PH Mobile Application
NCD Service Module

eHealth Kerala
State Digital Health Mission

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1 Introduction

NCD screening, or Non-Communicable Disease screening, is a vital component of preventive healthcare aimed at detecting diseases early or assessing risk factors before symptoms appear. Non-communicable diseases (NCDs) are chronic conditions not caused by infectious agents and include cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases.

As part of the public health activities at the institution and field visit a NCD screening is conducted, and high-risk individuals are identified and referred to the institution for a proper detailed examination by the doctors. If a person is diagnosed with hypertension or diabetes, he/she is registered under NCD, and follow-up is done to bring hypertension or diabetes under control.

To carry out these activities an NCD service module need to be introduced in the PH mobile application which works in the **online mode.** NCD service module will have SHAILI Info, screening, registration, follow-up, and history sections. Each of these sections has a set of data fields which needs to be captured and based on this the program will be monitored.

- NCD Screening which is capturing details of people who are suspected to have an NCD.
- NCD Registration which captures details on people who are confirmed with an NCD.
- NCD Follow-up which is capturing details about the NCD confirmed for the patient during follow-up/subsequent visits.

The module will allow for capturing the data through PH mobile app, storing, viewing, editing and synchronizing data to central PHS server in online mode.

2 Keycloak Dependencies

- ✓ Username and password authentication happens through Keycloak.
- ✓ Institutions mapped against the user will be provided by Keycloak.
- ✓ Once login the MPIN will be set.
- ✓ Users will have to login with username and password for the first login for a day.
- ✓ Users with doctor & nurse roles must be able to login to PH App. In non eHealth institution the doctor and nurse will also login to PHC through PH app and perform the NCD service.

3 Service Mapping for Users

- ✓ As part of the user assigning process, the option to map the service modules will be provided to HS/HI/MO in PH Web application.
- ✓ HS/HI/MO can assign the ASHA Area (ASHA Block) wise services for the JPHN/JHI/MLSP.
- ✓ Based on this configuration, the services will be listed in the PH Mobile Application.
- ✓ The option to flag the services as ONLINE / OFFLINE mode will be required based on which the services will be listed after login.
- ✓ List of PH Module services (Additional services expected in future)
    1. Survey ➔ (One ASHA Block for one user only) ➔ Offline mode.
    2. IDSP ➔ Offline mode
    3. NCD (HT/DM/CA) ➔ Online mode
    4. *TB ➔ Online mode (after ncd module completion)*
    5. *Respiratory ➔ Online mode (after ncd module completion)*
    6. *Visual ➔ Online mode (after ncd module completion)*
    7. *Hearing ➔ Online mode (after ncd module completion)*
    8. *Leprosy ➔ Online mode (after ncd module completion)*

9. *Mental Health ➔ Online mode (after ncd module completion)*
10. *Elderly Care ➔ Online mode (after ncd module completion)*

- ✓ Survey is considered as the first service in which one user can do survey in an ASHA Block. Whereas all other services can be done by any user irrespective of ASHA blocks.
- ✓ **Doctors & Nurses Access To PH Mobile App**
  - Doctors and nurses are available at the main PHC/FHC where asha block is not directly mapped under a PHC, instead its mapped under the sub centers of that PHC. Doctors & Nurse have to login to PHC in PH mobile app. In this case service assigning for the doctor and nurse will be a challenge.
  - To address this issue if logged in employee is a doctor or nurse (not under PH category) and have doctor or nurse user role, he/she must be able to access NCD services screen and perform NCD activities even if no services are assigned to that user and irrespective of any institution binding. Doctor and nurse will have to do NCD service for any person in the state.

4 Basic Measurement Mapping with HMS Charge Code Master

- To link the PH data capture with the HMS charge code master API must provide the HMS charge code master.
- Data captured from PH screening/registration/follow-up must be against this HMS code.
- Result value, unit must be set based on result type defined in the diagnostic master configuration of HMS.
- For basic vital measurements normal value validation must be done for all charge code based on HMS diagnostic master configuration.

Basic Measurements	HMS ➔ charge_code_id (PK)	HMS ➔ charge_code_name	Result Type In HMS	Unit as per HMS diagnostic master	Normal Values Range
Height (CM)	137839	Height	Numeric Value		
Weight (Kg)	137841	Weight	Numeric Value		
BMI(kg/m2)	137843	BMI (c)	Numeric Value		
Waist circumstance	137875	Waist Circumference	Numeric Value		
GRBS	137342	Random Blood Sugar (Glucometer)	Numeric Value		
FBS	136867	Fasting Blood Sugar	Numeric Value		
PPBS	136868	Post Prandial Blood Sugar	Numeric Value		
RBS	136866	Random Blood Sugar	Numeric Value		
HbA1C	136991	HBA1C	Numeric Value		
BP ==> Systolic	137881	Systolic Pressure	Numeric Value		
BP ==> Diastolic	137879	Diastolic Pressure	Numeric Value		

5 NCD Diseases Wise Drug Grouping

- To link the PH data capture with the HMS, charge code master API must provide the HMS charge code master.
- Each drug will be mapped under a separate category named “Hypertensive protocol drug, Diabetic Protocol Drug”. These categories will have to be mapped against diseases.
- Based on this category the drugs must be listed under respective diseases.

		HMS Item Master	
hms_category		itemid	itemname
Hypertension protocol drug	Amlodipine	10953	AMLODIPINE TAB 10 Mg
		10077	AMLODIPINE TAB 2.5 MG
		10076	AMLODIPINE TAB 5 MG
		10078	AMLODIPINE TAB (FILM COATED) 2.5 MG
		8	AMLODIPINE TAB IP(FILM COATED) 5 mg
	Telmisartan	10812	TELMISARTAN TAB IP 20MG
		363	TELMISARTAN TAB IP 40mg
		10942	TELMISARTAN TAB IP 80mg
	Chlorthalidone	10936	CHLORTHALIDONE TAB 12.5mg
Diabetes Mellitus protocol drug	Metformin	11024	METFORMIN 500mg GLIMEPIRIDE 1mg TAB
		11124	METFORMIN HCL SUSTAINED RELEASE TAB IP 500 mg
		11272	METFORMIN HYDROCHLORIDE PR IP TAB 1000mg
		11136	METFORMIN HYDROCLORIDE TAB IP 1000mg
		11019	METFORMIN SR TAB 1000 MG
		83	METFORMIN TAB IP 500mg
	Glimepiride	10395	GLIMEPIRIDE TAB 2 MG
		67	GLIMEPIRIDE TAB IP 1 mg
		68	GLIMEPIRIDE TAB IP 2mg
	Pioglitazone	10640	PIOGLITAZONE TAB 15 MG
	Insulin	138	BIPHASIC ISOPHANE INSULIN INJECTION IP 30:70 40IU/mL 10ML VIAL
		10427	HUMAN INSULIN MIXTARD 30/70 10 ml vial
		137	INSULIN HUMAN RAPID ACTING INJ 40 IU/ml
		10467	INSULIN HUMAN REGULAR/NPH INJ 50/50 10 ML
		136	INSULIN ISOPHANE IP INJ 40 IU/ml
		11185	LISPRO INSULIN INJ 3ml
Other NCD protocol drug	Aspirin	10056	ACETYLSALICYLIC ACID TAB IP 300 MG
		10055	ACETYLSALICYLIC ACID TAB IP 300 MG
		2	ACETYL SALICYLIC ACID TAB IP(GASTRO-RESISTANT) 150mg
		3	ACETYLSALICYLIC ACID TAB IP(GASTRO-RESISTANT) 75mg
		19	ATORVASTATIN TAB IP 10 mg
		10107	ATORVASTATIN TAB IP 20 MG
		10951	ATORVASTATIN TAB IP 40 mg
		11142	ATORVASTATIN TAB IP 5 mg
		11052	ROSUVASTATIN 5 mg
		11106	ROSUVASTATIN TAB IP 10mg
	Beta-blocker	10104	ATENOLOL TAB 25 MG
		18	ATENOLOL TAB IP 50 mg
		11109	METOPROLOL SUCCINATE PROLONGED RELEASE TAB IP 50mg
		10977	METOPROLOL TAB
		10542	METOPROLOL TAB IP 25MG
		86	METOPROLOL TAB IP 50 MG

6 General

- ✓ In non eHealth institutions where HMS is not available, PH mobile app will be used by doctor and nurse at the PHC level for performing NCD screening, registration, and follow-up. Users with doctor & nurse roles must be able to login to PH App. In non eHealth institution the doctor and nurse will also login to PHC through PH app and perform the NCD service. The nurse will do the screening, doctor will do registration.
- ✓ **Doctors & Nurses Access To PH Mobile App**
  - Doctors and nurses are available at the main PHC/FHC where Asha block is not directly mapped under a PHC, instead its mapped under the sub centers of that PHC. Doctors & Nurse have to login to PHC in PH mobile app. In this case service assigning for the doctor and nurse will be a challenge.
  - To address this issue if logged in employee is a doctor or nurse(not under PH category) and have doctor or nurse user role, he/she must be able to access NCD services screen and perform NCD activities even if no services are assigned to that

user and irrespective of any institution binding. Doctor and nurse will have to do NCD service for any person in the state.

