Regional Consultation and Partners’ Forum on NCD Surveillance and Monitoring

Bangkok, Thailand
September 17 – 19, 2018

Final Report

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New Delhi
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Executive Summary

NCD prevention and control is a regional and a national priority in South-East Asia. Regional Director has identified it as one of the four flagship priorities. Regular monitoring of NCD risk factors, mortality and other relevant service utilization and programmatic indicators is a must to evaluate and shape the current and future NCD policy and programs and ensuring efficient use of limited resources available. Conducting and organizing surveillance for NCDs is a relatively new concept in most of the member states. It differs substantially from that of communicable diseases surveillance (where systems have been set up long ago with substantial investments in past several decades) both technically and in terms of resource availability.

Hence, a Regional consultation on NCD surveillance and monitoring and Partners’ Forum was organized from September 17-19, 2018 in Bangkok, Thailand with the following objectives:

1. To analyze the status of national NCD surveillance and monitoring systems, and identify tangible actions to strengthen them:
   a. To review the adequacy and suitability of national targets and indicators for NCD prevention and control in the national NCD multisectoral action plan and of the systems in place to measure them
   b. Share best practices across member states in surveillance and monitoring for NCDs
   c. Develop integrated draft national NCD surveillance and monitoring frameworks and roadmaps

2. Establish a South-east Asia regional partners’ working group/Forum to coordinate and mobilize support for prevention and control of NCDs including surveillance and monitoring activities in the Region

The meeting was opened by Dr Thaksaphon Thamarangsi, Director, Department of Noncommunicable Diseases, WHO SEARO and Dr. Daniel Kartnez, WHO Country Representative, Thailand delivered the opening remarks on behalf of Regional Director, WHO SEARO. The technical sessions on the next three days were organized along four key themes: measuring premature mortality from NCDs; measuring risk factors for NCDs; measuring policy and system’s response for NCD prevention and control; and cost and financing of surveillance for NCDs. Group work involved developing a national action plan with completion of a surveillance workbook. A partners’ forum was organized on the third day with a proposal to establish a regional working group to coordinate partners’ response for NCD prevention and control.

Key conclusions and recommendations:

1. Measuring NCDs’ premature mortality:
   a. All the member states have included premature mortality from NCDs as defined in GMF as their key indicator, but few are actually measuring it.
   b. The Civil and vital registration (CRVS) performance varies across the region, but all countries have some data on NCD mortality from either CRVS, SRS, or hospitals.
   c. Countries must use the data generated currently, even if incomplete or of poor quality, to estimate their current mortality—use of data is likely to put a positive pressure for improvement of overall systems.
   d. Global initiatives have already developed statistical capacity to use ‘incomplete data’ and the same analytical capacity should also be developed at the national levels.
• At the same time, countries must accelerate the efforts to expand death registration and ascertain of cause of death using all available tools, and with mobilization of additional funding and human resources.

2. Monitoring NCD risk factors:
• Regular monitoring of prevalence of key risk factors is an essential component of overall NCD surveillance and monitoring framework.
• In the absence of universal screening (which is not feasible in majority of the countries), periodic population-based surveys are the most preferred tools to measure and track NCD risk factors.
• Integrated NCD risk factor surveys are not an ALTERNATIVE to weak HMIS, but are important in their own right, and add additional value even in the context of best functioning HMIS.
• Countries may need to organize more than one (or even more) population-based public health surveys to cover all important public health issues, and it may be difficult to add NCDs to ongoing DHS/MICS surveys that focus primarily on reproductive health age groups and have already expanded substantially beyond their original mandate by including communicable diseases, domestic violence etc.
• The decision to organize stand-alone survey for a single risk factor (such as tobacco) or only the integrated NCD surveys, depends on the country, their human and financial capacity, the status and stage of the program, etc.

3. Measuring national system response:
• NCD Prevention and Control requires multi-sectoral interventions/approaches. So, the M&E systems should measure overall ‘national’ system response rather than just the ‘health’ sector response, including policy response indicators from other sectors as well.
• Two most preferred data sources for measuring national system response are periodic population NCD surveys (such as STEPs) and national health facility-based information systems. Both of these sources may complement each other, rather than a substitute for each other.
• Countries should adapt NCD Global Monitoring Framework to their own policy and health system context including more indicators to assess level of implementation of their own policies.
• Use standardized indicator definitions, techniques of sample collection and analysis for physiological and biochemical indicators (Blood Pressure, Blood Sugar, Triglycerides, Cholesterol, Salt Intake, etc.) to ensure comparability and assessment of trends over time.
• Health insurance systems may generate another large data set that may shed light on NCD mortality, morbidity, health care expenditure and quality.

4. National NCD surveillance and monitoring plans: While each country has developed indicators and targets in their multi-sectoral action plan, these must be reviewed regularly for their appropriateness. In additions, systems must be setup to measure them regularly.

5. Partners’ Forum and Regional working group:
• All the present partners welcome the idea and expressed interest to participate in the proposed Regional Working Group to coordinate partners’ response.
• SEARO will serve as the secretariat and will follow-up with all partners with a more detailed proposal and seeking names of the representatives from each organization.
1.0 Background

NCD prevention and control is a regional and a national priority in South-East Asia. Regional Director has identified it as one of the four flagship priorities. The resolution of the WHO Regional Committee for South-East Asia (SE/RC66/R6) in September 2013 requested Regional Director to convene a mid-course regional consultation (during 2018-2019) to review baseline data and regional targets and make adjustments as required. The resolution also requested to build capacity of Member States in strengthening national surveillance and monitoring systems, including vital registration, risk factors surveys and health facility surveys as well provide support on reporting on global and regional voluntary targets.

Regular monitoring of NCD risk factors, mortality and other relevant service utilization and programmatic indicators is a must to evaluate and shape the current and future NCD policy and programs and ensuring efficient use of limited resources available. Member states are also required to report regularly the progress to the UN General Assembly both as part of specific global commitments for NCD control and prevention and as part of recently endorsed Sustainable Development Goals.

However, the national capacity for surveillance and monitoring of NCD is limited in most of the countries in the Region. Conducting and organizing surveillance for NCDs is a relatively new concept in most of the member states. It differs substantially from that of communicable diseases surveillance (where systems have been set up long ago with substantial investments in past several decades) both technically and in terms of resource availability. Risk factor surveys, an essential part of NCD surveillance system, are expensive to do and require substantial technical expertise. Mortality registration is weak with incomplete registration of deaths. Hence, building national capacity in NCD surveillance and mortality must be prioritized under Flagship 2 to ensure appropriate policies and programmatic interventions.

Hence, a Regional consultation was organized to review the current status of NCD surveillance and monitoring and to brainstorm on way forward to strengthen the NCD surveillance as part of overall health information systems.

2.0 Opening Session

Dr Thaksaphon Thamarangs, Director, Department of Noncommunicable Diseases, WHO SEARO, New Delhi, opened the Regional Consultation and Partners’ Forum on NCD Surveillance and Monitoring by welcoming all the participants. He stated that NCD mortality and morbidity have taken an epidemic form globally, including in the South-East Asia Region. NCDs have become a major public health problem as almost three-fourth of all the deaths occur due to NCDs. The WHO and SEAR member countries have developed NCD Prevention and Control program strategies and interventions. Effective surveillance and monitoring of NCD mortality and risk factors is essential for assessment and measurement of trends and program effectiveness in terms reduction of NCD mortality and prevalence of risk factors.

Dr. Daniel Kartinez, WHO Country Representative, Thailand delivered the opening remarks on behalf of Regional Director, WHO SEARO. The Regional Director informed that NCD prevention and control is one of the South-East Asia Region’s eight Flagship Priorities. There is need for a Region-wide effective surveillance to evaluate and inform NCD programs and ensure efficient use of the limited resources available. All Member States have developed indicators and targets to assess progress.
towards NCD prevention and control in their national health plans. Nevertheless, conducting and organizing surveillance for NCDs is a relatively new and evolving concept. NCD surveillance differs substantially from that of communicable diseases surveillance, both in terms of technical and resource availability. Participants should identify some key actions and steps that can strengthen national NCD surveillance systems for more effective control of NCDs in the next three days. She expressed her pleasure with the presence of the Asian Development Bank, World Bank, UNESCAP, IHME, George Institute of Global Health and Vital Strategies and other important partners at these discussions, and trusts that the coming days will be used as an opportunity to strengthen collaboration between development partners.

Dr Thaksaphon Thamarangsi introduced the participants of the consultation and partner representatives. He presented the objectives and organization of the consultation meeting.

2.0 Objectives and Organization of the Consultation

3. To analyze the status of national NCD surveillance and monitoring systems, and identify tangible actions to strengthen them:

   a. To review the adequacy and suitability of national targets and indicators for NCD prevention and control in the national NCD multisectoral action plan and of the systems in place to measure them
   b. Share best practices across member states in surveillance and monitoring for NCDs
   c. Develop integrated draft national NCD surveillance and monitoring frameworks and roadmaps

2. Establish a South-east Asia regional partners’ working group/Forum to coordinate and mobilize support for prevention and control of NCDs including surveillance and monitoring activities in the Region
3.0 Technical Sessions

**Figure 1** shows the overall framework of the Regional Consultation and Partners’ Forum for NCD Surveillance and Monitoring over the three days.

