Regional Consultation on Strengthening Noncommunicable Diseases (NCD) Prevention and Control in Primary Health Care

Beijing, China
14–17 August 2012
REPORT

REGIONAL CONSULTATION ON STRENGTHENING NONCOMMUNICABLE DISEASES (NCD) PREVENTION AND CONTROL IN PRIMARY HEALTH CARE

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NOTE

The views expressed in this report are those of the participants at the Regional Consultation on Strengthening NCD Prevention and Control in Primary Health Care and do not necessarily reflect the policies of the Organization.

This report has been prepared for the World Health Organization Regional Office for the Western Pacific for the use of governments from Member States in the Region and for those who participated in the Regional Consultation on Strengthening NCD Prevention and Control in Primary Health Care held at Beijing, China, from 14 to 17 August 2012.
Prevention and control of noncommunicable diseases (NCD) is a global and regional priority. The Political Declaration of the High-level Meeting of the United Nations General Assembly on the Prevention and Control of Non-communicable Diseases in September 2011 provided the highest level of commitment for advancing the work in this area. The Regional Committee resolution WPR/RC62.R2 on expanding and intensifying NCD prevention urged Member States to fulfill the commitments of the political declaration and requested WHO to provide technical support. One of the strategic priorities of the resolution is to develop and strengthen essential NCD services for prevention, early detection, management, rehabilitation and palliative care as central part of health system strengthening for NCD prevention.

The Regional Office for the Western Pacific and the Ministry of Health, People’s Republic of China, co-organized the Regional Consultation on Strengthening NCD Prevention and Control in Primary Health Care. The meeting was held in Beijing, China, from 14 to 17 April 2012 and brought together 32 participants from 10 countries in the Region, three temporary advisers and one resource person.

The objectives of the consultation were:

1. to review the current status, challenges and opportunities for strengthening NCD prevention and management through primary health care;
2. to visit, discuss and learn from the community-based models of NCD prevention and control in China; and
3. to discuss the requirements of applying the package of essential NCD interventions (PEN) in primary care, and to identify country-specific steps.

The proceedings included presentations and group works on identifying cross-cutting issues for strengthening NCD prevention and control in introducing essential disease interventions in primary care and development of next steps for action. The current status of NCD management in primary health care, the WHO Package of Essential Noncommunicable (PEN) disease Interventions for Primary Health Care and the role of health systems and essential drugs for NCD prevention and management were presented to set the scene. Experiences of Malaysia, the Philippines, Hong Kong (China), Japan and the Republic of Korea were presented in different areas of NCD prevention and management in primary health care.

The meeting achieved its objectives and developed recommendations.
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1. INTRODUCTION

Prevention and control of noncommunicable diseases (NCDs) is a global and regional priority. The Political Declaration of the High-level Meeting of the United Nations General Assembly on the Prevention and Control of Non-communicable Diseases 2011 provided the highest level of commitment for advancing the work in this area. The Regional Committee resolution WPR/RC62.R2 on expanding and intensifying NCD prevention and control urged Member States to urgently fulfil the commitments of the political declaration.

One of the strategic actions envisioned in the above resolution is to develop and strengthen essential NCD services for prevention, early detection, management, rehabilitation and palliative care as a central part of health system strengthening for NCD prevention. Primary health care can provide the majority of the population with broader coverage and easy access to essential services for reducing NCD risk factors, promoting healthy lifestyle, facilitating early detection, management and referral of NCDs. The main challenge, however, is to strengthen the primary care services to offer a package of evidence-based interventions. Effective primary care services alone would not work and should be seamlessly linked with specialized services through a referral system. A WHO Package of Essential Noncommunicable (PEN) disease Interventions for Primary Health Care could be adapted for implementation in primary care in specific country contexts.¹

The consultation addressed the challenges and opportunities for NCD management in primary care and identified next steps for country-specific approaches. This consultation also served as a follow-up to the WHO-organized Intercountry Consultation on Improving Access to Essential Medicines, Diagnostics and Medical Devices for the Management of Noncommunicable Diseases held in August 2011.

1.1 Objectives

The objectives of the consultation were:

1. To review the current status, challenges and opportunities for strengthening NCD prevention and management through primary health;

2. To visit, discuss and learn from the community-based models of NCD prevention and control in China; and

3. To discuss the requirements of applying the Package of Essential NCD interventions (PEN) in primary care, and to identify country-specific steps.

1.2 Participants

The meeting brought together 32 participants from 10 countries in the Western Pacific Region: Brunei Darussalam, Cambodia, the People’s Republic of China, China Western Area Health Initiative (WAHI), Hong Kong (China), Macao (China), Japan, the Lao People’s

Democratic Republic, Malaysia, Mongolia, the Philippines, the Republic of Korea and Viet Nam. Three temporary advisers and one resource person provided technical support during the consultation. The Secretariat was composed of staff from the WHO Regional Office for the Western Pacific and WHO China Country Office.

Representatives from the Canadian Embassy in China, Chinese Center for Disease Control and Prevention, Ningxia Medical University China, Fu Wai Hospital National Center for Cardiovascular Diseases (China), Department of Health (Government of the Special Region of Hong Kong), NCD Alliance and World Hypertension League also attended as observers.

The list of participants, temporary advisers, resource person, and Secretariat are presented in Annex 1.

1.3 **Organization**

The meeting comprised eight sessions and the opening and closing ceremonies. Participants presented their country situations following a structured template provided to them beforehand. They worked in groups to identify cross-cutting issues in countries and worked as country groups to identify potential next steps for action in their respective countries. The programme included a visit to Dongcheng Management Center of Community Health Centers and some primary care centres to observe NCD prevention and management.

A full outline of the programme is presented in Annex 2. A background paper was also provided to the participants (Annex 8).

1.4 **Opening ceremony**

Ms Han Jianli, Deputy Director of Department of International Cooperation, Division of International Organizations, Ministry of Health, China, welcomed the distinguished guests and participants. Dr Liang Xiaofeng, Deputy Director General of the Chinese Center for Disease Control and Prevention, and Dr Han Tieru, Director of Building Healthy Communities and Populations, WHO Regional Office for the Western Pacific, delivered the opening remarks.

Dr Michael O’Leary, WHO Representative in China, delivered the opening address on behalf of Dr Shin Young-soo, WHO Regional Director for the Western Pacific.

Dr Liang Xiaofeng (China) and Dr Tomofumi Sone (Japan) were elected as Chairperson and Vice-Chairperson, respectively, for the consultation.
2. PROCEEDINGS

2.1 Session 1 - Setting the scene

Dr. Han Tieru, Director of Building Healthy Communities and Populations, WHO Regional Office for the Western Pacific, presented an overview of NCD prevention and control in the Region. He discussed the magnitude of NCDs in the Region in terms of mortality and the risk factors associated with it as well as the intensified response of WHO to the global epidemic which can be classified under five themes: (1) national policy and plan within the national health and development plan, (2) population-based, multisectoral actions for risk reduction, (3) health system strengthening for NCD prevention and management, (4) surveillance, monitoring and reporting, and (5) sustainable partnerships and advocacy.

Dr Cherian Varghese, Senior Medical Officer (NCD), WHO Regional Office for the Western Pacific, presented the status of NCD management in primary health care and the objectives of the consultation. Dr Varghese covered aspects of NCD management in terms of service delivery (both demand and supply sides), health systems, drugs and technology, and the variation in country capacity to address NCDs. He also introduced WHO PEN as an innovative, cost-effective, and action-oriented response for primary care in low-resource settings, as well as the proposed global monitoring framework for NCDs.

Dr Evgeny Zheleznyakov, WHO Temporary Adviser, presented in detail the WHO PEN. Dr Zheleznyakov tackled the underpinning principles for integrating NCD prevention and control into primary health care, the flexibility and cost-effectiveness of PEN in diverse settings, its components and guidelines for implementation and some country examples.

Professor Bruce Arroll, Department of General Practice and Primary Health Care, University of Auckland, New Zealand, described the management of total cardiovascular risk in primary care as experienced in New Zealand. Dr Arroll presented various ways in assessing cardiovascular risk and the influence of risk factors, such as blood pressure, smoking and total cholesterol, in increasing cardiovascular diseases (CVD) risk.

Ms Kong Linghzi, Deputy Director of the General Bureau of Disease Control, Ministry of Health, China, presented the management of NCD in China. Ms Kong outlined how China developed primary care in rural areas in accordance with their plan of 2001-2010. She also discussed the other milestones in China NCD prevention and control: Health Care System Reform (launched in 2009) and the National Plan for NCD prevention and control for 2012-2015.

2.2 Session 2 - Country presentations

Each participating country provided an overview of the situation in the country (Annex 3). A summary of challenges and requirements in countries is presented in Table 1.
Table 1. Summary of challenges and requirements in countries

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low level of political commitment</td>
<td>Increase awareness of NCD and risk factors</td>
</tr>
<tr>
<td>Human resources</td>
<td>Adoption of WHO PEN in national health policy</td>
</tr>
<tr>
<td>- Lack of adequate staff and skills</td>
<td>Training for enhancement of skills</td>
</tr>
<tr>
<td>- Limited capacity</td>
<td>Budget allocation (for PEN, staff, etc.)</td>
</tr>
<tr>
<td>- Work overload (increase of aging chronic diseases and aging population)</td>
<td>Regular and appropriate drug supply Development of technical guidelines for primary care staff</td>
</tr>
<tr>
<td>Finance</td>
<td></td>
</tr>
<tr>
<td>- Limited budget for NCD in general and procurement of drugs and equipment</td>
<td></td>
</tr>
<tr>
<td>- NCD medicines cost is high</td>
<td></td>
</tr>
<tr>
<td>- Limitation in equipment, new techniques and methods</td>
<td></td>
</tr>
<tr>
<td>Lack of technical guidelines for NCD management at primary health care centres (PHC)</td>
<td></td>
</tr>
</tbody>
</table>

2.3 Session 3 - Health systems and essential drugs for NCD prevention and management

Mr Sjiewke Postma, Team Leader, Health Services Development, WHO Regional Office for the Western Pacific, made a presentation on NCDs and health systems. Mr Postma highlighted the fact that chronic diseases require a continuum of care that includes health promotion, preventive, curative, rehabilitative and palliative care and that this continuum of care requires a patient-centred and integrated service delivery, within the context of an overall NCD policy, strategy and/or operational plan. However, reality shows that many countries face different service delivery barriers at both demand and supply sides of the health services. These barriers prevent the appropriate implementation of NCD service delivery. It was acknowledged that the Member States present are at different levels of health sector (and thus NCD services) development and that not all barriers may or need to be addressed immediately. Therefore, a menu was provided with options to address those key barriers, with the suggestion that key health systems such as human resources, financing and the availability of drugs are priority areas to be addressed. By keeping the priority areas in view, Member States will ensure that equitable NCD service delivery is easily accessible, providing a range of acceptable and affordable services to the majority of the population.

The proposed way forward includes NCD and other service delivery assessments (by "following an NCD patient's journey in the health system") to identify key service delivery and health systems issues and concurrently start looking at staff capacity-building and undertake
(re)allocation of staff, finance, drugs and other supply resources while at the same time continue with health promotion and advocacy to political leaders and budget holders on NCD issues. Other health systems recommendations were: a) to ensure inclusion and regulation of the private and civil society organization; b) to make sure that Member States collect NCD data on burden and interventions, and c) to provide patients with unique identification codes so that they can easily pass through the health system while being covered for services supported by an appropriate insurance system.

Dr Klara Tisocki, Senior Technical Officer, Essential Medicines and Health Technologies, WHO Regional Office for the Western Pacific, presented the essential drugs for NCD. Dr Tisocki stressed that ensuring equitable access to essential medicines and technologies (EMT) would be essential for low- and middle-income countries to manage the increasing burden of NCDs. The main challenges for access to EMT for NCDs are inadequate access, unsafe and poor quality products, and their incautious use by prescribers and patients. Measures to overcome these barriers include rational selection of limited range of EMT (based on PEN) and improvement of procurement and supply chain efficiency. Affordability and financial protection can be enhanced by defining health insurance benefits that cover essential needs at all levels of care for NCDs. Public sector medicine budget can be prioritized and prices of chronic diseases medicines in the private sector can be reduced.

Good governance will be needed to ensure that an appropriate balance of private and public partnerships is maintained. The use of generic medicines and devices, which have been shown to have bio-equivalence with branded medicines, will be the cornerstone of establishing the PEN programme. This action will require the use of national guidelines, preferential registration, permitting of generic substitution, education of prescribers and consumers, and ensuring quality of EMTs.

2.4 Session 4 - Learning from the field

Dr Fatanah Binti Ismail, Senior Principal Assistant Director of the Primary Care Section in the Ministry of Health, Malaysia, discussed the Malaysian experience in NCD management in primary care (Annex 4). Her presentation included a description of the structure of the Malaysian Health System with a focus on PHC and the evolution from a limited service in 1960, with a focus on acute illness, to a comprehensive, coordinated, continuous and community service that is now in place. There is a National Plan for NCDs for 2011 to 2015, including governance and a seven-step strategy, to provide a complete and high quality service. There is a plan to train health workers at all levels as well as promote self-management of patients.

Dr Francisca Cuevas from the Philippines highlighted the critical activities that were involved in the introduction of WHO PEN in Pateros, Metro Manila (Annex 4) which included baseline assessment of the capacity to implement PEN, the procurement of essential devices and medicines, and the training of health providers on the protocol. The risk assessment was integrated with other public health programmes, although purposive case finding through community outreach was done. The referral system was strengthened by involving the referral doctors during the training and the drafting of the referral protocol. NCD days were designated to improve compliance. Community awareness on the availability of NCD services was made through a high-visibility event and through the community health volunteers. Information, education and communication (IEC) materials on NCD were also developed and used in the community. Health education classes were conducted among the patients and their families. The poor had no out-of-pocket payments but the non-poor paid US$ 1.19 for one-month’s supply of medications.
Dr Hiu Yeung Jacqueline Choi, Principal Medical Officer (NCD) Surveillance and Epidemiology Branch, Centre for Health Protection, Department of Health, Government of the Special Region of Hong Kong, presented the human resources, drugs and technology for NCD management as experienced in Hong Kong. Dr Choi highlighted the significant progress in primary care development such as the development of Strategy Document on Primary Care Development in Hong Kong. This development includes the primary care conceptual models and reference frameworks for adults and children and the primary care directory with doctor and dentist subdirectories, and the inclusion of the subdirectory on Chinese Medicine Practitioners (CMP).

Under existing legislation, 13 types of healthcare professional are required to be registered with their respective boards or councils before they are allowed to practice in Hong Kong. Healthcare professionals are encouraged to identify and address risk factors of NCDs, engage early intervention through screening and counselling and support patients for self-management. Reference frameworks on two major NCDs (hypertension and diabetes) were published in 2011 by Department of Health with the aim to improve patient care. Regarding human resources, various Boards and Councils were established under relevant ordinances to look after the registration, conduct and discipline of their respective healthcare professionals practicing in Hong Kong. Thirteen types of healthcare professionals (medical practitioners, Chinese medicine practitioners, dentists, dental hygienists, nurses, midwives, medical laboratory technologists, physiotherapists, occupational therapists, optometrists, radiographers, pharmacists, and chiropractors) are required to register with their respective boards or councils before they are allowed to practice in Hong Kong. To provide information for the formulation of policy on health manpower planning, Department of Health regularly conducts Health Manpower Surveys to collect updated information on the size, characteristics and employment status of all healthcare professionals practicing in the private and public sectors.

Dr Tomofumi Sone, Director of the Department of International Health and Collaboration, National Institute of Public Health, Japan, presented the screening programme for NCDs in Japan. Dr Sone reiterated that screening should be combined with health guidance/education to change people’s behaviours; otherwise, it does not contribute to the prevention of diseases. Occupational settings are appropriate to improve the coverage of programmes. High participation rate and quality control of screening are crucial for making the programme effective. State of the art technologies may not always be the best for screening in the population. Pros and cons of each programme should be strictly considered on the merit of the scientific data. There is a sort of “digging-up” paradox in NCD screening. The more “effective” secondary preventions are, the more will be the number of patients, as well as increased medical expenditure. This will continue until most patients are found and properly treated. Careful consideration of overall strategies and resource allocation on primary and secondary prevention is, therefore, essential.

