Scaling-Up NCD Interventions
in South-East Asia

SUNI-SEA
White Paper
Concepts and Frameworks
for management and research
in community-based healthcare

7 August 2023

Scaling-Up NCD Interventions in South-East Asia (SUNI-SEA) is a research consortium project delivered through a collaboration of ten consortium members. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825026, under the Global Alliance for Chronic Diseases.

This document provides background reading on methodology and instruments used in SUNI-SEA and should be read in combination with the end reports for the work packages, which can be found on the SUNI-SEA website: https://www.suni-sea.org/en/resources/suni-sea-work-package-reports/

The outcomes of the research project and recommendations for policy makers are described in the policy briefs: https://www.suni-sea.org/en/resources/sunisea-policy-briefs/

Scaling-Up NCD Interventions in South-East Asia (SUNI-SEA):

The increasing prevalence of non-communicable diseases (NCDs) and their high impact on mortality, morbidity and public health, particularly in low- and middle-income countries, prompted the launch of an implementation research project "Scaling-Up NCD Interventions in South-East Asia (SUNI-SEA)" which was being implemented in Indonesia, Myanmar and Vietnam. This four year initiative began in 2019 and was a collaboration between ten consortium members namely University Medical Center Groningen (Netherlands), Faculty of Economics and Business, University of Groningen (Netherlands), University of Passau (Germany), Trnava University (Slovak Republic), HelpAge International, Age International, Sebelas Maret University (Indonesia), Thai Nguyen University of Medicine and Pharmacy (Vietnam), Health Strategy and Policy Institute (Vietnam) and Vietnam Association of the Elderly (VAE).

The SUNI-SEA project aims to identify the best and most affordable ways to expand programmes that prevent and control diabetes and hypertension in Southeast Asia. The project investigates which interventions work effectively and are worth the investment, also in other low- and middle-income countries.

Disclaimers:

The contents of this report are the sole responsibility of the SUNI-SEA consortium and do not necessarily reflect the views of the European Union or the Global Alliance for Chronic Diseases.

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Acronyms

CB	Community-Based
CBO	Community-Based Organisation
CHS	Commune Health Station
DID	Difference in difference analysis
FINDRISC tool	Finnish Diabetes Risk Score tool
GACD	Global Alliance for Chronic Diseases
HAI	HelpAge International
HiAP	Health in All Policies
HR	Human Resources
ICOPE	Integrated Care for Older People
ISHCs	Intergenerational Self-Help Club
ISHGs	Inclusive Self-Help Groups
KAP	Knowledge-Attitude-Practice
M&E	Monitoring & Evaluation
MOH	Ministry of Health
NCD	Noncommunicable disease
OPA	Older People Association
PAR	Participatory Action Research
PHC	Primary Health Care
RE-AIM	Reach Effectiveness Adoption Implementation and Maintenance
SDG	Sustainable development Goals
SOP	Standard Operating Procedure
STEPS programme	STEPwise approach to NCD risk factor surveillance
SUNI SEA	Scaling-Up Non-communicable diseases Interventions in Southeast Asia
VAE	Vietnamese Association of the Elderly
WHO	World Health Organization

1 Introduction and background

1.1 Objectives of the SUNI-SEA project

The research project Scaling-Up NCD Interventions in Southeast Asia (SUNI-SEA) was implemented from January 2019 until June 2023 in Indonesia, Myanmar and Vietnam. The project was part of the scaling-up programme of NCD prevention and control by the Global Alliance of Chronic Diseases (GACD). The project was funded by the European Union under the Horizon 2020 research and innovation programme.

The three main objectives of the project were:

1. Identify a set of evidence-based interventions and scaling-up strategies[1] [1] by analysing contextual factors, core components, and effective scaling-up strategies for both PHC and community-based (CB) interventions in work package 1.
2. Perform cost-effectiveness analysis of ongoing interventions and of entire scaling-up programmes for prevention and management of hypertension and diabetes in Vietnam, Myanmar and Indonesia in work package 2.
3. Improve and test guidelines and instruments for scaling-up prevention and management of hypertension and diabetes worldwide in work package 3.

1.2 Concepts, Frameworks, and Instruments

The scientific approach in this project required working with evidence-based methods. This allowed for systematic planning, and thorough analysis of the findings.
In the preparation of the SUNI-SEA research project, we developed objectives for the research project, a hypothesis of synergy between community-based healthcare and a theory of change, which served as the basis for our participatory action research (PAR) in community-based health activities and primary healthcare.
Furthermore, in the course of the project, we applied existing concepts, frameworks and instruments, modified tools and developed new ones. On the one hand these tools served as theoretic background for planning and monitoring of implementation, and on the other hand they were for better analysis and research
In the publications, these tools were not always reflected, as results were more prominent in sharing lessons learned. However, for understanding of how choices in this complex research were made, it is relevant to gather these instruments in one paper.

1.3 Purpose of this white paper

The purpose of this white paper is to share the tools we applied in the SUNI-SEA research project with the research community and the health sector, and to share lessons learned from using the concept and frameworks. Other programmes, projects, and research in community-based healthcare can benefit from these tools.
For the achievements of the SUNI-SEA project, we refer to the public end-reports of the work packages, WP1 Scaling-up, WP2 Cost-effectiveness and WP3 Guidelines and training. The policy briefs

[1] Scaling-up, or large-scale implementation refers to deliberate efforts to increase the impact of successfully tested health interventions to benefit more people and foster policy and programme development on a lasting basis.

on Achieving Universal Health Coverage, Scaling Up, and Digital Health also provide more information on the project contents. All documents are available on www.suni-sea.org.

1.4 COVID-19 and project implementation

The project was implemented in the period 1 January 2019 until 30 June 2023, and therefore was affected by the COVID pandemic in the years 2020 – 2020. There were restrictive measures in all countries, also in the countries where the research was implemented, Indonesia, Myanmar and Vietnam. It was not allowed to organise public gatherings, meetings, conferences, training sessions. With the reduction of infection rates, or with increase of vaccination coverage, measures were released. On and off, activities were performed, but also many of the project activities were shifted to online meetings. Nearly all international, and even many national meetings, took place online.
An important development was the use of multi-media in communication, with development of a learning platform for SUNI-SEA (see chapter 5) and many online training and teaching materials. (See https://www.suni-sea.org/en/resources/compilation-of-suni-sea-training-and-health-education-materials/).

2 Conceptual framework for objectives SUNI-SEA

For each of the objectives of the research project we formulated specific objectives in the preparation phase of the project. We looked at the micro-level (individuals), the meso-level (communities) and macro-level (nation). The reason for this approach was that NCDs are complex problems, and addressing these conditions requires a multi-level approach [2]. In each of the specific objectives, models, frameworks or theoretical concepts were used. They are mentioned in the relevant area with a reference to the section where they are explained.

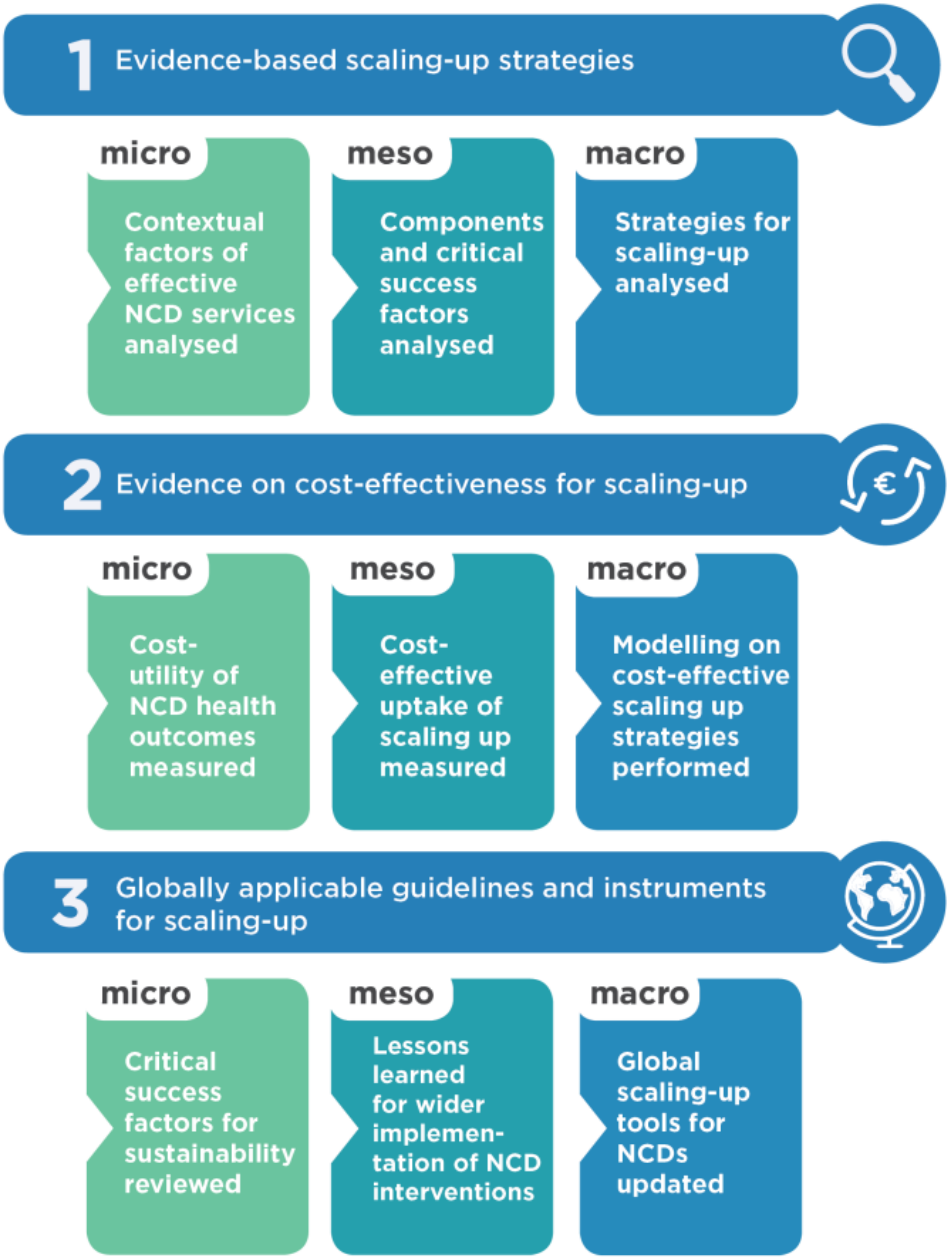

Figure 1 Specific objectives at micro-, meso- macro-level

1. Identification of a set of evidence-based interventions and scaling-up strategies for prevention and management of hypertension and diabetes in Vietnam, Myanmar and Indonesia (Work Package 1) consisted of:

a. Analysis of contextual factors that contribute to equitable, gender- and population-sensitive, safe, feasible and *effective* NCD services, embedded in health systems that are more responsive to the needs of patients and person centred (micro-level). See section 3.1.
b. Analysis of combinations of core components and critical success factors of the comprehensive community-based and primary health facility-based programmes, which are essential for a successful national strategy (meso-level). See section 3.2.
c. Analysis of the most effective scaling-up strategies taking into account the changing environments in community, organisation and programme (macro-level). See section 3.3.

2. Cost-effectiveness analysis of ongoing interventions and of entire scaling-up programmes for prevention and management of hypertension and diabetes in Vietnam, Myanmar and Indonesia (Work Package 2) consisted of:
   a. Identification of cost-effectiveness differences between various beneficiaries, such as gender, age and income (micro-level). See section 4.1.
   b. Identification of critical success factors for achieving synergies between community groups and health facilities in the scaling-up process to further enhance cost-effectiveness (meso-level). See section 4.2.
   c. Analysis of the most cost-effective scaling-up strategies taking into account the changing environments in community, organisation and programmes (macro-level). See section 4.3.
3. Development of guidelines and instruments for scaling-up prevention and management of hypertension and diabetes worldwide (Work Package 3) consisted of:
   a. Review of the critical success factors concerning sustainability of scaling-up the comprehensive community-based and primary health facility-based programmes (micro-level). See section 5.1.
   b. Documentation of lessons learned from Indonesia, Myanmar and Vietnam for wider implementation of NCD interventions with an optimal synergy between management and prevention programmes worldwide (meso-level). See section 5.2.
   c. Review and update global scaling-up and assessment tools, which will be available via international agencies (macro-level).