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<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
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<tbody>
<tr>
<td><strong>Completion of surveillance workbook</strong></td>
<td><strong>1 Measuring risk factors for NCDs:</strong></td>
<td><strong>1. Partners’ Forum</strong></td>
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<tr>
<td>1. Overview of surveillance and monitoring of NCDs</td>
<td>• Why</td>
<td>• Why</td>
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<td>2. Measuring mortality (death) indicator for NCDs:</td>
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<td>• What</td>
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<td>• How</td>
<td>• Models</td>
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<td>• Way forward</td>
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<td>• National and Regional</td>
<td>3. Conclusion and way forward</td>
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<td>• Microdata repositories</td>
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3.1 Overview of Surveillance and Monitoring for NCDs in WHO South East Asia Region

**Presenter:** Dr Manju Rani, Regional Advisor, NCD and Tobacco Surveillance

South East Asia is one of the largest regions with a population of 1.9 billion representing almost one-fourth of global population. Noncommunicable diseases is a pressing public health and development problem in the region, both from overall and from equity perspective. NCDs accounted for 8.8 million (64%) deaths out of a total 13.8 million deaths in the region in 2015. Of these 4.4 million (72%) deaths were premature occurring between 30 and 70 years of age. NCD mortality reduction is one of the SDG targets: ‘By 2030, reduce premature mortality from NCDs through prevention and treatment and promote mental health and wellbeing’.

The Member countries are at varying stages of evolution and development of their multisectoral policies and national plans to combat NCDs and their implementation (**Figure 1, 2**). While all the Member States have started responding to the rising threat of the NCDs and have developed multisectoral national NCD policy and action plans, the level of implementation varies from country to country.
She discussed the indicators and targets set by Member States in the Region for NCD prevention and control in the overall context of the Global Monitoring Framework (Annex 2).

Dr. Manju Rani raised the following key questions to be addressed and discussed in the Consultation meeting:

i. Do we have suitable surveillance and monitoring systems to guide and evaluate the impact of these newly developed and on-going policies and programmatic interventions for NCD prevention and control?

ii. Are the health information managers acting to change/fine-tune their health information systems and data collection mechanisms to track growing NCD epidemic and policy and programmatic response?

Do the current NCD Surveillance and Monitoring System Serve the purpose of program managers and policy makers?

Help advocate for new initiatives/resources by documenting the disease burden and public health impact

Help to monitor the implementation of ongoing programs and initiatives or in assessing the impact of ongoing programs and policies

iii. NCD monitoring indicators should be examined in the following context:

- Appropriateness of indicators:
- Are these indicators sufficient/ relevant to assess and guide NCD control and prevention efforts?
- Measurability of the indicators at optimal frequency?
- Are the member states measuring them or able to measure them?
- Achievability of the TARGETS: Are the current policies and programmatic interventions and their current level of implementation enough to achieve those targets?

iv. What should we measure – from risk factors to NCDs and outcomes on a continuum on the chain of causation of various noncommunicable diseases and mortality, including premature mortality.
### Figure 2: Policies and target achievement in SEAR member states

<table>
<thead>
<tr>
<th>And action plans</th>
<th>NCDs in national health plan</th>
<th>NCDs in national development agenda</th>
<th>Time-bound national targets</th>
<th>Integrated National NCD policy/ plan/ strategy</th>
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<tr>
<td>Specific key NCDs</td>
<td>CVD policy</td>
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<td>Cancer policy</td>
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<td>Diabetes policy</td>
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<td>CRD policy</td>
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<td>Oral health policy</td>
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<td>Specific Risk factor</td>
<td>Alcohol policy</td>
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<td>Overweight/ obesity policy</td>
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<td>Physical activity policy</td>
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<td>Tobacco control policy</td>
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<td>Unhealthy diet policy</td>
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<td>Policies</td>
<td>Marketing of foods policy</td>
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<td>Fat/ Trans-fat policy</td>
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<td>Salt policy</td>
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<th>Number of countries in the WHO SEA Region</th>
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### Figure 3: Availability of governance structures and financing for different NCD activities

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<thead>
<tr>
<th>NCD capacity in MOH</th>
<th>Multisectoral commission, agency or mechanism</th>
<th>Separate unit/ dept/ branch</th>
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<tr>
<td>Funds allocated in government budget for</td>
<td>Palliative Care</td>
<td>Capacity building</td>
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<td></td>
<td>Surveillance, monitoring</td>
<td>Healthcare/ treatment</td>
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<td></td>
<td>Early detection/ screening</td>
<td>Health promotion</td>
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<td>Primary prevention</td>
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<tr>
<td>Country implementing any fiscal interventions</td>
<td>Tax to promote PA</td>
<td>Subsidies for health food</td>
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<td>Tax on unhealth food</td>
<td>Tax on SSB</td>
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<td>Tax on tobacco</td>
<td>Tax on alcohol</td>
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<tr>
<td>Funds earmarked</td>
<td>For health promotion</td>
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<th>Number of countries in the WHO SEA Region</th>
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3.2 Measuring premature mortality From NCDs: importance, current Status, way forward: Session Moderators: Dr Chelapati Rao, Dr Kanitta Bundhamcharoen
3.2.1 Explaining global indicator on premature mortality and global and regional status of data availability:
Presenter: Dr Leanne Riley, WHO HQ

NCD mortality data is critical to help size the problem and inform interventions; to provide information for policy and program development and appropriate legislation, and for evaluating impact of these policies and to prioritize resource allocation. The NCD mortality indicator has been included in the 2030 Agenda of Sustainable Development. SDG Goal 3: Good Health and Well-being has set the target of reducing premature mortality from NCDs by one-third (Target 3.4).

A standardized definition of NCD mortality indicator is needed to measure trends and enable international comparisons. The WHO Global Monitoring Framework defines NCD mortality indicator in terms of unconditional probability of dying between ages 30 and 70 years from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases. This age group was chosen to exclude confounding across countries or over time due to differences or changes in mortality rates for other competing causes and to control for differences in population age structure. Age of 30 years represents the point in the life cycle where the mortality risk for the four selected chronic diseases starts to rise in most populations from very low levels at younger ages. The upper limit of 70 years has been chosen to identify an age range in which these chronic diseases deaths can be truly considered premature deaths in almost all regions of the world. Upper limit of 70 years has been decided as assessment of cause-specific death rates tend to be increasingly uncertain at older ages because of ill-defined causes of deaths, co-morbidity, and lack of ascertainment of correct age at death.

Civil Registration and Vital Statistics System (CRVS) is the most appropriate source of population-based mortality data at national and sub-national levels. However, there are several challenges and bottlenecks in collecting mortality data, in general, and cause-specific NCD mortality, specifically. In 2017, WHO estimated that only 38% countries worldwide fully met the criteria for reliable mortality data and 24% partially met those criteria. Remaining 38% of all countries (73 in number) did not meet the criteria of reliable mortality data at all. Data are considered to generate reliable cause-specific mortality data on a routine basis if data from the five most recent reporting years are, on average, at least 70% usable, with usability calculated as (Completeness (%))*(1 - Proportion Garbage); at least five years of cause-of-death data have been reported to the WHO in the last 10 years; and the most recent year of data reported to the WHO is no more than five years old.

3.2.2. Availability, Quality and Use of Mortality Data in SEAR Countries:
Presenter: Mr. Mark Landry, Regional Advisor, Health Situation and Trend Assessment

Mr. Mark Landry reviewed status and quality of mortality data in the Member States in SEAR. Out of 11 countries, only seven countries have made death registration compulsory, and only six SEAR
countries have full registration systems and seven countries use International Medical Death Certificate. Three countries use verbal autopsy techniques to identify cause of death.

The availability of cause-specific mortality data is rather poor in most countries in the region. India, Bangladesh, Bhutan, Indonesia had less than 50% of deaths with stated cause-of-death, whereas no information was available from Myanmar, Nepal and Timor-Leste. Thailand, Sri Lanka and Maldives reported about 90% or more registered deaths with stated cause-of-death. ICD compliance was very low in most of the countries except Thailand, Sri Lanka and DPR Korea.

A fully functional population-based Civil Registration of Vital Statistics System doesn’t exist in any member country. It is at different stages of evolution in SEAR.

Mr. Landry informed about the multi-partner, multi-stakeholder initiative - Asia/Pacific Regional Action Framework for Improving CRVS involving UNESCAP, WHO, UNICEF, UNFPA, UNHCR, ADB, SPC and other stakeholders. The initiative has several program components including: legal framework and institutional capacity building; public awareness and political commitment; completeness of registration of vital events; quality of civil registration; use and dissemination of vital statistics; and coordination and collaboration.

He described the CRVS achievements in the WHO South-East Asia Region—completion of a comprehensive CRVS assessment in 8 countries with ongoing strategic action plans development and development of Regional strategy for strengthening the role of health sector for improving CRVS (2015-2024).

He concluded the presentation by outlining the priority actions for future to improve mortality data and cause of death. These included: scaling up and using medically certified and ICD-coded CoD classification for deaths occurring in health facilities and the use of verbal autopsy for capturing CoD data for deaths in communities; provide CRVS systems implementation guidance and support; linking CRVS systems with the overall HIS to improve completeness and availability of mortality data; and improving analysis, interpretation, and use of CoD data and mortality statistics for policy and planning
3.2.3 Country Experiences in the Region in measuring NCD mortality

**Bangladesh:**

**Sample registration system as an alternative to CRVS: the data generated and shared**

**Presenter:** Dr Mohammad Abdus Salam, Chief of the Health Information Unit and Deputy Chief Management Information System, DGHS

Bangladesh has made significant progress in collection of vital statistics and cause of death data. The vision of Bangladesh CRVS is to ‘get everyone in the picture’. CRVS was started in 1973 and used nonstandard death certification for cause of death. Out of 0.9 million deaths annually, only 0.1 million deaths are reported to the Directorate of Health Services through the Health Management Information System. To address this issue, Sample Vital Registration System (SRVS) was established as a short-term alternative in 1980 in Bangladesh. It now covers 1500 PSUs selected through integrated Multipurpose Sample Design. SRVS uses 11 schedules to actively collect wide range of information on births, deaths, marriage, divorce, migration disability, contraception and HIV/AIDS. It generates information on crude birth rate, crude death rate, infant and child mortality rate, and life expectancy. However, the system still does not produce and publish estimates of the NCD mortality rate or NCD premature mortality indicator as defined in WHO Global Monitoring Framework, and the data are only published as top-ten causes of death. Rather, it publishes the information in the form of “top 10 causes of death. Among the top 10 causes of deaths, the first 3 causes of deaths were CVD, Hypertension and Ischemic Heart Disease, followed by Diabetes.

