



Thai Poison Control Center to Regional Preparedness of Poison management

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THAILAND

Poisoning & Toxicological Disasters

- Poisoning is one of the global health problems.
- In 2012, an estimated 193,460 people died from unintentional poisoning worldwide.
- 84% of these poisoned fatality cases occurred in low- and middle-income countries.
- Poisoning from chemicals, pesticides and venomous snakes are the important poisoning problems in the South East Asia region.
- Poisoning may turn to be Toxicological disasters.

Poisoning & Toxicological Disasters

- Treatment of life threatening poisoning includes supportive care and specific treatment.
- Antidotes are the specific treatment and only treatment of choice for some kinds of poisoning.
- Antidote therapy reduces mortality rate, minimize disability, shorten clinical course or minimize the total expenditure of treatment.

Poisoning & Toxicological Disasters

- The shortage of many antidotes is the global problem, where low- and middle-income countries suffer most.
- The nature of antidotes market is oligopoly, where production is limited.
- The unpredicted demand and lack of stockpiling result in lack of incentives by the pharmaceutical industry to produce adequate amount.

Management of poisoning

Common shortage of resources

- Knowledge & Experiences
- Information
- Antidotes





Ramathibodi Poison Center

- Established in 1996 under Queen Sirikit Medical Center, Faculty of Medicine Ramathibodi Hospital, Mahidol University
- One of 6 Excellent Centers of the Faculty
- Components:
 - Poison Information Center
 - Toxicological Laboratory Center
 - Poison Treatment Services



Ramathibodi Poison Center



Hotline 1367: 24 hour poison help line

- Line ID: poisrequest
- Email address: poisrequest@gmail.com
- Facebook: Ramathibodi Poison Center
- Website: www.ra.mahidol.ac.th/poisoncenter/

PoisonCenter.mahidol.ac.th



RAMATHIBODI POISON CENTER

Surveillance

- Surveillance is a basic daily works
- Notify and collaborate with related agencies
 - Ministry of Public Health: Department of Disease Control, FDA
 - Office of Narcotic Control Board
 - Ministry of Agriculture and cooperative: Department of Agriculture



Preparedness for Toxicological Incidents



FOOD AND DRUG
ADMINISTRATION
Thailand



- **National Health Security Office (NHSO)**
- Thai Food and Drug Administration
- Ministry of Public Health
- **Ramathibodi Poison Center**
- Siriraj Poison Center
- Thai Society of Clinical Toxicology
- Queen Saovapha Memorial Institute, Thai Red Cross
- **Government Pharmaceutical Organization (GPO)**
- Thai Military Pharmaceutical Organization



Ramathibodi Poison Center

Preparedness for Toxicological incidents

- **Antidotes preparedness**
 - Thai National Antidote Project (Nationwide access to antidote)
 - Antidote networks
- **Capacity building**
 - Training
 - Poisoning Management Protocol



Thai National Antidote Project (Nationwide access to antidote)

New approaches

- The antidotes are belong to NHSO. Public hospitals are stock sites
- Antidote nationwide distribution system is response to the local epidemiology, urgency of need.
- A real-time update of number of stockpiling at national, regional and provincial level of antidotes and antivenom on the website.



Thai National Antidote Project

(Nationwide access to antidote)

New approaches

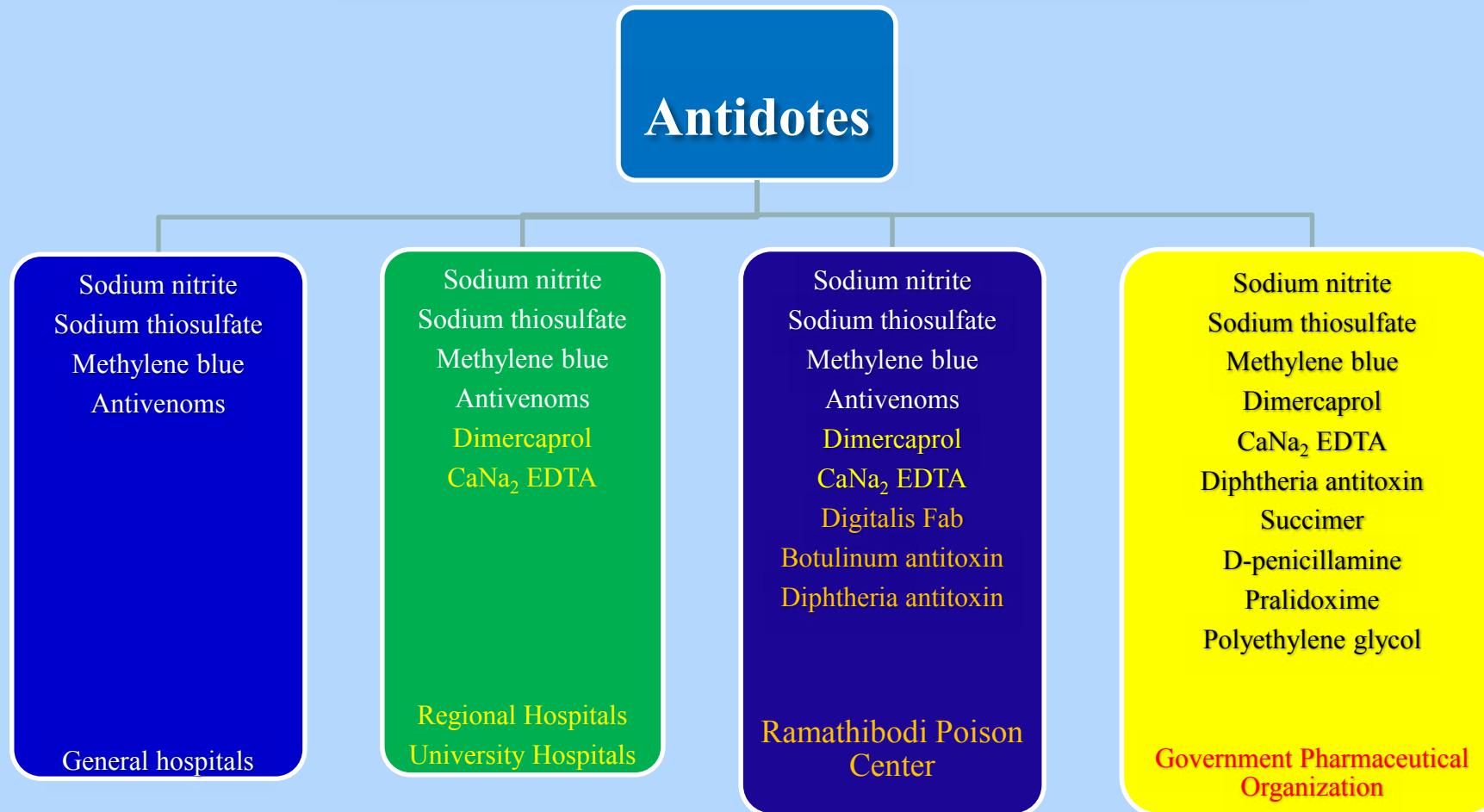
- Capacity building at all levels
- 24 h consultation service for the frontline health care personnel for the proper use antidote and antivenom.