3 Evidence-based scaling up strategies

3.1 Micro-level scaling-up concept and frameworks

3.1.1 Factors contributing to knowledge and behavioural change

Health behaviour is a core component of the prevention and control of NCDs as four out five of the main risk factors for NCDs are related to behaviour, i.e., tobacco use, harmful use of alcohol, physical inactivity, and unhealthy diet [3]. For prevention of risk behaviour, it is important to explore the determinants of health behaviour. One of the preconditions of health behaviour is knowledge. The Theory of Reasoned Action (TRA) aims to explain how knowledge and health behaviour are interconnected [4]. According to TRA behaviour is determined by intentions, attitudes, subjective norms and beliefs. In turn, attitudes and subjective norms are established by behavioural, normative and control beliefs, which are based on knowledge. These jointly determine intentions which in turn determine behaviour [5]. Understanding the determinants of health behaviour or intentions to that behaviour, provides insights for targeting prevention at the community/population level, and the TRA provides a framework to study and to influence that.

An important factor in converting from behavioural intentions to actual behaviour regards self-efficacy [6]. Self-efficacy is built on the beliefs that individuals have based on their expectations of their own abilities, and it includes the perceived confidence to conduct a behaviour successfully. The perceived ease or difficulty of performing a behaviour, reflects past experiences and future obstacles [5]. Perceived control (self-efficacy) is one of the most determining factors of behaviour.

Higher socioeconomic status and younger age are associated with a higher level of knowledge [7,8]. Having hypertension is also associated with improved knowledge of the disease [9-11]. In addition, if patients are aware of medication-use, physical activity and diet, they are more able to self-manage and prevent complications. It is also known that interpersonal communication between physicians and hypertensive patients can improve knowledge of treatment and management of hypertension [12]. Moreover, diagnosis of a disease leads to health seeking behaviour, i.e. searching for additional information and help beyond the medical consultation [13].

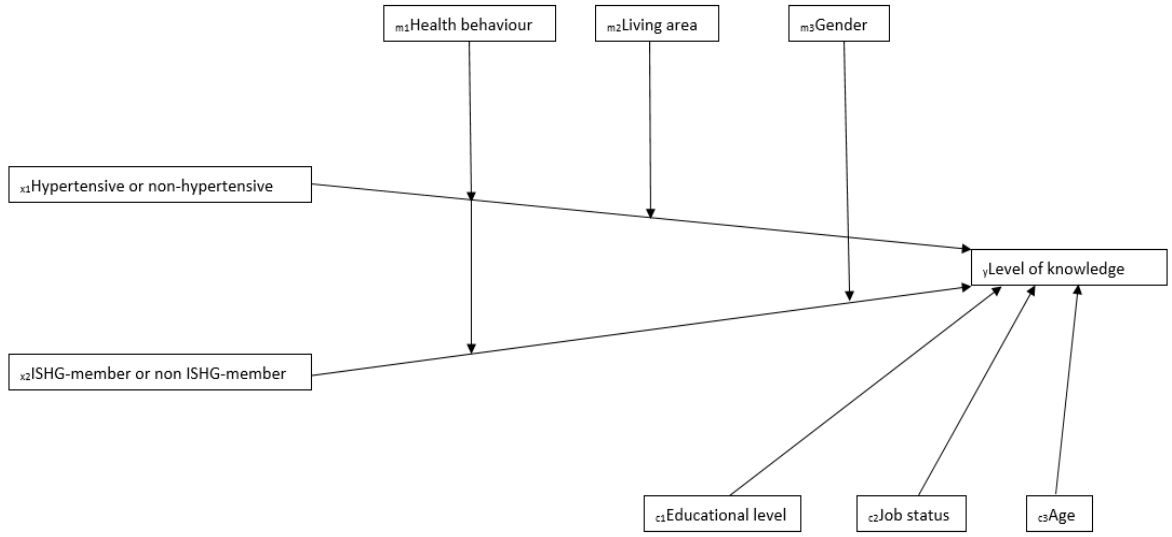

Figure 2 Theory of intended behaviour

Health behaviour is a core component in the prevention and control of NCDs and is affected by multiple determinants. To date, research on the relationship between behaviour change and community-based programmes regarding NCDs prevention and management is scarce for LMICs. Within the SUNI-SEA project, behavioural change and contextual factors that influence behaviour were studied as part of analysis of prevention and management of NCDs.

Experiences in SUNI-SEA

Within the SUNI-SEA project we found that lower educated and unemployed people in Myanmar had less knowledge about risk factors, symptoms and complications of hypertension than higher educated and employed people. Moreover, we found low treatment adherence among hypertensive patients in Myanmar, namely almost half of the hypertensive patients did not take their medication. Self-efficacy is one of the determinants of medication adherence in patients with non-communicable diseases[14-16]. In summary, lower educated people, unemployed people and people with hypertension are vulnerable for negative health outcomes of NCDs. Community-based programs can reach these vulnerable groups and education in these programmes can improve health knowledge and health behaviour.

3.1.2 Core components and contextual factors

While community-based interventions are widely used in Southeast Asia to target various health aims, including NCD prevention, evidence on their effectiveness was scattered. Moreover, little was known about the contextual influences and programme elements, such as their interaction with health-facility-based NCD interventions. Figure 3 illustrates a framework, based on the WHO input-process-output-outcome-impact model [17], depicting theories of change of community-based programmes aimed at NCD-prevention and management. Community-based programmes need different resources (input), which enable core health-components and activities of these programmes (processes), in turn resulting in products within these processes (output), which result in short-term and intermediate results (outcomes), and eventually long-term results (impact). Moreover, this causal chain of input-processes-output-outcome-impact is organised within and affected by different environments (context).
With this framework, based on examples from literature and our own experience, we illustrate how we expect core health components in community-based interventions, in certain contexts, to interact. Within the SUNI-SEA project we aimed to assess the processes of interaction of core health-components and to explore the contextual factors and programme elements that influence in each stage of the process in the Southeast Asian context.
The goal of our literature review was to better understand the link between community-based interventions and health outcomes in the region [18].

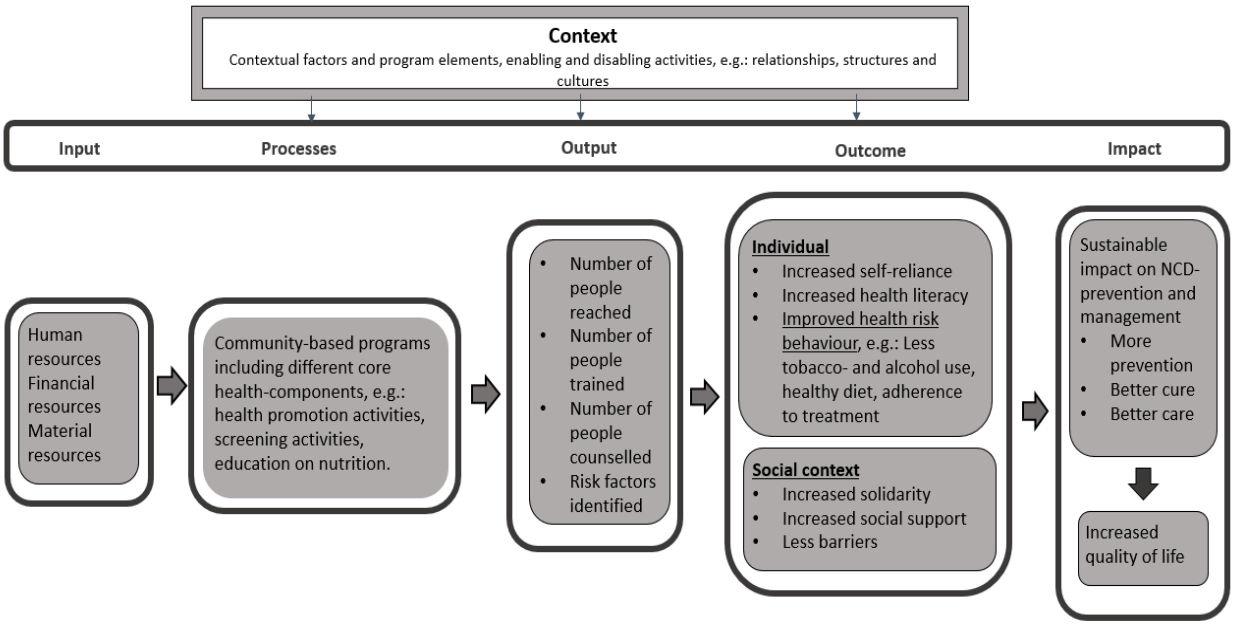

Figure 3 change model and contextual factors

We performed an extensive literature review to identify the contextual factors that influence the process of inputs, activities, outputs and outcomes. These contextual factors are described in the figure 4 below.

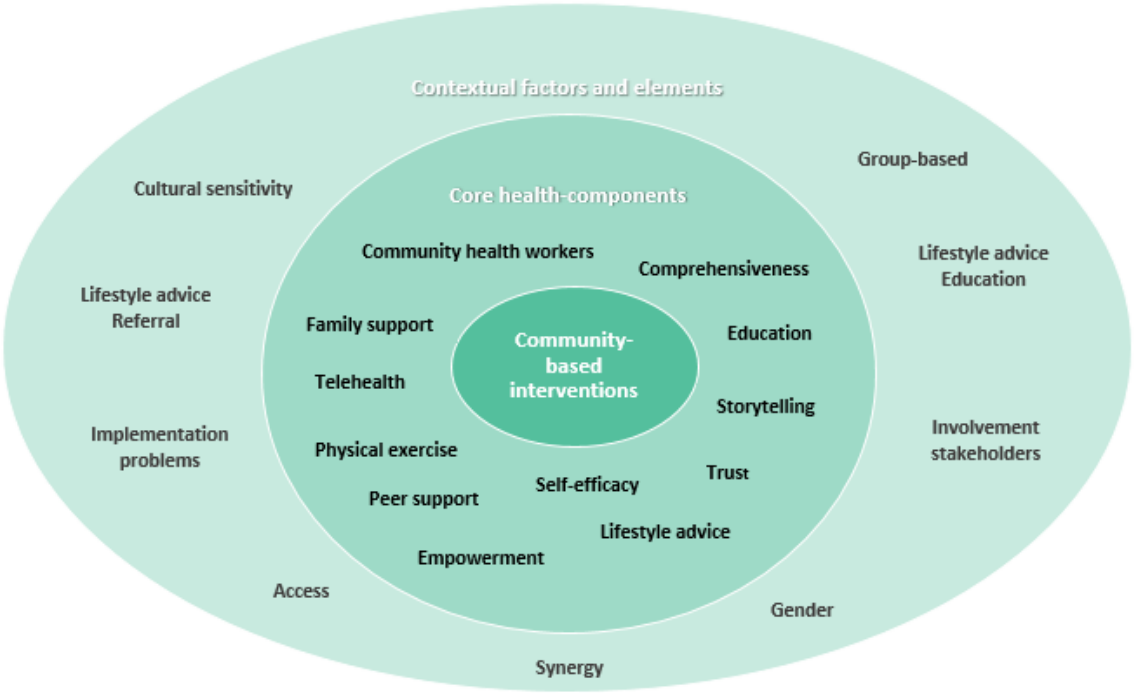

Figure 4 Core health components, contextual factors and intervention elements of community-based interventions

Experiences in SUNI-SEA

We found in the literature review 12 core-health components that strengthen community-based interventions (see figure 3), of which the most innovative were:

1) Community health workers can function as liaisons between primary healthcare and community members,

2) Family support can influence adherence to treatment, and
3) Comprehensive interventions are more effective than single-target interventions.