**Thailand:**

**Achieving high mortality registration with cause-of-death: Strategies and remaining challenges**

**Presenter:** Ministry of Public health, Thailand

Thailand have a well-developed Civil Registration of births and deaths. Over 90% of deaths are registered with cause-of-death, and the ICD compliance is 100%. The civil registration system has evolved significantly over a period in Thailand. During the past three decades, the system has changed from a manual, paper-based registration system, to an electronic, centralized and online system. All provincial registration offices and almost all of the district registration offices are linked online to a central civil registration system. Vital statistics was improved from 1996 when the civil registration system of the Ministry of Interior (MOI) began providing electronic birth and death data directly into the vital statistics management system of the Ministry of Public Health (MOPH). Further, Thailand has achieved universal health care coverage with the promulgation of national health insurance act in 2002. The insurance reimbursement data of most in-hospital patients, also contain standardized disease codes and status at discharge. These insurance data are being used to enhance the quality of vital statistics.

The success of the civil registration is attributed to various initiatives.

- First, the Registration Authority, Ministry of Interior, has built their capacity to establish computerized registration system throughout the country, even in the remote area.
Second, establishment the health insurance system for the majority of population under the National Health Security Office (NHSO), has led to marked increase in the birth registration.

Third, economic benefit for the death registration has increased the demand for death registration.

Additional interventions from the Ministry of Public Health, with long term cooperation from the National Registration Authority, has increased coverage and quality of causes of death.

Myanmar:

Current status of mortality data collection in Myanmar:

Presenter: Dr. Kyaw Nan Kaung, Director (NCD), Department of Public Health, Ministry of Health and Sports, Myanmar

Central Statistical Organization is mainly responsible for birth and death data in Myanmar. The Health Management Information System collects the inpatient data including death and publishes these data as part of Health Statistics Report. However, Myanmar still does not use international death certificate for medical certification of cause-of-death. In 2018, Myanmar introduced Electronic Hospital Reporting System in 316 Public Hospitals and 43 Private Hospitals. Cause of death in community (townships) is ascertained through Verbal Autopsy. The mortality data obtained using Verbal Autopsy in townships revealed that CVD, Cancers, COPD, Cirrhosis, Diabetes and Chronic Renal Failure are main causes NCD mortality in Myanmar. There was a close similarity in cause of deaths obtained from inpatient data from hospitals. Hence, as of now, the country does not have nationally representative data on NCD mortality and does not calculate the mortality rate or probability of premature NCD mortality yet based on the data available.

Indonesia

Setting up SRS to generate mortality data and the challenges faced in Indonesia.

Presenter: Center for Data and Information, Ministry of Health

Mortality attributed to CVD, Ischemic heart disease, Diabetes, Hypertensive disorders and Chronic lung diseases are among the top 10 causes of mortality in Indonesia (2014). Indonesia established Sample Registration System (SRS) in 2014 to measure representative outcome indicators including cause-of-death data based on ICD 10 in selected representative sentinel sites. The implementation of SRS is coordinated by the Centre for Health System and Policy Research and Development (NIHRD). SRS is a collaborative effort of Ministry of Health and Director General of Population and Civil Registry, and Ministry of Home Affairs. The SRS strategy included three core elements: Legal Framework (enforcement of existing Population Administration Laws (Law no. 24/2013) that cover registration and vital events); collection of data on all deaths in the sentinel sites and ascertainment of cause-of-death using Verbal Autopsy (VA) instruments; and verification of completeness of data using capture and recapture methods to assess completeness of registration and validation of cause of death.
Networking with local subdistrict and village public officials and capacity development of local Puskesmas staff was an important element of the strategy to assure completeness and high quality of data.

**Selection of Nationally representative SRS sites:** Indonesia is divided into Cities (representing urban areas) and district (representing rural areas). Using Village Potency Survey (PODES) 2008 data, a total number of sub districts in cities and districts were identified. A minimum 2% sample was estimated to provide valid estimates. A sample of 4.62 million, spread over 25 subdistricts in cities and 103 subdistricts in districts, have been selected for SRS.

**Reporting mechanism of death events:** Information on any death at home were obtained by the subdistricts health center through village administrators and health cadres. For death occurring in health facilities/hospitals, a medical certificate with multiple causes of death is completed by attending physician. Trained Puskesmas staff visits the house of deceased and ascertain the history of illness and treatment from the family using a semi-structured verbal autopsy instrument, and the health center physician would assign the causes of death and the trained coders will provide ICD-10 codes.

Despite establishment of this system, the country is not estimating the NCD premature mortality indicator from the system and rather publishes the data as top 10 causes of death or proportion of total deaths caused by NCDs.

### 3.2.4 Monitoring NCD premature mortality indicators

**Estimation of mortality from Noncommunicable diseases and related factors: insights from Global Burden of Disease Study**

**Presenter:** Dr Nikhila Kalra, IHME

Population-based complete and regular collection of data on deaths with medical certification of cause of death is the most desired approach to measurement NCD mortality and cause specific mortality. However, there are several challenges and limitations in population-based measurement of mortality and cause of death statistics. Summary mortality estimates from NCDs and their isk factors could be measured through Global Burden of Disease (GBD) approach—a systematic scientific effort to quantify the comparative magnitude of health loss due to diseases, injuries, and risk factors by age, sex, and geographies for specific points of time. GBD is a global enterprise with 3,470 collaborators, 141 countries and 3 non-sovereign states. It provides comprehensive estimates of health loss with traditional and novel summary metrics. This approach focuses on death counts, mortality rates, incidence and prevalence, Years of Life Lost (YLL) to premature death, Years lived with disability (YLD), Disability adjusted life years (DALY) and Years of health life lost (YPLL), and Comparative risk assessments. The GBD estimations are based on eight principles, namely,

- Comprehensive comparisons
- Communicate the strength of the evidence
- Ensure internal consistency
- Iterative approach to estimation
- Identify all relevant data sources
- Compare like with like, aka crosswalk different measurements
• Correct for data errors
• Pick the best model based on performance

GBD estimation is based on the following four building blocks as shown in Figure 4:

• All-Cause Mortality: How many people died?
• Cause of Death: What do they die from?
• Risk Factors: What is causing this death and sickness?
• Non-fatal outcomes: What makes people sick?

![Figure 4: Four Building Blocks of Estimation](image)

Estimations of NCD mortality and risk factors and their contribution are derived using statistical modeling. Linear modelling is a first stage prediction that incorporates covariate information. The estimation is further refined by spatiotemporal smoothing across time, age and geography. Gaussian Process Regression model is used to measure and estimate uncertainties around the predicted mortality measurements.

The results of GBD estimation of NCD mortality revealed that the portion of NCD mortality has shown a rising trend since 1990 through 2016, from 39% to about 70% of all deaths in all groups and both sexes, in the South east Asia Region. The trends also showed shifting ranking of the cause deaths due to NCDs. The most noticeable changes are seen in deaths due to diabetes, from 19th rank in 1990 to the 7th rank, and hypertensive heart disease, from 24th to 14th rank. in 2016. Deaths due to Ischemic heart disease have moved on to the top from the fourth rank; stroke from 6th to 2nd rank; and COPD from 5th to 3rd rank. Lung cancer mortality ranking has moved from 34th to 16th; and Alzheimer disease from 27th to 11th rank.

Globally, there are changing trends in the leading physical, behavioral and environmental risk factors since 1990. Prominent among them is high systolic blood pressure which is ranked number 1 as a leading risk factor, followed by dietary risks, air pollution, high fasting plasma glucose, tobacco consumption, high total cholesterol, high and body-mass index, and impaired kidney functions, in the order of ranking of the risk factors of NCDs, in 2016.

GBD estimates further showed these risk factors majorly contribute to NCD mortality due to CVD, diabetes COPD and various neoplasms.
3.2.5 Best practice models in measuring mortality from outside SEA Region

**Presenter:** Dr. Chalapati Rao, Australian National University

Population-based complete and regular collection of data on mortality and medical certification of all deaths is the best model for measurement of NCD mortality and cause of deaths. However, it would not be practical. There is widespread diversity in SEAR countries in composition and size of populations, and geography and terrain. For example, Indonesia has nearly 12000 islands and faced difficult access; and India has highly diverse areas of mountainous terrain and vast deserts. Around 9.5 million deaths occur in India, and about 7.5 million deaths are registered. It would require large resources to register all deaths.