- ✓ All dropdown values must be master based, which must be configurable at database level.
- ✓ Master values must be in common across PH App, HMS, PH Web
- ✓ Data entry source must be captured against each entry in screening, registration, follow-up. This is to identify the entry has come from PH App / PH Web/ SHAILI/ HMS.
- ✓ Risk Factors when updated from screening/follow up it must be updated in member survey table, however no need to keep history of risk factors in the member survey history table, because historical data will be available in screening and follow-up tables.
- ✓ Both member_id and hin_id must be kept in the transaction table so that we can use same table in HMS
- ✓ Expected External integrations.
  - Integration with HMS
  - Integration with SHAILI
  - Integration with national portals like CPHC
- ✓ The same form to be used with NCD clinic and NCD Camp
- ✓ Data captured in the PH member survey to be auto fetched in common fields for example smoking, tobacco, alcohol under risk factors, if required user can update and save it against screening/follow-up transaction and update it to member survey info also.
- ✓ Remarks field present in screening, registration and follow-up must be based on master data. Screening, registration, followup based and common remarks master data must be maintained. Remarks master data will be provided by domain team.
- ✓ Option to view the trend of BP, RBC, GRBS, HBA1C, PPBS, FBS, Weight, BMI in NCD screening, follow-up will be required. (last 5 values)
- ✓ Network availability must be checked at regular intervals, service must be delivered only if network is available. If network is unavailable prompt the user “No internet available.”

7 NCD Screening

7.1 Overview

- NCD service must be enabled only if the user has selected online mode.
- NCD mainly includes Hypertension, Diabetes, and Cancer activities which will be done by JPHN/JHI/MLSP at the sub-center level. Doctors and nurses will perform NCD activities at the main PHC/FHC level.
- Users under the public health category must be able to provide NCD service if he/she has NCD service right. In the case of doctor and nurse there is no need to check these rights.
- **Member Search:**
  - ➢ Member search must be based on either or combination of following criteria.
    - Aadhaar
    - Mobile
    - UHID
    - House No
    - House Name
    - Member Name
  - ➢ Search result must show below information.
    - Member Name

- Age
- Gender
- Contact number,
- House name (LSG No)
- NCD registration status
- UHID if available

- By default, members mapped under the logged in institution must be searched.
- The option to search for members from outside logged in institution must be provided as an additional option. Provide a checkbox " Include member from Other Institutions" in the member search screen as an optional. Member search will be based on Aadhaar/Mobile/UHID/House No./House Name/Member Name search alone.
- Prompt to select which activity user needs to perform screening/ registration/ follow-up.
  - If screening is selected open screening page, registration completed diseases need not be allowed to screen again.
  - If registration is selected open registration page→ direct registration must be possible
  - Enable follow-up only if the member is registered for hypertension / diabetes.
- Check if the selected member has a record in SHAILI, if yes show an alert in the member profile section. On the alert icon click summary of SHAILI data to be shown and detailed questionnaire must be shown in separate division.
- On SHAILI Alert Click:
  - Show the summary of SHAILI questioners like below image.
  - In new division when clicked show the detailed SHAILI questionnaire

- If a member is not yet screened, then JPHN/JHI/MLSP will do a new screening entry.
- If a member is already screened and not registered under NCD multiple screening can be done.
- If a member is selected alert the user if selected member has any NCD service alerts for example referred but not consulted, follow-up due, defaulter, etc.
- Under the history section multiple screening, registration and follow-up history from PH mobile app and HMS must be made available. (May be limited to last 5 records)
- Once NCD registration is done against a disease then screening should not be done again for that disease, only follow-up should be done.

- Cervical cancer screening is not required for male members; hence this section must not be shown.
- Under the screening observation section, the next screening date is to be captured.
  - If HT/DM next screening date will be after 1year
  - If Cancer next screening date will be after 1year
- If screening is done and registration is not done, then a reminder SMS must be sent for next screening 7 days before next screening due date.
- Basic vital measurements saving must be against the HMS charge code master. Result value must be based on result type defined in the diagnostic master configuration of HMS. Unit and normal value validation must be done based on the HMS diagnostic master configuration.
- Option to view the patients list who not reported PHC (HMS NCD clinic visit based)
  - Member name
  - Age
  - Mobile Number
  - Address
  - Type
    - NCD Screening
    - NCD Follow-up
- The option to get list of members who are referred from subcenter to the PHC is required. Against this list if the JPHN/JHI/MLSP came to know that the person has already visited hospital it needs to be marked. In such case the option to mark this person as visited should be made available. And such patient details should be removed from the pending list. Referred but not reported for screening.
- In the main dashboard an additional alert section is required in which the following alerts must be shown to the user.
  - Follow-up missed member.
  - Drug not taking cases.
  - Uncontrolled (HT, DM previous follow-upvalues related)
  - NCD registered patients from HMS
  - Prescription details from HMS

7.2 Process Flow

a) Login with username and password
b) Select the assigned institution. If only one institution is assigned auto, select it.
c) Enable the option to select online or offline mode.
d) Offline Mode:
  - If offline is selected enable ASHA block selection and proceed. And data of the selected ASHA block is only must be downloaded to the local device. Show an alert after download.
  - Data download and sync must be done daily during the first login.
  - Home screen will have dashboard, main menu, and alert selection option.
  - Dashboard shows the monitoring indicator, and the main menu will list only offline-enabled services. Services enabled for the logged-in user in the selected ASHA block must be enabled.

- Alert lists provide the critical alerts and due list of the members under the logged-in institution. An option to redirect to the respective service from the alert must be provided.

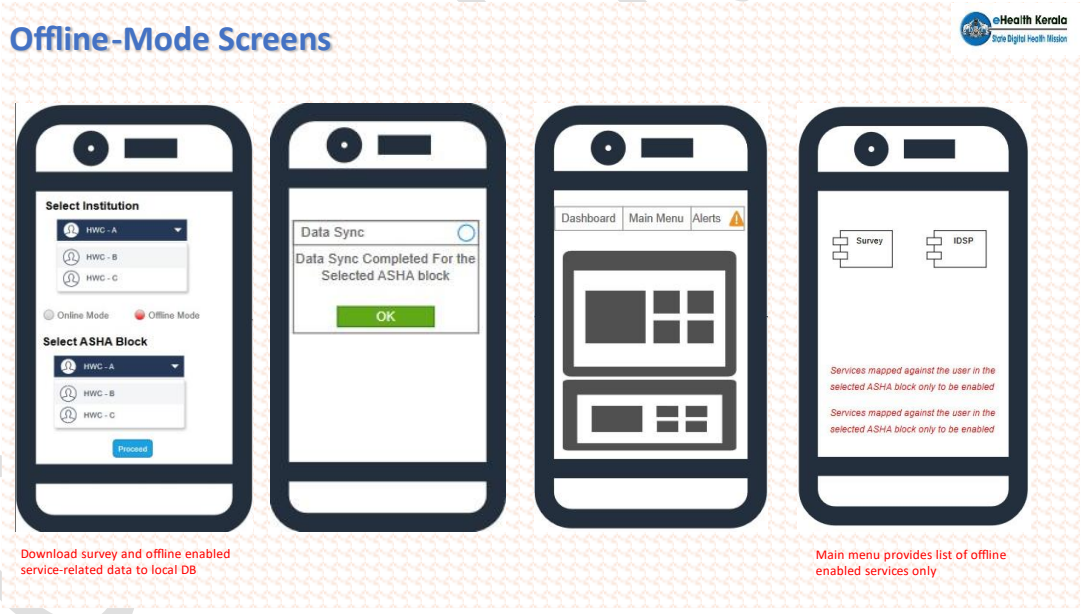
e) Online Mode:

