Chapter 9: Kingdom of Thailand

Implementation of Thailand's SRRT (Surveillance and Rapid Response Team) for Outbreak Containment

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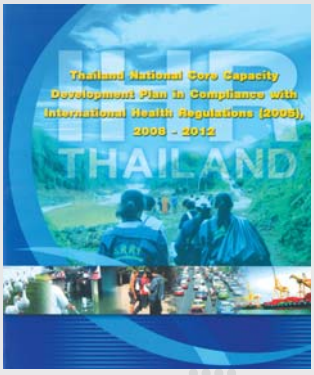
1. Before

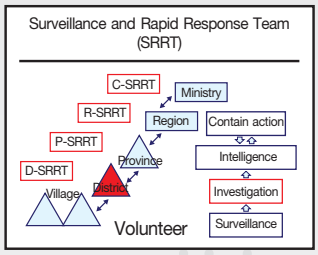
Outbreak containment is a mandate for Ministry of Public Health since more than one hundred outbreaks happen each year in Thailand. In the past, only one or two epidemiological staff were assigned to do both surveillance and investigation of the outbreak and propose recommendation for containment which was always a bit late for control of outbreaks. When a big epidemic such as cholera outbreak did occur, a war room with ad hoc operation team would then be urgently set up to control the incident. This special response team had to rush out to the scenes immediately. They must be capable to identify the source of infection and factors that may cause the epidemic. Once the mission had been accomplished, the team would then be dissolved. Although there was a strong need to have a permanent rapid response team, the sustainability and capacity building of the team was limited somehow.

2. Initiation

When the SARS outbreak occurred in Thailand, the Ministry of Public Health (MoPH) issued an order that at least two special operational teams consisting of physician, epidemiologist, lab technician and disease control officer must be all time available to respond. The team was headed by the deputy provincial chief medical officer, tasked with identifying SARS suspect cases and follow-up of households or close contacts for 10 consecutive days. The teams were on duty 24 hours and seven days a week to investigate the suspect cases in the hospitals and rush for field investigation immediately. Update information of the situation was reported from all provinces to the central unit on a daily basis.

Picture 1:
Surveillance and Rapid Response Team (SRRT) distribution in Thailand.





When the SARS outbreak was over, the concept of public health emergency response team was adopted and a functional team had been set up at all levels. During the avian influenza outbreak in 2004, the MoPH renamed this special operation team as Surveillance and Rapid Response Team (SRRT), and every district had established one team for SRRT.

SRRT is a team of approximately five persons which composed of field epidemiologist and public health staff who were trained for the primary responsibilities to:

(1) Perform surveillance on outbreak or unusual event that might put public health at risk.
(2) Conduct preliminary field investigation to verify the fact, and determine the cause and magnitude of the event in a rapid manner.
(3) Implement necessary containment response in an immediate fashion.

3. Vision

The Thai MoPH had officially enacted the policy of establishing and supporting SRRT into the first National Strategic Plan on avian influenza prevention and control (2005-2007). When the International Health Regulation (IHR) master plan was endorsed by the Thai Cabinet in 2008, SRRT was one of the four major strategies in this master plan.

At each level there will be one team, although in fact there might compose of several small teams. At present, there are 1030 SRRTs overall the country, 941 at district level (D-SRRT), 76 at provincial level (P-SRRT), 12 at regional level (R-SRRT) and one central level (C-SRRT). The teams at higher level are more capable and support the operation of the lower levels respectively (Picture 1). The road map can be briefed as followings:

2004-2005: One district - one team (Organizing and training of one SRRT for each district and province)
2006-2007: One team - one operation (At least one outbreak investigation and containment operation per team every year)
2008-2009: One province - one success (At least one success outbreak containment can be demonstrated in each province)
2010-2012: One team - one success (At least one success outbreak containment for every team)

Picture 2: Network of SRRT for control of H5N1 in Thailand.

Epidemiological Surveillance network

Hospital

Laboratory

Pathologists

SRRT

- Screening of history of exposure
- Confirm clinical finding
- Testing of respiratory specimens
- Survey of village and identify exposure
- Active case finding and surveillance of all household member for 10 days
- Antiviral prophylaxis for family member of confirm H5 cases
- Culling of affected poultry
- Educated villagers to avoid risk

Veterinarian

4. Progress

A simply way to measure the accomplishment of the SRRT is to observe the activeness and the performance on outbreak detection, investigation and implementation of appropriate containment action. If more number of outbreaks are detected, more investigation will be performed and more number of outbreak containment should be monitored for success. The number of outbreak detected and investigated by SRRTs was increasing from 450 reports in 2006 to 750 reports in 2008, which included outbreaks on food poisonings (160+), vaccine preventable diseases (60+), dengue and chikungunya (40+), zoonosis (50+), respiratory syndrome (15+), etc. However, the actual number of event investigated by SRRTs would be higher than the number of outbreaks reported to Bureau of Epidemiology (BoE.)