In addition, we found contextual factors and programme elements that may affect the outcome, of which the most relevant were:
1) Solving programme operational implementation problems helps in achieving results
2) Performing group-based activities for improving health behaviour leads to better compliance,
3) It is important to approach cultural sensitivity in projects.

This review contributed to an in-depth understanding of which core health-components, contextual factors and programme elements work in community-based interventions. The results of this review were used in the SUNI-SEA project to design, plan and adjust the community-based programmes. For example, in the development process of a training for community health volunteers in Vietnam, the training was checked and adapted for culturally appropriate aspects.

3.1.3 Cultural adaptation to contextual factors

We found in our literature review that cultural appropriateness is crucial for community-based programmes. A good fit between a programme and context can bring out desired effects. If programmes are simply replicated from other countries, they are less likely to reproduce effect.
We developed a guideline for cultural and contextual adaptation of community-based programs, using the concept of positive health [19] to map contextual and cultural aspects of community-based programmes.

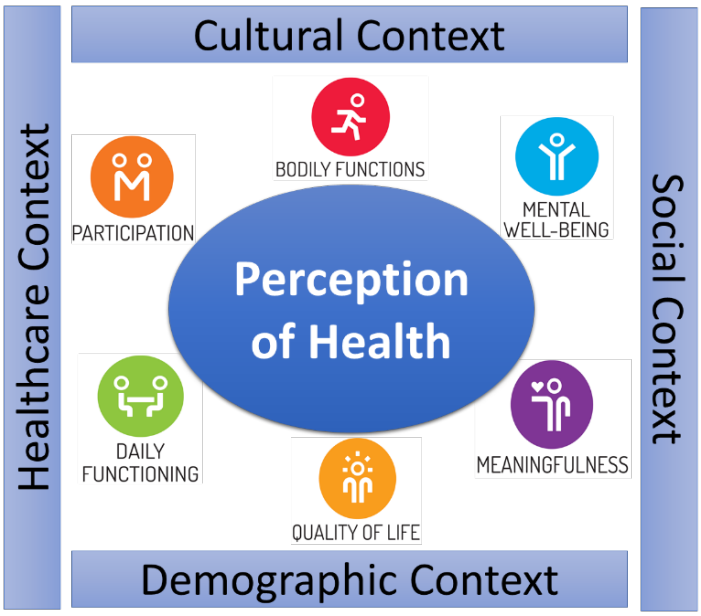

Figure 5 Contextual factors for a culturally sensitive approach

We developed a guideline for cultural adaptation in two stages: first, a checklist for contextual and cultural adaptation was drafted with a narrative literature review; and second, a guideline for adaptation was developed and tested with informal meetings, pilot-testing, stakeholder meetings, an expert meeting and all the data was synthesised [20]. Based on the conceptual model we developed a checklist for cultural and contextual adaptation of community-based health interventions (CBHIs). (See for explanation of the topics in the handbook on the SUNI-SEA website.)

This checklist can be used when international guidelines are to be used in a national context. For example, when Integrated Care for Older People (ICOPE) guidelines are to be applied in specific countries [21].

Topic	Contextual/cultural aspects	Yes	No
1. General	1a. Gender differences		
	1b. Ability to read/write		
	1c. Age friendly methods, addressing differences between generations; if end users were adults, adult learning methods were applied		
	1d. Digital inclusion/exclusion		
2. Bodily functions	2a. Perception of own body		
	2b. Physical fitness (cultural and individual exercise options) and/or somatic complaints		
	2c. Coping with stress and stigmatization of illnesses		
3. Mental well-being	3a. Perceptions regarding health: individual differences		
	3b. Local health traditions		
	3c. Cultural influences in diet		
	3d. Cultural influences on healthy living		
	3e. Myths and facts regarding health promotion		
	3f. Stigmatization of mental health, main issues		
	3g. Psychological stress, sources		
4. Meaning-fulness	4a. Barriers to access health information		
	4b. Feeling supported: role of peers, working together on health		
	4c. Religious and spiritual beliefs		
	4d. Feeling of belonging: social cohesion, part of community		
	4e. Availability of/barriers to informal resources: relatives/friends		
	4f. Access to resources: Barriers to access healthcare and medicines		
5. Participation	5a. Family structure: role of elders, in-laws and siblings		
	5b. Being able to participate, and having a role in usual community activities		
	5c. Being able to participate and having a role in usual family activities (earning money, cooking and cleaning)		
6. Daily functioning	6a. Availability of/barriers to healthy food		
	6b. Current/past working life		
7. Quality of life	7a. Social network, role of social structures in health, e.g., governmental and non-governmental organisations		
8. Role of imple-menter	8a. Does implementer represent or have knowledge of healthy lifestyle?		
	8b. Is implementer a role model for the target group?		
	8c. Is implementer culturally and linguistically matched to target group?		
	8d. Are participants treated equally and inclusively by implementer?		
	8e. No stigma or discrimination by implementer? Inclusiveness, stimulation of participants to come with solutions for local issues?		
	8f. Does implementer take into account cultural diversity of participants?		
	8g. Does implementer take into account different levels of participant knowledge?		
	8h. Does intervention enhance self-efficacy of participants?		
9. Lessons learned or other remarks:			

Table 1 Checklist for cultural sensitivity of guidelines

Experiences in SUNI-SEA

The guideline was used to tailor community-based health interventions to the health perspectives of community members, and to the context in which the intervention is implemented.
In SUNI-SEA this guideline was used to adapt training materials and curricula for community health volunteers. The WHO Package of Essential NCD interventions (PEN) materials for example were adapted to the Vietnamese context [22].

3.1.4 OPA model

In Vietnam, Older People's Associations are established as Intergenerational Self-Help Club (ISHC) [23], which are co-created with the target groups, focusing on the members priorities, potential of the areas and specific challenges of the community following the dimensions of positive health [24].

Figure 6 OPA model and relation to positive health

The ISHC is a national model which is continually being scaled up and will eventually spread over all provinces. Community members become engaged by community orientation, i.e., village meetings or loudspeaker announcements. Five members will be chosen by other members to become the management board. Membership is open to everyone aged 45 years and over. Priority is given to female, older people and people with economic or social disadvantages. The ISHCs receive support and resources, such as training and equipment, to carry out activities and they collaborate with commune health stations regarding health activities, such as screening. The area of focus is determined in consultation with the members. ISHCs promote multiple aspects of wellbeing, such as psychosocial health, healthy and active lifestyles, economic development, rights and entitlements, and self-help and peer support— i.e., helping each other in the community and improve members'

livelihoods. Moreover, ISHCs organize social, cultural and self-reliance activities, offer legal support, and homecare volunteer-based services. The ISHCs can have effects on health if implemented properly.

Experiences in SUNI-SEA

Within the SUNI-SEA project we found good implementation of the OPA -model and multiple benefits for its members. This corresponds with other research on the OPAs showing positive effects on multiple aspects of members' lives, including social participation and income [25]. Moreover, we found that training and education is important for the maintenance and sustainability of ISHCs and this confirms findings on other community-based interventions in other Southeast Asian countries [26,27]. Still improvements in terms of planning and management of activities can be made to enhance impact.

3.2 Meso-level Scaling Up Concepts and Frameworks

3.2.1 The synergy model

The focus of the SUNI-SEA project was on prevention and control of NCDs, especially hypertension and diabetes. SUNI-SEA aimed to provide evidence for an integrated response to NCDs by communities and primary healthcare facilities, which can be scaled up nationally and globally. The planned interventions are summarised in figure 1, SUNI-SEA's synergy model, which shows the synergies that can be achieved if the different elements of community-based and primary health care-based interventions are carried out well.

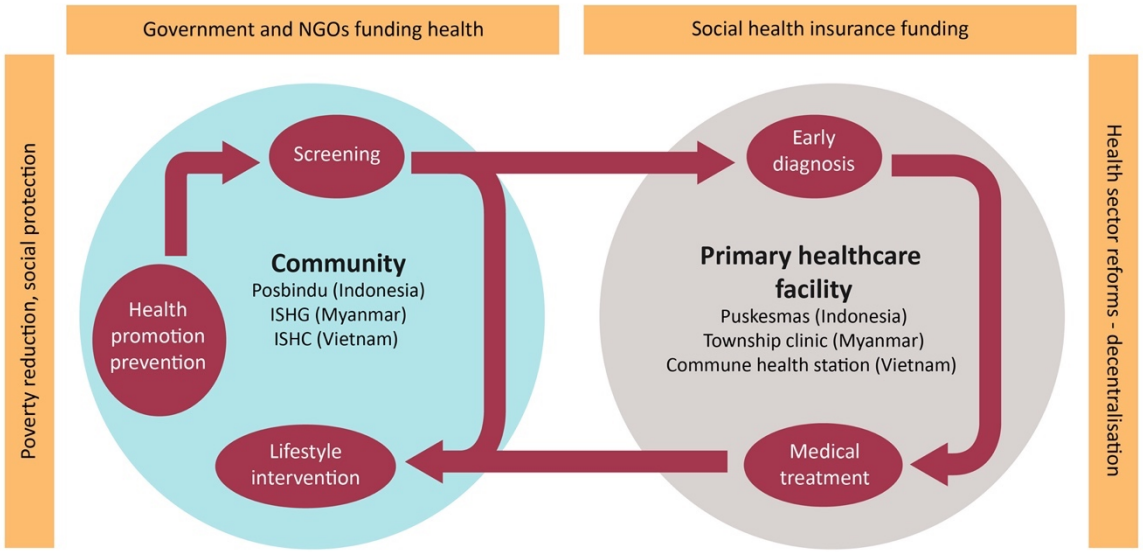

Figure 7 Synergies between community-based and PHC interventions

In this project we aimed to achieve:

- ***Impact on prevention*** Community groups promote health and encourage healthy behaviours and provide NCD screening, thus reducing health risk behaviours. Groups organise lifestyle interventions through peer support. Linking NCD prevention to solidarity, self-reliance and social participation in community groups has a sustainable impact. There are positive effects on both men and women, and on lower socio-economic groups.
- ***Impact on early detection*** Community groups can, through screening, detect early cases of hypertension or diabetes and advise these persons to visit PHC facilities for further diagnosis and

treatment. When community groups become self-reliant this screening can become an integrated part of social life in communities. It is possible to do the screening partially online through apps.

- ***Impact on early treatment*** When people with risk factors for diabetes or hypertension are detected in their community, peer groups promote lifestyle changes, e.g., healthy diet, physical exercise. Adequate medical treatment starts close to their home in primary healthcare facilities and is easily followed up in the same facilities. The scaling-up process of the integrated community-based and PHC-based interventions leads to an increase of people treated and adhering to therapy.
- ***Health systems strengthening*** The linkage and synergy between community-based and health facility-based interventions encourages health seeking behaviours, improves adherence to treatments, broadens knowledge and awareness of NCDs and their risk factors and enhances uptake of insurance and accountability for primary healthcare provision.

The synergy model shows how the different elements in community and primary healthcare are interlinked and strengthen each other. For making the interventions possible, commitment from community members, funding agencies and decision-makers is needed. Therefore, an environment conducive for innovations in NCD prevention and control is needed.

Experiences in SUNI-SEA

The synergy model was at the heart of interventions and actions in the participatory research. Each country where the project was implemented, planned and executed health promotion, screening, lifestyle interventions, PHC diagnosis and treatment of NCDs. Thousands of persons were reached with the activities and the synergy model proved to be a valuable instrument for planning the activities. The achievements are described in the WP1 final report.

