.

Table: *Recommended Min and Max stock based on frequency of supply*

Frequency of supply	Buffer stock	Minimum stock	Maximum stock
Monthly	1 month	2 month	3 month
Two monthly	1 month	3 month	5 months
Quarterly	1 month	4 month	7 months

Calculating indent = Max stock quantity level – stock in hand

Annexure F: Specification for quality digital BP instruments

1. Designed for professional use in hospital settings (personal homebased use models not to be included).
2. Model(s) meets at least 1 of 3 global standards[#]
    i. Association for the Advancement of Medical Instrumentation (AAMI)/ American National Standards Institute (ANSI) / International Organization for Standardization (ISO)
    ii. British Hypertension Society (BHS)
    iii. European Society of Hypertension International Protocol (ESH-IP)
3. Device must have the validation as per international standards and the publication of the device validation should be available.
4. Pressure measurement range should be 60 to 290 mm Hg systolic, and 40 to 200mm Hg diastolic
5. Pressure display accuracy of +/- 3 to 5 mm Hg
6. Measurement method: oscillometric measurement
7. Cuff Size: At least two cuff sizes (minimum two cuffs to be supplied for each machine)
8. Operable in both battery and electrical outlet (input range 100-240V and output voltage DC 6V) and 150-200 measurements when fully charged
9. Availability of replacement cuff/sleeve
10. Built-in surge protection to prevent damage to instrument in case of power surge.
11. Service centres available within the state
12. Devices should include a temperature-stabilizing system, which allows for use in extreme weather conditions.
13. Minimum of three years warranty including all spares and re-calibration
14. Rate of inflation/deflation to be specified by vendor
15. Low Battery indicator and error indicators
16. Carrying case/bag to be provided

Chapter 4: Task sharing and patient-centred care

Expected competency on completion of session:

- Understanding how task sharing and Patient centred approaches can be used to provide comprehensive hypertension management in public health systems
- Processes of decentralized care

Audience: Program managers, medical officers, non-physicians (staff nurse, ANMs and others)

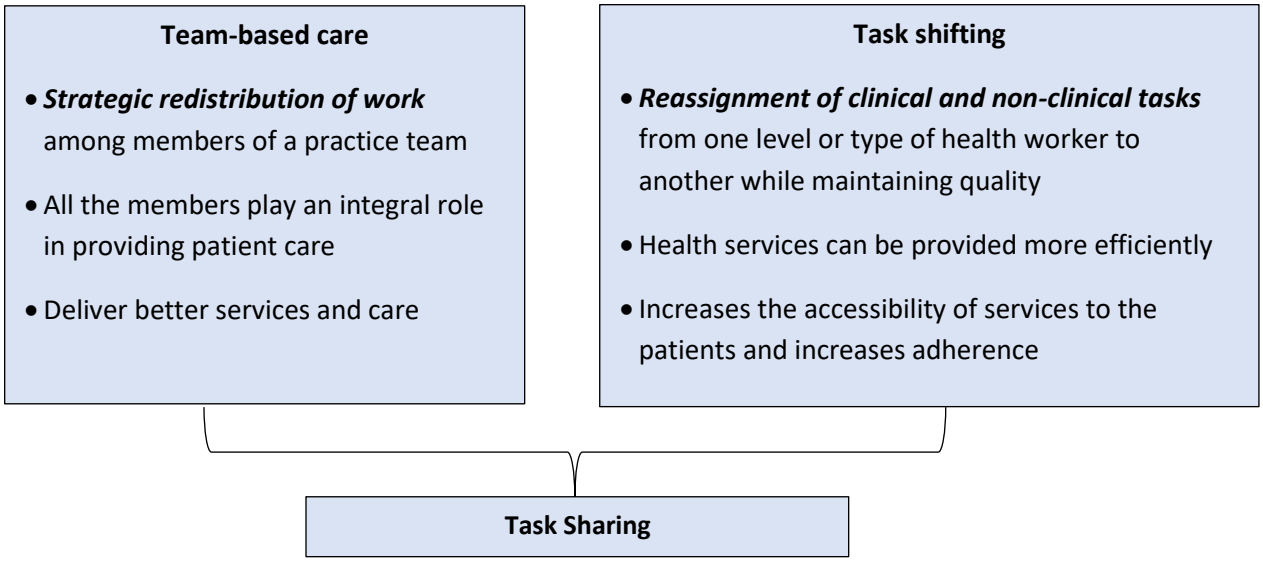
In this session, you will learn about:

- Implementing team-based care & patient-centred services
- Improving patient flow in clinics
- Decentralization to subcentres and health and wellness centres

4.1 Task sharing

Strategic redistribution of tasks among various health care workers within the public health clinics can enhance the efficiency of care. Some examples of task sharing in hypertension management are:

- Diagnosis of hypertension by a medical officer
- Blood pressure measurement by a staff nurse ***instead of*** a medical officer
- Drug refill by a staff nurse or ANM when BP is under control ***instead of*** a medical officer
- Dispensing of NCD drugs by staff nurses at the NCD clinic/corner***, instead of*** a pharmacist
- The entry of patient details in treatment cards by a counsellor ***instead of*** a staff nurse



4.1.1 Advantages of task sharing

- Expanded access to care
- Provision of better support to patients

- Improved patient awareness
- Improved adherence to medications
- Improved follow up visits and BP control
- Time-saving and cost-efficient
- Enhanced patient and health staff satisfaction

4.1.2 Requirements to initiate and establish task sharing in a facility

- Identification of potential staff by Medical officer
- Training of health staff on tasks such as BP measurement and dispensing of medications
- Enable existing health staff cadres such as supervisors, entry operators to enter patient details in treatment cards or Simple app
- Clearly define roles and responsibilities for each cadre of health staff
- Ability to monitor the process regularly and take feedback for further improvement

4.1.3 Steps for implementing task sharing

1. **Engage the team:** At the health facility, bring together a team of health staff of various cadres such as regular and/or NCD staff nurses, supervisors, pharmacists, counsellors, lab technicians, and non-clinical staff such as attenders. The team should be guided and managed by a physician/medical officer.

2. **Determine the team composition:** Determine the model of care which needs to be set up depending on the level of health facility (PHC/CHC/DH) and patient load. Identify which cadre of health staff need to be trained on new skills in order to establish streamlined patient flow. The members of the team must be motivated enough to carry out the newly designated tasks.

3. **Design workflows to reflect the new model of care:** Based on the composition of the new team and newly designated roles and responsibilities, determine the new workflow pattern or patient flow. Plan the workflow so that the members of the team are comfortable in doing the allocated tasks and the process is saving time while preserving quality.

E.g.: When a patient's BP is under control, the staff nurse dispenses the same drugs to the patient and sends the patient directly to the pharmacist, instead of the patient going to the Medical officer.

4. **Increase communication among the team members and with patients:** Organise weekly meetings with the team to see their progress and modify the flow based on feedback. The team leader, typically a medical officer should keep the communication open with the team members. Make patients aware of the new roles of the health staff using wall posters/signs.

Examples:
a. BP will be measured by a staff nurse after issuing OP slip
b. Hypertension and diabetes medicines will be dispensed by a pharmacist

5. **Use a gradual approach to implement the model:** Give time for the team members to get adapted to the new workflow and their new roles. This might take weeks or months.

E.g.: A supervisor at the facility might take time to get used to entering patient details in the treatment cards or entering data online.

6. **Optimize the workflow:** After receiving feedback and observing the new workflow, optimize it so that the patient needs to visit fewer counters. This saves time and increases efficiency.

E.g.: A patient with controlled blood pressure meets only a staff nurse and a pharmacist and, in some cases, just a staff nurse (if the nurse can dispense drugs)

4.1.4 Responsibilities which can be shifted to non-physicians

Certain functions or skills can be shifted from physicians to other health staff such as staff nurses, supervisors, pharmacists, etc. They are:

- History taking
- Blood pressure measurement
- Continuing medication to those patients with controlled BP
- Providing lifestyle management advice
- Advice on adherence to medication

Table 1: *Example team member and roles matrix for hypertension management*

Task	Doctor	Nurse/ Community Health officer	Pharmacist	Counsellor	Community HW
Patient history		✓			✓
Diagnosis	✓				
Evaluation for secondary causes, other risk factors & organ damage	✓				
Identify barriers to adherence		✓	✓	✓	✓
BP measurement		✓		✓	✓
Lifestyle counselling	✓	✓		✓	✓
Refill medications		✓	✓		✓
Titrate medications	✓				
Patient follow-up		✓		✓	✓
Refer to higher centre		✓			✓
Data entry		✓	✓	✓	✓

4.2 Opportunistic screening and patient flow

As discussed in chapter 2, all adults aged ≥ 18 years should be screened for hypertension at health care facilities. To ensure that every patient's BP is measured, the following measures can be undertaken:

a. Structural

- Putting up of notice boards stating that "All adults should check their blood pressure" and providing directions to the place of measurement.
- Setting-up an NCD pre-check area before the examination by the doctor and establishing proper patient flow.

b. Manpower-related

- Dedicated/ designated NCD staff nurses and counsellors for blood pressure measurement and recordings.
- Engaging available staffs in the clinic – PHC ANM, health supervisor, educator, pharmacist, dressers, nursing students, etc.

c. Logistic

- Ensuring availability of professional digital BP monitors.
- Regular refresher training of staff in BP measurement.
- Documentation of BP measurement for all adults in OPD registers.

d. Administrative

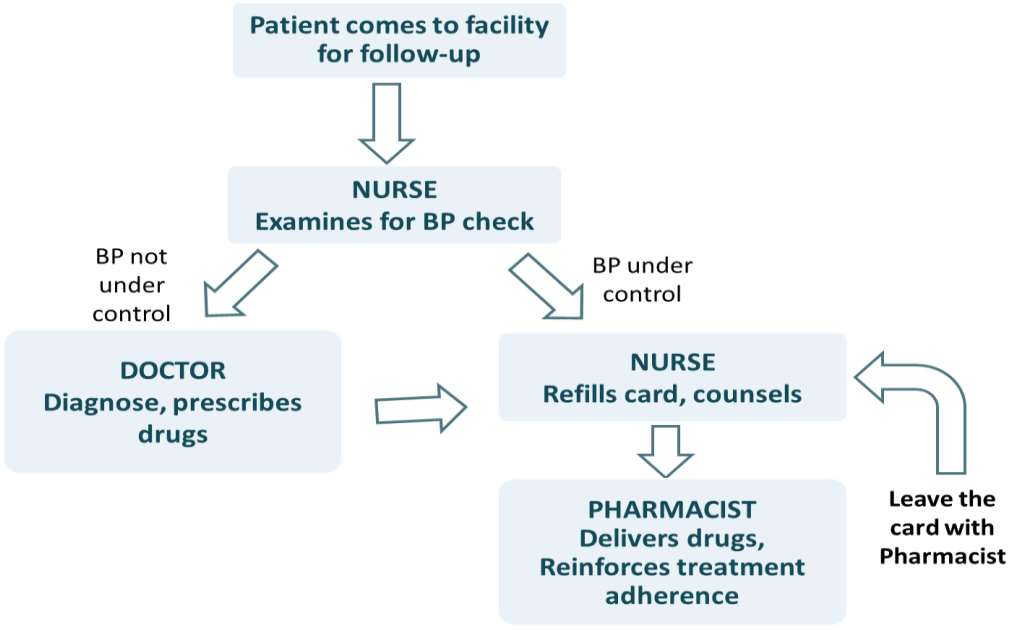
- Gradual scale-up in facilities: start in few facilities; once established, use the lessons learnt in other facilities.
- District/State official should issue guidelines/orders on opportunistic screening.
- Discussing issue of opportunistic screening and registrations at the review meetings.

e. **Supportive supervision:** During supportive supervision, a supervisor can

- Identify a paramedical staff who can be trained and engaged for BP measurement
- Assess gaps in opportunistic screening (e.g. compare the OPD attendance and number screened)

Once a patient has been diagnosed with 'hypertension' and started on treatment by the medical officer, facility staff nurse (or another person designated for the job) should document details in treatment cards or the Simple app and facility hypertension register. A patient ID card/BP passport should be is issued to the patient.

Suggested Patient flow for opportunistic screening in clinic



4.3 Patient-centred services

The success of any program depends on how effective it is in reaching the patients and the community. That is why developing a patient-centric approach is crucial in ensuring the long-term sustainability of the program.

A patient-centred approach is **"providing care that considers the patient's needs, values, preferences and ensures accessibility of quality services."**

Services under any program must be

Affordable

Accessible

Acceptable

4.3.1 What are the ways to improve patient-centred services?

- Reduce and preferably eliminate the cost for medications and medical visits;
- Increasing patient convenience of visits and medication refills (e.g. refills for at least 30 days and when possible for 90 days);
- Use of once-daily treatment regimens to increase treatment adherence and make the patient feel comfortable taking the medicines;

- Improving access to blood pressure measurements and possibly medication refills at HWC and SC;
- Provide lifestyle advice and adherence counselling.

4.3.2 Strategies to establish patient-centred services

- Decentralized care: moving care closer to the patient's home (from district hospitals to PHCs; From PHCs to sub-centre/health and wellness centers);
- Home-based BP check-up and drug refills to bedridden patients and elderly patients;
- Awareness generation in the community about the importance of hypertension and its regular treatment - through ANMs and ASHAs in local meetings and gatherings;
- Form patient support groups for mutual motivation;
- Public education to increase awareness of the importance of blood pressure control.

4.4 Decentralisation to sub-centres/health and wellness centres (HWC)

Patient-centred services can only be made possible if the services under the program are decentralised to make them available at the sub-centre/health and wellness centre level.

