2020

Briefing Note: Strengthening Integrated Diabetes Care in Cambodian Primary Health Care

"This Briefing Note of National Institute of Public Health (NIPH) is developed in collaboration with Knowledge to Policy (K2P) Center, a WHO-Collaborating Center for Evidence-Informed Policy and Practice"

Strengthening Integrated Diabetes Care in Cambodian Primary Health Care

Merit Review

The Briefing Note undergoes a merit review process.
Reviewers assess the brief based on merit review guidelines.

Acknowledgements

We would like to acknowledge the team at K2P Center for their technical support as part of the K2P Mentorship Program. We are grateful to the key informants whom we interviewed during the process of developing this Briefing Note. They provided constructive input and suggestions. This Briefing Note was developed by Sokvy Ma, Vannarath Te, Sereyreaksmey Long, Wuddhika Invong, Sotheara Heng, Duk Panharat, Lama Bou Karroum, Rana Saleh, and Chhorvann Chea.

Vannarath Te wishes to acknowledge funding from the Belgian Directorate General for Development for supporting his PhD studies through the Institute of Tropical Medicine in Antwerp. His PhD research has provided significant input for this brief.

Since NIPH is also a consortium partner in a research project funded by European Commission's Horizon 2020 Framework on "Scale up an integrated care package for diabetes and hypertension for vulnerable people in Cambodia, Slovenia and Belgium"—SCUBY, this brief does benefit from some input of the SCUBY.

Funding

This briefing note was funded by the Alliance for Health Policy and Systems Research/WHO. We would like to acknowledge the Alliance for Health Policy and Systems Research at the World Health Organization for financial support as part of Knowledge to Policy (K2P) Center Mentorship program [BIRD Project] aimed at strengthening evidence-informed decisions and policymaking in the country.

Citation

This NIPH Briefing Note should be cited as: Ma S, Te V, Long S, Invong W, Heng S, Panharat D, et al. Briefing note: strengthening integrated diabetes care in Cambodian primary health care. National Institute of Public Health (Cambodia), 2020.

Table of Contents

Executive Summary

Purpose

The purpose of this briefing note is to highlight current problems and barriers to the primary health care (PHC) for diabetes by taking a health system perspective and looking at vulnerable parts of the population. Policy recommendations are necessary to improve the integrated diabetes care in Cambodian PHC system through synthesis of evidence-based interventions that have been evidently shown to improve practice of diabetes care and management in the PHC, in Cambodia or in other low-and middle-income settings.

Problem

It was observed that the prevalence of diabetes in Cambodia among population aged 18-69 in 2016 was 9.6% in 2016, but it was only 2.9% of the age groups 25-64 in 2010. The prevalence of deaths attributable to diabetes has also increased by 45.9% between 2007 and 2017. However, the integrated care for diabetes in the Cambodian PHC is quite limited.

Size of the problem

- The demographic and epidemiological transition will lead to an aging population and an increase in non-communicable diseases (NCDs) including diabetes
- The prevalence of people at high risk with impaired fasting blood glucose was also observed significantly high (8.9% of the age groups 18-69) in 2016.
- More than 50% of Cambodian with diabetes lack access to treatment and only one quarter reached good glucose control

Underlying factors

- NCD services at the level of primary health care are still at its infancy.
- The existing care organizations for diabetes are implementing their initiatives on care models in isolation with little linkage with one another.
- Out of pocket payments accounts for more than 50% of all health expenditure. There are still large segments of the population not under any social health protection scheme, especially elderly. This constraints access to prevention and care for diabetes.

To strengthen the integrated diabetes care in the Cambodian PHC, we propose addressing the above-mentioned underlying factors through the following policy recommendations.

Policy Recommendations

Recommendation 1: Strengthen the role and capacity of health care organization

- **National level:**
  - Rapid scale up of World Health Organization Package of Essential Noncommunicable disease interventions (WHO PEN program)
  - Revise and update nursing pre-service curriculum to enhance the role of nursing staff to meet demand for NCD (in particular diabetes) care
  - Integrate PEs into a formal system of CHWs
  - Revise and update scope of practice of nurses
  - Include diabetes (and other NCDs) questions in H-EQIP assessments
  - Link performance-based payment (as part of H-EQIP) to NCDs (diabetes in particular)
  - Expand coverage of social health protection scheme among the elderly in informal sector
  - Invest in integrating databases

- **Sub-national level:**
  - Provincial Health Department (PHD) and Operational District (OD) assign and support a focal point person to facilitate the NCD program—in particular the WHO PEN
  - The PHD focal point person establishes a regular meeting schedule with each OD focal point person
  - The OD focal point person establishes a regular meeting schedule with a focal point person from a referral hospital and health centers for refreshing training and problem-solving purposes
  - Each OD focal point person closely works with a person in charge of drug request and supply at OD
  - Each OD focal point liaises with the Department of Preventive Medicine for on the job training for health care staff at both hospital and health centers
  - Make efficient use of decentralization as a window of opportunity
  - Each OD focal point person is responsible coordinating health information system
- **Institutional level:**
  - Each referral hospital and health center assign and support a focal point person for NCD program—in the particular the WHO PEN
  - Strengthen a multi-disciplinary team of physicians, nurses and pharmacists at the PHC level in implementation of the WHO PEN
  - Provide routine screening for diabetes at the triage for both hospitals and health centers
  - Provide proper treatment at hospitals for severe cases
  - Provide follow up care for stabilized cases and pre-diabetes cases at health centers
  - Increase the role of pharmacist-led care providing pharmaceutical care and health promotion activities in improving diabetes patients' outcomes at both hospitals and health centers (can be nurses who play the role).
  - Incentivize performance of the multi-disciplinary team
  - Use Services Delivery Grant (SDG) to ensure adequate medicines and equipment for treatment at hospitals and follow up care at health centers
  - Recruit a non-health staff to be in charge of health information in health facilities
  - Strengthen the leading role of the referral hospital in improving referral system
  - Continue follow up Community Health Workers (CHWs) included Village Health Support Group (VHSG) and peer educator (PE) in case detection, follow up care and self-management support
- **Community level:**
  - Raise awareness of NCDs (in particular diabetes) at the Health Center Management Committee (HCMC) platform
  - Support CHWs (VHSG and PE) to assist the health centers in case detection and follow up care
  - CHWs (VHSG and PE) support health centers in case detection, follow up care and self-management support
  - Mobilize community resources to support NCD programs (diabetes in particular)
  - CHWs (VHSG and PE) regularly report follow up cases to each health center
  - Raise awareness of NCDs (in particular diabetes) at community through CHWs' health education/promotion

Recommendation 2: Empower community support

- **National level:**
  - Recognize an important role of CHWs (VHSG and PE) in care management
  - Allocate SDG for supporting CHWs (VHSG and PE)
  - Consider regular financial remunerations in order to improve their working conditions and satisfaction which in turn could lead to improved health care.
  - Support and provide adequate IEC materials to promote health education in their communities.
- **Sub-national level:**
  - Strengthen partnerships with NGOs and other community actors in supporting CHWs (VHSG and PE)
- **Institutional level:**
  - Incentivize CHWs (VHSG and PE) through free health care for themselves and immediate family members
  - Health centers provide training to CWHs (VHSG and PE) on care management
  - Adopt the shared decision-making process among CHWs (VHSG and PE)
  - Use SDG to incentivize CHWs (VHSG and PE)
- **Community level:**
  - Make effective use of HCMC platform in promoting NCD program (diabetes in particular)
  - Mobilize community resources to support CHWs (VHSG and PE)
  - Adopt the shared decision-making process among CHWs and patients which is key element of successful interventions on diabetes care and management

Recommendation 3: Expand the use of digital technologies to support self-management and coordination for the continuum of care

- **National level:**
  - Support use of digital technologies and continuum of care
  - Increase coverage of PMRS among health centers
- **Sub-national level:**
  - Organize training for health care staff on use of digital technologies
  - Organize training on how to use Patient Management Registration System (PMRS)
- **Institutional level:**
  - Adopt some digital technologies in management and work of hospitals and health centers
  - Use some available software application to manage care with patients at both hospitals and health centers
- **Community level:**
  - Adopt digital technologies as continuum of care and promoting self-management

Recommendation 4: Strengthen ownership of local health governance

- **National level:**
  - NIPH provides training on leadership and management to health center and hospital directors
  - Support community-based care
- **Sub-national level:**
  - Involve in all budget and resource planning in the province and district level
  - Organize training to health care staff on decentralization
  - Support and facilitate community-based care
- **Institutional level:**
  - Increase trust and strengthen collaboration with commune leaders

- Set up priority planning for implementation of community-based care on diabetes

- **Community level:**
  - Engage actively in HCMC meetings

Implementation considerations

- Enhance the nurses' existing core capabilities with well-regulated nursing staff on appropriate work-loads and skills mix and minimize organizational risk
- Train CHWs to improve their competencies prior to implementation
- Educational reinforcement using technological devices
- On-going supervision and mentorship are crucial from higher level management.
- Maintaining great efforts and strong mutual coordination from well-trained health workforce at all level is essential.
- The concept of selecting younger health workers should be expanded and implemented.
- Political and financial commitment from government lead to the long run of task shifting through supporting adequate resources for training activities
- Performance-based incentives were considered efficient in increasing CHWs' job motivations and improving their work performance
- Strengthen implementation of National Social Protection Policy framework 2016–2025 in order to contribute to achieving Universal Health Coverage in Cambodia by expanding population coverage under the Health Equity Fund and the NSSF
- Expand the coverage of training on leadership and management among health care professionals via the approved course conducted by the National Institute of Public Health (NIPH)
- Extend the coverage of training on leadership and management to local community leaders. This course is available and conducted by National School of Local Administration (NASLA) under General Department of Administration, Ministry of Interior

សេចក្តីសង្ខេប

គោលបំណង

គោលបំណងនៃសេចក្តីព្រាងអត្ថបទគោលនយោបាលនេះ គឺដើម្បីបង្ហាញអំពីបញ្ហានិងការប្រឈមនានា ក្នុងពេលបច្ចុប្បន្ន ចំពោះការថែទាំសុខភាពបឋមនៃជំងឺទឹកនោមផ្អែម ដោយផ្អែកលើទស្សនវិស័យរបស់ប្រព័ន្ធសុខាភិបាល និង ពិនិត្យមើលលើផ្នែកដែលងាយរងគ្រោះរបស់ប្រជាជន។ អនុសាសន៍គោលនយោបាយគឺមានសារៈសំខាន់ណាស់ ដើម្បីធ្វើឱ្យប្រសើរឡើងនូវសេវាថែទាំជំងឺទឹកនោមផ្អែមក្នុងសេវាថែទាំបឋមនៅកម្ពុជា តាមរយៈការសំយោគនូវបទអន្តរាគមន៍ដោយផ្អែកលើភស្តុតាង ដែលបានបង្ហាញជាក់ស្តែង ក្នុងការចូលរួមកែលម្អការអនុវត្តការថែទាំ និងគ្រប់គ្រងជំងឺទឹកនោមផ្អែមក្នុងសេវាថែទាំសុខភាពបឋមនៃប្រទេសកម្ពុជា ឬ ប្រទេសដែលមាន ប្រាក់ចំណូលទាប និងមធ្យមផ្សេងៗទៀត។

បញ្ហា

អត្រាប្រេវ៉ាឡង់នៃជំងឺទឹកនោមផ្អែមនៅកម្ពុជាគឺ ៩% ក្នុងឆ្នាំ ២០១៦ ក្នុងចំណោមប្រជាជនអាយុពី ១៨ ទៅ ៦៩ ឆ្នាំ ប៉ុន្តែ នៅក្នុងឆ្នាំ ២០១០ អត្រាប្រេវ៉ាឡង់នៃជំងឺនេះមានត្រឹមតែ ២.៩% តែប៉ុណ្ណោះ។ អត្រាប្រេវ៉ាឡង់នៃការស្លាប់ដែលបណ្តាលមកពីជំងឺទឹកនោមផ្អែមក៏បានកើនឡើងផងដែររហូតដល់ ៥៥,៩% ក្នុងចន្លោះឆ្នាំ ២០០៧ និងឆ្នាំ ២០១៧ ។ យ៉ាងណាមិញ សេវាថែទាំជំងឺទឹកនោមផ្អែមក្នុងសេវាថែទាំបឋមនៃប្រទេសកម្ពុជានៅមានកំរិតនៅឡើយ។

ទំហំនៃបញ្ហា

- ការផ្លាស់ប្តូរប្រជាសាស្ត្រនិងប្រព័ន្ធអេពីដេមីសាស្ត្រ នឹងនាំឱ្យមានការកើនឡើងប្រជាជនដែលមានវ័យចំណាស់ និងការកើនឡើងនៃជំងឺមិនឆ្លង (NCDs) ផងដែរ ដែលក្នុងនោះរួមមានជំងឺទឹកនោមផ្អែមផងដែរ
- អត្រាប្រេវ៉ាឡង់នៃប្រជាជនដែលមានហានិភ័យខ្ពស់នឹងកំរិតជាតិស្ករខ្ពស់ក្នុងឈាម បានកើនឡើងគួរឱ្យកត់សម្គាល់ (៨,៩% ក្នុងចំណោមប្រជាជនអាយុពី ១៨ ទៅ ៦៩ ឆ្នាំ) ក្នុងឆ្នាំ ២០១៦។

- ប្រជាជនលើសពី ៥0% ដែលបានកើតជំងឺទឹកនោមផ្អែម មិនបានទៅទទួលការព្យាបាល ហើយត្រឹមតែ ១/៤ ប៉ុណ្ណោះដែលបានទទួលការព្យាបាលគ្រប់គ្រងជាតិស្ករបានត្រឹមត្រូវ។

