

## Annex 3

### Proposing Priority Areas for WHO-RTG Country Cooperation Strategy (CCS) 2022-2026

#### Propose Priority Area: Public health emergency (PHE), in particular one health

##### Q 1. This proposal is submitted by

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##### Q 2. How can WHO add value? What is the role of WHO (either WHO Thailand or SEARO or Headquarter) in supporting this priority area? (Max 300 words)

A CCS priority programme on Public Health Emergencies has the potential to leverage WHO's convening and social / intellectual capital to support both capacity building *in* Thailand and the work of Thailand *beyond* its borders.

#### Capacity building in Thailand

- Bringing national and international technical and funding partners together in a common forum will help to align / harmonize technical and financial support for national capacity building, as well as maximizing efficiency by identifying technical and funding gaps, and avoiding support overlaps.
- Expertise can be accessed through WHO and partners to evaluate PHE capacities in Thailand, and a CCS programme can then be used to advocate for additional domestic funding to support implementation of recommendations.
- Support provided by the extensive global network of WHO Collaborating Centres can be accessed to provide technical support to strengthen PHE capacities in Thailand.
- Engagement in the development of the 4th bi-regional WHO 'Asia Pacific Strategy for Emerging Diseases' will help ensure alignment with Thailand-led GHSA objectives, harmonize capacity building approaches between countries and across borders and mobilise donor funds.

#### Support for Thailand's work outside its borders

- Capacities of WHO Collaborating Centres in Thailand could be better leveraged through a CCS health emergency forum to provide coordinated technical support to other countries.
- Re-designation of the Division of Epidemiology as a WHO Collaborating Centre for FETP (or for strengthening PHE Human Resources) will help to strengthen Thailand in a regional / global leadership role, including revitalization and provision of funding for the international FETP.

- Engagement with FAO and DLD / FETPV may help to align and strengthen arrangements for international outbreak response for zoonotic diseases in the context of 'One Health'.
- Identification of new GOARN partners in Thailand and providing GOARN training in international outbreak response will better enable Thailand to support outbreaks in other countries.
- Further strengthening of Thailand 'Emergency Medical Team' (EMT) will better enable Thailand to respond to natural disasters and provide clinical management support to outbreaks in other countries.
- Leveraging the capacity of relevant WHO CCS in Thailand will help to provide international support for chemical / toxicological events.

### Q 3. Please specify all partners who collectively drafted and submitted this proposal

- This proposal has been developed based on inputs from the analysis of 3 key official reports namely the Joint External Evaluation of IHR core capacities of the Kingdom of Thailand 2017 (JEE) [1], the Global Health Security Index of Thailand 2019 (GHSA) [2] and the Joint Intra-Action Review of the Public Health Response to COVID-19 in Thailand July 2020 (IAR) [3]. These formal evaluations have been conducted through comprehensive and participatory process with several key stakeholders from health and non-health sectors in Thailand. These analyses point out to achievement and gaps on PHE.
- In the concept note development process, we (the secretariat team assigned by the CCS central manager include DDC (include the key partners: IHR center/DOE (Division of Epidemiology), GHSA secretariat, EOC), IHPP (Health Security Policy and Systems research team), WHO CCS-AMR and WCO Thailand), have worked together to plan for the concept note development. Below is the process,
  - 20-23 July 2021: all key partners have been informed about the concept note development process and a survey had been launched to collect information from all stakeholders. The essential information from key stakeholders drawn from survey are inputs for the concept note development.
  - 27 July 2021: A brainstorming session was convened. [4]
    - Chaired by Dr. Sopon Iamsirithaworn, the Deputy DG of DDC
    - Objectives
      - To agree on program goal, program guiding principles, scope/definition, and strategic objectives
      - To brainstorm and identify key inputs for concept note development
    - Participants:
      - MOPH (Ministry of Public Health): DDC (Department of Disease Control), DMSC (Department of Medical Science), DOH (Department of Health), FDA (Food and Drug Administration), GHD (Global Health Division), PSO (Permanent Secretary Office), National Vaccine Institute (NVI),
      - WHO-CCS contributors: (WHO, HSRI (Health System Research Institute), THPF (Thai Health Promotion Foundation), NHSO (National Health Security Office), NHCO (National Health Commission Office))