Antidote list (since 2015)

1. Sodium nitrite 3%
2. Sodium thiosulfate 25%
3. Methylene blue 1%
4. Dimercaprol (BAL)
5. CaNa₂ EDTA
6. Succimer
7. Diphenhydramine
8. Botulinum antitoxin
9. Diphtheria antitoxin
10. Antivenom for Cobra
11. Antivenom for Malayan krait
12. Antivenom for Green pit viper
13. Antivenom for Malayan pit viper
14. Antivenom for Russell's viper
15. Polyvalent antivenom for neurotoxin
16. Polyvalent antivenom for hematotoxin

Antidote distribution

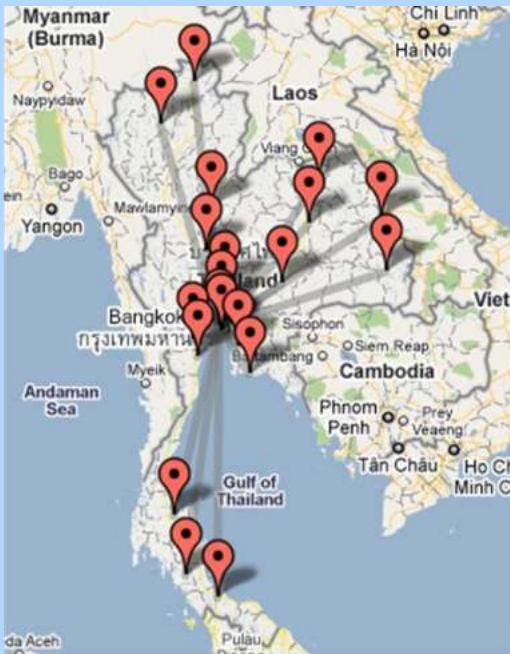




Antidote distribution



Cyanide antidotes
Methylene blue
Antivenoms

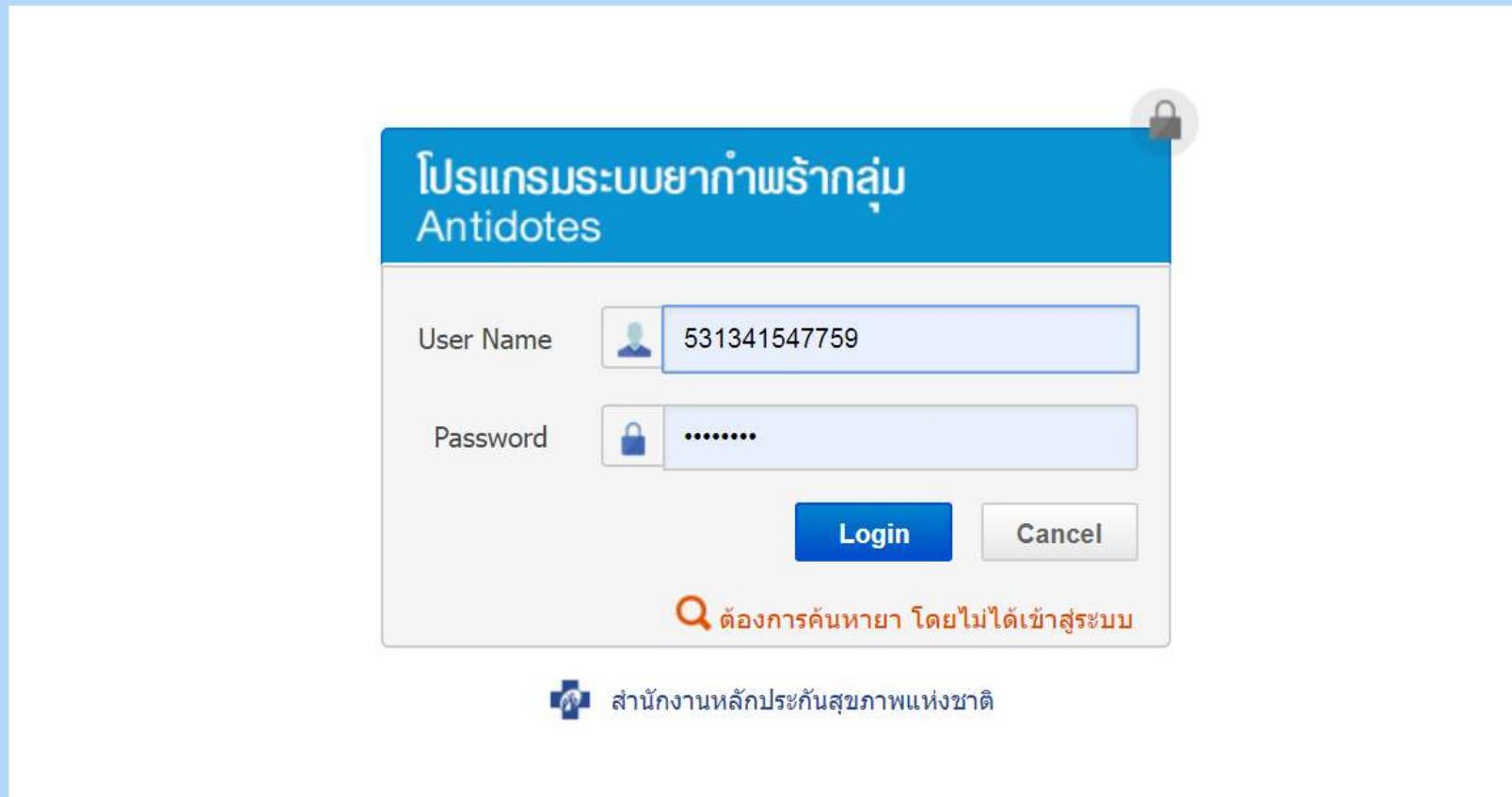


Dimercaptrol
 $\text{CaNa}_2 \text{ EDTA}$



Botulinum antitoxin
Diphtheria Antitoxin
Digitalis Fab

Web-based for searching antidotes



Web-based for searching antidotes

ระบบยาแก้พิษกลุ่ม
Antidotes

ชื่อผู้ใช้งาน : จารุวรรณ ศรีခากา หน่วยงาน: รพ.รามาธิบดี นหาริษาลัยห้อด (Profiles) | [Logout](#)

Home Search Stock Inbox 4 Reverse 0 Pending 0 History Follow 17291 Report

ค้นหาจากโรงพยาบาล (วัดตัวบ รัคเม)

โรงพยาบาลที่ต้องการขอเบิก 10695 - รพ.พระทุตราชาน

Antidote

ยาในรักเม (กม.)