When services like BP measurement and drug refills are available only at the level of PHC/CHC/DH, patients may find it difficult to visit the facility every month due to various reasons:

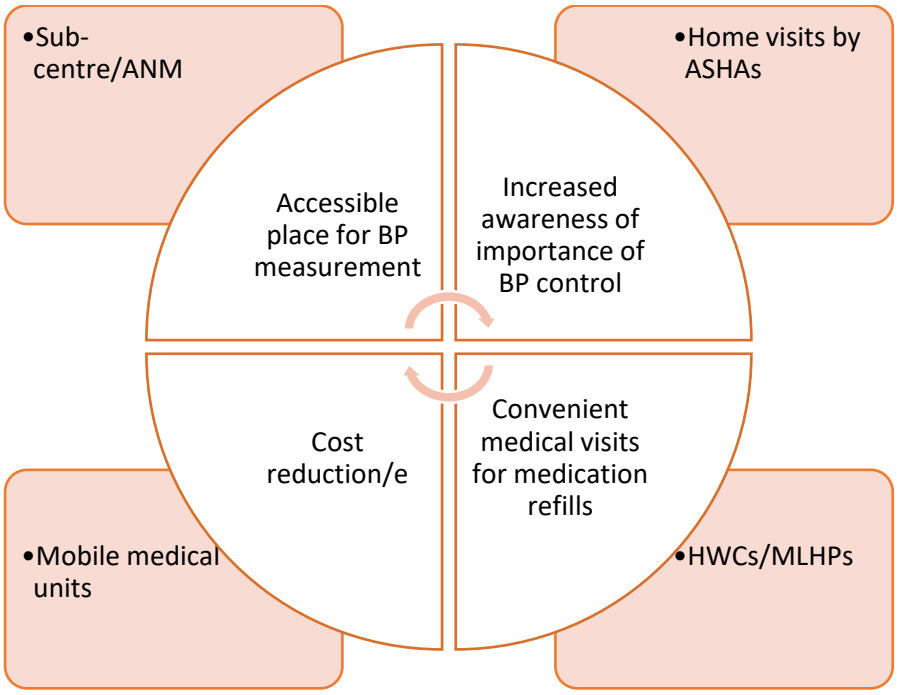
- Distance between the patient's home and facility
- Lack of adequate transport facilities
- Out-of-pocket expenditure on transport by the patient
- Inability to travel – elderly/disabled/bedridden patients

Most patients come from rural areas with difficult access to PHC/CHC/DH and hence will find the services more acceptable if they are made available nearer to them

Decentralisation is "BP check-up and drug refills at the sub-centre level/HWC level"

Principle of comprehensive primary health care: *Time to care < 30 mins*

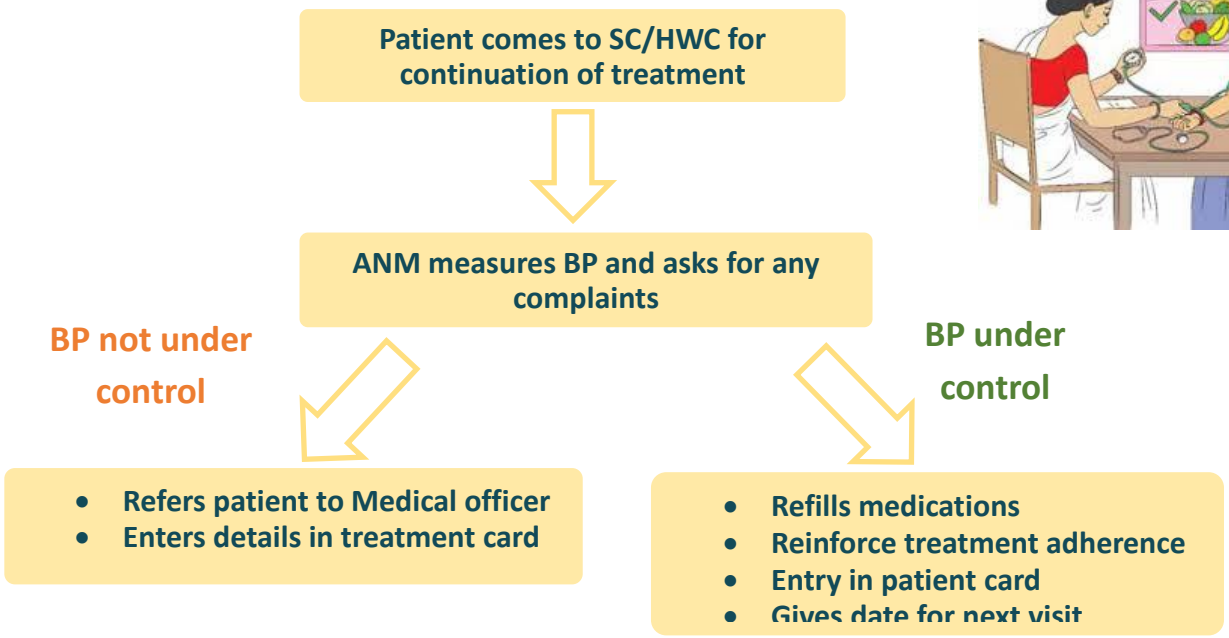
4.4.1 Strategies for decentralisation



Experience from Telangana: Decentralisation was initiated as a pilot in select facilities in IHCI districts of Telangana. The following strategies were adopted:

- Training of ANMs on IHCI components and BP measurement by CVHO and STS
- Orientation of ASHAs on components of IHCI
- Ensuring functional BP apparatus at all sub-centres
- Copies of original treatment cards given to ANMs to maintain at sub-centre
- Drugs supplied to sub-centres from the PHCs based on number of patients registered in those sub-centres
- Details of patients' visits entered in the copy of treatment card or in the register maintained by ANM during the follow-up visits
- ANM refills drugs for patients with controlled BP, while patients with uncontrolled BP are referred to PHC
- Data of follow up visits in the copies of cards transferred to the original cards at the PHC during monthly meetings
- Defaulters identified by ANM at the end of the month and information of those patients given to respective ASHAs for tracking and retrieval through home visits

4.4.2 Patient flow under decentralisation

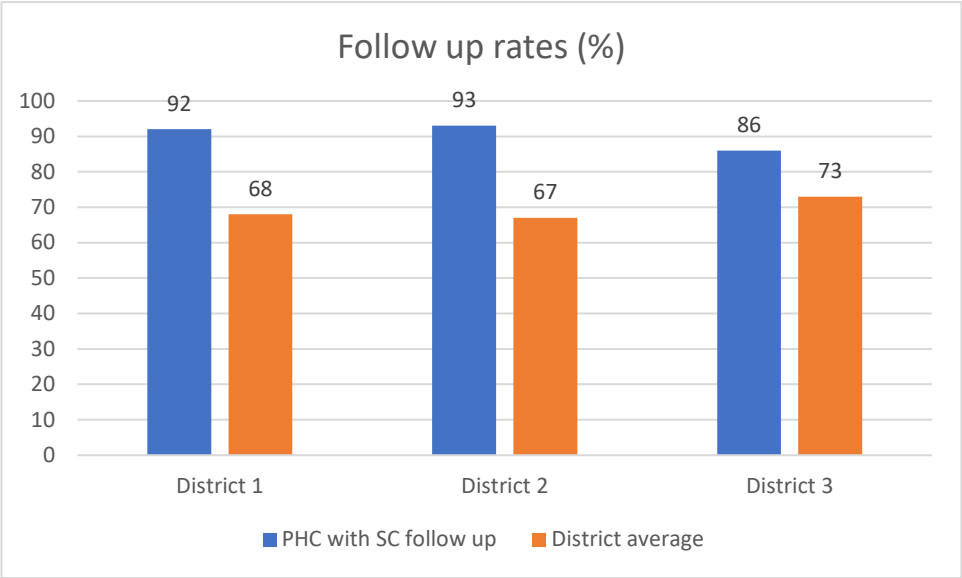


4.4.3 Format for line list register at the sub-centre

Sl.No.	Patient Id*	Patient Name	Age/Sex	Address & Phone Number	Adhar Number	Month 1		Month 2	
						Date/BP	Treatment (Drug Name & Dose)	Date/BP	Treatment (Drug Name & Dose)
1.	23	Ganta Shyam	45/M	H.no 1-28 Near high school	0098 ...	09.07 134/84	Amlo 5mg	08.08 130/34	Amlo 5mg

*Only for registered patients

The response to decentralization in Telangana is highly encouraging. For example, in Telangana, the follow-up and BP control rates were 77% vs.47% and 53% vs. 35% in decentralized and not-decentralized PHCs, respectively. This is because patients find it convenient to do a follow up at the subcentres as there is less travel and wait time. Further, the follow-up rates in decentralised villages were significantly higher than the district averages. (See figure below).



Decentralization of hypertension care to HWCs and subcentres is likely to enhance detection and control of hypertension and helps to achieve the National Action Plan goal of a 25% reduction in high blood pressure.

4.5 Health and Wellness Centre (HWC)

Transforming existing sub-centres and primary health centres into health and wellness centres will ensure universal access to an expanded range of comprehensive hypertension management services, including prevention of risk factors, promotion of healthy lifestyles, effective hypertension treatment, and rehabilitative care.

A team-based approach by mid-level healthcare provider (MLHP) and auxiliary nurse midwife (ANM) in HWCs can enable the delivery of high-quality care through a commensurate expansion in improved delivery of medicines and availability of diagnostics, use of standard treatment protocols and advanced technologies, including IT systems like Simple app.

4.5.1 Implementing IHCI in HWCs

1. **Manpower**:- MLHP is additional manpower in HWCs supporting already existing ANMs and ASHAs in sub-centres.
2. **Capacity building**: Training of staff on comprehensive hypertension management and control.
3. **Logistics and drugs**: All HCWs would be equipped with a professional digital sphygmomanometer, treatment cards, hypertension line list and follow up registers and adequate stock of all anti-hypertensive drugs as specified under the state hypertension treatment protocol.
4. **IEC**: Posters on the method of blood pressure measurement along with hypertension diagnosis and treatment protocols. Health education materials on lifestyle modifications.

5. **Recording and reporting**: Manually done through individual treatment card and hypertension register or through electronically-maintained data through the GOI CPHC NCD solution or the Simple app.
6. **Health promotion and counselling**: Counselling on lifestyle modifications and treatment adherence.

4.5.2 Services to be provided in HWCs under IHCI

1. **Opportunistic screening**: Early detection using professional Sphygmomanometer and linking with population-based screening. All suspected cases identified at HWCs would be confirmed by a medical officer at PHC or higher centre.
2. **Registration** :Confirmed cases would be registered at HWCs by issuing the treatment card or in the Simple app.
3. **Standard treatment protocol**: Equitable distribution of free and quality drugs as per the established state-specific standard treatment protocol. Treatment provided at HWCs to hypertensives whose blood pressure is under control. However, confirmation and initiation of treatment would be done only by the medical officer at PHC or higher centres.
4. **Referral services:** for patients with uncontrolled BP or complications. In addition, suspected cases whose diagnosis need to be confirmed or treatment initiated will be referred to a PHC or higher centres.
5. **Follow up**: Tracking and follow up of each patient every month through individual treatment card ensuring the continuum of care. ASHA incentives would be tagged with home visits and follow up of treatment compliance.
6. **Linkage with mobile medical units (MMUs):**ANM/MLHP attending the MMUs would ensure the linkages of services
7. **Recording and reporting** – HWCs will maintain individual treatment cards and hypertension register for tracking of treatment compliance and retrieval of defaulters. Monthly registration and quarterly and annual reports are sent to PHC.
8. **Health promotion and community mobilisation** – Provision of regular advice on adopting a healthy lifestyle and avoiding modifiable risk factors along with training on yoga and meditation.

4.5.3 Roles of various field staff under the program

Staff Cadre	Roles
ANM	Compile village level line list of hypertensives
	Mobilise patients for registration
	Maintain a copy of treatment cards or the follow-up register
	Measure BP of patients and give drug refills during follow up visits
	Enter details of follow up visits in treatment cards or follow up register
	Give appointment for next follow up visit
	Refer to medical officer if BP is not under control or if any complications are present

	Receive and maintain antihypertensive drugs from PHC pharmacist
	Send monthly report of follow-ups and missed cases to PHC staff nurse
	Share list of defaulters with ASHAs for home visits
	Organise awareness activities related to NCDs during village level meetings
	Coordinate with local public representatives in awareness activities
MLHP/CHO	Screening for hypertension in the community and referral of suspected cases to PHC
	Registration of confirmed cases under IHCI and issue treatment card and patient ID card
	Monthly drug refills to patients with BP under control
	Refer patients with uncontrolled BP or complications to Medical officer
	Tracking of follow up visits with defaulter identification and retrieval
	Follow up of patients receiving drugs at Mobile medical units
	Maintain treatment cards and send regular reports such as Quarterly and Annual reports
	Health education to patients on lifestyle modifications
ASHA	Maintain a line list of hypertensives of their village
	Mobilise patients for registration
	Collect a list of defaulters from ANM
	Make home visits to defaulters and counsel to come for follow up
	Counselling patients on treatment adherence
	Patient education about complications and danger signs

4.6 Lost to follow up – prevention, identification, and retrieval

For the success of IHCI, it is crucial for the program to ensure that people with hypertension registered with IHCI are regularly followed up at the health facilities for monitoring of blood pressure and refilling of medication.

For programmatic reporting, IHCI defines **'lost to follow up'** as those individuals who did not return to care for 12 months. "**Missed visit"** is defined as those individuals who did not return to care at least once in a quarter following 3-6 months of registration. In this section, we describe the strategies for prevention, identification, and retrieval of patients.

Based on the experiences of IHCI phase 1,the following factors that can affect lost to follow up have been identified:

1. **Health system factors**
    - Drug stock-outs: patients lose trust with the system
    - Non- or irregular availability of service providers
    - Unfriendly staff
    - Longer distance to health facilities or higher cost of travel
    - Lack of patient education on importance of adherence and follow up
    - Drug side effects

2. **Patient factors**
    - Lack of awareness - asymptomatic condition; lack of perceived importance of regular treatment
    - Elderly patients and bedridden patients
    - Preference for private sector/informal providers

In addition, the following factors hinder retrieval of patients back into the system:

- Large registrations in higher-level health facilities, such as district hospitals, where
    - The clinic is not linked to community-level staff to retrieve patients
    - Registered patients may be from far-off places
- Poor documentation of patient contact details
- Lack of telephone facilities in clinics and nurses' concerns relating to the usage of personal phones for making patient calls.

4.6.1 Prevention of Loss to follow up

The focus should be on good quality implementation of IHCI strategies to prevent or reduce patient loss to follow up.

1. **Availability of drugs and service providers**
    i. Patients lose trust in the clinic/system if drugs and providers are frequently unavailable during their visit.
    ii. Ensuring uninterrupted medication through improved drug logistic systems would reduce the issue of shortage of drugs.
    iii. If there is a deficiency in human resources, a stop-gap arrangement should be made to ensure no interruption in services. For example, if there is no medical doctor at PHC, a medical doctor from neighboring PHC or CHC may be deputed to visit the PHC on a fixed day of the week. (This is being practiced in Punjab and Madhya Pradesh)
    iv. Patient BP monitoring and continuation of medications can be carried out by other trained staff in the clinic- staff nurse, health supervisor, ANM or pharmacist.

2. **Decentralization** – Patients are more likely to come regularly for follow up if the clinics are closer to their home. This can be ensured at two levels.

i. Patients detected with hypertension at higher facilities (district hospitals & CHCs) - Register and initiate the treatment. Thereafter, facilitated 'transferring out' to a PHC closest to their place of stay. This has been piloted in Telangana with reasonable success.

ii. Patients registered at PHCs, should be encouraged to follow up for medications and BP monitoring services at a sub-centre/HWC near their residence.

In parallel, ensure

- Availability of medications at the HWC/SC
- Systems for sharing of patient information between HWC/SC and PHC/CHC where the patient is registered

In Telangana, this is been tried in a few PHCs where sub-centres were provided with IHCI medications from the PHC and a copy of the treatment card. In these PHCs, programmatic data showed that the follow up was higher than the district average.

3. Patient counselling and education

a. Counsel/educate patient during registration about the importance of regular treatment and follow up visits
b. Staff who can counsel at various levels
    i. Staff nurse
    ii. Counsellor
    iii. Pharmacist
    iv. MLHP/ANM
c. Patients must be educated on
    i. Importance of regular treatment and BP monitoring
    ii. Risk of stroke, heart attack, kidney failure if BP not controlled
    iii. Availability of services
    iv. Patients must come at least 3-4 days before the medicines are going to be finished

4. Documentation of patients' details

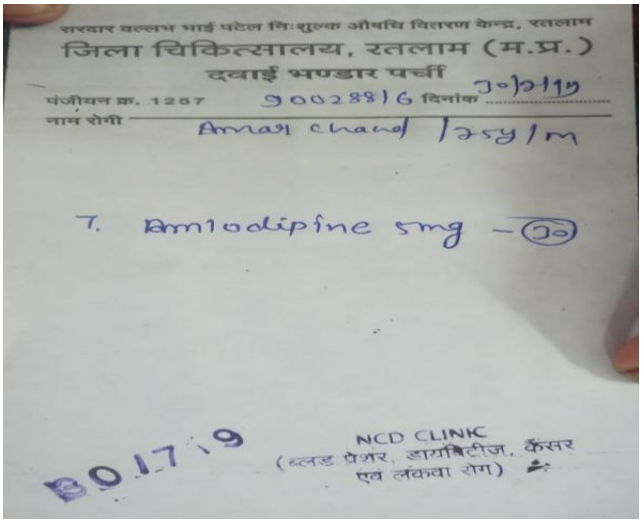
- Documentation of patient contact details in the treatment card is essential to retrieve the patient who missed visits. The details which must be documented are:
    i. Full name
    ii. Full address with landmark (PHC area, sub-centre, and village)
    iii. Patient's phone number
    iv. Phone number of relatives or neighbors if the patient does not have his/her own phone

5. **Documentation of every visit:** It is important to ensure all visits of a patient are documented and the blood pressure recorded. Lack of documentation will lead to an incorrect marking of 'missed visit'.