3.2.2 The Korten Model

For structuring the interventions and assessing possible impact we used the 'model of fit' (David C. Korten, 1980) [28]. This model is also used in the WHO guidelines for scaling-up [29]. Figure 8 shows the three elements of the community, healthcare organisation and NCD control programme with the relevant contextual factors.

Figure 8 Structure of interventions in SUNI-SEA

Three elements are interdependent (as shown in the arrows) and need to be addressed in a comprehensive manner, in order to achieve impact:

- ***Community:*** The community is a complex organisation and has formal and informal structures, for example local government authorities, community-based organisations, informal elders, religious leaders, networks). Social, cultural and political factors influence communities. Members of the community express demands for services to healthcare organisations (or even to perform health-related activities) and are dependent on decisions of healthcare organisations for services to be delivered. In the interaction with healthcare organisations, community participation, co-creation and co-ownership is shaped.
- ***Healthcare Organisation of health services:*** the healthcare organisation consists of multiple layers of primary health care, hospital care, and management. It is a dynamic organisation with its socio-cultural beliefs and practices, being closely integrated with policies, protocols, resources and other health system structures. The organisation is responsible for implementing the NCD control programme and must be capable of implementing tasks as required. Here is where quality comes in. The healthcare organisation interacts directly with the community.
- ***NCD Control Programme for implementing NCD interventions:*** Based on epidemiological, social and cultural factors, the NCD control programme is developed (as explained in the introduction). There is an increasing need for hypertension and diabetes services. The NCD programme must deliver outputs, which will reduce hypertension and diabetes in the community. The programmes must be acceptable and accessible for community members. The programmes define the tasks for the health care organisations and must guide healthcare organisations in resources management.

Experiences in SUNI-SEA

In the prospective phase of the project interventions were planned and implemented for community, healthcare organisations and NCD control programme. The interventions are described in the WP1 Scaling up final report. The important lesson learned is that a comprehensive approach addressing multiple elements is achieving better results. It is possible to address specific issues in the country, linking to existing NCD programmes. It also allowed for flexibility, which was very much needed during the COVID-19 pandemic.

3.3 Macro-level Scaling Up concepts and frameworks

3.3.1 Scaling up strategy

In literature scaling up is often described as horizontal and vertical scaling up [30]. Horizontal scaling up is aiming at reaching more people with existing services (for example NCD screening in new geographic areas), while vertical scaling up aims to increase the services for people already reached (for example adding NCD screening to health education programmes). In the retrospective phase of the SUNI-SEA project we analysed contextual factors for the scaling-up and identified the most important barriers and facilitators [18]. Based on the findings from the retrospective phase, the SUNI-SEA project saw the necessity to add a third dimension to the traditional model of vertical and horizontal scaling up, namely the dimension of quality improvement. The SUNI-SEA project planned the scaling-up strategy in the following way:

- **Increase the package of services** in the existing community programmes or in the health facilities in the research area, for example by making NCD screening and counselling available for all adults, who are already participating in community health programmes.
- **Increase the quality of service** in communities or health facilities to achieve a more sustainable impact. Ensure that health workers and volunteers apply quality procedures, have equipment or medicines.
- **Increase the coverage of services** reaching more people in more geographical areas. For example, training staff in new health facilities or initiating more community groups in areas where previously no services were provided.

Figure 9 Scaling up strategies

Experiences in SUNI-SEA

In the SUNI-SEA project we increased the services of ISHCs in Vietnam with improved screening, health education and lifestyle interventions. In Indonesia we introduced an improved algorithm for screening in Posbindu. We also reached out to new communities in Indonesia, Myanmar and Vietnam, to make screening and prevention activities available for new populations.
Major efforts were made in capacity building of volunteers and healthcare professionals, in order to improve and maintain quality of services. The WP3 final report on guidelines and training explains in detail the activities and achievements.

3.3.2 Theory of change

The theory of change (TOC) has been used at different levels in the SUNI-SEA project. It is also mentioned in section 3.1.2 to describe contextual factors. The first draft of the TOC was developed in the proposal phase, and further refined in the retrospective phase.
The TOC described the inputs and activities of the project, and the relevant output and impact. Thus, the TOC helped in formulating relevant indicators to be monitored in surveys. Due to the short duration of the prospective phase of the project, impact indicators were not monitored. In the final report of WP2 the results are described.

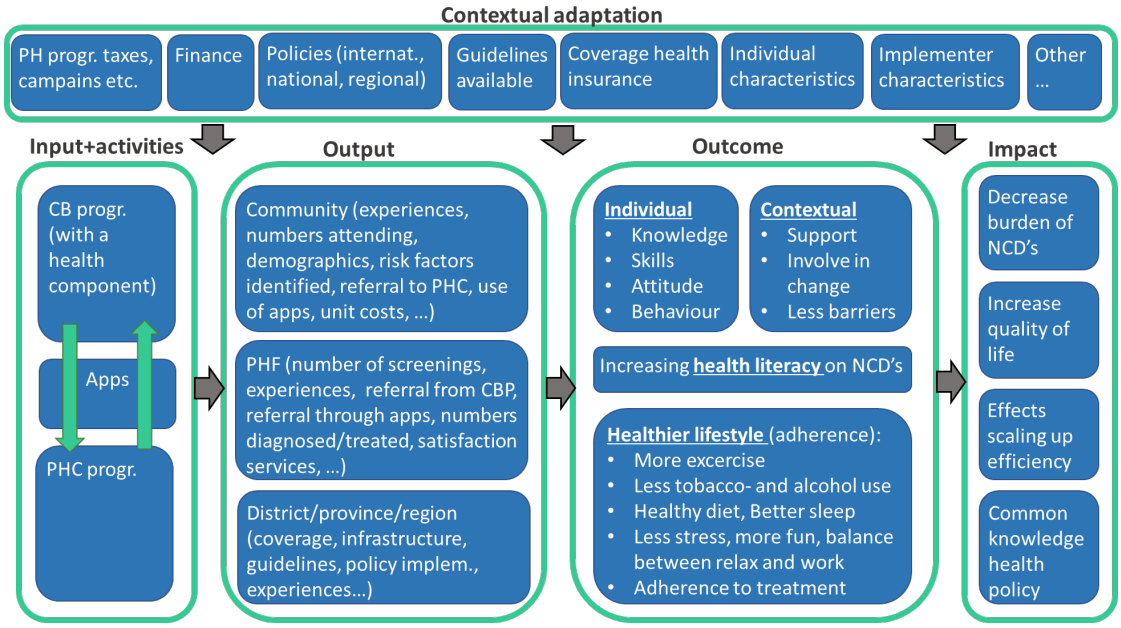

Figure 10 Theory of Change SUNI-SEA

Experiences in SUNI-SEA

The activities and outputs are described in the final report of WP1 Scaling up. Despite the COVID-19 restrictions most of the planned activities have been carried out. The outcomes are described in the end report of WP2. In general increase in knowledge and intentions for behavior change have been found. In some areas people have adopted a healthier lifestyle. It was not possible to measure impact.

3.3.3 RE-AIM model

The RE-AIM framework addresses five dimensions of individual- and organisational-level outcomes important to programme impact and sustainability: Reach, Effectiveness, Adaption, Implementation and Maintenance. RE-AIM includes an explicit focus on the design, dissemination and implementation process that can either facilitate or impede success in achieving broad and equitable population-based impact. We integrate our theory of change aspects with the dimensions of the RE-AIM framework as shown in the figure below.

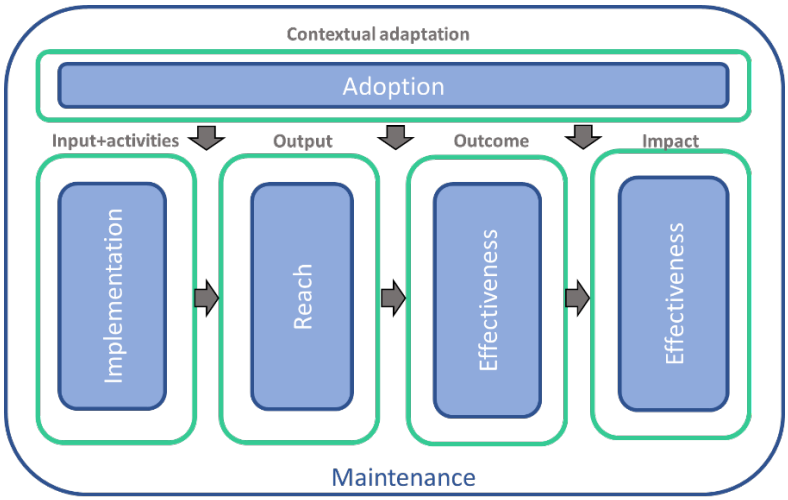

Figure 11 RE-AIM framework for SUNI-SEA

Reach (output)

- Defined as types of people who participated in the prevention programmes, and assessment of who was more likely to participate and why. Also defined as extent to which programmes were covering all areas they are supposed to cover, covering the hotspots or places within certain miles of a hospital or well-known health clinic, or whether areas were missing.
- Measures: number and types of participants, satisfaction, sites, and baseline and endline surveys including demographics, such as gender, income level of participants as well as who did not participate and who was missing over 2 years.

Effectiveness (outcome and impact)

- Defined as quality assurance throughout the project, attitudes, toward perceived effects on targeted outcomes at end of the programme. This is about the outcome and impact of the programme, including potential negative effects, quality of life and economic outcomes.
- Measures: reported subjective and objective measures related to primary outcome (for instance knowledge about NCD's and lifestyle, and attitude towards that, quality of life.

Adoption (contextual adaptation)

- At the organisational level, defined as characteristics of organisations and implementation sites, including those invited to participate and their organisations; and reasons for adoption or non-adoption. At the participant level, defined as characteristics of those who participated, who were hesitant, and reasons for hesitations. These are mostly contextual factors related to the participants, the implementers of the programme, culture, organization of programme, policies, guides, and tools.
- Measures: absolute number, proportion, and representativeness of the settings in which the programmes are implemented and the intervention agents (people who are delivering the program) who are willing to initiate the programme. Data were gathered with survey, the collection of the host information form and the population that they served.

Implementation (input and activities)

- Defined as intervention agent's fidelity to the various elements of the protocol, including consistency of delivery as intended and time required. This includes also the training of staff, using checklists, recording of adaptations made and the costs of implementation.
- Measures: recording of implementation of the programme and strategies to improve implementation, using attendance logs and completion logs. Fidelity observations. Focus group discussions with implementers on how they use training in practice.

Maintenance (*sustainable* activities-output-outcome-impact-context)

- This part of the frameworks integrates the other parts. It is defined as ongoing interventions to sustain the effectiveness (outcome and impact) at individual level of participants/patients, on programme-level, organisations embedding these programmes into their routine operations and budgets and on regional/national level policy that makes optimal reach and implementation possible.
- Measures: Questionnaires and interviews with implementers and representatives of organizations involved local, regional, national and even global if possible.

Experiences in SUNI-SEA

We assessed the implementation of the Older People Associations (OPA) model in Vietnam with the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework. Our research shows how the RE-AIM framework can be used for evaluating the implementation of community-based approaches. Community-based programs are real-world settings [31], and therefore, the RE-AIM

framework is seldomly applied [32]. This framework addresses a significant gap in implementation science and RE-AIM literature, providing a valuable tool for funders and researchers to have an insight into real-world evaluations [33].

In the final evaluation of the project for assessing the scaling up activities we applied the RE-AIM model as well.