- Click “Proceed” button.
- Redirect to home page having dashboard & main menu options.
- By default, “Dashboard” to be shown.
- Users can select “Main menu” to get a list of services.
- When NCD is selected show NCD dashboard & member search options
- Using member search option user can search member based on Aadhaar, Mobile, UHID, House No, House Name, Member Name. Combination of search conditions must be possible to refine search.
- The option to search for members from outside logged in institution must be provided as an additional option. As mentioned above under general section.
- Based on the search condition, list the matching member records with the following information member name, age, gender, house name, house number, address, mobile, UHID. Maximum of 50 records only to be listed in the search list. In case the record count is above 50 alert the user that the search cannot be completed and ask to refine the search conditions. **“Search records above the allowed limit, kindly refine your search condition.”**
- Users select a member and proceed.
- Prompt to select which activity user needs to perform screening/ registration/ follow-up!
  - If screening is selected open screening page, registration completed diseases need not be allowed to screen again.
  - If registration is selected open registration page→ direct registration must be possible
  - Enable follow-up only if the member is registered for hypertension / diabetes.
- **NCD Screening:**
  - The member profile section is to be shown on top with the following information.
    - Member Name
    - House name (LSG No)
    - Age
    - Gender
    - Contact number,
    - NCD registration status
    - UHID
    - ABHA (if available)
  - Check if the selected member has a record in SHAILI, if yes show an alert in the member profile section. On the alert icon click summary of SHAILI data to be shown and detailed questionnaire must be shown in separate division.
  - Hypertension, Diabetes, Oral Cancer, Cervical Cancer, Breast Cancer selection must be provided on top. Based on this selection the screening entry fields must be enabled. By default, Hypertension and Diabetes must be selected with Risk

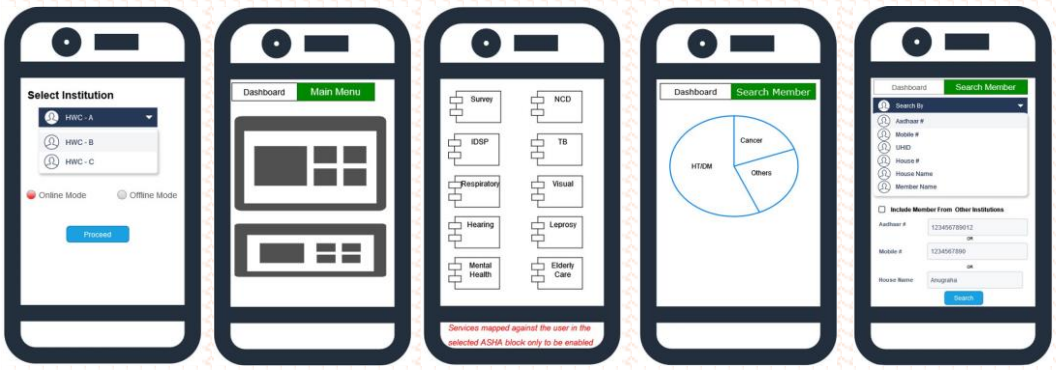
Factors, Lifestyle, Physical Activity, Basic Measurements, Screening Observations entry fields enabled. If cancer is selected respective entry fields must enabled.

- In case of cancer screening the fields must be enabled based on the screening type (Oral, Breast, Cervical)
- On the submit button the screening entry must be saved against each disease so that the disease-wise screening status can be shown in the next screening and registration section.
- Systolic & Diastolic values must be mandatory if hypertension is selected.
- Any one of the sugar values (GRBS/RBS/FBS/PPBS) must be mandatory if diabetes is selected.
- If BP or blood sugar values are abnormal or any cancer questioner is YES, the suspected field should be automatically turned YES and reference request to parent institution (PHC/FHC/CHC) must happen.
- Capture the entry source against each entry. From the transaction data we must be able to identify from where entry has come from PH App, PH Web, SHAILI, HMS
- Multiple screening can be done for a person, which is to be shown in the history section.

7.3 Prototype



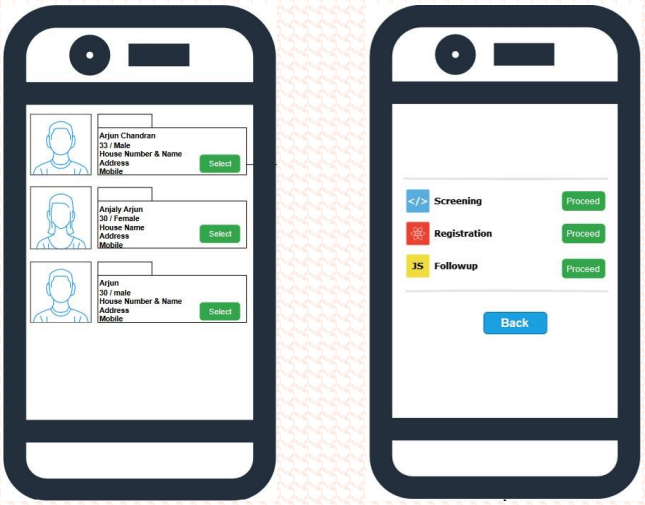
Online-Mode Screens



Service enabled for that user must be enabled. Rest show as disabled

Default only that institution data Checkbox to search from total member to be provided

Member Selection



SHAILI Survey Info View In PH & Screening fields

7.4 Data fields and master values

NCD Screening Section 1

Fields	Field type	Master Data	Remarks
Demographics (Name, Age, Gender, House details, Address, Contact No, UHID, ABHA)	Label Profile view	Auto-populated based on member survey Latest information	
Option to view the Shaili survey data	Icon		Show if data is available in SHAILI Summary
Screening Type	Checkbox	Hypertension, Diabetes, Oral Cancer, Cervical Cancer, Breast Cancer	Hypertension, Diabetes by default selected
Risk Factors			
Smoker/Ex-smoker	Radio button	Yes / No	Auto-populate data from member surveys. If any change in data then update in membersurvey Option to view the history must be provided (last 5 entry)
if yes --> At what age did you start smoking?	Text field		
if yes --> Smoking details	Dropdown	• Smokes daily • Occasional smoking • Stopped(<1 year) • Stopped(> 1 year)	
Use tobacco products	Radio button	Yes / No	
if yes --> Tobacco details	Dropdown	• current • past • Occasionally	
Substance abuse	Radio button	Yes / No	
if yes --> Substance details	Dropdown	• Current • Past • Occasionally	
Are you Alcoholic ?	Radio button	Yes / No	
if yes --> Alcoholic details	Dropdown	• daily • Occasional • Stopped(<1 year) • Stopped(> 1 year)	
Any Family History of NCD	Radio button	Yes / No	
If 'Yes' is selected Family History of NCD (Disease, Relationship)	Dropdown	**Disease** • Diabetes Mellitus Type I • Diabetes Mellitus Type II • Hypertension • Stroke • Coronary Artery Disease • Cancer • Obesity • Chronic Kidney Disease • COPD • CLD **Relationship :** • Father ,• Mother ,• Sibling	