จำนวน

ค้นหา

- Botulinum Antitoxin Injection
- Calcium Disodium edetate
- DIPHENHYDRAMINE 5 % 1 ML
- Digoxin specific antibody fragment
- Dimercaprol
- Diphtheria antitoxin
- Esmolol Hydrochloride 100 mg /10 ml
- Glucagon
- Methylene blue
- Sodium nitrite
- Sodium thiosulfate
- Succimer
- เซรูมแก้พิษงูงูชงะ
- เซรูมแก้พิษงูหันสิงค์ดา
- เซรูมแก้พิษงูงูกระสาท

Web-based for searching antidotes

Screenshot of a web-based application interface for searching antidotes.

The top navigation bar includes: Home, Search, Stock, Inbox (4), Reverse (0), Pending (0), History, Follow (1729), and Report.

The search bar shows: 10695 - ยา พาราฟูโรบนา.

The dropdown menu shows: Sodium nitrite.

The input field shows: 200.

The button shows: ค่าในระบุจำนวนและค้นหาในสืบมีค่ากันด.

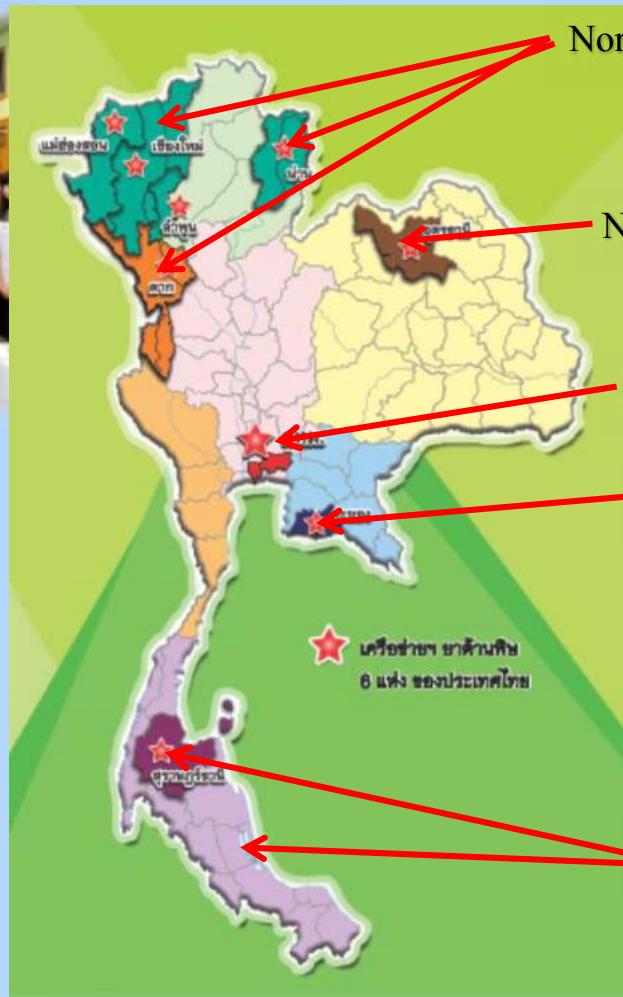
The map view shows locations in Thailand with red markers indicating specific points of interest.

The table below lists search results:

ชื่อยา/ยาแก้พิษ	รายละเอียด	เม็ดเงินเดือนที่ออก	รวมเงินเดือนที่ออก	In Stock
ยา น้ำยาห้ามหายใจ - ถังสูญญากาศ		0897469066	24	11
ยา สารเคมี - ถังสูญญากาศ ถังสูญญากาศ เมือง จังหวัด สารเคมี 18000			40	10
ยา ล้างอ่อน - 3 ถังน้ำเตมน้ำ 6 ถังน้ำเก็บอ่อน เมือง ล้างอ่อน 14000			46	10
ยา บ้านทึ่ง - 139 บ้านทึ่ง บ้านทึ่ง หมู่ที่ 15110			50	10
ยา พรมดูดซับน้ำ - ถุงห่อหีบ บ้านทึ่ง หมู่ที่ 13000		0818039650	64	10
ยา พรมดูดซับน้ำ - ถุงห่อหีบ บ้านทึ่ง หมู่ที่ 13000		0814199718		



Local networks for the antidote supply Up to 2018



North: 3 networks

Northeast: 1 network

Central: 1 network

East: 1 network

South: 2 network



Ramathibodi Poison Center

Preparedness for Toxicological incidents

- Antidotes preparedness
 - Thai National Antidote Project (Nationwide access to antidote)
 - Antidote networks
- Capacity building
 - Training
 - Poisoning Management Protocol



Ramathibodi Poison Center

Preparedness for Toxicological incidents

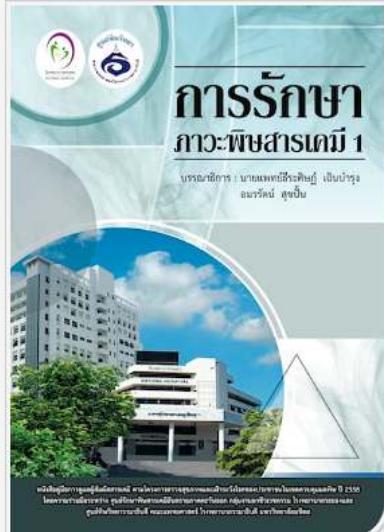
- Capacity Building: Training
 - Formal training
 - Resident: Internal Medicine, Emergency Medicine
 - Fellow: Clinical Pharmacology and Toxicology
 - Short course
 - **Antidote workshops**
 - Training for doctor and nurse in rural area
 - WHO sponsored fellowship



Preparedness for Toxicological incidents

Capacity building: Poisoning Management Protocol

การรักษาภาวะพิษสารเคมี 1



เนื้อหาในฉบับนี้ :

- Acrylonitrile
- Ammonia
- Cesium-137
- Chlorine
- Cobalt-60
- Crude Oil
- Cyanide, Sodium cyanide, Potassium cyanide
- Hydrogen fluoride และ Hydrofluoric acid
- Hydrogen cyanide(HCN)
- Hydrogen sulfide
- Iodine -131
- Phenol
- Phosgene
- Simple asphyxiants
- Tear gas
- Toluene และ Xylene

Full scale exercise: Emergency response for Chemical disaster (cyanide spill) Rayong Province: 9 March 2017





Table top exercise

Situation: HCN leakage

(6 March 2017)





Field exercise

Situation: HCN leakage (9 March 2017)





Field training

After action review (9 March 2017)





Roles of Ramathibodi Poison Center

- Provide consultation for diagnosis and management plan
- Confirm indications for treating with antidotes
- Search and communicate with the stock-site
- Collaborate to send the antidote to the patient
- Follow up and provide further suggestion
- Evaluate the outcome
- Assess and evaluate the overall outcome of the project

Improving access to antidote and antivenom, Thailand

Bull World Health Organ 2018;96: | doi: <http://dx.doi.org/10.2471/BLT.18.217075>