- Other sectors (MHESI (Ministry of Higher Education, Science and Innovation), MOI (Ministry of Interior)), MNRE (Ministry of Natural Resources and Environment)
- International partners (USAID (U.S. Agency for International Development), JICA (Japan International Cooperation Agency))
- Experts related to PHE: epidemiologists, Public Health specialist, drug system and security, AMR, One Health, health systems
- Advisors to DDC, PSO in disease control and Global Health
- Outcome of the meeting
  - Agreed on the program goal, program guiding principles, scope/definition and strategic objectives
  - Assigned secretariat to jointly develop the concept note (IHPP, DDC, WHO, WHO-CCS AMR, a representative from Security Council and Division of Public Health Emergencies)
- **In conclusion**
  - Inputs for the development of the concept note were drawn from three major official documents, survey of key stakeholders (health and non health sector), and deliberations on 27 July 2021.
  - The concept note has been collectively developed by IHPP, DDC, WHO, WHO-CCS AMR, representatives from National Security Council and Division of Public Health Emergencies.

Q 4. Please provide a clear problem statement with justification for the inclusion of this topic in the CCS 2022-2026. Please also specify why there is a need for additional support under the CCS, beyond the usual budget and current work of Thai health system will not be able to solve the problem. (Max 500 words)

**1. PHE in pandemic backdrop, the More Than Ever Significance:** It is one of the most important global health agenda with increasing opportunities for more resource/investment to support countries.

- PHE is becoming one of the most important global health agenda. It is an essential element of the Sustainable Development indicator 3.d.1 (International Health Regulations capacity and health emergency preparedness) [5] and one of the WHO triple billion goals [6]. There are several significant ongoing global movements to drive for better global health security systems including the negotiation towards an international legally binding framework Convention and the new funding mechanism for pandemics.
- PHE is the policy priority of influential global players and they will invest more for better health security. (G20, USA, China, Japan, UK, BMGF). Further, UK's global health security agenda for G7 summit in 2021 in Cornwall focuses on universal health security, antimicrobial resistance, digital health.
- Comprehensiveness and balance between preparedness and response—require collective capacity

## ***2. Demonstrated commitments and Given Priority at national level***

The Government of Thailand and the key stakeholders has demonstrated its strong policies and commitments to support PHE and health system strengthening for decades which are reflected through...

- There are several national plans, mechanisms and legislations related to PHE. (National Disaster Prevention and Mitigation Plan 2558 approved by cabinet, The National Strategic Plan for Emerging Infectious Disease (2017-2021), Integrated and multi-sectoral COVID-19 plan for safety and mitigating impact from 2019 coronavirus approved by the Prime Minister, the Communicable Diseases Act B.E. 2558, the Vaccine Security Act B.E. 2561 with full funding supports)
- The investment for the strong and resilient health security systems for decades including the well-established health system through primary health care and UHC, the development of national disease control programs and surveillance/lab system/epidemiological workforce (FETP, FEMT, FETP-V, SRRT), one health network, village health volunteers.
- WHO CCS AMR had demonstrated all partners' commitment to generate evidence which address AMR challenges and support the effective implementation of the national plan. The Health Policy and System Research Network on AMR which contribute to the M&E structure of AMR; notably the establishment of Surveillance Antimicrobial Consumption in humans and animals; working with National Statistical Office in integrating AMR module in the national biennial Health and Welfare Survey to monitor population knowledge and awareness of AMR. Such capacity to produce One Health report in 2017, 2018, 2019 and the upcoming 2020 is on par with European Union Member States [7]. The One Health Report is built in into routine data collection and is sustainable.

## ***3. System Gaps and Challenges remained:***

- Although Thailand has been widely accepted as a well-performed country in PHE but during COVID-19 crisis we can identify a number of policy and system gaps which can be improved. Good governance and better PHE capacities could lead to achievement of health security for all.
- Policy and system gaps are classified in the area of governance and coordination, pandemic financing, legislations, health system capacities (surveillance, laboratory, preparedness, risk communication) on specific areas (drug and vaccine security, AMR, One Health, Zoonosis))
- To address these gaps, we need evidence to support and inform policy decisions through knowledge generation, establish/strengthen monitoring and evaluation system and capacity building and international collaboration. This cannot effectively perform through routine administration or business as usual approach. It needs a fulltime and full commitment of core team specialized in policy and system to serve as the manager and closely collaborate with key implementing agencies and actively engage with multisectoral partners. The WHO-CCS is a potential platform that provides convening power from WHO and partners in resource mobilization not only financing but also the social and intellectual capitals. The WHO CCS is also a flexible and an agile platform in terms of

administration which allow establishing and sustaining high capable core team staff to manage the program.