Mr Minsoo Park, Director of the Health Insurance Policy Division, Ministry of Health and Welfare, Republic of Korea, highlighted the universal service coverage which covers almost all NCDs in every level of hospitals and clinics. Korea’s National Health Insurance (KNHI) is a mandated social insurance programme and financed by various sources such as contribution of salaries, government taxes and surcharge on tobacco. This universal coverage of KNHI enables citizens of the Republic of Korea to enjoy remarkable improvement of access to medical services. Recently, the government of the Republic of Korea has implemented two new policies to enhance NCD management in primary health care. One of them is to provide economic incentives to primary health care in case of hypertension and diabetes, and the other is to increase coinsurance for medicines for 50 non-serious diseases seen in hospitals.
Dr Young Kyung-Do, Professor in Duke-NUS Graduate Medical School, Singapore, presented the challenges and opportunities in NCD management in health systems. Strategies for low- and middle-income countries according to critical health care components (patient, provider, health care delivery, community, policy environment) were covered in his presentation. Dr Young also highlighted the well-known challenges in NCD control: that it requires revenue and political will to prioritize public expenditure for health; low public health expenditure is insufficient for the delivery of a basic package of health services; and governance and regulatory capacity of many countries may lack strength or experience to implement public health laws and pricing/taxation policies relevant to population level strategies for NCD control. Sample strategies presented were co-management of tuberculosis (TB) and diabetes, integrating NCD disease prevention into maternal and child health programmes, offering integrated care for HIV/AIDS, diabetes and hypertension within chronic disease clinics and leveraging HIV programmes to support NCD services.

Dr. Young suggested a systematic approach to strengthen NCD management in primary care: introduction of most relevant, selected priority interventions (e.g., tobacco control) and PEN; use of PEN as an opportunity to strengthen existing health systems (PHC and district health system) with improved resources/governance; and learning lessons from success and replicating them in other contexts (‘risk factors share common characteristics’).

2.5 **Session 5 - Group work**

Participants worked in three country groups: Group 1 - Cambodia, the Lao People’s Democratic Republic, Viet Nam; Group 2 - China (WAHI); and Group 3 - Brunei Darussalam, Macao (China), Mongolia and the Philippines. The groups identified cross-cutting issues for strengthening NCD prevention and control in introducing PEN in primary care (Annex 5). Countries made presentations in different areas and a brief summary of challenges and solutions is presented in Table 2.

Table 2. Summary of challenges and solutions (from group work)

<table>
<thead>
<tr>
<th>Area</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>National health service plan</td>
<td>No NCD plan/committee/guideline; multisector coordination</td>
<td>External support; Multisector coordination</td>
</tr>
<tr>
<td>Financial resources</td>
<td>Low funding; No proper allocation</td>
<td>Establish health promotion fund; Increase investment; Insurance</td>
</tr>
<tr>
<td>Human resources</td>
<td>Staff shortage and low skills</td>
<td>Redistribution; Maximize other health care staff; Staff training</td>
</tr>
<tr>
<td>Drugs</td>
<td>Cost and quality; patient compliance; Procurement</td>
<td>Improve access to generic drugs; Increase awareness</td>
</tr>
<tr>
<td>Technology and laboratory services</td>
<td>Not enough equipment; low/no staff capacity; sustainability</td>
<td>Donation policy; Staff rotation for training; Reimbursement through insurance</td>
</tr>
<tr>
<td>Referral systems</td>
<td>Self-referral; Double referral system not established</td>
<td>Establish referral system; Increase awareness</td>
</tr>
<tr>
<td>Community linkages</td>
<td>Lack of public participation and organization</td>
<td>Get local authorities involvement; Public health leadership</td>
</tr>
<tr>
<td>Monitoring and evaluation</td>
<td>No system of reporting</td>
<td>Establish/improve data collection system</td>
</tr>
</tbody>
</table>
2.6 **Session 6 - Field visit**

The participants were taken to the Dongcheng Management Center of Community Health Centers at Dongcheng District, in Beijing. Dr Qiang Shen, Deputy Director of the Center, explained the details about the primary health care organization which included a demonstration of the computerized systems capable of tracking individuals with NCDs in the community.

After this event, participants visited three primary care centres: Beixinqiao Health Center, Haiyuncang Health Center, and Huayuan Health Center in Dongcheng District, Beijing.

The functioning of the primary care centres was explained, with emphasis on their role in NCD prevention and management. The role of traditional Chinese medicine in NCD prevention and management was also explained.

2.7 **Session 7 - Approaches for NCD interventions in primary care**

Dr Liang Xiaofeng presented the learning from China. Critical factors include government and political support, coordinated NCD prevention and control system to address the severe epidemic of NCD, and effective NCD prevention and action (meaning when government takes leadership, when there is multisectoral collaboration in appropriate manner, and there is involvement of community, family and individuals).

Even with this progress in NCD prevention and control, China still faced a number of challenges that need to be addressed, such as uneven distribution of health resources, imperfect health information system, weak capacities of health workforce, insufficient basic health facilities, inadequate financial resources for NCD and uncoordinated response to NCD.

2.8 **Session 8 - Next steps for implementing/strengthening PEN in primary care**

Participants worked in country groups developed their plans for action under different areas (Annex 6), as presented briefly in Table 3.

<table>
<thead>
<tr>
<th>Area</th>
<th>Next steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy advocacy, stakeholder consultation</td>
<td>Multisectoral coordination; local government involvement; Revision of current NCD policy/plan</td>
</tr>
<tr>
<td>Adapt PEN- Assess, identify a feasible package, reorient services, provide improved care</td>
<td>Situational analysis; Local adaptation of PEN service package</td>
</tr>
<tr>
<td>Drugs-policy pricing, purchase distribution</td>
<td>Improve procurement mechanism; Revise essential drug list and improve accessibility</td>
</tr>
<tr>
<td>Human resource development</td>
<td>Capacity building through training</td>
</tr>
<tr>
<td>Infrastructure, laboratory services</td>
<td>Improve capacity according to PEN package</td>
</tr>
<tr>
<td>Integrated service delivery-NCD services in current programmes</td>
<td>Combine NCD services in relevant existing programmes in different levels; Set up systems for monitoring and evaluation of services</td>
</tr>
<tr>
<td>Financing for NCD services in PHC</td>
<td>Redistribution of national or health budget; Inclusion in national insurance; External support</td>
</tr>
</tbody>
</table>
2.8.1 Evaluation

An evaluation of the consultation was conducted. Participants were asked about the overall impression of the consultation and achievements obtained. They were also encouraged to make comments and suggestions. The structured questionnaire used and detailed results are in Annex 7.

The overall impression of the consultation was good (78%). Most of the participants indicated that they collected valuable information in the sessions and learnt from the experiences of other countries.

2.9 Session 9 - Closing ceremony

Dr Liang Xiaofeng and Ms Kong Linghzi presented the closing remarks. Highlights and main outcomes of the consultation were captured by Dr Han Tieru in his final remarks.
3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

Noncommunicable diseases (NCD) are increasing in all countries of the Region. There is a need for a shift in health care needs from acute care for infectious diseases to the long-term management of chronic conditions. Many of what are considered conditions that can be well managed in primary health care settings are currently being managed in secondary health care facilities, usually by staff who are “over trained” for the task. A reorientation of thinking, personnel and systems is needed if health services are to cope with the workload. Flexibility is also important as different countries will have different capacity and requirements.

3.2 Recommendations

3.2.1 Countries may opt to do the following under each domain:

*Advocacy*

1) Acknowledge the NCD epidemic and its health systems challenges by reflecting appropriate responses through policy, strategy, national health plan development as well as resource allocation.

2) Highlight the need for strengthening NCD prevention and management in primary care and to bring a package of services for NCD as part of the health services.

3) Promote PEN as a cost-effective, evidence-based package for NCD prevention and control in primary care.

*Assessment*

1) Assess the capacity of health system for introducing a package of essential NCD services.

2) Study the availability of essential drugs and technology for providing NCD services and to identify measures at appropriate levels.

3) Review the procurement and distribution of NCD medicines.

4) Assess the human resource needs for NCD service provision at different levels of health care.

*Phased implementation*

1) Consider a pilot phase and a phased-implementation strategy.

2) Consider different models for rural and urban population.

3) Identify and strengthen two way referral systems.
4) Use workplaces and other settings for opportunistic case finding.

5) Provide a continuum of care service delivery that includes preventive, promotive, curative rehabilitative and palliative care.

**Human resources**

1) Target key staff for reorientation and training on NCD service delivery.

2) Develop human resource plans to meet the current and future demands for NCD prevention and control.

**Essential drugs and technology**

1) Revise and include in the national lists, products to be made available in line with the medicines and technologies recommended by WHO PEN.

2) Develop and implement actions and innovative solutions necessary to improve access to NCD essential medicines and technologies in primary care.

3) Identify and implement actions that can increase efficiency of procurement and distribution of NCD medicines to optimize the use of available resources.

**Financing**

1) Undertake national health account reviews to indicate availability and initiate resource distribution to focus on NCDs.

2) Prioritize NCD prevention, treatment and care options and identify actions to provide adequate financing and financial protection to ensure equitable access to essential NCD medicines and technologies, and progress towards universal coverage at primary care level.

3) Provide more cost-effective and efficient health, including for NCDs service delivery packages.

4) Ensure early NCD prevention activities are included in health insurance systems.

5) Ensure health insurance coverage is portable and covers the whole continuum of care.

**Monitoring**

1) Ensure the existence of a Hospital Management Information System (HMIS) that includes key NCD burdens and interventions. Indicators to assess population coverage can also be included.

2) Develop monitoring and evaluation framework with clear targets and indicators (aligned to the global targets) to monitor availability, affordability and rational use of NCD medicines as part of monitoring the availability and quality of NCD services in primary care.
3) Ensure that unique identification codes are allocated to patients to ensure easy identification, registration and monitoring of the patient throughout the health system and disease journey.

3.2.2 Partners may consider the following:

1) Harmonize capacity building efforts aimed at strengthening national procurement and supply chain management systems. The aim should be to build sustainable, resilient integrated public health supply chain systems and optimize the efficiency of procurement system.

2) Promote integration of essential public health interventions at primary care level, including recommended intervention in WHO PEN package and equitable access to essential NCD medicines and technologies in primary care.

3) Provide continuing technical support to Member States to develop and implement pharmaceutical policies and regulations that can ensure quality of medicines and strengthen the capacity for national procurement and supply chain management to efficiently deliver to these commodities to primary care users.

4) Industries may work together with national governments and regulatory agencies to increase availability of low-cost, quality-assured, generic essential NCD medicines identified in WHO PEN package for priority NCD interventions.

5) Pharmaceutical industry can work on technical solutions that can increase accessibility and affordability of essential NCD medicines including packaging of combination treatments and development of affordable and rational fixed-dose combinations.

3.2.3 WHO may consider doing the following:

1) Provide technical and operational guidance to undertake national health accounts and development of cost-effective and efficient health service packages.

2) Advocate for the provision of adequate funding and implementation of financing mechanisms that can enhance the affordability and access to essential NCD medicines in primary care and include coverage in insurance reimbursement with the aim of progression towards universal coverage.

3) Provide technical support to adapt and make operational the WHO PEN at different levels of health care delivery in a phased manner.

4) Continue to promote and advocate for adoption of pharmaceutical policies, including generic medicines policies, by Member States which can enhance access to essential NCD services, medicines and technologies in primary care.


6) Support strengthening of health information systems which can capture health system response to NCDs.
ANNEX 1

LIST OF PARTICIPANTS, TEMPORARY ADVISERS, RESOURCE PERSON, REPRESENTATIVES/OBSERVERS, AND SECRETARIAT

1. PARTICIPANTS

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Day 1 - Tuesday, 14 August 2012

08:00-09:00  Registration

Session 1: Opening ceremony

09:00-09:10  Welcome address  Ms Han Jianli
             Deputy Director
             Division of Int'l Organizations
             Dept of Int'l Cooperation
             Ministry of Health, China

09:10-09:20  Opening remarks  Dr Liang Xiaofeng
             Deputy Director General
             Chinese Center for Disease
             Control and Prevention

09:20-09:30  Opening remarks  Dr Han Tieru
             Director, Building Healthy
             Communities and Populations

09:30-09:40  Opening address  Dr Michael O'Leary
             WHO Representative, China

(Election of chair and vice chair for the meeting)

09:45-10:15  Group photo and coffee break

Session 2: Setting the scene

10:15-10:35  Overview of NCD prevention and control  Dr Han Tieru
             WHO WPRO

10:35-10:55  NCD management in primary care:  Dr Cherian Varghese
             Current status and objectives of
             the consultation  WHO WPRO

10:55-11:15  WHO Package of Essential NCD Interventions  Dr Evgeny Zheleznyakov
             for Primary Health Care  WHO Temporary Adviser

11:15-11:40  Managing total CVD risk in primary care  Dr Bruce Arroll
             Department of General Practice
             and Primary Health Care
             Auckland, New Zealand

11:40-12:00  NCD Management in China  Ms Kong Linghzi
             Deputy Director General
             Bureau of Disease Control
             Ministry of Health, China

12:00-12:30  Discussion

12:30-13:30  Lunch break
Session 3: Country presentations
Challenges and opportunities for strengthening NCD prevention and control in Primary care

13:30-14:15 Cambodia, Lao PDR, Viet Nam
14:15-14:30 Discussion
14:30-14:50 China Western Area Health Initiative (WAHI)
14:50-15:00 Discussion
15:00-15:30 Coffee break
15:30-16:30 Brunei Darussalam, Macao (China), Mongolia, Philippines
16:30-17:00 Discussion
18:00-19:00 Reception
**Day 2 - Wednesday, 15 August 2012**

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<tr>
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<td>08:30-08:40</td>
<td>Recap of Day 1</td>
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<tr>
<td>08:40-08:55</td>
<td><strong>Session 4: Health systems and essential drugs for NCD prevention and management</strong></td>
<td>Mr. Sjiewke Postma, WHO WPRO</td>
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<tr>
<td>08:55-09:10</td>
<td>Ensuring essential drugs for NCD</td>
<td>Dr. Klara Tisocki, WHO WPRO</td>
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<td>09:10-09:45</td>
<td>Discussion</td>
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<td>09:45-10:15</td>
<td>Coffee break</td>
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<td>10:15-10:35</td>
<td><strong>Session 5: Learning from the field</strong></td>
<td>Dr. Fatanah Binti Ismail, Malaysia</td>
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<td>10:35-10:55</td>
<td>NCD management at primary care</td>
<td>Dr. Francisca Cuevas, Philippines</td>
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<td>10:55-11:15</td>
<td>Experience of incorporating WHO PEN in primary care</td>
<td>Dr. Hiu Yeung Jacqueline Choi, Hong Kong, China</td>
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<td>11:15-11:35</td>
<td>Human resources, drugs and technology for NCD management</td>
<td>Dr. Tomofumi Sone, Japan</td>
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<td>11:35-12:00</td>
<td>Screening for NCDs in the population</td>
<td>Mr. Minsoo Park, Republic of Korea</td>
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<td>12:00-12:30</td>
<td>Financing NCD management in primary care</td>
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<td>12:30-13:30</td>
<td><strong>Lunch break</strong></td>
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<td>13:30-13:50</td>
<td>NCD management in health systems Challenges and opportunities</td>
<td>Professor Young Kyung-Do, Programme in Health Services and Systems Research, Duke-NUS Graduate Medical School, Singapore</td>
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<td>13:50-15:30</td>
<td><strong>Session 6: Group work on cross cutting issues for strengthening NCD prevention and control (introducing PEN) in primary care</strong></td>
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<td>15:30-16:00</td>
<td>Coffee break</td>
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<td>16:00-16:30</td>
<td>Group 1: Cambodia, Lao PDR, Viet Nam</td>
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<td>16:30-16:45</td>
<td>Group 2: China (WAHI)</td>
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<td>16:45-17:00</td>
<td>Group 3: Brunei Darussalam, Macao (China) Mongolia and Philippines</td>
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<tr>
<td>17:00-17:15</td>
<td><strong>Briefing on field visit</strong></td>
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Day 3 - Thursday, 16 August 2012

Session 7: Field visit

12:30-13:30 Lunch

14:00-14:10 Recap of Day 2

Session 8: Approaches for NCD interventions and primary care

14:10-15:00 Learning from the field visit Dr Liang Xiaofeng
Chinese Center for Disease Control and Prevention

15:00-15:30 Coffee break

15:30-16:30 Discussion on approaches for NCD interventions

Day 4 - Friday, 17 August 2012

08:30-08:40 Recap of Day 3

Session 9: Next steps for implementing/strengthening PEN in primary care

08:40-09:30 Model for strengthening NCD prevention and control in primary care through health system strengthening Dr Evgeny Zheleznyakov
Dr Bruce Arroll
Professor Young Kyung-Do

09:30-10:00 Coffee break

10:00-11:00 Country group work

Country presentations and discussion

11:00-12:00 Cambodia, Lao PDR, Viet Nam

12:00-13:00 Lunch break

13:00-13:30 China (WAHI)

13:30-14:30 Brunei Darussalam, Macao (China)
Mongolia, Philippines

14:30-14:45 Session 10: Closing ceremony

14:45-15:00 Coffee
Country presentation

Name of country: BRUNEI DARUSSALAM
Presenter:

Levels of health care

National hospital
Spatial hospital
District hospital

Primary health care
- Previously hospital-based until 2000 (decentralisation)
- Community-based, government funded for locals, nominal for non-locals
- Dr to patient ratio in 2010 is 795 population per doctor (includes hospital doctors)
- Previously patients seen on walk-in basis, chronic cases given booked appointments
- Since 2011, appointment system for outpatient cases introduced in several health centres
- First point of contact for patients
- Gate-keeper to secondary care
  - Referral rate 1-10%
  - Admission rate <1%
- Provides comprehensive & holistic care
- Provides on-going care for minor illnesses & chronic cases

Services at PHC level
- Medical record registration
- Nurse triage
- Laboratory results
- Doctor consultation
- Treatment room/observation bay
- Phlebotomy
- Radiology
- Dispensary

Communicable diseases
- TB clinics in 3 districts
- DOTS in all health centres
- Flu clinics (after 2009)

Non-communicable diseases
- Smoking Cessation Clinic
- Healthy Lifestyle clinic (run by Health Promotion Centre)
- Pap smear clinics in all health centres
- Obesity clinic
- Diabetic nurse counselling
- Asthma nurse counselling

Community linkage
- Home-based nursing currently based in hospital and run by brunei-based nurses
- Community MOH nurses do home-based nursing, and provide postnatal care of mother and infant
- Village heads occasionally contacted as liaison for DOTS treatment
- Programs such as ‘Mukim Sahit’ or ‘Healthy Province’ organised in collaboration with community
Drug and devices for NCD
- Drug Purchasing Section is responsible for ensuring sufficient and continuous supply of pharmaceutical products that are of acceptable quality, safe and cost effective to all the healthcare institutions under Ministry of Health.
- The types of pharmaceutical products purchased are based on the National Standard Drug List (NSDL) and also drug which are purchased under Tainted Patient Basic List (TPBL).
- Drugs purchased under a few processes, i.e., through Tender process which is valid for 3 years, quotation and direct purchase (only for drugs which cannot be purchased on tender or quotation).
- The distribution of drug/device in hospital & community pharmacies are through State Medical Store.
- Sharing of stocks amongst the pharmacies also help to facilitate the shortcomings of insufficient stocks supply by State Medical Store in certain occasions.
- The supply of drugs for flying services is through the community pharmacy.