- A good patient flow within a health facility will improve the documentation.

- The entry of patient's BP in OPD register cab be an effective way to ensure patients aren't missed
- Local measures may be undertaken. For example (**Stamping of outpatient card).** In higher health facilities such as district hospitals, the recording, and reporting are maintained at the NCD clinic. However, registered patients may visit other doctors in the facility to receive treatment for hypertension. These patients will be noted as missed follow up as they did not visit the NCD clinic, though they had followed up at the same facility (false negative reporting). To address this issue, District Hospital Ratlam has started using an NCD clinic stamp on out-patient cards. The pharmacist of the clinic has been instructed that the medication for hypertension is provided only to those patients whose cards have the NCD clinic stamp. If the stamp is missing, patients are requested to visit the NCD clinic where their visit is noted.

Practice of NCD clinic stamp at DH Ratlam, Madhya Pradesh



6. **Patient-centred care**
   - **i.** Simple prescriptions: patients should get medication for a minimum of 30 days. If BP is under control and adequate drugs are available, medication may be provided for 90 days. If available, preferably provide fixed-dose combination medication.
   - **ii.** Less wait time: patients are unlikely to visit clinics regularly if the wait time is long and if they must go to multiple counters. Minimal documentation and single window clearance may encourage patients to make a quick visit to the clinic.
7. Friendly staff that make patients comfortable ensures that patients will want to come regularly for visits.

   Patient reminders
   - **i.** Some facilities in Telangana telephonically contact patients before the due date to remind them of their impending visit. However, this may not be feasible in busy clinics.
   - **ii.** Short Message System (SMS): An automated reminder message (text message or WhatsApp message) before the due date may be tested for its effectiveness in improving follow up.

4.6.2 Identifying 'missed visits'

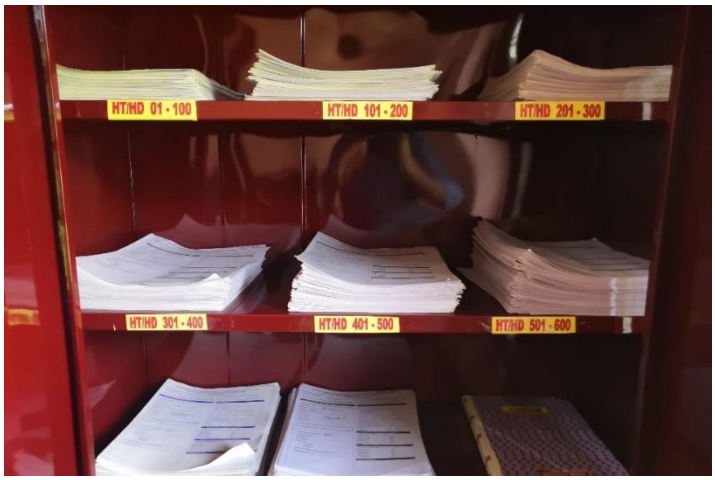
A. Paper-based reporting

1. **Two stack system** *(see chapter 5 for more details)*
   - Commonly followed system for quick identification patients who missed a visit by the end of the month
   - Requires two shelves
   - On the first day of each month, all cards should be in the shelf 1.
   - As patients come for treatment during the month, the card is taken from shelf 1, updated and placed at corresponding numbers in shelf II.
   - On the last day of the month, review leftover cards on shelf 1. These are patients who did not visit the health facility during the month.
   - Once in three months, a list of patients who did not come for follow up should be prepared, ideally sub-centre wise and shared with the respective ANM/ASHA for follow up.

<u>Example of two stack system of storage</u>

Pre-printed patient registered numbers

- Some PHCs in Kerala has a large number of registered patients (up to 2000) and also have only one or two days of NCD clinic in a week. This has resulted in very busy clinics wherein maintaining two stack system is difficult. Some clinics in Thrissur have designed a system of pre-printed patient registration numbers



- At the beginning of the month, all IHCI registered patient ID numbers are printed on a sheet of paper. When a patient visits the facility his/her registration number is struck off.
    - At the end of the month, all the numbers that are not struck out are the defaulters

Defaulter Identification: HT/HD									
Name of Institution:				Name of the Nodal Person of institution:					
Month & Year:				Total no: of defaulters identified in the month:					
~~0001~~	0041	0081	0121	~~0161~~	~~0201~~	~~0241~~	0281	0321	0361
0002	~~0042~~	0082	0122	~~0162~~	~~0202~~	~~0242~~	0282	0322	0362
~~0003~~	~~0043~~	~~0083~~	~~0123~~	~~0163~~	~~0203~~	~~0243~~	~~0283~~	~~0323~~	~~0363~~
~~0004~~	~~0044~~	~~0084~~	~~0124~~	~~0164~~	~~0204~~	~~0244~~	~~0284~~	~~0324~~	~~0364~~
0005	0045	0085	0125	0165	0205	0245	0285	0325	0365
~~0006~~	~~0046~~	~~0086~~	~~0126~~	~~0166~~	~~0206~~	~~0246~~	~~0286~~	~~0326~~	~~0366~~
0007	~~0047~~	0087	0127	0167	~~0207~~	~~0247~~	~~0287~~	~~0327~~	0367
0008	0048	0088	0128	0168	~~0208~~	~~0248~~	~~0288~~	~~0328~~	0368
~~0009~~	~~0049~~	~~0089~~	~~0129~~	~~0169~~	~~0209~~	~~0249~~	~~0289~~	~~0329~~	~~0369~~
~~0010~~	~~0050~~	~~0090~~	~~0130~~	~~0170~~	~~0210~~	~~0250~~	~~0290~~	~~0330~~	~~0370~~
~~0011~~	~~0051~~	~~0091~~	~~0131~~	~~0171~~	~~0211~~	~~0251~~	~~0291~~	~~0331~~	~~0371~~
~~0012~~	~~0052~~	~~0092~~	~~0132~~	~~0172~~	~~0212~~	~~0252~~	~~0292~~	~~0332~~	~~0372~~
~~0013~~	~~0053~~	~~0093~~	~~0133~~	~~0173~~	~~0213~~	~~0253~~	~~0293~~	~~0333~~	~~0373~~
~~0014~~	~~0054~~	~~0094~~	~~0134~~	~~0174~~	~~0214~~	~~0254~~	~~0294~~	~~0334~~	~~0374~~
~~0015~~	~~0055~~	~~0095~~	0135	0175	~~0215~~	~~0255~~	~~0295~~	~~0335~~	~~0375~~

2. Line list of missed visits

- At the end of every month, based on various systems mentioned above, staff nurse identifies patients who missed their visits.
- List of patients who did not visit in the last three months are made and the patients contacted and reminded for follow up.
- Once every 3 months, coinciding with the quarterly report, a list of patients with missed visits who did not return to care for the last 3 months is made sub-centre-wise and shared with ANMs and ASHAs for further tracking and retrieval.

3. Follow up register

- Many facilities (specifically those with high registration) maintain separate follow up register. Patients' contact details are entered registration number-wise and month-wise columns are provided for marking follow up over the subsequent 12 months. In the monthly column, the date of the visit is noted when the patient visits.
  Advantages:

a. All contact and follow-up details of the patient are in one place
b. Helps identify patients who miss visits
c. Facilitates preparation of facility monthly report
d. Allows identification of not just those who defaulted in the previous month but also patients who have defaulted for a longer duration
e. Provides pattern of defaulters at a glance

B. Digital reporting

1. **Overdue list from Simple App**

The Simple app automatically generates the overdue list of patients who have missed visits after 30 days of the previous visit. This is accessed at the 'overdue' tab of the app. The list is also organised in order of priority (patients with BP≥160/100 and longer duration of 'no follow up') along with phone numbers for the ease of health facility nurse. The Simple app in mobile phones also has an overdue list from where staff can directly make calls to patients. The calling number is masked to ensure the privacy of the health staff phone number.

The overdue list may also be downloaded by the supervisors from the Simple app dashboard. The list can be downloaded at the end of every quarter.

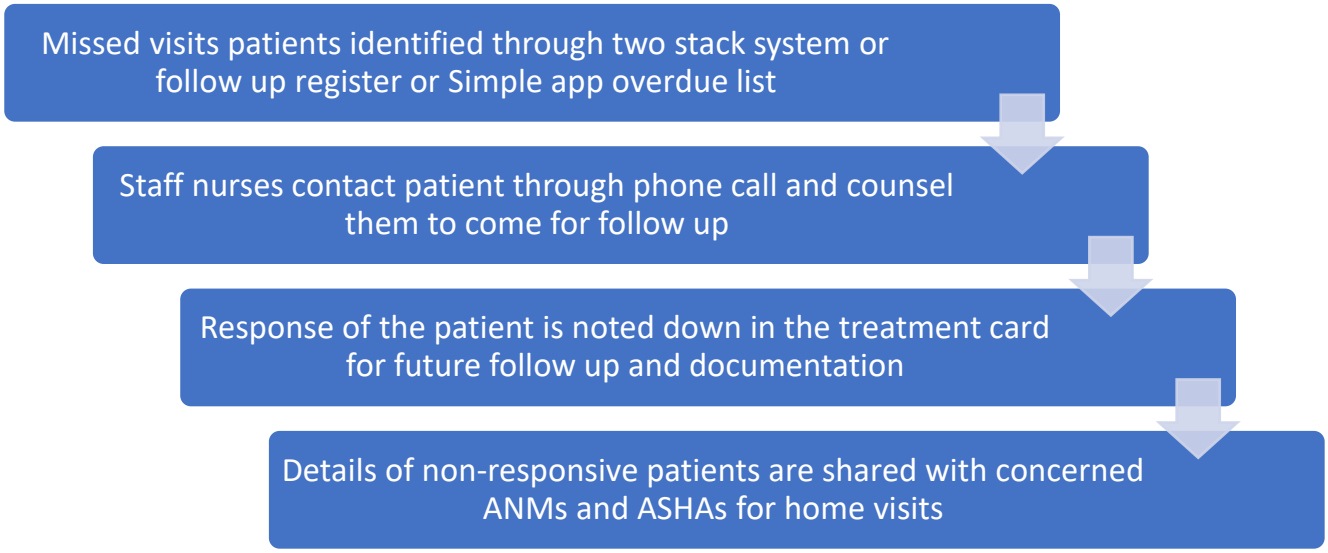
Example of an overdue list from the SIMPLE app

Patient nam	Gender	Age	Days	Registrati	Last BP	Last BP	Last BP da	Risk leve	Patient ad	Patient village or colo	Patient pho
Guri	Female	70	465	18-May-18	170/96	CHC Bha	18-May-18	High		Mojpur	
Jasbir Kaur	Female	52	337	24-Sep-18	160/96	CHC Bha	24-Sep-18	High		Old bagria	
Bano	Female	55	197	6-Mar-19	170/88	CHC Bha	6-Mar-19	High		Near water tanki Bhaini	mian khan
Karamjit Kau	Female	60	168	11-Mar-19	170/90	CHC Bha	11-Mar-19	High		Near peer baba vill new	9779112324
Balwant Sing	Male	59	146	3-Apr-19	160/90	CHC Bha	3-Apr-19	High		S/o shingar singh nanov	9781874929
Manjit Kaur	Female	70	134	15-Apr-19	160/90	CHC Bha	15-Apr-19	High		W/o kartar singh nanow	9915568046
Manjit Kaur	Female	52	134	15-Apr-19	140/100	CHC Bha	15-Apr-19	High		W/o Rashpal singh Shis	9815335108
Nishan Singh	Male	45	104	14-May-19	176/90	CHC Bha	14-May-19	High		Virsa singh Rajpura	9878791525
Baldev Kaur	Female	70	103	15-May-19	160/90	CHC Bha	15-May-19	High		Nanowal kalan	9915982503
Nancy	Female	60	97	20-Apr-18	160/90	CHC Bha	21-May-19	High		Old bagria	7347668977
Balbir Kaur	Female	60	78	10-Jun-19	160/90	CHC Bha	10-Jun-19	High		W/o dalbir singh alma	9872118989
Gurmeet Kau	Female	47	51	6-May-19	160/100	CHC Bha	27-Jul-19	High		Gandhi camp batala	7814162843
Kirandeep (2	Female	50	51	27-Jul-19	160/100	CHC Bha	27-Jul-19	High		Gandhi camp batala	8528446270
Sharanjit Kau	Female	80	38	19-Jul-19	160/90	CHC Bha	19-Jul-19	High		W/o harbans singh old b	9815727902
Harbans Kau	Female	60	419	4-Jul-18	148/90	CHC Bha	4-Jul-18			Near palace , b.m khan	
Amarjit Kaur	Female	53	375	16-Aug-18	140/90	CHC Bha	16-Aug-18			P.o. b.m. khan, jhanda	9876229855
Gurmeet Kau	Female	32	360	1-Sep-18	140/85	CHC Bha	1-Sep-18		Out side fr	Bhaini	9878083685
Kewal Singh	Male	65	347	14-Sep-18	150/90	CHC Bha	14-Sep-18			Jhanda	
Surjit Kaur	Female	57	321	9-Oct-18	150/90	CHC Bha	9-Oct-18			B.m. khan	
Jasbir Kaur	Female	34	185	20-Dec-18	140/90	CHC Bha	20-Dec-18			Lakhanpur	9914078413
Bachno Devi	Female	60	166	13-Mar-19	146/90	CHC Bha	13-Mar-19			W/o jagdish lal Vill Dtarp	8427048516
Swarn Singh	Male	60	146	20-Aug-18	140/90	CHC Bha	8-Mar-19			Mullanwal	9915946946
Sudesh Kum	Female	42	146	7-Aug-18	142/88	CHC Bha	2-Mar-19			Bhaini mian khan	8283006784
Rattan Kaur	Female	62	125	18-May-18	140/88	CHC Bha	24-Apr-19		Primary sc	Kotli harchanda	9878587706
Harbhajan Si	Male	0	123	17-Aug-18	140/86	CHC Bha	26-Apr-19			P.o. alma	9876278363
Sunita	Female	42	119	30-Apr-19	150/90	CHC Bha	30-Apr-19			Bhadhroa ptk	9914456344
Lakhwinder K	Female	67	116	4-Dec-18	140/80	CHC Bha	2-May-19			Alma	8284875846
Malook Char	Male	68	111	13-Nov-18	140/90	CHC Bha	7-May-19			Old bagria	9501780532
Dhalwinder S	Male	46	108	10-May-19	140/90	CHC Bha	10-May-19			Nirmal singh ALma	9876718341
Surinder Kau	Female	55	104	14-May-19	150/90	CHC Bha	14-May-19			Fulrha	9915302134
Jasveer Kaur	Female	50	98	20-May-19	150/90	CHC Bha	20-May-19			Jaspal singh BM khan	9779342679
Sarabjit Kaur	Female	60	95	7-Mar-19	140/86	CHC Bha	23-May-19			Vill ferochechi b m khan	9592321956
Gurmeet Kau	Female	70	95	23-May-19	140/90	CHC Bha	23-May-19			Vill raju bela	9876664376

4.6.3 Retrieval of patients who missed follow up visits

A. Retrieval strategies

1. **Telephonic contact:**
   - Practiced in most facilities. Patient should be contacted over the phone if he/she did not return for the visit. The first attempt to connect with patients is telephonic contact irrespective of paper or digital record system. The call is usually done by health facility nurse. A list of patients who missed visit in the previous 3 months can be prepared for making calls.
   - The phone calls that are made through the Simple app allows masking of the caller's phone number. The outcome of the call made to patient should be documented.