កត្តាដែលបង្កមូលហេតុ

- សេវាថែទាំជំងឺមិនឆ្លង (NCD) នៅកម្រិតថែទាំសុខភាពបឋមគឺនៅមានភាពទន់ខ្សោយនៅឡើយ។
- អង្គភាពដែលកំពុងផ្តល់សេវាថែទាំសុខភាពដល់អ្នកជំងឺទឹកនោមផ្អែមកំពុងតែអនុវត្តគំនិតផ្តួចផ្តើមរបស់ពួកគេរៀងៗខ្លួន ដាច់ដោយឡែកពីគ្នា និង មានទំនាក់ទំនងតិចតួចជាមួយគ្នាក្នុងពេលផ្តល់សេវា ។
- ការចំណាយដោយប្រើប្រាស់ថវិកាផ្ទាល់ខ្លួន (ប្រាក់ហោចប៉ៅខ្លួនឯង) មានច្រើនជាង ៥0% នៃការចំណាយលើសុខភាពទាំងអស់ក្នុងប្រទេសកម្ពុជា។ ប្រជាជន មានចំនួនច្រើនទៀត ដែលមិនបានស្ថិតក្រោមគម្រោងគាំពារសុខភាពសង្គម ជាពិសេសមនុស្សចាស់។ បញ្ហានេះ រារាំងដល់ការទទួលបានការការពារ និង ថែទាំសម្រាប់ជំងឺទឹកនោមផ្អែម។

ដើម្បីពង្រឹងសេវាថែទាំជំងឺទឹកនោមផ្អែមក្នុងសេវាបឋមនៃប្រទេសកម្ពុជា យើងស្នើរអោយមានការដោះស្រាយ កត្តាដែលបង្កអោយមានមូលហេតុខាងលើតាមរយៈអនុសាសន៍គោលនយោបាយដូចខាងក្រោម៖

អនុសាសន៍គោលនយោបាយ

អនុសាសន៍ទី ១៖ ពង្រឹងតួនាទី និង សមត្ថភាពរបស់ប្រពន្ធ័ថែទាំសេវាសុខភាព

ថ្នាក់ជាតិ

- ពង្រីកការអនុវត្តការថែទាំជំងឺទឹកនោមផ្អែមដែលជាផ្នែកមួយ នៃកញ្ចប់កម្មវិធីអន្តរាគមន៍ចាំបាច់សម្រាប់ជំងឺមិនឆ្លងរបស់អង្គការសុខភាពពិភពលោក (WHO PEN) អោយបានឆាប់រហ័ស ។
- កែសំរួល និង ដាក់បញ្ចូលការគ្រប់គ្រងជំងឺទឹកនោមផ្អែមក្នុងកម្មវិធីបណ្តុះបណ្តាលគិលានុបដ្ឋាក/យិកាមុនពេលចូលបំរើការផ្តល់សេវានេះ ដើម្បីលើកកំពស់តួនាទីគិលានុបដ្ឋាក/យិកាក្នុងការបំពេញតម្រូវការការថែទាំជំងឺមិនឆ្លង (ពិសេសជំងឺទឹកនោមផ្អែម)
- ដាក់បញ្ចូល បណ្តាញមិត្តអប់រំមិត្តដែលដើរតួជាអ្នកសម្របសម្រួលក្នុងការជួយមណ្ឌលសុខភាព និងបុគ្គលិកគ្លីនិកទឹកនោមផ្អែម ដោយជួយគាំទ្រអ្នកជំងឺក្នុងការគ្រប់គ្រងកំរិតជាតិស្ករ ក្នុងឈាមរបស់ពួកគេដែលនាំឱ្យមានការអនុវត្តកម្មវិធីប្រសើរឡើង និងលទ្ធផលទទួលបានល្អ។

- កែសំរួលនិង ធ្វើបច្ចុប្បន្នភាពលើទំហំនៃការអនុវត្តការងាររបស់គិលានុបដ្ឋាក/យិកា
- ដាក់បញ្ចូលសំនួរទាក់ទងនឹង សេវាជំងឺមិនឆ្លង (ពិសេសជំងឺទឹកនោមផ្អែម) ទៅក្នុងការវាយតំលៃរបស់ H-EQIP
- ភ្ជាប់ទំនាក់ទំនងរវាងការផ្តល់ការលើកទឹកចិត្តដល់ក្រុមការងារដែលមានជំនាញខាងលើដោយផ្អែកលើលទ្ធផលការងារ (ផ្នែកនៃ H-EQIP) ជាមួយនឹងសេវាជំងឺមិនឆ្លង (ពិសេសជំងឺទឹកនោមផ្អែម)
- ពង្រីកវិសាលភាពនៃគម្រោងគាំពារសុខភាពសង្គមក្នុងចំណោមមនុស្សចាស់ក្នុងវិស័យក្រៅផ្លូវការ
- វិនិយោគលើប្រព័ន្ធពត៌មានសុខាភិបាលដែលមានលក្ខណៈរួមបញ្ចូលគ្នា

- **ថ្នាក់ក្រោមជាតិ(មន្ទីរសុខាភិបាល និង ស្រុកប្រតិបត្តិ)**

- មន្ទីរសុខាភិបាល និង ស្រុកប្រតិបត្តិ ត្រូវតែងតាំង និងគាំទ្របុគ្គលិកបង្គោលទទួលខុសត្រូវក្នុងការសម្របសម្រួលកម្មវិធីជំងឺមិនឆ្លង-ពិសេសការអនុវត្តការថែទាំជំងឺទឹកនោមផ្អែមដែលជាផ្នែកមួយ នៃកញ្ចប់កម្មវិធីអន្តរាគមន៍ចាំបាច់សម្រាប់ជំងឺមិនឆ្លងរបស់អង្គការសុខភាពពិភពលោក (WHO PEN)
- បុគ្គលិកបង្គោលទទួលខុសត្រូវថ្នាក់មន្ទីរសុខាភិបាលខេត្តដែលសម្របសម្រួលកម្មវិធីជំងឺមិនឆ្លងត្រូវបង្កើតនូវកិច្ចប្រជុំជាទៀងទាត់ជាមួយនឹងបុគ្គលិកបង្គោលទទួលខុសត្រូវថ្នាក់ស្រុកប្រតិបត្តិ រាប់បញ្ចូលទាំងមន្ទីរពេទ្យបង្អែក និង មណ្ឌលសុខភាព ហើយមានវគ្គបណ្តុះបណ្តាលរំលឹក និង មានគោលដៅការដោះស្រាយបញ្ហានានា
- បុគ្គលិកបង្គោលទទួលខុសត្រូវថ្នាក់ស្រុកប្រតិបត្តិដែលសម្របសម្រួលកម្មវិធីជំងឺមិនឆ្លងត្រូវសហការនិងធ្វើការយ៉ាងជិតស្និទ្ធជាមួយបុគ្គលិកទទួលបន្ទុកលើការស្នើសុំឪសថ និងសំភារៈបរិក្ខារនៅថ្នាក់ស្រុកប្រតិបត្តិ
- បុគ្គលិកបង្គោលទទួលខុសត្រូវថ្នាក់ស្រុកប្រតិបត្តិដែលសម្របសម្រួលកម្មវិធីជំងឺមិនឆ្លង ត្រូវមានទំនាក់ទំនងជាមួយនាយកដ្ឋានការពារសុខភាព ពាក់ពន្ធ័នឹងវគ្គបណ្តុះបណ្តាលនៅនឹងកន្លែង ដល់បុគ្គលិកសុខាភិបាលទាំងថ្នាក់មន្ទីរពេទ្យ និង មណ្ឌលសុខភាព
- ប្រើប្រាស់ដំនើរការវិមជ្ឈការអំណាច ដែលជាឪកាសមួយ ប្រកបដោយប្រសិទ្ធភាព ។

- បុគ្គលិកបង្គោលទទួលខុសត្រូវថ្នាក់ស្រុកប្រតិបត្តិម្នាក់ៗដែលសម្របសម្រួលកម្មវិធីជំងឺមិនឆ្លងត្រូវទទួលខុសត្រូវលើប្រព័ន្ធពត៌មានសុខាភិបាល

- **ថ្នាក់ស្តាប័នមូលដ្ឋាន (មន្ទីរពេទ្យបង្អែក/មណ្ឌលសុខភាព)**

- មន្ទីរពេទ្យបង្អែក និង មណ្ឌលសុខភាព ត្រូវតែងតាំង និងគាំទ្របុគ្គលិកបង្គោលទទួលខុសត្រូវក្នុងការសម្របសម្រួលកម្មវិធីជំងឺមិនឆ្លង-ពិសេសការអនុវត្តការថែទាំជំងឺទឹកនោមផ្អែមដែលជាផ្នែកមួយ នៃកញ្ចប់កម្មវិធីអន្តរាគមន៍ចាំបាច់សម្រាប់ជំងឺមិនឆ្លងរបស់អង្គការសុខភាពពិភពលោក (WHO PEN)
- ពង្រឹងក្រុមការងារពហុជំនាញ រួមមាន វេជ្ជបណ្ឌិត គិលានុបដ្ឋាក/យិកា និង ឱសថការីនៅកម្រិតសេវាថែទាំសុខភាពបឋមក្នុងការអនុវត្តកញ្ចប់កម្មវិធីអន្តរាគមន៍ចាំបាច់សម្រាប់ជំងឺមិនឆ្លងរបស់អង្គការសុខភាពពិភពលោក (WHO PEN)
- ផ្តល់សេវាស្វែងរកករណីជំងឺទឹកនោមផ្អែមនៅនឹងកន្លែងទទួលជំងឺដំបូងទាំងមន្ទីរពេទ្យបង្អែក និង មណ្ឌលសុខភាព
- ផ្តល់សេវាព្យាបាលអោយបានត្រឹមត្រូវលើករណីជំងឺទឹកនោមផ្អែមធ្ងន់ធ្ងរនៅមន្ទីរពេទ្យ
- ផ្តល់សេវាថែទាំ តាមដាន លើករណីជំងឺទឹកនោមផ្អែមដែលគ្រប់គ្រងបាន និង ករណីប្រឈមនៅថ្នាក់មណ្ឌលសុខភាព
- បង្កើនតួនាទីនៃការថែទាំដោយឱសថការី ដោយផ្តល់នូវការថែទាំតាមរយៈឱសថ និងសកម្មភាពលើកកម្ពស់សុខភាពក្នុងការកែលំអលទ្ធផលសុខភាពរបស់អ្នកជំងឺទឹកនោមផ្អែមទាំងមន្ទីរពេទ្យបង្អែក និង មណ្ឌលសុខភាព (អាចជាគិលានុបដ្ឋាក/យិកាដែរ) ។
- អោយមានការលើកទឹកចិត្តលើការអនុវត្តការងាររបស់ក្រុមការងារពហុជំនាញ រួមមាន វេជ្ជបណ្ឌិត គិលានុបដ្ឋាក/យិកា និង ឱសថការី
- ប្រើប្រាស់ថវិការដែលមានក្នុង Services Delivery Grant (SDG) ដើម្បីធានាអោយមានថ្នាំ និងឧបករណ៍ព្យាបាល ព្រមទាំងតាមនដានថែទាំទាំងមន្ទីរពេទ្យបង្អែក និង មណ្ឌលសុខភាព
- ជ្រើសរើសបុគ្គលិកក្រៅសុខាភិបាលទទួលបន្ទុកប្រពន្ធ័សុខាភិបាលនៅតាមសេវាមូលដ្ឋាននានា
- ពង្រឹងតួនាទីគិលានុបដ្ឋាក/យិកា ដោយផ្តល់ការបណ្តុះបណ្តាល និងការគាំទ្រសមស្របដល់គិលានុបដ្ឋាក/យិកា ដើម្បីធានាបាននូវតំរូវការនៃការថែទាំជំងឺទឹកនោមផ្អែមដ៏សមស្រប តាមបរិបទដែលខ្វះខាតគ្រូពេទ្យ បន្ទាប់មក បង្កើតអោយមានជាបទដ្ឋានទៀងទាត់មួយ។

- ពង្រឹងតួនាទីដឹកនាំមុខគេនៃមន្ទីរពេទ្យបង្អែក ដែលនាំឱ្យមានភាពប្រសើរឡើងនៃប្រព័ន្ធបញ្ជូនអ្នកជំងឺ
- បន្តការតាមដានបុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដែលមានស្រាប់ក្នុងការស្វែងរកករណីតាមដាន គាំទ្រដល់ការគ្រប់គ្រងជំងឺខ្លួនឯងរបស់អ្នកជំងឺ

- **ថ្នាក់សហគមន៍**

- លើកកំពស់ចំណេះដឹងពីជំងឺមិនឆ្លង-ពិសេសការអនុវត្តការថែទាំជំងឺទឹកនោមផ្អែម នៅក្នុងវេទិការប្រជុំគណកម្មការគ្រប់គ្រងមណ្ឌលសុខភាព
- គាំទ្របុគ្គលិកសុខភាពសហគមន៍ (CHWs)រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្ត ដើម្បីជួយការងាររបស់មណ្ឌលសុខភាពលើការស្វែងរកករណីថ្មី តាមដាន ថែទាំ
- បុគ្គលិកសុខភាពសហគមន៍ (CHWs)រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្ត ត្រូវជួយគាំទ្រការងាររបស់មណ្ឌលសុខភាពលើការស្វែងរកករណីថ្មី តាមដាន ថែទាំ
- គៀងគរធនធានក្នុងការគាំទ្រសេវាជំងឺមិនឆ្លង-ពិសេសការអនុវត្តការថែទាំជំងឺទឹកនោមផ្អែម
- បុគ្គលិកសុខភាពសហគមន៍ (CHWs)រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្ត ត្រូវផ្តល់របាយការណ៍ជាទៀងទាត់ពីករណីតាមដាន ថែទាំដល់មណ្ឌលសុខភាពនីមួយៗ
- លើកកំពស់ចំណេះដឹងពីជំងឺមិនឆ្លង-ពិសេសការអនុវត្តការថែទាំជំងឺទឹកនោមផ្អែម នៅតាមសហគមន៍តាមរយៈការអប់រំ លើកកំពស់សុខភាពរបស់បុគ្គលិកសុខភាពសហគមន៍ (CHWs)រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្ត

