

Table 1a. NCD Competencies for Hypertension & Cardiovascular diseases and Diabetes Mellitus in PAHS MBBS curriculum and the level of competency

Topic/ Competency	Teaching / learning method				Assessment methods	Competency Level
Competencies Identified by SEAR NCD group	Lecture	Small group discussion/Group Exercise	Field visit/ health systems/ community visit, Bedside clinic, Skill lab/ simulated exercise	Video demonstration/ DOPA session	MCQ, PBQ, OSCE/OSPE, Viva, Portfolio Logbook	K=Knows; KH=Knows how; S= Shows; SH= Shows how; P=Performs
Hypertension and CVDs						
Elicit and record the medical history from patients/ or relatives or caregivers, contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values regarding hypertension and CVDs	Yes	CBD, CP, VCR	PHCC, HP postings		OSCE, MiniCEX, Portfolio, Logbook	P
Measure blood pressure	Yes	Grp Ex	PHCC, Skill Lab	DOPA	OSPE, Logbook	P
Perform a 12 lead ECG and interpret its finding with respect to common conditions in primary care set-up	Yes	ACLS, PALS Training	Skill Lab, Bedside	DOPA	OSPE, Logbook	P
Use total risk approach for assessing a patient with hypertension and/ or CVDs and set up risk score practice in health facilities	Yes		Bedside		MCQ, PBQ, Viva, Logbook	KH
Illustrate the benefits of the use of standardized protocols to deliver hypertension treatment services for hypertension such as using WHO PEN and HEARTS CVD protocol	Yes	CBD, TP, PBL, VCR	Bedside, District posting		MCQ, PBQ, MiniCEX, Viva	KH
Identify complications of hypertension and comorbidities and determine the need of specialist consultation	Yes	CBD, TP, PBL, VCR	Bedside		MCQ, PBQ, OSCE, Viva	P
Recognize and prioritize hypertensive and cardiac emergencies (chest pain and signs of stroke) and provide immediate care at primary level	Yes	CBD	Bedside	DOPA	MCQ, PBQ, OSCE, CP, Viva	P
Demonstrate understanding of the impact of hypertension and/ CVDs on quality of life, work and family, and use for providing personalized patient education for mitigating it	Yes	CBD,CP	Bedside, Community	DOPA	MCQ, PBQ, OSCE, Viva, MiniCEX, Portfolio	SH
Diabetes Mellitus						

Elicit and record the medical history from patients/ or relatives or caregivers, contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values regarding diabetes mellitus	Yes		CBD	Bedside, PHCC	DOPA	OSCE, MiniCEX, Portfolio, Logbook	P
Measure blood glucose using glucometer and interpret the findings	No	Grp Ex		Bedside	DOPA	OSPE, Logbook	P
Conduct systemic examination and plan diagnostic work up for a case of diabetes mellitus (at primary care level)	Yes		CBD, CP	Bedside	DOPA	OSCE, MiniCEX, Portfolio, Logbook	P
Understanding to apply treatment decisions to manage diabetes mellitus in the same alignment with WHO PEN protocol	Yes	TP		District posting		MCQ, PBQ, MiniCEX, Lgbook, Viva	SH
Identify complications of diabetes mellitus and comorbidities and determine the need of specialist consultation	Yes		CBD, VCR	District posting		MCQ, PBQ, MiniCEX, Viva Logbook	P
Recognize and prioritize diabetes related emergencies and provide immediate care at primary level	Yes		CBD, VCR	Bedside, District posting		MCQ, PBQ, Portfolio, Viva, Logbook	P
Demonstrate understanding of the impact of diabetes on quality of life, work and family, and use for personalized patient education for mitigating it	No	CP, VCR		Bedside, Community	DOPA	MCQ, PBQ, Portfolio, Viva, Logbook	SH

CBD=Case Based Discussion, CP=Case presentation, Grp Ex=Group exercise, TP= Topic presentation, PBL= Problem Based Learning, ACLS=Advanced Cardiac Life Support, PALS= Paediatric Advance Life Support, VCR= Visual Classroom, PHCC= Primary Health Centre, HP=Health Post, DOPA=Directly Observed Procedural Assessment

Table 1b. NCD Competencies for COPD and Asthma and common cancers in PAHS MBBS curriculum and the level of competency