2. **Home visits by ANM/ASHAs:**
   - Under the NPCDCS program there is a provision for incentives to ASHAs for ensuring follow up of patients with hypertension and diabetes. This provision should be leveraged for the retrieval of patients.
   - At PHC level
     - Staff nurses prepare sub-centre-wise list of patients who missed visits and hand it over to the ANMs during the monthly meetings.

- The ANMs return the list with their comments (after home contacts by ASHA workers)- whether the patient agreed to return, could not be contacted, had taken medicine from private providers, or other reasons.
- This system is currently used in many facilities in Telangana

- At the level of district hospital or CHC
  - It is challenging to retrieve the patients due to the lack of community health workers at the higher-level facilities.
  - The list of patients who missed visits can be prepared according to the PHC area (based on the name of the village). This strategy is being tried in many facilities in Telangana. The list is shared with respective PHC NCD nurse through WhatsApp
  - PHC NCD nurse attempts retrieval through ANMs

3. **Short Message System (SMS):** The Simple app automatically sends reminder text messages requesting patients to return if they have missed their visit by 3 days.

4. **Patient support groups:** can be tried in remote areas such as tribal areas and closely-knit communities
   - Local support groups can be formed by ASHAs, consisting of local influencers like elected representatives, teachers, local volunteers, village elders, etc.
   - The group can be educated about the patients with hypertension in their community and the importance of their regular follow up.
   - The group can speak to these patients with the objective of "pushing" them for follow up visits.

5. **Phone calls by supervisors**
   - During supportive supervision visits, supervisors such as medical officers/district program officers/CVHO/STS can identify missed visits especially of patients with BP ≥ 160/100 mm of Hg and call them for retrieval.
   - In the process, the staff nurse is also trained and motivated.
   - For non – responsive cases, concerned ANMs/ASHAs are to be contacted.

6. **District/block level monthly reviews**
   - Regular monthly reviews at the district/block level, along with NPCDCS should be carried out.
   - This will help in generating problem-specific discussions and identification of solutions that may require administrative support.

B. Effectiveness of retrieval strategies

As of now, the effectiveness of each of the retrieval strategy is unknown.

- Operational research in the sentinel sites under IHCI is being conducted and the results of this research are expected to provide significant insights. Initial data suggests that nearly half of the patients who were contacted returned to the health facility.
- Analysis of data from the simple app may provide important insights on:

  - The pattern of loss to follow up
  - Effectiveness of SMS and phone calls in the retrieval of patients
- CVHOs and supervisors should also make efforts to document effectiveness in a few health facilities in their districts.

Chapter 5: Information systems - monitoring indicators and reporting tools

Expected competency on completion of session: Ability to correctly maintain primary/secondary health care-level recording and reporting tools
Audience: Medical officers; facility staff nurses; district and state supervisors
In this session:

- Understand the core Indicators for monitoring using facility reports: Quarterly & Annual
- Information system
    - Paper-based - Patient BP passport with QR code; hypertension treatment card & facility hypertension register
    - Digital systems - Simple App
- How to do facility reports - Quarterly and Annual

An information system that will enable cohort-based monitoring is one of the core strategies of IHCI. This chapter will provide an overview of monitoring indicators and reporting tools for the paper-based system and an android based Simple app.

5.1 Core indicators

There are two health facility-level indicators calculated from the 'facility quarterly reports' and 'facility annual report'. (These reports are discussed in later part of the chapter)

5.1.1 Quarterly indicator – 3 to 6 monthly hypertension control rates

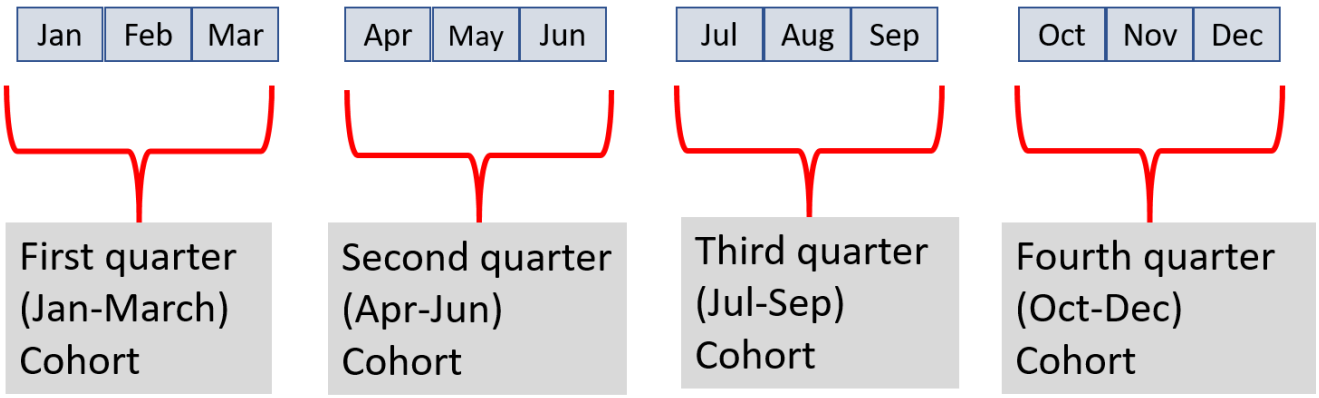
- Percent of patients starting treatment during a quarter (cohort) who achieve BP control (<140/90) 3 - 6 months after the start of treatment

  $$\frac{\textit{Number of patients with controlled BP (<140/90) during the last clinical visit who started hypertension treatment 3 – 6 months earlier (A2)}}{\textit{Total number of patients who started hypertension treatment 3 – 6 months earlier (A1)}} \times 100$$

- Tracer indicator for the quality of the program
- It is a measure of the effectiveness of treatment among patients
- Identify health facilities with lower performance and support them early with the required interventions
- Indicator can be measured for each treating health facility once every quarter

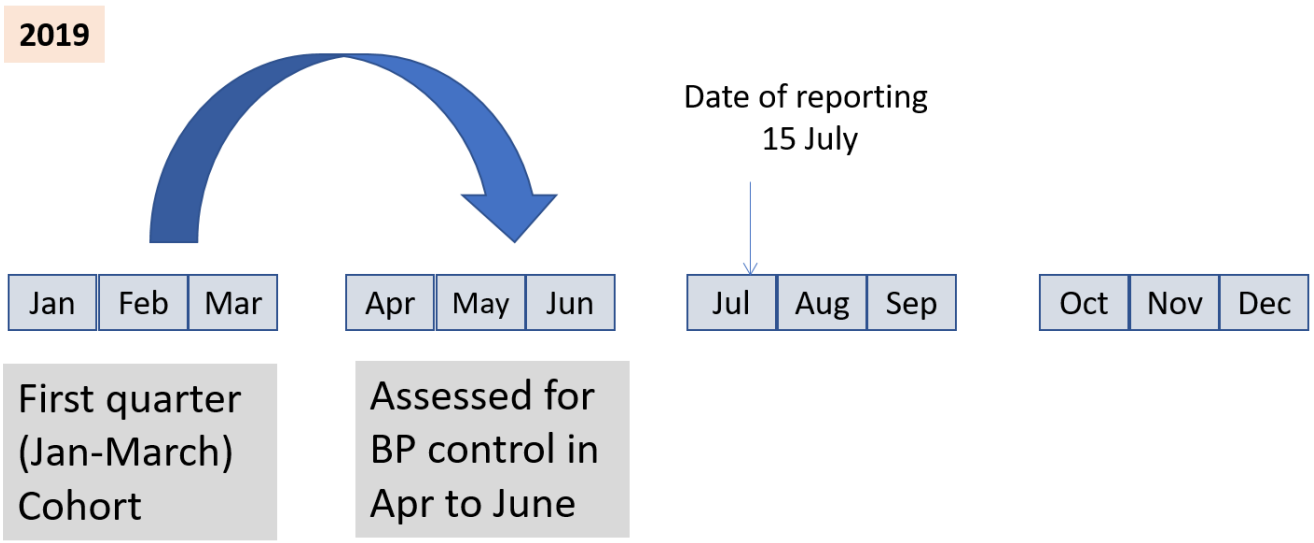
Understanding the patient cohorts for the quarterly report

- Cohort is defined by the quarter of registration
- BP control of each cohort is assessed 3- 6 months after the start of medication

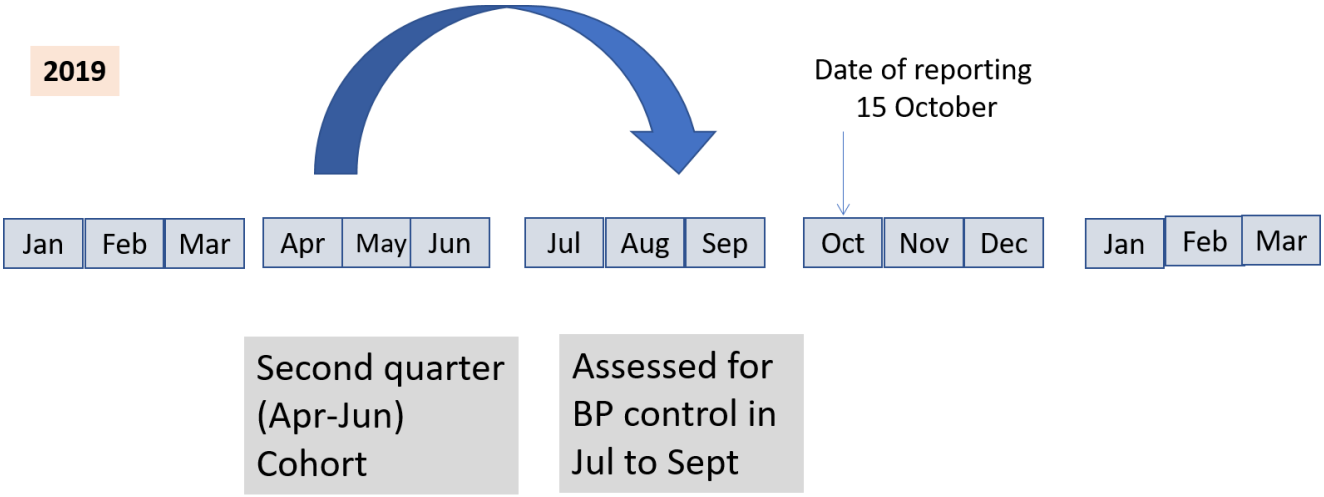


3 - 6 months' cohort for quarterly indicator

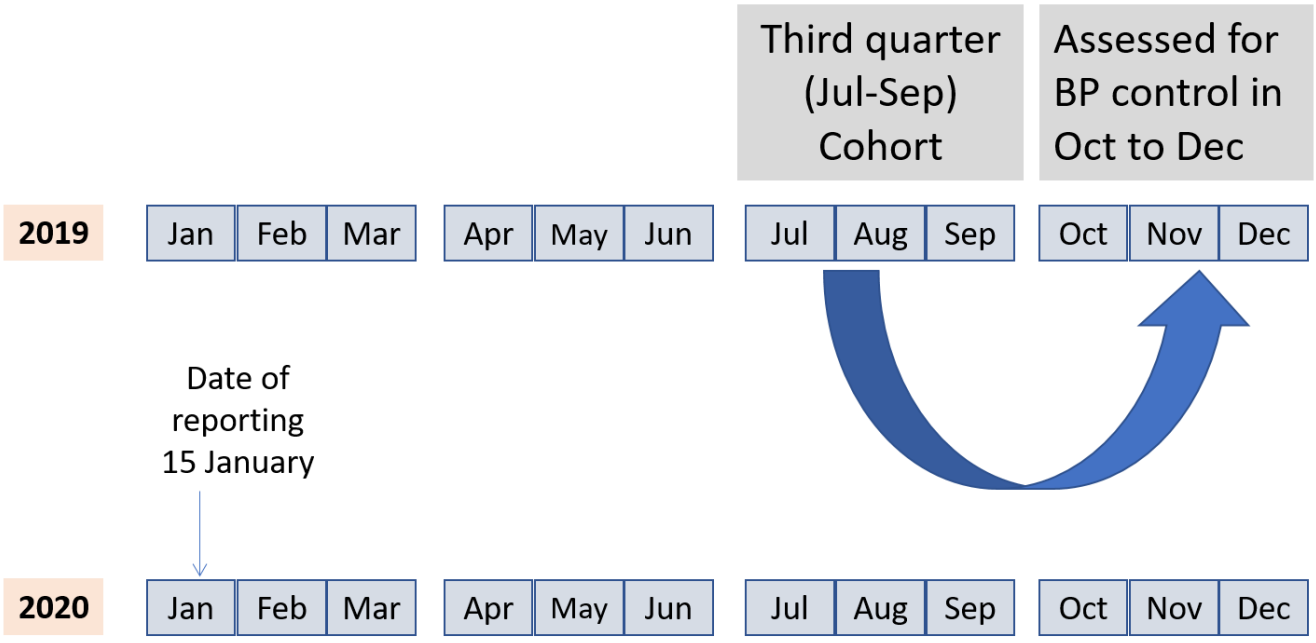
BP control of cohort registered in January to March



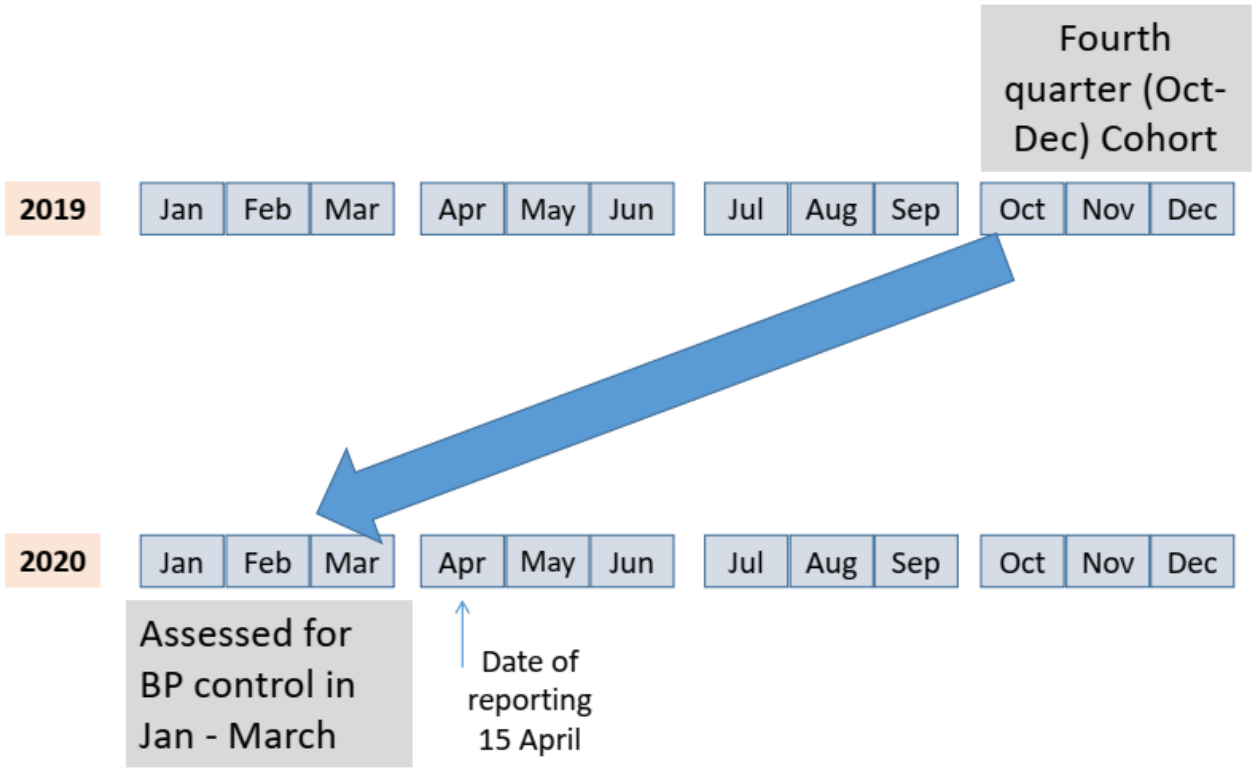
BP control of cohort registered in April to June