Facilities at PHC level
RURAL
- Flying services: Traveling health clinics run by GR, nurses, dentists.
- Equipments usually carried by staff, occasionally left in purpose-built building outposts.
- Drugs list limited in travelling/flying, mostly OTC drugs.
- Note: Rural setting still accessible via water and land services.
- No phlebotomy/ECG services.

URBAN
- Almost all are available.
- Current ROV available.
- Troponin test strips.
- All blood samples taken sent to National Laboratory in hospital for processing & analysis.

Referral care
- Emergency cases are referred to the nearest hospital for treatment, but suspected stroke cases have direct access to Specialist Neuro services (JPMC).
- Uncontrolled chronic cases such as diabetes, hypertension, asthma are referred to specialist clinic as an outpatient basis.
- (Appointment given subject to urgency and nature of referral)
- Severe cases are referred to Obesity clinic in hospital multidisciplinary team run by endocrinologist, dietitian, physiotherapist, clinical psychologist, nurses.

Burden of NCD in PHC
- Stable cases seen on average twice a year, with more frequent visits if uncontrolled e.g., high BP or sugar.
- Figures from 2010:
  - Hypertensive diseases: 46,947
  - Diabetes: 15,003
  - Asthma/COPD: 10,310

Monitoring health services at PHC
- Laboratory & radiology tests ordered or done.
- Medical sick leaves given.
- Any admissions or referrals made and where to.
- Notification of infectious diseases e.g., HFMD, TB.

Challenges in introducing WHO PEN
- Lack of adequate personnel (doctors, nurses and support staff).
- Need for training for staff at all levels.
- Some equipment are outdated, procurement delayed.

What is needed for introducing WHO PEN?
- List the immediate requirements for WHO PEN introduction.
Country presentation

CAMBODIA

Dr. PRAK PISETH RAINGSEY

Structure of health system-administration

Levels of health care

- National hospital (5)
- Provincial hospital (24)
- Referral hospital (5)
- Basic health care village (200)
- PHC Level (1)
- Basic Health units (100)
- Clinics (1000)
- Community Linkage (10000)

Primary health care

- Health Centre covered 8000-12000 people (boundary 10 km and about 2h by walking)
- Health Post established in the remote area that poor infrastructure (mounting, river, bad road) distance around 15 km and covered 2000-3000 people,
- Primary prevention
- Minimum Package of Activities (MPA):
  - MCH (ANC, normal delivery, PNC, EPI, PMTCT, nutrition, IMCI, New born and child care, birth spacing, safe abortion reproductive health, cervical & breast screening.
  - CDC (STDs, HIV/AIDS, TB, malaria Dengue, H1N1
  - NCD (HBP, Diabetes, Cervical & Breast cancer, VIA/SBSE, Oral Health, Mental Health, Eye care
  - Small surgeries
  - Health promotion

Services at PHC level

NCD
- HBP: management mild HBP without risk factors, refer
- Diabetes: identification & management of high risk individuals for diabetes including smoking cessation and refer
- Cervical & breast: VIA, SBE, health education, counseling, refer
- Mental health: continuing treatment and follow up, basic treatment (stress, depression, foolish, epileptic, drunk, Alzheimer), health education, identified severity of the patient, counseling, refer
- Oral health: oral urgent treatment (OUT), traumatic restorative treatment "ART", afford fluoride toothpaste
- Eye care: red eye, trachoma, identified severity and refer

Community linkage

Outreach:
- Provide health care at the community
- Vaccination and vitamin A (child, mother)
- Acute diarrhea treatment
- Birth spacing
- Deworming
- TB & Hansen follow up
- Iron to nursing mother
- Home based care for HIV/AIDS patient

Provide complementary services in remote area:
- ANCPNC
- Follow up birth spacing patient
- New born care & counseling for breast feeding & nutrition
- Health education on CDV&CDMonal care
- Monitoring some diseases
- Malaria treatment,
- Bed net impregnation distribution
Drugs and devices for NCD
- Acid acetate
- Hydrochlorothiazide
- Salbutamol
- NSS 0.9% available at HC

Facilities at PHC level (Rural/urban)
- Blood pressure cuff
- Stethoscope
- Speculum
- Weighing scale

Referral care
- Community First Aid
- Own transport
- Community transport
- HC Ambulance

Health Center
- Triage patient
- Appropriate care
- Register
- Feedback when refer by VHS
- Basic life support
- Intubation
- Letter of transferring
- Take note when refer patient
- Transfer to RH

Burden of NCD in PHC
- Average consultation at HC 225/day (2011)
- High blood pressure 2.3%
- Eye diseases 3.2%
- Mental problems 0.6%
- Road traffic accident 0.4%
- Head injury 0.1%

Monitoring health services at PHC
- OPD register books (EPD, MOH, CD, NCD)
- Drug check list
- Referral book
- Discharge book
- Report system (HC1: New cases, total cases, laboratory, MOH, nutrition, dental care, vaccination, injury, HIV/AIDS, malaria)
- Zero reporting (six diseases, ARI, acute diarrhoea, meningitis, Dengue, Hansen, Rabies, dysentery, other emergent diseases)
- Monthly consumption report
- Drug and consumable consumption report for outreach services
- Stock/EM card
- Drug and consumable remaining in the stock report

Challenges in introducing WHO PEN
- Shortage of staff skill on NCD risk factors reduction
- Staff trained move to another place
- Lack of drug for HBP and diabetes
- Overload work
- Lack of competition as MOH/CD
- Lack of appropriate consumable for NCDs

What is needed for introducing WHO PEN?
- Provide training skill
- Provide appropriate drug and consumable
- Raising awareness on NCDs risk factors
- Staff bonus
Progress of NCD Prevention and Control in Chongqing, China

Chongqing Center for Disease Prevention and Control

Overview of Chongqing

Chongqing is located in Southwest of China and the largest Municipality. She is the largest administrative area with large population, big city and big rural area, big industry and big reservoir in China. There are 19 districts and 19 counties. The population is 32,540,000. 29,400,000 of them are rural residents. They owned 47,000 square Kilometers.

Structure of NCD prevention and country in Chongqing

- Ministry of Health
- National CDC
- Chongqing Health Bureau
- Chongqing CDC
- Provincial Hospital
- District or County health Bureau
- District CDC
- District Hospital
- Community health Center
- Patients' Club
- Village health Ward
- Social group

To establish the area of comprehensive prevention and control for NCD and improve the mechanism of NCD prevention and control

Chongqing have started to establish the area of comprehensive prevention and control for NCD since 2010. In 2011, 3 districts were approved to be national area of comprehensive prevention and control for NCD. In 2012, 3 districts and counties applied to establish national area of comprehensive prevention and control for NCD. And 15 districts and counties were named provincial area of comprehensive prevention and control for NCD.

Through the campaign of establishing the area of comprehensive prevention and control for NCD, the mechanism of NCD prevention and control that government dominating, multi-sectors involving and all society participating has be improved. In the meantime, the capacity of doctrs has be raised. To prevent high risk factors of NCD were conducted and standardized the care service for NCD patient.

To create health supportive environment and promote the action against high risk factors of NCD

- All 38 districts and counties initiated campaign of health life style. By the end of 2011, a total of 346 fitness trails, 53 health communities, 65 health units, 51 health canteens, 43 health restaurants, 1 health supermarket, 6 health townships, 3 health schools, 12 health parks and 2 health streets have been constructed. This campaign have developed a good health environment for residents.

The current status of the basic medical institution

1. Shortage of human-resource

In 2010, 275 basic medical institutions were surveyed. The result indicated that the average number of staff, practice physician, registration nurse and pharmacy staff per institution is 34, 17,9 and 3 respectively.

In 2012, the result of WHO PEPFAR baseline survey indicated that the number of public servants were equipped according to the population. 60% of them is 30000-1 and 25.67% of them is 2000-30000.
2. The basic equipment is guaranteed
In 2012, the result of WHO PEN basic survey indicated that all community centers were equipped with basic equipment such as Mercury sphygmomanometer, electronic blood pressure monitor, an oxygen bottle (or central oxygen supply), weight scales, ECG machine, tape, atomizer, stethoscope, thermometer, blood glucose meter. But the equipments such as Peak flow meter, pulse Oximetry were equipped rarely.

3. The basic service of NCD management is popular
In 2012, the result of WHO PEN basic survey indicated that all community centers provided the instruction for patient and their family member about balance diet, physical activity, no smoking and limit alcohol. 73.33% of centers conducted self-management of NCD patient and 86.67% of centers provided the instruction about insulin injection for diabetes patient.

4. The accessibility of NCD medical service is well and the condition of double referral is set.
In 2012, the survey indicated that a total of 2915 person-times of clinic in 15 community health center were sampled one day, 243 of them seek medical service because of cardiovascular disease, hypertension, diabetes, tumor, which accounted for 8.34%. All health centers have developed the role of double referral and equipped the ambulance vehicle. The average time of referral is 11 minutes.

5. The community supportive environment is beneficial to conduct the case management of NCD
The result reflected that the basic medical institution conducted the physical examination, screened NCD patients and risk population, follow-up, family doctor's service, self-management, health education, health lecture and community propaganda based on the community and village commission.

Challenges
1. The policy and funding haven't been guaranteed, which influence the sustainable development of the basic network of NCD prevention and control.
2. The capacity of staffs of the basic medical institution haven't meet the need of the sever epidemic.
3. The prevention and control for NCD in rural area is poor. However, it in major battle field of NCD prevention and control, it is urgent to invest more on NCD prevention and control in rural area.
4. Pre-prevention and control for NCD need more support of personality, fund and equipment. The effect of patient management isn't well.

Suggestions
1. To strengthen policy advocacy and promote to implement Planning for NCD prevention and control.
2. To enhance the training for medical staffs of the basic medical institutions to raise their capacity.
3. To explore the different mode of NCD prevention and control in different area and motivate all social resource to involve the campaign for NCD prevention and control.
4. To perfect the integration management mode of town-village—patient and popularize the contract management of family health in order to Play the initiative of the patients and their families.
Procurement and supply

- Develop guidelines on drug procurement
- Promote Good Procurement Practice
- Revolving Drug Fund
- Centralized procurement
- Centralize Logistic Management

Drug and devices for NCD

- Cardiovascular medicines 14 items
- Antihypertensive medicines 10 items
- Insuline & other antidiabetic agents 4 items
  - Rural
- Drug for HC: 115 items
- Drug for Village 49 items
  - Urban: 350 items

Trends in NCD risk factors

- STEP Survey 2008
  - Vientiane Capital only
- Laos will get information on the trends in NCD risk factors after the 5th National STEP survey 2008

- NCDs are estimated to account for 40% of all deaths

- Indicate the referral practices and nearest referral facility for PHC for NCD management
- In Laos the referral system is not yet set up
- Indicate the average number of visits in a PHC; average number of hypertension, diabetes, and other NCDs seen in the PHC
- The survey hasn’t carried out to collect the data for visit in PHC, at the PHC services were focused on the MCH and CDC
- What information is collected on a routine basis from PHC level (Number of patient visits, drugs used, laboratory tests done)
- The survey conducted only to assessment of the EML accessibility based on the WHO Pharmaceutical Operational Package, which focused on the availability of EML, there are 75% of EML have been used in the health care system

Challenges for NCD control

- Limited budget available for NCD activities
- Limited Donor for NCD Projects
- Conflict of interest between
  - Lao Ministry of Health (public health)
  - Non-health Sectors such as Private tobacco and alcohol companies
    (Companies’ benefit Vs public health)
- Price of medicines for NCD is high
- Limitation on the access to NCD medicines

- What level can WHO PEN be introduced in the health system? What are the challenges in terms of systems, personnel, equipment, drugs and infrastructure?
- In appropriate condition for Laos should introduce the WHO PEN for District level
- List the immediate requirements for WHO PEN introduction
- The capacity building among health staff is needed
Country presentation

Macao SAR of the People’s Republic of China

Dr. Chou Kuok Hei, Philip

Health Bureau

Two Levels of Service:
- Specialized Health Care System (Hospital CHCS)
- Primary Health Care System
  - Health centres provide free health care services to all Macao residents

Primary health care

- Primary health care is set up to provide comprehensive primary health care services to all Macao residents.
- Primary health care, including: early diagnosis and comprehensive treatment of diseases, health promotion, disease prevention, and help patients to recover. Therefore, the objective of health centers are not limited to providing primary health care services to patients, but also including healthy people.

Service at PHC level

Basic general health care
- e.g. maternal and child care, vaccination program, prevention and control of common diseases, essential drugs and health education, etc
- Consecutive services: life cycle; different stages of diseases
- Comprehensive services: health promotion, prevention, diagnosis, therapy and rehabilitation
- Humanized services: physical, psychological and social support
- Prevention-oriented

Community linkage

- Health Bureau, through the cooperation with the NGO to provide free home care services for patients in need, including hospital discharge patients and incapacitated patients who can not go to health centers for follow-up action.
Drugs and devices for NCD

- Under Macau law, the import of all drugs and devices for NCD must get the approval of the Macau Division of Pharmacy.
- As a responsible public sector, must to ensure that the use of public funds to meet the cost-effectiveness, in order to protect the interests of the patient. All drug and devices procurement procedures must according to the guidelines of the Macau law, in a formal and fair manner.

Facilities at PHC level

- Technical Coordinating Officer
  - 6 Health Centres
  - 1 Top Clinic
  - 10 Tsui Wai
  - 3 Ling San Tong
  - 11 Kowloon
  - 15 Tai Po
  - 2 Health Stations
    - 11 Kowloon (five-star health care station)
    - 4 Lam Tin
  - Medical Activity Licensing Unit
  - Training & Documentation Unit

- Up to September 2010, there are 442 staffs in PHC system
  - 33 specialist general practitioners
  - 74 other doctors
  - 154 nurses

Referral Care

- Patients who enjoy free medical services, after their specialist treatment in stable condition, can arrange for a referral to Primary Health Center for follow-up treatment, should the patients condition changes, can be reversed to the hospital specialist for follow-up treatment.
- Hospital CHCSJ and Primary Health Care will enhance the specialist - two-way referral system of community health centers, and joint follow-up patients, and the rational use of resources, reducing the diagnosis and treatment of out-patient waiting time.