Topic / Competency	Teaching / learning method				Assessment methods	Competency Level
Competencies Identified by SEAR NCD group	Lecture	Small group discussion/Group Exercise	Field visit/ health systems/ community visit, Bedside clinic, Skill lab/ simulated exercise	Video demonstration/ DOPA session	MCQ, PBQ, OSCE/OSPE, Viva, Portfolio Logbook	K=Knows; KH=Knows how, S= Shows; SH= Shows how; P=Performs
COPD and Asthma						
Elicit and record the medical history from patients/ or relatives or caregivers, regarding COPD and Asthma	No	CBD, CP	Bedside, PHCC Posting		OSCE, MiniCEX, Logbook	P
Assess the control status of asthma by medical history,	No	CBD, CP	Bedside	DOPA	MCQ,PBQ, MiniCEX, Viva	P

systemic examination and PEFR

Manage well-controlled and uncontrolled asthma, and its exacerbations with first-line and second line drugs using WHO PEN protocol	No	TP	Bedside		MCQ, PBQ, Viva, Logbook	SH
Impart counselling and patient and family education on prevention and exacerbation of asthma and COPD	No	Grp Ex	Bedside, PHCC Posting	DOPA (MDI use)	OSCE, PBQ, Viva, MiniCEX, Logbook	P
Prepare a follow-up plan for management of a patient with asthma and COPD	No	Grp Ex	Bedside, District Posting		PBQ, Viva, Logbook	P
Identify the conditions requiring referral and assess the severity of asthma during an exacerbation	No	CBD, TP	District Posting, Bedside		MCQ, PBQ, Viva, Logbook	P
Assess the severity of COPD by medical history, PEFR, and Oxygen saturation (if available)	No	CBD, CP	Bedside, District Posting,		MCQ, OSCE, PBQ, Viva, Logbook	P
Manage COPD and its exacerbations in the same alignment with WHO PEN protocol	No	Grp Ex	District Posting, Bedside		MCQ, PBQ, Viva, MiniCEX, Log book	SH
Common Cancers						
Identify presenting features (signs, symptoms) and risk factors of common cancers, and educate individuals/ patients for self-awareness about them.	Yes	PBL, CBD, TP	Bedside clinic		MCQ, OSCE, PBQ, Viva	SH
Examine pelvic and screen eligible women for cervical cancer using HPV DNA testing or VIA to identify suspect cancerous and precancerous lesions	No	CP, TP	Bedside	DOPA	OSCE, MiniCEX, Logbook	KH
Perform head and neck examination and inspect the oral cavity for suspicious cancerous and precancerous lesions and lumps	No	CP	Bedside clinic,		OSCE, MiniCEX, Logbook	P
Perform clinical breast examination and screen, eligible women, for any suspicious lump or physical changes	Yes	CP	Bedside, Skill lab		OSCE, MiniCEX, Logbook	SH
Assess clinical status and provide counseling to those screened as positive cases and timely referral to the next level for confirmation of diagnosis	No	CBD	Bedside		MiniCEX, Viva, Logbook	KH

CBD=Case Based Discussion, CP=Case presentation, Grp Ex=Group exercise, TP= Topic presentation

Table 1c. NCD Competencies for and Mental health and Healthy lifestyle Counselling in PAHS MBBS curriculum and the level of competency

Topic/ Competency	Teaching / learning method					Assessment methods	Competency Level
	Lecture	Small group discussion / Group Exercise	Field visit / health systems/ community visit, Bedside, Skill lab / simulated exercise	Video demonstration/ DOPA session			
Competencies Identified by SEAR NCD group							
Mental Health							
Screen, diagnose, and provide appropriate referral to patients with common mental health disorders at primary care level	Yes	CBD, CP, TP	Bedside, Skill lab	Role play	MCQ, OSCE, PBQ, Viva, MiniCEX, Logbook	P	
Diagnose, manage and refer the patients/ individuals with stress, depression and suicidal behaviour	Yes	CBD, TP	Bedside, Skill lab	Role play	MCQ, PBQ, Viva, MiniCEX, Logbook	P	
Assess and manage the patients/ individuals with alcohol use, and substance use		CBD, TP	Bedside, Skill lab	Role play	MCQ, PBQ, Viva, MiniCEX, Logbook	P	
Healthy lifestyle Counselling							
Employ motivational interviews and techniques such as the 5A's and 5R's and provide personalized healthy lifestyle counselling	No	TP		Motivational Interview (Role play)	MCQ, PBQ, MiniCEX, Viva		KH
Tobacco: Assess tobacco use; deliver brief tobacco cessation interventions to tobacco users at individual and community level	Yes	Grp Ex	Community PHCC, District posting	DOPA	MCQ, OSCE, MiniCEX, Field Report		KH
Alcohol: Identify alcohol use disorders and provide brief advice, and referral mechanisms for persons with Alcohol Use Disorders (AUD) and employ AUDIT or similar screening techniques	Yes	TP	Community PHCC, District posting	Motivational Interview (Role play)	MCQ, OSCE, MiniCEX, Viva, Field Report, Log book		KH
Diet: Conduct dietary intake assessment; Provide brief advice using the 5A's and 5R's to patients/clients to adopt healthier diets based on standard recommendations	Yes	Small group discussion	Community		MCQ, OSCE, MiniCEX, Viva, Field Report		KH
Physical activity: Deliver brief interventions using the 5A's and 5R's to patients/clients to promote	No	Small group discussion			MCQ, Viva		KH

