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Rabies Elimination in South-East Asia

*Report of a Workshop
Colombo, Sri Lanka, 10-12 November 2005*

WHO Project: ICP BCT 001



**World Health
Organization**
REGIONAL OFFICE FOR
South-East Asia
New Delhi

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1. INTRODUCTION

The WHO South-East Asia Region (SEAR) carries most of the burden of rabies contributing to 60% of global mortality due to this preventable disease. Of the estimated 25,000 deaths due to rabies in SEAR, a majority are in India (around 19,000) and Bangladesh (2000). Myanmar, Nepal, Indonesia, Sri Lanka and Thailand, on an average, report less than 100 deaths every year due to rabies. More than 2.5 million people undergo post-exposure prophylaxis after being bitten by rabid or suspected rabid animals causing considerable morbidity and economic loss.

Control of rabies in the canine population is fundamental to elimination of rabies. 96% of rabies mortality in SEAR is because of dog bites. Effective vaccines to induce protection in animals are extensively available and cost US\$ 1.5 to US\$2 for complete vaccination of a dog. A Regional Strategy for Elimination of Rabies was drafted in 1998 which focused on reduction of rabies in animal reservoirs and promotion of early and appropriate post-exposure treatment in human beings to obviate mortality.

Though cost-effective tools for elimination of rabies and modalities for use of these tools are available, their application requires considerable efforts. Political commitment, development of nationally coordinated activities through a comprehensive programme in which all stakeholders play their designated role and active participation of communities are the pillars of this strategy.

During the past decade, Sri Lanka and Thailand have made significant efforts and reduced human mortality to a great extent. To learn from the experiences of various countries and to develop a feasible way forward, an intercountry meeting was organized at Colombo, Sri Lanka from 10 to 12 November 2005.

The meeting brought together national focal points from health and animal husbandry departments from all the countries where rabies is a major

problem and from countries where well functioning nationally coordinated programmes are in place (Thailand and Sri Lanka), to facilitate experience-sharing and formulation of action plans. The meeting was attended by 13 participants from Bhutan, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand and facilitated by experts from Sri Lanka, Thailand, SEARO and WHO/HQ. Technical inputs were also provided by seven international experts on rabies who were special invitees. Please see Annexes 1 and 2 respectively for the list of participants and the programme of work. Dr P.A.L. Harishchandra, Director, Veterinary Public Health, Ministry of Health, Sri Lanka was elected as chairman and Dr Veera Thepsumethanon, Head, Department of Clinical Service, Queen Saovabha Memorial Institute, Bangkok as co-chairman. Dr A.K.Harit, Chief Medical Officer, Directorate-General of Health Services, Government of India, New Delhi was nominated as the rapporteur.

2. OBJECTIVES

The following were the objectives of the workshop:

- (1) To review the status of rabies and its prevention and control activities
- (2) To formulate mechanisms for implementation of the Strategy for Elimination of Rabies
- (3) To draft country-specific plans of action and follow-up mechanism for rabies elimination

3. INAUGURAL SESSION

The workshop was inaugurated by Dr. Athula Kahandaliyange, Director-General of Health Services, Sri Lanka. In his inaugural address Dr Kahandaliyange emphasized the public health importance of rabies in developing countries. Quoting data from Sri Lanka, he informed that though considerable progress had been made in Sri Lanka in reducing human rabies in the past decade, additional efforts were needed to achieve rabies elimination. He stated that rabies was a priority disease in Sri Lanka and

recently a policy decision had been taken by the national government to accelerate the process of elimination. A National Task Force had been constituted to implement the policy. Dr Kahandaliyange hoped that deliberations and recommendations of the meeting would be of use to strengthen rabies elimination in Sri Lanka.

Dr Bipin Verma from the WHO Representative's office in Sri Lanka delivered the address of Dr Samlee Plianbangchang, Regional Director, WHO South-East Asia Region. Dr Samlee stated that rabies was an important public health problem in many Member States of the South-East Asia Region. Though the exact magnitude of the problem was not known, it was estimated that around 25 000 people died of rabies every year in South-East Asia. This constituted almost 60 per cent of the global mortality due to rabies. The majority of cases were reported from India where an estimated 19 000 lives were lost to rabies annually, followed by Bangladesh with about 2 000 deaths. Apart from the significant mortality, animal bites were also responsible for considerable morbidity. The economic loss due to rabies, though not calculated, was obviously considerable.

Dr Samlee observed that rabies was a disease with complex epidemiology. Several socioeconomic factors influenced it. Dogs were prolific breeders and multiplied rapidly and survive if adequate food, water, and shelter were made available to them either willfully or by improper disposal of garbage. Effective and affordable tools for the prevention and control of rabies were widely available. These included safe and potent vaccines for the pre-exposure prophylaxis in dogs as well as for the post-exposure protection in human beings. The technology for mass production of these vaccines was available within the Region. Though the vaccines for human beings were expensive, the WHO-advocated method of intradermal inoculation reduced the cost considerably.

Emphasizing the role played by WHO, Dr Samlee informed that a regional strategy on rabies elimination was prepared by the Regional Office in consultation with countries of the Region. A WHO Expert Committee on Rabies held discussions at Geneva in October 2004. WHO was providing technical support to countries to eliminate rabies. He stressed the importance of sustained political commitment and effective implementation of national rabies elimination programmes utilizing the currently available tools and knowledge. He reminded that dog rabies elimination was a difficult but not an

impossible task. With strong commitment and innovative use of available tools, dog rabies elimination could become an attainable goal. He assured all technical support from WHO to countries in their endeavours to eliminate rabies.