BP control of cohort registered in July to September



BP control of cohort registered in October to December



5.1.2 Annual Indicator

- Percentage of patients with hypertension who have controlled BP in a defined geographical area (reported annually):

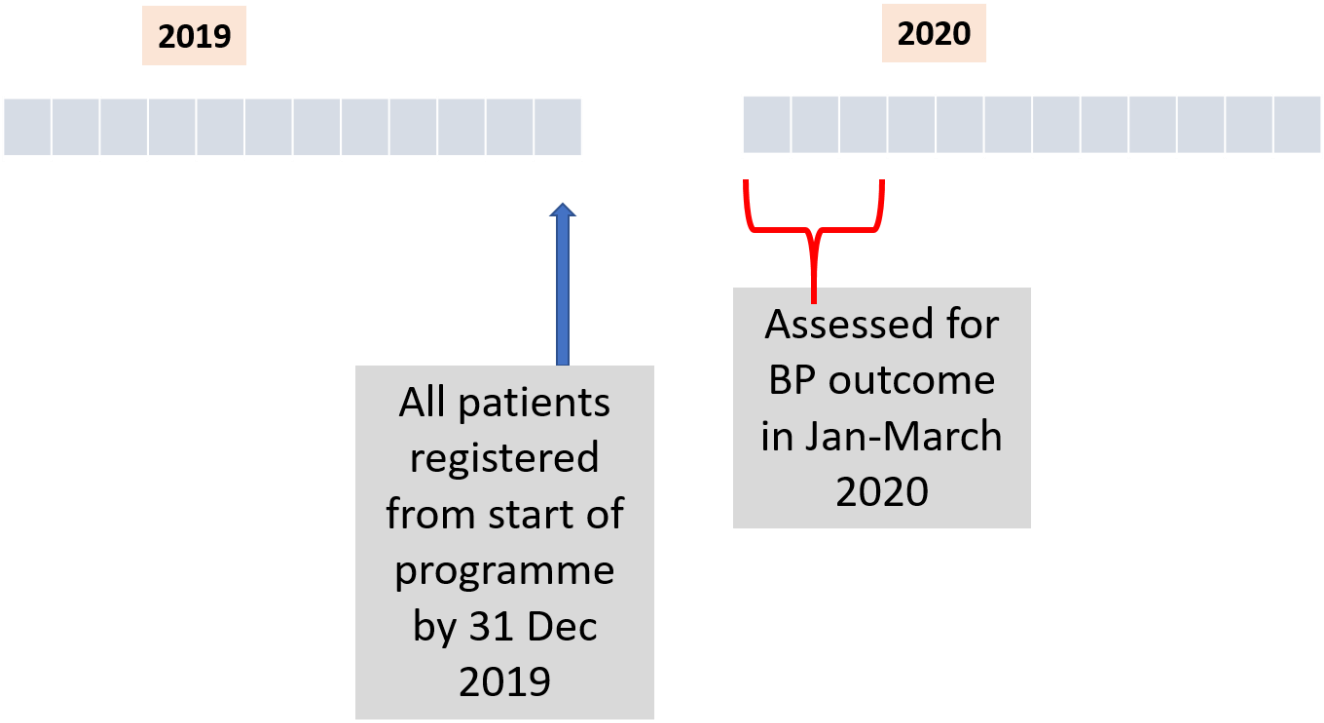
  Number of patients with controlled BP (<140/90) during quarter 1 of the next year (if the patient made more than one visit in the quarter, use most recent reading) (B2)
  ---------- X 100
  Estimated number of people with hypertension in the catchment population/geographical area (district/state/province level) (B1)

  - The numerator will include all patients with blood pressure under control during the recent visit between January 1 to March 31 irrespective of year of registration. It will also include patients who got registered in previous years.
  - Indicator of impact: coverage and quality of the programme
  - Estimates coverage of patients with controlled hypertension in an area
  - The aim is to increase the number of people with controlled BP to increase the impact of the programme

- Measured for a district or a State
- The denominator is derived from the estimated prevalence for a District/State
- Measured once in a year in April month each year

For Annual indicator – hypertension control coverage rate for one year

Date of reporting – 15th April of every year



Ready reckoner to determine the quarter for which the quarterly report is to be prepared		
Month in which quarterly report prepared	**Quarter for assessing if BP is under control (Yes/No) (A2)**	**Quarter in which patients registered for HTN Treatment (A1)**
July, 2019	April – June, 2019	January – March, 2019
October, 2019	July – September, 2019	April – June, 2019
January, 2020	October – December, 2019	July – September, 2019
April, 2020	January – March , 2020	October – December, 2019
July, 2020	April – June , 2020	January – March, 2020
October, 2020	July – September , 2020	April – June, 2020
January, 2021	October- December , 2020	July – September, 2020
April, 2021	January – March , 2021	October- December, 2020
July, 2021	April – June , 2021	January – March, 2021
October, 2021	July – September , 2021	April – June, 2021
January, 2022	October – December , 2021	July – September, 2021
April, 2022	January – March, 2022	October- December, 2021
July, 2022	April – June , 2022	January – March, 2022
October, 2022	July – September , 2022	April – June , 2022
January, 2023	October – December , 2022	July – September , 2022

Exercise 1

Please complete the following table:

Date of reporting	On the given date of reporting, you will consider the denominator as the number of patients registered in _____ Quarter/Year	On the given date of reporting, you will consider the BP measurement of patients in Column 2 in _____ Quarter/year
Quarterly report		
15 April 2019		
15 April 2020		
15 July 2019		
15 January 2020		
15 October 2019		
Annual report		
15 April 2019		
15 April 2020		

Interpretation of core monitoring indicators

Exercise 2:

Examine figure 1 and 2 and answer the following questions:

1. Which indicator does the figure depict?
2. How do you interpret this graph?
3. What is the difference in the control rate between the two states?
4. What is the difference in the uncontrolled rate between two states and possible reasons?
5. What is the difference in the proportion of patients who missed visits between two states and possible reasons?

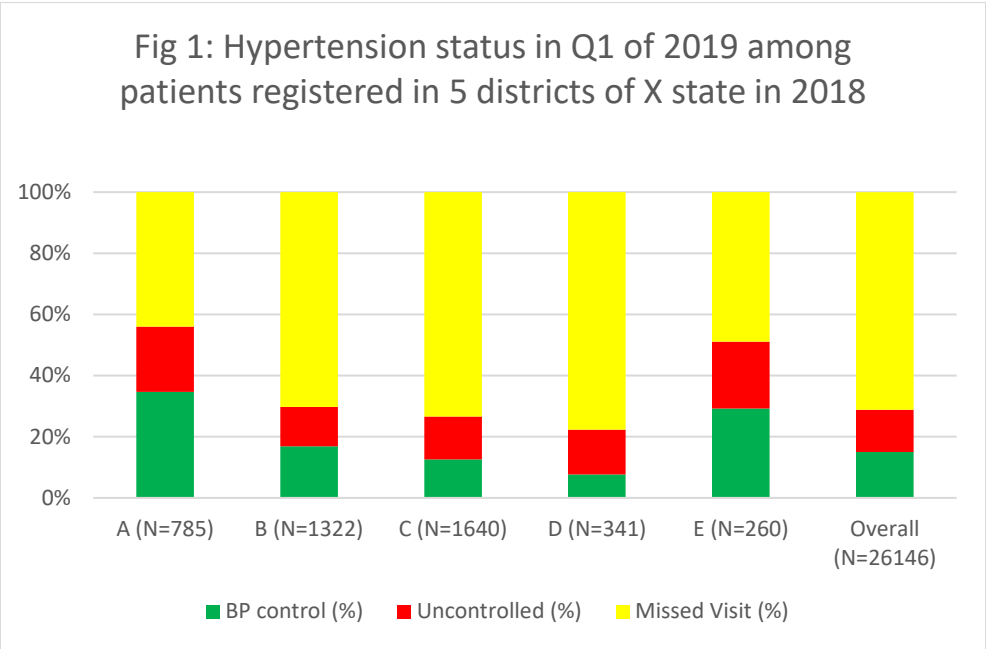


Fig 1: Hypertension status in Q1 of 2019 among patients registered in 5 districts of X state in 2018
100%
80%
60%
40%
20%
0%
A (N=785)
B (N=1322)
C (N=1640)
D (N=341)
E (N=260)
Overall (N=26146)
BP control (%)
Uncontrolled (%)
Missed Visit (%)

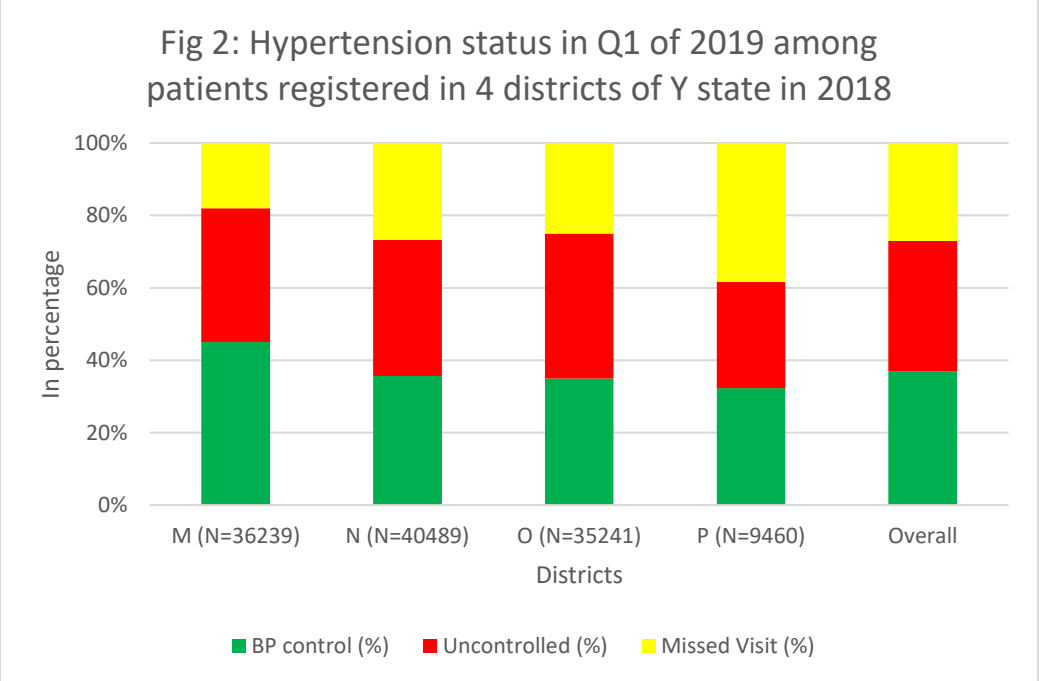


Fig 2: Hypertension status in Q1 of 2019 among patients registered in 4 districts of Y state in 2018
In percentage
100%
80%
60%
40%
20%
0%
M (N=36239)
N (N=40489)
O (N=35241)
P (N=9460)
Overall
Districts
BP control (%)
Uncontrolled (%)
Missed Visit (%)

Exercise 3: Calculate the annual indicator with the information given below:

As per the Annual Health Survey, the prevalence of hypertension in district X of ABC state is 26.5%. The projected population for 2019, of adults above 18 years of age is 1,78,9695. The number of patients with BP less than 140/90 in January 2019 is 655. Calculate estimated hypertension for the given population and annual hypertension control rate.

5.1.3 Hypertension Registration Rate

- Hypertension registration rate:

  Total number of patients with hypertension registered at district/state under IHCI
  ---------- X 100
  Estimated number of people with hypertension in district/state

  This is an important process indicator of the IHCI program. This indicator is used to evaluate the coverage of the program.

5.2 Digital Reporting system and tools

The use of mobile phones and wireless technologies has grown exponentially across the globe in recent times. Digital technologies in the management of hypertension can ensure:

Efficient and high-quality care

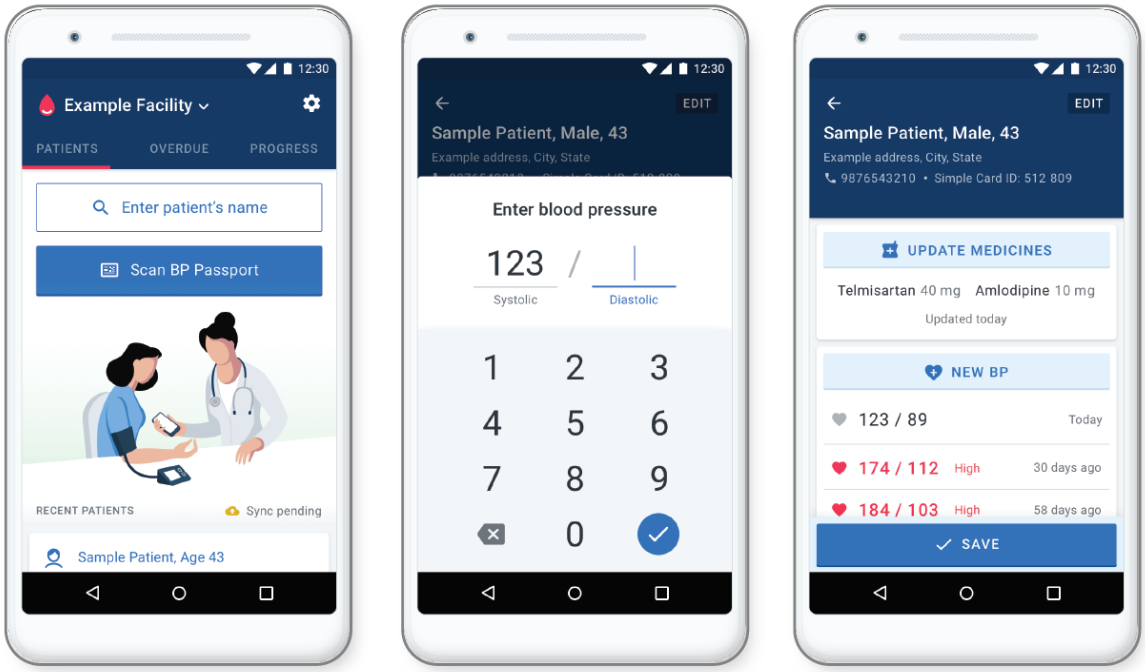
- Efficient communication and use of information across health care providers
- Provision of timely and secure access to longitudinal clinical data that can help prevent NCDs and improve the delivery of care

5.2.1 Simple app

Simple is an android app that helps health care workers manage the recording of blood pressure measurements and medications. A web-based Simple dashboard gives health system managers the feedback they need to improve BP control across their facilities.
The Simple app system consists of the following recording and reporting tools that are maintained and utilized at health facilities implementing the India Hypertension Control Initiative:

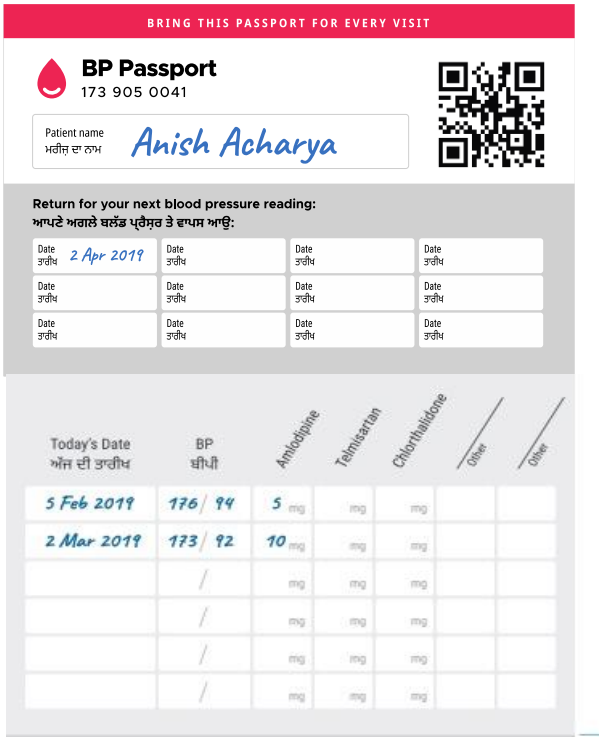
- Simple android app for data entry
- BP passport with QR code for patient identification
- Simple web-based dashboard for monitoring

Simple android app for data entry: Healthcare workers enter BP values and BP medications at each patient's visit. Finding patients takes only 3-4 seconds with a scannable patient ID system.