physical activity based on standard recommendations							
Overweight and obesity: Conduct anthropometric measurements and calculate BMI and relevant indicators ; Deliver brief interventions using the 5A's and 5R's to manage overweight and obesity in adults and children	Yes	TP	Community Diagnosis	DOPA	MCQ, OSCE, MiniCEX, Viva, Field Report		KH

CBD=Case Based Discussion, CP=Case presentation, Grp Ex=Group exercise, TP= Topic presentation

Table 2. Listed Competencies by SEAR NCD Network partners under Self-care and Palliative care, Health Promotion Data analysis and its use in service delivery and decision making, Organization of NCD Service Delivery through People-centered approaches

Self-care and Palliative care
Hypertension: Counsel patients about self-measurement to monitor blood pressure, adherence to medications
Diabetes: Counsel patients about self-monitoring of blood glucose, adherence to medications, insulin administration
Asthma and COPD: Counsel patients about self-monitoring in asthma and COPD
Lifestyle Modification: Adherence to healthy lifestyle behaviours
Manage pain in cancer patients using WHO step-ladder approach of pain management
Identify issues pertaining to cancer survivorship and quality of life and provide supportive counsel to them and caregivers for it
Guide setting up of home and community based palliative care service with help of community health workers, family members and social workers
Health Promotion
Develop health promotion aids and campaigns targeting identified NCDs and their risk factors/ determinants in the catchment area
Organize health promotion campaigns (such health talks and shows, health promoting schools, healthy workplace, etc) at the community level to address prevailing NCDs
Data analysis and its use in service delivery and decision making
Describe the basics of monitoring, and identify key NCD service performance measures and their data sources for health services related to hypertension, diabetes, CVDs, chronic kidney disease, COPD/asthma and cancer
Explain the concept of monitoring the NCD patients using cohort approach (e.g., hypertension control rates, control among registered patients) and service coverage and use of such information
Familiarize with data collection and monitoring tools and perform basic analysis (such as frequency, performance indicators calculation, comparison with other facilities, province, country, etc.) to inform the needs of health facility and relevant stakeholders
Comprehend context-specific dashboard for monitoring people-centred NCD services
Estimate the burden of NCDs and its determinants in the health facility catchment area and use this for planning and organizing the health services (promotive, preventive, and curative)
Organization of NCD Service Delivery through People-centred approaches
Familiarize with steps of team based care approach with focus on task shifting/ task sharing to manage NCD patients in primary care setting
Develop simple clinical pathway in a health care facility to smoothen the care and improve patient's experience
Provide clinical mentoring and supportive supervision of primary care workers to manage the NCD services in health centre catchment population
Take steps to improve continuity of care of patients with NCD using:
- refill the medicines and recall reminders
- Referral and back referral linkages between primary to secondary/ tertiary care centres