Year	Antidotes		Antivenom		Total	
	Patients	Budgets* (USD)	Patients	Budgets* (USD)	Patients	Budgets* (USD)
2011	49	142,000		2,233,357**	49	142,200
2012	106	422,000			106	422,000
2013	402	407,000	964	651,393	1,366	1,058,393
2014	466	204,000	4,966	1,675,677	5,432	1,879,677
2015	191	252,000	6,234	1,114 ^	6,425	1,366,286
2016	317	283,000	6,824	1,402,286	7,141	1,423,286
2017	269	223,000	60% of the previous budget		6,917	1,673,690

*1 USD ≈ 35 Thai Baht

** The average cost of annual national purchasing of antivenom



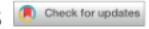
Cyanide Poisoning in Pre and Post “Nationwide Assess to Antidote Project” Era

CLINICAL TOXICOLOGY, 2017
<https://doi.org/10.1080/15563650.2017.1370098>

POISON CENTRE RESEARCH



OPEN ACCESS



Cyanide poisoning in Thailand before and after establishment of the National Antidote Project*

Sahaphume Srisuma^{a,b}, Aimon Pradoo^a, Panee Rittilert^a, Sunun Wongvisavakorn^a, Achara Tongpoo^a, Charuwan Sriapha^a, Wannapa Krairojananan^c, Netnapis Suchonwanich^c, Sumana Khomvilai^d and Winai Wanrukul^{a,b}

^aRamathibodi Poison Center, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; ^bDivision of Clinical Pharmacology and Toxicology, Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand.

	Before the project (Jan 2007- Oct 2010)	Project (Nov 2000 – Dec 2015)
No. patients	130	213
No. severe cases	25	60
Mortality rate (severe cases only)	52.0%	28.3%



Cyanide Poisoning in Pre and Post “Nationwide Assess to Antidote Project” Era

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^aRamathibodi Poison Center, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; ^bDivision of Clinical

Factor	OR	95% CI	P value
Age ≥ 5 yr	1.64	0.50 – 5.43	0.41
Male	1.40	0.47 – 4.14	0.54
Suicidal intent	10.19	1.91 – 54.31	<0.01
Cyanide solution ingestion	1.93	0.63 – 5.92	0.25
Present of antidote project	0.24	0.07 – 0.79	0.02



Childhood Lead encephalopathy in Myanmar 2013



Condition on Admission



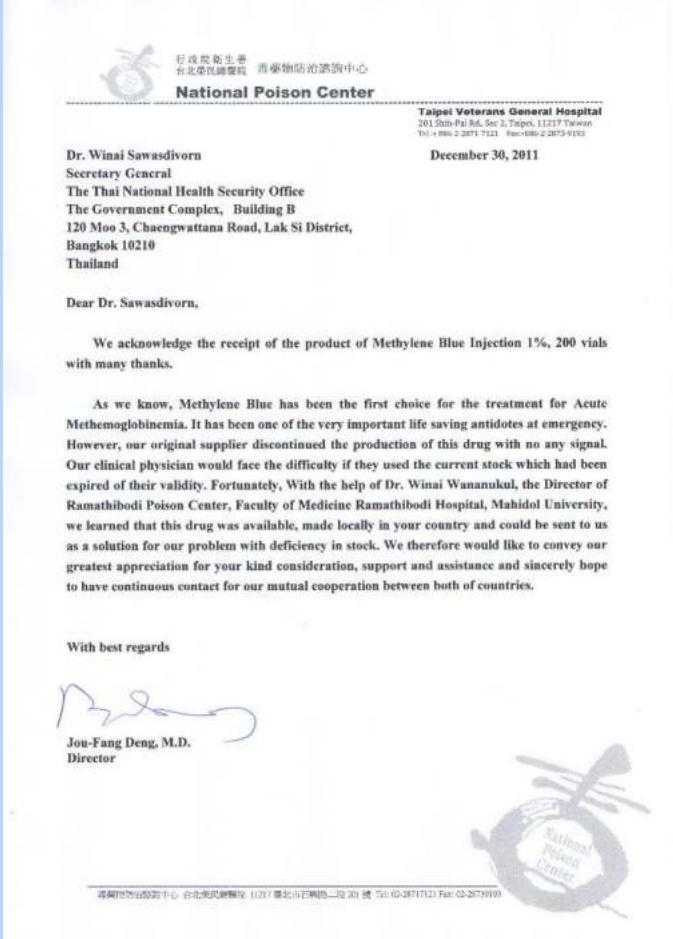
Childhood Lead encephalopathy in Myanmar 2013



Condition on follow up

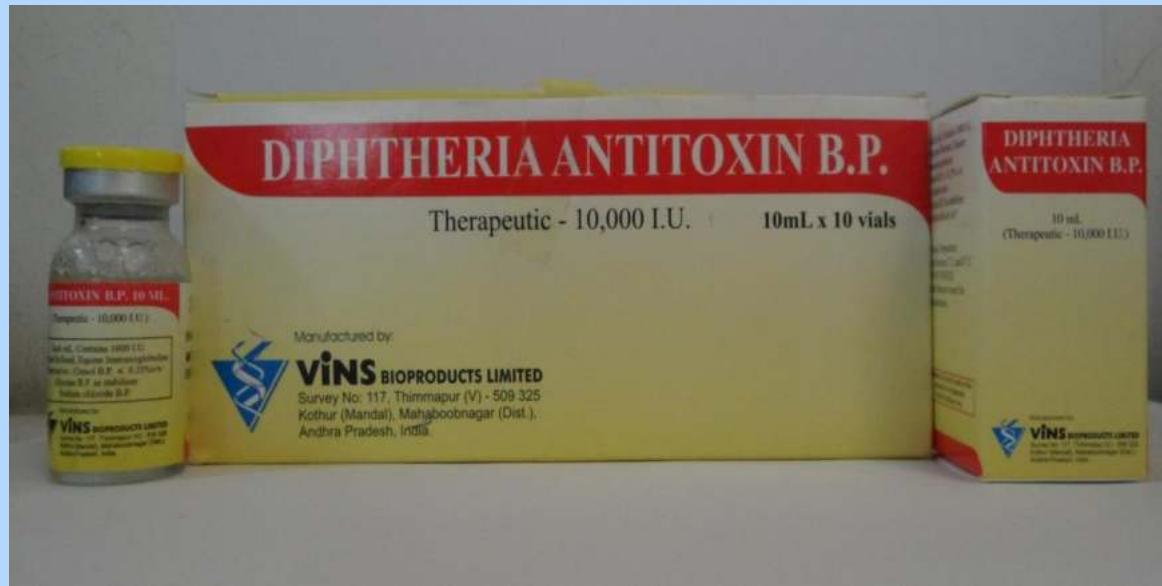


Methylene blue to Taiwan





Diphtheria antitoxin to Laos and Myanmar





Botulism in Nigeria



  **NIGERIA CENTRE FOR DISEASE CONTROL**
Office of the National Coordinator/Chief Executive Officer

OUR REF: NCDC/HQ/ABI/04/V.1/163 DATE: 30th May 2018

Professor Winai Wanaukul, M.D.
Director, Ramathibodi Poison Center
Deputy Director, Ramathibodi Hospital
Faculty of Medicine Ramathibodi Hospital
Mahidol University
Bangkok, Thailand

LETTER OF APPRECIATION

On behalf of the Nigeria Centre for Disease Control, I write to thank you for your support during our response to cases of foodborne botulism among a family in Abuja, Nigeria in January 2018.