NCD Screening Section 2

Lifestyle			
Exercise Do you undertake any physical activities for minimum of 2.30 hours in a week? (Daily minimum 30 minutes per da –Five days a week)	Radio button	Yes / No	Auto-populate data from member surveys. If any change indata, then update in membersurvey Option to view the history must be provided (last 5 entry)
Physical Activity	Dropdown	• Sedentary • Mild • Moderate • Severe	
Basic Measurements			
Height (CM)	Text field		
Weight (Kg)	Text field		
BMI(kg/m2)	Label		Auto populate based on height and weight value
Waist circumstance	Text field		
GRBS	Text field	Save against charge code master present in HMS	GRBS 80 - 140mg/dl (as per HMS normal value)
FBS	Text field	Save against charge code master present in HMS	Fasting Blood Sugar 70- 110 mg/dL(as per HMS normal value)
PPBS	Text field	Save against charge code master present in HMS	Post Prandial Blood Sugar 90-130mg/dl(as per HMS normal value)
RBS	Text field	Save against charge code master present in HMS	>140 & <=200 : PreDiabetic ,,, >200: High Risk(as per HMS normal value)
HbA1C	Text field	Save against charge code master present in HMS	HBA1C 4.6 - 6.2%(as per HMS normal value)
BP ==> Systolic	Text field	Save against charge code master present in HMS	Systolic >140 : High Risk(as per HMS normal value)
BP ==> Diastolic	Text field	Save against charge code master present in HMS	Diastolic >90 : High Risk(as per HMS normal value)

Basic Measurements	HMS ➔ charge_code_id (PK)	HMS ➔ charge_code_name	Result Type In HMS	Unit as per HMS diagnostic master	Normal Values Range
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PPBS	136868	Post Prandial Blood Sugar	Numeric Value		
RBS	136866	Random Blood Sugar	Numeric Value		
HbA1C	136991	HBA1C	Numeric Value		
BP ==> Systolic	137881	Systolic Pressure	Numeric Value		
BP ==> Diastolic	137879	Diastolic Pressure	Numeric Value		

NCD Screening Section 3

Cancer Screening			
Oral Cancer			Based on the screening type selection screening questions to be listed below
Option to mark the issues in mouth image	Image		Option to mark the issues in mouth image
Symptoms	Subheading		
Any issue in mouth ?	Radio button	Yes / No	
Difficulty in tolerating spicy food	Radio button	Yes / No	
Change in voice /Hoarseness	Radio button	Yes / No	
Difficulty in opening mouth	Radio button	Yes / No	
White patches	Radio button	Yes / No	
Red patches	Radio button	Yes / No	
Non-Healing Ulcers	Radio button	Yes / No	
Growth of Recent Origin	Radio button	Yes / No	
Visual Examination			
White patches	Radio button	Yes / No	
Red patches	Radio button	Yes / No	
Non-Healing Ulcers	Radio button	Yes / No	
Growth of Recent Origin	Radio button	Yes / No	
Restricted Mouth Opening	Radio button	Yes / No	
Oral Image	Image		If Yes is selected for any of the above option, provide a visual/graphics at the right side . After examining the patient's mouth, click on the visual/graphics to indicate the patches that are affected. The Abnormal patches selected should be be indicated in Red color.

NCD Screening Section 4

Breast Cancer			
Any Breast related symptoms?	Radio button	Yes / No	
Option to mark the issues in Breast image	Image		
Symptoms			
Lump in Breast	Radio button	Yes / No	
Swelling in Armpit	Radio button	Yes / No	
Nipple Retraction/Distortion	Radio button	Yes / No	
Ulceration	Radio button	Yes / No	
Discharge from Nipple	Radio button	Yes / No	
Skin Dimpling/Retraction	Radio button	Yes / No	
Visual Examination			
Patient has refused screening	Radio button	Yes / No	
Trained Individual for Self Breast Exam	Radio button	Yes / No	
Lump in Breast	Radio button	Yes / No	
Swelling in Armpit	Radio button	Yes / No	
Nipple Retraction/Distortion	Radio button	Yes / No	
Ulceration	Radio button	Yes / No	
Discharge from Nipple	Radio button	Yes / No	
Skin Dimpling/Retraction	Radio button	Yes / No	

NCD Screening Section 5

Cervical Cancer			
Any Cervical related symptoms?	Radio button	Yes / No	
Excessive Bleeding during period	Radio button	Yes / No	If response to above Question is 'Yes' Please select the right option (YES/NO) by clicking on the radio button for below symptoms.
Postmenopausal Bleeding	Radio button	Yes / No	
Bleeding after Intercourse	Radio button	Yes / No	
Excessive Foul-smelling Vaginal Discharge	Radio button	Yes / No	
Bleeding between Periods	Radio button	Yes / No	
Visual Examination			
Patient has refused screening	Radio button	Yes / No	
Polyp	Radio button	Yes / No	
Ectopy(Erosion)	Radio button	Yes / No	
Hypertrophy	Radio button	Yes / No	
Bleeds on Touch	Radio button	Yes / No	
Unhealthy Cervix	Radio button	Yes / No	
Suspicious Looking	Radio button	Yes / No	
Frank Malignancy/Growth in Cervix.	Radio button	Yes / No	
Prolapse Uterus	Radio button	Yes / No	
Excessive Discharge	Radio button	Yes / No	
Screening Observations			
NCD Suspected	Radio button	Yes / No	•If the member has high GRBS, FBS,RBS, PPBS, HbA1C, and BP then automatically NCD suspected should be YES • In case of individual answers Yes to any one of the above mentioned Cancer symptoms then NCD suspected should be YES
Refer the patient to the parent institution	Dropdown	Select parent institution by default	PHC/FHC/CHC
Next Screening Date (By default One year)	Date	DD/MM/YYYY	current date + 365 days
Remarks	Dropdown	Configurable master values	

Oral Cancer sample for reference

Oral Cancer Screening

Symptoms

Any issue in mouth?*
Yes No

White/Red Patch in Oral Cavity?
Yes No

Difficulty in tolerating spicy food?
Yes No

Difficulty in opening mouth?
Yes No

Change in voice/Hoarseness?
Yes No

Ulceration/roughened areas in mouth for more than 3 weeks?
Yes No

Remarks

Visual Examination

White patches?
Yes No

Red patches?
Yes No

Non healing ulcers?
Yes No

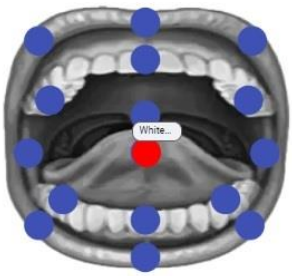
Growth of recent origin?
Yes No

Restricted mouth opening?
Yes No

Remarks

White Patches
Red Patches
Non-healing users
Growth of recent origin

Select findings from dropdown and mark the points on the mouth



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Breast Cancer sample for reference

Symptoms

Any breast related symptoms?*
(•) Yes ( ) No

Lump or thickening in breast?
(•) Yes ( ) No

Change in shape and position of nipple?
(•) Yes ( ) No

Change in size?
(•) Yes ( ) No

Discharge from one or both nipples?
(•) Yes ( ) No

Any retraction of nipple?
(•) Yes ( ) No

Swelling/lump in armpit?
(•) Yes ( ) No

Puckering or dimpling?
(•) Yes ( ) No

Redness of skin over breast or any ulcer?
(•) Yes ( ) No

Constant pain in breast or armpit?
(•) Yes ( ) No

Erosion of nipple?
(•) Yes ( ) No

Remarks

Visual Examination

☐ Patient has refused screening

Trained individual for self breast exam?
( ) Yes ( ) No

Swelling in armpit?
☑ Left ☑ Right

Lump in breast?
(•) Yes ( ) No

Ulceration?
(•) Yes ( ) No

Nipple retraction/distortion?
(•) Yes ( ) No

Skin dimpling/puckering?
(•) Yes ( ) No

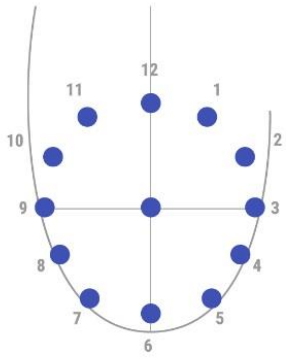
Discharge from nipple?
(•) Yes ( ) No

Remarks

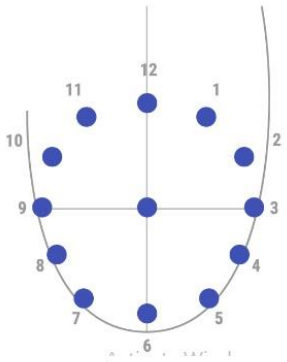
Skin dimpling/puckering

Select findings from dropdown and mark the points below.