Table 3. PAHS working group Identified NCD competencies to be certified

Competencies	Responsible department	Year	Tool
Approach & management of NCD			
Able to diagnose & manage case of Hypertension	GPEM	4/5	CBD
Able to diagnose & manage case of Diabetes	Internal Medicine	4/5	CBD
Able to diagnose & manage case of COPD	Internal Medicine	4/5	CBD
Able to diagnose & manage case of Asthma	Paediatrics	4/5	CBD
Use of WHO MHGAP algorithms to diagnose, manage, refer common Mental health problems	Psychiatry	4/5; Internship	Mini CEx, CBD
Examination skills			
Breast examination	Surgery	4/5	OSPE (Skill lab)
Head & Neck examination	Surgery	4/5	OSPE
Procedure & Interpretation			
Taking Blood pressure	Physiology	1	DOPS
Bed side blood glucose testing & interpretation	Nursing rotation	3	DOPS
ECG recording			
Identifying common ECG abnormalities	GPEM	3	DOPS
Identifying common ECG abnormalities	GPEM	4/5	OSCE
Counselling for healthy lifestyle			
Counselling on self-care & healthy lifestyle	CHS	4/5	OSCE
Palliative Care			
Palliative Care training	Training team	Internship	Post test
Data Analysis & Use in Service Delivery			
Data Collection, Basic analysis. Report preparation & presentation	Community Health Sciences	1,2,3,4,5	CBLE Field reports, Strategic Planning report
Organization of NCD Service Delivery			
Understanding of Principles of Chronic care	GPEM	3	Chronic Care Clinic placement, Exit questionnaire

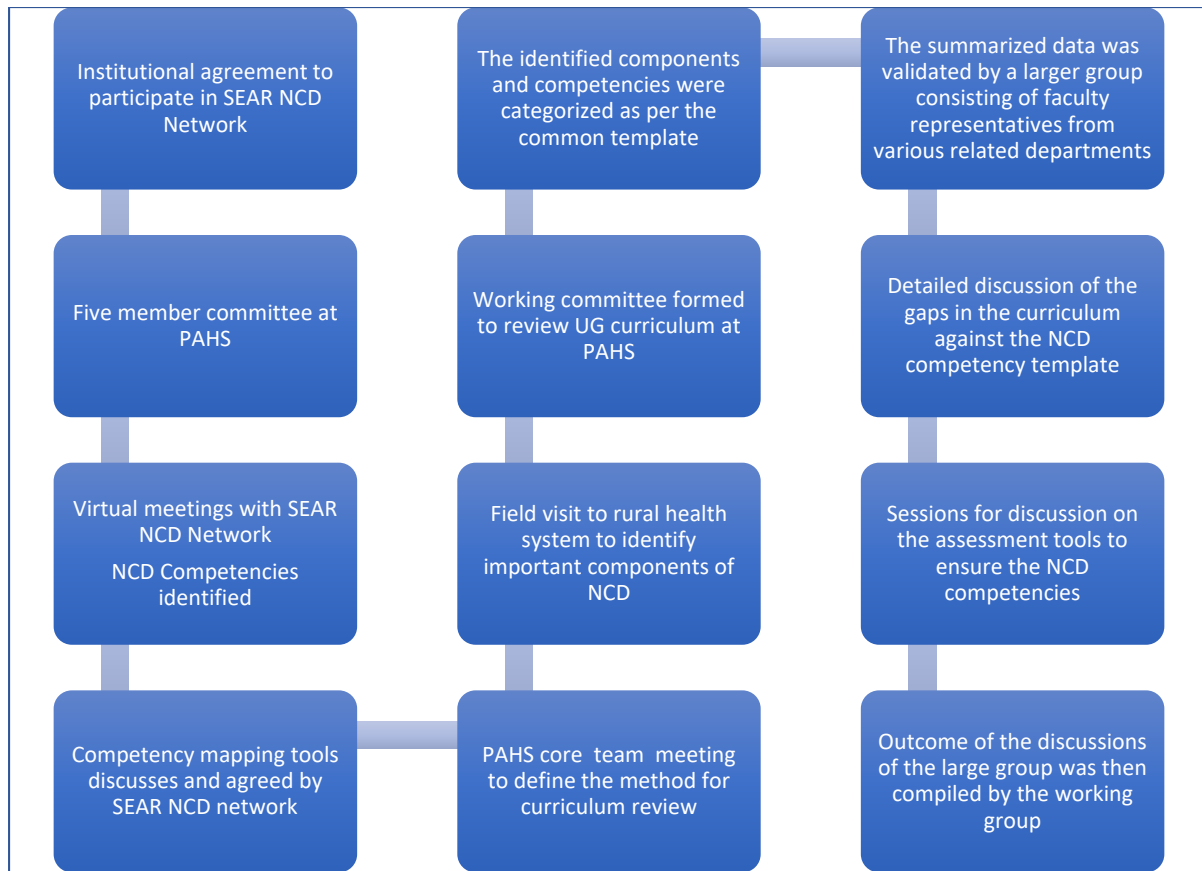


Figure 1. Process of NCD competency mapping of the PAHS MBBS curriculum as per the template developed by SEAR NCD Network Partners