- The strong PHE systems will contribute for saving lives and achieve security for all and support at least one of WHO Triple Billion Goals.

4. The PHE program will drive for concrete outcomes and measurable results with clear timeline. The achievement of the program is feasible. These are the reasons.

- The PHE has been a national priority, an important global agenda and it can attract new partners.

- The program will facilitate effective integration of multisectoral and multistakeholder work to achieve sustainable and measurable results toward common targets in alignment with national policies and strategies.

- The PHE network (including One Health) in Thailand is strong as all potential partners have long been working together through previous regular outbreaks, pandemics and public health crises.

- The PHE program will be managed by potential leading agency and program manager with strong support from key implementing agencies.

- The program is designed to drive by evidence and have clear focus on prioritization and policy and system. (see responses to Q5 and Q6)

- The Program will be governed by a steering committee which would compose of key stakeholders and experts and effectively measured the results.

- The audiences include the National Infectious Diseases Committee chaired by Minister of Public Health, the provincial diseases control committee chaired by the governor, the National Security Council, the general public and media.

*[Note: (1) Problem statement should highlight a demonstrable impact on the health of people in Thailand. (2) If this topic is part of the current CCS 2017-2021, please indicate why it should continue under CCS 2022-2026 and what will be differences. Please highlight any lessons learned from the previous implementation period (CCS 2017-2021).*

*Max 500 words*

Q 5. Please specify what focus areas need to be addressed under this priority area, proposed plans/activities and the budget needed in Thai Baht for 5 years during 2022-2026. (maximum 5 areas, each area should be linked to the problem statement) (Max 500 words)

According to the analysis of the JEE, GHSA, IAR and stakeholder consultation; all key partners agreed on program goal, guiding principles, scope, definition and objectives. (see ANNEX)

These are proposed priority, major program activities and budget needed. There are 4 key areas (Knowledge generation and management, monitoring and evaluation, capacity building and networking and international collaboration)

	Objectives	Process	Outputs
<b>1.</b>	<b>Area 1: Knowledge generation and knowledge management</b>		
<b>1.1</b>	<b>Policy and systems research in PHE</b>		
	<ul style="list-style-type: none"> <li>To identify and analyze the existing capacity and capacity gaps</li> <li>To identify and prioritize strategic actions which boost and sustain PHE capacities</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> <li>Interview with key informants</li> <li>Onsite visit</li> <li>The framework for analysis will build on IHR core capacities and the policy and system gaps</li> <li>It would be conducted with the next round JEE.</li> </ul>	<p><b>Year 1</b></p> <ul style="list-style-type: none"> <li>The first comprehensive situation analysis report of PHE system in Thailand</li> <li>Prioritize strategic actions and Policy recommendations</li> </ul> <p><b>Year 2, 3, 4, 5</b></p> <ul style="list-style-type: none"> <li>Report of the analysis of specific PHE systems and policy recommendations</li> <li>Series of publications</li> </ul>
	<ul style="list-style-type: none"> <li>To identify key knowledge gaps and prioritize key PHE policy and system research</li> <li>To develop the roadmap on health policy and systems research</li> <li>To Conduct priority research</li> </ul>	<ul style="list-style-type: none"> <li>Literature review</li> <li>Identify research needs, key research questions and expected outcomes</li> <li>Mapping R&amp;D in PHE and prioritization</li> </ul>	<p>Year 1</p> <ul style="list-style-type: none"> <li>Roadmap of Health policy and systems research on PHE (5 year)</li> </ul> <p>Year 2-5</p> <ul style="list-style-type: none"> <li>Conduct priority research</li> <li>Advocate/drive evidence informed policy decision on some essential issue</li> <li>Publications</li> </ul>
<b>1.2</b>	<b>Knowledge management</b>		
	<ul style="list-style-type: none"> <li>To establish knowledge sharing and knowledge management platform</li> </ul>	<ul style="list-style-type: none"> <li>Annual PHE Knowledge exchange forum</li> <li>Target: key person from relevant organizations from policy to local level</li> </ul>	<p>Year 1-5</p> <ul style="list-style-type: none"> <li>Annual PHE knowledge exchange forum</li> </ul>
	<ul style="list-style-type: none"> <li>Knowledge management on specific issues</li> </ul>	<ul style="list-style-type: none"> <li>Knowledge management in any priority areas (see the scope in ANNEX)</li> </ul>	<p>Year 1-5</p> <ul style="list-style-type: none"> <li>KM products to support effective implementation/archives</li> </ul>