អនុសាសន៍ទី ២៖ ពង្រឹងការគាំទ្រដល់សហគមន៍

- **ថ្នាក់ជាតិ**

- ទទួលស្គាល់នូវតួនាទីដ៏សំខាន់របស់បុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដែលមានស្រាប់តាមរយៈការផ្សារភ្ជាប់ពួកគេទៅនឹងប្រពន្ធ័ថែទាំសេវាសុខភាពបឋម លើការគ្រប់គ្រងថែទាំ
- គៀងគរថវិការដែលមានក្នុង Services Delivery Grant (SDG) ក្នុងការគាំទ្របុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដែលមានស្រាប់រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្ត

- ពិចារណាលើការផ្តល់ថវិកាទៀងទាត់ដើម្បីធ្វើអោយប្រសើរឡើងលើការចូលរួមរបស់ពួកគេ ដែលមានអត្ថប្រយោជន៍ដល់ការអនុវត្តកម្មវិធី និងទទួលបានផលល្អ តាមរយៈភាពរួមគ្នានៃវប្ប ធម៌និងភាសារបស់ពួកគេ ជាមួយប្រជាជនគោលដៅ។
- គាំទ្រនិងផ្តល់សំភារៈអប់រំអោយបានគ្រប់គ្រាន់ដើម្បីលើកកំពស់ការអប់រំសុខភាពក្នុងសហគម ន៍របស់ពួកគេ

- **ថ្នាក់ក្រោមជាតិ(មន្ទីរសុខាភិបាល និង ស្រុកប្រតិបត្តិ)**

- ពង្រឹងភាពជាដៃគូជាមួយអង្គការមិនមែនរដ្ឋាភិបាល និង ភ្នាក់ងារក្នុងសហគមន៍នានាក្នុងការ គាំទ្របុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដែលមានស្រាប់រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្ត

- **ថ្នាក់ស្ថាប័នមូលដ្ឋាន (មន្ទីរពេទ្យបង្អែក/មណ្ឌលសុខភាព)**

- អោយមានការលើកទឹកចិត្តបុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដែលមានស្រាប់រួមមាន ក្រុម ទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្តតាមរយៈការថែទាំសុខភាពរបស់ពួកគាត់ និង សមាជិកគ្រួសារផ្តាល់ដោយមិនគិតថ្លៃ
- មណ្ឌលសុខភាពត្រូវផ្តល់វគ្គបណ្តុះបណ្តាលដល់បុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដែល មានស្រាប់រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្តពីការគ្រប់គ្រងការថែទាំ
- ទទួលយកដំណើរការនៃការសំរេចចិត្តរួមគ្នាជាមួយ បុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដែលជាធាតុសំខាន់នៃការធ្វើអន្តរាគមន៍បានជោគជ័យ លើការថែទាំ និងការគ្រប់គ្រងជំងឺទឹក នោមផ្អែម ដែលនាំឱ្យមានលទ្ធផលប្រកបដោយប្រសិទ្ធភាព និងធ្វើអោយប្រសើរឡើងនូវគុណ ភាពជីវិតចំពោះមនុស្សចាស់នៅក្នុងសហគមន៍។
- ប្រើប្រាស់ថវិការដែលមានក្នុង Services Delivery Grant (SDG) ក្នុងការលើកទឹកចិត្តបុគ្គលិក សុខភាពសហគមន៍ (CHWs)ដែលមានស្រាប់រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញ មិត្តអប់រំមិត្ត

- **ថ្នាក់សហគមន៍**

- ប្រើប្រាស់វេទិការប្រជុំគណកម្មការគ្រប់គ្រងមណ្ឌលសុខភាពប្រកបដោយសុខភាពដើម្បីលើក កំពស់កម្មវិធីជំងឺមិនឆ្លង-ពិសេសការអនុវត្តការថែទាំជំងឺទឹកនោមផ្អែម
- គៀងគរធនធានក្នុងសហគមន៍ក្នុងការគាំទ្របុគ្គលិកសុខភាពសហគមន៍ (CHWs)ដែលមាន ស្រាប់រួមមាន ក្រុមទ្រទ្រង់សុខភាពភូមិ និង បណ្តាញមិត្តអប់រំមិត្ត

- ទទួលយកដំណើរការនៃការសំរេចចិត្តរួមគ្នារវាងបុគ្គលិកសុខភាពសហគមន៍ (CHWs) ជាមួយអ្នកជំងឺ ដែលជាធាតុសំខាន់នៃការធ្វើអន្តរាគមន៍បានជោគជ័យ លើការថែទាំ និងការគ្រប់គ្រងជំងឺទឹកនោមផ្អែម ដែលនាំឱ្យមានលទ្ធផលប្រកបដោយប្រសិទ្ធភាព និងធ្វើអោយប្រសើរឡើងនូវគុណភាពជីវិតចំពោះមនុស្សចាស់នៅក្នុងសហគមន៍។

- **អនុសាសន៍ទី ៣៖ ពង្រីកការប្រើប្រាស់បច្ចេកវិទ្យាឌីជីថលដើម្បីជួយក្នុងការគ្រប់គ្រងថែទាំជំងឺដោយខ្លួនឯង និងការសម្របសម្រួលសម្រាប់សេវាថែទាំបន្ត**
  - **ថ្នាក់ជាតិ**
  - គាំទ្រការប្រើប្រាស់ប្រពន្ធ័បច្ចេកវិទ្យា និង ការថែទាំបន្ត
  - បង្កើនការគ្រប់ដណ្តប់ប្រពន្ធ័ PMRS នៅតាមមណ្ឌលសុខភាពទាំងអស់
  - **ថ្នាក់ក្រោមជាតិ(មន្ទីរសុខាភិបាល និង ស្រុកប្រតិបត្តិ)**
  - រៀបចំវគ្គបណ្តុះបណ្តាលសំរាប់បុគ្គលិកមណ្ឌលសុខភាពទាំងអស់ពីការប្រើប្រាស់ប្រពន្ធ័បច្ចេកវិទ្យា
  - រៀបចំវគ្គបណ្តុះបណ្តាលស្តីពីការប្រើប្រាស់ប្រពន្ធ័ PMRS
  - **ថ្នាក់ស្ថាប័នមូលដ្ឋាន (មន្ទីរពេទ្យបង្អែក/មណ្ឌលសុខភាព)**
  - ទទួលយកប្រពន្ធ័បច្ចេកវិទ្យាជួយក្នុងការគ្រប់គ្រង និងបំពេញការងារទាំងក្នុងមន្ទីរពេទ្យ និងមណ្ឌលសុខភាព
  - ប្រើប្រាស់ប្រពន្ធ័ software ដើម្បីគ្រប់គ្រងការថែទាំអ្នកជំងឺទាំងក្នុងមន្ទីរពេទ្យ និង មណ្ឌលសុខភាព
  - **ថ្នាក់សហគមន៍**
  - ទទួលយកប្រពន្ធ័បច្ចេកវិទ្យាជួយក្នុងការថែទាំបន្ត និង ការគ្រប់គ្រងថែទាំខ្លួនឯង

- **អនុសាសន៍ទី ៤៖ ពង្រឹងភាពជាម្ចាស់ការលើអភិបាលកិច្ចសុខាភិបាលក្នុងមូលដ្ឋាន**
  - **ថ្នាក់ជាតិ**
  - វិទ្យាស្ថានជាតិសុខភាពសាធារណៈ(NIPH)ផ្តល់វគ្គបណ្តុះបណ្តាលអំពីភាពជាអ្នកដឹកនាំនិងការគ្រប់គ្រងសម្រាប់ប្រធានមណ្ឌលសុខភាព និង មន្ទីរពេទ្យ
  - គាំទ្រអោយមានការថែទាំបន្តនៅក្នុងសហគមន៍

- **ថ្នាក់ក្រោមជាតិ(មន្ទីរសុខាភិបាល និង ស្រុកប្រតិបត្តិ)**

- ចូលរួមក្នុងការធ្វើផែនការថវិកា និង ធនធានទាំងថ្នាក់ខេត្ត និង ថ្នាក់ស្រុក
- រៀបចំវគ្គបណ្តុះបណ្តាលដល់បុគ្គលិកមណ្ឌលសុខភាពស្តីពីដំណើរការវិមជ្ឈការអំណាច
- គាំទ្រនិងសម្របសម្រួលអោយមានការថែទាំបន្តនៅក្នុងសហគមន៍

- **ថ្នាក់ស្តាប័នមូលដ្ឋាន (មន្ទីរពេទ្យបង្អែក/មណ្ឌលសុខភាព)**

- បង្កើនទំនុកចិត្ត និង ពង្រឹងកិច្ចសហការ ជាមួយថ្នាក់ដឹកនាំឃុំ/សង្កាត់
- រៀបចំផែនការអទិភាពដែលចាំបាច់ សម្រាប់អនុវត្តការថែទាំតាមសហគមន៍លើជំងឺទឹកនោមផ្អែម

- **ថ្នាក់សហគមន៍**

- ចូលរួមដោយសកម្មក្នុងកិច្ចប្រជុំគណកម្មការគ្រប់គ្រងមណ្ឌលសុខភាព

ការពិចារណាលើការអនុវត្ត

- បង្កើនសមត្ថភាពស្នូលរបស់គិលានុបដ្ឋាក/យិកា ជាមួយការចាត់តាំងបុគ្គលិកគិលានុបដ្ឋាក/យិកា ស្របទៅតាមទំហំការងារ និង ជំនាញចំរុះ និង កាត់បន្ថយហានិភ័យដែលបណ្តាលមកពីការរៀបចំក្នុងអង្គភាព។
- បណ្តុះបណ្តាល បុគ្គលិកសុខភាពសហគមន៍ (CHWs) ដើម្បីពង្រឹងសមត្ថភាពរបស់ពួកគេមុនពេលការអនុវត្ត។
- ពង្រឹងការអប់រំតាមរយៈការប្រើឧបករណ៍បច្ចេកវិទ្យា។
- បន្តអោយមានការត្រួតពិនិត្យនិងការណែនាំពីអ្នកគ្រប់គ្រងថ្នាក់លើ ពិតជាមានសារៈសំខាន់ណាស់ ។
- រក្សាអោយមានការខិតខំប្រឹងប្រែង និងការសម្របសម្រួលគ្នាទៅវិញទៅមកក្នុងក្រុមការងារដែលបានទទួលការបណ្តុះបណ្តាលនៅគ្រប់កម្រិតទាំងអស់ គឺមានភាពចាំបាច់ខ្លាំងណាស់។
- ការជ្រើសរើសបុគ្គលិកថែទាំសុខភាពវ័យក្មេងគួរតែពង្រីកនិងអនុវត្ត។

- ការប្តេជ្ញាចិត្តផ្នែកនយោបាយ និង ហិរញ្ញវត្ថុពីរដ្ឋាភិបាល ដែលនាំទៅរកដំណើរការរយៈពេលយូរ ក្នុងការឆ្លាស់ភារកិច្ច តាមរយៈការគាំទ្រគ្រប់គ្រាន់ផ្នែកធនធាន សម្រាប់សកម្មភាពបណ្តុះបណ្តាល ។
- ការលើកទឹកចិត្តផ្អែកលើលទ្ធផលការងារ ត្រូវបានគេចាត់ទុកថាមានប្រសិទ្ធភាព ក្នុងការជម្រុញទឹកចិត្តក្នុងការធ្វើការងាររបស់បុគ្គលិកសុខភាពសហគមន៍ (CHWs) និងធ្វើអោយការងាររបស់ពួកគេប្រសើរឡើង ។
- ពង្រឹងការអនុវត្តគោលនយោបាយជាតិគាំពារសង្គមក្នុងឆ្នាំ ២០១៦-២០២៥ ដើម្បីរួមចំណែកដល់ការសម្រេចបាននូវសេវាសុខភាពជាសកលនៅកម្ពុជា តាមរយៈការពង្រីកវិសាលភាពប្រជាជនគ្របដណ្តប់ ក្រោមមូលនិធិសមធម៌ និងបសស។
- ពង្រីកវិសាលភាពនៃការបណ្តុះបណ្តាលលើភាពជាអ្នកដឹកនាំ និងការគ្រប់គ្រងក្នុងចំណោមអ្នកជំនាញថែទាំសុខភាព តាមរយៈវគ្គបណ្តុះបណ្តាលដែលបានធ្វើឡើងដោយវិទ្យាស្ថានជាតិសុខភាពសាធារណៈ (NIPH) ។
- ពង្រីកការគ្របដណ្តប់នៃវគ្គបណ្តុះបណ្តាលស្តីពីភាពជាអ្នកដឹកនាំ និងការគ្រប់គ្រងដល់អ្នកដឹកនាំសហគមន៍មូលដ្ឋាន។ វគ្គសិក្សានេះមាន និងដឹកនាំដោយសាលាជាតិរដ្ឋបាលមូលដ្ឋាន (NASLA) ក្រោមអគ្គនាយកដ្ឋានរដ្ឋបាលនៃក្រសួងមហាផ្ទៃ។

Briefing Note

I. Purpose

The purpose of this briefing note is to propose policy recommendations necessary to improve integrated diabetes care in Cambodian primary health care (PHC) system.

It highlights current problems and barriers to the integrated care by taking health system perspective and vulnerable population, identified as the elderly and poor living in rural areas into account.

It also provides synthesis of evidence-based interventions that have been shown to improve the practice of diabetes care and management in the PHC in low-and middle-income settings.

II. Problem

It was observed that prevalence of diabetes in Cambodia among population aged 18-69 in 2016 was 9.6% in 2016, but it was only 2.9% of the age groups 25-64 in 2010 (1). The prevalence of deaths attributable to diabetes had also increased by 45.9% between 2007 and 2017 (2). However, the integrated care for diabetes in the Cambodian PHC is quite limited and not responsive (3). Despite putting effort to integrating the diabetes management into the PHC, more than two third of the total population have never had their blood glucose measured and more than half of the population with diabetes received no treatment (4, 5). Proportion of the diabetes patients accessing to treatment but did not reach to recommended treatment targets is also low (6). Diabetes-related complications—including cardiovascular disease, kidney disease, neuropathy, blindness, and lower-extremity amputation—are a significant cause of morbidity and mortality among people with diabetes if there is not early diagnosis and adequate care (7, 8). The resulting complications will increase healthcare costs and pose challenges to population health, socio-economic development, and the health system itself (9, 10). The burden will negatively affect Cambodia's effort to achieve Sustainable Development Goals in Cambodia (11).