RIGHT



LEFT



8 NCD Registration

8.1 Overview

- Disease-wise registration must be done based on the diseases selected in the registration screen.
- In disease master a 2-character short code must be maintained and it must be prefixed in registration number. NCD registration number format will be disease_code+ inst_code+ year+sequence (eg: DM+10001+2024+00001). Year to be saved separately as part of date.
- Registration is normally done for people whose NCD screening is completed. However, if the screening is not done, the user must be able to do NCD registration directly. In such cases screening records will not be available in eHealth PH mobile app. Such directly registered patients will be considered the same as NCD registration done by doctors. This will be considered for reporting & integration.
- JPHN/JHI/MLSP does the NCD activities at the sub-center level. Doctors and nurses will perform NCD activities at the main PHC/FHC level.
- For non eHealth institutions the NCD registration will be done by JPHN/JHI/MLSP using PH mobile application module.
- If NCD registration is done by the doctor through HMS no need to register again in PH App by JPHN/JHI/MLSP, consider it as registered in PH App also. PH and HMS NCD modules must be bidirectionally integrated.
- **Member Data:**
  - By default, members mapped under the logged in institution must be searched.
  - The option to search for members from outside logged in institution must be provided as an additional option. Provide a checkbox " Include member from Other Institutions" in the member search screen as an optional. Member search will be based on Aadhaar/Mobile/UHID/House No./House Name/Member Name search alone.
- Member search must be based on either or combination of following criteria.
  - Aadhaar
  - Mobile
  - UHID
  - House No
  - House Name
  - Member Name
- Search result must show below information.
  - Member Name
  - House name (LSG No)
  - Age
  - Gender
  - Contact number,
  - NCD registration status
- Check if the selected member has a record in SHAILI, if yes show an alert in the member profile section. On the alert icon click summary of SHAILI data to be shown and detailed questionnaire must be shown in separate division.
- **On SHAILI Alert Click:**
  - Show the summary of SHAILI questioners like below image.
  - In new division when clicked show the detailed SHAILI questionnaire

- Once NCD registration for a disease is done then screening should not be done again, only follow-up will be done.
- Under the diseases section the following details will be captured for registration.
  - Disease ➔ disease list dropdown
  - Diagnosed At ➔ Government / Private
  - Since ➔ Date of diagnosis (If exact date is not known user can enter 1st of last date of that month, so that count reflects in that month). Based on this person will be identified as OLD/NEW registration.
- Under the history section screening, registration and follow-up history from PH mobile app and HMS must be made available. (May be limited to last 5 records)
- If family grouping is done and any of the family members is already registered in NCD registration, then the family history must be automatically selected as yes, and it should not be allowed to be changed.
- If family grouping is not done, then in the family history section user need to enter details manually and it should be saved only against NCD registration record. (not into family grouping)
- Death Marking:
  - If the family member is already marked as dead in death registration, then auto select the family history as yes and auto select "died" against that member. If death is not due to NCD user need to unselect and continue.
  - If death is marked directly from here against a family member, then save it only against that registration, no need to do death registration for that family member.
- No need to store age in the NCD registration table, age at the time of NCD registration can be calculated based on registration date & DOB of the person.
- Both member_id and hin_id must be kept in the transaction table so that we can use same table in HMS
- Data entry source must be captured against each entry. This is to identify whether the screening entry has come from PH App / PH Web/ SHAILI/ HMS.
- Expected External integrations.
  - Integration with HMS
  - Integration with SHAILI
  - Integration with national portals like CPHC

Undergoing Treatment & Current Medication Details

- Based on the discussion held with domain experts on 15th May 2024 it was confirmed that at the time of registration no need to capture the medicine details against disease. Disease details can be entered from a follow-up screen after registration.

8.2 Process Flow

a) Users select a member and proceed.
b) Prompt to select which activity user needs to perform screening/ registration/ follow-up.
   - If screening is selected open screening page, registration completed diseases need not be allowed to screen again.
   - If registration is selected open registration page→ direct registration must be possible
   - Enable follow-up only if the member is registered for hypertension / diabetes.

c) Check if the selected member has a record in SHAILI, if yes show an alert in the member profile section. On the alert icon click summary of SHAILI data to be shown and detailed questionnaire must be shown in separate division.

d) Click history section for viewing screening, registration and follow-up history from PH mobile app and HMS must be made available. (May be limited to last 5 records)

e) The user selects if the patient is an existing NCD patient or not.
   - If YES, enable the "Treatment Records verified" mandatory field.
   - If NO proceed to disease selection.

f) From the diseases section update the following details:
   - Disease ➔ disease list dropdown
   - Diagnosed At ➔ Government / Private
   - Since ➔ Date of diagnosis
     - If existing person=YES then, if exact date is not known user can enter 1st of last date of that month, so that count reflects in that month
     - If existing person=NO then, current date to be auto selected as non-editable

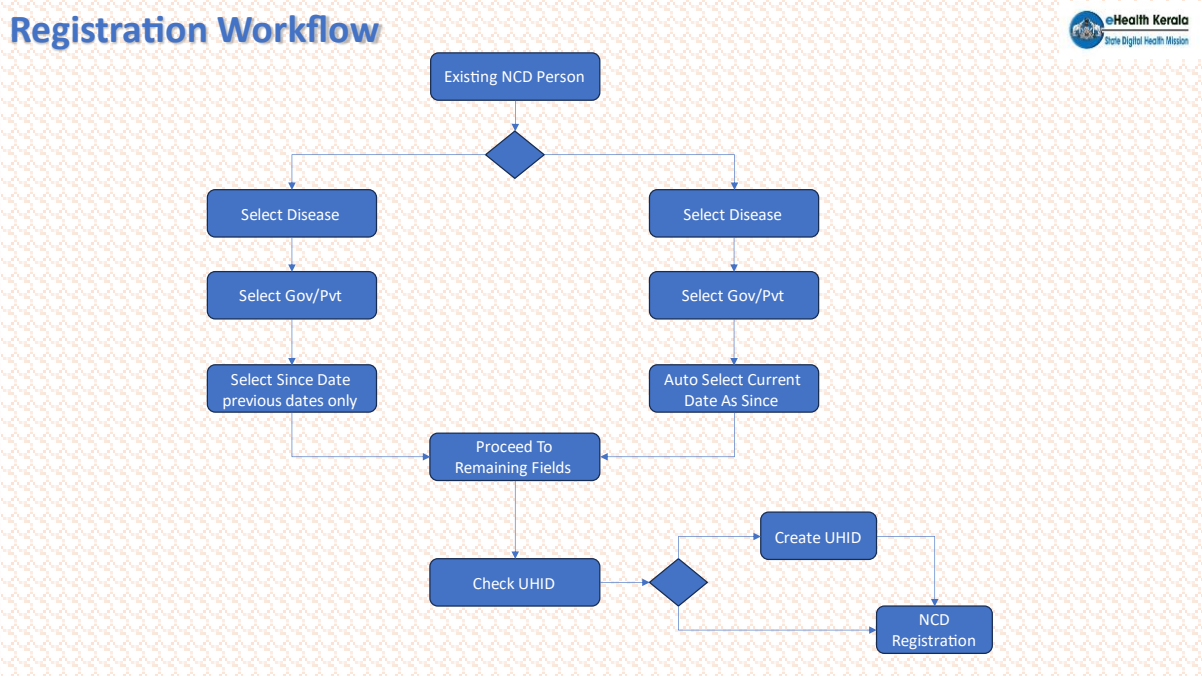
g) Fill in the remaining fields as mentioned in the data field section.

h) If permanent UHID is already linked against the member how the UHID info (number, name, age, gender, address)