The donation of four doses of tetravalent botulism antitoxin by your organisation within a short notice was very helpful and supported our response activities.

Once again, thank you for your support and we look forward to building a strong working relationship with your institute.

Please accept the assurance of my highest regards.



Dr. Chikwe Ihekweazu
National Coordinator/Chief Executive Officer

Administrative Headquarters: Plot 801, Ebute, Jikwo Fiter, Jabi, Abuja - Nigeria.
Email: info@ncdc.gov.ng Website: www.ncdc.gov.ng

PROTECTING THE HEALTH OF NIGERIANS



WHO General Director Visit

2nd February 2018

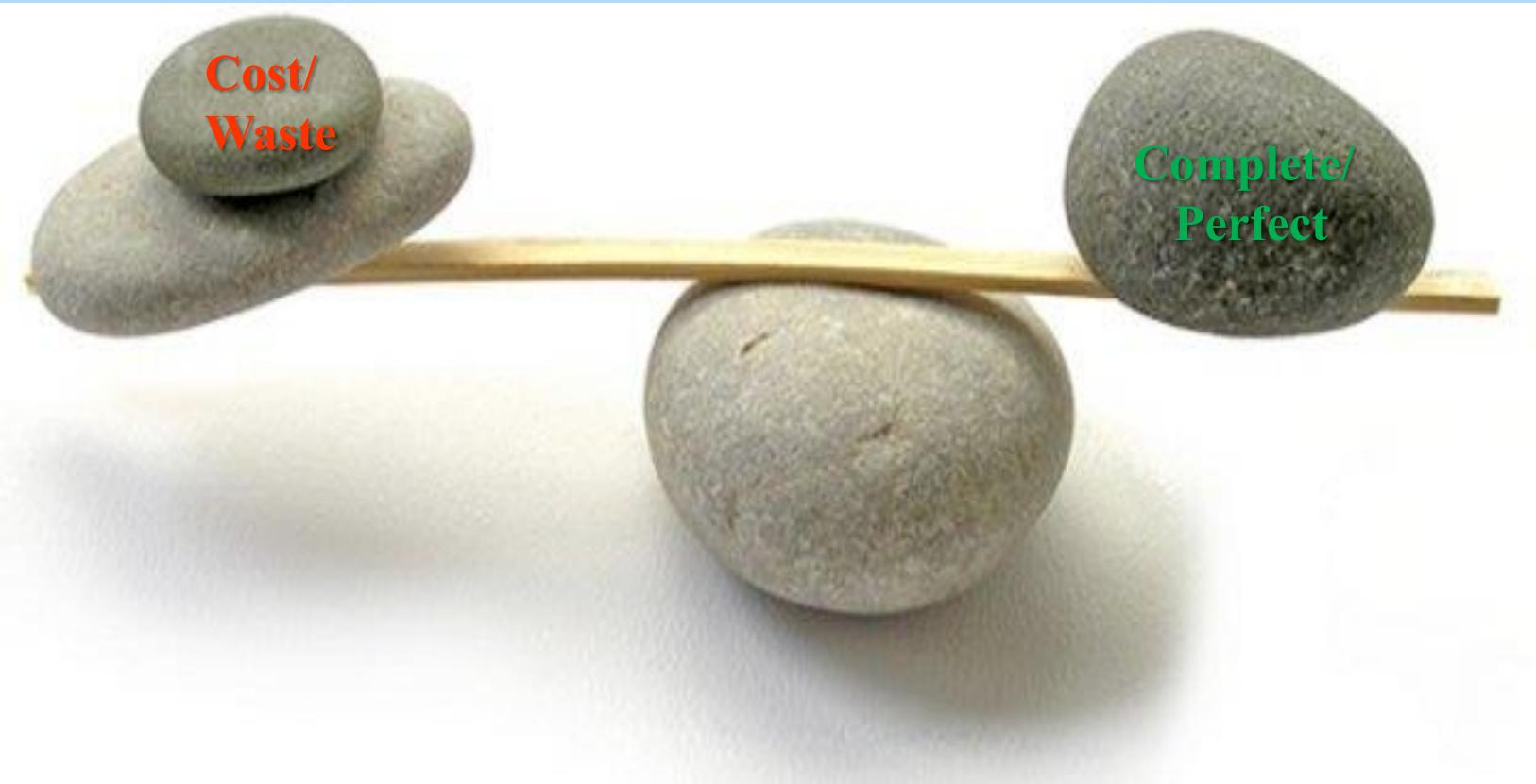


Dr. Tedros Adhanom Ghebreyesus
World Health Organization General Director

International Health Regulation: Chemical Emergencies

- WHO recently has been considering the development of stockpiling of essential medical products in response to radiation and chemical emergencies.
- According to International Health Regulation, emergency preparedness and response operation as well as capacity-building are needed for every member country.

Balance between cost and benefit



Antidote Preparedness for disaster

Key components:

- Country's capacity
- International collaboration

Regional Collaboration on Procurement, starting with Antidotes (August 2017)



Informal expert consultation on coordinated procurement of antidotes in the South-East Asia Region

Summary Report
12-13 February 2018, Ramathibodi Hospital, Bangkok, Thailand

Background
Ensuring access to antidotes is a health security issue that can reduce preventable deaths. In the WHO South-East Asia Region (SEAR) improving access to these life-saving medicines, which have potential risk of shortages, was identified as a concrete step by Member States of the 70th Regional Committee (Sept 2017). The National Antidote Project in Thailand is an example how efficient national public health systems can ensure the availability of antidotes and improve the clinical capacity for case management of poisonings.

An informal expert consultation was organized with experts from India, Maldives, Sri Lanka, Thailand and Timor-Leste to learn about country experiences and challenges, gaps faced when trying to ensure uninterrupted access to antidotes and discuss potential pathways for coordinated procurement of antidotes in the South-East Asia Region, with support and leadership from Thailand.

Informal Consultation Objectives

1. Discuss coordinated procurement focused on improving availability of lifesaving antidotes in the South-East Asia Region.
2. Understand how Thailand and other countries have improved availability of antidotes through improved procurement and distribution systems.
3. Discuss potential pathways for joint coordinated procurement of antidotes by interested countries with central organizational support by Thailand.
4. Agree on next steps for joint procurement of antidotes by interested countries and necessary approval processes to initiate participation.

DECISIONS FROM THE MEETING

AIM: To initiate a collaborative mechanism for coordinated procurement of antidotes in the South-East Asia Region with Thailand serving as a regional hub to supply agreed antidotes either on a regular or on emergency response basis.