Background to Briefing Note

A Briefing Note quickly and effectively advises policymakers and stakeholders about a pressing public issue by bringing together global research evidence and local evidence.
A Briefing Note is prepared to aid policymakers and other stakeholders in managing urgent public health issues.

A Briefing Note describes priority issues, synthesizes context-specific evidence, and offers recommendations for action.

The preparation of the briefing note involved six steps:

1. Identifying and selecting a relevant topic according to predefined criteria
2. Conducting a comprehensive search strategy to retrieve national, regional and international evidence
3. Appraising and synthesizing relevant research evidence
4. Drafting the Briefing Note in such a way as to present concisely and in accessible language the global and local research evidence to support decision-making
5. Undergoing merit review
6. Finalizing the Briefing Note based on the input of merit reviewers
7. Submitting finalized Briefing Note for translation into Khmer, validating translation and disseminating through policy dialogues and other mechanisms

Size of problem

With a population of approximately 15 million people (12), Cambodia has achieved significant economic development with an annual growth rate of approximately 7% in GDP, enabling the country to move from low to lower-middle income group (13, 14). Cambodian demographic and health survey 2014 showed that under-5 mortality had decreased from 54 to 35 deaths per 1,000 live births between 2010 and 2014 (15). The survey also revealed a continuing decline in fertility rate from 4 children per woman in 2000 to 2.7 children per woman in 2014. The trends do follow the stages of demographic transition observed by Jorgensen (16) in most countries. Jorgensen (16) further explains the transition would lead to decline in dependency ratio which in turn increases resources for human capital formation and capital savings. This demographic transition is very conducive to the potential economic growth on the condition that the working age population are healthy and productive (17).

However, along with the development, Cambodia has also experienced epidemiological transition towards a noticeable increase in non-communicable diseases (NCDs) including diabetes. It was found that the prevalence of people at high risk with impaired fasting blood glucose was also observed significantly high (8.9% of the age groups 18-69) in 2016 (1). More than 50% of Cambodian with diabetes lack access to treatment and only a quarter received adequate control during treatment (18).A modelling study based on STEPS Survey 2010 data projected a 10% of type 2 Diabetes Meletus (DM) increase in the population older than 35 years of age in Cambodia by 2028(19). In the meantime, it was reported that almost 2 times of mortality rate related to diabetes among women are higher than men with age between 30 - 69 and older than 70 respectively. Cambodian women tend to have diabetes than men at all age groups (20).

The health transition leading to increasing number of people with NCDs including diabetes could be due to increase in life expectancy at birth, demographic transition, epidemiological transition, and changing lifestyle (9, 15, 21-23). This transition in Cambodia will pose a big challenge to the health care system in the near future. Between 1998 and 2018, the life expectancy at birth for females had increased from 58 to 71 years and males from 54 to 67 years (12). It is estimated that the proportion of the elderly in Cambodia aged over 60 will reach approximately 1.7 million (10.1% of the total population) by 2025 and 2 million (11.5%) by 2030 and will continue to rise dramatically (24). This demographic trend will have significant policy implications for social protection and the health care system because the elderly are vulnerable members of the society and prone to development of NCDs including diabetes (25).

If nothing is done, the complications resulted from diabetes will impose heavy socio-economic burden to patients themselves, families, and the country as a whole. Direct medical costs which refer to resources used to treat the disease at an advanced stage, indirect costs which refer to productivity lost due to morbidity, disability, and premature mortality, and intangible costs which refer to reduced quality of life of patients are all large (7). An investment case study on NCDs calculated the cost of the clinical interventions for cardiovascular diseases and diabetes in Cambodia, to amount to KHR 1.2 trillion (US$ 301 million) over the next 15 years (10).

Current Organization of Diabetes Care in Cambodia

Diabetes care, in fact, has also been prioritized in the national policy documents including the Multisectoral Action Plan 2018- 2027 for Prevention and Control of NCDs that is endorsed in 2018 by Samdech Techo Hun Sen, Prime Minister of the Royal Government of Cambodia, in response to the growing burden of NCDs in Cambodia (26), and the current National Strategic Plan for Prevention and Control of NCDs 2013-2020 (9). Besides the public health delivery system, care for diabetes has also been supported and carried out by health development partners, international or local non-governmental organisations (NGOs) both for profit or non-profit, and both private clinics and pharmacies.

To strengthen the public health care system in providing integrated basic care for diabetes in the PHC, the Ministry of Health has adopted World Health Organization Package of Essential Noncommunicable disease interventions (WHO PEN) for the PHC (27). A national standard operating procedure for diabetes

management in primary care has been developed and implemented (3). It was started with 4 health centers in 2015 (28). In early 2020, 86 health centers have implemented the WHO PEN. Based on this operating procedure, health center staff are trained to do screening, provide follow up care for diabetes and/or hypertension patients with mild and stable conditions, and offer health education and counselling on healthy behaviour (3) (see Figure 1). The WHO PEN is not another package of basic services but rather an integrated first step of diabetes management into the PHC contributing to country's effort to achieve universal health coverage and strengthen the health system (29). It is horizontally integrated in a way that all the supporting structures (health systems components) are health centers' current resources. However, its implementation is still limited and requires strengthening.

Cambodia has a pluralistic health system which encompasses public health care services delivered through the Ministry of Health and private health care services mainly offering outpatient curative care (30). The government's public health care system was established based on a district health system model. By the end of 2018, there were 102 operational districts (ODs) including 123 referral hospitals and 1,205 health centres across the country. Each OD serves approximately 100,000 to 200,000 populations and consists of a referral hospital and a number of health centres (31).

Care for diabetes is currently available at district or provincial referral hospitals in most of the ODs (31) . The referral hospitals provide ambulatory care and are mentioned in the standard operating procedure as supporting the health centers in treating serious cases (3). At the community level, there is a role for peer educators, informally recognized as CHWs. A local NGO called MoPoTsyo is running Peer Educator Networks with a prime objective to exchange information about diabetes and hypertension among patients living with diabetes and/or hypertension in poor communities in 16 ODs (32). Peer educators are diabetic patients themselves who are trained by the networks to be educators and counselors on lifestyle change. In addition, the peer educators assist registered patients in the network to have access to professional medical consultations at the referral hospitals with which they have partnership agreements (32). The NGO is also providing paid laboratory services to patients in the network. Plus, a revolving drug fund program is being implemented.

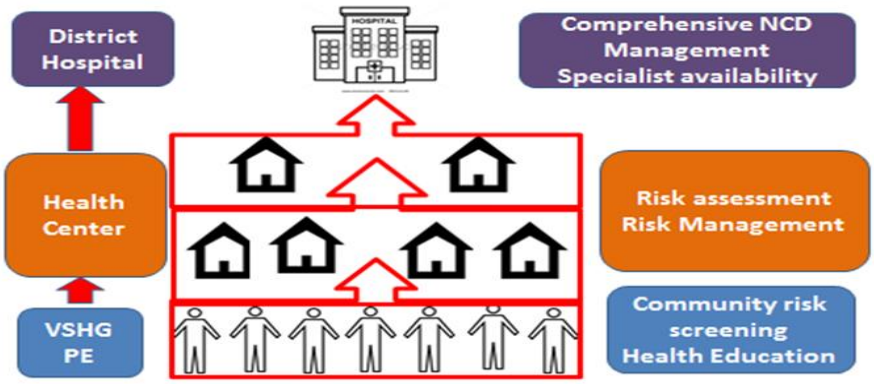

Figure 1: An overview of WHO PEN implementation arrangement in Cambodia

Underlying Causes

There are five main causes underlying the limited implementation of the integrated care for diabetes in Cambodia. we identified underlying factors that related to governance, to health service delivery, to health financing, to health information systems and to the socio-economic cultural context.

Governance arrangements

At the level of governance arrangements, the public health care system funded by the government has not yet been oriented towards care for chronic conditions. The public health system mainly covers health prevention activities and focuses on primary health care particularly for communicable diseases (HIV and AIDS, tuberculosis, malaria, diarrhea and pulmonary diseases) and maternal and child health. Despite having guidelines, the public health system, nevertheless, is fragmented and the overall quality of health services is still low (15, 33). The peer educator networks are already there in the system and mentioned in the strategic objective 2 of the 2013-2020 priority NCD strategies (9) but are not yet systematically integrated into the PHC. At the same time, private providers, play an active role in curative care particularly for NCDs, but they are not well regulated by the Ministry of Health (22).

According to recent findings of situation analysis in Cambodia [unpublished report] which involves document review, in-depth interviews with policy makers at the national level and implementers at the sub-national level, field observations at implementation sites, and focus group discussions with health care workers, CHWs including peer educators and village health support groups, and patients, the main barriers to the integrated care for diabetes in the PHC are identified as follows: NCD services are still at its infancy—lacking of funding, political support, and necessary health system structures, including coordinated health information system, adequate supply and access to essential medicines, and trained human resources at both public health centers and hospitals, to support its ongoing operation.

Health service delivery arrangements

There are several different diabetes care initiatives being implemented in Cambodia, each with their own health care service delivery models and implementation strategies. Despite the fact that their roles could be complementary to each other in the PHC, they are being implemented in isolation with relatively little linkage or interaction with each other.

There is a shortage of resources to provide NCD care in the public health care system. A study on NCD management at the health district level clearly indicates that the government funded health system is unable to cope with the NCD burden (34). None of health centers had essential technology to measure blood glucose levels or to perform urine tests. Availability of NCD medicines was also limited at health centers. Supply of medicines for diabetes from Central Medical Store (CMS) is inadequate due to scope of practice at health centers, inaccurate forecasting of average monthly consumption, and distribution issues (34). In the meantime, PHC staff had very limited knowledge on diabetes (35) and capacity to deliver quality care for diabetes management, and consequently patients were either left untreated or had interrupted care due to lack of knowledge and skills (36). Despite the inclusion of NCD management in Minimum Package Activities (MPA) guidelines for health centers, nearly half of health centers examined did not have any staff completing formal training of NCD management (34).

The interviews with the stakeholders [unpublished] found that, follow up care and self-management for diabetes are challenging. Self-management support involving multiple approaches including both community-based interventions and interventions from health care organization has been increasingly cited in a meta-review as effective in helping lower blood glucose and keep it under control (37-39). Self-

management, according to Anuruang, Hickman (40), is conceptualized as processes undertaken by patients to manage their living activities with chronic illness which also entail active participation in controlling their life, deployment of strategies to increase self-efficacy for effective self-management behaviors, gathering of disease-specific information focusing on individuals' competence in behavioral change, and capability to continuously and efficiently adhere to a medical plan and decrease risk factors for the chronic illness.

It has been increasingly true that self-management is effectively and evidently supported by community the CHWs in low-and middle-income settings (41), but functionality of the CHWs in Cambodia, is currently quite limited, especially for NCD services (34). In a study on community involvement, only half the health care providers and managers reported the availability of community involvement in management of NCD (34), and financial support for the CHWs is largely influenced by external funders leading to fragmented delivery of CHW programs (42). Furthermore, the work of peer educator network in the community is not systematically integrated into the public health system. The interviews with the stakeholders at the national level [unpublished] recognized potential role of the CHWs in supporting the self-management but indicated challenges why the CHWs cannot be formalized into the public health system and financially salaried by the state. A study on expansion of CHWs in Cambodia for malaria management highlighted other constraints of CHW integration into the health systems such as village topography, involvement of the CHWs in other community roles(43).

Another problem related to the delegation of tasks among health care staff. The MPA guideline has been revised in 2018 allowing health center staff to do screening for diabetes and provide follow up care for mild and stable conditions (44). With the revision, health centers can now request the CMS for anti-diabetic medications upon the condition that staff (in particular nurses) have been trained in the WHO PEN program to provide care to patients based on prescription from doctors at the referral hospitals. It is noted that the majority of the health centers in Cambodia are run by nurses, and nurses based on the scope of practice (45) are not allowed to make diagnosis for diabetes and issue prescription. The diagnosis has to be confirmed and the prescription has to be issued by doctors at the referral hospitals (3). As stated above, the current coverage of health centers equipped and trained to implement the WHO PEN program is just 86.

Health information system

Health information system (HIS) is managed by the Department of Planning and Health Information of the Ministry of Health. HIS includes Health Management Information System (HMIS), Patient Management Registration System (PMRS), Logistics Management Information System (LMIS), Human Resources Information System (HRIS), and Financial Management System (FMS) (30).

National system of aggregated level data. The HMIS was developed for management and planning of health programs. It collects and reports each program information at an aggregated level, such as, incidence of disease, disease patterns, health services use, etc. As part of the HMIS, on a monthly basis, each health center is required to submit a report form called HC1 and referral hospital submit a report form called HO2 to the operational district and then provincial health department by hard copies of Excel files or mails. HC1 collects information on the use of daily registers for curative outpatient consultation, antenatal care, immunization, birth spacing, deliveries, etc. HO2, similar to the HC1, records data from each health service ward such as, general medicine, paediatrics, obstetrics, gynaecology, surgery, tuberculosis, pharmacy, laboratory, etc. Both HC1 and HO2 are summative tally sheets. Due to development of an HIS web-based database, data could be entered or accessed directly at the operational district or provincial department level. The HMIS is predominantly capturing data from the public health facilities. It did not report any outcome such as people controlling their condition or regularly treatment.