All models and achievements are reported in WP1 final report Experiences with scaling-up. See https://www.suni-sea.org/en/resources/suni-sea-work-package-reports/

4 Cost-effectiveness

4.1 Micro level cost effectiveness concept and frameworks

4.1.1 Patient journey

In Figure 12 the screening flow of the SUNI-SEA intervention compared to a control situation is presented in an average ISHC in Vietnam with 59 members, as reported by the clubs, with then average number of referrals (23 members), the number of new cases detected (12 members) of both HBP and DM, and the number of new treatment cases (10 members) as reported by the clubs. A comparable control situation did not report any screening activities, and therefore the 10 new treatment cases could be considered as undiagnosed and untreated cases in the control situation. Additional costs are incurred as new treatment cases have consequences in terms of additional treatment cost related to diagnosis, as well as additional costs of undiagnosed cases and its related complications of untreated cases in the control group.

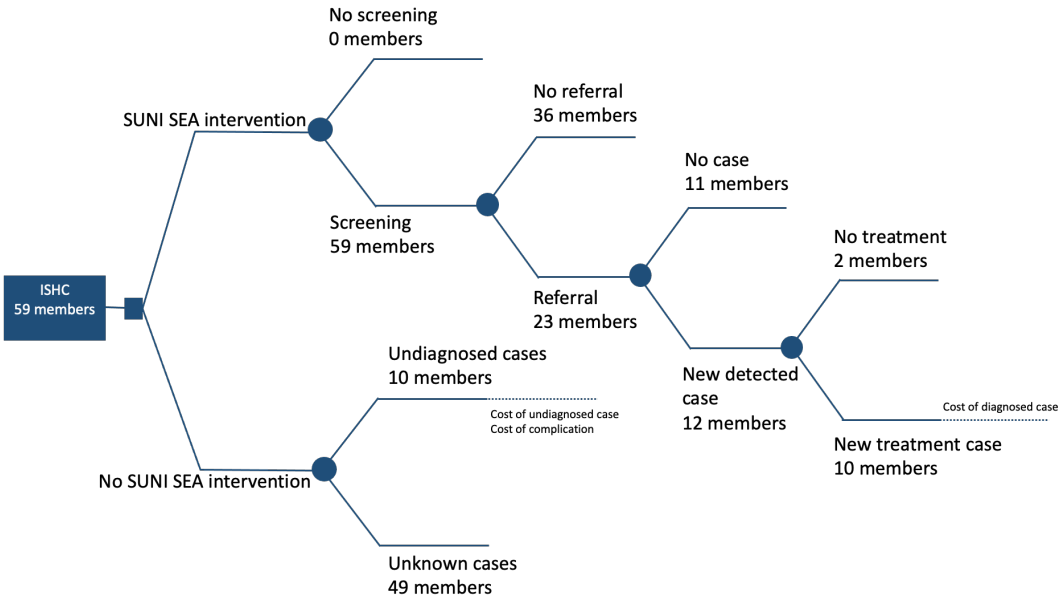

Figure 12 Screening flow of an average ISHC compared to control situation

The details of the patient journey provide necessary information to measure cost effectiveness at different stages of the NCD prevention and control program.

Experiences in SUNI-SEA

The patient journey data were used in the costing exercise. See the WP2 final report for the results.

4.1.2 Cost Data

To be able to conduct in-depth cost-effectiveness analyses, detailed data on the financial and human resources needed to run the community interventions need to be collected. Such cost data might differ depending on the intervention to be evaluated. For SUNI-SEA, different cost components were collected at different stages throughout the project, i.e., at the retrospective phase, during the baseline and endline survey of prospective phase, or as separate questionnaires. In general, cost data can be divided into the following components:

Direct health care costs

- **fixed cost**, such as capital costs, labour costs, and overhead costs
- **semi-fixed costs**, such as cost for staff
- **variable/material costs**, such as cost for medication or disposable equipment

Question guide for data collection of direct health costs

To elicit information of direct health care costs, the following questions can guide the cost data collection:

1. What is the number of people working in the community programs? Are these only volunteers or do they receive a payment? If yes, how is this financed? How high are the payments?
2. How high are the costs for training of health workers? How is this financed?
3. How does gender equity come in the cost?
4. What are the costs for the place or the facilities where the interventions take place?
5. What are the generally available financial resources (per month/year) for the program?
6. What are the costs of available and required health equipment within the facilities (e.g. scales, blood pressure meters)? How many available or needed?
7. Is digital equipment available or needed? E.g. would more computers/tablets improve the health data recording or could they simplify the data transferring?

Individual health care cost and opportunity cost

Additionally, information on individual (opportunity-)cost with respect to health services and the community intervention is necessary. Such data can be collected within household surveys and includes **direct non-health care costs** (patient and family out-of-pocket expenses) and **indirect non-medical costs** (productivity loss), for example:

- Spending for health services (community services as well as PHC services, possibly also higher-level health services)
- Costs for health insurance
- Costs for medicines/treatment
- Travel time and costs to place of intervention
- Travel time and costs to PHC and higher health care centres
- Average salary lost due to treatment or disease

For the final cost-effectiveness analysis, it is then of foremost importance to differentiate which cost are always occurring (i.e. also in case the intervention is not implemented) and which are only occurring because the intervention is implemented. In the case of SUNI-SEA, this cost was primarily the resources needed to conduct capacity training, to develop a new screening tool and to provide technical equipment that eased data collection and transfer.

In a next step, the ratio of the gains in health outcomes due to the intervention (i.e., the additional number of patients with diabetes detected in the intervention areas) relative to the additional cost that were required to implement the intervention can be calculated:

$$\boldsymbol{Health\ improvement\ per\ dollar\ invested} = \frac{(Health\ outcomes\ with\ intervention - Health\ outcomes\ without\ intervention)}{(Cost\ with\ intervention - Costwithout\ intervention)}$$

Comparing cost ratios for different interventions the finally allows to identify those interventions that are most cost-effective and hence lead to the largest health improvements for the money invested.

Insights from SUNI-SEA

Figure 12 presents the model flow that was used for the cost-effectiveness analysis in Vietnam. In this analysis, we compared the "treatment" scenario of the SUNI-SEA intervention in Vietnam (screening in ISHCs) versus a "control" scenario, in which the SUNI-SEA intervention is not implemented (no screening in ISHCs). The screening flow is presented for an average ISHC with 59 members. In such an average club, 23 members are referred to a higher-level facility, 12 new members with hypertension or diabetes are detected and 10 new members receive adequate treatment.
Without the intervention, no screening activities take place, and therefore the 10 new treatment cases could be considered as undiagnosed and untreated cases in the control situation. Additional costs will be incurred as new treatment cases have consequences in terms of additional treatment cost related to diagnosis, as well as additional costs of undiagnosed cases and its related complications of untreated cases in the control group.

4.1.3 Diff in Diff approach

A DID is a useful tool to quantify the impact of an intervention in case it was not implemented in a randomized manner. The analysed interventions in SUNI-SEA followed certain targeting criteria and existing infrastructures in terms of the existing community-based groups, and were consequently not randomized. This implied that the communities receiving ("treatment groups") or not receiving ("control groups") the interventions might have not been completely identical. A DID takes care of possible pre-existing differences by comparing the *changes in outcomes over time* between the treatment and the control groups. This implies that data on all outcomes to be evaluated must be measured in two points in time (once before the intervention is implemented and once after it has been implemented) and for both, the treatment and control groups. The first difference – the difference between treatment and control at baseline – takes care of any time constant differences that that might exist because of the non-random assignment of the interventions. The second difference – the changes observed in the control group even in absence of the intervention – takes care of time-varying factors that can affect the outcomes of interest. The DID then brings both differences together. The remaining effect on the outcome variables can then be considered the intervention effect [34]. This approach is graphically displayed in Figure 13.

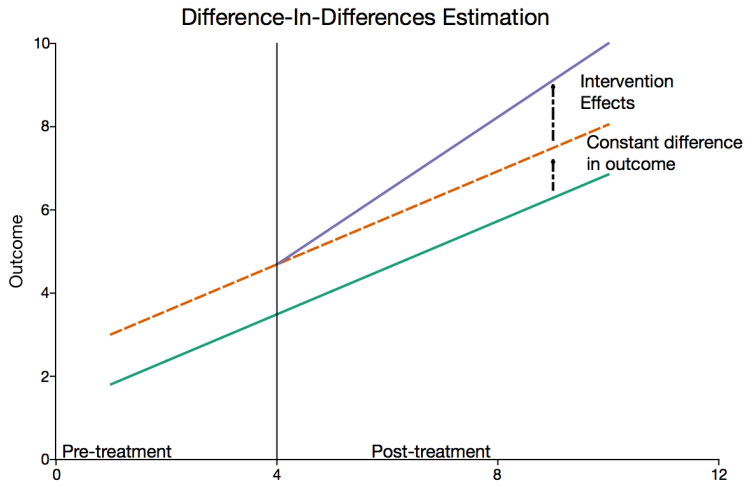

Figure 13 DID model [35]

Experiences in SUNI-SEA

The diff in diff results are reflected in the WP2 final report for the results.

4.2 Meso level cost effectiveness concepts and frameworks

4.2.1 Building blocks analysis

The interventions piloted in Vietnam, Myanmar, and Indonesia have a strong focus on a combination between clinical (patient level) interventions and health system strengthening interventions. All these system building blocks directly link to an improvement of access, coverage, quality, or safety of the provided intervention and enhance the effectiveness of the present or implemented clinical intervention.[17] (Figure 14.)

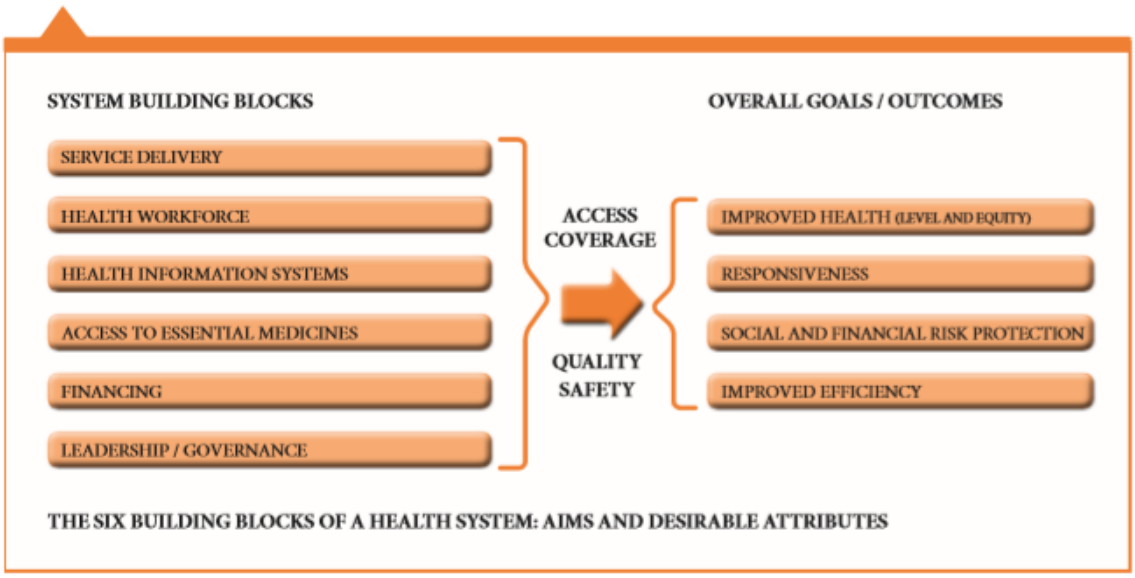

Figure 14 WHO building blocks

In SUNI-SEA we divided the activities, carried out in the intervention research in the different relevant building blocks. We processed a model for the community activities (figure 15) and PHC activities (figure 16).