Some successful operations as a result of synergistic work of the SRRTs from different provinces and levels are as below.

4.1 Avian Influenza

During January 2004 when Thai MoPH confirmed the first case of avian influenza (H5N1) patient, avian influenza surveillance was implemented and the effort had significantly changed the approach of disease surveillance. Whenever there is a notification from hospital for acute respiratory tract infection with suspected bird exposure, the disease investigation has to be undertaken, including specimen collection, lab testing, and visits to the community for further case detection. Daily reports are to be prepared and submitted to high level administrators. Press conference will be convened immediately whenever a case is confirmed.

Between early 2004 and end of 2006, Thailand reported 25 confirmed cases of avian influenza and 17 deaths. SRRT played an active role in investigating, reporting and working closely with animal health sector to implement the outbreak control measures. With the surveillance and investigation, major weaknesses in outbreak control were identified and fixed (Picture 2).

In 2004, there were 2,920 notifications of avian influenza infection, which after investigation, identified 17 confirmed cases and 12 deaths. During 2005, 3,244 outbreaks were notified with 5 confirmed cases and 2 deaths while there were 5,614 notifications with 3 confirmed deaths in 2006. The last human avian influenza case was detected in July 2006 and there has been no new case reported since then. However, daily surveillance was still ongoing during 2007 and 2008, with more than 2,000 notifications and investigations.

Picture 3:
Massive Botulism food poisoning from consumption of domestic bamboo shoot, 2006, Thailand.

2006 Massive outbreak of Botulism from home canned bamboo shoot.

- 209 cases
- 134 hospitalized
- 43 on ventilator
- doses of antitoxin were mobilized from US, UK, Japan through WHO and US CDC
- No death

4.2 Botulism Outbreak 2006

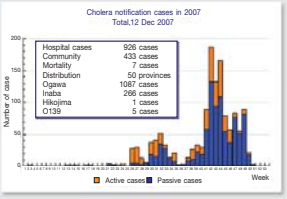
On 15 March 2006, there was a merit-making ceremony in a small village of a northern province. The villagers used local product of canned bamboo shoots to prepare the food for merit-makers. In the afternoon, a few villagers visited the local hospital for medical treatment followed by dozen of villagers seeking treatment in the evening. All patients manifested the symptoms of stomach upset and difficulty in speaking or breathing. A few severe cases required respiratory support machines which had led the physician to think of botulism food poisoning (Picture 3).

District SRRT was sent out to the village at that night to conduct investigation. The team, via the public radio system, requested all villagers who had eaten canned bamboo shoots to see the doctor. And they also confiscated all remaining canned bamboo shoots from the affected and neighboring villages. In this operation, 209 cases of botulism were detected and treated, of who 134 were hospitalized, including 43 with respiratory failure in need of intensive care and respirator. Meanwhile, as botulism antitoxin was not available in Thailand, antitoxins were requested from the US Centers for Disease Prevention and Control (50 doses), the United Kingdom (20 doses) and Japan (23 doses). As a result of these efforts, no death occurred. The success was the result of rapid detection of the outbreak and the identification of source of the outbreak by the joint effort of the district, provincial and central SRRTs in addition to the capability of the medical team in case management.

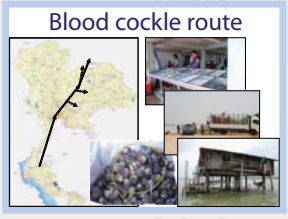
4.3 Cholera Outbreak in Multiple Provinces of Thailand 2007

The year 2007 experienced a large increase in the number of cholera cases, almost 1,000, in Thailand. The first wave of the outbreak was related to cross-border movement of labor in the northern part of the country along the border between Thailand and Myanmar. However, the second wave of the epidemic started in mid September (Picture 4). Outbreaks of *Vibrio cholerae* El Tor Ogawa were simultaneously reported from more than ten provinces mainly in the northeastern region of the country. Initial investigations by local SRRTs revealed that most cases had common history of consuming undercooked blood cockles (Picture 5).