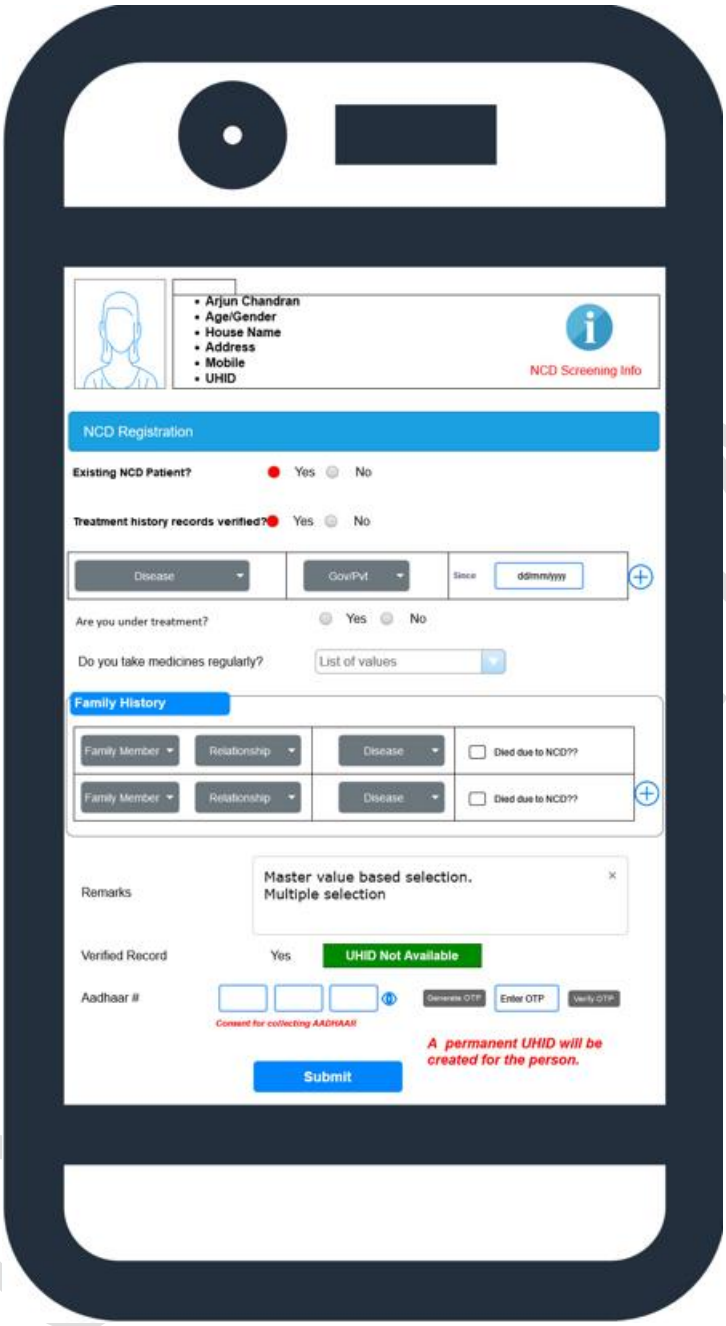
i) If permanent UHID is not available, the option to capture AADHAAR number and do a permanent registration(eKYC) method must be provided. The option to scan AADHAAR QR is also to be provided.

j) UHID will be mandatory for registering for NCD.

k) On submission the disease-wise NCD registration status must be maintained.



8.3 Prototype



8.4 Data fields and master values

NCD Registration Section 1

Fields	Field type	Master Data	Remarks
Demographics (Name, Age, Gender, House details, Address, Contact No, UHID, ABHA)	Label Profile view	Auto-populated based on member survey Latest information	
Option to view the Shaili survey data	Icon		Show if data is available in SHAILI Summary
Option to view NCD Screening data	Icon		
Risk Factors			
Existing NCD patient?	Radio button	Yes / No	
Treatment Records verified?	Radio button	Yes / No	Mandatory if existing NCD patient is YES
Registration Status			
Disease	Dropdown	• Diabetes Mellitus Type I • Diabetes Mellitus Type II • Hypertension • Stroke • Coronary Artery Disease • Breast Cancer • Cervical Cancer • Oral Cancer • Other Cancers • Obesity • Chronic Kidney Disease • COPD • CLD	
Diagnosed At	Dropdown	• Government • Private	
Since	Text field		Numeric Value only

NCD Registration Section 2

Are you under treatment?	Radio button	Yes / No	
Do you take medicines regularly?	Dropdown	• Regular • Irregular	
Any Family History of NCD	Radio button	Yes / No	auto-populate fromfrom screening If 'Yes' is selected then enable the option to add the Famil History of NCD
Family Member	Dropdown	Based on family member grouping	
Relationship	Dropdown	• Father • Mother • Sibling	
Disease	Dropdown	• Diabetes Mellitus Type I • Diabetes Mellitus Type II • Hypertension • Stroke • Coronary Artery Disease • Cancer • Obesity • Chronic Kidney Disease • COPD • CLD	
Died due to NCD?	Checkbox		If death entry is marked auto, select. If death is not due to NCD user unselect and proceed. if selected consider as person I

NCD Registration Section 3

Registration Observations			
eHealth UHID	Label	UHID No, Name,Age,Gender	If available
AADHAAR No for UHID Creation	Text field		If UHID not available
Remarks	Dropdown	Configurable master values	

9 NCD Follow-up

9.1 Overview

- Follow-up is done only for registered hypertension, diabetes. Indication to identify the registered disease to be provided in the member profile section.
- Risk factors updated from follow-up details must be updated in member survey tables.
- JPHN/JHI/MLSP does the NCD activities at the sub-center level. Doctors and nurses will perform NCD activities at the main PHC/FHC level.
- Member Data:
  - By default, members mapped under the logged in institution must be searched.
  - The option to search for members from outside logged in institution must be provided as an additional option. Provide a checkbox " Include member from Other Institutions" in the member search screen as an optional. Member search will be based on Aadhaar/Mobile/UHID/House No./House Name/Member Name search alone.
  - Only the registered members have to be considered for follow-up.
- Member search must be based on either or combination of following criteria.
  - Aadhaar
  - Mobile
  - UHID
  - House No
  - House Name
  - Member Name
- Search result show below information.
  - Member Name
  - House name (LSG No)
  - Age
  - Gender
  - Contact number,