Burden of NCD in PHC

<table>
<thead>
<tr>
<th>Major NCD in year 2011</th>
<th>no. of patient</th>
<th>no. of case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>38,067</td>
<td>121,528</td>
</tr>
<tr>
<td>Diabetes</td>
<td>5,169</td>
<td>17,183</td>
</tr>
<tr>
<td>Diabetes mellitus and hypertension</td>
<td>9,132</td>
<td>33,594</td>
</tr>
</tbody>
</table>

Prevention and treatment of non-communicable diseases

- Chronic diseases such as cancer and circulatory system is the leading cause of death in Macao.
- Set up a “chronic disease prevention Committee” in year 2009
  - The head of the health areas to act as Chairman
  - Members from government departments, and medical professional
  - To assist the Government to plan and promote the prevention and control of chronic non-communicable diseases and to support different areas of public health departments and private health care entities to implement
- The Health Bureau and the Shanghai Cancer Institute signed a Letter of Intent at the end of May 2010
  - According to the Macao community and tumor popular features in tumor prevention, diagnosis and treatment, joint collaborative research projects to develop prevention and research programs, implementation plans, and to strengthen the staff exchange visits.

Challenges

- Increase and aging of population
- Rapid increase of incidence of chronic diseases and malignant diseases
- Expectation of residents and health professionals becomes higher and higher
- New techniques and methods
- Outbreaks of infectious diseases
Challenges and opportunities for strengthening NCD prevention and control in Primary health care in Mongolia

Regional Consultation on Strengthening NCD Prevention and Control in Primary Health Care
Beijing, China, 14-17 August 2012

CURRENT STRUCTURE OF HEALTH SERVICE IN MONGOLIA

The services offered at the primary health care

- Medical care
  - Emergency medical care
  - Maternal and child health care
  - Antenatal care
  - Postpartum care
  - Folic acid
  - Elderly people care
  - Palliative care
  - Rehabilitation care

- Public health care
  - Immunization
  - Adolescent’s service
  - Education, communication
  - Hygiene
  - NCD

Community linkage

<table>
<thead>
<tr>
<th>Service</th>
<th>Time sheet</th>
<th>Who / response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum home visit for mother and baby</td>
<td>Every week until 1 month</td>
<td>Nurse or midwife or FGPs</td>
</tr>
<tr>
<td>Palliative care</td>
<td>by needs</td>
<td>Nurse or FGPs</td>
</tr>
<tr>
<td>Home visit for disability client</td>
<td>by needs</td>
<td>Nurse or FGPs</td>
</tr>
<tr>
<td>Community health nursing</td>
<td>by needs</td>
<td>Nurse</td>
</tr>
<tr>
<td>Training for health volunteers</td>
<td>Quarterly</td>
<td>Medical staffs</td>
</tr>
<tr>
<td>Provide IEC handouts and contraceptives</td>
<td>Route</td>
<td>Medical staffs and health volunteers</td>
</tr>
<tr>
<td>IEC activities</td>
<td></td>
<td>Medical staffs and health volunteers</td>
</tr>
</tbody>
</table>

Health workers in PHC (2011)

<table>
<thead>
<tr>
<th></th>
<th>Family health centers</th>
<th>Soum health centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of PHC facilities</td>
<td>219</td>
<td>326</td>
</tr>
<tr>
<td>Number of physicians</td>
<td>786</td>
<td>576</td>
</tr>
<tr>
<td>Number of nurses</td>
<td>756</td>
<td>1,341</td>
</tr>
</tbody>
</table>

Medicines for NCD

- VI Essential Medicine List adopted in 2010 including most of NCD drugs there is no formal list of NCD.
- Since privatization of the State Wholesaler in 2007, supply of medicines is provided by private suppliers and manufacturers.
- Outpatients in Family health centers and Soum health centers get their medicines from pharmacy by prescription.
- When essential medicines are dispensed through community pharmacies, 60-80 percent of the price is reimbursed from Health Insurance Fund.
- According to Law on Health, medicines needed for diseases that require long-term treatment are paid by the government (HIV, Melanoma, Glaucoma).
- Medicines for inpatients in Soum health centers paid by the government.
Availability of Medicines as per the PEN list

**Urban**
- Community pharmacies - 85.3%
- Soum pharmacies 76.5%
- Soum hospitals - 88.2%

**Rural**

<table>
<thead>
<tr>
<th>Availability of basic devices as per the PEN list</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name of device</strong></td>
</tr>
<tr>
<td>Thermometer</td>
</tr>
<tr>
<td>Sphygmomanometer</td>
</tr>
<tr>
<td>Blood pressure measurement device*</td>
</tr>
<tr>
<td>Measurement tape</td>
</tr>
<tr>
<td>Weighing machine</td>
</tr>
<tr>
<td>Peak flow meter**</td>
</tr>
<tr>
<td>Spirometer for infants</td>
</tr>
<tr>
<td>ECG machine</td>
</tr>
<tr>
<td>Blood glucose test strips</td>
</tr>
<tr>
<td>Blood cholesterol test strips</td>
</tr>
<tr>
<td>Blood triglyceride test strips</td>
</tr>
</tbody>
</table>

Referral system in Mongolia

<table>
<thead>
<tr>
<th>Burden of NCD in PHC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family health centers</strong></td>
</tr>
<tr>
<td>Number of hospital beds</td>
</tr>
<tr>
<td>Number of in-patients</td>
</tr>
<tr>
<td>Number of out-patients</td>
</tr>
<tr>
<td>Percentage of preventive medical check-up</td>
</tr>
<tr>
<td>Number of visits person per year</td>
</tr>
</tbody>
</table>

Achievements in WHO PEN

- In 2011 updated clinical guidelines 6,
- All family doctors are trained how to use clinical guidelines, identify risk people and refer next level of health care were it is necessary.
- Screenings have started

Challenges in introducing WHO PEN

- Lack of human resource and allocation in resource limited settings
- Limited of skills and knowledge for medical staffs
- Medical equipment and devices supply is not enough
Challenges and Opportunities for Strengthening NCD Prevention and Control in Primary Care

DR. ERINE V. VERA
National Center for Disease Prevention and Control
Department of Health
Philippines

Structure of Health System- Administration

Office of Secretary of Health
Regional Offices
Attached Agencies

Provincial Office
City Health Office
Health Unit

Disease Prevention & Control
Integrated Delivery System
Health System

Levels of Health Care

Primary Health Care

- Refers to Strategic Health Stations or its equivalent in the community (Level 1) and Rural Health Units or its equivalent in the community (Level 2) which are directed to cities and municipalities.
- Clinics or health units in the schools, work places, and communities can serve as primary level outlets.
- It is the first level contact between the community members and the levels of health care facility and to the national health system. Primary Health Care constitutes the first element of a continuing health care cycle.

Types of health care workers:
- Basic community health workers, traditional birth attendants, health auxiliary, volunter, helper
- Intermediate level health workers
  - General medical practitioners, public health nurses, rural sanitary inspectors, midwives

Services at PHC level

- Maternal and Child Health
- Communicable Disease
- NonCommunicable Disease

Community Linkage

To achieve Universal Health Care, Katarungang Pangkabuhayan (KP) provides for the capacitation of community-level stakeholders into Community Health Teams.

Community Health Teams (CHTs) shall:
- Assist families in assessing and acting on health needs through health use planning;
- Provide information on available health service in the locality;
- Provide basic public health services such as, among others, nutrition counseling, family planning and reproductive health, maternal care and newborn care;
- Track families and their members for utilization of public health services;
- Regular follow-up beneficiary families;
- Facilitate the organization of transportation and communication systems, outreach services, and linkages with other providers in the service delivery network.
Facilities at PHC Level (Rural and Urban)

**Drugs**
- Common Infections
- Anti-Helminths
- IMI, DCA

**Equipment**
- Thermometer
- Stethoscope
- Blood pressure measurement device
- Measurement Tape
- Weighing Scale
- Patient Clinical Record
- Target Client List
- Clinical Protocol
- Urinalysis
- X-Rays
- Visual Inspection
- Referral Laboratory
- Laboratory

**Referral Care**
- Primary
- Secondary
- Tertiary
- Hospital
- Clinic
- Private Hospital
- Rural Hospital
- Municipal/District Hospital
- Provincial Hospital
- Medical/Regional Center

**Monitoring health services at PHC**
- Health Service Coverage Statistics
- Tuberculosis Control
- Malaria
- Schistosomiasis
- Filariasis
- Expanded Program on Immunization
- Environmental Health

**Challenges of WHO PEN**
- Devolved structure of health care system
- Political resistance
- Communicable Disease programs are not the priority
- Program overload for local health providers (multiple)
- Retaining of health personnel in PEN standards
- Financial support for procurement of drugs
- Budget source for purchase of equipment
- Adoption of a new information and logistics management system for PEN

**Requirements for WHO PEN**
- Adopt WHO-PEN as a national policy in NCD control
- Integrate in the province investment in the plan for health
- Allocate budget for PEN operation
- Develop standard PEN training protocol
- Formulate PEN Health Guidelines
- Develop an information and logistics management system
- Develop a Monitoring and Evaluation System
- Create a Marketing Strategy for PEN
- Ensure regular drug supply

**Status: PEN Initiative**
- Drafted an Administrative Order
  - Adopting PEN as a Policy for NCD Control
- Conducted Training of Trainers
  - Regional NCD Coordinators (April & May 2012)
- Rolled-Out Training Courses on PEN
  - Started June 2012
  - Four Regions have completed the training among municipal health officers of priority LGUs (CCT/NTS-PR Areas)
Country presentation

Name of country: Vietnam
Presenters: TRUONG DOH BAC & HOANG KIM HA

Structure of health system-administration

Central level
- National Central Hospitals
- National/Regional Institutes, Centers

Provincial level
- Provincial hospitals
- Provincial Center for Health Prevention

District level
- District Health Centers (Treat and prevention)
- District Health Workers

Commune level
- Commune Health Stations
- Networks of village health workers

Levels of health care

Central level
- 3 National Central Hospitals

Provincial level
- 392 Provincial Hospitals
- 60 centers for preventive care
- 65 centers for food safety

District level
- 713 District Health Centers (51 hospitals)

Commune level
- 11,390 Commune Health Stations (92.8% of commune/ward health stations)
- 75.2% of commune/ward health workers

100% of Villages have health workers (130,634 persons)

Primary health care

District level
- District health centers

Commune level
- Commune health stations
- Networks of village health workers

Community linkage

- Solving the health problems of the community not just the health sector that need the participation of many other sectors (People’s Committee, Women’s Union, Youth Union, Father and Friends, Veterans Affairs, Farmers, ...).
- Strengthening health services closely related to the socio-economic development of the country.
- Increasing of Health is required close coordination with the development of other sectors.

Each commune/District has a PHC Committee.

- Vice President of People’s Committee is Chairman of PHC Committee, Head of DEODEC and Vice Chairman and Members from other sectors.

CCHC has responsibilities to list all families, including patients with infectious disease (HIV/AIDS, TB, ...), and maternal, child health care.

- Village health workers manage and periodically visit all households in the village.
- Brings all essential health services to health stations (people visit health stations)

Services at PHC level

- The main content of current protection of maternal and child health can be summed up in the program DGBIPP:
  - Growth monitoring, nutrition education, food feeding, immunization, family planning, food supplement, female education.

- Communicable diseases:
  - Health education aimed at changing habits and unhealthy habits;
  - Foods: Inadequate food and proper nutrition;
  - Breastfeeding and nutrition;
  - Vaccination against common infectious diseases in children;
  - Prevention of common chronic diseases in the locality;
  - Prevention of essential treatment, drugs, consultation, rehabilitation, traditional medicine

- MCI:
  - Training for the health staff on Management, Action, and prevention of MCI
  - Infection of essential drugs, medical equipment (EPI machines, ultrasound machines, blood pressure...);
  - Health communication and education.
Drugs and devices for NCD
Two methods of purchasing drugs and equipment in VN:

1. **Centralized procurement**: Provincial Health Department purchase and provides for hospitals (Provincial and District Hospitals)
   - District Hospital provides for CCH

2. **Decentralized procurement**: The Hospital itself was purchased after the Provincial Health Department approved Hospital 's procurement plan.
   - District Hospital provides for CCH

Facilities at PHC level

**Rural**
- Each Commune health station:
  - 4-7 staff (doctor, assistant doctor, nurse, midwife, assistant pharmacist...)
  - Facility: 7-8 rooms for health care services
  - Drugs and devices: in accordance with the essential drugs and device lists issued by MoH
- Each village has 1 health worker with village health bag

**Urban**
- Each Ward health station:
  - 2-4 staff (doctor, assistant, nurse, midwife, assistant pharmacist...)
  - Facility: 4-5 rooms for health care services
  - Drugs and devices: in accordance with the essential drugs and device lists issued by MoH
- Each administrative block has 1 health worker

Referral care

- The nearest referral facility for PHC for NCD management is District health center

Burden of NCD in PHC

- Average each commune health station serves for 5000-8000 pop
- For each commune health station:
  - Average 400 visits per month (all kinds)
  - Average 100 visits (25%) due to NCD conditions
  - 80 visits for hypertension consults
  - 20 visits: diabetes, cancers, mental disorders

Monitoring health services at PHC

Ministry of Health issued the template of Basic recording and reporting at PHC

A. CCH records:
   1. Examination record
   2. The expanded immunization record
   3. Vaccination record against tetanus for women
   4. Record of cigarette smoking
   5. Book record for monitoring services and family planning
   6. Book record for monitoring mental health
   7. Mental in-service book record

B. CCH information reports to District Health Center:
   1. Prevalence by qualification (T-total, in PHC, Village, private sector)
   2. Activities in maternal health care, children and family planning; Full using the records, total in 3, 9, 15 and 12 months
   3. Examination activities. The total number of visits, number of cases of diseases, days of hospital stay, average stay, source data, the number of smear tests, the number of exams, the total number of patients referred, the total number of preventive medical
   4. Examinations on expand immunization
   5. Reporting communicable diseases epidemic (trend of disease, mobility, mortality)
   6. Report on communicable diseases (Malaria, HIV/AIDS, mental health...)

Challenges in introducing WHO PEN

- WHO PEN can be introduced in the health system:
  - CCH: Integrated Management of Hypertension, obesity, mental disorder, diabetes
  - DCH: PEN: Treatment of Hypertension, diabetes

- The challenges in terms of systems, personnel, equipment, drugs and infrastructure:
  - Limited capacity of PHC staff (CCH assessment, case management, counseling, follow up, communication...)
  - Chroniclong term management approach to HCP increases work burden for PHC staff
  - Unavailability and insufficiency of available price drugs for NCDs at PHC
  - Lack of devices and technical guidelines for CCH management at PHC

What is needed for introducing WHO PEN?