Sample Registration Systems (SRS) is the second option if it is not possible to set up a population-based vital registration system. Medical certification of cause-of-death is essential in SRS sites, especially for the deaths that occur in the hospitals and health facilities. The cause of deaths that occur outside the health facilities/hospital should be ascertained by using standard verbal autopsy techniques. There are various computer models for analysis of verbal autopsy data, however, these models analyze single cause-of-death. NCDs are associated with multiple causes and therefore need to be supplemented by the physician review for verification of multiple causes-of-deaths. There is no final answer as which method is better, and countries should test the models that are suitable to their needs and resources. One of the major drawbacks of SRS is that a population denominator is not available to measure mortality rates. Mapping of mortality data may be helpful and relating it to the population of that area.

In conclusion, measuring NCD mortality would require a sound system of vital registration systems for continuous and complete account of deaths and medical certification of cause of death. Strengthening Civil Registration and Vital Statistics Systems is essential to measure population-based mortality data in general, and NCD mortality specifically with medical certification.
3.3 Cost and Financing of NCD Surveillance for NCDs.

Session Moderators: Prof. T. Surdararaman, Dr Robert Oelrichs

3.3.1 Nepal: Increasing domestic resources for NCD surveillance

Nepal has implemented multiple NCD surveillance and monitoring activities, which are mainly dependent on external funding. The NCD surveillance activities are supported by external agencies, namely, ADB, UNICEF, USAID, UNFPA, IHME, WHO and World Bank. The domestic funding is only about 25 percent of the total expenditure on NCD surveillance and monitoring and remaining comes from the external agencies. Since 2011, the contribution of external funding is rising in volume and proportion of total funding of the program. However, the investments are not sustainable and predictable. There are peaks in budget and spending during special activities or surveys. The human resource costs are included in the funding of NCD surveillance and monitoring. CRVS is the major source of data but domestic investment is low. According to World Bank, US $ 0.90 per capita is needed for CRVS, while budget allocation is less than US $ 0.1 per capita. There is a lack of collaboration and harmonization of funding in implementing multisectoral plan among external agencies and various government departments.

3.3.2 Maldives: Implementing and financing of NCD Surveillance: The challenges faced

Maldives is an island country. Eighty-one percent of total deaths are attributed to NCDs, the most prominent being deaths due to cardiovascular diseases, followed by cancers and chronic respiratory diseases. The current health expenditure (CHE) per capita, US $ 944, is the highest among SEAR member countries, and percentage of CHE to GDP, about 11.5 percent. The funding of health care is mostly from the government sources, and private funding accounts for only 18 percent. The out-of-pocket expenses are low at 16 percent as compared to other member countries in the region.

Maldives has a major national NCD campaign ‘25 by 25’ to reduce NCD mortality by 25 percent. NCD surveillance is challenging, mainly due to poor access and lack of transport, and difficult topography of the country. In addition, many inhabitants seek diagnostic and treatment services abroad due to lack such facilities in Maldives. The main challenge is lack of funds to support NCD surveillance. The WHO is the major source of funding of NCD surveillance and monitoring in this island nation.

3.3.3 Financing NCD Surveillance and Monitoring: Role and extent of external financing:

Presenter: Dr Manju Rani, Regional Advisor, NCD Surveillance and Monitoring

Sound funding of NCD prevention and treatment including NCD surveillance and monitoring is essential for effective implementation. Funds are needed for human resources for surveillance and monitoring; specific operational activities; and capacity building of staff. Few countries in the region have detailed national health accounts that could show domestic health spending in prevention and care of NCDs, and more specifically, for NCD surveillance and monitoring.

Based on the reports from the member countries, the status of current health expenditure varies in the SEAR member countries, the lowest being US $ 32 per capita in Bangladesh, and the highest, US $ 944 in Maldives. Bhutan, Bangladesh, India, Myanmar, Nepal and Timor-Leste spend less than US $ 100 per capita. The proportion of health expenditure to GDP, ranges between 2.6 percent in Bangladesh and 11.5 percent in Maldives. Nepal and Myanmar, despite low per capita health
spending, spend higher proportion of GDP on health, being 6.1 and 4.9 percent of GDP, respectively. The out-of-pocket expenses (OOE) are disproportionately high in Myanmar (74%), Bangladesh (72%), Nepal (71%) and India (65%).

A recent NCD country capacity survey has shown that all countries in the region have allocated funding for NCD surveillance and monitoring. Funds have been allocated for palliative care, capacity building, surveillance and monitoring, health care and treatment, early detection and screening, health promotion and primary prevention.

Fiscal interventions to raise funding for NCD are mainly in terms of taxation on tobacco and alcohol in all but one country in the region. Taxation on SSB and unhealthy foods is not increased in most countries. Except two countries, there is no subsidy on health foods in most countries.

Few countries budget the cost of population-based NCD mortality and risk factor surveys in their national budgets and are dependent on external funding from various global initiatives. In the recent years, Bangladesh, India, Nepal and Thailand have started funding either partial or complete cost of these surveys.

Financing of CRVS is crucial for generating mortality data and cause of death, particularly for training support, special data analysis, and/ or helping to set up new initiatives such SRS. There is a need for mobilizing domestic funding to strengthen surveillance and monitoring for NCDs--one of four pillars of multisectoral plans to support NCD prevention and treatment. Unfortunately, domestic funding is currently ad-hoc and inadequate with substantial dependence on external funding. There should be at least 0.5 to 1% of program cost to be allocated to monitoring and evaluation.

### 3.4 Measuring Risk Factors for NCDs to Measure NCD Response

**Session Moderators:** Hong Rathavuth, Dr Nandita Murukutla

**3.4.1 WHO approach and global progress in measuring risk factors for NCDs: STEPS**

**Presenter:** Dr. Leanne Riley, Coordinator, NCD surveillance, WHO Headquarters

Noncommunicable diseases are multifactorial in origin, and there are multiple risk factors which are common in CVD, diabetes, cancers and COPDs. WHO STEPwise surveillance tools were developed to allow comprehensive monitoring of multiple established NCD risk factors that account for majority of NCD burden and the health system response.

The STEPS is an integrated approach that focuses on collecting data on NCD risk factors at a relatively low cost. Use of standardized methodology and tools help in tracking prevalence of NCD risk factors and policy response over time and across geographical entities to help plan programs and interventions.

**STEPS Methods:** STEPS surveys uses three stepwise instruments:

**STEP 1 – Questionnaire – core questions on behavior and socio-demographic data**
It contains as the core or “minimum set” of variables. In addition to socio-economic data, data on tobacco and alcohol use, some measure of nutritional status and physical inactivity are included as markers of current and future health status. Standard definitions are used to measure prevalence of tobacco and alcohol consumption, and physical activity. It provides a snap shot of behavioral risk factors and their distribution across the population.

STEP 2 – Physical measurement – height, weight, blood pressure

Step 2 includes physical measurements (height, weight, waist circumference, blood pressure) over and above core variable of Step 1. These measures allow monitoring of prevalence of overweight/obesity and raised blood pressure prevalence.

STEP 3 - Biochemical measurement – blood sugar, urinary salt

In this step, blood and urine samples are collected (thought a finger prick) to assess fasting blood sugar, blood cholesterol levels and urinary salt levels. Collecting and analyzing blood samples is a very relatively complex process and can be done only in the context of a comprehensive survey and in settings where appropriate resources are available.

In addition to the core modules, country can adapt the tools to their context by modifying the response categories or adding new questions. There are several optional modules (cervical cancer, tobacco policy, violence and injuries, and oral health) also available, which can be used by the country based on their needs.

3.4.2 Country Presentations

India: Integrated risk factor surveys in a large country – the need for national and sub-national estimates of NCD risk factors

The National NCD Monitoring Framework of India included 21 indicators in three categories; NCD Mortality and morbidity (2 indicators), NCD Risk factors (12), and Health systems response (7). Indian Council of Medical Research (ICMR) recently conducted a nation-wide integrated risk factor survey in 2018. This is the first nationwide survey and was fully funded by Government of India with technical support from WHO country office and Regional office for South-east Asia. A summary assessment of adequacy of data sources was conducted prior to designing the survey. The national risk factor survey was conducted with the primary objective to generate national level estimates of 17/21 key NCD indicators (risk factors and health systems response) identified in national NCD monitoring framework 2017-18. Secondary objectives were to create a central and regional pool of resources to support conduct of similar surveys at state levels, and to strengthen capacity of monitoring of NCDs at national and sub-national levels.

The survey included a sample of 12000 households in 600 PSUs, with equal urban and rural distribution. The survey sampled one adult respondent (18-69 years) and all adolescents (15-17 years) from each of the sampled household. In each of the sampled PSUs, one primary health Centre, community health Centre, district hospital and private hospital were selected for the facility survey to assess health systems preparedness. Data collection tools were harmonized with the tools
developed by WHO STEPS, GATS, GYTS, GSHS and SARA. The nation-wide risk factor survey incorporated measurement of key household factors, behavior risk factors, physiological and biochemical risk factors as done in WHO STEPs module and the WHO Global School Health Survey for the adolescents. The results from the survey will be published shortly.

**Indonesia**

*Riskesdas – The Indonesian integrated survey to monitor NCD risk factors*

Indonesia is the fourth most populous country in the world with a population of over 258 million. The country has 7504 islands spread over a vast expanse of land area of 1,904,569 sq. km. Indonesia has developed a vast surveillance and monitoring system for NCDs and set up national criteria for health examination/health screening at community level under the Minimum Standard Requirement (SPM) as per the government MOHA Regulation (2016) and MOH Regulation (2016).

Deaths due to stroke, cardiovascular diseases, diabetes, tuberculosis and hypertension are top five causes of deaths in Indonesia. The prevalence of NCDs is high with hypertension (25.8%) at the top, followed by stroke (12.1%), injury (8.2%), Diabetes Mellitus (6.9%), COPD (3.7%), and coronary heart disease (1.5%).