		<ul style="list-style-type: none"> <li>Knowledge distribution through different channels</li> </ul>	<ul style="list-style-type: none"> <li>Knowledge distribution (website, pamphlets, E-newsletter, webinar series, GH fora)</li> </ul>
<b>2.</b>	<b>Monitoring and Evaluation</b>		
	<ul style="list-style-type: none"> <li>To establish the monitoring and evaluation platforms and framework</li> </ul>	<ul style="list-style-type: none"> <li>Develop and strengthen monitoring and evaluation framework/tools of PHE at national and provincial level (Provincial score card)</li> <li>Piloting the provincial score card in some selected provinces</li> </ul>	<p>Year 1</p> <ul style="list-style-type: none"> <li>Framework of monitoring and evaluation of the PHE at national level</li> <li>Provincial score card and piloting in some selected provinces</li> </ul> <p>Year 2,3,4,5</p> <ul style="list-style-type: none"> <li>Dashboard of the monitoring and evaluation of PHE capacities</li> </ul>
	<ul style="list-style-type: none"> <li>To establish a repository of information on PHE</li> </ul>	<ul style="list-style-type: none"> <li>Collect all important health information</li> <li>Data linkage (Epidemiology, laboratory)</li> </ul>	<ul style="list-style-type: none"> <li>Data repository</li> </ul>
<b>3.</b>	<b>Capacity building and networking</b>		
	<ul style="list-style-type: none"> <li>To develop a medium term (five year) PHE capacity development plan and implementation</li> </ul>	<ul style="list-style-type: none"> <li>Identify capacity gaps/manpower/training needs</li> </ul>	<p>Year 2</p> <ul style="list-style-type: none"> <li>Medium term PHE capacity development plan</li> </ul> <p>Year 3, 4, 5</p> <ul style="list-style-type: none"> <li>Implementation of the plan</li> </ul>
	<ul style="list-style-type: none"> <li>To establish a capacity building program on PHE to strengthen individual capacity and strengthen network (domestic/international network) through the INNE model</li> </ul>	<ul style="list-style-type: none"> <li>Health security initiative Academy: leadership program</li> <li>Target: young/middle career (Thailand, other countries)</li> <li>Training workshop (establish workshop, curriculum)(Focus on advance course, not a routine training, international training) <ul style="list-style-type: none"> <li>Target: executive, middle level</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>New batch of new health security leaders every 2 years</li> <li>Training workshops (advance)</li> </ul>
<b>4.</b>	<b>Promote International collaboration</b>		
	<ul style="list-style-type: none"> <li>To actively engaged in the</li> </ul>	<ul style="list-style-type: none"> <li>Identify and analyse international and domestic legal</li> </ul>	<p>Year 1,2</p>

	development of pandemic treaty and the new financing mechanism for pandemic, other important initiatives	frameworks financing mechanisms in pandemic <ul style="list-style-type: none"> <li>Actively engage and constructively contribute to the development of pandemic treaty, pandemic financing mechanism, bio-hub</li> </ul>	<ul style="list-style-type: none"> <li>Draft WHA decision/resolution</li> <li>Process for the development of the treaty, the pandemic fund, bio-hub</li> </ul>
	<ul style="list-style-type: none"> <li>To actively involve in the establishment of ACPHEED</li> </ul>	<ul style="list-style-type: none"> <li>Identify and analyze PHE system capacities in ASEAN countries</li> <li>Actively involve in the establishment of the ACPHEED</li> </ul>	Year 1,2 <ul style="list-style-type: none"> <li>Contribute of the establishment of ACPHEED</li> </ul>
	<ul style="list-style-type: none"> <li>To actively engage with platforms/initiative/network in PHE area</li> <li>Identify strategic alliance to collaborate</li> </ul>	<ul style="list-style-type: none"> <li>Identify and analyse potential platforms/initiatives/network/strategic alliances and the potential area to collaborate</li> </ul>	Year 1,2 <ul style="list-style-type: none"> <li>Actively engage with 1-2 potential partners</li> </ul> Year 3-5 <ul style="list-style-type: none"> <li>Expansion to other potential partners</li> </ul>

- Proposed budget for 5 years during 2022-2026. (80 million baht)

Q 6. What are the changes we want to see over the 5 years – what will be different in 5 years as a result of this program under CCS 2022-2026. (Max 500 words)

These are the expected changes in 5 years based on the 5 strategic objectives.