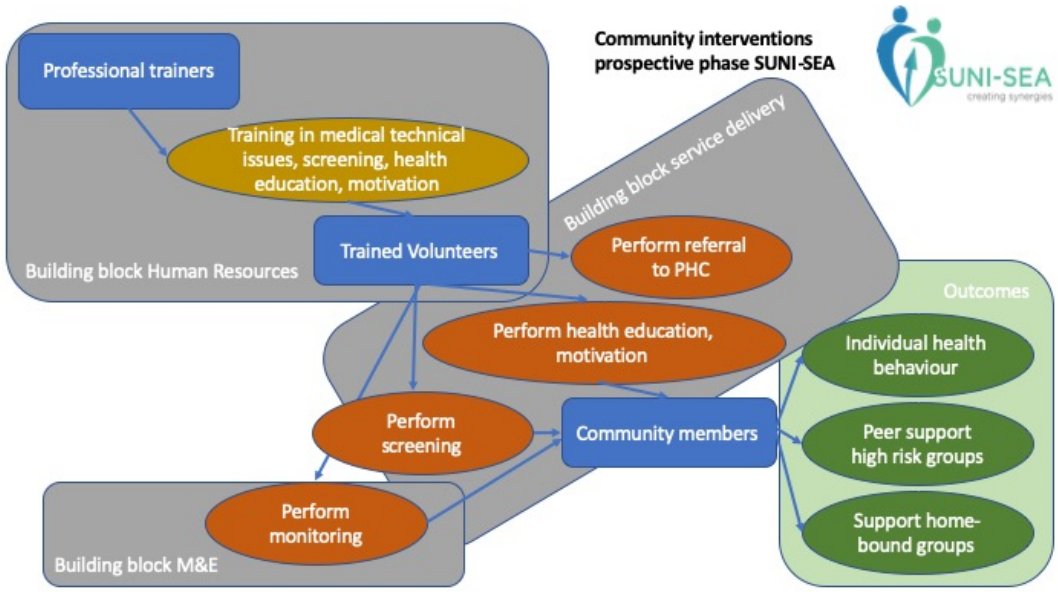

Figure 15 SUNI-SEA community interventions according to the WHO building blocks

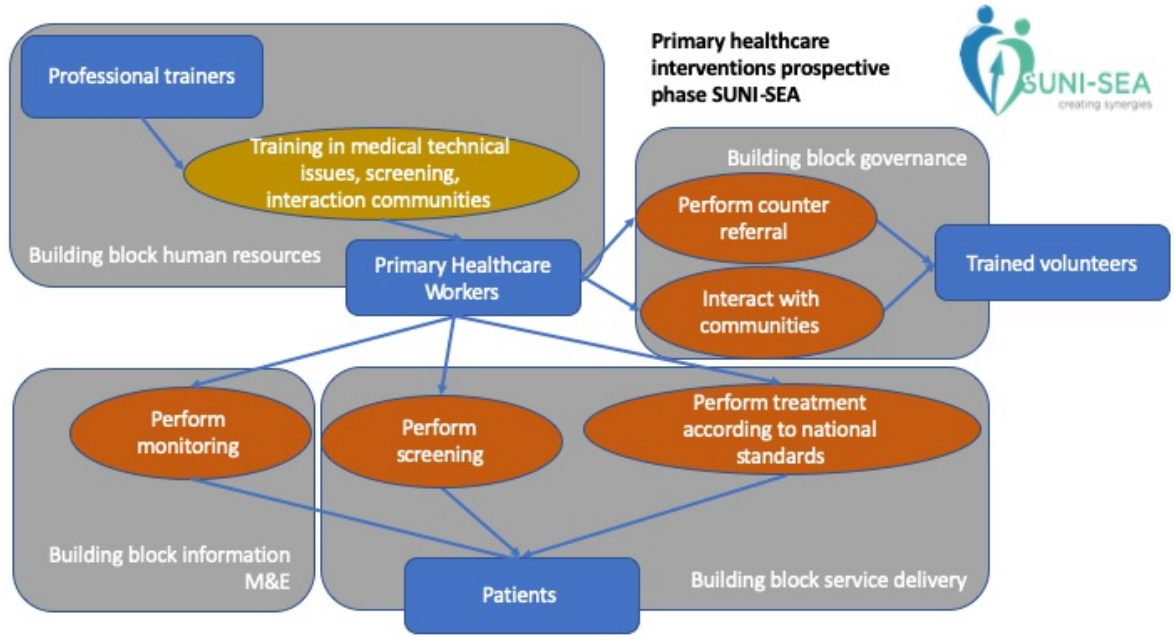

Figure 16 SUNI-SEA PHC interventions according to WHO building blocks

Single clinical interventions as implemented by the pilot projects in Vietnam, Myanmar and Indonesia are most likely to be (cost-)effective considering the current burden of disease of both hypertension and diabetes, and the suboptimal treatment and prevention of both diseases.
Problems with implementation and the surrounding health care system can however lower the impact of the chosen clinical interventions and its cost-effectiveness ratio. Because of this reason, the cost-effectiveness of an intervention is highly dependent on the context in which the clinical intervention will take place, the interaction with the existing health care system, and its implementation. Especially in low- and middle-income countries, where a substantial difference between efficacy of a treatment and real-world effectiveness is not unimaginable, since service delivery interventions (interventions focused on by whom care is provided, where care is provided, quality, safety) in low- and middle income countries in existing interventions are highly cost-effective [36].

Assessing the impact of access, coverage, quality, and safety on effect indicators like treatment effectiveness, disease incidence, or percentage of total disease population treated could help evaluate the combination of different clinical and health system strengthening interventions on its cost-effectiveness. Introducing specific health system strengthening interventions which are not primarily part of the implementation of the clinical intervention, but which could have a major impact on the effectiveness of the clinical intervention could be the factor evaluated in our intervention-control difference in difference analysis. If during the primary implementation of interventions in Vietnam, Myanmar, and Indonesia more substantial implementation challenges will arise, this will be taken into account during the "model-based approach" to further specify the cost-effectiveness of the interventions to the local context.

The figures 17, 18 and 19 provide some explanation of the approach (and explain specific areas of attention in the work packages). Community 1 refers to "treatment" community and community 2 refers to "control" community.

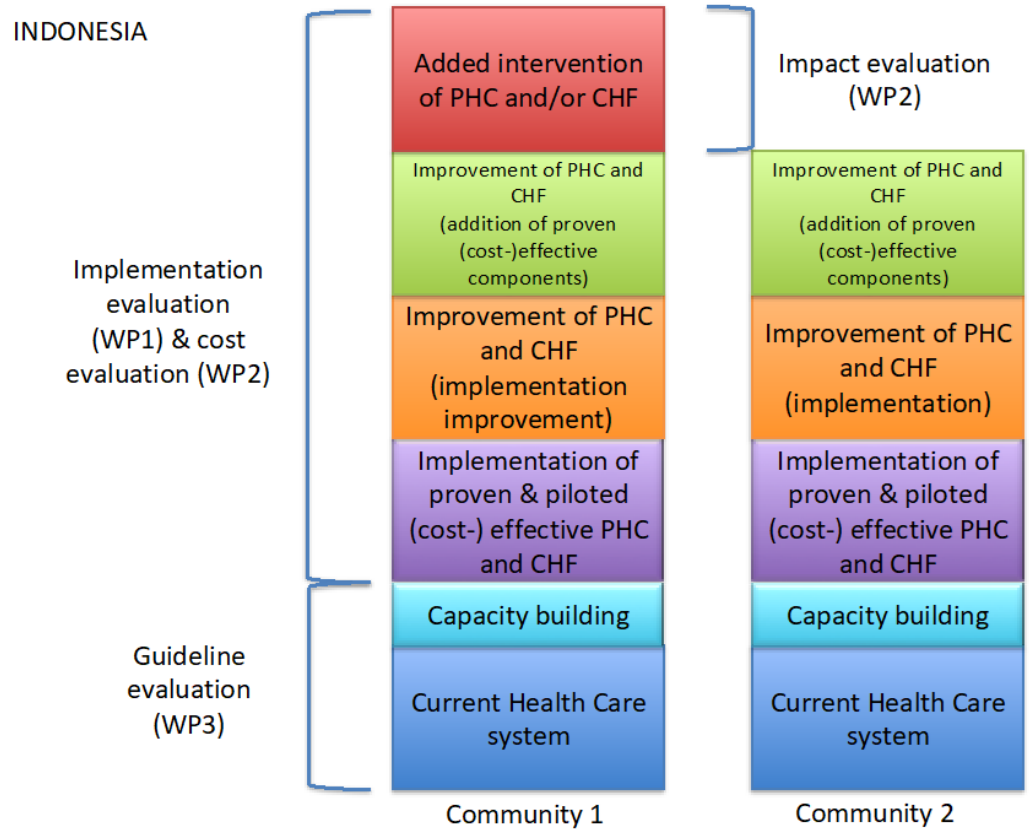

Figure 17 Implementation elements SUNI-SEA in Indonesia for cost effectiveness

VIETNAM

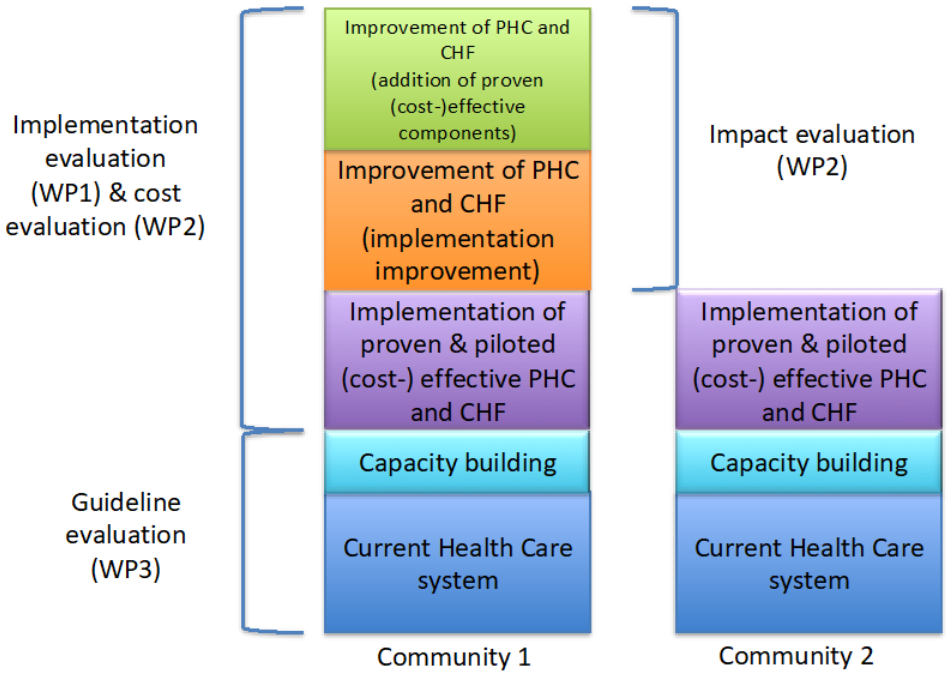

Figure 18 Implementation elements SUNI-SEA in Vietnam for cost effectiveness

MYANMAR

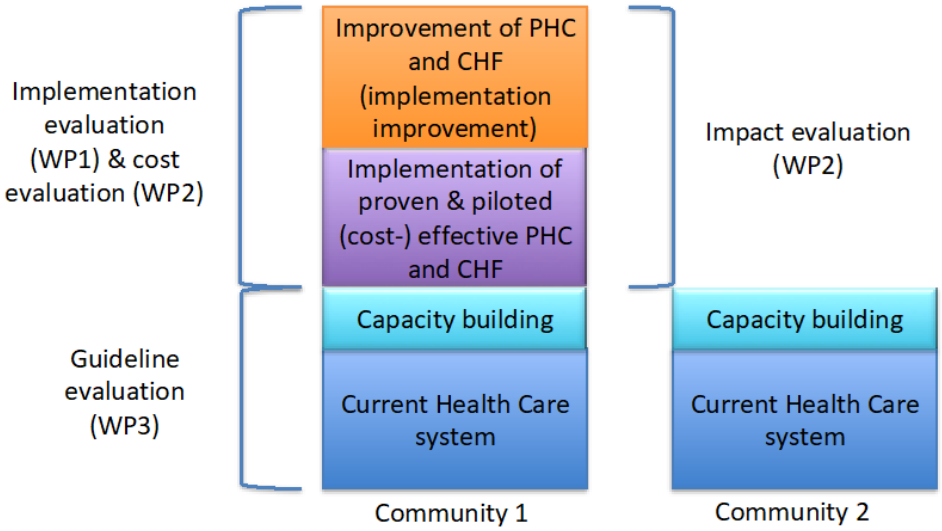

Figure 19 Implementation elements SUNI-SEA in Myanmar for cost effectiveness

Proceedings in the analysis:

1. Identification of changes to community interventions that were implemented, e.g. alternative ways to increase uptake of health promotion (including healthy lifestyle promotion), screening at the community level or referral to primary health care centres.
2. Baseline survey among households in a significant number of communities where these changes have been implemented and in a significant number of comparable communities where these changes were not implemented.
3. Endline survey among the *same* households interviewed at baseline.
4. Collection of relevant cost data.
5. Impact assessment and cost-effectiveness analysis.
6. Simulation-model based assessment of longer-term cost-effectiveness and scaling-up

Experiences in SUNI-SEA

All countries developed action plans for capacity, improvement of community health, the improvement of PHC services and measured the effects. These are reflected in the end report of WP1 and the relevant surveys for evaluation are reflected in the end report of WP2.