Picture 4:
Number of cholera cases by week 2007, Thailand.



Picture 5:
Selling of blood cockle route related to occurrence of cholera cases 2007.



The central SRRT and the Field Epidemiology Training Program in collaboration with SRRTs of 8 affected provinces initiated an epidemiological study to identify source of infection, food chain and risk factors for the outbreaks. The team conducted a basic case-control study and advanced case-case comparison. A total of 235 cases and 235 controls were face-to-face interviewed. The study revealed that consumption of inadequately cooked blood cockles was statistically associated with developing cholera cases. Those cockles were imported from farms in southern and central provinces. Same isolate of *V. cholerae* was identified from patients in different provinces. Intensive education on eating well-cooked cockles was implemented. As a result, the outbreaks were brought under control within a month period.

5. Lessons

SRRT is very helpful for outbreak detection and containment. To nourish SRRT, it needs:

5.1 Advocacy: Whenever there is a new Director General or Permanent Secretary or Minister, we have to brief them and put this term "SRRT" in their policy statement. We found that politician and decision makers love the term "SRRT" because it reflects a good image of the Ministry. They perceived SRRT as the "SWAT" of the police or those appeared in Hollywood movies. In addition, whenever there is an outbreak news appear in the media, the press release from the Ministry will add a phrase that "Surveillance and Rapid Response Team has already been dispatched in the area to contain the outbreak". As a policy, SRRT is now appeared on the job description in every provincial health office structure.

5.2 Budget support: The Ministry had set a high ambition of having 1,030 professional teams over the country under the International Health Regulation plan, and was endorsed by the cabinet. In the Thai budgetary system, those programs endorsed by the cabinet are considered to be high priority. The cabinet also requires a progress report every six months. This results to be an active oversight by the high authorities, and the SRRT received sufficient budget support for field operation and training. Department of Disease Control provides a matching fund to the local health authorities. We also received some support from the US CDC Emerging Infectious Disease Program for a 5-year plan.

5.3 Coordination, networking and moral support: The Bureau of Epidemiology and the 12 Regional Disease Prevention and Control offices serve as a coordinating body for networking and supporting of all SRRTs over the country. Every year, training courses for SRRT leaders and team members are conducted, and a three-day seminar is organized at the regional and national levels to update activities and outbreak presentations of SRRTs. Good works of the district and provincial SRRTs are selected and awarded.

5.4 Training and supporting: The Bureau had developed a curriculum to strengthen and keep network with the SRRT member and new comers. The curriculum was developed according to the situation, trend of disease and policy at that time. Sometimes, we adopted the curriculum and adapted some to fit with country's norm. We piloted and revised the curriculum to make it more practical for the trainers and trainees which can be completed in two weeks. Not only curriculum development, we also support the equipment and medicine for SRRTs. During cholera outbreak, the Bureau supported the antibiotics, ORS, transport media, in cooperation with National Institute of Health, Regional Medical Science Center and hospital.

6. Conclusion

Thailand had faced several major public health emergencies such as SARS in 2002, avian influenza in 2003, tsunami in 2004, massive botulism food poisoning in 2006, etc. The country was able to control of these public health emergencies due to well established public health infrastructure, multi-sectoral collaboration, participation of people and good public health policy. The existing SRRTs in all districts is a result of an immediate policy formulation as a response to avian influenza. It is envisioned that by 2012, the team will be of high competency to ensure a vigilance and containment of any public health emergency. Thailand's SRRT is on the move and need continuous support.

7. Appreciation

We would like to thank the Thai Ministry of Public Health and the Department of Disease Control in putting SRRT as a policy. Our thanks to US CDC and WHO for co-hosting the trainings and seminars, and ASEAN+3 EIDs program in selecting this topic to share with others. Last but not least, our sincere appreciation of all the good works and good will of all SRRT members in Thailand.

8. Suggested Readings

(1) Surveillance system for diseases control and public health emergencies. Chapter 11 in Thailand Health Profile 2005-2007. Ministry of Public Health, Thailand.

(2) The need for global planned mobilization of essential medicine: lessons from a massive Thai Botulism outbreak. Bulletin of the World Health Organization. 2007; 85 (3):238-40.

(3) Thailand National Core Capacity Development Plan in Compliance with International Health Regulation (2005), 2008-2012.