Strategic objectives	Expected outputs/outcomes
<p>1. To identify and analyze the existing capacity and capacity gaps related to PHE</p> <p>2. To identify and prioritize strategic actions which boost and sustain PHE capacities</p>	<p>a) Known existing capacities/capacity gaps through knowledge generation and knowledge management</p> <ul style="list-style-type: none"> <li>○ At national/provincial level</li> <li>○ In priority areas (Policy and coordination (+intersectoral), Governance/structure, pandemic financing, legislations, health system capacities (surveillance, laboratory, preparedness, risk communication, manpower)</li> <li>○ In specific areas (drug and vaccine security, AMR, One Health, Zoonotic))</li> </ul> <p>b) Develop Policy and system research roadmap in PHE and support researchers to conduct priority research</p> <p>c) The evidence from a) and b) will be prioritized and analyze into strategic actions and will be used as the key input for policy decision to strengthen, boost and sustain PHE system in Thailand</p>
<p>3. To build on and sustain intersectoral and multidisciplinary collaboration at sub-national and national levels based on COVID-19 crisis</p>	<p>The program will engage all key intersectoral partners in all key activities</p> <ul style="list-style-type: none"> <li>▪ engage intersectoral /multidisciplinary partners in the Steering Committee</li> <li>▪ involve key intersectoral/multidisciplinary partners (at all levels, international/national/subnational) in the policy and system research and in the prioritization/analyzing strategic actions</li> <li>▪ ensure ownership/participation of intersectoral/multidisciplinary partners in networking platforms and capacity building activities</li> </ul>
<p>4. To strengthen monitoring and evaluation systems for PHE</p>	<p>a) Strengthen/establish monitoring and evaluation system and tools at national and provincial level</p> <p>b) Piloting the tools (such as Provincial scorecard ) in some provinces and expand to other provinces</p> <p>c) Available Dashboard/information platforms to reveal PHE capacities/PHE related information at national and provincial levels</p>
<p>5. To promote international collaboration, initiatives and instruments/frameworks relevant for PHE</p>	<p>a) Strengthen international collaboration to support domestic work in priority areas through existing multilateral/bilateral platforms (such as border health, FETP, GHSA)</p> <p>b) Seek for new strategic alliance to promote and support domestic work in priority areas</p> <p>c) Promote Thailand's leadership/constructive roles in important international movements (pandemic treaty, pandemic fund,</p>

## ANNEX

### Public Health Emergency Program

#### 1. Program goals

Improved national capability to prepare, prevent, detect and respond to public health emergencies

#### 2. Program guiding principles

##### **2.1 Strengthening effective multi-sectoral actions at sub-national, national, regional and global level**

- Identify and work synergistically with the existing networks or organisations to promote the coherence of the existing policies, processes, and actions across relevant stakeholders, and avoid duplications through close consultation and building on existing mechanisms or platforms (not reinvent the wheel) and trust building with the national public health emergency networks and partners.
- Build on and sustain intersectoral and multidisciplinary collaboration during COVID-19.
- Aim to achieve sustainable and measurable results toward common targets in alignment with national and global policies and strategies.
- Facilitate international collaboration and engage with international partners based on benefit of the country and balance the partnership in all aspects including geopolitics.