The start of a national system of individual level data. In addition to HMIS, PMRS is a national Patient Management and Registration System which is also a web-based application developed for management of individual patient data at public health facilities. Unique patient identification numbers are created in the system that manages personal patient details (name, address, contact details, photo, etc.), service utilization, service fee accounting, and includes tools for the aggregate reporting of utilization and financial data by facilities. Through the unique patient identification numbers, individual facilities can organize central patient dossier filing systems which are retrieved during each patient visit. Beyond the unique patient identification numbers, individual services (procedures, tests and medications) that can be attributed to individual patients can also be found in the system (30). However, patients' clinical information is quite limited in this web-based system. In term of functions, PMRS includes patient registration, patient ID assignment, patient dossier retrieval, the HEF, patient billing, referral tracking system and monitoring system. The coverage of health facilities using PMRS is still limited. By the end of April 2017, 103 out of 116 referral hospitals were operating PMRS for the HEF purpose only. Among the 103 hospitals, 75 were using PMRS to track both the poor and non-poor patients (i.e. full implementation of PMRS). Nevertheless, only 26 health centers were using PMRS for full function (30).

Facility-based databases and program-based databases. Diabetes clinics at some referral hospitals have their own patient database but it is not yet integrated into the HMIS. This database is not web-based and data are extracted offline in Excel files. Data are not entered directly into the system. They are recorded on papers first and there is a staff transferring data to the system later on which has been seen as additional burden for staff and resulted in delayed or incomplete entry of data, according to recent findings of situation analysis in Cambodia [unpublished report].

Other diabetes programs such as MoPoTsyo and WHO-PEN also still have a separate system. The WHO PEN program still use a paper-based patient record. The patient record includes information on (1) patient's socio-demographic information, lifestyle (smoking, alcohol consumption, physical activity), medical history (hypertension, diabetes, on hypertension medication, on diabetic medication, family relatives having cardio-vascular diseases or diabetes, screening (height, waist circumference, weight, BMI, blood pressure, blood glucose (fasting or random), cholesterol, urine—albumine and ketone), assessment of cardio-vascular risk, treatment including counselling and medications, and follow up date. Nonetheless, the information is not well integrated into the HMIS and PMRS. For MoPoTsyo that runs the peer educator network, they do have their own patient registries and database storing both patient information and clinical information but also not integrated with the public health information system, according to recent findings of situation analysis in Cambodia [unpublished report].

All these different co-existing systems lead to a burden of data entry at the operational district level, data inaccuracy of population denominators, limited routine data quality check, and limited capacity to consolidate data for analysis due to the disintegrated health information system pose challenges on diabetes case management.

Health financing arrangements

On health financing aspect in Cambodia, total health expenditure is significantly supported by external funding (around 20%), while more than 50% was out-of-pocket expense (46). With the government's commitment to achieving universal health coverage and the recent economic growth, government health expenditure has gradually been increased and expansion of social health protection has been observed through a number of schemes including the HEF for the poor and vulnerable and National Social Security

Funds (NSSF) for employees in the private sector and government staff in the public sector (47). However, policy challenges on sustainability of public health system funding and integration of disparate financing mechanisms have also become a concern (48).

Only a little proportion of public health expenditure is used for NCDs. For clinical management of diabetes and cardiovascular diseases, it was estimated to be 4.4% (equal to US$11 million) of the total government expenditure on NCDs (49). Only few of the health facilities received annual budget for NCDs from the government funding, and if available, it was minimal due to most of spending was on procurement and supplies instead of on (50). Nevertheless, the study on NCD management at the district level showed that the HEF has been an enabler factor allowing the poor to have access to NCD care, if available (34).

To promote improvement in quality of care, the government has allowed the public health facilities to charge user fee from patients with a set of service prices agreed by local communities and stakeholders relevant to the public health facilities (51). The prices have to be affordable to people in the community because every public health facility already receives subsidy from the government on operation. According to the user fee guideline, 60% of the user fee received can be used for incentivizing staff at the facility, 39% for supporting and enhancing the service quality of the facility, and 1% allocated to the national treasury (51). However, based on field observations and focus group discussions with health care workers at the health centers and patients [unpublished], patients could get medications including in the consultation package for 5 to 7 days only. Although the consultation fee is affordable (ranging from approximately 0.5 to 1 USD), this time span is pretty short for chronic illnesses like diabetes and requires patients to visit the health center frequently which in turn increases indirect costs. It is noted that care for diabetes and/or hypertension at the health center is part of the outpatient consultation. The user-fee revenues provide much less than 10% of government spending on health care but they do constitute a significant source of operating revenues at the facility level (47). There is evidence showing positive impact of user fees which bring additional funding for the health facility to flexibly improve quality of services (52, 53). However, there is also considerable evidence of negative impact related to nepotism which negatively affect the most vulnerable (54). The fact is that user fees are prone to abuse as the chronicity of the condition requires repeated returns to the health providers. They can abuse it by having the patient return weekly while this can be done at much larger intervals. These repeated returns impose a burden of on the patient of direct non-medical costs like transport, medical costs like user fees and opportunity costs as absent from work. The user fees are nominal, not reflecting the real costs and mainly used as staff incentive.

Fairness in health care is central to the health system and has been a paramount consideration for the expansion of social health protection scheme (55). The NSSF is rapidly expanding its coverage, with more than 1,712,000 people covered by April 2019. However, the scheme does not presently include family members. The HEF scheme established to provide free access to health care for the poorest including family members currently covers approximately 2.6 million household members (56). More recently, free benefits under the HEF have been extended to some informal workers and selected populations such as commune council members, village chiefs, deputy village chiefs, professional sport practitioners, association members, and people living with HIV. Nevertheless, there are still large segments of the population presently not under any social health protection mechanism (56). Among these vulnerable groups, only the poorest of the poor, and more recently people living with HIV, are currently covered under the schemes. A study on equality in financial access to health care in Cambodia revealed that gains in recent economic and health sector development has benefited urban residents more (especially the capital residents) than rural residents, with a suggestion to allocate more resources to rural health services in an attempt to reduce healthcare-related financial hardship (57), despite the fact that distribution of total benefits in relation to health need provided by the public sector is pro-poor in the rural areas (58).

Cultural, socioeconomic and lifestyle among patients (individual level)

Socio-culturally, it is observed that cases enrolled in a diabetes treatment program typically have poorly controlled diabetes and lack of knowledge about diabetes care that can limit their ability to manage their conditions. This is important as better patient self-management ability is related to improved diabetes control (59). However, perceived quality of life is also lower due to lack of dramatic disease-related symptoms and side-effects of interventions leading to poor compliance with medical advice (60). It was also well documented that Cambodian health behaviors, which are rooted in natural, spiritual, and metaphysical beliefs about illness causality, also often dictate the course of treatment by using traditional herbs as cultural practice and Western medicine as the secondary option which may inhibit or delay care provided by medical professionals (61-66). There is limited knowledge on diabetes among general population (35). For Cambodian eating behavior, in 2016, it was found that more than haft of respondents reported eating less than five serving of fruit and/or vegetable which did not meet recommended consumption by WHO and leading to increased risk of NCD including diabetes (1). A study on expansion of CHWs in Cambodia for malaria management highlighted perceptions on the role of CHWs in medical care, and perceptions about the disease nature (43).

To strengthen the integrated diabetes care in the Cambodian PHC, we propose addressing the above-mentioned underlying factors through the following policy recommendations.

III. Policy Recommendations

The WHO has endorsed any service delivery model that provides continuity of care for an individual across health conditions, levels of care, and over a lifetime (67). Wagner (68) proposed a model for improvement of chronic illness care (Figure 3).

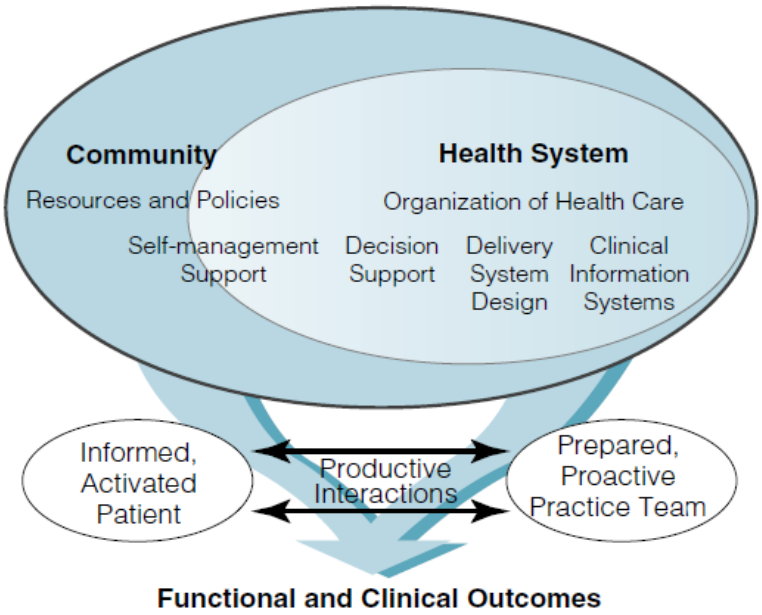

Figure 2: Model for improvement of chronic illness care

This model is generally termed Chronic Care Model (CCM) that enables reorganization of health care system for chronic conditions including diabetes via interactions between health systems and communities (69). For chronic conditions including diabetes, care management requires life-long care in which patients' self-management and behavioral change are crucial for improvement of chronic illness care which has been found by an increasing number of empirical studies to evaluate this CCM in both high-income countries and LMICs included Thailand and Philippines. The results shown to be effective for management of diabetes in primary care. It highlighted better and appropriate care for diabetes patients and improvements in clinical outcomes which came from consulting at a more supportive health care system had better self-efficacy and self-care practice (70-77).

In 2002, an expanded framework of the CCM—Innovative Care for Chronic Conditions (ICCC), was developed and endorsed by the WHO as a gold standard for managing chronic conditions including diabetes (78). For chronic conditions, the care management, unlike acute problems, requires broader support from policy makers, health care team, community partners, families, and patients themselves in an integrated way rather than focusing solely on biomedical interventions (78).

This model could be effectively implemented in LMICs including Cambodia itself. Therefore, in this briefing note, we recommend to strengthen the integrated diabetes care in the PHC as following:

3.1. Recommendation 1: Strengthen the role and capacity of health care organization

Underlying Factors	National Level	Sub-national Level (PHD and OD)	Institutional Level	Community Level
Governance arrangement	(1) Rapid scale up of WHO PEN program (2) Revise and update nursing pre-service curriculum to enhance the role of nursing staff to meet demand for NCD (in particular diabetes) care (3) Integrate PEs into a formal system of CHWs	(1) PHD and OD assign and support a focal point person to facilitate the NCD program—in particular the WHO PEN (2) The PHD focal point person establishes a regular meeting schedule with each OD focal point person (3) The OD focal point person establishes a regular meeting schedule with a focal point person from a referral hospital and health centers for refreshing training and problem-solving purposes	(1) Each referral hospital and health center assign and support a focal point person for NCD program—in the particular the WHO PEN (2) Strengthen a multi-disciplinary team of physicians, nurses and pharmacists at the PHC level in implementation of the WHO PEN	(1) Raise awareness of NCDs (in particular diabetes) at the HCMC platform (2) Support CHWs (VHSG and PE) to assist the health centers in case detection and follow up care
Health service delivery arrangement	(1) Revise and update scope of practice of nurses (2) Include diabetes (and other NCDs) questions in H-EQIP assessments	(1) Each OD focal point person closely works with a person in charge of drug request and supply at OD (2) Each OD focal point liaises with the Department of Preventive Medicine for on the job training for health care	(1) Provide routine screening for diabetes at the triage for both hospitals and health centers (2) Provide proper treatment at hospitals for severe cases (3) Provide follow up care for stabilized cases and pre-	(1) CHWs (VHSG and PE) support health centers in case detection, follow up care and self-management support

		staff at both hospital and health centers	diabetes cases at health centers (4) Increase the role of pharmacist-led care providing pharmaceutical care and health promotion activities in improving diabetes patients' outcomes at both hospitals and health centers (can be nurses who play the role).	
Health financing arrangement	(1) Link performance-based payment (as part of H-EQIP) to NCDs (diabetes in particular) (2) Expand coverage of social health protection scheme among the elderly in informal sector	(1) Make efficient use of decentralization as a window of opportunity	(1) Incentivize performance of the multi-disciplinary team (2) Use SDG to ensure adequate medicines and equipment for treatment at hospitals and follow up care at health centers	(1) Mobilize community resources to support NCD programs (diabetes in particular)
Health information system	(1) Invest in integrating databases	(1) Each OD focal point person is responsible coordinating health information system	(1) Recruit a non-health staff to be in charge of health information in health facilities (2) Strengthen the leading role of the referral hospital in improving referral system	(1) CHWs (VHSG and PE) regularly report follow up cases to each health center
Cultural and socio-economic factors and lifestyle			(1) Increase the role of pharmacist-led care providing pharmaceutical care and health promotion activities in improving	(1) Raise awareness of NCDs (in particular diabetes) at community through CHWs' health education/promotion

			diabetes patients' outcomes at both hospitals and health centers (can be nurses who play the role). (2) Continue follow up CHWs (VHSG and PE) in case detection, follow up care and self-management support	