- NCD registration status

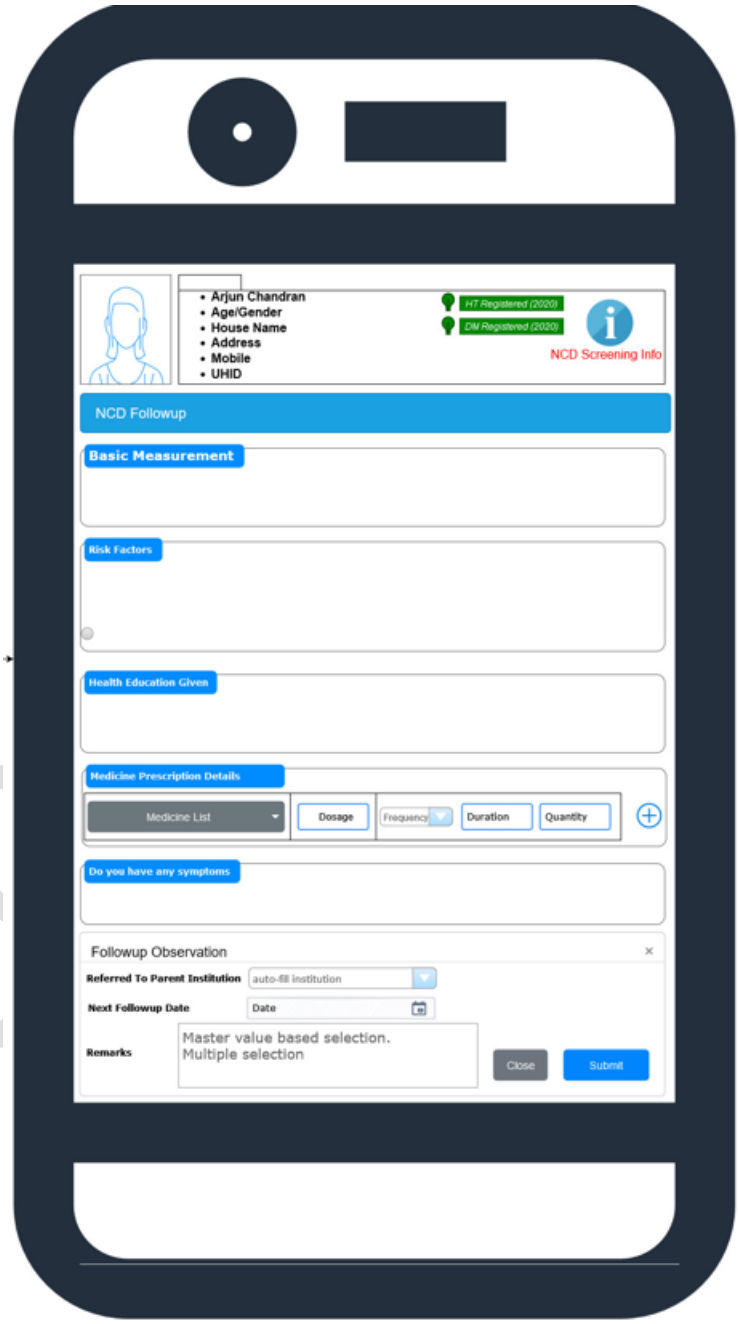
- Option to view trend of last 5 entries to be provided in basic measurement section.
- Data entry source must be captured against each entry. This is to identify the screening entry has come from PH App / PH Web/ SHAILI/ HMS.
- Risk Factors when updated from screening/follow up it must be updated in member survey table, however no need to keep history of risk factors in the member survey history table, because historical data will be available in screening and follow-up tables.
- Both member_id and hin_id must be kept in the transaction table so that we can use same table in HMS
- Expected External integrations.
  - Integration with HMS
  - Integration with SHAILI
  - Integration with national portals like CPHC
- Basic vital measurements saving must be against the HMS charge code master. Result value must be based on result type defined in the diagnostic master configuration of HMS. Unit and normal value validation must be done based on the HMS diagnostic master configuration.
- **Medication Prescription Details Entry**
  a) Based on the discussion held with domain experts on 15th May 2024 it was confirmed that medicine section must be used for capturing the disease wise medicines prescription details and not consumption of stock. Medicine, Dosage, Frequency, Duration will be entered by the doctor/JPHN/JHI/MLSP, and quantity must be auto calculated same as in HMS prescription screen.
  b) Medicines to be listed based on HMS master values as per diseases wise grouping. For example, for hypertension only the medicines grouped under hypertensive protocol drugs must be listed.
  c) Consumption must be done through pharmacy module itself.
- If screening and registration is done, then a reminder SMS must be sent for next follow-up 7 days before next follow-up due date.
- The last 3 prescriptions done by doctors in HMS have to be viewable in the PH mobile app follow-up screen.
- "Health Education Given" in the follow-up section must be master based. Master table already available and used in HMS NCD screen.
- Under the follow-up observation section, the next follow-up date is to be captured.
  - For HT/DM next follow-up date will be after 30days

9.2 Process Flow

a) Users select a member and proceed.
b) Prompt to select which activity user needs to perform screening/ registration/ follow-up.
   - If screening is selected open screening page, registration completed diseases need not be allowed to screen again.
   - If registration is selected open registration page→ direct registration must be possible
   - Enable follow-up only if the member is registered for hypertension / diabetes.

c) Check if the selected member has a record in SHAILI, if yes show an alert in the member profile section. On the alert icon click summary of SHAILI data to be shown and detailed questionnaire must be shown in separate division.
d) Under the history section screening, registration and follow-up history from PH mobile app and HMS must be made available. (May be limited to last 5 records)
e) Update risk factor details.
f) Enter basic measurements in respective fields.
g) Update prescribed medicine details.
h) On submission the disease-wise follow-up status must be saved.

9.3 Prototype



9.4 Data fields and master values

NCD Follow-up Section 1

Fields	Field type	Master Data	Remarks
Demographics (Name, Age, Gender, House details, Address, Contact No, UHID, ABHA)	Label Profile view	Auto-populated based on member survey Latest information	
Option to view the Shaili survey data	Icon		Show if data is available in SHAILI with Summary
Option to view NCD Screening data	Icon		
Option to view NCD Registration data	Icon		
Basic Measurements			Option to view the history must be provided (last 5 entry) Latest data to kept against member, previous history to be moved to log
BP ==> Systolic	Text field	Save against charge code master present in HMS	Systolic >140 : High Risk
BP ==> Diastolic	Text field	Save against charge code master present in HMS	Diastolic >90 : High Risk
GRBS	Text field	Save against charge code master present in HMS	GRBS 80 - 140mg/dl
FBS	Text field	Save against charge code master present in HMS	Fasting Blood Sugar 70- 110 mg/dL
PPBS	Text field	Save against charge code master present in HMS	Post Prandial Blood Sugar 90 130mg/dl
RBS	Text field	Save against charge code master present in HMS	>140 & <=200 :PreDiabetic ,,, >200: High Risk
HbA1C	Text field	Save against charge code master present in HMS	HBA1C 4.6 - 6.2%
Height (CM)	Text field		
Weight (Kg)	Text field		
BMI(kg/m2)	Label		Auto populate based on height and weight value
Waist circumstance	Text field		

NCD Follow-up Section 2

Risk Factors			
Smoker/Ex-smoker	Radio button	Yes / No	
if yes --> At what age did you start smoking?	Text field		
if yes --> Smoking details	Dropdown	• Smokes daily • Occasional smoking • Stopped(<1 year) • Stopped(> 1 year)	
Use tobacco products	Radio button	Yes / No	
if yes --> Tobacco details	Dropdown	• current • past • Occasionally	Auto-populate data from member survey, which is the latest data of that member If any change in data then update in member survey (keep the transaction log also) Option to view the history must be provided (last 5 entry)
Substance abuse	Radio button	Yes / No	
if yes --> Substance details	Dropdown	• Current • Past • Occasionally	
Are you Alcoholic ?	Radio button	Yes / No	
if yes --> Alcoholic details	Dropdown	• daily • Occasional • Stopped(<1 year) • Stopped(> 1 year)	
Health Education Given	(Muti-Select) Dropdown	• Hypoglycemia and Management • Foot Care • Physical Activity • Ophthalmic Care • Salt Restriction • Tobacco Cessation • Alcohol Cessation • Dietary Advice	
Medicine Issue Details			
Medicine	Dropdown	Configurable master values	Save against drug master present in HMS
Dosage	Text field		
Frequency	Dropdown		Master from HMS to be taken
Duration	Text field		
Quantity	Text field		

NCD Follow-up Section 3

Do you have any symptoms ?	(Muti-Select) Dropdown	• Defective vision (not correctable with spectacles) • Facial puffiness • Oedema • Pain/ sensory loss in upper and lower limb • Chest Pain • Headache • Ulcer (mainly in lower limb) • Occasional weakness of limbs • Brittle nails • Cold extremities • Erectile dysfunction • Hypoglycemic events • Redness/ Ulceration of genitalia • Frequent urinary tract infection • Uncontrolled Vomiting • Breathing difficulty • Convulsions • Episodes of unconsciousness • Hearing loss • Reduced urine output • Hematuria • Hematemesis • Ascites • Others	
Followup Observations			
Refer the patient to the parent institution	Dropdown	Select parent institution by default	
Next Follow-up Date (By default One month)	Date	DD/MM/YYYY	
Remarks	Dropdown	Configurable master values	

Basic Measurements	HMS ➔ charge_code_id (PK)	HMS ➔ charge_code_name	Result Type In HMS	Unit as per HMS diagnostic master	Normal Values Range
Height (CM)	137839	Height	Numeric Value		
Weight (Kg)	137841	Weight	Numeric Value		
BMI(kg/m2)	137843	BMI (c)	Numeric Value		
Waist circumstance	137875	Waist Circumference	Numeric Value		
GRBS	137342	Random Blood Sugar (Glucometer)	Numeric Value		
FBS	136867	Fasting Blood Sugar	Numeric Value		
PPBS	136868	Post Prandial Blood Sugar	Numeric Value		
RBS	136866	Random Blood Sugar	Numeric Value		
HbA1C	136991	HBA1C	Numeric Value		
BP ==> Systolic	137881	Systolic Pressure	Numeric Value		
BP ==> Diastolic	137879	Diastolic Pressure	Numeric Value		