- A advocacy for integrating WHO PEN in national Health policy
- Building capacity and technical guidelines for PHC staff
- WHO develops and recommends lists of essential drugs and devices for NCDs at PHC level and it should be included in national health policy as well as Health Insurance policy
NCD Management at Primary Care Level – Malaysian Experience

Dr. Fatnah Abas, MD, MPH, RM
Senior Principal Assistant Director (Primary Care Section)
Dr. Hamzah Haji, MD, MPH
Public Health Physician
Ir. Noor Azlina Mohd. Amin
Principal Assistant Director (Pharmacy Practice & Development)

WHO Regional Consultation on Strengthening NCD Prevention and Control in Primary Health Care, Beijing, China, 14 - 17 August, 2012

Malaysian Healthcare System at a Glance

- Health care provided at nominal charge for all Malaysians
- Total MCH Budget (RM 13.7 billion) - 6.60% of total National Budget
- Total expenditure on health (% of GDP) 4.75%
- About 90% within 5 km of static health facility

Primary Care Services: Comprehensive & Population-based

PHC Delivery System

- Static Clinics
  - Health Clinics
  - MCH Clinics
  - Community Clinics
  - 1 Malaysia Clinic (K1M)

- Mobile Clinics
  - Terrestrial
  - Air
  - Riverine & Sea

About 90% within 5 km of static health facility

Trends in NCD Risk Factors, Diseases

Prevalence of Diabetes, 218 years (2006 & 2011)
Prevalence of Hypertension, 218 years (2006 & 2011)
**NCD Management at the PHC Level**

1. **Patient self-management**
   - Resource Centres established in 2001
   - Health clinics throughout Malaysia
   - Patient diaries
   - Self-Monitoring of Blood Glucose
   - Provided for patients at the primary care level

2. **Integration with Other Programs**
   - School Health Service
   - Mobile Services

**ACCESS TO MEDICINES**

- National Medicines Policy of Malaysia ensures equitable access to quality, safe and efficacious medicines at affordable prices
  - Robust drug regulatory system
  - Growing domestic pharmaceutical industry
  - Government policies which encourage use of generic medicines
  - Transparent drug procurement system in the public sector

**ACCESS TO MEDICINES**

- Standardized drug formulary used in government facilities
  - Inclusion of drugs based on needs assessment and pharmacoeconomic evolution
  - Stratified to differentiate between various levels of care
- National Essential Drug List
  - Applies to both public and private sectors

**Drug distribution in PHC**

- Health District Office
- Bigger Health Clinics
- Procurement centre
- Supplier
  - Central contract
  - Local purchase
  - Concession company
- Bigger Health Clinics
- Health clinics
- End user

**Challenges**

**Challenges in PHC**
- Ensuring equity
- Ensuring universal access
- Lack of integration
- Clinical control of chronic diseases
- Patient Empowerment
- Empower the Community and individuals to plan/conduct wellness
EXPERIENCE OF INTRODUCING THE WHO PACKAGE OF ESSENTIAL NCD INTERVENTIONS (WHO PEN) IN PRIMARY HEALTH CARE FACILITIES IN THE MUNICIPALITY OF PATEROS PHILIPPINES

Francisca P. Cuevas, MD
Health Programme Coordinator, MERLIN

PEN Introduction
1. Consultation meetings with the Mayor, Local Finance Committee and the Healthy Pateros Task Force

PEN Introduction
2. Consultation workshop with stakeholders – National Center for Disease Control, Health Promotion, Epidemiology Center, TeleHealth Center, Center for Health Development, WHO, health center staff, Pateros specialists, etc

PEN Introduction
3. Baseline assessment of the facility-based and community-based services in the municipality
4. Development of a practice manual with forms and tools on risk assessment and screening, risk estimation and risk management

WHO PEN Protocol on the Integrated Management of Hypertension and Diabetes

Prevention of Cardiovascular Disease

World Health Organization
PEN Introduction

5. Organization and training of the CHRONIC CARE TEAM

- Minimum:
  - Physician
  - Nurse/Midwife (non-physician health worker)

- Desirable to have:
  - Dietician
  - Health Educator (HEPO)
  - Smoking cessation counselor

CHRONIC CARE TEAM

- Minimum:
  - Physician
  - Nurse/Midwife (non-physician health worker)

- Desirable to have:
  - Dietician
  - Health Educator (HEPO)
  - Smoking cessation specialist

PEN Introduction

6. Development of an electronic information system to facilitate the management and tracking/monitoring of clients

- Made use of an existing system, and added an NCD component
- Used funds from DOH grants to buy hardware
**PEN Introduction**

7. Reproduction and distribution of IEC materials

8. High-visibility event – to launch the project and to raise awareness on the NCD services that were available at the health facilities

9. Conduct of community health education classes

---

Launching of the WHO PEN, 2011

“I keep my HEART healthy”
**PEN Introduction**

- Linked with the National Center for Pharmaceutical Access and Management for the NCD complete treatment packs

**Essential Drugs and Medicines**

- Thiazide Diuretics
- Beta blockers
- Angiotensin converting enzyme inhibitors
- Calcium Channel blockers (sustained release formulations)
- Aspirin
- Metformin

**Essential Devices**

- Stethoscope
- Blood Pressure measurement device
- Measuring Tape
- Height Board
- Weighing Scale
- Glucometer & test strips
- Cholesterol Meter & test strips
- Test strips for checking urine ketones and protein

**PEN Introduction**

- Local procurement of additional NCD medications – also in blister packs
- Delivery of NCD services at the health centers and in the communities
  - Outreach services monthly
  - NCD day at the health centers – Tuesdays and Thursdays
  - Referral of cases to Speciality Clinics – Diabetes Clinic and Cardiovascular Clinic

**Community Risk Assessment form**

- Common Major Risk Factors:
  - Sex
  - Age
  - Family History
  - Physical Inactivity
  - Unhealthy diet
  - Use of tobacco
  - Excessive alcohol intake
  - Blood pressure
  - Waist circumference

THE NCD COMMUNITY TEAM

1. Midwife or non-physician health worker
2. Barangay Nutrition or Barangay Health Worker

![Diagram of Community Risk Assessment process]
**Way forward**

- Management of Asthma and COPD
- One visit approach for cervical cancer screening (VIA) and cryotherapy
- Strengthen referral mechanism for NCDs, particularly for cancers
- Medicines access program for breast cancer
## ANNEX 5

### National health service plan

<table>
<thead>
<tr>
<th>Group 1 (CAM, LAO, VNM)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>No NCD plan or NCD committees or specific guidelines (LAO)</td>
<td>WHO to support plans/guidelines</td>
<td></td>
</tr>
<tr>
<td>No integrated approach, many vertical programs (VNM) (CAM) or departments involved (LAO)</td>
<td>Ministries and Donors to harmonize WHO try to facilitate integration</td>
<td></td>
</tr>
<tr>
<td>Health systems network: curative/ preventive functions are split (VNM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National strategic plan does not belong to MoH; challenge to integrate with other sectors (MAY)</td>
<td>Sit with all sectors/ Ministries and plan activities with roles and responsibilities; Donors to harmonize</td>
<td></td>
</tr>
<tr>
<td>Revise NCD implementation plan (CAM)</td>
<td>Needs political commitment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 2 (China WAHI)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political commitment</td>
<td>Health care reform</td>
<td></td>
</tr>
<tr>
<td>Multi-sectors coordination and action</td>
<td>Health education and promotion to raise awareness of NCD</td>
<td></td>
</tr>
<tr>
<td>Priority on treatment</td>
<td>Enhance primary health system</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 3 (BRU, MAC, MOG, PHL)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability after donor funding after initial PEN</td>
<td>Insurance</td>
<td></td>
</tr>
</tbody>
</table>

### Financial resources

<table>
<thead>
<tr>
<th>Group 1 (CAM, LAO, VNM)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low budget/priority for health and for NCDs (all countries)</td>
<td>Shifting balance Establishment health promotion fund</td>
<td></td>
</tr>
<tr>
<td>Limited insurance coverage (for NCDs) (LAO, CAM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little donor and NGO financial support for NCDs (VNM)</td>
<td>Less emphasis on some other diseases (By WHO and DPs)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 2 (China WAHI)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sufficient funding but no proper allocation</td>
<td>To increase investment</td>
<td></td>
</tr>
<tr>
<td>Effective use</td>
<td>Health insurance on prevention Monitoring and feedback</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 3 (BRU, MAC, MOG, PHL)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where to get the funding</td>
<td>Insurance</td>
<td></td>
</tr>
</tbody>
</table>

### Human resources

<table>
<thead>
<tr>
<th>Group 1 (CAM, LAO, VNM)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase capacity of current staff (CAM)</td>
<td>Multi-disciplinary teams; IMAI; Empower staff; Change behaviour of staff towards patients</td>
<td></td>
</tr>
<tr>
<td>Lack of Training for NCDs (CAM)</td>
<td>IMAI</td>
<td></td>
</tr>
<tr>
<td>Increase staff (CAM, LAO, MAY)</td>
<td>Rural assignment policy; Provide incentives; Move from curative to primary care</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 2 (China WAHI)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of regular staff</td>
<td>Human resource management</td>
<td></td>
</tr>
<tr>
<td>Lack of capacity</td>
<td>Continuous training to raise their comprehensive capacity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 3 (BRU, MAC, MOG, PHL)</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of staff</td>
<td>Nurses, pharmacists could also do the prescribing functions</td>
<td></td>
</tr>
<tr>
<td>Capability of staff</td>
<td>Intensive training of staff; Online courses; To have on-going capacity building for staff</td>
<td></td>
</tr>
<tr>
<td>Lack of trainors for the PEN guidelines</td>
<td>Online courses; To have on-going capacity building for staff</td>
<td></td>
</tr>
<tr>
<td>CHALLENGES</td>
<td>SOLUTIONS</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>Drugs</strong>&lt;br&gt;Group 1 (CAM, LAO, VNM)</td>
<td>Limited drug list for NCDs for all levels (VNM, LAO)</td>
<td>Improve consumption profiles</td>
</tr>
<tr>
<td></td>
<td>Refuse patients without insurance (VNM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHC facilities have limited access to NCD drugs (VNM, CAM), especially in remote areas (MAY)</td>
<td>Train staff to prescribe (change policy to allow this?)</td>
</tr>
<tr>
<td></td>
<td>Quality of Medicines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patient compliance with taking drugs low (LAO)</td>
<td>Better information from health staff</td>
</tr>
<tr>
<td>Group 2 (China WAHI)</td>
<td>Essential drug list is limited</td>
<td>Increase essential drug list</td>
</tr>
<tr>
<td></td>
<td>Procurement problem</td>
<td>Access to generic drugs</td>
</tr>
<tr>
<td></td>
<td>Patient’s perception</td>
<td>Public education</td>
</tr>
<tr>
<td>Group 3 (BRU, MAC, MOG, PHL)</td>
<td>Pricing mechanism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitoring of drug dispensing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Procurement efficiencies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality issues</td>
<td></td>
</tr>
<tr>
<td><strong>Technology, Laboratory Services</strong></td>
<td>Make equipment needs profiles</td>
<td></td>
</tr>
<tr>
<td>Group 1 (CAM, LAO, VNM)</td>
<td>Not enough equipment (VNM, CAM); limited equipment list</td>
<td>Make equipment needs profiles</td>
</tr>
<tr>
<td></td>
<td>Consumable expensive (after having received free equipment) (MAY)</td>
<td>Appropriate donation policy to be developed</td>
</tr>
<tr>
<td></td>
<td>Quality and calibration issues of existing (often old) equipment (LAO)</td>
<td>Rotation of staff from central level</td>
</tr>
<tr>
<td>Group 2 (China WAHI)</td>
<td>Lack of skills or technical staffs</td>
<td>Training and management</td>
</tr>
<tr>
<td></td>
<td>Quality of service;</td>
<td>Better health service planning to management</td>
</tr>
<tr>
<td>Group 3 (BRU, MAC, MOG, PHL)</td>
<td>Sustainability</td>
<td>Insurance through reimbursement could sustain in the procurement Funding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Regulatory control in the quality of devices</td>
</tr>
<tr>
<td><strong>Referral Systems</strong></td>
<td>Self-referral by patients (CAM, LAO, VNM)</td>
<td>Only allow if properly referred</td>
</tr>
<tr>
<td>Group 1 (CAM, LAO, VNM)</td>
<td>Refusal by patients (CAM); lack of symptoms and money issues</td>
<td>Improve patient’s understanding of early treatment</td>
</tr>
<tr>
<td></td>
<td>No system for referral; particularly transport (LAO)</td>
<td>Transportation</td>
</tr>
<tr>
<td>Group 2 (China WAHI)</td>
<td>Double referral system hasn’t established</td>
<td>To establish referral system</td>
</tr>
<tr>
<td></td>
<td>Pilot program need further improvement of the mechanism of double referral system</td>
<td>To raise primary health care capacity</td>
</tr>
<tr>
<td>Group 3 (BRU, MAC, MOG, PHL)</td>
<td>Hospital staff are not aware in the PEN guidelines</td>
<td>Training of hospital staff</td>
</tr>
<tr>
<td></td>
<td>Geography and insurgency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patients tend to go to hospitals first</td>
<td></td>
</tr>
<tr>
<td>Community linkages</td>
<td>Solutions</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td><strong>Group 1</strong> (CAM, LAO, VNM)</td>
<td>No surveillance in communities (LAO)</td>
<td>Get local authorities involved</td>
</tr>
<tr>
<td>No commitment of local authorities (VNM, CAM)</td>
<td>Healthy cities strategy</td>
<td></td>
</tr>
<tr>
<td>Cultural festivals in the communities (too much partying/smoking) (LAO)</td>
<td>Increase price, but conflict of interest</td>
<td></td>
</tr>
<tr>
<td>Empowerment of communities to change their habits (MAY)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group 2</strong> (China WAHI)</td>
<td>Workplace: no access</td>
<td>To build healthy workplace.</td>
</tr>
<tr>
<td>Lack of public participation and organization</td>
<td>Public health leadership. Community based.</td>
<td></td>
</tr>
<tr>
<td><strong>Group 3</strong> (BRU, MAC, MOG, PHL)</td>
<td>Prevention and control</td>
<td>Good community health teams</td>
</tr>
<tr>
<td>Sustainability of community interventions</td>
<td>Philippine Barangay health workers</td>
<td></td>
</tr>
</tbody>
</table>

**Monitoring and evaluation**

<table>
<thead>
<tr>
<th>Group 1 (CAM, LAO, VNM)</th>
<th>No specific NCDs reporting (CAM); especially at PHC.</th>
<th>Improve HMIS; include key NCDs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No surveillance/screening of risk factors in communities (LAO)</td>
<td>Register in OPD</td>
</tr>
<tr>
<td></td>
<td>STEPs implementation</td>
<td>Improve death registration</td>
</tr>
<tr>
<td><strong>Group 2</strong> (China WAHI)</td>
<td>System of M&amp;E hasn’t established</td>
<td>To establish the system of M&amp;E.</td>
</tr>
<tr>
<td>Pilot program not expand</td>
<td>To use electronic health records effectively</td>
<td></td>
</tr>
<tr>
<td><strong>Group 3</strong> (BRU, MAC, MOG, PHL)</td>
<td>Duplication of tasks</td>
<td>Harmonization of monitoring</td>
</tr>
<tr>
<td>Monitoring of drug use, health outcomes, drugs</td>
<td>Strict in data gathering</td>
<td></td>
</tr>
<tr>
<td>Overpopulations</td>
<td>To set up medical data system</td>
<td></td>
</tr>
</tbody>
</table>
## NEXT STEPS

### Policy advocacy, stakeholder consultation

<table>
<thead>
<tr>
<th>Country</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>• Health educations for the whole people</td>
</tr>
<tr>
<td></td>
<td>• Supportive environment for smoking control, healthy diet, physical activities, etc</td>
</tr>
<tr>
<td>Cambodia</td>
<td>• Policy maker consultation with stakeholders for introducing PEN in primary health care</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>• Revise the existing policy to be address the NCD prevention and Control as the high light of the up dated policy</td>
</tr>
<tr>
<td></td>
<td>• Nationwide Dissemination the NCD Policy</td>
</tr>
<tr>
<td></td>
<td>• Set up National NCD committee including local NCD committee</td>
</tr>
<tr>
<td></td>
<td>• Advocacy among stakeholders</td>
</tr>
<tr>
<td></td>
<td>• Health system reform</td>
</tr>
<tr>
<td></td>
<td>• Introduce WHO PEN to be in place for action taken</td>
</tr>
<tr>
<td>Macao, China</td>
<td>• Modify the current NCD control program</td>
</tr>
<tr>
<td>Mongolia</td>
<td>• Develop strategy and policy on PHC</td>
</tr>
<tr>
<td></td>
<td>• Multisectoral (MOH, other ministries, NGO, WHO etc.) consultation on strengthening NCD prevention and control in PHC</td>
</tr>
<tr>
<td>Philippines</td>
<td>• Harmonize PEN in the National Lifestyle-Related Diseases Program (Q4 2012)</td>
</tr>
<tr>
<td></td>
<td>• Integrate PEN in the City-wide/Province-wide Investment Plan for Health (2013)</td>
</tr>
<tr>
<td></td>
<td>• Multisectoral action with NGAs (including CHED), LGUs, NGOs and development partners (Q4 2012)</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>• NCD Programme: Ministry of Health and the Institutes / Hospitals</td>
</tr>
<tr>
<td></td>
<td>• WHO</td>
</tr>
<tr>
<td></td>
<td>• Health System at the province (including medical village)</td>
</tr>
<tr>
<td></td>
<td>• Local government</td>
</tr>
<tr>
<td></td>
<td>• Institute of Nutrition, Health Education Center, Medical University</td>
</tr>
<tr>
<td></td>
<td>• NGOs</td>
</tr>
<tr>
<td></td>
<td>• Social Organizations: Women, Youth, Farmer, Fatherland, Parent committees</td>
</tr>
</tbody>
</table>