Table 1: Key findings from systematic reviews and single studies

Study intervention	***Setting***	***Rationale***	***Country(ies)***	***References***
Evaluation of non-medical prescribing Vs medical prescribing (usual care)/ prescribing by health professionals other than doctors	Primary and secondary care setting	One systematic review shown that non-medical prescribers such as nurses and pharmacists can deliver comparable outcomes for systolic blood pressure, glycated haemoglobin, low-density lipoprotein, medication adherence, patient satisfaction, and health-related quality of life. When receiving appropriate training and support, this shift in roles is beneficial to address health workforce need in the context where there are shortages of doctors or the health system is facing pressures in coping with the burden of disease.	High income countries and low- and middle-income settings within Colombia, South Africa, Uganda, and Thailand	Weeks, 2017 (79)
Investigate the role of hospitals in the care of chronically ill patients	Secondary care settings	One systematic review reported hospitals which is specialized care setting play an important and extensive role in transitional care interventions and in the coordination of care especially the collaboration with primary care setting. These integrated care programs included structured clinical follow-ups and case management, often combined with self-management support and patient education have positive effects on the reduction of hospital readmission and lower costs.	The United States, Canada, the United Kingdom, Spain, The Netherlands, Sweden, Ireland, Italy, China, Thailand, Australia, and Africa	De Regge, 2017 (80)
Evaluating the effectiveness of interventions targeting primary care or community-based professionals on diabetes and cardiovascular risk factor control.	Primary care and community settings	One systematic review shown that multifaceted professional team targeting various professionals in a structured collaborative manner is more effective in improving glycaemic control customize to the needs of local population. For instance, in the primary care setting the use of pharmacists in areas where this resource abounds can yield improvements in diabetes intermediate outcomes.	The United States of America, the United Kingdom, Australia, Denmark, Ireland, and Asia Pacific region	Seidu, 2016 (81)
Evaluation of the effectiveness of healthcare interventions	Primary care and community settings	One systematic review found that interventions for T2DM in primary care, are better targeted at very poor glycaemic control patients and	The United States of America, Europe,	Murphy, 2017 (82)

delivered in primary care and community settings, targeting poorly controlled T2DM		that organizational interventions have more positive effective including nurses and other professionals who provided structured organization of care with optimal results such as intensification and adherence to medications.	Australia , Mexico, and Israel	
Examination on the sustained effectiveness of Quality Improvement (QI) strategy in multicomponent integrated care	Low-resource settings	One systematic review reported that using a team-based care with better information flow improved patient-provider communication and self-management in patients who are young, with suboptimal control and improve clinical outcomes where contact time with doctors is short in low-resource settings.	Asia and middle-income countries, Europe, and North America	Lim, 2018 (83)
Evaluation the impact of pharmacist interventions as part of health care	Ambulatory care settings, (hospital-based outpatient clinics, community pharmacies, primary care physician offices, federally qualified and community clinics)	One systematic review shown the positive effects of pharmacist care as part of member of diabetes management teams in providing direct patient care and diabetes education, increased access to care and promote self-management by significantly reducing A1C, SBP, and LDL-C among patients. The important role of pharmacists can contribute to address primary care provider shortage, and growing populations with chronic diseases.	The United States of America, Thailand	Fazel, 2017 (84)
Evaluation of the feasibility of incorporating community pharmacies into Thai health system and their values to stakeholders	Community pharmacy	One systematic review illustrated that the strengthening public health in the community requires public-private partnerships including community pharmacy services. These primary care professionals improved outcomes for diabetic and hypertensive patients through providing pharmaceutical care and health promotion activities.	Thailand	Asayut, 2017 (85)

Evaluation of the effect of using pharmacists to provide services other than medicine dispensing	Community (outpatient departments, community pharmacies or primary healthcare centers)	One systematic review found that patient targeted services provided by pharmacists versus services provided by other healthcare professionals or untrained healthcare workers were not comparable. However, It was stated that pharmacist-provided services that target patients can improve a number of clinical outcomes such as management of high glucose levels, management of blood pressure and cholesterol levels, the quality of life and health service utilization, although the effect size was not always large or statistically significant.	Low-and middle-income countries	Pande, 2013 (86)
Evaluation of the effectiveness of pharmacist interventions in the management of type 2 diabetes	Hospital settings	One systematic evidenced that pharmacist interventions involved of pharmacists as members of a health care team can have a positive influence on metabolic control, medication adherence, and health-related quality of life (HRQol) of patients with type 2 diabetes.	North America, South America, Europe, Africa, Asia, Australia	Pousinho, 2016 (87)
Evaluation of the effectiveness of pharmacist-led interventions	Outpatient settings	A systematic review stated the role of pharmacy to help and support other healthcare professionals to achieve optimal treatment targets in diabetes care is very important included improving medication adherence and blood glucose control among patients with diabetes.	Asia, North America, Europe, South America, Australia, and Africa	Presley, 2019 (88)
Identification nursing and midwifery policy, staffing, education and training interventions, collaborative efforts and strategies that have improved the quantity, quality and relevance of the nursing and midwifery workforce	Primary health care settings	One systematic review shown that collaboration between nurses, midwives, other health providers and organizations, across sectors, and with communities and individuals resulted in improved health care and outcomes among vulnerable population. Communication among health care team with other implementation will be improved over time when professionals became “aware of each other’s public health work,	Uganda, South Africa, Indonesia, Kenya, Cameroon, Rwanda, Tanzania Germany, the United Kingdom, the United States, Canada, Australia, The	Dawson, 2015 (89)

		more confident in contacting each other.	Netherlands, New Zealand	
Evaluation and compare the efficacy of different pharmacist-based interventions on clinical outcomes of type 2 diabetes patients.	community pharmacy, outpatient primary care or hospital settings	One systematic review found that all interventions had a significantly positive effect on HbA1c, but there was no statistical evidence from this study that one intervention was significantly better than the other for achieving glycemic control. However, pharmacist-based diabetes education plus pharmaceutical care showed maximum efficacy on HbA1c and rest of the clinical outcomes.	Asia Malaysia, china, Singapore and Thai	Allah Bukhsh, 2018 (90)

Table 2: Implementation considerations for Recommendation 1

Barriers	***Facilitators***
• Insufficient knowledge of health care professionals to address the growing burden of chronic illnesses led to an increase in adverse events and poor care (47, 89)	• Enhance the nurses' existing core capabilities with well-regulated nursing staff on appropriate work-loads and skills mix and "minimize organizational risk while supporting nurses' role expansion within the community at the primary health care level through the education and training from doctor or higher level (89): - Promote health equity among distinct populations - Promote more collaboration at PHC level in practice • Based on the interviews with nurses at the health centers [unpublished], they showed more enthusiasm and were more motivated in joining the WHO PEN program as they saw it as a capacity building opportunity through the training from the national level. The program has indeed expanded their scope of practice enabling more services at the health centers.

• Lack of monitoring (stakeholders views)	• On-going supervision and mentorship, before Primary health care staffs were allowed to consult patients independently (89) • Maintaining great efforts and strong coordination from well-trained health workforce who work at national, district, and local level leads to improving the quality of health services (91)
• Lack of financial support and drug supplies (stakeholders views)	• Through Health Equity and Quality Improvement Project (H-EQIP) (see Figure 2), the expansion of the WHO PEN coverage is on the way (92). More attention should be put on enhancing its implementation. It is suggested that diabetes management should be more explicitly addressed in the quarterly appraisal of staff performance as part of the H-EQIP. • Raising the quality of care at public health facilities is at the heart of the donor-government-funded Health Equity and Quality Improvement Project (H-EQIP) (93)
• Lack of familiarity with shared decision making among health care professionals (94)	• Capacity building on shared decision making with motivational behavior support techniques among health care professionals (94)

3.2. Recommendation 2: Empower community support

Underlying Factors	National Level	Sub-national Level (PHD and OD)	Institutional Level	Community Level
Governance arrangement	(1) Recognize an important role of CHWs (VHSG and PE) in care management	(1) Strengthen partnerships with NGOs and other community actors in supporting CHWs (VHSG and PE)	(1) Incentivize CHWs (VHSG and PE) through free health care for themselves and immediate family members	(1) Make effective use of HCMC platform in promoting NCD program (diabetes in particular)
Health service delivery arrangement			(1) Health centers provide training to CWHs (VHSG and PE) on care management (2) Adopt the shared decision-making process among CHWs (VHSG and PE)	
Health financing arrangement	(1) Allocate SDG for supporting CHWs (VHSG and PE)		(1) Use SDG to incentivize CHWs (VHSG and PE)	(1) Mobilize community resources to support CHWs (VHSG and PE)
Cultural and socio-economic factors and lifestyle	(1) Consider regular financial remunerations in order to improve their working conditions and satisfaction which in turn could lead to improved health care. (2) Support and provide adequate IEC materials to promote health education in their communities.			(1) Adopt the shared decision-making process among CHWs and patients which is key element of successful interventions on diabetes care and management leading to enhance effective outcomes and improve quality of life for older people

Table 3: Key findings from systematic reviews and single studies

Study intervention	***Setting***	***Rationale***	***Country(ies)***	***References***
Evaluation of characteristics of the CHWs involved in diabetes prevention programs and their contributions to expected outcomes.	Community settings	One systematic review reported that the CHWs have been found to be likely contributing better program implementation and outcomes due to shared culture and language with the target population. CHWs in this review delivered the intervention activities (led or facilitated the group sessions included developing and organizing activities to promote healthy diets and physical activity)	The United States of America and Thailand	Hill, 2017 (95)
Identification key elements of developing self-care and self-management	Community settings	In an integrative review of 13 studies shown that multiple strategies (shared decision-making and mutual goal setting) between interventionists and patients improved health behaviors and outcomes and a combination of group are elements of successful interventions. These lead to enhance effective outcomes and improve quality of life for older people in community-based settings through the CHWs.	Thailand	Anuruang, 2014 (40)
Evaluation of the effectiveness of peer-led intervention in improving the clinical outcomes of patients	Community and clinic settings	One systematic review reported that peer support intervention is effective and causes clinically and statistically significant reduction in HbA1C and SBP levels and helps in achieving better control status among DM and HTN patients. Peers in the	The United States of America, the United Kingdom, China, Vietnam, and the Philippine	Krishnamoorthy, 2018 (96)

		review are defined as those having similar characteristics as the target popluation (diabetes patients) in terms of diagnosis and not being professionally trained. The interventions included both individual and group sessions delivered face-to-face or mobile calls for improving glycaemic control		
Evaluation of the effects of peer support at improving glycemic control	Community and clinic settings	One systematic review shown that peer support models provide a potentially flexible means for diabetes self-management education or on-going support programs but only occurred in interventions with moderate and high frequency of contact and more effective with patients having poor glycaemic control.	The United States of America, Ireland, and Vietnam	Qi, 2015 (97)
Exploring the challenges CHWs in rural Cambodia face when implementing health initiatives.	Community	CHWs in Cambodia are a valuable workforce and so clearly have a potential role in improving community health. However, without a more structured delivery system that allows them to be part of the planning and development process, their performance is compromised.It was observed that CHWs require adequate resources and tools to do their jobs as part of a long-term ongoing strategy.	Cambodia	Ozano, 2018 (42)

Table 4: Implementation considerations for Recommendation 2

Barriers	***Facilitators***
• Insufficient knowledge and skill of CHWs lead to poor performance and miss-trust from communities (98)	• Train CHWs to improve their competencies prior to implementation to make sure that they received appropriate key messages. In this regard, it should be though using simple terms that can be more easily remembered by CHWs due to their low formal education. This was shown to be effective in achieving better health coverage by CHWs (99, 100). • Mutual trust between CHWs and patients facilitated smooth delivery of CHWs' work, and lead to better medication adherence and patients' satisfaction (98).
• Lack of financial support/incentive (stakeholders views) and (98)	• Political and financial commitment from government lead to the long run of task shifting through supporting adequate resources for training activities (99, 101). • performance-based incentives were considered efficient in increasing CHWs' job motivations and improving their work performance (98)
• Ineffective supervision contributes to low CHW morale and poor productivity (102)	• Supervision is an important factor to demonstrate better performance (102)
• Irrelevant training venue and lack of means of transport to join training or mobile community activities (102).	• Having training at the community setting had more impact than training centers located in a government facility, on the learning process and motivation for better understanding on the current issue in the community and subsequently intervene (102).
• Insufficient refresher training and job aids are factors that can influence CHVs' motivation and subsequently affect their performance (102).	• Continuing or refresher training is as important as initial training (102): - Training should be competence and practice-based and located close to CHVs' working context. - Training materials and activities should be specifically developed for CHVs rather than using training packages developed for facility-based workers. Provision of adequate job aids, equipment, health diaries, and others has been identified as crucial to CHW effectiveness.
• Not many young generations of CHW - Majority of CHWs belonged to the middle to elder groups. If this condition continues to happen, it will lead to shortage of CHVs' manpower in the future (102).	• The concept of selecting younger health workers should be expanded and implemented especially in younger age groups. A minimum of age requirement needs to be set in selection (102).

3.3. Recommendation 3: Expand the use of digital technologies to support self-management and coordination for the continuum of care

As mutually reinforcing each other, this policy recommendation would act as a catalyst to policy recommendation 1 and 2.

Underlying Factors	National Level	Sub-national Level (PHD and OD)	Institutional Level	Community Level
Governance arrangement	(1) Support use of digital technologies and continuum of care	(1) Organize training for health care staff on use of digital technologies	(1) Adopt some digital technologies in management and work of hospitals and health centers	
Health service delivery arrangement			(1) Use some available software application to manage care with patients at both hospitals and health centers	(1) Adopting digital technologies as continuum of care and promoting self-management
Health information system	(1) Increase coverage of PMRS among health centers	(1) Organize training on how to use PMRS		
Cultural and socio-economic factors and lifestyle				(1) Adopting digital technologies as continuum of care and promoting self-management

Table 5: Key findings from systematic reviews and single studies

Study intervention	***Setting***	***Rationale***	***Country***	***References***
Evaluation the effectiveness and economic impact of digital education in improving health care professionals' knowledge, skills, attitudes, satisfaction, and competencies	Online modalities	One systematic review indicated that digital health education proved to be more effective in health professions' education in increasing diabetes self-management in relation to knowledge and skills of self-care practice.	Australia, the United States of America, the United Kingdom, Thailand, and Brazil	Huang, 2019 (103)
Investigation the impact of different telemedicine strategies on glycaemic control management of type 2 diabetes	outpatient setting	A systematic review and network meta-analysis also confirmed effectiveness of telemedicine strategies which this in improving blood glucose control through education, small group discussion as well as structural changes (replacing clinic visits with remote consultations).	Asia, Europe, South and North America, Australia	Lee, 2017 (104)
Descriptive discussion of web-based behavioral interventions for the management of type 2 diabetes mellitus	Online modalities	A systematic review shown a favorable outcome through Goal-setting, personalized coaching, interactive feedback and online peer support groups were some of the successful approaches which were applied in e-interventions to manage T2DM.	The United States of America, South Korea, Canada and Taiwan	Ramadas, 2011 (105)
Evaluation the impact of education through mobile text-messaging on glycemic control	Online modalities	A systematic review shown that text messaging is diabetic self-management education tool that has a	Bahrain, the United States of America, Korea, Iran, India	Saffari, 2014 (106)

		considerable effect on glycemic control among patients with type 2 diabetes		
Assessment of mHealth intervention on NCD	Online platforms	Text messaging is a dominant mHealth tool for patient-directed of quality improvement interventions in LMIC. It reports little on implementation barriers, while a questionnaire among implementors reveals significant barriers and strategies to address them. This information is relevant for decisions on scale-up of mHealth in the domain of NCD.	LMICs	Van Olmen J, 2020(107)

Table 6: Implementation considerations for Recommendation 3

Barriers	***Facilitators***
• Limited literacy on technology use among health care practitioners, CHWs and patients (stakeholders views) and (108, 109)	• Educational reinforcement using technological devices (109) • Lesson learnt from development web-based education in Cambodia context would be beneficial. It was found Cambodian local initiatives for digital technologies in health can be beneficial to health care professionals, CHWs and patients with caregivers such as a group of doctors at Calmette Hospital in Phnom Penh has developed the first free application suitable for smartphones to date with the prime purpose to raise awareness of diabetes and support diabetes self-management (110)
• Lack of financial support (stakeholder views)	• Political and financial commitment from government lead to the long run through supporting adequate resources for training activities (99, 101).