4.3 Macro-level cost effectiveness analysis

Due to the short-term implementation and follow-up time of the interventions in SUNI-SEA, we could not yet determine their long-term impact. For example, the short-term changes in knowledge and awareness of NCDs such as diabetes that were identified in the impact analyses are expected to lead to healthier behaviour, to improved wellbeing and perhaps even a reduction of disease development in the long run, which however could not be assessed in the short time horizon of the projects. We therefore used model extrapolations of the SUNI SEA results and combined it with existing evidence from the related scientific literature to model the potential impact of diabetes prevention beyond the SUNI SEA program. This extrapolation relied on the model-based cost-effectiveness methods according to the WHO CHOICE methods [37].
WHO 'Best Buys'. These learnings should be considered when prioritizing and scaling up cost-effective interventions in the prevention of NCDs such as presented in the WHO 'Best Buys' [38,39].
We applied incremental cost-effectiveness ratios (ICERs). A hybrid of a decision tree and Markov model was developed to simulate the lifetime costs and Quality Adjusted Life Years (QALYs) of Current NCD interventions compared to the no-intervention strategy to prevent T2DM.
In Indonesia three different Enhanced Posbindu scenarios were analysed: 1) Posbindu with increased quality, 2) Posbindu with increased coverage, and 3) Posbindu with increased quality and coverage. The analysis incorporated a societal perspective, which includes direct and indirect medical and indirect costs to provide a broader societal impact of the Posbindu strategies. The model was simulated using a lifetime horizon with a one-year cycle. A 3% discount rate was applied to long-term cost and health outcomes as recommended by WHO CHOICE. The report was written according to Consolidated Health Economic Evaluation Reporting Standard (CHEERS) 2021.

- ***Study Population***

The current T2DM screening guideline recommends that T2DM screening starts in the general population aged 40 years and older. Therefore, a hypothetical cohort of 100,000 people aged 40 was used to populate our model in simulating the lifetime cost and QALYs gained from different Posbindu strategies for T2DM prevention. Individuals who had already been diagnosed with T2DM were excluded from the simulation.
The study's primary outcome is the Incremental Cost Effectiveness Ratio (ICER), expressed as Int$ per QALYs gained. It is calculated by dividing the difference of cost by the difference of QALYs gained between two Posbindu strategies as described in the following equation:

$$ICER = \frac{Total\ Cost\ Posbindu\ Strategy\ X - Total\ Cost\ No\ Posbindu\ Strategy}{Total\ QALYs\ Posbindu\ Strategy\ X - Total\ QALYs\ No\ Posbindu\ Strategy}$$

Moreover, Incremental Net Monetary Benefit (INMB) was calculated to rank the cost-effectiveness between Posbindu strategies (48) by using the following equation:

$$INMB = ((Total\ QALYs\ Strategy\ X - Total\ QALYs\ No\ Posbindu\ Strategy)\ x\ threshold)$$

$$- (total\ cost\ strategy\ X - total\ cost\ No\ Posbindu\ Strategy)$$

We used one GDP per capita in Indonesia, which equals Int$ 13,207 as the Willingness To Pay (WTP) or threshold as advised by WHO CHOICE guidelines. Posbindu strategies are considered cost-effective if the ICER value is equal to or below the threshold of one GDP per capita in Indonesia and if the INMB value is positive. The most cost-effective Posbindu strategy is the strategy which has the lowest ICER and the highest INMB value.

- ***Model Structure***

The decision tree illustrates the immediate outcome of four Posbindu and No Posbindu strategies (Figure 1). T2DM screening in all strategies except for the No Posbindu strategy was performed by RCBG test. When individuals had positive results (> 200 mg/dl), they would be referred to PHC to receive a confirmation test by Fasting Plasma Glucose (FPG) test, followed by treatment and medication as advised in the Indonesian guideline for T2DM management.

This assumption was in line with a prior study which found that undiagnosed T2DM patients had higher cardiovascular risks, such as hypertension and more elevated low-density lipoprotein (LDL) cholesterol, than the diagnosed T2DM group. When entering a health state in the Markov model, an individual might stay in the same health state, move to another state, or die from all-cause mortality. The probability of dying from all causes was adjusted according to the individual's age. The simulation was stopped when all individuals reached the death stage.

- ***Model Validation***

Face validity to ensure the relevance of the model in depicting the actual situation of Posbindu and assess the model's logic was conducted through discussion with the SUNI-SEA Indonesian team, two General Practitioners working in PHC in Indonesia, and health economic experts. It concluded that the model structure, assumptions, and results were logical for simplifying different Posbindu strategies being compared. Furthermore, internal validation by incorporating extreme or null values as the input parameters to the model resulted in reasonable outcomes.

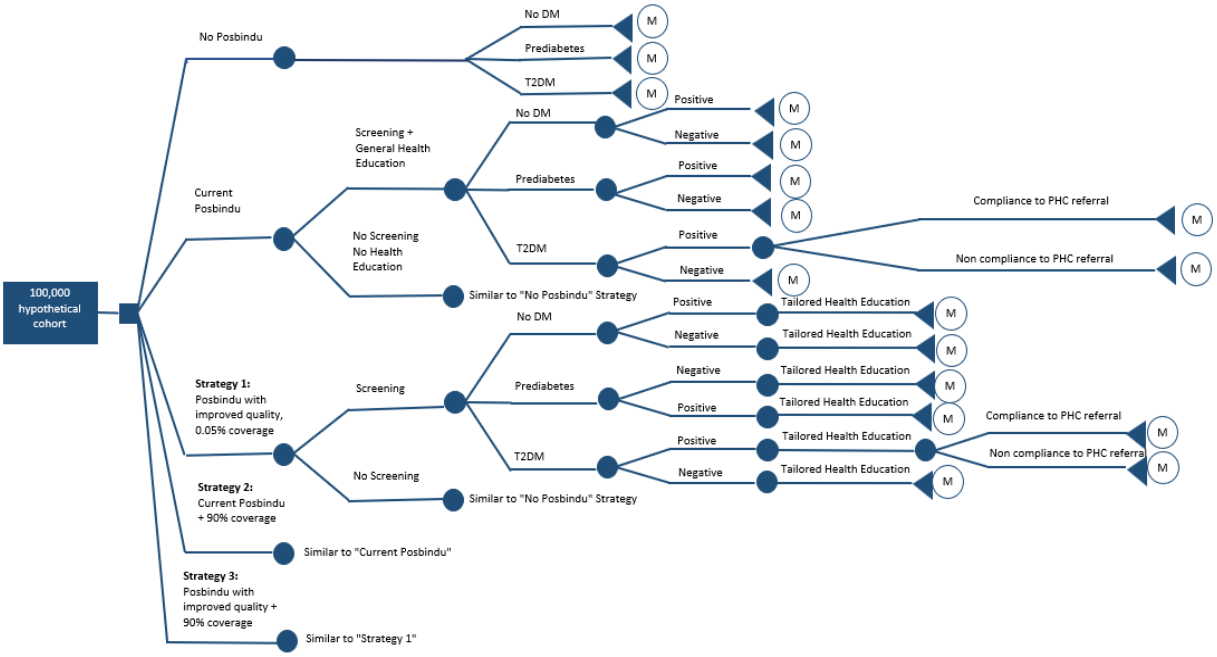

Figure 20 Flow diagram model Impact Posbindu

Similar validation was done in Vietnam. In addition, we used a Markov modelling approach to "simulate" cost-effectiveness over a longer period (in alternative scenarios) and also to "simulate" "scaling-up" of community-based intervention and health facilities. The "model-based approach" gave us a representative model for the two countries involved (so only one model, covering a typical Asian country in figure 21).

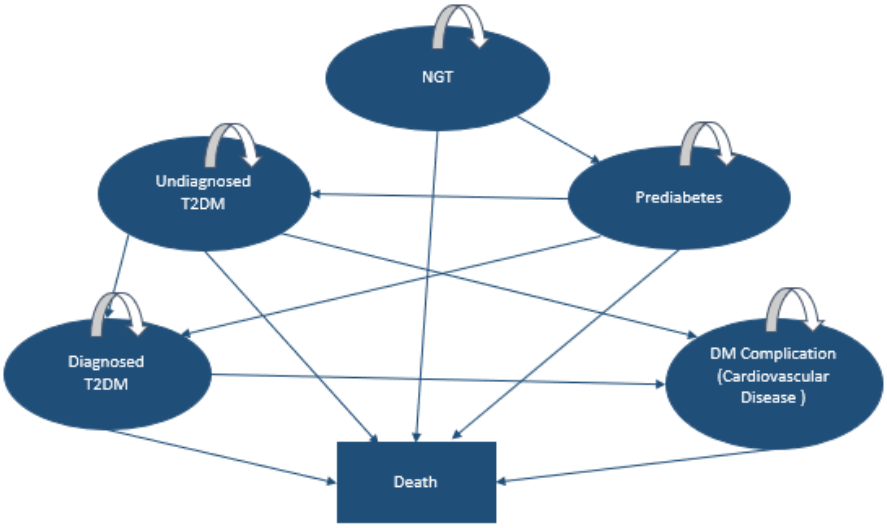

Figure 21 Markov Model to Simulate Long-term Outcome of Posbindu Strategies

Experiences in SUNI-SEA

The modelling exercise is described in the WP2 final report for the results. Also, all other results of the DID and costing are reported in the final report. See https://www.suni-sea.org/en/resources/suni-sea-work-package-reports/

5 Guidelines and training

5.1 Training needs

Community level

The SUNI-SEA project developed curricula based on the competencies required for community health volunteers or cadres. The final aim at community level for members of communities (in green) is threefold:

- Change individual behaviour (better prevention, more screening, better adherence to treatment)
- More peer support in groups (in Vietnam and Myanmar well-established clubs or groups based on the OPA-model, in Indonesia more ad-hoc Posbindu groups)
- Trained volunteers (within the community clubs or groups, or related to Posbindu) perform
    - Health education and motivation
    - Screening on certain topics
    - Referral to health facilities if indicated
    - Monitor activities, risks, etc.

The activities of the volunteers have to be defined in more detail, with different accents per country. In in order to perform the tasks properly, they need training and capacity building as is shown in figure 22.