Various health surveys are main source of data on NCD mortality and risk factors, namely, Basic Health Survey (*Riskesdas*), National Health Indicator Surveys (2016), National Social Economic Survey (Annual), Global Adult Tobacco Survey GATS 2011, 2018-19), Global Youth Tobacco Survey (GYTS 2006, 2008, 2014 and 2018-19), and Global School Based Health Survey (2007, 2008, 2015). The tools of data collection for *Riskesdas* are adapted from WHO STEPS. *Riskesdas* targets population 10 years of age and above and collects data at the national, province and district levels. The information about NCD risk factors include tobacco use, alcohol consumption, physical activity, and dietary habits (fruits and vegetables consumption). obesity and hypertension.

The NCD risk factor survey 2018 revealed that 26.1% of the population have insufficient physical activity, 93.5% population consumes less than five portions of fruits and vegetables, high levels of consumption of seasonings (77.3%), sugar (53.3%) and salt (26.2%). 19.7% men and 32.9% women are obese. About 2/3 of the male population consumes tobacco. The prevalence of hypertension was very high at 25.8%. Smoking in the age 10-24 years (males) was 31.8%.

**3.4 Doing Population-based Surveys to Measure NCD risk Factors: Best Approaches**

Session Moderators: Hong Rathavuth, Dr Nandita Murukutla

**3.5.1 Demographic Health Surveys (DHS)**

Other than the NCD risk factor surveys, there are several surveys that capture NCD data and related risk factors. Demographic Health Survey (DHS), a population based national level health survey, is the main source of data on reproductive and child health in many countries. It is conducted under the DHS Program, funded by the United States Agency for International Development (USAID). DHS provides assistance to developing countries for collection and use of data to monitor and evaluate population, health and nutrition data. DHS were started in 1984 with the main objective of collecting high quality data for policy formulation, program planning and monitoring and evaluation.
It applies several data collection tools and laboratory investigations. It uses standardized questionnaire for household, individuals, and biomarkers and multiple modules on specific issues including NCD and NCD risk factors and health expenditure. NCD data have been collected in 56 DHS surveys in 31 countries. Information on biomarkers, namely, measurement of blood pressure, blood glucose/ HbA1C and lipid profile is captured in many in DHS in many countries. The questionnaire includes questions on self-reported hypertension, diabetes, prostate cancer breast cancer, cervical cancer, asthma, etc.

DHS also collects data on other risk factors or covariates related to NCDs, such as, physical activity, diet, salt consumption, tobacco use, alcohol consumption, height and weight (BNI), cholesterol levels and various socio-demographic characteristics of the population.

DHS is an excellent source of data, though its focus is on reproductive and child health. Over a period, new modules have been included in the questionnaire as per the country needs and focus. DHS has also included modules on NCDs and risk factors and health systems access and service utilization. However, it is a sample based cross-sectional survey conducted in a five-year cycle. Most results of DHS are based on self-reported data, and measurements of some of the key variables and biomarkers. DHS data availability has been instrumental in evidence-based policy formulation, planning, monitoring and evaluation in most developing countries. However,

3.5.2 Best Approaches to Measure Physiological Risk Factors Requiring Biological Sample

Presenter: Leanne Riley

Measurement of physiological risk factors that require biological samples, make NCD risk factors survey complex and expensive. In addition, it requires logistics of sample collection, storage and transportation to laboratory.

STEPS approach may be used to facilitate collection of biological samples. The core biochemical measures include urinary sodium and creatinine, fasting blood sugar and total cholesterol. Other expanded measures are triglycerides and HDL cholesterol.

Collection of biological samples is clinic based. STEPS method targets a scientific sample of adults aged 18-69 years. Household surveys are conducted using trained interviewers for STEP 1 and STEP 2. After STEP 2, the interviewer can set an appointment for test, leaving appointment card, container for urine sample, and instructions for urine collection and fasting next morning. The urine sample is collected on the prior evening before fasting starts. Next morning, after fasting, the participant would bring urine sample for collection. The interview will collect the fasting blood sample for testing.

However, there are challenges in the biochemical risk factor measurement. Biological sample collection is a resource intensive activity. Most countries have weak surveillance capacity and high staff turn overs. There is a risk of survey fatigue due to repeated contacts with respondents. Then, there is a requirement of fasting for at least 8 hours which makes the logistics more complex. Further, logistics management is elaborate and in the large countries it becomes complex. NCD risk factor survey is repetitive (every 5 years) and requires not only resources but also commitment of the MoH. Data management capacity is low in the developing countries, nevertheless, use of electronic data collection devices and cloud-based server would help overcome the challenges.
3.5.3 Measurement of Population salt intake with use of sport urine samples

**Presenter:** Prof. Vivekanand Jha, George Institute of Global Health

High salt intake is an important behavioral risk factor for NCDs, and a 30% relative reduction in mean population intake of salt/sodium by 2025 is one of the 9 global targets for NCD surveillance and monitoring. Overall average population salt intake is estimated from 24-hour urine samples. However, there are operational difficulties in collection of 24-hour urine samples in the population. Would the spot urine sample provide reliable estimates comparable to 24-hour sample? Studies have shown that 24-hour sample had mean 9.3g/day salt, compared to 9.0g/day estimated from the spot urine samples in the same participants. Estimates based upon spot urine samples had high sensitivity (97%) and specificity (100%) for classifying mean population salt intake as above or below the World Health Organization target of 5g/day. For every gram per day higher salt intake as determined from the 24-hour urine samples, the estimates based upon the spot urine samples either over- or under-estimated by approximately 0.3g/day. Further analysis would be needed to confirm or refute these findings.

He concluded that estimates of mean population salt intake based upon spot urine samples can provide countries with a fair indication of mean population salt intake and a good idea about whether action on salt consumption is required. Spot urine samples may be a method for tracking changes in mean population salt intake over time. Hence, spot urine sample may be collected when 24-hour sample is not feasible or not possible.

Novel tools for measuring urinary sodium and potassium concentration have been developed using ion selective electrode which is easy to use and cost effective.

3.4 Measuring Policy and Health Systems Response to Prevent and Control NCDS

**Session Moderators:** Prof. T. Sundararaman, Dr Robert Oelrichs

3.4.1 Health Systems response indicators in global monitoring framework and their measurement in existing WHO STEP Survey.

**Presenter:** Dr Manju Rani

The approach to NCD prevention and control is multisectoral. It is not only the health sector, but the other sectors also that are not only directly responsible but essential for prevention and control of NCD such as tobacco control policies through taxation, policies for control of alcohol use, food policy, education and youth affairs. Hence, the more inclusive terminology should be national ‘systems’ response rather than health systems response.

An effective surveillance and monitoring system for NCD prevention and control should be able to measure the implementation status, reach and outcome/impact of health and multisectoral policies and the key interventions.

There are three key dimensions of a system: inputs, process and outputs. Measurement of National system response may be undertaken on the continuum of these key dimensions of a system.

- **Inputs:** policy, infrastructure, equipment, drug and other supplies, human resources, financial resources, etc.).
• **Processes (set of activities):** program interventions, service delivery, screening, training of individuals, operations of logistic and other systems, treatment protocols and check-lists, etc.

• **Outputs (volume of activities):** Percent of eligible population screened/ treated, percentage of NCD cases covered with treatment, percentage of population exposed to IEC, percentage of population exposed to tobacco/alcohol advertising, etc.

• **Outcomes:** prevalence of risk factors, incidence of morbidity or cause-specific mortality rates

The national systems response can be assessed for short and medium- term, and in the long -term perspective aligned with the WHO’s NCD Global Monitoring Framework (GMF). Out of the 25 indicators in the GMF, 8 indicators are related to national system response to NCD prevention and control. These included indictors related to:

1. Essential medicines and technologies for NCD
2. Policies in place for elimination of trans-fats
3. Policies in place marketing to children
4. Policies in place for HPV vaccination
5. Drug therapy and counselling to prevent heart attacks and stroke
6. Access to Palliative care
7. Vaccination for Hepatitis B
8. Cervical cancer screening

In the short to medium term, system’s response may be monitored for input, process and output indicators as a measure of performance.

In the long-term horizon (3-5 years), the system’s response would be measured as program effectiveness in terms of reduction of prevalence of risk factors, morbidity and mortality due to NCDs.

The information for measurement and monitoring national system response may be collected from various potential data sources, such as, health facility-based information system; population-based sample household surveys; and administrative data sources of different sectors.

3.6.2 Country Experiences in Surveillance and Monitoring

**Sri Lanka:** Is there role of special health facility surveys or use alternative approaches: The SARA Experience

Service Availability and Response Assessment (SARA) was conducted for the first time in Sri Lanka in 2017 as a joint effort between Ministry of Health, Nutrition and Indigenous Medicine, and Department of Census and Statistics, with the technical support of WHO. **The objectives of SARA were to:**

• describe the **availability** of trained staff, equipment, diagnostic capacities and medicines/commodities to deliver services related to key health areas in the state sector and private sector health facilities in Sri Lanka

• assess the **readiness** of the state sector and private sector health facilities in Sri Lanka to deliver general health services

• assess the **readiness** of the state sector and private sector health facilities in Sri Lanka to deliver services related to key health area
It enabled collection of data relevant to following key health areas: maternal and child Health, non-communicable disease (diabetes, CVD, COPD, CKD, cancers, mental health); infectious diseases; Care for elderly and the disabled; and gender-based violence.

Overall, 755 public and private health institutions participated in the project. It covered tertiary care and secondary care hospitals, primary care facilities, public clinics, and private sector hospitals.