### Adapt PEN - Assess, identify a feasible package, reorient services, provide improved care

<table>
<thead>
<tr>
<th>Country</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>• Select some PHC centres from WAHI to assess current services</td>
</tr>
<tr>
<td></td>
<td>• Adjust the PEN according to local situation</td>
</tr>
<tr>
<td>Cambodia</td>
<td>• Adaptation of integrating management of HBP and diabetes and tobacco use as an entry point at national and provincial level</td>
</tr>
<tr>
<td></td>
<td>• Protocol of NCD risk factors screening (PA, tobacco use, BMI, blood pressure &amp; glucose, cholesterol)</td>
</tr>
<tr>
<td></td>
<td>• Integration into MCH package the screening of cervical cancer and breast examination and blood glucose tests for GDM</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>• Assessment current situation by using the guideline provided in the WHO PEN in PHC</td>
</tr>
<tr>
<td></td>
<td>• Adjust PEN in to all health care levels</td>
</tr>
<tr>
<td></td>
<td>• Set up PEN national guideline for all health care levels</td>
</tr>
<tr>
<td>Macao, China</td>
<td>• Gain the understanding and support from the bottom</td>
</tr>
<tr>
<td>Mongolia</td>
<td>• Revise health service package for PHC</td>
</tr>
<tr>
<td></td>
<td>• Conduct an assessment of capabilities of the PHC infrastructure</td>
</tr>
<tr>
<td>Philippines</td>
<td>• Assess – sampling of CCT/NHTS-PR LGUs (Q3 2012)</td>
</tr>
<tr>
<td></td>
<td>• Develop package based on results of assessment (Q42012)</td>
</tr>
<tr>
<td></td>
<td>• Develop PhilHealth benefit package following PEN – consisting of services and drugs (Q4 2012)</td>
</tr>
<tr>
<td></td>
<td>• Develop Health Information System (2013)</td>
</tr>
<tr>
<td></td>
<td>• Review implementation of Pilot Project in Pateros (Q4 2012)</td>
</tr>
</tbody>
</table>

### Drugs-policing, pricing, purchase distribution

<table>
<thead>
<tr>
<th>Country</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei Darussalam</td>
<td>• Procurement prices can be compared to the international drug price indicator in addition to the current setting where only prices from the BNF or other reference source is used</td>
</tr>
<tr>
<td></td>
<td>• Encourage Generic Prescribing &amp; Public education on Generic Drugs</td>
</tr>
<tr>
<td></td>
<td>• Improve efficiency in drug monitoring / drug availability through Health Information Technology – currently implemented in the country</td>
</tr>
<tr>
<td>China</td>
<td>• Rationale EML</td>
</tr>
<tr>
<td></td>
<td>• Improve accessibility of EM</td>
</tr>
<tr>
<td></td>
<td>• Reasonable Pricing of EM</td>
</tr>
<tr>
<td></td>
<td>• Strengthen Local government involvement in the Procurement of drugs</td>
</tr>
</tbody>
</table>
### Drugs policy, purchase distribution

<table>
<thead>
<tr>
<th>Country</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>• Adaptation of MPA essential drug list according to WHO PEN drug list</td>
</tr>
</tbody>
</table>
| Lao PDR       | • Bring in to account of price control based on the PM degree and cooperate with the concerned Ministries  
• Address the issue for exemption the tax of medicines importation  
• Negotiation and improvement on procurement procedure/mechanism  
• Promotion the Good Distribution Practice  
• Promote local production and procurement  
• Promotion of EML and RUM  |
| Macao, China  | • the current drugs supplement is sufficient to support PEN implementation  |
| Mongolia      | • Revise Essential drug list for NCD  
• Improve transparency, efficiency of procurement and requirement for quality of medicines  
• Develop a system for the control prices  |
| Philippines   | • Continue with the COMPACK program; roll-out to other LGUs  
• Harmonize with PhilHealth benefit package  |
| Viet Nam      | • Drug List  
• Distribution Essential Drug to CHC  |

### Human resource development

<table>
<thead>
<tr>
<th>Country</th>
<th>Actions</th>
</tr>
</thead>
</table>
| China         | • Re-mobilize the current human resources  
• Bring-in qualified technical staff and some volunteers  
• Traditional Chinese Medicines practitioners  |
| Cambodia      | • Develop and dissemination PEN guideline  
• Refreshment training PEN guideline  
• Reallocate or recruit more staff at PHC level  |
| Lao PDR       | • Deployment in appropriate resources by using Family Medicine Specialist in PHC  
• Capacity building among health staffs in PHC  
• Train specialist nurses  |
| Macao         | • Grouping technical personnel to implement the PEN  |
| Mongolia      | • Improve capacity building of human recourse  
• Trainings on PEN, clinical guidelines on NCD  
• Trainings volunteers and social workers  
• Promotion for PHC health workers  |
| Philippines   | • Roll-out of PEN training course – LGUs, hospitals  
• Develop of online course  
• Develop certification mechanism of health workers  |
| Viet Nam      | • Capacity building  
  - Develop documentation for training  
  - Training on hypertension, diabetes, Health promotion, NCD Management for Provincial trainers, Clinical Dr Officials Health village, School teachers and government, and departments and unions. Project Management Officer.  
  • Provide drugs and essential equipment for Hypertension treatment: measure equipment, phonendoscope, scale.  |

### Infrastructure, laboratory services

<table>
<thead>
<tr>
<th>Country</th>
<th>Actions</th>
</tr>
</thead>
</table>
| China         | • Training and qualifying lab staff  
• Remobilize the current facilities  |
| Cambodia      | • Improve laboratory capacity according to PEN  
• Provision of appropriate Logistic  |
| Lao PDR       | • Setting up of lab equipment and supply standard in PHC of essential requirements  
• Procure the set of lab equipment and supplies  |
| Macao, China  | • Current Lab system is sufficient for the PEN  |
| Mongolia      | • Due to devolved set-up, provide list of approved devices (glucometer, cholesterol meter) and guidance on partnership with level 2 laboratory facilities  
• Incorporate laboratory test in PhilHealth benefit package  |
<p>| Philippines   | • Use available medical equipment at CHC and District Preventive Centers, and Provincial Preventive Medicine Center  |
| Viet Nam      | • Use available medical equipment at CHC and District Preventive Centers, and Provincial Preventive Medicine Center  |</p>
<table>
<thead>
<tr>
<th><strong>Integrated service delivery- NCD services in current programmes</strong></th>
</tr>
</thead>
</table>
| **China** | • Identify the current available programs  
  • Establish evaluations and feedback on health programs. |
| **Cambodia** | • Integration of NCD services into relevant existing program (MCH, TB, HP unit, HIV/AIDS) including outreach activities |
| **Lao PDR** | • Combined Prevention and Control on NCD at all levels  
  • Setting up appropriate information system  
  • Increasing public awareness on NCD prevention e.g. health promotion activities |
| **Macao** | • Modify the 4 major NCD control programs |
| **Mongolia** | • Adapt training materials of NCD for PHC health workers  
  • Set up monitoring system NCD intervention in PHC |
| **Philippines** | • Drafting of Memorandum Circular/Department Order prescribing the integration of PEN in existing public health programs such as MCH, infectious and environmental health programs (ongoing) |

<table>
<thead>
<tr>
<th><strong>Financing for NCD services in PHC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cambodia</strong></td>
</tr>
</tbody>
</table>
| **Lao PDR** | • Reallocation health budget for NCD from health sector budget  
  • Internal and external Donor support |
| **Macao, China** | • The support from the superior level |
| **Mongolia** | • To improve financial management on PHC  
  (Now we’re using Capitation payment on PHC, case based payment on II, III level. Still studying which is useful for what level. End of the year payment research will be done on SOUM Health centre.  
  For the medicine outpatients in PHC centres get their medicines by prescription and 50-80 % of the price reimbursed from HIF) |
| **Philippines** | • Implementation and enhancement of PhilHealth benefit package on NCD at primary health care facilities (4th Q 2012)  
  • Municipal/City-wide/Province-wide Investment Plan for Health – DOH grants, LGU budget and NGOs (2013) |
| **Viet Nam** | • Redistribution National Budget, priority to NCD prevention and Control.  
  • National Targeted Programmes  
  • Health Insurance  
  • WHO  
  • NGO |

<table>
<thead>
<tr>
<th><strong>Recommendations for Ministry of health</strong></th>
</tr>
</thead>
</table>
| **China** | • MoH committed to implement PEN  
  • Referral system-Health policies  
  • Increase investment on preventive measures |
| **Cambodia** | • Reallocation budget for NCD at all levels  
  • Policy commitment to support NCDs operational plan  
  • Program investment plan for stakeholder invested |
| **Lao PDR** | • Restructure organization within MoH  
  • Nominate NCD focal point in MoH  
  • Setting up network from Central to local level  
  • Setting up NCD surveillance system  
  • Review the budget to make the fund available for NCD |
| **Macao, China** | • PEN Introduction |
| **Mongolia** | • Strengthen monitoring and evaluation on PHC  
  • Build sustainability of intervention with other projects  
  • Find out the way maintain financial mechanism |
| **Philippines** | • Fast-track the development and implementation of the DOH policy on PEN (by end of December 2012)  
  • Develop more trainers for PEN  
  • Review Manual of operations |
<table>
<thead>
<tr>
<th>Region</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| China        | • Translate PEN into Chinese and other languages  
• Add preventive contents into PEN  
• Add alternative medicines into PEN |
| Cambodia     | • WHO should initiated the integration of all comprehensive program such as TB, MCH, HIV/AIDS, FCTC with NCDs especially PEN management.  
• Provide technical support and advise Minister of Health to commit PEN integrated management with MCH and other CDC program |
| Lao PDR      | • Technical, operational and financial support for NCD                                                                                                                                                    |
| Macao        | • Experience exchange  
• Control model share  
• Solution share                                                                                                                                         |
| Mongolia     | • Provide technical and methodological support  
• Funding from WHO                                                                                                                                 |
| Philippines  | • Technical assistance for the baseline assessment  
• Technical support for the roll-out trainings  
• Technical support for the development of the framework for PEN implementation |
(Please check)  □ a participant
            □ a facilitator/a resource person
            □ an observer
            □ a secretariat

A. Questionnaire

Questionnaire 1 – Overall impression
Please rate your impression of this meeting by filling the applicable number.

1: Excellent  2: Good  4: Not very good  5: Not good

A. The participation in this meeting was
   Comments, if any.

B. The facilitation in this meeting was
   Comments, if any.

C. The leadership in this meeting was
   Comments, if any.

D. Transport for the meeting was
   Comments, if any.

E. Facilities of this meeting was
   Comments, if any.

F. Accommodation for this meeting was
   Comments, if any.

G. Meals of this meeting were
   Comments, if any.

H. The overall impression of this meeting was
   Comments, if any.
Questionnaire 2 – What have you achieved?
Please rate your achievement by filling the applicable number.
1: Excellent    2: Good    4: Not very good    5: Not good

Sessions 2-3: Setting the scene and country presentations
a. to understand the objectives
b. to exchange views and information in discussion
c. to learn from the experience of other countries
d. Please add any examples you actually achieved.

Session 4: Health systems and essential drugs for NCD prevention and management
a. to understand the objectives
b. to exchange views and information in discussion
c. to learn from the experience of other countries
d. Please add any examples you actually achieved.

Session 5: Learning from the field
a. to understand the objectives
b. to exchange views and information in discussion
c. to learn from the experience of other countries
d. Please add any examples you actually achieved.

Session 6: Group work
a. to understand the objectives
b. to learn the experience of other countries
c. to identify common challenges
d. to identify common solutions
e. Please indicate any specific learning from the group work.

Sessions 7-8: Field visit and approaches for NCD interventions and primary care
a. To learn the organization of NCD prevention and health care in China
b. To discuss and exchange information on NCDs in health systems
c. Please indicate any specific learning.

Session 9: Next steps for implementing/strengthening PEN in primary care
a. to exchange views and information in discussion
b. to learn from the experience of other countries
c. Please add any examples you actually achieved.
**Questionnaire 3 – Comments and suggestions**

Please let us know your comments and suggestions. Please provide a maximum of 5 comments per question.

A. How can the Package of Essential NCD interventions be introduced/strengthen in health systems?
B. What are the additional support/information that will help you to do this work?

### B. Results

#### QUESTIONNAIRE 1

<table>
<thead>
<tr>
<th>Objective</th>
<th>Excellent</th>
<th>Good</th>
<th>Not very good</th>
<th>Not good</th>
</tr>
</thead>
<tbody>
<tr>
<td>The participation in this meeting was</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>The facilitation in this meeting was</td>
<td>36%</td>
<td>64%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>The leadership in this meeting was</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Transport for the meeting was</td>
<td>32%</td>
<td>68%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Facilities of this meeting was</td>
<td>32%</td>
<td>68%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Accommodation for this meeting was</td>
<td>32%</td>
<td>60%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>Meals of this meeting were</td>
<td>17%</td>
<td>67%</td>
<td>17%</td>
<td>0%</td>
</tr>
<tr>
<td>The overall impression of this meeting was</td>
<td>22%</td>
<td>78%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

#### QUESTIONNAIRE 2

**Sessions 2-3: Setting the scene and country presentations**

to understand the objectives                                             | 36%       | 64%  | 0%            | 0%       |
to exchange views and information in discussion                           | 22%       | 78%  | 0%            | 0%       |
to learn from the experience of other countries                           | 26%       | 74%  | 0%            | 0%       |

**Session 4: Health systems and essential drugs for NCD prevention and management**

to understand the objectives                                             | 43%       | 57%  | 0%            | 0%       |
to exchange views and information in discussion                           | 30%       | 70%  | 0%            | 0%       |
to learn from the experience of other countries                           | 32%       | 68%  | 0%            | 0%       |

**Session 5: Learning from the field**

to understand the objectives                                             | 26%       | 74%  | 0%            | 0%       |
to exchange views and information in discussion                           | 30%       | 67%  | 4%            | 0%       |
to learn from the experience of other countries                           | 27%       | 73%  | 0%            | 0%       |

**Session 6: Group work**

to understand the objectives                                             | 37%       | 63%  | 0%            | 0%       |
to learn the experience of other countries                                 | 31%       | 69%  | 0%            | 0%       |
to identify common challenges                                             | 37%       | 63%  | 0%            | 0%       |
to identify common solutions                                               | 13%       | 79%  | 8%            | 0%       |

**Sessions 7-8: Field visit and approaches for NCD interventions and primary care**

to learn the organization of NCD prevention and health care in China     | 24%       | 76%  | 0%            | 0%       |
to discuss and exchange information on NCDs in health systems             | 8%        | 84%  | 8%            | 0%       |

**Session 9: Next steps for implementing/strengthening PEN in primary care**

to exchange views and information in discussion                           | 36%       | 64%  | 0%            | 0%       |
to learn from the experience of other countries                           | 36%       | 64%  | 0%            | 0%       |
Regional Consultation on Strengthening NCD Prevention and Control in Primary Health Care

Background Paper on CVD Risk Reduction

August 2012
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Prepared by:

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Auckland, New Zealand
I. INTRODUCTION

Cardiovascular disease (CVD) is a major cause of disability and premature death throughout the world.\textsuperscript{1} The underlying cause is atherosclerosis (narrowing of the arteries) (Figure 1); this process develops over many years and is usually advanced by the time that symptoms occur. Symptoms commonly present in middle age, but atherosclerosis does affect some high risk individuals in their 20s.

Figure 1. Process of atherosclerosis and a photo of narrowed artery

The process can start with a tear in the wall (especially if the blood pressure is high, the blood glucose is high or the person is a smoker) and fat in the blood sticks to the wall and forms a plaque. A CVD event occurs when the plaque breaks (ruptures) and causes a blood clot to form, which in turn stops the blood supply to one or more of the organs of the body.

A CVD event includes damage to the arteries of the heart (coronary heart disease or CHD), brain (cerebrovascular disease or CeVD), kidneys and legs (peripheral vascular disease or PVD). Acute CVD occur as strokes (in the brain) and as acute coronary events (heart attacks). They can also occur suddenly, even causing death before health care attention can be given.
II. RISK FACTORS FOR CVD

There are a number of factors that contribute to CVD events. These can be grouped as modifiable and non-modifiable.

a. Modifiable risk factors

1. Smoking

   This is a major cause of CVD and it is modifiable. Smoking also causes many cancers and lung disease. There is no safe level of smoking. There are many ways of reducing the risk of smoking such as banning smoking in public, raising taxes (very effective), medication and individual therapies such as counselling (Wheel of change). ³ Most smokers give up without any help from health professionals.

2. Blood sugar (as in diabetes)

   The food we eat is turned into a form of sugar in the blood called glucose. When the levels of blood sugar get too high, the patient is said to have diabetes. Diabetes can be prevented and treated with reducing food intake and exercising as well as medication. It is modifiable.

3. High cholesterol (fat in the blood)

   Cholesterol is a term used for fat in the blood. Most of the cholesterol made in our bodies is a response to eating fatty foods. Less than 30% comes from the food we eat.⁴ There are many types of fat but the ones commonly discussed are HDL (the good fat) and LDL (the bad fat). It is good to have a combination of both high HDL and a low LDL. The term that is commonly used is total cholesterol (TC), which is where three forms of fat in the blood are added together to make a total. This is a modifiable risk factor and can be improved by losing weight, eating food that increases HDL, and by losing weight and/or using medication. Clinicians often refer to a ratio of TC/HDL. When this ratio has a score of < 4.5 the patient is considered to be of lower CVD risk than when it is > 4.5.