##### **2.2 The program is not an implementing agency of public health emergencies, but it generates evidence to guide effective implementation**

- Draw lessons from COVID-19 pandemic responses, identify capacity, assess capacity gaps and prioritize actions for building up capacities.
- Review and identify the governance mechanisms for PHE responses, notably multi-sectoral mechanisms, policies, legal framework, financing mechanism, integrated health information systems, government restructuring and management including decentralisation.
- Generate evidence which supports implementation focusing on policy and systems
- Support strengthening the coverage and quality of surveillance systems and other relevant M&E platforms and propose necessary corrective actions.
- Support the capacity building program of one health workforce and strengthen networking on One Health partners including non traditional OH network

#### 3. Strategic Objectives

3.1 To identify and analyze the existing capacity and capacity gaps related to PHE

3.2 To identify and prioritize strategic actions which boost and sustain PHE capacities

- Strategic actions are generated from evidence generation and or knowledge management focusing on policy and system research

- Inform policy decision on development of capabilities across different emergency scenarios and broad spectrum of potential risk
  - 3.3 To build on and sustain intersectoral and multidisciplinary collaboration at sub-national and national levels based on COVID-19 crisis
  - 3.4 To strengthen monitoring and evaluation systems for PHE
  - 3.5 To promote international collaboration, initiatives and instruments/frameworks relevant for PHE
- #### 4. Scope and definition

##### 4.1 Definition

Public health emergencies are defined as much by

- ***Their health consequences*** as by their causes and precipitating events
- A situation becomes emergent when its health consequences have the ***potential to overwhelm routine community capabilities*** to address them.
- The all-hazards approach to preparedness instead of focusing on a “disaster du jour”
- ***Causes*** (bioterrorism, a novel or previously controlled or eradicated biological agent, natural disaster, chemical attack/accidental release of toxic chemicals, nuclear attack/accident)
- ***Impact***: poses a high probability of any of the following harms, a large number of deaths, illness, or injury in the affected population, a large number of serious or long-term impairments in the affected population, exposure to a biological agent or chemical that poses a significant risk of substantial future harm to a large number of people in the affected population)

##### 4.2 Scope of work

- **The CCS-PHE program will initially focus on infectious disease threats and will expand to other hazards such as disaster, chemical and radionuclear hazards.**
- **The scope of CCS PHE may apply the 13 core capacities required by IHR 2005 and include** Antimicrobial Resistance (AMR), immunisation, linking public health with security authority (JEE components). Health system capacity and resilience, cross border collaboration, environmental risks, infrastructure adequacy, political and security risk would be considered as a key component.
- **The scope will be applied to priority issues arising from the ongoing real-life response to COVID-19 pandemic.<sup>1</sup>**

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<sup>1</sup> Governance, Legal and regulatory capacity especially man-made public health emergency from chemical blast, Generate evidence and Thailand position in the negotiation of a Pandemic treaty. This may involve review of the strengths and weakness of the current international instruments and how to improve it, Institutional capacity (Human resources, Information technology, Certified laboratory capacity, number of distribution, Stockpiling of medicines and medical supplies), , Pandemic financing, Legislations related to pandemic, procurement act, Drug and vaccine security (R&D and manufacturing), Diagnostic development, **Preparedness**, Disease surveillance and monitoring (Regular table-top drill, GIS mapping of hazardous chemical substances, Health system capacity/infrastructure (investment for hospitals, laboratory), **Prevention** (Vaccine, countermeasures), **Detection** (Surge capacity of SRRT, surveillance in urban area, Surveillance in special populations and settings such as migrants, Industrial sectors, Modelling), **Responses** (IPC capacities in healthcare settings to prevent healthcare as major source of transmissions, Capacity to mobilize surge capacity and essential resources for public health actions (test, trace, quarantine), introducing and enforcing social measures, clinical management, Agile and adaptive responses to the dynamics of transmission, Capacity to mobilize health and all other workforce to support pandemic containment, Vaccine roll-out (mass campaign), National production capacity of all types of PPE, Procurement

## References

- [1] the Joint External Evaluation of IHR core capacities of the Kingdom of Thailand 2017
- [2] the Global Health Security Index of Thailand 2019
- [3] the Joint Intra-Action Review of the Public Health Response to COVID-19 in Thailand July 2020
- [4] Note for the record of the brainstorming session on the development of concept note on PHE area.  
[27 July 2021]
- [5] Sustainable Development Goals
- [6] WHO triple billion goals and the 13rd General Programme of Work.
- [7] Thailand's One Health Report on Antimicrobial Consumption and AMR in  
2017:[http://ihppthaigov.net/DB/publication/publication\\_research\\_show.php?id=433](http://ihppthaigov.net/DB/publication/publication_research_show.php?id=433);  
2018:[http://ihppthaigov.net/DB/publication/publication\\_research\\_show.php?id=432](http://ihppthaigov.net/DB/publication/publication_research_show.php?id=432)