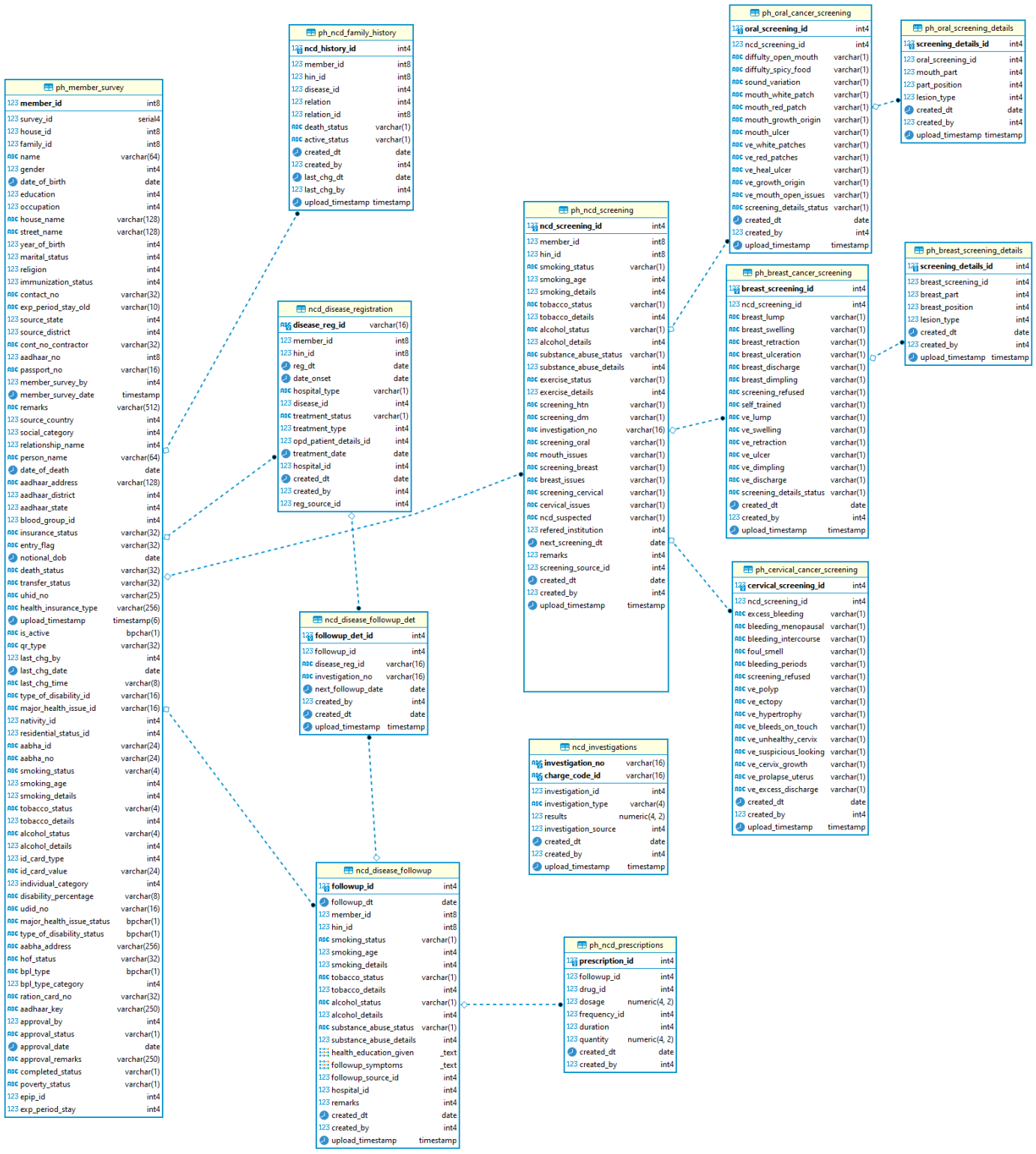
		HMS Item Master	
hms_category		**itemid**	**itemname**
Hypertension protocol drug	Amlodipine	10953	AMLODIPINE TAB 10 Mg
		10077	AMLODIPINE TAB 2.5 MG
		10076	AMLODIPINE TAB 5 MG
		10078	AMLODIPINE TAB (FILM COATED) 2.5 MG
		8	AMLODIPINE TAB IP(FILM COATED) 5 mg
	Telmisartan	10812	TELMISARTAN TAB IP 20MG
		363	TELMISARTAN TAB IP 40mg
		10942	TELMISARTAN TAB IP 80mg
	Chlorthalidone	10936	CHLORTHALIDONE TAB 12.5mg
Diabetes Mellitus protocol drug	Metformin	11024	METFORMIN 500mg GLIMEPIRIDE 1mg TAB
		11124	METFORMIN HCL SUSTAINED RELEASE TAB IP 500 mg
		11272	METFORMIN HYDROCHLORIDE PR IP TAB 1000mg
		11136	METFORMIN HYDROCLORIDE TAB IP 1000mg
		11019	METFORMIN SR TAB 1000 MG
		83	METFORMIN TAB IP 500mg
	Glimepiride	10395	GLIMEPIRIDE TAB 2 MG
		67	GLIMEPIRIDE TAB IP 1 mg
		68	GLIMEPIRIDE TAB IP 2mg
	Pioglitazone	10640	PIOGLITAZONE TAB 15 MG
	Insulin	138	BIPHASIC ISOPHANE INSULIN INJECTION IP 30:70 40IU/mL 10ML VIAL
		10427	HUMAN INSULIN MIXTARD 30/70 10 ml vial

		137	INSULIN HUMAN RAPID ACTING INJ 40 IU/ml
		10467	INSULIN HUMAN REGULAR/NPH INJ 50/50 10 ML
		136	INSULIN ISOPHANE IP INJ 40 IU/ml
		11185	LISPRO INSULIN INJ 3ml
Other NCD protocol drug	Aspirin	10056	ACETYLSALICYLIC ACID TAB IP 300 MG
		10055	ACETYLSALICYLIC ACID TAB IP 300 MG
		2	ACETYL SALICYLIC ACID TAB IP(GASTRO-RESISTANT) 150mg
		3	ACETYLSALICYLIC ACID TAB IP(GASTRO-RESISTANT) 75mg
		19	ATORVASTATIN TAB IP 10 mg
		10107	ATORVASTATIN TAB IP 20 MG
		10951	ATORVASTATIN TAB IP 40 mg
		11142	ATORVASTATIN TAB IP 5 mg
		11052	ROSUVASTATIN 5 mg
		11106	ROSUVASTATIN TAB IP 10mg
	Beta-blocker	10104	ATENOLOL TAB 25 MG
		18	ATENOLOL TAB IP 50 mg
		11109	METOPROLOL SUCCINATE PROLONGED RELEASE TAB IP 50mg
		10977	METOPROLOL TAB
		10542	METOPROLOL TAB IP 25MG
		86	METOPROLOL TAB IP 50 MG

10 Table Design

10.1 ER Diagram

- Instead of saving YES/NO flag store the child table primary key to the parent table for example oral_screening_id must be linked to ph_ncd_screening . If this value is present, consider it as YES.
- Link the image details table primary key with main screening table so that we can directly understand from main screening table, whether to go to child table.



10.1 Table Scripts

<< Will be shared separately>>>

11 Dependencies

1) API for diseases wise grouped drug codes
2) API for basic parameter HMS charge code.
3) Data migration to new table structure
4) Changes in the HMS NCD screening process must be done along with the NCD service rollout. Permanent UHID must be made mandatory for NCD screening and registration in HMS. Only for permanent UHIDs the NCD registration must happen. Migration of already registered temporary UHIDs will be a challenge which needs to be looked at.
5) If death entry if done in PH mobile app then block the mapped UHID in visit and admission screens of HMS.
6) HMS masters must be mapped with SNOMED/LOINC standard codes.