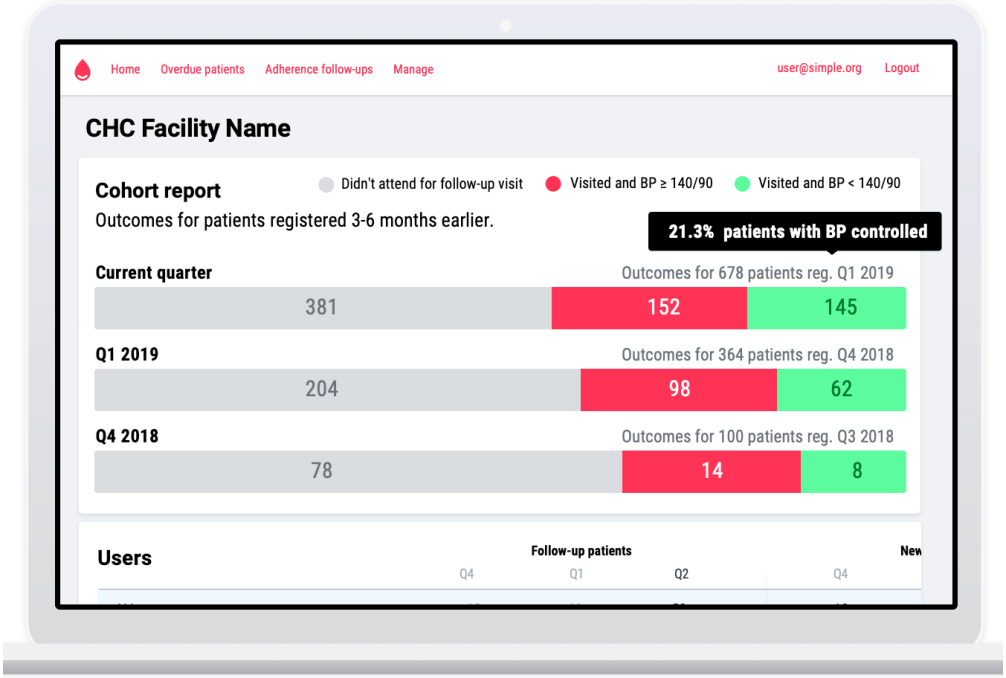
5.2.2 BP passport for patient identification:

The BP passport is a patient ID card in which blood pressure and medicines can be recorded during every visit. The BP passport card also has a QR code which will help to quickly look up a patient in the Simple app in subsequent visits. Every patient registered will get a BP passport. When a patient forgets or loses their BP Passport, a new one can be issued easily.



5.2.3 Simple web-based dashboard for monitoring:

Facility administrators, district, and State officials can monitor the performance of facilities in near real time through a secure web-based dashboard. They can track registration rates, follow-up and BP control rates of all registered patients with hypertension across all facilities in the district or state. They can also track the number of calls made through the app by healthcare workers to patients who are at default risk or lost to follow up.



Advantages of the Simple app

- **Fits in workflows:** Simple is fast and fits into most workflows, so healthcare workers spend more time with patients and less time doing data entry.
- **Easy to learn:** Healthcare workers can learn Simple in the field in less than an hour.

- **Works on any Android device:** Simple works on any modern Android phone or tablet, version 5 or above.
- **Offline performance:** Simple works in offline mode as well. Data is synced whenever the user's internet is active.
- **Interoperable with other systems:** HL7 FIHR compatible messaging and APIs make the Simple app interoperable with many health systems.
- **Secure:** Patient data is encrypted on the device and is aligned with top industry-standard security.
- **Free and truly open source:** Simple's codebase is freely available and open source.

Pilot in India

Simple was deployed in Oct 2018 in Punjab and thereafter in Maharashtra under the India Hypertension Control Initiative. Simple has had strong uptake in public health facilities in these two states. Healthcare workers appreciate that Simple is easy to learn, simple to use, and takes up very little data. In a recent survey, nurses and doctors gave Simple a 4.5/5-star rating.

More details on the Simple app can be found at https://www.simple.org/

5.2.4 Facility hypertension register

Each facility maintains a 'facility hypertension register' which has line listing of all patients on blood pressure treatment in that health facility. Each health facility designates a staff member who will be responsible for maintaining this register. This register is maintained at the health facility level by the data assistant/dedicated NCD staff nurse/health worker designated for this task. It is:

- updated with new patients registered
    - at the time of issuing the treatment card or entering in the Simple app
- update records if patient is moved to another facility (transferred out/moved to private facility) or died.

Date of registration	Name s/o, d/o, w/o	Age	Gender	Phone number	Full address (House no, Name of hamlet/ village/colony/ Nagar/ town, nearest landmark)

Entered immediately or soon after registering the patient

1. **TO:** Transfer to another govt facility- Transferred to another govt facility/patient opted to take treatment in another govt facility (mention name of the facility if known)
2. **Pvt:** Shifted to Pvt facility - Contacted and taking treatment in the private sector (mention name of doctor if known)
3. **Died-** Mention date of death if known

Nearest subcenter/ Health & wellness center	Entered in Simple app (enter ✔ if yes)	Annual HTN Outcome Q1 2020 Outcomes: TO/ Pvt/ Died	Annual HTN Outcome Q1 2021 Outcomes: TO/ Pvt/ Died

Entered later

Total Registered	Annual HTN Outcome Q1 2020			Annual HTN Outcome Q1 2021		
	Transfer to other Govt	Shifted to Pvt	Died	Transfer to other Govt	Shifted to Pvt	Died

5.2.5 Other digital systems

The public health system in India has several digital recording and reporting systems for NCDs - either in use or currently under development. Broadly these systems are used at two levels.

- Community-level – for creating family records and population-based screening
- Health facility level – for clinical data records

The Ministry of Health and Family Health Welfare has partnered with DELL and TATA Trust to create Comprehensive Primary Health Care – IT solutions. Further, many states have their own digital systems for clinical data records. Irrespective of the software used for NCD clinical records, if the longitudinal records of patient blood pressure are available, IHCI dashboards can be generated for monitoring.

5.3 Facility reports

The medical officer will be responsible for timely submitting quarterly and annual reports. Reports will be prepared by the data entry operator/designated health staff. Based on these reports the core indicators are calculated.

The facility report comprises of the following variables:

S. No	Serial number of health facilities, district wise
District	District name
Block	Name of block to which the health facility belongs to wherever applicable
Facility type	Either PHC/CHC/GH
Health Facility name	Full name of health facility
Q1_R	Number of patients registered in quarter 1
Q1_C_n	Number of patients under control in quarter 1
Q1_UC_n	Number of patients not under control in quarter 1
Q1_MV_n	Number of patients missed visit in quarter 1
Q2_R	Number of patients registered in quarter 2
Q2_C_n	Number of patients under control in quarter 2
Q2_UC_n	Number of patients not under control in quarter 2
Q2_MV_n	Number of patients missed visit in quarter 2
Q3_R	Number of patients registered in quarter 3
Q3_C_n	Number of patients under control in quarter 3
Q3_UC_n	Number of patients not under control in quarter 3
Q3_MV_n	Number of patients missed visit in quarter 3
Q4_R	Number of patients registered in quarter 4
Q4_C_n	Number of patients under control in quarter 4
Q4_UC_n	Number of patients not under control in quarter 4

ANN_R	Number of patients registered in health facility
ANN_C_n	Number of patients under control in first quarter of subsequent year
ANN_UC_n	Number of patients not under control in first quarter of subsequent year
ANN_MV_n	Number of patients missed visit in first quarter of subsequent year
ANN_LFU_n	Number of lost to follow up for 12 months continuously
ANN_PVT_n	Number of patients taking treatment in private sector
ANN_TO_n	Number of patients transferred to other gvt. facility for treatment
ANN_DTH_n	Number of deaths

Registered: Total hypertensive patients registered in the health facility under IHCI
BP Controlled: Systolic blood pressure <140 and diastolic blood pressure <90 during last visit of quarter

BP Uncontrolled: Systolic blood pressure ≥140 or Diastolic blood pressure ≥90
Missed visit (MV): If the patient did not visit for follow up for 3 months consecutively or blood pressure not measured or blood pressure not documented
Loss to follow up (LFU): If the patient did not visit for 12 months continuously and treatment status not known
Transfer to Private (TFRPVT): Taking treatment in the private sector
Transfer to the government (TO): Transferred to other government facilities for treatment or patient opted to take treatment from the government facility
Death (DTH): Death of registered patient

Sample facility report – Quarter

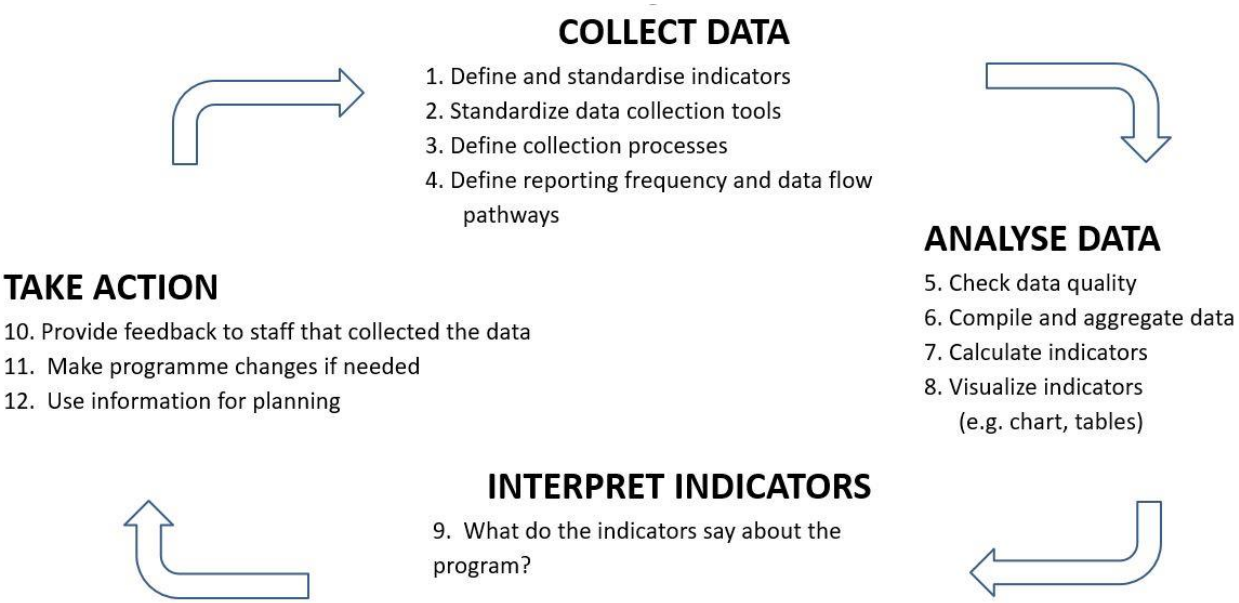
S.No	Health Facility name	Q1_R	Q1_C_n	Q1_UC_n	Q1_MV_n	Q2_R	Q2_C_n	Q2_UC_n	Q2_MV_n	Q3_R	Q3_C_n	Q3_UC_n	Q3_MV_n	Q4_R	Q4_C_n	Q4_UC_n	Q4_MV_n
		Report for quarter 1 (A)								**Report for quarter 3 (A)**							
						Report for quarter 2 (A)								**Report for quarter 4 (A)**			

Sample facility report – Annual

S.No	Health Facility name	ANN_R	ANN_C_n	ANN_UC_n	ANN_MV_n	ANN_LFU_n	ANN_PVT_n	ANN_T0_n	ANN_DTH_n
Report for annual (B)									

Section A of facility report is submitted by 15th of first month of every quarter as 'facility quarterly report'. On 15th April every year, Section B is also submitted as 'facility annual report'.

5.4 Monitoring cycle



Answer key for Monitoring Indicators and Reporting tools

Exercise 1: Determining the Quarter: *Complete the following table*

Date of Reporting	On the given date of reporting, you will consider the denominator as the number of patients registered in _____ Quarter	On the given date of reporting, you will consider the BP measurement of patients in Column 2 in _____ Quarter
15 April 2019	October- December, 2018	January – March , 2019
15 April 2020	October- December, 2019	January – March , 2020
15 July 2019	January– March, 2019	April– June, 2019
15 January 2020	July – September, 2019	October- December, 2019
15 October 2019	April – June, 2019	July – September , 2019
Annual report	**Denominator**	**Numerator**
15 April 2019	Estimated number of people with hypertension in the catchment population/geographical area (district/state/province level)	January – March 2019
15 April 2020	Estimated number of people with hypertension in the catchment population/geographical area (district/state/province level)	January – March 2020

Note: For annual report:

- The numerator will include all patients with blood pressure under control during the recent visit between January 1 to March 31 irrespective of year of registration. It will also include patients who got registered in previous years.
- The denominator is derived from the estimated prevalence for a District/State

Interpretation of Core indicators of Monitoring

Exercise 2: Examine figure 1 and 2 and answer the following questions

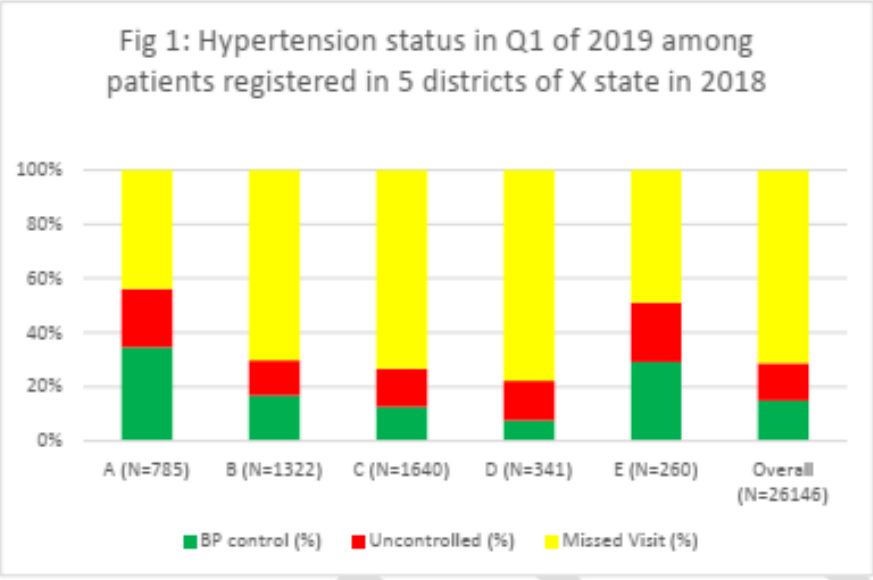
6. Which indicator does the figure depict?

