Chapter 1: Kingdom of Cambodia

Event based Surveillance in Cambodia

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1. Introduction

The Kingdom of Cambodia, with the area of 181,035 sq km, is located in Southeastern Asia, and borders with Thailand, Vietnam and Lao PDR. We have border with Lao PDR for 541 km, Thailand 803 km and Vietnam 1,228 km, and have a coastline for 440 km.

The official health structure of Ministry of Health has been established by the government in August 1997. The Department of Communicable Disease Control has just been established officially in 2009, which consists of two bureau -- Disease Surveillance Bureau, and Prevention and Control Bureau.

From 1997 to 2000, our department was responsible for the Integrated Management of Childhood Illness (IMCI). Since year 2000, due to the outbreak of cholera which killed more than 100 people and sickened over 1,000 people, the zero report surveillance was move into our department, under the direct responsibility of Disease Surveillance Bureau. There are 4 diseases under the zero reporting surveillance system, which include suspected cholera, suspected Acute Flaccid Paralysis, Dengue Hemorrhagic Fever and measles. All of these diseases are under the National Vertical Programs, except suspected cholera which is collaborated among National Program for Acute Respiratory Infection, diarrhea and cholera.

In June 2003, world pandemic of SARS occurred. Since SAR was a new disease and did not include in the National Vertical Program, it was under the direct responsibility of Communicable Disease Control Department. During that period, all resources were very limited such as human power, equipments and supplies, system of detection and funding support, and the most difficult one was that we did not have the local response teams to assist Communicable Disease Control Department.

Due to the facts mentioned above, the Ministry and all organizations recognized the role of the Communicable Disease Control Department to carry the responsible of the diseases which did not include in National Vertical Program. The Communicable Disease Control Department has set up an action plan to strengthen the surveillance, outbreak investigation and response, and establish

the local teams to assist the Communicable Disease Control Department. Since the comprehensive and accurate surveillance system was not in place, the department introduced the system for early detection of cluster or abnormal event by setting up 2 hotlines. These hotlines were disseminated to public hospitals, private clinics and the public through media, newspapers, communities' forum, etc. Meanwhile, the Communicable Disease Control Department set up the action plan for 5 years as seen in the figure 1.

After setting up the above action plan, the Communicable Disease Control Department implemented the plan under technical and funding support from French Cooperation and World Health Organization (WHO). The objective of this action plan was to prevent and respond any priority diseases which were important to the Cambodian Public Health. We organized first workshop on diseases burden in Cambodia, and participants included epidemiologists, clinicians, lab experts and veterinarians. During the workshop, we used the 8 criteria of WHO (Figure 2) to identify the diseases of highest burden in Cambodia.