Availability of services for NCD prevention and treatment were measured as percentage of availability; e.g. availability of blood glucose capillary and venous blood measurement for screening or diagnosis of diabetes.

The readiness of the services was assessed based on presence of tracer items for 4 domains in terms of availability of:

- guidelines and trained staff
- equipment
- diagnostics
- medicines and commodities

Readiness scores for each domain is given as score out of total 100.

The SARA results are used to estimate the SDG indicator 3.8.1.15. The results were used to inform the NCD prevention and control program for reorganization of primary care services; process improvement using guidelines; and training needs assessment and developing capacity development programs for health workers and doctors in private and public hospitals.

**Bangladesh:** NCD activities and data collection process through MIS in Bangladesh-use of DHIS2

**Presenter:** Dr. Mohammad Abdus Salam, Chief (Deputy Director), HIU, Program Manager, HIS, Management Information System, Directorate General of Health Services.

Bangladesh has established online management information systems since 2012 to collect and generate real-time health data from all levels of health facilities for decision-making. The system has an offline data use application as well as mobile data application to capture data from the peripheral health facilities which is sent to a cloud server.

Several data collections forms have been in introduced in community clinics to collect NCD data such as blood glucose, blood pressure, and cervical screening. The system can generate aggregate summaries of diagnosed case of various NCDs enrolled in public facilities as well as risk behavior prevalence among patients seeking care at the health facilities. Raw data collected through DHIS2 is used to compute NCD related indicators including service coverage indicators. Data on some of the indicators are made available publicly through a dashboard. Indicators are updated and calculated real time using DHIS2 and shared in the monthly meetings of health managers.

Despite the progress made, challenges remain in terms of timeliness and completeness of data collection, accuracy and quality of data submitted and difficulties in estimating population prevalence based on these data.

**3.6.3 Experiences from other Regions**

Regional tools for collecting routine health facility data and providing counseling for eligible population:

**Presenter:** Warrick Junsuk Kim, Medical Officer, NCDs and Health Promotion, WHO Regional Office for the Western Pacific
3.6 Use of National Health Insurance Systems to Measure and Monitor NCD Indicators: Potential and Reality

Presenter: Dr Manju Rani

In the last decade, SEAR countries have witnessed a rapid growth of insurance-based universal health systems.

Thailand has registered a population coverage of about 95% with various social security schemes and private insurance since 2003.

Insurance coverage (JKN) in Indonesia has reached over 65% in informal and formal sectors.

Several Indian states launched state level insurance or health protection schemes, targeting certain population age groups in the last few years. India has recently launched, *Ayushman Bharat*, a nationwide health protection scheme with an insurance coverage for treatment at the secondary and tertiary healthcare facilities and hospitals. The scheme will cover about 500 million people.

Maldives has a national state health insurance scheme, *Hasunvaa Aasadha*, providing universal access to health since January 2014.

Health insurance data holds great potential for measurement of NCDs and their risk factors. It has an advantage that it provides real-time and continuous big data. Data are collected as a core business process of claim settlement which also includes data of public health interest, such as, medications, diagnostic procedures, treatment procedures, outcomes and various costs. Insurance data have a great potential to assess quality of care, adherence to clinical protocols, patterns of drug prescription, diagnostics, and costs.

The health insurance data distinguishes itself from the traditional health data for its inclusiveness, as it covers, both private and public hospitals, and may provide complete picture. Insurance data allows longitudinal tracking of data on health facilities and providers, and individual patients with unique identification number. It may provide opportunity for linking health outcomes to inputs and process of health care. Triangulation of insurance data with other traditional sources may help in cancer registry, comparison of cause of death from vital registration systems, and cost comparison.

3.8 Increasing access to data: SEARO Microdata Repository: Documenting and Archiving Public Health Survey Data.

There is a substantial increase in data collection activities and volume of data generated from national surveys. Some important national surveys, namely, Demographic and Health Surveys and Multiple Indicator Survey, NCD surveys – STEPs/ NHES, GSHS, National TB Prevalence Surveys.

These data sources have long-term and wider value to assess trends in key health outcomes and change over time periods. This necessitates documentation and establishment of data repositories. Return on investment is low and inefficient.

This is a challenging and difficult task and confronted with several problems and constraints. Organization of surveys is scattered across multiple department in government, and there is a lack of
coordination and little sharing of information. Further, there is an excessive dependence on external agencies for technical support and funding. Data archiving is limited and often left to the coordinators risking losing data over time. While designing survey, several variables are included out of enthusiasm, but never analyzed and used. The published final report contains only 10-15% of information from huge data sets. More value come from secondary data analysis.

The current status of data archiving and access

- Data archiving and preservation from surveys often left to partners/donors supporting the surveys
- In some instances, partners have maintained the archiving sites and provided regular access to data: DHS, CDC funded projects.
- Limited institutional policy and implementation framework within countries on how to archive and provide access from these public health surveys.

The solution for improving the situation

- Each country set up their national data archives that provides access to public health researchers and students and other bonafide stakeholder to maximize the use of data
- To preserve data for long term analysis
- Single repository to provide a snapshot on data available from different sources
- Archive data at multiple places- regional and global level

WHO is taking initiative to better preserve these data. Following data repositories can be accessed at the Regional and Headquarters levels at the following websites.

**WHO Regional** microdata repository

[https://nada.searo.who.int](https://nada.searo.who.int)

**WHO HQ** microdata repository:

[http://www.who.int/ncds/surveillance/microdata](http://www.who.int/ncds/surveillance/microdata)

### 3.8 Partners’ Forum

The Regional Consultation meeting was attended by 8 partner agencies which are active in the SEAR countries and providing financial and technical support. The following partner agencies participated in the meeting:

- Asian Development Bank (ADB)
- Centers for Disease Control (CDC)
- UN ESCAP
- ICF/ Demographic Health Surveys
- Institute of Health Metrics and Evaluation (ISME)
- George Institute of Global Health
- Vital Strategies: Data for Action
- World Bank
3.8.1 Introduction and Need for Regional Coordination Mechanism: Beating NCDs Together.

Need for Regional Partners’ Forum: There is a growing NCD epidemic in all member states. NCDs account for more than 60% deaths and DALYs in South east Asia Region. The region shares a disproportionate contribution of premature deaths, a 29% of all global premature deaths from NCDs. National efforts at the country level are just starting to establish and strengthen human resource capacity for complex policy matters and NCD service delivery at the primary health care level. There is an increasing involvement of international agencies in funding and efforts to support national NCD prevention and control. More and more partners have come forward to provide funds, research and technical support to member states. Different partners have different strengths, mission and resources. It would be desirable to set up an effective coordination mechanism at the regional level to achieve the goals and targets of NCD prevention and control efficiently through synergy and complementarity of efforts.

It is proposed to set up a Regional Partner Working/Coordination Group to facilitate efficient resource harmonization and utilization to reduce NCD premature mortality and risk factors. Though there are many global partner working/coordination groups, a Regional level working group can be established in the SEAR which has one-quarter of world’s population. The SEAR is undergoing a demographic, economic and health transition, and rapidly urbanizing. The health infrastructure is sub-optimally developed. Health systems are weak and lacks access and availability of affordable care. Rising cost of health care and unorganized and poorly regulated private health sectors seriously affect utilization of services.

The Regional Partner Working Group would coordinate to identify opportunities for interventions through sharing information; develop collaborative program; reduce duplication of efforts and funding through better harmonization; and maximize impact of their investments at the country level.

Composition of Regional Working Group

An organization that international presence with active presence /work plan in one or more-member states of SEAR will be eligible to be a member of the partners’ working group.

The members may be International NGOs, Development Banks, various UN agencies, Bilateral development partners active in SEAR, global health institutes. Partner agencies will be responsible for designating the representative/alternate to the forum

Special invitees/observers: WHO HQ, others, member state representatives

New partners can join the group with request to Secretariat, which will propose a new agenda item to that effect in the next meeting

Terms of Reference

1. The group will serve as a forum where partners keeps each other updated on activities /future plans that being undertaken in respective countries in the Region, making sure that these activities are coordinated.
2. Facilitate collaboration among different partner agencies on identified activities where areas of synergies are identified
3. The group will coordinate technical assistance provided to respective member states by partners and/or their contractors to reduce duplication and improved efficiency at the country.

4. Regularly review the progress made by member states in different aspects of NCD control to inform the future plans

Secretariat

WHO SEARO will serve as the secretariat for RWG/RCM with the following responsibilities

- Regularly organize the virtual (2-3 times) and face-to-face meetings of the group (at least once/year)
- Face to face meeting may be organized as part of some other regional meetings
- Coordinate member states updates on NCD control and prevention activities for sharing at RCM/RWG meetings to inform partners’ work
- follow-up with partners on implementation of key decisions taken up at RWG/RCM

3.8.2 Partners’ Presentations

Asian Development Bank (ADB). It is a major financing agency in Asia Pacific Region. ADB has a 2030 vision to achieve prosperous, inclusive, resilient, and sustainable Asia and Pacific, while sustaining its efforts to eradicate extreme poverty. ADB has seven operational priorities: addressing poverty and reducing inequalities; gender equity, tackling climate change and building climate and disaster resilience; livable cities; strengthening governance and fostering regional cooperation and integration. ADB is committed to managing growing disease burden due to NCDs and elderly care. It is supporting several ongoing projects addressing NCDs.

UN ESCAP. It focuses on collaborative initiative to improve CRVS in Asia and Pacific. It aims at universal registration of births and legal documentation civil registration of vital events and making available accurate, complete and timely vital statistics and dissemination. It targets deaths statistics disaggregated by cause of death; reduction of deaths coded to ill-defined codes; and increase in non-facility deaths coded through Verbal Autopsy.