3.4. Recommendation 4: Strengthen ownership of local health governance

This policy recommendation is the most vital one in a way that it enables and sustains the work of the above 3 recommendations.

Underlying Factors	National Level	Sub-national Level (PHD and OD)	Institutional Level	Community Level
Governance arrangement	(1) NIPH provides training on leadership and management to health center and hospital directors	(1) Involve in all budget and resource planning in the province and district level (2) Organize training to health care staff on decentralization	(1) Increase trust and strengthen collaboration with commune leaders	(1) Engage actively in HCMC meetings
Health service delivery arrangement	(1) Support community-based care	(1) Support and facilitate community-based care	(1) Set up priority planning for implementation of community-based care on diabetes	

Table 7: Key findings from systematic reviews and single studies

Study intervention	***Setting***	***Rationale***	***Country***	***References***
Identification nursing and midwifery policy, staffing, education and training interventions, collaborative efforts and strategies that have improved the quantity, quality and relevance of the nursing and midwifery workforce	Primary health care settings	One systematic review shown that strong leadership and governance lead to improving health care and outcomes among vulnerable population through collaboration between nurses, midwives, other health providers and organizations, across sectors, and with communities and individuals.	Uganda, South Africa, Indonesia, Kenya, Cameroon, Rwanda, Tanzania Germany, the United Kingdom, the United States, Canada, Australia, The Netherlands, New Zealand	Dawson, 2015 (89)
Evaluation of the effectiveness of healthcare interventions delivered in primary care and community settings, targeting poorly controlled T2DM	Primary care and community settings	One systematic review found that organizational enhancement has more positive effective on the interventions for T2DM in primary care, are better targeted at very poor glycaemic control patients.	The United States of America, Europe, Australia , Mexico, and Israel	Murphy, 2017 (82)

Table 8: Implementation considerations for Recommendation 4

Barriers	***Facilitators***
• Limited orientation of sub degree of decentralization (stakeholders views) - Not fully implementation yet since the pandemic of COVID 19 is spreading in Cambodia so far	• Clear orientations on the Sub-degree on decentralization of health service to local governance (# 199 issued on 04th Dec 2019) will be a window of opportunity for enhancing the ownership of local health governance (in

	term of financial and human resource allocation) (111) • Strong political commitment from our Cambodia government through Speech from Samdech Krola Hom SAR KHENG, Cambodian Deputy Prime Minister on 03rd June 2020 to declare the implementation of this sub-degree (112). • Ensure successful decentralization reforms, as reforms are often hampered by quick interventions without the slow process necessary to build the capacity of sub-national governments and community groups to generate resources, oversee service delivery, determine optimal size and the right mix of decentralization.(113)
• Unclear budget planning for health from local leaders lead to limitation of financial support (stakeholders views)	• Decentralization process holds great potential if properly structure. It will help to increase the delegation of administrative functions and resources from the national to the subnational level, as well as improve both administrative and financial efficiencies. D&D also holds the potential to make the system more accountable and responsive to local community needs (114). • Strengthen implementation of National Social Protection Policy (NSPP) framework 2016–2025 in order to contribute to achieving UHC in Cambodia by expanding population coverage through extending coverage under the Health Equity Fund to all vulnerable groups accessing to health care on diabetes especially social assistance in the component of welfare for vulnerable people(56).
• Limited nationwide coverage of training on leadership and management among health care professional and community leaders (stakeholders views)	• Expand the coverage training on leadership and management among health care professionals as this course is available and already trained in some provinces by National Institute of Public Health (NIPH) approved by Ministry of Health (115). • Expand the coverage of training on leadership and management to local community leaders as this course is available and already trained by National School of Local Administration (NASLA) under General Department of Administration, Ministry of Interior (116). • Decentralize elements of health sector administration and increase the level of

	autonomy in decision-making. Within the evolving process, redefine roles and functions of the MoH and its institutions at all levels, adjust their organizational structures, accordingly, and continue institutional capacity development. (114).
• Communication of a community health team between different professional groups was described as difficult in the early stages of the implementation(89)	• Communication will be improved over time when professionals became "aware of each other's public health work, more confident in contacting each other (89)

Next Steps

Next Steps

The aim of this policy document is to foster a dialogue with key stakeholders informed by the best available evidence. The intention is not to advocate specific recommendations or close off the discussion. Further actions will flow from the deliberations that the Briefing Note is intended to inform. These may include:

- ✓ Deliberation amongst policymakers and stakeholders regarding the recommendations described in this Briefing Note.
- ✓ Refining the recommendations, for example by incorporating, removing or modifying some components

References

1. University of Health Sciences. Prevalence of non-communicable disease risk factors in Cambodia: STEPS survey 2016. Phnom Penh: University of Health Sciences, 2018.
2. IHME. Country profiles: Cambodia USA: IHME; 2016 [cited 2016 May 14]. Available from: http://www.healthdata.org/cambodia.
3. Department of Preventive Medicine. National standard operating procedure for diabetes and hypertension management in primary care Phnom Penh: Cambodian Ministry of Health, 2019.
4. Sophal Oum, Raingsey P. Prak, Mony E. Khuon, Vannareth Mey, Sothea Aim, Youttiroung Bounchan, et al. Prevalence of non-communicable disease risk factors in Cambodia: STEPS survey country report. Phnom Penh: University of Health Sciecnes,

Ministry of Health, 2010.
5. King H, Keuky L, Seng S, Khun T, Roglic G, Pinget M. Diabetes and associated disorders in Cambodia: two epidemiological surveys. The Lancet. 2005;366(9497):1633-9.
6. Raguenaud M-E, Isaakidis P, Reid T, Chy S, Keuky L, Arellano G, et al. Treating 4,000 diabetic patients in Cambodia, a high-prevalence but resource-limited setting: a 5-year study. BMC medicine. 2009;7(1):33.
7. Narayan KV, Zhang P, Kanaya AM, Williams DE, Engelgau MM, Imperatore G, et al. Diabetes: the pandemic and potential solutions. 2006.
8. Allain TJ, van Oosterhout JJ, Douglas GP, Joukes S, Gadabu OJ, Darts C, et al. Applying lessons learnt from the 'DOTS'tuberculosis model to monitoring and evaluating persons with diabetes mellitus in Blantyre, Malawi. Tropical Medicine & International Health. 2011;16(9):1077-84.
9. Ministry of Health. National strategic plan for the prevention and control of noncommunicable diseases: Cardiovascular disease, cancer, chronic respiratory disease and diabetes (2013-2020). Ministry of Health (Cambodia), 2013.
10. Alexey Kulikov AM, Dudley Tarlton,Daniel Grafton,Rebekka Aarsand. Prevention and control of noncommunicable diseases in Cambodia:The case for investment. WHO; 2019.
11. Royal Goverment of Cambodia. Cambodian Sustainable Development Goals (CSDGs) Framework 2016-2030. 2018.
12. National Institute of Statistics. General population census of the Kingdom of Cambodia 2019: provinsional population totals. Ministry of Planning, 2019.
13. ADB. ADB forecasts Cambodia's economic growth to remain robust: Asian Development Bank; 2017 [cited 2017 01 October]. Available from: https://www.adb.org/news/adb-forecasts-cambodias-economic-growth-remain-robust.
14. World Bank. World Bank country and lending groups 2017 [cited 2017 September 04]. Available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519.
15. National Institute of Statistics, Directorate General for Health, ICF International. Cambodia demographic and health survey 2014. Phnom Penh, Cambodia,Rockville, Maryland, USA: National Institute of Statistics, Directorate General for Health, ICF International, 2015.
16. Jorgensen OH. Health, demographic transition and economic growth. World Bank Policy Research Working Paper Series, Vol. 2010.
17. Bloom DE, Canning D. Population health and economic growth. The World Bank, Washington, DC. 2008.
18. Otgontuya D, Oum S, Palam E, Rani M, Buckley BS. Individual-based primary prevention of cardiovascular disease in Cambodia and Mongolia: early identification and management of hypertension and diabetes mellitus. BMC Public Health. 2012;12(1):254.
19. Flessa S, Zembok A. Costing of diabetes mellitus type II in Cambodia. Health economics review. 2014;4(1):24.
20. WHO. Diabetes Cambodian country profile 2016.

21. Department of Planning and Health Information. Health strategic plan 2008-2015. Phnom Penh: Cambodian Ministry of Health, 2008.
22. Annear PL, Grundy J, Ir P, Jacobs B, Men C, Nachtnebel M, et al. The kingdom of Cambodia: health system review. In: Policies APOoPHSa, editor. Health Systems in Transition. Manila: World Health Organisation 2015.
23. WHO. CAMBODIA–WHO Country cooperation strategy 2016–2020. World Health Organization, 2016.
24. Ministry of Planning. National population policy 2016-2030: continue to improve the quality of life and well-being of the people. Phnom Penh: General Secretariat for Population and Development, 2015.
25. ADB. Cambodia country poverty analysis 2014. Manila: Asian Development Bank, 2014.
26. MoH. National Multisectoral Action Plan for the Prevention and Control of Non-Communicable Diseases 2018-2027. Cambodia: Ministry of Health; 2018.
27. WHO. Implementation tools: package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings. Geneva: World Health Organization, 2013.
28. Khim SA. Demonstration project: package of essential NCD interventions for primary care in Cambodia.
29. WHO. Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings. Geneva: World Health Organization, 2010.
30. Department of Planning and Health Information. Health information system master plan 2016-2020. Phnom Penh: Cambodian Minstry of Health, 2017.
31. Department of Planning and Health Information. National health congress report 2018. Phnom Penh: Cambodian Ministry of Health, 2019.
32. MoPoTsyo. [cited 2018 Jan 01]. Available from: http://www.mopotsyo.org/.
33. Ministry of Health, WHO. Cambodia health service delivery profile. 2012.
34. Jacobs B, Hill P, Bigdeli M, Men C. Managing non-communicable diseases at health district level in Cambodia: a systems analysis and suggestions for improvement. BMC health services research. 2015;16(1):32.
35. Jacobs B, Men C, Bigdeli M, Hill PS. Limited understanding, limited services, limited resources: patients' experiences with managing hypertension and diabetes in Cambodia. BMJ global health. 2017;2(Suppl 3):e000235.
36. Nang EEK, Dary C, Hsu LY, Sor S, Saphonn V, Evdokimov K. Patients' and healthcare providers' perspectives of diabetes management in Cambodia: a qualitative study. BMJ open. 2019;9(11).
37. Captieux M, Pearce G, Parke HL, Epiphaniou E, Wild S, Taylor SJ, et al. Supported self-management for people with type 2 diabetes: a meta-review of quantitative systematic reviews. BMJ open. 2018;8(12):e024262.
38. Chrvala CA, Sherr D, Lipman RD. Diabetes self-management education for adults with type 2 diabetes mellitus: a systematic review of the effect on glycemic control. Patient education and counseling. 2016;99(6):926-43.
39. Johansen MA, Berntsen GKR, Schuster T, Henriksen E, Horsch A. Electronic symptom reporting between patient and provider for improved health care service quality: a systematic review of randomized controlled trials. part 2: methodological quality and effects. Journal of medical Internet research. 2012;14(5):e126.
40. Anuruang S, Hickman LD, Jackson D, Dharmendra T, Van Balen J, Davidson PM. Community-based interventions to promote management for older people: an integrative review. Journal of clinical nursing. 2014;23(15-16):2110-20.
41. World Health Organization. Use of community health workers to manage and prevent noncommunicable diseases: policy options based on the findings of the COACH study. 2018.
42. Ozano K, Simkhada P, Thann K, Khatri R. Improving local health through community health workers in Cambodia: challenges and solutions. Human Resources for Health. 2018;16(1):2.