Figure 1: *CDC Action Plan*

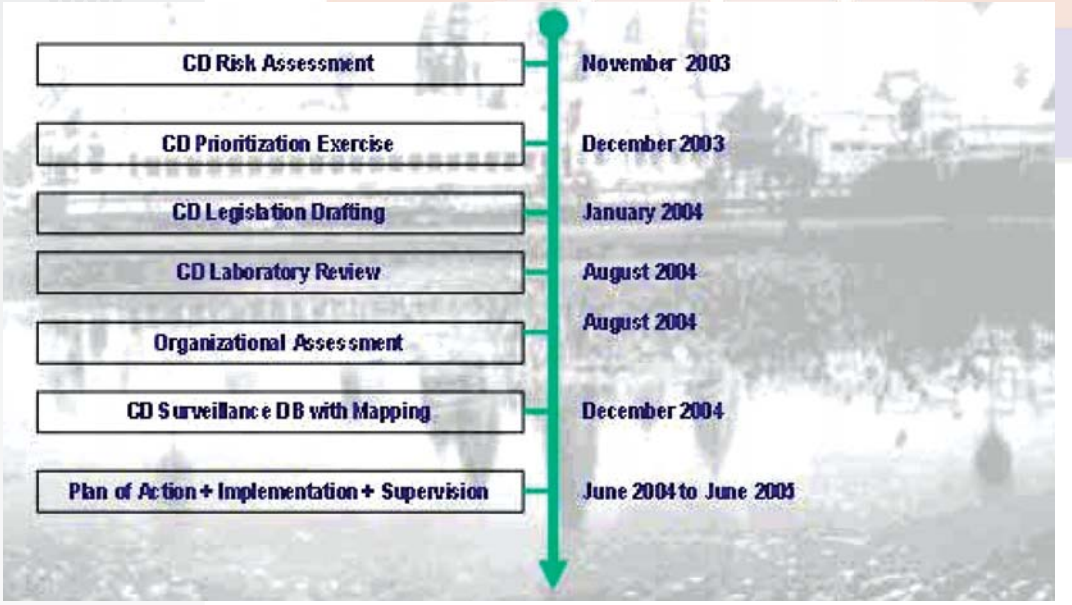


Figure 2: *The 8 criteria to assess the diseases burden in Cambodia*

1. Present burden of disease
2. Severity
3. Potential threat
4. Health gain opportunity
5. Need for immediate public health response or regional/international report
6. Effect of public health activities, diseases under specific control programs
7. Social and economic impact
8. Public perception

The workshop identified the list of diseases to be considered as followings:

1. Anthrax	19. Viral meningitis
2. Brucellosis	20. Pertussis
3. Cholera	21. Plague
4. Dengue	22. Polio/AFP
5. Diphtheria	23. Rabies
6. Ebola-Marburg viral diseases	24. Rubella/Congenital rubella syndrome
7. Japanese encephalitis	25. Salmonellosis (non-typhoid)
8. Lymphatic filariasis	26. SARS
9. Hemophilus influenzae b	27. Schistosomiasis
10. Hepatitis A	28. Soil-transmitted Helminths
11. Hepatitis B	29. Syphilis
12. Hepatitis C	30. Neonatal tetanus
13. HIV/AIDS	31. Tuberculosis
14. Influenza	32. Typhoid fever
15. Leprosy	33. Typhus
16. Leptospirosis	34. Yellow fever
17. Malaria	35. Clusters of severe diseases
18. Meningococcal disease	36. Dysentery

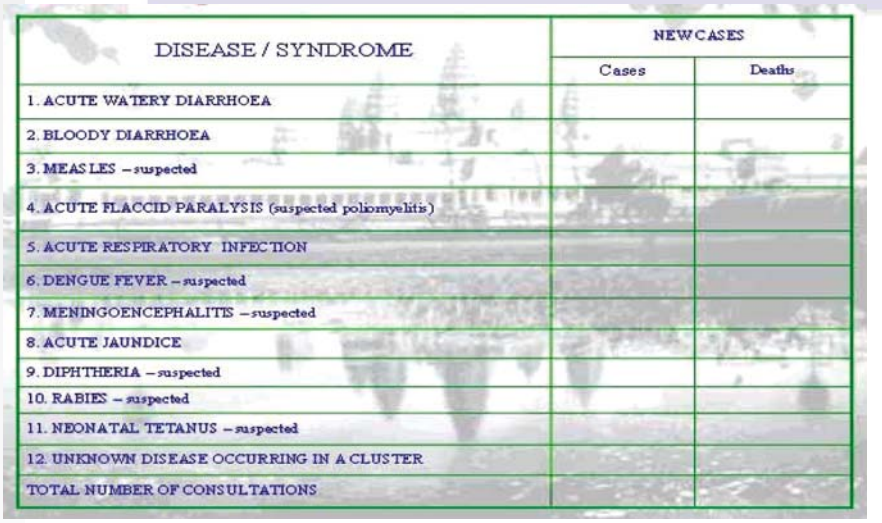
Nevertheless, due to limited resources, the group decided that fewer number of diseases should be selected for prevention and control. Therefore, we conducted another workshop to prioritize the diseases. During this workshop, we invited the same participants as first workshop, and used the same 8 criteria to prioritize by giving scores for the diseases.

Figure 3: *Priority of diseases as determined by score*

Rank	Disease	Mean score 26 participants	Standard deviation
1	HIV/AIDS	36,31	3,65
2	Dengue	33,96	4,25
3	SARS	33,31	4,95
4	Tuberculosis	33,31	5,58
5	Cholera	32,50	4,81
6	Malaria	31,04	6,17
7	Hepatitis B	29,42	6,18
8	Neonatal Tetanus	28,54	7,07
9	Polio	28,31	6,98
10	Measles	28,12	7,60
11	Rabies	27,50	6,07
12	Hepatitis C	27,15	5,70
13	Diphtheria	26,65	4,91
14	Japanese Encephalitis	25,92	6,05
15	Pertussis	25,15	7,86

Since there was limited laboratory capacity to identify the etiological agents at local level, we identified 12 diseases of highest burden, based on clinical signs of the cases reported to the surveillance system.