Institute for Health Metrics and Evaluation (IHME). IHME is based in University of Washington in USA and is the lead agency to provide estimates of Global Disease Burden that collaborates to strengthen global burden of disease through capacity building. It has that has over 4000 collaborators in 56 countries. IHME and WHO have recently signed memorandum to improve accuracy, timeliness and policy-relevance of health data.

Vital Strategies. The agency envisions a world where everyone is protected by a strong public health system and a world where governments use data and evidence for action and impact. Their key current project include: Data for Health projects designed to build government capacity in the generation and use of data and NCD risk factor prevention projects. Data for Health Initiative has a CRVS improvement program and Data Impact Program. The NCD risk factor projects cover a range of issues from tobacco control to road safety and air pollution. The agency provides technical support for data use and applications.
World Bank. World Bank is global financing agency for development projects including strengthening health systems, and financing in several countries. The World Bank Representative shared experiences of a project in Tonga ‘improving the use of taxation policy on tobacco, alcohol, food, and beverages as a response to the NCD crisis in Tonga. The top seven most obese countries in the world are in the Pacific. over one-fourth of the adult population in most Pacific-Island Countries is clinically obese (BMI equal to or greater than 30). Prevalence of tobacco consumption in the Pacific is much higher than the global average. Taxation policy on tobacco, alcohol and unhealthy foods has a positive impact. But effects of tobacco policy are diluted due to shift from more expensive brands to lesser expensive brands of manufactured cigarettes. Taxation of unhealthy food has limited effect on consumption. Tax on alcohol leads to reduction in the frequency and amount of alcohol consumed, but there are also substitutes. Price, rather than health, is the main reason among those who decided to change behaviors and reduced consumption.

The lessons learned from the project are: engage political, social and community leaders to support social and behavior change, and countries need multi-sectoral interventions to address NCD burdens. Tax policy alone is not adequate to change consumption behavior.

Australian National University (ANU). The ANU is an academic and research university. It can support range of activities including CRVS assessment, quality evaluation, strategic planning, design and implementation of CRVS system strengthening, sample mortality surveillance, capacity building and institutionalization of death registration; MCCD; and verbal autopsy. The ANU can also help in data management; ICD coding; statistical analysis (demographic and epidemiology); and mortality estimation from partial data.

3.8.3 Group Work: Country Expectations from Partners

The participant countries expressed their expectations for assistance from the Partners in the following key areas:

1. Financial and Technical support in establishing and strengthening CRVS system to ensure complete and accurate data mortality.
2. Capacity building ICD coding and Cause of Death for NCD assessment
3. Verbal Autopsy methods, techniques and analysis of cause of death
4. Capacity building in basic and advance data analysis and triangulation of NCD mortality and morbidity
5. STEPs approach for risk factors assessment and measurement
6. Estimation of Global Burden of Disease
7. Competence in multisectoral planning and coordination for NCD prevention and control
8. Developing Electronic health records, registration and reporting system, and ePatient information systems
4.0 Conclusions and recommendations

4.1 Conclusions

1. Noncommunicable diseases is a pressing public health and development problem in the region, both from overall and from equity perspective. Out of a total 13.8 million deaths in the region in 2015, 8.8 million deaths (64% of all deaths) were caused by NCDs and accounted for 4.4 million premature deaths (72% of all premature deaths) in 30-70 years age.

2. Measuring NCDs’ premature mortality: The NCD mortality reduction is one of the SDG targets: ‘By 2030, reduce premature mortality from NCDs through prevention and treatment and promote mental health and wellbeing’. All the member states have included premature mortality from NCDs as defined in GMF as their key indicator, but few are actually measuring it.

3. The Civil and vital registration (CRVS) performance varies across the region, but all countries have some data on NCD mortality from either CRVS, SRS, or hospitals. Countries must use the data generated currently, even if incomplete or of poor quality, to estimate their current mortality—use of data is likely to put a positive pressure for improvement of overall systems. Global initiatives have already developed statistical capacity to use ‘incomplete data’ and the same analytical capacity should also be developed at the national levels.

At the same time, countries must accelerate the efforts to expand death registration and ascertain of cause of death using all available tools, and with mobilization of additional funding and human resources.

4. Monitoring NCD risk factors: Regular monitoring of prevalence of key risk factors is an essential component of overall NCD surveillance and monitoring framework. In the absence of universal screening (which is not feasible in majority of the countries), periodic population-based surveys are the most preferred tools to measure and track NCD risk factors.

5. Integrated NCD risk factor surveys are not an ALTERNATIVE to weak HMIS, but are important in their own right, and add additional value even in the context of best functioning HMIS. Countries may need to organize more than one (or even more) population-based public health surveys to cover all important public health issues, and it may be difficult to add NCDs to ongoing DHS/MICS surveys that focus primarily on reproductive health age groups and have already expanded substantially beyond their original mandate by including communicable diseases, domestic violence etc.

6. The decision to organize stand-alone survey for a single risk factor (such as tobacco) or only the integrated NCD surveys, depends on the country, their human and financial capacity, the status and stage of the program, etc.

7. Measuring national system response: NCD Prevention and Control requires multi-sectoral interventions/approaches. So the M& E systems should measure overall ‘national’ system response rather than just the ‘health’ sector response, including policy response indicators from other sectors as well. Two most preferred data sources for measuring national system response are periodic population NCD surveys (such as STEPs) and national health facility based information systems. Both of these sources may complement each other, rather than a substitute for each other.

8. Countries should adapt NCD Global Monitoring Framework to their own policy and health system context including more indicators to assess level of implementation of their own policies.
9. Standardized indicator definitions, techniques of sample collection and analysis for physiological and biochemical indicators (Blood Pressure, Blood Sugar, Triglycerides, Cholesterol, Salt Intake, etc.) should be used to ensure comparability and assessment of trends over time.

10. Health insurance systems may generate another large data set that may shed light on NCD mortality, morbidity, health care expenditure and quality.

11. Financing needed for human resources for surveillance and monitoring; specific operational activities; and capacity building of staff. Few countries in the region have detailed national health accounts that could show domestic health spending in prevention and care of NCDs, and more specifically, for NCD surveillance and monitoring. Based on the reports from the member countries, the status of current health expenditure varies in the SEAR member countries, the lowest being US $ 32 per capita in Bangladesh, and the highest, US $ 944 in Maldives. Bhutan, Bangladesh, India, Myanmar, Nepal and Timor-Leste spend less than US $ 100 per capita. The proportion of health expenditure to GDP, ranges between 2.6 percent in Bangladesh and 11.5 percent in Maldives. Nepal and

12. There is a substantial increase in data collection activities and volume of data generated from national surveys. Some important national surveys, namely, Demographic and Health Surveys and Multiple Indicator Survey, NCD surveys – STEPs/ NHES, GSHS, National TB Prevalence Surveys. Data collection from multiple sources and integration is a challenging and difficult task and confronted with several problems and constraints. Organization of surveys is scattered across multiple departments in government, and there is a lack of coordination and little sharing of information. Further, there is an excessive dependence on external agencies for technical support and funding. Data archiving is limited and often left to the coordinators risking losing data over time. While designing survey, several variables are included out of enthusiasm, but never analyzed and used. The published final report contains only 10-15% of information from huge data sets. More value come from secondary data analysis.

13. There is an increasing involvement of international agencies in funding and efforts to support national NCD prevention and control. More and more partners have come forward to provide funds, research and technical support to member states. Different partners have different strengths, mission and resources.

4.2 Recommendations

1. Regular reviewing and updating of the national NCD surveillance and monitoring plans as part of national multisectoral plans. Rising NCD burden and premature mortality warrants effective planning and implementation of NCD prevention and control programs in the member countries in Member States in WHO South-East Asia Region

2. Establishing Regional Partner’s Coordination Mechanism. There is increasing number of external/international agencies that work for and support activities related NCD prevention and control through funding and technical assistance. The Partners’ Forum with the Secretarial support from WHO SEARO should be formalized to coordinate partners’ role and their involvement in funding, technical support and capacity building in the member countries.

3. Partners can play important role in strengthening overall NCD surveillance and monitoring in terms of finance, technology and capacity building. Partner support should be mobilized and coordinated in the following areas:
• Financial and Technical support in establishing and strengthening CRVS system to ensure complete and accurate data mortality.
• Capacity building ICD coding and Cause of Death for NCD assessment
• Verbal Autopsy methods, techniques and analysis of cause of death
• Capacity building in basic and advance data analysis and triangulation of NCD mortality and morbidity
• STEPs approach for risk factors assessment and measurement
• Estimation of Global Burden of Disease
• Competence in multisectoral planning and coordination for NCD prevention and control records, registration and reporting system, and ePatient information systems

4. Data repositories of NCD mortality, morbidity and risk factors should be created at the surveys, disease specific national surveys, sample surveys, and nutrition and diet surveys, frequently carried out in the SEAR member countries. The data generated from such sources may be stored in data repositories and made accessible to policy makers, health planners, program managers and researchers for their use.