43. Liverani M, Nguon C, Sok R, Kim D, Nou P, Nguon S, et al. Improving access to health care amongst vulnerable populations: a qualitative study of village malaria workers in Kampot, Cambodia. BMC Health Services Research. 2017;17(1):335.
44. Department of Hospital Service. Minimum Package of Activities (MPA) Clinical Guideline. Phnom Penh: Ministry of Health 2018.
45. Ministry of Health. Prakas: The Roles and Responsibilities of Nurses. 2003.
46. Health Policy Project, USAID, PEPFAR. Health financing profile: Cambodia. Washington, DC: Health Policy Project, 2016.
47. Legido-Quigley H, Asgari-Jirhandeh N. Resilient and people-centred health systems: Progress, challenges and future directions in Asia. 2018.
48. Ensor T, Chhun C, Kimsun T, McPake B, Edoka I. Impact of health financing policies in Cambodia: A 20 year experience. Social Science & Medicine. 2017;177:118-26.
49. Organization WH. Prevention and control of noncommunicable diseases in Cambodia: The case for investment. WHO Regional Office for the Western Pacific, Manila, Philippines: 2018.
50. Peat S. Cambodia health system review: The current policies and strategies of the health system's governance, financing, and service delivery. 2013.
51. Department of Planning and Health Information, . Guideline on management of user fee at public health facilities Phnom Penh: Ministry of Health, 2011.
52. Barber S, Bonnet F, Bekedam H. Formalizing under-the-table payments to control out-of-pocket hospital expenditures in Cambodia. Health Policy and Planning. 2004;19(4):199-208.
53. Akashi H, Yamada T, Huot E, Kanal K, Sugimoto T. User fees at a public hospital in Cambodia: effects on hospital performance and provider attitudes. Social Science & Medicine. 2004;58(3):553-64.
54. Khun S, Manderson L. Poverty, user fees and ability to pay for health care for children with suspected dengue in rural Cambodia. International Journal for Equity in Health. 2008;7(1):10.
55. Murray CJ, Knaul F, Ke X, Musgrove P, Kawabata K. Defining and measuring fairness in financial contribution to the health system. Murray CJL, Knaul F, Xu k, Musgrove P, Kawabata K(2000) Defining and Measuring Fairness of Financial Contribution World Health Organization GPE Discussion Paper Series. 2000(24).
56. Kolesar RJ, Pheakdey S, Jacobs B, Chan N, Yok S, Audibert M. Expanding social health protection in Cambodia: An assessment of the current coverage potential and gaps, and social equity considerations. International Social Security Review. 2020;73(1):35-63.
57. Fernandes Antunes A, Jacobs B, de Groot R, Thin K, Hanvoravongchai P, Flessa S. Equality in financial access to healthcare in Cambodia from 2004 to 2014. Health policy and planning. 2018;33(8):906-19.
58. Asante AD, Ir P, Jacobs B, Supon L, Liverani M, Hayen A, et al. Who benefits from healthcare spending in Cambodia? Evidence for a universal health coverage policy. Health policy and planning. 2019;34(Supplement_1):i4-i13.
59. Heisler M, Smith DM, Hayward RA, Krein SL, Kerr EA. How well do patients' assessments of their diabetes self-management correlate with actual glycemic control and receipt of recommended diabetes services? Diabetes care. 2003;26(3):738-43.
60. Huang ES, Brown SE, Ewigman BG, Foley EC, Meltzer DO. Patient perceptions of quality of life with diabetes-related complications and treatments. Diabetes care. 2007;30(10):2478-83.
61. Palinkas LA, Pickwell SM. Acculturation as a risk factor for chronic disease among Cambodian refugees in the United States. Social Science & Medicine. 1995;40(12):1643-53.
62. Pickwell S. The incorporation of family primary care for Southeast Asian refugees in a community-based mental health facility. Archives of psychiatric nursing. 1989.
63. Buchwald D, Panwala S, Hooton TM. Use of traditional health practices by Southeast Asian refugees in a primary care clinic. Western Journal of Medicine. 1992;156(5):507.
64. Uba L. Cultural barriers to health care for southeast Asian refugees. Public health reports. 1992;107(5):544.

65. Aronson L. Traditional Cambodian health beliefs and practices. Understanding Cambodian traditions will facilitate their care in a Western setting. Rhode Island medical journal. 1987;70(2):73-8.
66. Lewis DC. A hierarchy of medicine: health strategies of elder Khmer refugees in the United States. Qualitative Report. 2007;12(2):146-65.
67. WHO. Everybody's business-strengthening health systems to improve health outcomes: WHO's framework for action. Geneva: World Health Organisation, 2007.
68. Wagner EH. Chronic disease management: what will it take to improve care for chronic illness? Effective clinical practice: ECP. 1998;1(1):2-4.
69. Stellefson M, Dipnarine K, Stopka C. The chronic care model and diabetes management in US primary care settings: A systematic review. Preventing chronic disease. 2013;10.
70. Baptista DR, Wiens A, Pontarolo R, Regis L, Reis WCT, Correr CJ. The chronic care model for type 2 diabetes: a systematic review. Diabetology & metabolic syndrome. 2016;8(1):7.
71. Strickland PAO, Hudson SV, Piasecki A, Hahn K, Cohen D, Orzano AJ, et al. Features of the Chronic Care Model (CCM) associated with behavioral counseling and diabetes care in community primary care. The Journal of the American Board of Family Medicine. 2010;23(3):295-305.
72. Chaowalaksakun P, Nantachaipan P, Kunaviktikul W, Panuthai S, Kosachunhanun N. Action Research: Development of a Diabetes Care Model in a Community Hospital. Pacific Rim International Journal of Nursing Research. 2016;20(2):119-31.
73. Tunpichart S, Sakulbumrungsil R, Somrongthong R, Hongsamoot D. Chronic care model for diabetics by pharmacist home health in Bangkok Metropolitan: A community based study. International Journal of Medicine and Medical Sciences. 2012;4(4):90-6.
74. Ku GMV, Kegels G. Integrating chronic care with primary care activities: enriching healthcare staff knowledge and skills and improving glycemic control of a cohort of people with diabetes through the First Line Diabetes Care Project in the Philippines. Global health action. 2014;7(1):25286.
75. Ku GMV, Kegels G. Effects of the First Line Diabetes Care (FiLDCare) self-management education and support project on knowledge, attitudes, perceptions, self-management practices and glycaemic control: a quasi-experimental study conducted in the Northern Philippines. BMJ open. 2014;4(8):e005317.
76. Ku GMV, Kegels G. Knowledge, attitudes and perceptions of people with type 2 diabetes as related to self-management practices: Results of a cross-sectional study conducted in Luzon, Philippines. Chronic illness. 2015;11(2):93-107.
77. Pilleron S, Pasquier E, Boyoze-Nolasco I, Villafuerte JJ, Olchini D, Fontbonne A. Participative decentralization of diabetes care in Davao City (Philippines) according to the Chronic Care Model: A program evaluation. Diabetes research and clinical practice. 2014;104(1):189-95.
78. WHO. Innovative care for chronic conditions: building blocks for action. Noncommunicable Diseases and Mental Health of World Health Organization, 2002.
79. Weeks G, George J, Maclure K, Stewart D. Non-medical prescribing versus medical prescribing for acute and chronic disease management in primary and secondary care. Cochrane Database of Systematic Reviews. 2017(11).
80. De Regge M, De Pourcq K, Meijboom B, Trybou J, Mortier E, Eeckloo K. The role of hospitals in bridging the care continuum: a systematic review of coordination of care and follow-up for adults with chronic conditions. BMC health services research. 2017;17(1):550.
81. Seidu S, Walker N, Bodicoat D, Davies M, Khunti K. A systematic review of interventions targeting primary care or community based professionals on cardio-metabolic risk factor control in people with diabetes. Diabetes research and clinical practice. 2016;113:1-13.
82. Murphy ME, Byrne M, Galvin R, Boland F, Fahey T, Smith SM. Improving risk factor management for patients with poorly controlled type 2 diabetes: a systematic review of healthcare interventions in primary care and community settings. BMJ open. 2017;7(8):e015135.
83. Lim LL, Lau ES, Kong AP, Davies MJ, Levitt NS, Eliasson B, et al. Aspects of multicomponent integrated care promote sustained improvement in surrogate clinical outcomes: a systematic review and meta-analysis. Diabetes Care. 2018;41(6):1312-20.

84. Fazel MT, Bagalagel A, Lee JK, Martin JR, Slack MK. Impact of diabetes care by pharmacists as part of health care team in ambulatory settings: a systematic review and meta-analysis. Annals of Pharmacotherapy. 2017;51(10):890-907.
85. Asayut N, Sookaneknun P, Chaiyasong S, Saramunee K. Outcomes, costs and stakeholders' perspectives associated with the incorporation of community pharmacy services into the National Health Insurance System in Thailand: a systematic review. International Journal of Pharmacy Practice. 2018;26(1):16-27.
86. Pande S, Hiller JE, Nkansah N, Bero L. The effect of pharmacist-provided non-dispensing services on patient outcomes, health service utilisation and costs in low-and middle-income countries. Cochrane Database of Systematic Reviews. 2013(2).
87. Pousinho S, Morgado M, Falcão A, Alves G. Pharmacist interventions in the management of type 2 diabetes mellitus: a systematic review of randomized controlled trials. Journal of managed care & specialty pharmacy. 2016;22(5):493-515.
88. Presley B, Groot W, Pavlova M. Pharmacy-led interventions to improve medication adherence among adults with diabetes: A systematic review and meta-analysis. Research in Social and Administrative Pharmacy. 2019;15(9):1057-67.
89. Dawson A, Nkowane A, Whelan A. Approaches to improving the contribution of the nursing and midwifery workforce to increasing universal access to primary health care for vulnerable populations: a systematic review. Human resources for health. 2015;13(1):97.
90. Bukhsh A, Khan TM, Lee SW, Lee L-H, Chan K-G, Goh B-H. Efficacy of pharmacist based diabetes educational interventions on clinical outcomes of adults with type 2 diabetes mellitus: a network meta-analysis. Frontiers in pharmacology. 2018;9:339.
91. Malaria RB. Global Malaria Action Plan: The Global Strategy. Geneva: World Health Organization. 2008.
92. Cambodia Health Equity and Quality Improvement Project (H-EQIP): Resettlement of policy framework 2018. Available from: http://moh.gov.kh/content/uploads/2017/05/H-EQIP-RPF-Updated-for-AF-ENG.pdf.
93. General procurement notice related to Health Equity and Quality Improvement Project (H-EQIP), Ministry of Health, Kingdom of Cambodia.
94. Légaré F, Ratté S, Gravel K, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: update of a systematic review of health professionals' perceptions. Patient education and counseling. 2008;73(3):526-35.
95. Hill J, Peer N, Oldenburg B, Kengne AP. Roles, responsibilities and characteristics of lay community health workers involved in diabetes prevention programmes: a systematic review. PloS one. 2017;12(12).
96. Krishnamoorthy Y, Sakthivel M, Sarveswaran G, Eliyas SK. Effectiveness of peer led intervention in improvement of clinical outcomes among diabetes mellitus and hypertension patients—A systematic review and meta-analysis. Primary care diabetes. 2018;13(2):158-69.
97. Qi L, Liu Q, Qi X, Wu N, Tang W, Xiong H. Effectiveness of peer support for improving glycaemic control in patients with type 2 diabetes: a meta-analysis of randomized controlled trials. BMC public health. 2015;15(1):471.
98. Long H, Huang W, Zheng P, Li J, Tao S, Tang S, et al. Barriers and facilitators of engaging community health Workers in non-Communicable Disease (NCD) prevention and control in China: a systematic review (2006–2016). International journal of environmental research and public health. 2018;15(11):2378.
99. Ouma P, Van Eijk A, Hamel M, Sikuku E, Odhiambo F, Munguti K, et al. The effect of health care worker training on the use of intermittent preventive treatment for malaria in pregnancy in rural western Kenya. Tropical Medicine & International Health. 2007;12(8):953-61.
100. Yasuoka J, Poudel KC, Ly P, Nguon C, Socheat D, Jimba M. Scale-up of community-based malaria control can be achieved without degrading community health workers' service quality: the Village Malaria Worker project in Cambodia. Malaria Journal. 2012;11(1):4.

101. Lehmann U, Van Damme W, Barten F, Sanders D. Task shifting: the answer to the human resources crisis in Africa? Human Resources for Health. 2009;7(1):49.
102. Chung MHL, Hazmi H, Cheah WL. Role performance of community health volunteers and its associated factors in Kuching District, Sarawak. Journal of Environmental and Public Health. 2017;2017.
103. Huang Z, Semwal M, Lee SY, Tee M, Ong W, Tan WS, et al. Digital health professions education on diabetes management: systematic review by the Digital Health Education Collaboration. Journal of medical Internet research. 2019;21(2):e12997.
104. Lee SWH, Chan CKY, Chua SS, Chaiyakunapruk N. Comparative effectiveness of telemedicine strategies on type 2 diabetes management: a systematic review and network meta-analysis. Scientific reports. 2017;7(1):1-11.
105. Ramadas A, Quek KF, Chan C, Oldenburg B. Web-based interventions for the management of type 2 diabetes mellitus: a systematic review of recent evidence. International journal of medical informatics. 2011;80(6):389-405.
106. Saffari M, Ghanizadeh G, Koenig HG. Health education via mobile text messaging for glycemic control in adults with type 2 diabetes: a systematic review and meta-analysis. Primary care diabetes. 2014;8(4):275-85.
107. van Olmen J, Erwin E, García-Ulloa AC, Meessen B, Miranda JJ, Bobrow K, et al. Implementation barriers for mHealth for non-communicable diseases management in low and middle income countries: a scoping review and field-based views from implementers. Wellcome Open Res. 2020;5:7-.
108. Nelson LA, Zamora-Kapoor A. Challenges in conducting mHealth research with underserved populations: lessons learned. Journal of telemedicine and telecare. 2016;22(7):436-40.
109. Adu MD, Malabu UH, Malau-Aduli AE, Malau-Aduli BS. Enablers and barriers to effective diabetes self-management: A multi-national investigation. PloS one. 2019;14(6):e0217771.
110. Sum S. CarnetDia. Available from: https://apps.apple.com/st/app/carnetdia/id1435695534.
111. Sub-degree on decentralization of health service to local governance, (2019).
112. Sophal G. Sar Kheng says public health to be decentralized. rfi. 2020 03/06/2020.
113. Abimbola S, Baatiema L, Bigdeli M. The impacts of decentralization on health system equity, efficiency and resilience: a realist synthesis of the evidence. Health policy and planning. 2019;34(8):605-17.
114. Organization WH. Cambodia-WHO country cooperation strategy 2016-2020. Manila: WHO Regional Office for the Western Pacific; 2016.
115. National Institute of Public Health (NIPH) M. https://niph.org.kh/niph/detail-news-events/204/index.html.
116. School of Local Administration (NASLA) GDoA, MoI. https://gda.interior.gov.kh/news-kh/ General Department of Administration: School of Local Administration (NASLA)