Criteria for selection of antidote

- o Listed on current WHO Model Essential Medicine List and/or countries' national essential medicines list, or when country is considering adding it to its national essential medicines list
- o Difficult to source (limited suppliers); commonly experienced shortages or at high risk for shortages

Eight selected essential antidotes

- o Activated Charcoal
- o Dimercaprol
- o Methylene blue
- o Penicillamine
- o Sodium calcium edetate
- o Sodium nitrite
- o Sodium thiosulfate
- o Succimer

Key Partners

Beneficiaries

- Populations of SEAR Member States

Key stakeholders

- National procurement agencies, poison centers and medicines regulatory agencies

Leadership & coordination

- Ramathibodi Poison Center (RPC), Faculty of Medicine, Ramathibodi Hospital, Mahidol University
- National Health Security Office (NHSO)
- Government Pharmaceutical Organization (GPO), Ministry of Public Health, Thailand

Technical support

- WHO Regional Office for South-East Asia

A smaller group photograph of approximately 15-20 people, mostly men in suits and ties, and some women in professional attire, posing for a group photo indoors. They are standing in several rows, with some people in the front and others in the back. The background shows a wall with various posters or informational charts.

Informal expert consultation on coordinated procurement of antidotes in the South-East Asia Region

12-13 Feb 2018, Ramathibodi Hospital



Sharing: International collaboration

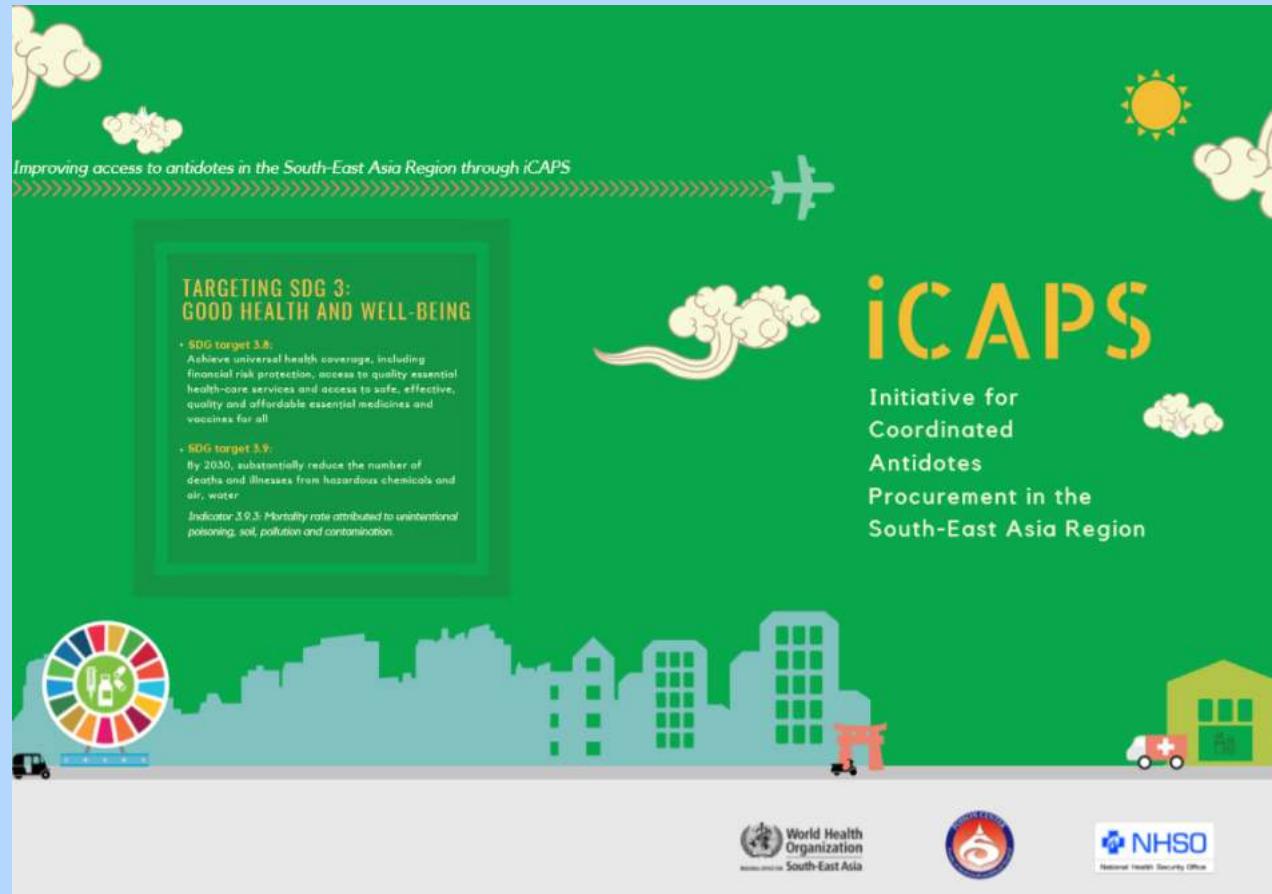


International Collaboration



- International body
(WHO, IPCS)
 - Country authorized agencies
 - Information
- Logistics and supply chain
 - Modes of transportation
 - Legal issues

Initiation for Coordinated Antidotes Procurement in the South-East Asia region



Principle of Collaboration

1. Builds on what exists

Leverages the capacity and experience of the Thailand National Antidote Project

2. Starts with small but concrete steps

Selected 8 initial antidotes to deliver via two coordinated pathways

3. Keeps collaboration voluntary

All South East Asia Region Member States are invited to join and nominate focal points

4. Builds trust

Encourages shared learning & transfer of knowledge between Thailand and countries