5. Countries with near universal social health insurance system (e.g. Indonesia, Thailand, and Maldives) should explore health insurance data for measurement of NCDs and their risk factors, which may provide continuous real-time data. Countries should exploit the great potential offered by health insurance system to assess quality of care, adherence to clinical protocols, patterns of drug prescription, diagnostics, and costs.
Annex 1: NCD Global Frameworks: National Indicators and targets in WHO South-East Asia Region

<table>
<thead>
<tr>
<th>Framework Element</th>
<th>Global Target</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>DPR Korea</th>
<th>India</th>
<th>Indonesia</th>
<th>Maldives</th>
<th>Myanmar</th>
<th>Nepal</th>
<th>Sri Lanka</th>
<th>Thailand</th>
<th>Timor-Leste</th>
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<tbody>
<tr>
<td>Target Year</td>
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<td><strong>MORTALITY &amp; MORBIDITY</strong></td>
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<td>Premature mortality from NCDs</td>
<td>1. A 25% relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases</td>
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<td><strong>BEHAVIOURAL RISK FACTORS</strong></td>
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<td>Harmful use of alcohol</td>
<td>2. At least 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context</td>
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<td>Physical Inactivity</td>
<td>3. A 10% relative reduction in prevalence of insufficient physical activity</td>
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<td>Salt/sodium intake</td>
<td>4. A 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years</td>
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<td>Tobacco use</td>
<td>5. A 30% relative reduction prevalence of current tobacco use in persons aged 15+ years</td>
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<td><strong>BIOLOGICAL RISK FACTORS</strong></td>
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<td>Raised blood pressure</td>
<td>6. A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances</td>
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<td>Diabetes and obesity</td>
<td>7. Halt the rise in diabetes &amp; obesity</td>
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<td><strong>NATIONAL SYSTEMS RESPONSE</strong></td>
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<td>Drug therapy to prevent heart attacks and strokes</td>
<td>8. At least 50% of eligible people receive drug therapy and counselling (including glycemic control) to prevent heart attacks and strokes</td>
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<td>Essential NCD medicines and basic technologies to treat major NCDs</td>
<td>9. An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities</td>
<td>80%</td>
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<td>Household indoor air pollution</td>
<td>Relative reduction in households use of solid fuels as the primary source of energy for cooking</td>
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Annex 3: Country surveillance book (available on web only)

Annex 4: Presentations from experts, country and other (available on web only)
Regional Consultation and Partners’ Forum on NCD Surveillance and Monitoring,
Hotel Dusit Thani, 946 Rama IV Road, Bangkok, Thailand, 17-19 September 2018

Annex 5: Agenda

Monday, 17 September 2018 @ Vimarn Suriya Room

0830 – 0900 hrs  Registration
0900 – 09.20 hrs  **Opening Session:**
                   (Session moderator: Dr Thaksaphon Thamarangsi)
                   Introduction of Participants and meeting objectives – Dr Thaksaphon Thamarangsi,
                   Director, Department of Noncommunicable Diseases and Environmental health
0920 – 09:50 hrs  An overview of surveillance and monitoring for NCDs in WHO south east Asia: - Dr Manju Rani
0950 – 10:00 hrs  **Message from Regional Director, WHO South-East Asia Region**
                   (to be delivered by Dr Daniel Kertesz, WR Thailand)
10:00-10:10       Group photo
1010 – 10:30 hrs  Tea/Coffee Break
1030 – 1200 hrs  **Session 1.1: Measuring premature mortality from NCDs: importance, current status, way forward**
                   (Session Moderators: Dr Chalapati Rao, Dr Kanitta Bundhamcharoen)
                   a. Explaining global indicator on premature mortality and global/regional status of data availability: Ms Leanne Riley
                   b. Availability and quality of mortality data in SEAR: Mr Mark Landry
                   c. **Thailand:** achieving high mortality registration with cause of deaths: strategies and remaining challenges.
                   d. **Bangladesh:** Sample registration system as an alternative to CRVS: the data generated and lessons to share
1200 – 1300 hrs  Lunch Break – Pavilion Restaurant @ Lower Lobby
1300 – 1430 hrs  **Session 1.2: Monitoring NCD premature mortality indicator: Country presentations**
                   (Session Moderators: Dr Chalapati Rao, Dr Kanitta Bundhamcharoen)
                   a. **Indonesia:** Setting up SRS to generate mortality data and the challenges faced
                   b. **Myanmar:** Current status of mortality data and what is being done
                   c. Estimation of mortality from Noncommunicable diseases and related risk factors: Dr Nikhila Kalra
                   d. Best practice models in measuring mortality from outside Region: Chalapati Rao

Completing the mortality section, the NCD surveillance worksheet.
1430 – 1500 hrs  |  Tea/Coffee Break

1500– 1630 hrs  |  **Session 1.3:** Cost and Financing of surveillance for NCDs (Session Moderators: Prof T Sundararaman, Dr Robert Oelrichs)

   a. **Nepal:** increasing domestic resources for NCDs surveillance  
   b. **Maldives:** implementing and financing the NCDs surveillance: the challenges faced  
   c. Financing NCD surveillance and monitoring: Role and extent of external financing  
      – Dr Manju Rani

1630 -1700 hrs  |  **Session 1.4:** Taking stock of the day: way forward to measure and monitor NCDs cause-specific mortality; and financing of surveillance for NCDs (Session Moderators: Prof T Sundararaman, Dr Chalapati Rao, Dr SD Gupta)

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**Tuesday, 18 September 2018 @ Dusit Thani Hall**

0830 – 08:40 hrs  |  Wrap up from Day 1 and introduction of key topics for day 2: Dr SD Gupta

0840 – 1000 hrs  |  **Session 2.1:** Measuring risk factors for NCDs to monitor NCD response: (Session Moderators: Dr Hong Rathavuth, Dr Nandita Murukutla)

   a. WHO approach and global progress in measuring risk factors for NCDs: MS Leanne Riley  
      Discussion: Scope of NCD risk factor surveys: mental health, household air pollution?  

   **Country presentations**

   b. **India:** doing integrated risk factor surveys in a large country—the need for national and subnational estimates for NCD risk factors.  
   c. **Thailand:** National health examination surveys to measure NCD risk factors  
   d. **Indonesia:** Riskesdas-The Indonesian integrated survey to monitor NCD risk factors

1000 – 1030 hrs  |  Tea/Coffee Break

1030 – 1200 hrs  |  **Session 2.2:** Doing population-based surveys to measure NCD risk factors: best approaches (Session Moderators: Dr Hong Rathavuth, Dr Nandita Murukutla)

   a. Collection of NCD risk factor data in other population surveys (DHS/MICS) — issues and challenges: Dr Hong Rathavuth  
   b. Best approaches to measure physiological risk factors requiring biological samples: Ms Leanne Riley  
   c. Measurement of population salt intake with use of spot urine samples: experiences: Prof Vivekanand Jha

Completion of NCD surveillance worksheet related to risk factors.

1200– 1300hrs  |  Lunch – Pavilion Restaurant @ Lower Lobby
Session 2.3: Measuring policy and health system response for control and prevention of NCDs  
(Session Moderator: Prof T Sundararaman, Dr Robert Oelrichs)

a. Health system response indicators in global framework and their measurement in the existing WHO STEP survey: Dr. Manju Rani, SEARO

b. Sri Lanka: Is there role of special health facility surveys or use of alternative approaches: Dr S Champika Wickramasinghe

c. Bangladesh: Use of routine health facility data for estimating and monitoring NCD indicators

d. Regional tools for collecting routine health facility data and providing counseling for eligible population: learning from Western Pacific Region: Dr Warrick Junsuk Kim

e. Use of National health insurance systems to measure and monitoring NCD indicators: Dr Manju Rani/SEARO

Panel discussion involving participants form India, Indonesia, Thailand and Maldives.

1430 – 1500 hrs  Tea/Coffee Break
1500 – 1630 hrs  Increasing access to data: Brief presentation on SEARO microdata repository: Dr Manju Rani

Group work (3 groups): Completion of surveillance workbook and developing national surveillance roadmaps in context of their own M&E frameworks.

Wednesday, 19 September 2018 @ Dusit Thani Hall

0830 – 0845 hrs  Wrap up from Day 2 and introduction of key topics for day 3: Dr.SD Gupta  
(Session Moderator: Mr Mark Landry, Dr Robert Oelrichs)

0845 – 0900 hrs  Partners’ forum: Introduction and need for a regional coordination mechanism:

0900 – 1030 hrs  Partners’ forum: Overview of technical or financial support provided in the area of overall NCD control and prevention with special focus on M&E activities for NCD control and prevention in SEAR

a. Asian Development Bank (ADB)
b. Centers for Disease control (CDC)
c. UN ESCAP
d. The Demographic Health Survey/ICF
e. Institute for Health Metrics and Evaluation (IHME)
f. George Institute for Global Health
g. Vital Strategies: Data for action
h. World Bank

1030 – 1100 hrs  Tea/Coffee Break

1100 – 1200 hrs  Discussion on models for regional coordination mechanisms: The proposals: Dr Thaksaphon Thamarangsi and Dr Robert Oelrichs

1200 – 1300 hrs  Lunch - 22 Kitchen and bar @ 22nd Floor
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>1300 – 1500 hrs</td>
<td><strong>Parallel sessions:</strong>&lt;br&gt;a. Partners’ forum: creation of a regional working group to coordinate the NCD surveillance activities in the Region.&lt;br&gt;b. Group work: Developing a national action plan based on their finding from completion of NCD surveillance book, which will be compiled and shared with all the participants.</td>
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<tr>
<td>1500 – 1530 hrs</td>
<td>Tea/Coffee Break</td>
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<tr>
<td>1530– 1630 hrs</td>
<td>Summary and conclusions from the day&lt;br&gt;Closing Remarks and vote of thanks</td>
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Annex 6: List of Participants

**Bangladesh**

**Dr Mohd. Abdus Salam**  
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**Bhutan**

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