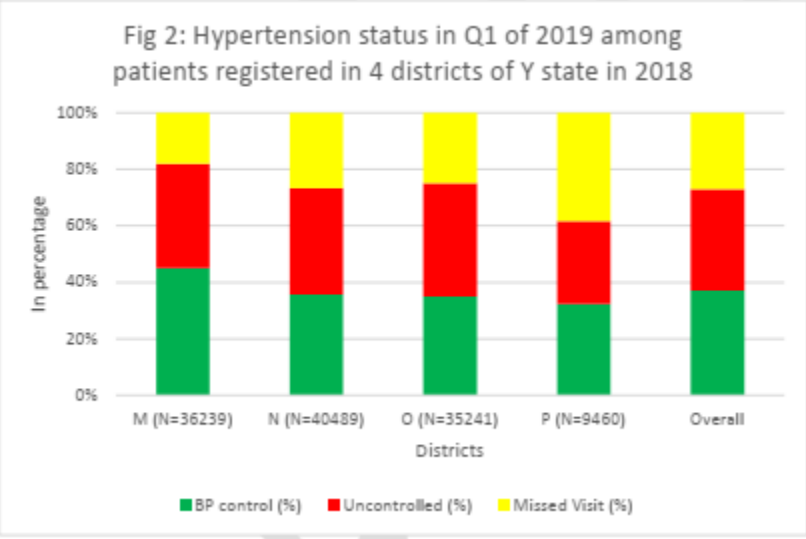
   Annual Indicator

7. How do you interpret this graph?
8. What is the difference in control rate between two states?
9. What is the difference in uncontrolled rate between two states and possible reasons?

10. What is the difference in proportion of patients who missed visits between two states and possible reasons?

Note: Have an overall discussion of how the graph is presented. Compare the control rate, uncontrolled rate, missed visits between states X and Y and discuss possible reasons for the difference.





Exercise 3: Calculate annual indicator with the information given below:

As per the Annual Health Survey, the prevalence of hypertension in district X of ABC state is 26.5%. The projected population for 2019, of adults above 18 years of age is 1,78,9695. The number of patients with BP less than 140/90 in January 2019 is 655. Calculate estimated hypertension for the given population and annual hypertension control rate.

Total >18 years' population: 1,78,9695

Total expected HTN cases: 4,74,269

Annual HTN control rate: 655 / 4,74,269 *100 = 0.1

Chapter 6: Supportive supervision

Expected competency on completion of session: Ability to conduct supervisory visits and provide constructive feedback to sub-centre/PHC/CHC/District Hospital staff.
Audience: Supervisors of the block, district, state, and national level
In this session you will learn about:

- *Supervision visits schedule preparation*
- *Supportive supervision checklist*
- *Interpersonal communication*

Good supervision is the process of helping staff improve their own performance continuously.

6.1 Purpose of supervision

Effective management of hypertension requires the cooperation of several health care providers in peripheral health facilities. As a supervisor, you will be responsible for ensuring that screening, diagnosis, treatment, and monitoring of patients with hypertension are undertaken as per guidelines. Supervisory visits to health units give you the opportunity to assess the performance and provide technical advice and guidance so that the staff can provide better services.

- Good supervision is the process of helping staff improve their performance.
- Supervision is an opportunity to improve staff knowledge and skills.
- Supervisory visits are an opportunity to jointly address the problem and explore solutions. The supervisory visit gives you the opportunity to see and better understand the problems which staffs face, especially at peripheral health facilities.
- During these visits, you can
    - Observe and reinforce good practices.
    - Identify and correct inadequate performance before it becomes a major problem.
- Supervisory visits also give staff the opportunity to talk with you.
- Regular supervisory visits place an emphasis on *helping* the staff identify and solve problems, instead of finding fault. This will create a good working relationship between you and the staff of the district.

6.2 Approaches to supervision

Traditionally, public health programs have used an authoritarian inspection or control approach to supervision. This approach is based on the thinking that health staff are unmotivated and need strong control to perform correctly. It has been shown that a supportive approach, where supervisors

and health staff work together to solve problems and improve performance, delivers improved results.

Supportive supervision explores if workers are aware of the program priorities and problems and recognize the fact that workers already know how well-placed they are to achieve those priorities. Supportive supervision helps local workers understand their programmatic data, interpret it in their local context and identify programmatic gaps. The hallmark is to listen and to acknowledge all positive points. Supportive supervision leads to a dialogue that jointly explores problems, sets priorities and formulates solutions.

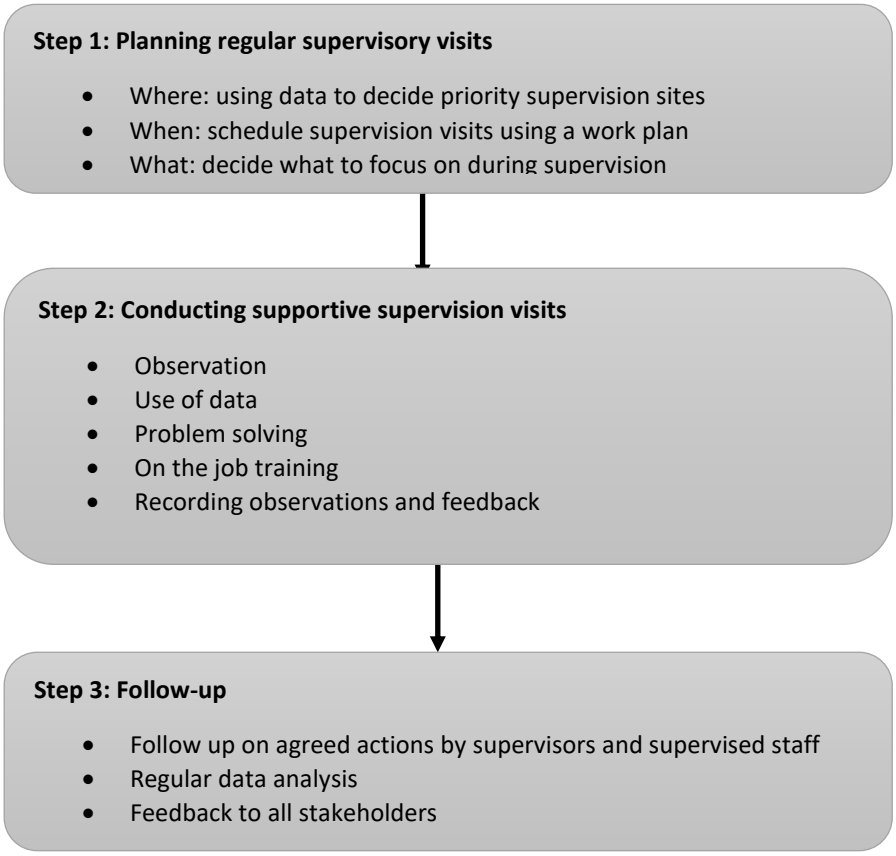
Supportive supervision explores if workers are aware of the program priorities and problems and recognize the fact that workers already know how well-placed they are to achieve those priorities. Supportive supervision helps local workers understand their programmatic data, interpret it in their local context and identify programmatic gaps. The hallmark is to listen and to acknowledge all positive points. Supportive supervision leads to a dialogue that jointly explores problems, sets priorities and formulates solutions.

Supportive supervision is about helping to make things work, rather than checking to see what is wrong.

"They should smile when they see you walking over the hill to visit"

- Effective supervisors are welcomed by the staff they supervise
- Frank feedback doesn't mean hostile feedback
- Joint problem-solving shows that the supervisor and the staff person are on the same team

6.3 Steps of supervision



6.3.1 Step 1: Planning supervisory visits

- **Where to conduct the visits:**
  - In general, each health facility should be visited at least once in a quarter.
  - If there are more health facilities, then prioritize your visits based on the following criteria:
    - Low / Decreasing blood pressure control rate
    - Low / Decreasing registrations
    - Follow-up of key issues identified during the last visit
    - Did not visit even once in the last quarter
    - Delayed / Incomplete / Inaccurate reporting in the last quarter
    - New staff who may need training

- **When to schedule supervisory visits**:
    - Plan your 3-month calendar using approximately 70 working days per quarter.
    - Ensure other planned works such as block, district, state or national level review meetings, training of new staff, preparation of reports or other planned work are included.
    - The schedule should be feasible and practical, considering the distance, transportation difficulties, or constraints due to weather and travel conditions.
    - Try not to rush your visit. Plan to spend enough time at each health facility so that you can do a good job of supervising.
    - The health staff under supervision should be informed of the schedule.
    - Consider other planned activities of health staff being supervised, such as weekly/monthly meetings and special activities (e.g., outreach clinics, market days, etc).

- **What to focus on:**
    - Prepare a summary of the review of previous supervision reports, or data analysis, to identify what to focus on during supportive supervision visits. An example is provided below:

Name of facility	3-6-month control rate	Last quarter supervision visit	Additional remarks	Focus of the planned visit
A	25%	Patient treatment had not been escalated according to the protocol	New staff had been recruited	Training on the treatment protocol
B	80%	There was an inconsistency between reported data and facility hypertension register data	Patient records and registers were not updated	Verify data. Provide on-the-job training
C	-	Missing report of some patients	Hypertension treatment cards out-of-stock	Provide support to print the treatment cards
D	30%	Stock out of core drugs had been reported	Sufficient drugs had not been indented	Training on drug inventory projections and indenting

Remember: Always keep the concerned officials informed about the visit well in advance. Involve the health facility in charge during the visit. Share a summary of findings and recommendations at the end of your visit. Written feedback will help you in the follow-up of key issues for subsequent visits. A summary of your key observations should be shared with all concerned officials at the institution/block/ district level on a regular basis.

Exercise 1. Supportive supervision planning

There are 150 SCs, 40 PHCs and 10 CHCs in a district. Plan your visits for the first quarter of 2020 (January to March) and mark your visits on the calendar. All facilities had a BP control rate of <50% in the last quarter. In addition, PHC Khera had drug stock-outs while PHC Sundal has only one doctor who has been on sick leave for the last 3 months. Note that you are busy during the first week of the quarter to prepare various reports. There is a district-level review meeting on the last Monday of every month and a state-level review every other month.

January 2018

Notes:

February 2018

Notes:

March 2018

Notes:

6.3.2 Step 2: Conducting supportive supervision visits

A **simple supervision checklist** facilitates systematic data collection on input, process, output and outcome indicators at the health facility. It enables a comparison of indicators among facilities of same level, thereby, allowing supervisors to identify good and replicable practices. The checklist can help to identify key problems and discuss possible solutions to address these problems.

Most importantly, supervisors should fix problems and address urgent issues during the visit. For example, if a supervisor finds a treatment card of the patient whose last recorded BP is 180/110 and hadn't turned up for treatment this month, then the supervisor should immediately call the patient.

Please refer to a supportive supervision (SS) checklist and a checklist for facilities using Simple App. SS is organized with the following sections:

1. Screening and BP measurement
2. Treatment outcome
3. Patient recording and reporting system
4. Identification and tracking of missed patient
5. Pharmacy
6. Laboratory facilities
7. Telephone calls by STS

Supervisory visits improve performance

- Supervision contributes to the clinical and monitoring quality
- The most efficient system will vary in different types of facility
- A role of the supervisor is to transfer successful experiences
- As a result, staff should be able to self evaluate their achievements
- A major and very common problem for supervisors is lack of time:
    - To travel to multiple facilities and arrive at opportune hours
    - To cover multiple patient paths and clinical areas in large facilities
    - To balance observation/advice and direct clinical involvement

India Hypertension Control Initiative (IHCI)

Supportive Supervision Checklist

Simple App / non-Simple App facility

District name: Facility type & name: DH/ AH/ SDH/ RH / CHC / PHC/ UPHC /SC ……. Name of medical officer in charge:		**Name of supervisor:** **Designation:** CVHO/STS/Both/ Others **Date:**
Last month total OP cases: …….		
Number of HTN patients registered till date:		
Last month registration: reported …… actual ……		
Is the HTN treatment protocol displayed on the wall or desk? □ Yes □ No		
Is the BP measurement checklist displayed? □ Yes □ No		
1	**Screening and BP measurement**	
1.1	Number of staff nurse:	NCD nurse posted under NPCDCS …… Nurse designated to do NCD work…….
1.2	Number of Medical officers:	……
1.3	Number of functional BP instrument/s in the facility (Digital/Aneroid/Mercury/LED)	___D, ___ A, ___M, ___L
1.4	Who does BP measurement in the facility? (Multiple choices)	NCD SN / SN /ANM/ Others (specify…….) NA
1.5	How many days in a week, opportunistic screening is done at the facility? (No. of days)	
1.6	In previous 3 working days a) No of adults whose BP was measured b) Total no of adult outpatients	 ……. ……. NA
1.7	Observe BP measurement for at least one patient. If there is no patient, get your own BP checked a. If staff is tying the cuff properly b. Patient's sitting position is correct	 Y N Y N Y N

	c. BP apparatus position is correct	
1.8	Are all adults with BP ≥140/90 referred to the medical officer for management?	Y N NA
2	**Treatment outcome**	

Review all treatment cards registered two months before. In case of fewer than 25 registrations in that one month, then previous months' cards to be reviewed till 25 cards are reviewed.