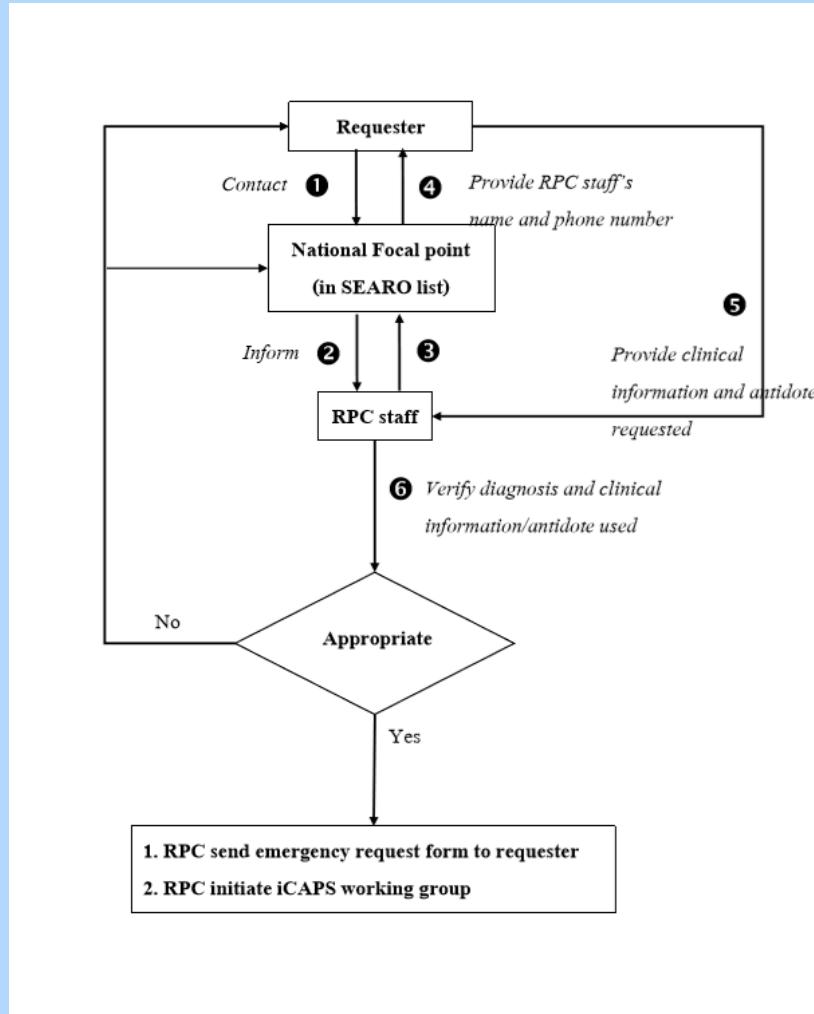
Pathways of Collaboration

- Emergency Response
- Planned joint annual procurement

Pathways of Collaboration

- Emergency Response
 - Thailand:
 - Ramathibodi Poison Center
 - National Health Security Office (NHSO)
 - Government Pharmaceutical Office (GPO)
 - WHO Country Representatives
 - South East Asia Regional Office

Emergency Response Pathways

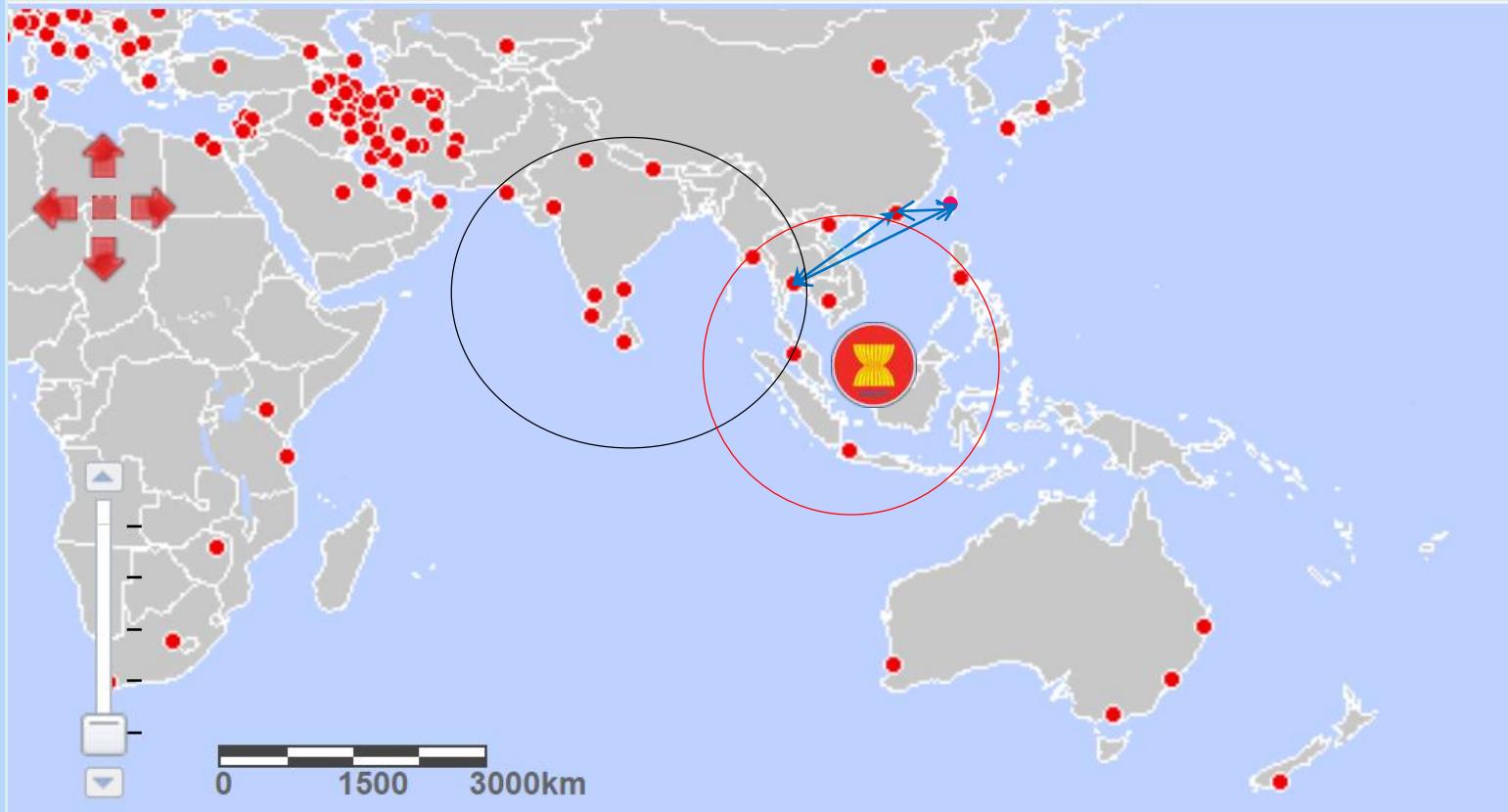


Pathways of collaboration

- Emergency Response
 - Thailand:
 - Ramathibodi Poison Center
 - National Health Security Office (NHSO)
 - Government Pharmaceutical Office (GPO)
 - WHO Country Representatives
 - SEARO
- Planned joint annual procurement
 - Well planned, annual order procured by NHSO & GPO, base on annual contact