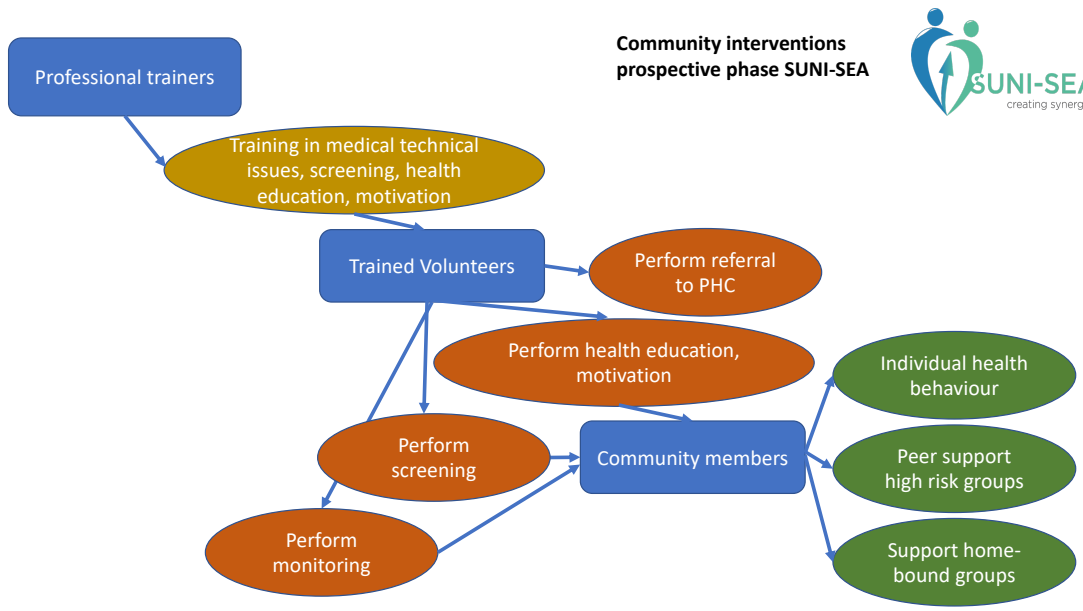

Figure 22 Training needs Community level

Primary Healthcare level

Patient care is the core business of primary healthcare services:

- diagnosis and treatment (according to national standards) and possibly referral to higher level;
- screening on certain topics (related to national programmes);
- monitoring of activities and documentation.

In addition to these regular activities, health workers:

- refer patients back for secondary prevention in the communities;
- interact with communities on health promotion and prevention through the volunteers.

The project has to define in more detail the activities at PHC level and discuss with authorities which changes and improvements can take place in the project area.
In order to perform the tasks properly, they need training and capacity building. Figure 23 gives an overview of these activities.

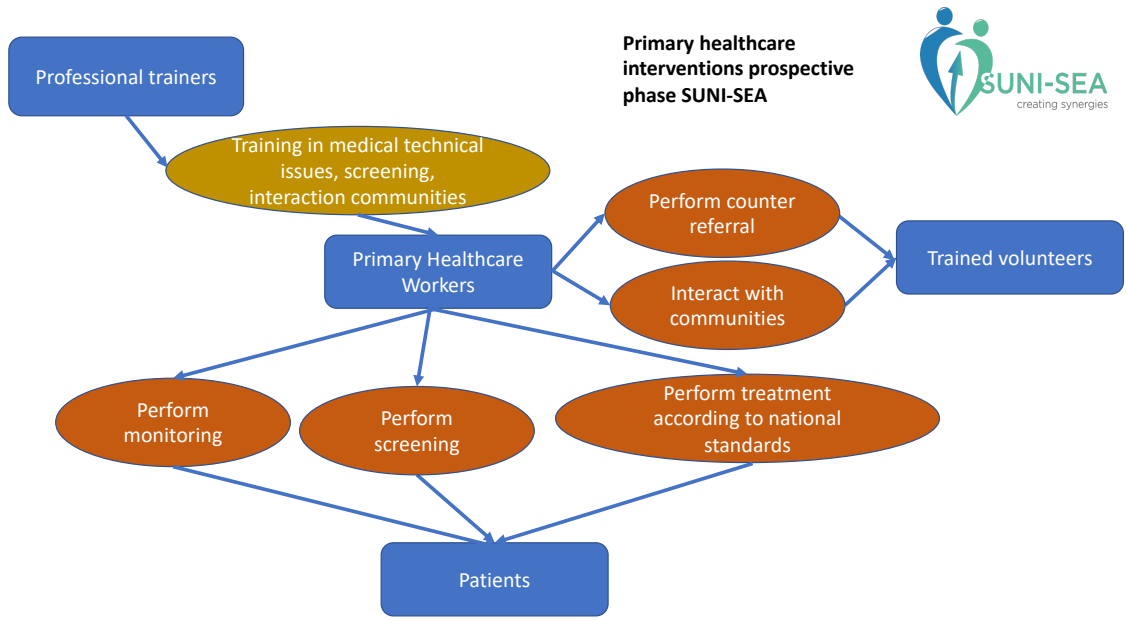

Figure 23 Training needs PHC level

5.2 Capacity building cycle

The capacity building process in the SUNI-SEA followed a planned approach, as shown in the figure 24 below.

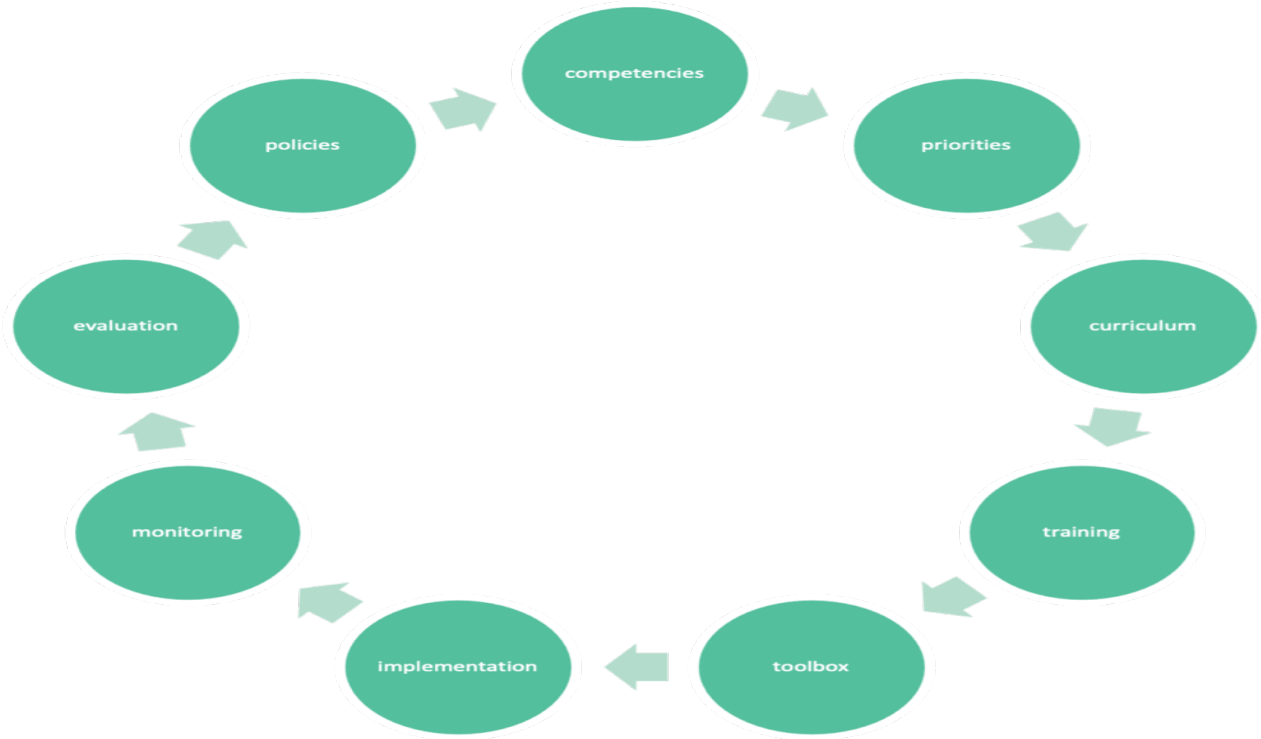

Figure 24 Capacity building cycle SUNI-SEA

i) Phase 1: Competencies

Competency is the consistent application of knowledge and skill to the standard of performance required in the workplace. Units of competency specify the standards of performance required in the workplace. Competency-based training (CBT) is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a training program. Not only that, it is also important to understand, how the recommendations from practice guidelines are executed and who has a competency to make it happen.
The competencies of PHC professionals were identified by using a questionnaire survey. Competency assessment helped in determining the gaps between the actual and the desired levels of performance of an individual.

ii) Phase 2: Priorities for training

The results from the competency assessment survey presented a clear picture of what gaps exist between the required and actual competencies. Those were addressed by defining priorities for training. The priorities were based on a consented list of *Core Competencies for Chronic Disease Prevention Practice*. The priorities complied with the results from a *systematic review* of regional and national documents and the review of local and international guidelines. General subjects, such as management of change in PHC practice, continuity of care between community and PHC as well as referral to secondary care were included, too.

iii) Phase 3: Curriculum design

Once the priorities were defined the curriculum for training of PHC staff have been developed. The curriculum differed among countries. However, all three countries focused on ensuring the continuity of care.

b) Phase 3.1: Clinical Governance: from Recommendations to Guidelines to Pathways

Training was provided in using process ADAPTE to develop guidelines from recommendations identified by systematic review. Materials facilitating the implementation of guidelines were developed. Cascade training process was implemented.

c) Phase 3.2: Screening for hypertension and diabetes

SUNI-SEA developed training materials for screening for hypertension and type 2 diabetes based on current international experiences. Cascade training process implemented.

d) Phase 3.3: General subjects

There was a need to cover general subjects related to managing practice, too. Based on priorities identified a set of training and educational materials were developed.

i) Phase 4: Training

Training was delivered either by using face-to-face or online approaches based on the possibilities and COVID-19 restrictions of the countries.

ii) Phase 5: Educational toolbox development

The training materials were delivered to participants face-to-face or by internet, depending on the opportunities. All training materials are also on the SUNI-SEA website for use by external parties.

iii) Phase 6: Implementation

The training in the three countries was provided as planned. See WP1 final report for details.

iv) Phase 7: Monitoring

The process was monitored, and regular reporting established. Publications about the monitoring are in process

v) Phase 8: Evaluation of effects

Effects of interventions have evaluated based on comparing pre-test and post-test data. It is expected to publish results in several scientific papers after the end of the project.

vi) Phase 9: Adapting results into national/local curricula and policies

In close cooperation with local/national governments, the curricula, policies and regulations are adapted on the basis of project outcomes. Policy briefs have been produced and have been discussed with stakeholders. In Vietnam and Indonesia government has made commitment for further incorporation of lessons learned (see report end conference

Experiences in SUNI-SEA

All results of the capacity building are reported in the WP3 final report. See https://www.suni-sea.org/en/resources/suni-sea-work-package-reports/

All capacity building materials are available on the website. See https://www.suni-sea.org/en/resources/capacity-building-materials/

6 Conclusion and Call to Action

SUNI-SEA has successfully used conceptual frameworks and developed new frameworks. The project has applied a series of scientific methods, developed globally in public health and health economics. We hope that other researchers and public health practitioners will be able to apply the instruments and replicate the SUNI-SEA activities.

We hope that the instruments will strengthen NCD prevention and control. SUNI-SEA's synergy approach has proved that community empowerment and close collaboration between PHC facilities and community groups can result in increased knowledge and awareness about NCDs, increased early detection and actions for addressing risk factors, and improved early treatment of NCDs at primary healthcare level. It is high time to implement two paradigm shifts globally:

1. Give NCDs the highest priority in healthcare, as these chronic diseases are responsible for the greatest number of deaths, the highest morbidity, and are affecting the poorest countries most. Allocate more funds to NCD prevention and control.

2. Emphasise prevention and early detection of NCDs, as this reduces human suffering, prevents complications of NCDs, and saves costs. Mobilise the human capital in communities for improvement of health and wellbeing.

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