4. Systolic blood pressure (SBP)

   This is the pressure exerted in the blood vessels from the heart contracting. Previously, the diastolic blood pressure (when the heart relaxes) was used to predict CVD. Now we know that systolic blood pressure is a more important predictor of CVD. The systolic BP is also easier to measure. This is modifiable through lowering the intake of salt, exercise, drinking less alcohol and losing weight. Relaxation may also be effective.⁵ SBP can also be lowered with medication.

   The risk of CVD events rise with rising levels of blood pressure and glucose and the same applies for cholesterol.⁶
5. Family history of early heart disease

A family history of heart disease occurs when a first degree male relative (e.g. father or brother) dies before the age of 55 years or a first degree female relative died before the age of 65 years due to CVD. This is most commonly due to cholesterol in the blood and, as such, requires special tests. In places where smoking is common, it can be difficult to decide if an early death is due to smoking or to a positive family history for CVD. When a person has a strong family history of CVD, they usually require medication to lower their blood pressure or cholesterol at an early age. To that extent, this is modifiable.

b. Non modifiable risk factors

1. Age

Figure 2 shows that age is an important risk factor as risk increases with age. It is not modifiable.

2. Sex

Men have a higher risk of CVD than women. It is not clear why this is but it may have something to do with the hormone, oestrogen. In women, oestrogen decreases at the time of menopause while the risk of heart disease starts to increase to levels typically seen in men. Sex, as a risk factor, is also not modifiable.

3. Previous CVD event

Individuals are at much higher risk after a CVD event. This usually warrants medication especially if the event occurs at a young age < 35 years.
III. APPROACH FOR TOTAL CVD RISK MANAGEMENT

a. Individual risk factor approach

Individuals can have multiple risk factors which can be treated individually. There is a move to consider the composite (multifactorial) risk rather than individual risk factors.

Table 1 shows the summary of advantages and challenges of treating individuals compared to composite risk.

Table 1. Advantages and challenges of treating individual risk factors

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinicians can easily identify patients with specific “elevated risk factors” and match specific drugs to treat these factors. It is easy to communicate this to patients but a clinician needs to know where to start.</td>
<td>Patients and lost clinicians have been trained to think in terms of individual risk factors. E.g. I am a diabetic. Individual risk factors are poor predictors of CVD risk and of the potential to benefit from treatment.6</td>
</tr>
<tr>
<td>Patients with high cholesterol may have an unknown genetic condition and hence will be treated for that condition (although the serum cholesterol is an imperfect measure of CVD).</td>
<td>Patients may have high blood pressure but no other risk factors. These patients may be exposed to medication risks when their total risk of CVD is low. Single risk factors will need treatment if they are very high-even in the absence of other risk factors.</td>
</tr>
<tr>
<td>There is a large rct* evidence base demonstrating the benefits of treating individual risk factors but a lack of direct rct evidence about when to start the benefits of treating CVD risk</td>
<td>Risk of over-treating those at low risk. There are cost and harm implications of treatment.</td>
</tr>
</tbody>
</table>

*rct= randomised controlled trial which is a type of study in which we can have confidence in the findings of studies (a high level of evidence)

The most cost-effective way of managing CVD risk is to treat those at high risk.8 The lower the risk, the more expensive it is to get any benefit.
b. Multiple risk factors

Individual risk factors do not contribute significantly to the risk of CVD. However, when risk factors add up they increase CVD risk. Figure 2 shows the addition of each risk factor to the total risk of CVD.

**Figure 2. Absolute risk of CVD over 5 years in patients by blood total cholesterol at specified levels of other risk factors**

The reference group in figure 2 is a 50 year old woman who does not have diabetes, has a systolic blood pressure of 110 mmHg and an HDL cholesterol of 1.6 mmol/l and each coloured bar represents a total cholesterol of 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5 and 9 mmol/l. The highest risk of CVD over 5 years is 2% which means that 2 people out of every 100 with this risk pattern will have a CVD event.

The second set of bars shows the same except the systolic blood pressure is 170 mmHg. The highest risk in this group is 6%. The third set of bars shows the same as the previous group but now the person is a smoker. The highest risk in this group is 12%. The fourth set of bars makes the person have a HDL cholesterol of 1 mmol/l and the highest risk in this group is 18%. The fifth set of bars makes the woman become a man. The highest risk in this group is 23%. The sixth set of bars adds diabetes to the previous bars. The highest risk in this group is 32%. The 7th and final set of bars makes the person 60 years old and the highest risk in this group is 43%.
A key message on this graph is that smoking is the most important contributor to risk in that it doubles the risk of CVD. All the rest increase risk but not by as much as what smoking does other than a 60 mmHg rise in blood pressure (which is a very high blood pressure in an individual and in this case such as increase triples the risk from 2% to 6%). It also shows the contribution of multiple risk factors to the overall risk of CVD.

Approaches for CVD risk scoring

1. **Risk tables**

   The early risk tables and guidelines focussed on the treating of individual risk factors, such as stopping smoking, lowering blood pressure, cholesterol and reducing blood sugar levels (in diabetics), were developed in New Zealand (NZ).\(^9\)\(^10\) They were based on the Framingham heart study, a 1950s American Cohort.\(^11\) This study was of men and women who were not treated for risk factors for CVD as there were few pills available at the time. There has been a follow up study of the children of the original study participants.\(^12\)

   The risk of CVD can be assessed using risk factors (Table 2) categorized by those that are commonly used in risk tables and those that are not. However, some of these risk factors are not used in assessing CVD as they are either too difficult to measure (e.g. enlarged heart) or are related to other risk factors (so as not to double count the impact of these risk factors). Risk tables usually express risk over a 5 to 10 year period.

### Table 2. Risk factors contributing to CVD

<table>
<thead>
<tr>
<th>Used in risk tables</th>
<th>Percentage of CVD explained by risk factors (^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>√</td>
</tr>
<tr>
<td>Smoking status</td>
<td>√ 36% ↑</td>
</tr>
<tr>
<td>Gender</td>
<td>√</td>
</tr>
<tr>
<td>Diabetes or measure of blood sugar</td>
<td>√ 10% ↑</td>
</tr>
<tr>
<td>Cholesterol (fat) measure in blood</td>
<td>√ 49% ↑</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>√ 18% ↑</td>
</tr>
<tr>
<td>HDL (good cholesterol)</td>
<td>√</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>√</td>
</tr>
<tr>
<td>Family history of premature CVD (CHD or stroke in 1(^{st}) degree relative)</td>
<td>√</td>
</tr>
<tr>
<td>Family history of diabetes or kidney disease in 1(^{st}) degree relative</td>
<td></td>
</tr>
<tr>
<td>Previous CVD event</td>
<td>√</td>
</tr>
<tr>
<td>Enlarged heart</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>√ 20% ↑</td>
</tr>
<tr>
<td>Risk Factor</td>
<td>Percentage</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Physical activity</td>
<td>12% ↓</td>
</tr>
<tr>
<td>Premature menopause</td>
<td></td>
</tr>
<tr>
<td>Raised levels of inflammatory markers in the blood</td>
<td></td>
</tr>
<tr>
<td>(e.g. C reactive protein etc.)</td>
<td></td>
</tr>
<tr>
<td>Raised pulse rate</td>
<td></td>
</tr>
<tr>
<td>Protein in urine</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic deprivation</td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>7% ↓</td>
</tr>
<tr>
<td>Psychological</td>
<td>30% ↑</td>
</tr>
<tr>
<td>Explained by the above</td>
<td>90%</td>
</tr>
</tbody>
</table>

↓ means a reduction in CVD risk and ↑ means an increase in risk

2. **WHO/ISH** (World Health Organisation/International society of hypertension) **risk prediction charts**

The WHO/ISH risk prediction charts indicate 10-year risk of a fatal or nonfatal major cardiovascular event (myocardial infarction or stroke), according to age, sex, blood pressure, smoking status, total blood cholesterol and presence or absence of diabetes mellitus for 14 WHO epidemiological sub-regions.

**Figure 3. WHO/ISH risk prediction chart for WPR B**

![WHO/ISH risk prediction chart for WPR B](image)
The charts provide approximate estimates of CVD risk in people who do not have established coronary heart disease, stroke or other atherosclerotic disease. They are useful as tools to help identify those at high cardiovascular risk, and to motivate patients, particularly to change behaviour and, when appropriate, to take antihypertensive, lipid-lowering drugs and aspirin (to prevent blood clots in the narrowed arteries).

For example, a man from China, aged 60 years, is a smoker, has diabetes, and whose systolic blood pressure is 140mmHg. His risk is 30 to 40% (see black dot on figure 4). This is very high and would warrant treatment with cholesterol lowering pills and multiple blood pressure pills. He may or may not be given aspirin.

3. Probability of an event

Risk tables calculate the risk of a CVD event based on a number of risk factors. The probability of 5% in the next 10 years means that for every 100 people with certain combination of risk factors, 5 will have a CVD event in the next 10 years. The risk tables in this book refer to primary prevention, i.e. before a CVD event has occurred. Those who have had an event are considered to all be at high risk, e.g. >30%. However, it is possible for a person who has not had a CVD event to have a greater risk probability than a person who has had a CVD event.

Table 3 shows the impact of changing risk factors on risk. This highlights that the highest risks occur in smokers and diabetics. (based on tables for WPR B region)

**Table 3. Varying levels of risk factors and its CVD 10-year risk in males**

<table>
<thead>
<tr>
<th>Person</th>
<th>Smoking status</th>
<th>SBP</th>
<th>Diabetes</th>
<th>CVD 10 year risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 year old male</td>
<td>Smoker</td>
<td>SBP-140</td>
<td>No Diabetes</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>40 year old male</td>
<td>Smoker</td>
<td>SBP 140</td>
<td>Diabetes</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>40 year old male</td>
<td>Smoker</td>
<td>SBP 180</td>
<td>No Diabetes</td>
<td>30 to 40 %</td>
</tr>
<tr>
<td>40 year old male</td>
<td>Smoker</td>
<td>SBP 180</td>
<td>Diabetes</td>
<td>≥40%</td>
</tr>
<tr>
<td>40 year old male</td>
<td>Non-smoker</td>
<td>SBP-140</td>
<td>No Diabetes</td>
<td>&lt; 10%</td>
</tr>
<tr>
<td>40 year old male</td>
<td>Non-smoker</td>
<td>SBP 140</td>
<td>Diabetes</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>40 year old male</td>
<td>Non-smoker</td>
<td>SBP 180</td>
<td>No Diabetes</td>
<td>10 to 20%</td>
</tr>
<tr>
<td>40 year old male</td>
<td>Non-smoker</td>
<td>SBP 180</td>
<td>Diabetes</td>
<td>30 to 40 %</td>
</tr>
</tbody>
</table>
Table 4. Varying levels of risk factors and its CVD 10-year risk in females

<table>
<thead>
<tr>
<th>Person</th>
<th>Smoking status</th>
<th>SBP</th>
<th>Diabetes</th>
<th>CVD 10 year risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 year old female</td>
<td>Smoker</td>
<td>SBP-140</td>
<td>No Diabetes</td>
<td>&lt; 10%</td>
</tr>
<tr>
<td>60 year old female</td>
<td>Smoker</td>
<td>SBP 140</td>
<td>Diabetes</td>
<td>10 to 20%</td>
</tr>
<tr>
<td>60 year old female</td>
<td>Smoker</td>
<td>SBP 180</td>
<td>No Diabetes</td>
<td>≥ 40%</td>
</tr>
<tr>
<td>60 year old female</td>
<td>Smoker</td>
<td>SBP 180</td>
<td>Diabetes</td>
<td>≥ 40%</td>
</tr>
<tr>
<td>60 year old female</td>
<td>Non-smoker</td>
<td>SBP-140</td>
<td>No Diabetes</td>
<td>&lt; 10%</td>
</tr>
<tr>
<td>60 year old female</td>
<td>Non-smoker</td>
<td>SBP 140</td>
<td>Diabetes</td>
<td>&lt; 10%</td>
</tr>
<tr>
<td>60 year old female</td>
<td>Non-smoker</td>
<td>SBP 180</td>
<td>No Diabetes</td>
<td>20% to 30%</td>
</tr>
<tr>
<td>60 year old female</td>
<td>Non-smoker</td>
<td>SBP 180</td>
<td>Diabetes</td>
<td>≥ 40%</td>
</tr>
</tbody>
</table>

Figure 4 shows the risk of 10-year CVD risk using risk tables for China demonstrating the increase in risk by adding the risk factors of diabetes, systolic blood (20 mmHg) pressure and age (20 Years). N.B. 40% is very high and equivalent to a person who has already had a CVD event.
IV. SERVICE PROVISION

(with permission from WONCA Dr Tiago Villanueva (Portugal) Prof Michael Kidd (Australia)

It is essential that prevention and control of CVD risk be based in primary health care settings. (WHO/EURO, 1998) reflects the culmination of a European-wide consultative process over almost a decade, initiated by the World Health Organization Regional Office for Europe. This group summarized the attributes of family practice (primary health care) as follows.

- **General.** Family practice addresses the unselected health problems of the whole population; it does not exclude certain categories of the population because of age, sex, social class, race or religion, or any category of complaint or health-related problem. It must be easily accessible with a minimum of delay; access to it is not limited by geographical, cultural, administrative or financial barriers.

- **Continuous.** Family practice is primarily person-centred rather than disease-centred. It is based on a long-standing personal relationship between the patient and the doctor, covering, individuals' health care longitudinally over substantial periods of their lives and not being limited to one particular episode of an illness.

- **Comprehensive.** Family practice provides integrated health promotion, disease prevention, curative care, rehabilitation, and physical, psychological and social support to individuals. It deals with the interface between illness and disease, and integrates the humanistic and ethical aspects of the doctor-patient relationship with clinical decision-making.

- **Coordinated.** Family practice can deal with many of the health problems presented by individuals at their first contact with their family physician but, whenever necessary, the family physician should ensure appropriate and timely referral of the patient to specialist services or to another health professional.

- **Collaborative.** Family physicians should be prepared to work with other medical, health and social care providers, delegating to them the care of their patients whenever appropriate, with due regard to the competence of other disciplines. They should contribute to and actively participate in a well-functioning multidisciplinary care team and must be prepared to exercise leadership of the team. Need to up skill administration and nursing staff e.g. we have nurses who suture, start insulin etc.

- **Family-oriented.** Family practice addresses the health problems of individuals in the context of their family circumstances, their social and cultural networks, and the circumstances in which they live and work. Need to deal with issues around language and health literacy
Community-oriented. The patient's problems should be seen in the context of his or her life in the local community. The family doctor should be aware of the health needs of the population living in this community and should collaborate with other professionals, agencies from other sectors and self-help groups to initiate positive changes in local health problems. Working from a similar conceptual framework, the College of Family Physicians of Canada has defined four principles that underlie family medicine.

The importance of Primary Health Care

Community-wide studies of whole populations also reflect the impact of primary care physicians on the quality of care. An analysis of mortality rates from cancer, heart disease and stroke, the three primary causes of death in the United States, showed a consistent relationship between availability of primary care physicians and positive health levels, including a decrease in the number of residents stricken with or dying from these diseases.¹⁴

This study also showed that higher numbers of primary care physicians correlated with lower infant mortality rates, lower overall mortality and higher life expectancy. Sub-analyses of the data indicated that these results were primarily due to the influence of the family doctor, an association that held after correcting for the effect of urban-rural differences, poverty rates, education, and lifestyle factors. It is of interest that a higher number of hospital beds or of specialists was not associated with a lower death rate or longer life span.

Other investigators have shown that expenditure on care for the elderly in the United States was lower in areas of the country with high ratios of primary care physicians to population and this ratio was found to be the only consistent predictor of improved age-specific mortality rates, even when considering such variables as educational levels, poverty and living in rural areas.

A study on the impact of primary care in 12 European and North American countries showed that those with more highly developed systems of primary care (mainly composed of general practitioners) tend to have lower health care costs, and that the lower cost is achieved without an increase in mortality rates and with significantly improved health outcomes as measured by 14 health indicators, including birth weight, neonatal mortality, infant mortality and age-adjusted life expectancy.¹⁵ These studies should convince decision makers of the quality and effectiveness of services provided by family doctors.
V. TOTAL CVD RISK MANAGEMENT IN PRIMARY CARE IN NEW ZEALAND

CVD is a major cause of premature death in New Zealand. However rates have fallen from a high level in the mid-1960s and have continued to fall until the present day. The most likely cause of this reduction is the decrease in consumption of saturated fats (butter and fatty meat), the reduction in tobacco consumption and the widespread use of CVD reducing pills.