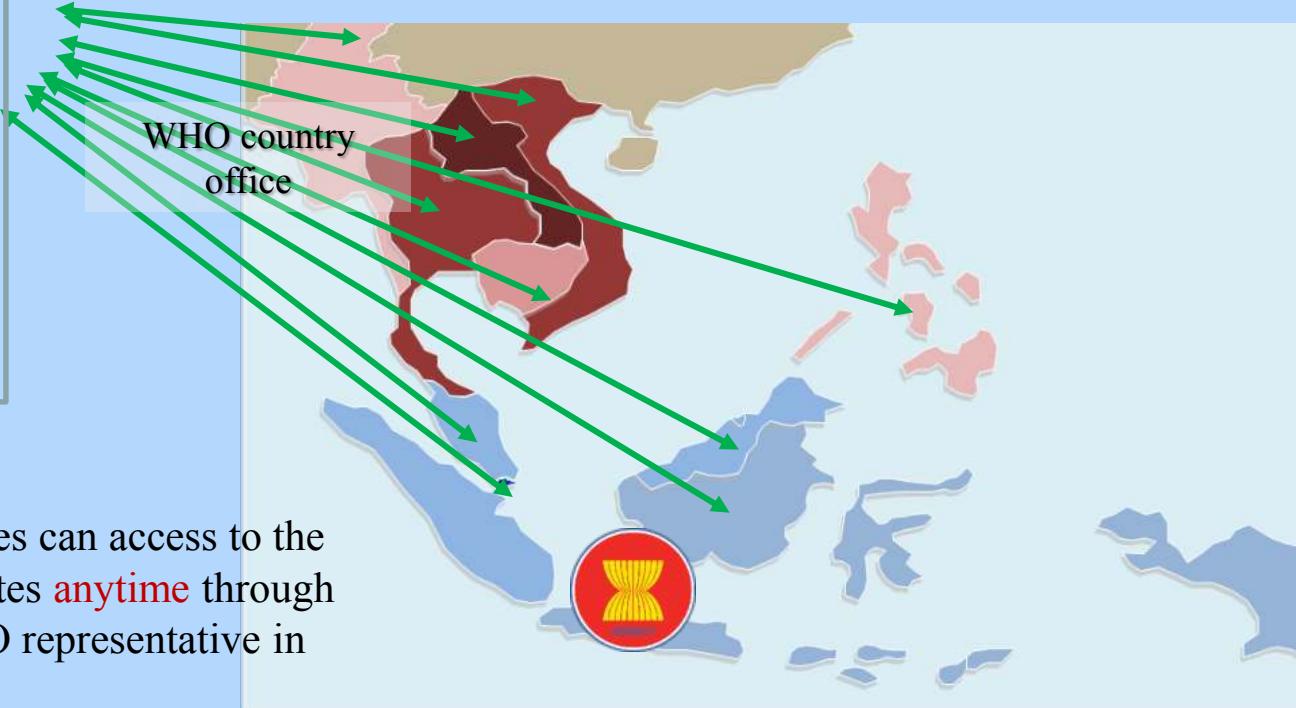
Preparedness for Poison Management Network



Pathway 1: Emergency Response

(Adapted from the Ramathibodi Poison Center-WHO SEAR Member States initiative 2017)

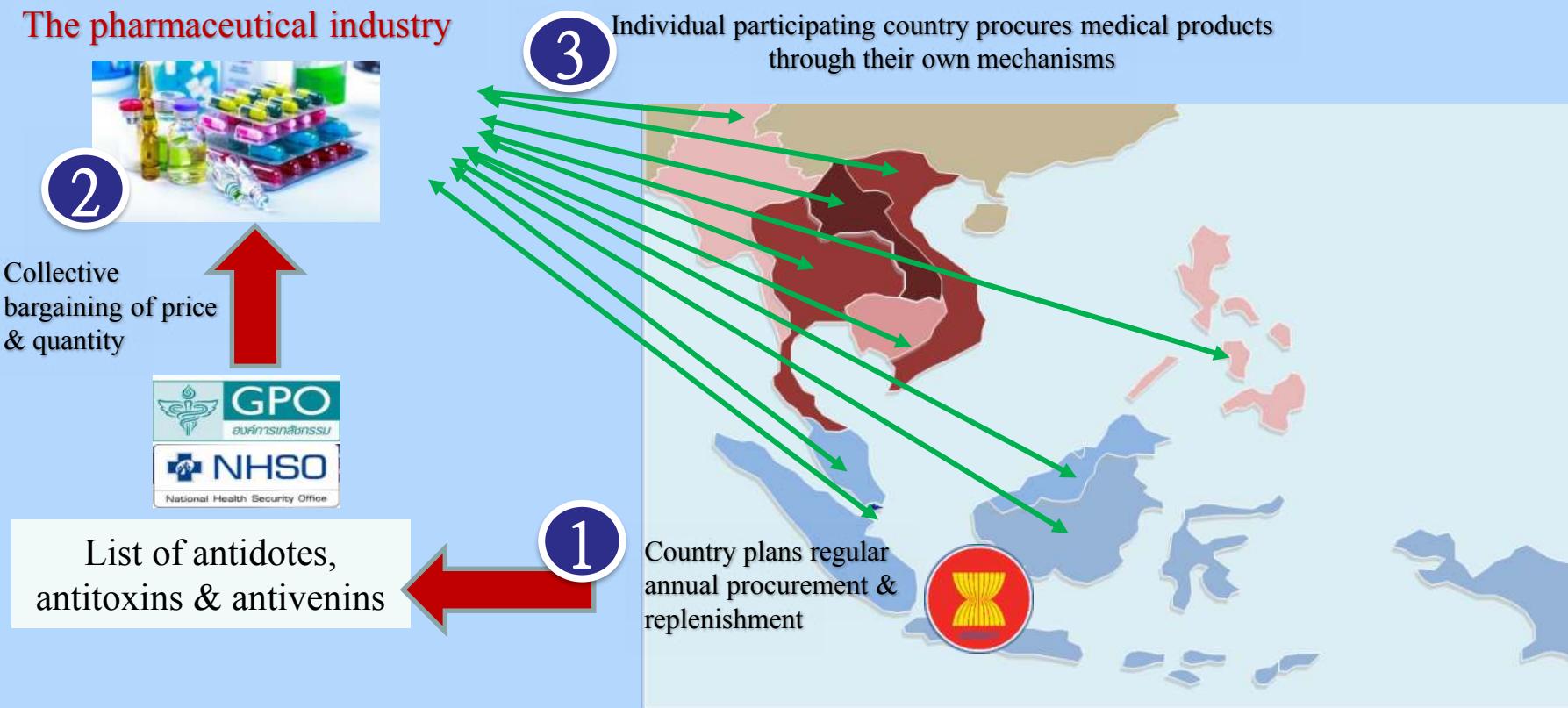
The Thailand Antidote Programme



Ramathibodi Poison Center, NHSO & GPO will work together to verify the need & then sent the antidote that country; the country will pay the cost in a later phase.

Pathway 2: Planned joint annual procurement

(Adapted from the Ramathibodi Poison Center-WHO SEAR Member States initiative 2017)



Proposed actions for ASEAN Foreign Ministerial Meeting considerations

- To endorse the decision to implement the innovation on Improve access to antidotes, antitoxin and antivenom for life-threatening poisoning by ASEAN Member States by a voluntary basis at the ASEAN Health Ministers' Meeting forum in August 2019 in Seam Reap
- To reflect the ASEAN commitments on enhancement the availability of antidotes, antitoxin and antivenom to ASEAN countries, a paragraph on this innovation will be added in the statement of the ASEAN Health Ministers' Meeting

Expected outcomes

Through effective management of purchasing and stockpiling among ASEAN countries,

There will be a better clinical outcome of the severe cases and cost savings from minimum wastage due to expiry of the antidotes and antivenom.



Separated we can't, together we can