Figure 4: *Disease or syndrome reporting form*



DISEASE / SYNDROME	NEW CASES	
	Cases	Deaths
1. ACUTE WATERY DIARRHOEA		
2. BLOODY DIARRHOEA		
3. MEASLES – suspected		
4. ACUTE FLACCID PARALYSIS (suspected poliomyelitis)		
5. ACUTE RESPIRATORY INFECTION		
6. DENGUE FEVER – suspected		
7. MENINGOENCEPHALITIS – suspected		
8. ACUTE JAUNDICE		
9. DIPHTHERIA – suspected		
10. RABIES – suspected		
11. NEONATAL TETANUS – suspected		
12. UNKNOWN DISEASE OCCURRING IN A CLUSTER		
TOTAL NUMBER OF CONSULTATIONS		

Given that service delivery was still limited and many patients could not access public health facilities, it was less likely to detect the outbreak or abnormal event from the indicator based surveillance. Hence, we concluded that the event based surveillance still acted an important role to detect the cluster of abnormal event and outbreak. We considered the hotlines and other report information as important information for assessing, verification and response.

2. Good Practice

The event based surveillance is not a formal and structural system, however, it could act as complement system for the indicator based surveillance to detect the abnormal events or outbreaks in the communities, hospitals and clinics from both public and private sectors. Most of the outbreaks are detected through this system in Cambodia. Whenever there is a report by hotlines, the national investigator contacts the local Rapid Response Teams (RRT) to assess the situation at the suspected site and confirm the outbreak. If it is confirmed, the province RRT will react by collecting samples of the suspected source and patient to identify the agent, and providing treatment and education to the communities. Most of the outbreaks are put under control by the local RRT. The central team will response whenever there is a request from the local level.

Figure 5: *Tasks at different levels of health system*

	Levels of Health System	Tasks
1	Peripheral	•Clinical diagnosis and case management •simple tabulation, graphing of data and report •.Report of over threshold and abnormal event, and primary respond •Assist province to investigation
2	Intermediate/ Provincial	•Clinical diagnosis and case management •Analysis of data, graphic and report (Automatic analysis) •Basic laboratory support, PPE supply •Primary investigation of suspected cases or outbreak or abnormal event •feedback to peripheral level
3	Central	•Overall support, coordination of national surveillance activities •laboratory support •analysis of data (Automatic analysis) •support to intermediate level for outbreak control scientific base •feedback to lower levels •report to WHO (IHR)

3. Benefits and Outcomes

This event based surveillance system acts as complementary to the indicator based surveillance system. It could communicate easily with physicians from both private and public sectors, media and communities to report of any abnormal events. It will assist RRT in early detection and response to outbreak of any kinds of diseases, and reduce morbidity and mortality.

4. Insights and Lessons

The advantages of this system include better sensitivity (about 90%) than database surveillance; able to confirm rumors and provide feedbacks to the sources; acting as complement to strengthen DBS; early detection and early response to small clusters; good opportunity for local RRT exercise or simulation; keeping alert and responsibility; stimulating policy makers to decision; opportunity to get finance support; and more involvement and participation from media, pubic and heath professionals.

The disadvantages of this system are that it needs more works and investment of funding; every report has to be assessed and verified in order to encourage the reporter; it requires many human, equipment and finance resources; donors and some decision/policy makers do not understand and hesitate to support as it is not a structured surveillance; and difficult to implement the action plan and convince them to support the program.

5. Recommendations for Adaptation

The event based surveillance is the highly sensitive and reliable system to detect the outbreak in the country where public sectors are less accessible by the people, and private sectors are less involved in surveillance system. This system could also be used for detecting suspected avian influenza cases reported directly from the physicians who work in both public and private hospitals, and also for identifying cluster of the Influenza Like Illness since most patients seek treatment in the community, such as drug seller and traditional healer, instead of clinics and hospitals.

Ministry of Health Cambodia, we will improve this system by developing alert system to all mobile phones of RRT and also keeping reports from teams or from the public in the database system for monitoring and evaluation such as frequency of reports from provinces and frequency of specific disease outbreaks by generating maps and tables.