In New Zealand primary health care is funded in part by the government and in part by co-payment from patients. The government funding is a capitation scheme (a fixed payment per person based on their age, sex and ethnicity and a measure of socio-economic status based on their address). In many practices there is no payment for children but this is at the discretion of the practice. The secondary care system is fully government funded. There is also a private secondary health system which only deals with elective health issues such as elective surgery. There is also a no-fault accident scheme which can pay for all or part of treatment required if there is an injury as the result of an accident. This includes payment for time off work and permanent disability payments. Maternity is fully covered by the government but patients can opt out and use a private system which needs to be fully funded by the patient.

New Zealand was the first country to develop risk tables in the form that the WHO now use. They first appeared in 1992 as blood pressure guidelines and were in black and white. In 1995 they became coloured in line with their European equivalent and in 2003 became focussed on total cardiovascular risk rather than high blood pressure.

a. Identification of those at risk

Screening for CVD risk factors is recommended for all men aged 45 years and above and all women 55 years and above. For those who are Maori or of Pacific Island identity or Indo-Asian (Fijian Indian, Sri Lankan, Afghani, Bangladeshi, Nepalese, Pakistani and Tibetan) should all have their risk assessed 10 years earlier.

Others warranting a risk assessment at 35 for men and 45 for women include diabetes in a first degree relative (parent or sibling), premature CVD in a first degree relative, people who smoke, have had gestational diabetes, BP \( \geq 160/95 \) or TC:HDL \( \geq 7 \). Pre-diabetes, body mass index (BMI) \( \geq 30 \), or waist circumference \( \geq 100 \) cm in men or \( \geq 90 \) in women or poor kidney function eGFR < 60 ml/min/1.73 m2.

Screening is now done using computers. Almost all general practice consultations are done using computers and virtually all prescriptions are written through a computer. This is accessible at [http://www.heartfoundation.org.nz/programmes-resources/health-professionals/your-heart-forecast/Your-Heart-Forecast-Online-Tool](http://www.heartfoundation.org.nz/programmes-resources/health-professionals/your-heart-forecast/Your-Heart-Forecast-Online-Tool) which is a free web tool (see figures 6,7,8,9).
Figure 5. Homepage of “Your Heart Forecast”

Figure 6. This shows a 60-year-old man with 10 years of diabetes who is a smoker and has a blood pressure of 150/80 and a total cholesterol to HDL ratio of 4.
Figure 7. This shows what will happen to the above man if he does not stop smoking and does not get his risk factors modified.

Figure 8. This figure shows how the clinician or patient can enter their mobile phone number and email and send their results to themselves or to whomever may be interested in their risk results.
b. Pharmacological interventions

Table 5 presents the drugs and daily doses, where those in asterisk constitutes the second line of treatment while the rest are the first line (all medications shown are available as generic, i.e. no-name brand).

Table 5. Drugs and daily doses

<table>
<thead>
<tr>
<th>Blood pressure lowering</th>
<th>Name of BP lowering drug</th>
<th>Daily dose range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chlorthalidone</td>
<td>12.5 mg to 25 mg</td>
</tr>
<tr>
<td></td>
<td>Hydrochlorothiazide</td>
<td>12.5 mg to 25 mg</td>
</tr>
<tr>
<td></td>
<td>Bendrofluazide</td>
<td>1.25 mg to 2.5 mg</td>
</tr>
<tr>
<td>ACEI (angiotensin converting enzyme inhibitors)</td>
<td>Captopril</td>
<td>6.25 to 50 mg 3 x daily</td>
</tr>
<tr>
<td></td>
<td>Enalapril</td>
<td>2.5 to 20 mg 2 x daily</td>
</tr>
<tr>
<td></td>
<td>Lisinopril</td>
<td>5 mg to 80 mg daily</td>
</tr>
<tr>
<td>CCBs (calcium channel blocker)</td>
<td>Amlodipine</td>
<td>5 to 10 mg daily</td>
</tr>
<tr>
<td></td>
<td>Felodipine</td>
<td>2.5 mg to 20 mg daily</td>
</tr>
<tr>
<td>Beta blockersa</td>
<td>Propranolol*</td>
<td>80 mg twice daily*</td>
</tr>
<tr>
<td></td>
<td>Metoprolol*</td>
<td>47.5 mg to 190 mg daily*</td>
</tr>
<tr>
<td>Cholesterol lowering</td>
<td>Name of cholesterol drug</td>
<td>Daily dose range</td>
</tr>
<tr>
<td>Statins</td>
<td>Simvastatin</td>
<td>10 mg to 40 mg at night</td>
</tr>
<tr>
<td></td>
<td>Atorvastatin</td>
<td>10 mg to 80 mg daily</td>
</tr>
<tr>
<td>Antiplatelet therapyb</td>
<td>Name of antiplatelet therapy</td>
<td>Daily dose range</td>
</tr>
<tr>
<td>Aspirin</td>
<td></td>
<td>75 to 100 mg daily</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td></td>
<td>75 mg daily</td>
</tr>
<tr>
<td>Hypoglycaemic drugs</td>
<td>Name of drugs</td>
<td>Daily dose range</td>
</tr>
<tr>
<td>Metformin</td>
<td></td>
<td>500 mg to 1 gm 3x daily</td>
</tr>
<tr>
<td>Sulfonylurea medications*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a atenolol is not mentioned here as there is some doubt as to how effective it is compared with other Beta blockers such as metoprolol.

b Antiplatelet therapy stops blood clots in the blood vessels


c. Thresholds for pharmacological interventions

The risk of CVD can be reduced and there is no threshold for intervening. Even a risk of 1% over 10 years can be reduced to below 0.5% risk with lifestyle change and medication use. The grey line on the table below shows the risk threshold for New Zealand, which is 15% over 5 years. Tables 6, 7, 8 show a range of thresholds.

Table 6 shows the effect of lowering cholesterol through giving atorvastatin (a powerful statin) which can cause a 40% reduction in cholesterol when the LDL cholesterol is reduced by 2 mmol/l, thus a 40% reduction against a range of baseline risks. The grey
line shows 15% 5 year risk of CVD risk which is the New Zealand threshold for treating CVD risk.

**Table 6. Effect of administration of Atorvastatin in reducing risks**

<table>
<thead>
<tr>
<th>Reduce cholesterol</th>
<th>Baseline risk</th>
<th>Risk of CVD after a drop of 2 mmol/l in LDL i.e. a 40% reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Similarly, the effect of lowering blood pressure using pills can cause a 30% reduction in blood pressure (Table 7), which is a 30% reduction against a range of baseline risks. The grey line shows 15% 5 year risk of CVD risk which is the New Zealand threshold for treating CVD risk.

**Table 7. Effect of administration of pills to lower blood pressure in reducing risks**

<table>
<thead>
<tr>
<th>Reduce BP</th>
<th>Baseline risk</th>
<th>Risk after a 30% reduction in risk assuming a drop of systolic BP 10 mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>5%</td>
<td>3.5%</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>21%</td>
</tr>
</tbody>
</table>

Table 8 shows the reduction of CVD risk by giving aspirin 75 mg to 100 mg per day, which causes reduction of CVD risk to 25%. The grey line shows 15% 5 year risk of CVD risk which is the New Zealand threshold for treating CVD risk. There is a fixed risk of harm which is 0.9%.

**Table 8. Effect of administration of aspirin in reducing CVD risk**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Baseline risk</th>
<th>Risk after giving low dose aspirin</th>
<th>Risk of a bleed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5%</td>
<td>3.75%</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>10.5%</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>10.5%</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>15%</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>22.5%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>
d. Service provision - scenarios

Delivery of health services is described in detail in three different communities: a village with a health care assistant, a village with a nurse and some finger blood testing equipment and a doctor in a standard clinic.

1. Community setting with a health care assistant (HCA) and no laboratory testing available

Case 1: A 50 year old illiterate man presents for a CVD risk assessment. He is a smoker, his BMI is 24, and he has never had a CVD event nor does he have a family history of CVD. The HCA estimates the patient’s heart age (table based your heart forecast tool at http://www.heartfoundation.org.nz/programmes-resources/health-professionals/your-heart-forecast/Your-Heart-Forecast-Online-Tool) at between 40 and 75 years (table 4) and encourages him to stop smoking. He may wish to advise the man to take a cholesterol lowering pill and perhaps an aspirin and be more insistent if the man does not stop smoking. He would not be able to offer him blood pressure lowering medication as he has no way of measuring blood pressure. The patient would get his medication in individual tablets and provided with a plastic blister pack to assist him in remembering his medications. He may wish to use a reusable blister pack (Photo 2). If blister packs are not available, he would be advised to put each day’s pills into a bowl. He can collect his medication from the local grocery store.

Photo 2. This shows a picture of a plastic blister pack that can be reused and can hold 7 days of pills

Table 9 presents the heart disease risk by heart age 50 yr old man, his cholesterol cannot be checked and nor can his blood sugars. He is a smoker and has a BP of 175 systolic.
Table 9. Heart disease risk by heart age of a 50-year old man

<table>
<thead>
<tr>
<th>Systolic BP (mmHg)</th>
<th>Non smoker</th>
<th>Smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td>175</td>
<td>60 years</td>
<td>75 years●</td>
</tr>
<tr>
<td>150</td>
<td>60 years</td>
<td>70 years</td>
</tr>
<tr>
<td>125</td>
<td>50 years</td>
<td>60 years</td>
</tr>
<tr>
<td>100</td>
<td>40 years</td>
<td>50 years</td>
</tr>
</tbody>
</table>

2. **Community setting with a nurse (HCA) who can do a blood test for cholesterol and a blood test for diabetes.**

Case 2: A 50 year old woman, illiterate, presents for a CVD risk assessment. She is a smoker and her BMI is 24. She has never had a CVD event and does not have a family history. The nurse checks her blood pressure at her upper arm and the systolic BP is 175 mmHg. Her total cholesterol is 5 mmol/l and her glucose is 20 mmol/l (suggesting she has diabetes) using an electronic blood testing device. There is good evidence that non health workers can use electronic blood pressure machines to check blood pressure in similar settings so this is an option in this setting.16 Looking at the risk table (figure 3) and assuming the total cholesterol is 5 mmol/l and the HDL cholesterol is 1 mmol/l. The nurse estimates the person’s risk of CVD is 10 to 20% over the next ten years. She encourages her to stop smoking and offers her medication. This could include a cholesterol lowering pill (table 5) a blood pressure lowering pill and possibly a low dose aspirin tablet. She will need metformin to help control her diabetes. She would get her medication in individual tablets provided with a plastic blister pack to assist her in remembering his medications. If these are not available, she would be advised to put her pills into a bowls marked out for each day. She can collect her medication from the local grocery store. The nurse can follow her up every 3 to 6 months to check her blood pressure, blood sugars and cholesterol and to see how she is doing with quitting smoking.

Photo 1. Picture of a specially made wrist blood pressure cuff

**Wrist blood pressure monitoring**

Blood pressure can be checked at the wrist (photo 1) using a wrist cuff. There are proper wrist blood pressure machines and cuffs meant for the upper arms should not be used at the wrist unless no other cuff is available. The wrist blood pressure is similar to that obtained on the upper arm and has the advantage of not needing a wide cuff in overweight patients.23
3. **A doctor who has access to all developed country equipment, i.e. who can do a blood test for cholesterol and a blood test for diabetes**

Case 3: A 50 year old female accountant presents for a CVD risk assessment. She is a smoker and her BMI is 24. She has never had a CVD event and does not have a family history. The doctor checks her blood pressure at her upper arm and the systolic is 175 mmHg. Her total cholesterol is 5 mmol/l and her blood sugar is 70 mmol/l (suggesting she has diabetes). The doctor looks at the risk table (Figure 4) and estimates the person’s risk of CVD is 10 to 20% over the next ten years. She encourages her to stop smoking and offers her medication. This could include a cholesterol lowering pill (table 5) a blood pressure lowering pill and possibly a low dose aspirin tablet. She will need metformin to help control her diabetes. She would get her medication in individual tablets and provided with a plastic blister pack to assist her in remembering to take her pills. If they are not available she would be advised to use the bowl as in the case above. She can collect her pills from the local grocery store or pharmacy. The clinic nurse can follow her up every 3 to 6 months to check her blood pressure, blood sugars and cholesterol and see how she is doing with quitting smoking.

e. **Lifestyle advice**

**Smoking cessation.** All non-smokers should be encouraged not to start smoking (especially teenagers). All smokers should be strongly encouraged to quit smoking by a trained person (not necessarily a health profession) and supported in their efforts to do so. The use of other forms of tobacco (e.g. Snus a form of chewing tobacco) should be discouraged. The majority of smokers wish to quit e.g. 53% of smokers in China wish to quit compared with 85% in the USA.¹⁸

**Dietary changes.** All individuals should be strongly encouraged to reduce total fat and saturated fat intake. Total fat intake should be reduced to about 30% of calories. Saturated fat (e.g. butter and fatty meat) to less than 10% of calories; trans fatty acids intake should be reduced as much as possible or eliminated; and most dietary fat be poly unsaturated (up to 10% of calories) or monounsaturated (e.g. avocado, peanut, canola oil – oils that are liquid at room temperature). All individuals should be strongly encouraged to reduce daily salt intake by at least one third and if possible to < 5 g or < 90 mmol per day (the average in most countries is between 150 and 300 mmol/day). All individuals should be encouraged to eat at least 400 g a day of a range of fruits and vegetables as well as whole grains and pulses.

**Physical activity.** All individuals should be strongly encouraged to take at least 30 minutes of moderate physical activity (e.g. brisk walking) a day through leisure time, daily tasks and work-related physical activity.
**Alcohol intake.** Individuals who take more than 3 units of alcohol per day should be encouraged to reduce to less than two units per day (one unit = 570 mls of 5% alcohol beer; 100 mls of wine (10%) alcohol)

**Weight control.** All individuals who are overweight or obese should be encouraged to lose weight through a combination of reduced-energy diet (dietary advice) and increased physical activity.

f. **Referral services**

Referral to secondary care may be considered at the following thresholds. This will depend on local protocols and what facilities are available. Once seen in secondary care many patients (below) could have on going care in primary care.

1. BP ≥ 140 ≥ 80 and age <40 to exclude secondary hypertension.
2. Known heart disease, stroke, diabetes mellitus (DM), kidney disease, angina, claudication, transient ischemic attack, worsening heart failure in case hospital based treatment is needed.
3. Raised blood pressure in diabetes mellitus (≥ 130/80)
4. Protein in the urine
5. Newly diagnosed blood glucose >14 mmol/l despite maximal metformin with or without sulphonylurea
6. DM with fasting blood glucose >14 mmol/l despite maximal metformin with or without sulphonylurea.
7. DM with severe infection and/or foot ulcers
8. DM with recent deterioration of vision or no eye exam in two years

**g. How to improve compliance?**

A systematic review of the evidence to improve the taking of cholesterol medication found no method of improving adherence (i.e. more likely to take their medication.19 The same applies to improving the adherence to taking blood pressure lowering medication.20 Nurse or pharmacist led care may be a promising way forward, with the majority of RCTs being associated with improved blood pressure control and mean SBP and DBP but these interventions require further evaluation. Appointment reminder systems also require further evaluation due to variability in studies and small trial numbers, but the majority of trials increased the proportion of individuals who attended for follow-up and in two small trials also led to improved blood pressure control. Blister packs are another way of increasing compliance.21
h. Financial protection

At the national level

Pharmac reference pricing. Pharmac is the Pharmaceutical management agency which funds medicines for the New Zealand Government. It has been successful in using a form of negotiation called reference pricing.

This involves approaching a pharmaceutical company and offering to fund a new medication at a high level if they will allow an older medicine drug A (but still on patent) to be funded at a very low level. Then they approach other companies and announce that they will fund all medicines in the same class as drug A at the low rate. If the other companies do not accept that low rate their product receives a part charge.

The New Zealand public is reluctant to pay part charges for medicines that do not provide any relief of symptoms such as blood pressure lowering and cholesterol lowering medicines. This has enabled New Zealand to keep a tight control on the medicines budget which has risen very little over the past 15 years. Reference pricing is less of an issue now for primary care medicines as most of them are available in a generic formulation which automatically reduces the price for the class of medicine.

Figure 9 shows the annual expenditure of Pharmac from 2000 to 2011 (i.e. the total cost of medicines in New Zealand).

Figure 9. Annual expenditure of Pharmac, 2000-2011
Individual financial protection

It is important that cost is not a barrier to health care. Primary Health Care should ideally be free at the point of care so as to encourage access. For example health care is free in Cuba and expensive in the United States yet Cuba spends just a fraction of its gross national product < $10,000/year on health care compared with the United States GNP= $34,000. The life expectancy of Cubans is the same as Americans (76 years). Many countries use a social insurance mechanism e.g. Canada where it is compulsory to have health insurance. In other countries it may come from income tax as in the United Kingdom.
Acknowledgements

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References