2.1	Number of cards reviewed	

Assess the treatment outcome for each card. (Use a tally mark to count only one treatment outcome per card)

a. Number with BP controlled (<140 and <90) at last visit	b. Number with BP uncontrolled (≥140 or ≥90) and treatment intensified at last visit	c. Number with BP uncontrolled (≥140 or ≥90) and treatment not intensified at last visit	d. Number for whom BP / treatment not documented at last visit	e. Number who did not visit the facility for previous two months (missed visit)

3	**Patient recording and reporting system**	
3.1	Was the facility hypertension register up to date till last week	Y N
3.2	a) Number of blank patient BP passports available at facility b) Number of blank treatment cards available at facility (For simple app only (a) to be kept; For non-simple app both (a) and (b) to be kept)	
3.3	a) Is there a place to store treatment cards? b) Is there a two-stack system in place for arranging treatment cards?	Y N NA Y N NA
3.4	Are the cards arranged by serial number to facilitate easy retrieval?	Y N NA
4	**Identification and tracking of the missed visit**	
4.1	Identification mechanism for missed patient	Two stack system / Follow up register / Simple App / Others / None
4.2	Tracking mechanism for missed patients	Phone call / IVRS / SMS / ASHA through home visit/Others / None
4.3	No. of patients who missed visit in the previous quarter based on available list ……/ list not available	
4.4	a. Overdue list shared with ANM / ASHA b. if, yes date	Y N DD/MM/YYYY
4.5	Among patients who missed visit, how many were contacted either through phone call or home visits? ……	
5	**Pharmacy**	

5.1	Number of days for which HTN medicine is dispensed by the facility				30, 15, 7, other (….) days						
5.2	Is drug stock register maintained and updated regularly				Y N						
5.3	Drug name				Is stock sufficient for one quarter for registered patients? (Write Y/N/NA)						
I	Amlodipine										
Ii	Telmisartan										
Iii	Losartan										
Iv	Enalapril										
V	Chlorthalidone										
Vi	Hydrochlorothiazide										
Vii	Others (specify)_____										
Viii	Others (specify)_____										
6	**Laboratory facilities**										
6.1	Is there a functional laboratory at the facility?				Y N						
6.2	If yes to 6.1, please encircle the type of tests offered to HTN patients										
	1. S. Creatinine 2. S. Electrolytes 3. Urine protein 4. Any other _____										
7	**Telephone calls (To be done by STS)**										
7.1	No of phone calls made on the day of visit (At least 10 calls to be made to patients who have missed visits, loss to follow up patients, high risk patients) a. Missed visit / loss to follow up patients…… b. High risk patients ……. c. Others ……										
7.2	Missed visit/ loss to follow up patients										
		1	2	3	4	5	6	7	8	9	10
	IHCI registration no.										
I	Current status										
Ii	If agree to visit/not willing to return, treatment status of patient										

	a. If on treatment										
	b. If not on treatment										

(i. Current status: **a.** Agree to visit **b.** Not willing to return **c.** Discontinued/ not willing to take treatment at all **d.** unable to contact/no response / wrong number **e.** Had visited the facility in the past 60 days (2 months) **f.** Death)

(ii. If agreed to visit/not willing to return, treatment status of the patient: **a.** On treatment, **b.** Not on treatment)

a. If on treatment, reason: **a.** Taking Treatment from other Government Hospital **b.** Taking Treatment from Private Hospital/Clinic **c.** Others (Specify)

b. If not on treatment, reason: **a.** Too long a wait in health facility **b.** Drugs were not available **c.** Drugs are given for a few days only **d.** Side effects of the drugs given from the facility **e.** Given drugs do not work **f.** Distance from home **g.** No proper conveyance to reach **h.** No one to help to reach health facility **i.** Too sick to make the trip **j.** Bedridden **k.** The financial burden of transportation cost

Checklist for assessment of Simple App

1.1	Who is using the simple app? a. NCD Staff Nurse b. NCD counsellor c. Doctor d. Pharmacist e. Others (Specify……..)	 Y N Y N Y N Y N Y N
1.2	Are you filling the details directly in the app?	Y N
1.3	Do you face any challenges in patient retrieval?	Never / Sometimes
1.4	If any challenges faced, specify:	
1.5	Are all patients registered?	Y N
1.6	If no, reasons	Unable to sync/ Technical errors in the app/ Unsupported device/ High OP load/ Incorrect patient flow
1.7	Are all follow-up patients updated in simple app concurrently?	Y N
1.8	Is the simple app user satisfied with the application? (Likert scale: Not satisfied at all 1 – 5 Very satisfied)	1 / 2 / 3 / 4 / 5
1.9	Do you face any challenges in getting timely support for issues experienced while using the simple app?	Y N Help not required
1.10	If yes, whom do you contact?	
1.11	Are you using the overdue list function?	Y N
1.12	How frequently do you call patients?	
1.13	Does the call masking work?	Never /Sometimes /Always
1.14	Are you being charged for the calls?	Never /Sometimes /Always
1.15	Are the patients receiving SMS?	All / Few / No
1.16	Are you using the 'progress' tab for reviewing status of program in your health facility?	Y N

1.17	Are you using the 'progress' tab for preparing reports?	Y N
1.18	Do you discuss the facility performance with supervisor?	Y N
1.19	How many patients are registered in Simple app?	……
1.20	How many patients are registered in facility hypertension registers? (Difference should be automatically calculated)	……. / Registered not maintained

Refer *Annex A* for instructions on using the supervision checklist.

Use the checklist to conduct supervision visits by

- Observation:
  - How staff does their work
  - Observe the availability and usage of IHCI related logistics in the health facility such as BP monitor, protocol poster, BP passports, treatment cards, and facility hypertension register
  - Watch how the patient moves inside the health facility and how services are organized including BP measurement, counselling, and treatment
  - Listen to how they interact with patients
- Interview:
  - Speak with various cadres of health staff to understand their roles and assess their knowledge
  - Ask if there is any shortage in IHCI related logistics
  - Phone call to patients to understand the quality of service being provided
- Examination:
  - Check records and validate data
  - Verify blood pressure entries on the treatment card
  - Assess treatment outcome using the patient treatment cards
  - Check prescriptions on the treatment card to see if treatment is given as per protocol
  - Validate entries on the patient card with the facility hypertension register versus reports
  - Check drug stock status

Always conduct supervision together with the health facility staff. The purpose of supervision is to help solve problems together.

Exercise 2: Collecting information for the supervision checklist

Please review the supervision checklist provided to you by the facilitator. For each section of the supportive supervision checklist, discuss how best to collect information.

Effective Communication Tips

Feedback should aim to help the recipients improve their effectiveness and should focus on developing skills and strengthening areas that need improvement, rather than criticizing or judging the recipient for inadequacy.

- The provider should suggest some possible alternatives to what the recipient has been doing.
- Feedback should help the recipient set reasonable goals for changing and improving performance or behaviour.

Be supportive

- Start on a positive note. Emphasize what really went well, and praise what the individual or group is doing right.
- See if the recipient is aware of the issues or concerns that the feedback addresses before stating them directly. If it comes from the recipient himself, he is much less likely to be defensive, and apt to be more constructive and creative in discussing alternatives.
- Don't look for expressions of guilt or responsibility, but rather for changes that will improve the effectiveness of an individual's or organization's efforts.
- Especially if you're dealing with the opposition, or with the targets of advocacy, assume— or, better yet, identify and describe—common ground and your common interest in making things better.
- Focus on the **specific issue**, and don't point fingers.
- Identify the issue or problem as clearly and specifically as possible. Once you've done that, stick to exploring it. The question is not "Who's to blame?" but "How do we make this work as well as possible?"

Be honest

- Providing formative feedback, being supportive, and not blaming doesn't mean ‘not being honest’. On the contrary, formative feedback requires honesty, the dishonesty renders it useless.
- Deal directly with the real problem or issue. Identify it clearly. If you know, explain how it became a problem, and help the recipient work out strategies for fixing it now and preventing its recurrence in the future.
- If the issue is a personal one, identify it clearly and help the recipient understand how to address it.

Feedback should be frank, constructive, and practical

- Understand what the actual problems facing staff are – staff are best positioned to identify these problems
- Be systematic, including meticulous review of records – use and disseminate practical checklists and job aids
- Help solve problems on the spot whenever possible (e.g., help update records and establish a mechanism to do so in the future, solve logistic problems when possible such as provision of forms or protocol copies when needed)
- Model good behavior (e.g., speak with patients and health workers privately and respectfully; call patients whose BP is dangerously high and who didn't return for care before leaving the visit)
- Give realistic, not theoretical, solutions
- Don't give false praise. Catch people doing the right things and reinforce these.

Ask questions in a friendly manner and you are likely to obtain more useful information. Always praise good performance.

6.3.3 Step 3: Follow-up activities

Soon after the supervisory visit, share the feedback report with all concerned. The feedback report is prepared based on the observations/ findings of visit.

Prefill the data in the feedback form based on the available reports : The report includes data on previous monthly registrations and quarterly BP control rate which a supervisor needs to fill before visiting facility.

Complete the form after completion of visit: The feedback also includes input and process indicators and data on adequacy of protocol drugs.

- It is always a good practice to arrive at prioritized recommendations with timelines with the staff being supervised and add in the feedback report.
- Use the opportunity of supervision to provide on-the-job training and identify training needs and mention in the feedback form.

Discuss the findings and handover the form: Discuss your findings with health unit supervisor and appropriate staff. Work with the staff to find possible solutions and mention it in comments section

After the visit, a copy of the report stays at the health facility and keep a copy for your files and sharing it with district officials. Giving and receiving feedback is a sincere attempt to

help the recipient improve his/her performance, behaviour, understanding, relationships, or interpersonal skills. This is corrective feedback, and all of us need it from time to time.

Supportive supervision does not end with the conducted visit. Follow-up should be done after the visit to act on issues as agreed with health facility staff, particularly to solve any urgent issues related to equipment or drug supply.

Establish a system for continuous feedback and improvement

- No program is perfect
- The best programs have information systems that indicate when and where they are getting off track
- The best supervisors establish, strengthen, and disseminate these information systems so health workers themselves can track and improve their own performance
- Demonstrate the value of accurate, timely data in improving performance

IHCI Supportive Supervision – Feedback to Health facilities

Name of Block: Name of Institution: Date of visit:

Program started on: Name of Supervisor: Designation:

Six-months Registration Trend							Coverage		%
Month & Year							**Total Registered**		
# Regd.							**Estd. Target Population**		

Quarterly Report Analysis					
Quarter/treatment card analysis	**Total Regd.**	**Control %**	**Uncont-rol %**	**Missed visits %**	**Remarks**
Treatment card analysis					

Input		Process		Drug stock for 3 months	
Dedicated Staff	Y/N	Opportunistic Screening (**N**one / **F**ew / **M**ajority)		Amlodipine	**A I S**
Functional digital BP monitor	Y/N	BP measured by health staff before consulting MO	Y/N	Telmisartan / Losartan	**A I S**
BP Measurement Checklist	Y/N	BP Measurement Technique C-correct, I-Incorrect		Chlorthalidone / Hydrochlorothiazide	**A I S**
Treatment Protocol	Y/N	Defaulter Identification System	Y/N	Enalapril	**A I S**
BP Passport / ID cards (100 nos.)	Y/N	Defaulter Retrieval System	Y/N		**A I S**
Treatment cards (100 nos.)	Y/N/NA	Timely Report Submission	Y/N		**A I S**
Storage facility for Treatment cards	Y/N/NA	Patient Education & Counselling	Y/N	Other	**A I S**
Facility Hypertension Register	Y/N	Other		Other	**A I S**

Y- Yes N- No NA-Not Applicable *A – Adequate; I – Inadequate; S – Stock out

Suggestions / Comments
Follow up of previous supervisory visits: **Current supervisory visits:**

Signature of Supervisor

Signature of Medical Officer

Supervision is not a one-time activity. Periodic follow up is required to ensure the recommendations are implemented.

- Continue to analyse data to review if there is improvement in performance.
- Communicate regularly with staff to see if recommendations are being followed.
- If needed, conduct a follow-up visit to the facility before the next supervisory visit to support health staff, reinforcing key messages, and ensuring that urgent problems identified during the supervisory visit are solved.

Key Messages

- Supervision should be data/evidence based.
- Start feedback with positive points.
- Discuss issues with the health staffs and reach a common understanding of problem and their solution.
- Leave the health facility with a plan of action on 3-5 key issues with timelines.

Exercise 3: Discussion: *What are the possible data you can use to perform evidence-based supervision?*

Exercise 4: Role play on problem solving and feedback

Pick one problem from the summary report in exercise 3, keeping in mind principles of good communication, provide feedback to the PHC staff.

References:

1. RNTCP M5-10, MOH, India
2. Supportive Supervision, Module 4, WHO/IVB/08.04

Annex A: How to Use the IHCI Supportive Supervision Checklist

- Use the checklist for every supervisory visit by CVHO, CVH-STS, officials and others who supervise the IHCI at health facilities
- Before going to the facility: review observations & recommendations of the previous supervisory visit to the facility, monthly IHCI report and quarterly BP control report of facility
- Carry printed treatment protocols and BP measurement checklist so that same can be given to health facilities, if not displayed
- The checklist should capture data and observation pertaining to NCD clinic of facility; if NCD clinic is not established at facility then data and observation pertaining to the whole facility should be captured
- Provide continuous on-job training to health care providers

Checklist to be filled through: (1) Observation of processes; (2) Talking with patients; (3) Reviewing records and reports (4) Discussion with health staff at facility

1. **Screening and BP measurement**
   - Ask about number of staff nurse posted to do exclusive work related to NCD under NPCDCS or staff nurse designated to do NCD work in addition to other duties
   - Ask about number of medical officers posted
   - Ask about number of functional BP monitors of different types
   - Observe/ask who all do measure BP
   - Ask for number of days in a week, opportunistic screening is done; verify the data of previous 3 days related to opportunistic screening; If data is not available for 3 days write "NA"
   - Observe process of BP measurement for at least one patient for minimum basic standard; If there is no patient at all, get your own BP checked
   - Observe if all adults with BP ≥ 140/90 mm hg are referred to Medical Officer

2. **Treatment outcome**
   - Review treatment cards of all patients registered in a month, two calendar months before the visit. The outcome of these patients will be assessed in the previous two months of visit. (e.g., for supervisory visit done from 1st to 30th November 2019, patients registered in August 2019 is to be reviewed and their outcome is to be assessed in September and October 2019)

Visit during	**Review cards of patients registered in**	**Assess outcomes in**
January 2020	October 2019	November and December 2019
February 2020	November 2019	December 2019 and January 2020

March 2020	December 2019	January and February 2020
April 2020	January 2020	February and March 2020
May 2020	February 2020	March and April 2020
June 2020	March 2020	April and May 2020
July 2020	April 2020	May and June 2020
August 2020	May 2020	June and July 2020
September 2020	June 2020	July and August 2020
October 2020	July 2020	August and September 2020
November 2020	August 2020	September and October 2020
December 2020	September 2020	October and November 2020

- If total registered patients in that month are less than 25, then patients registered in the previous month in the sequence are to be reviewed till 25 cards are verified
- If any patients (whose cards you identify) have missed a visit and last recorded blood pressure was greater than 180 systolic or greater than 110 diastolic, make efforts to call patient along with health staff and return patient to care as rapidly as possible
- Patients with BP under control, whether they are on protocol drugs or on any other drug, they are in 2.1a. However, if a patient's BP is not under control, it is important to note, who is being treated per-protocol (count in 2.1b) and who is not treated as per protocol (count in 2.1c) in the last visit
- If patients' BP and/or treatment is not documented in treatment card, then count them in 2.2d
- Patients who did not visit the clinic for two assessment months count them in 2.2e as a missed visit patient (and NOT to be counted in any other sections)
- Reviewed patients are to be categorized in only one of the five outcomes

3. Patient recording and reporting system

- Cross-check with NPCDCS and pharmacy register to determine if every patient dispensed medicine for HTN is registered in the program
- Check for number of Blank BP passport, treatment card at facility and ensure adequate availability

4. Identification and tracking of missed visit patient

- Observe/ Ask for type of identification mechanism for missed visit patients
- Observe/ Ask for tracking mechanism for missed visit patients
- Ask for no. of patients who missed visit in previous quarter
- Ask if, overdue list is being shared with ASHAs/ ANMs. If response is Yes, ask for date on which last overdue list was shared
- Ask for number of missed visit patients who were contacted either through phone call or home visit

5. Pharmacy

- Observe for number of days hypertension medicine is dispensed by facility
- Visit pharmacy, review records and stocks, discuss with the pharmacist
- Examine stock register for stock and expiry of all HTN protocol drugs
- Check if drug stock is enough for next quarter. Guide pharmacist for timely indenting accordingly

6. Laboratory facilities

- Confirm from laboratory and treatment card that patients are being tested as per state treatment protocol. Write NA, if state protocol doesn't require it.

7. Telephone calls (Must be done by STS during supervisory visit)

- Identify patients for phone call with either of this indicator: (1) who have missed visit in previous quarter/ loss to follow up for more than 12 months (2) who have systolic BP more than 180 mmhg or diastolic BP more than 110 mmhg (3) for any other indication like verification of record, overwriting in treatment cards, with borderline BP control, etc.
- Phone call to patients of missed visit/ loss to follow up must be done till responses are received from at least 10 patients
- Record IHC registration number, current status and willingness to return of each patient.

How to categorize the treatment outcomes in the supervisory checklist?