Dr P.A.L. Harishchandra proposed a vote of thanks.

4. PROCEEDINGS OF THE MEETING

4.1 Global status

Dr Francois Meslin, WHO/HQ presented the global scenario of rabies. He informed that of the 55,000 global deaths due to rabies every year, 31000 were from Asia and 24000 from Africa. Very few deaths took place in the rest of the world due to this disease. Based upon modeling techniques it was estimated that in India, about 1000 cases of rabies occurred in urban areas while more than 18000 succumb to it in rural areas.

More than 8 million people received post-exposure prophylaxis (PEP) in Asia and half a million each in Africa and Latin America. In the rest of the world, less than 250 000 people undergo PEP. A limited number of countries in Asia, Africa and Latin America were still using nervous tissue derived rabies vaccines which have questionable safety and efficacy. This number is, however, decreasing very rapidly.

Dr Meslin stressed that vaccination of dogs was the mainstay of rabies control in several countries. He gave examples of Mexico, Thailand and Sri Lanka where, during the last 15 years, significant decrease in the incidence of rabies in humans was recorded as a result of concerted efforts to vaccinate a large number of dogs. Use of oral rabies vaccine was also shown to be successful in several countries in control of wildlife rabies. He advocated application of proven technologies in combating rabies in Asia.

4.2 Country Reports

The country representatives presented an overview of the rabies situation in their respective countries. Their observations have been summarized in Table 1.

Table 1: Status of Rabies in SEAR countries

Status	Bhutan	India	Indonesia	Myanmar	Nepal	Sri Lanka	Thailand
National Rabies Control Programme	No	No	No	No	Yes	Yes	Yes
National multisectoral task force	No	No	No	No	Yes	Yes	Yes
Human deaths/year	2-5	~19000*	109	186	~75	98	19
Use of nervous tissue vaccine for PEP	No	No	No	Yes	Yes	No	No
PEP administered in 2004	1400	1,800,000	7917	~20000	25000	175000	351,536
Local production of cell culture vaccine for PEP	No	Yes	No	No	No	No	No
Intradermal route of PEP in use	No	No	No	No	No	Yes	Yes
Dog population in million	NA	29	NA	3.48	2.03	2.5	5.9
National mass canine vaccination programme	No	No	Yes	No	No	Yes	Yes
Local production of cell culture vaccine for dogs	No	Yes	No	No	Yes	No	No

* The figure is based upon a multicentric study as well as using modeling techniques. Officially reported : around 500.

Several common constraints were experienced by most countries (Bhutan, India, Indonesia, Nepal and Myanmar) where rabies is not considered a priority disease. These included inadequate resources, lack of political support, lack of consensus on strategy, weak intersectoral coordination, inadequate management structure, lack of public cooperation, prevalence of myths and religious factors.

The presentations revealed that Sri Lanka and Thailand had well defined structures and strategies in their National Programmes for the elimination of rabies. The strategies were focused on vaccination of a large number of dogs (targeted more than 75%) and providing post-exposure treatment to humans with modern cell culture vaccines. Both countries have used the intradermal route for PEP with excellent results. Active cooperation of communities either directly by the Programme or through collaboration with NGOs has been elicited and attractive educational materials have been produced and widely disseminated. Thailand also undertakes awareness campaigns amongst communities to alter owned dog's behaviour through their owners so that biting can be reduced. Both Thailand and Sri Lanka are procuring their requirements of vaccines through imports. Thailand had a veterinary vaccine production unit a few years back but recognizing the cost effectiveness of procuring the vaccines from international manufacturers, the production was discontinued. In contrast, Nepal has initiated its own production of cell culture vaccine for use in animals and proposes to phase out use of nervous tissue vaccine for human PEP by December 2006.

4.4 Rabies in SEAR : Progress made during 1998 to 2005

Dr Rajesh Bhatia, WHO/SEARO analysed the changes since the previous intercountry meeting held at New Delhi in 1998. The encouraging features were phasing out of nervous tissue vaccines for PEP especially by India which carried the highest burden of rabies in the world. Intradermal route has been established in Sri Lanka and Thailand whereas several studies in India have been conducted to demonstrate the efficacy of this route. In Sri Lanka, 125 000 people are given PEP using intradermal route and only 50 000 receive it intramuscularly.

Nepal, in addition to Sri Lanka and Thailand, has established a National Rabies Control Programme as well as commenced production of cell culture derived vaccines for veterinary use.

The number of human cases of rabies has decreased in Nepal, Sri Lanka and Thailand. However, an increase has been observed in Indonesia and Myanmar. In Indonesia, rabies has been reported in an increasing number of islands where it did not exist earlier. Recently, rabies has reemerged in Java from where it was eliminated in 1977.

In 1998, India had estimated 30 000 deaths every year due to rabies. This figure was based on the projections from selected centres where patients with hydrophobia were admitted. A WHO-supported multicentric study conducted recently showed that around 19 000 deaths occur every year in India. The official figures, however, are very few and can be attributed to a weak reporting system.

Dr Bhatia stressed the need of revisiting the strategy of rabies elimination including the following areas:

- Political commitment and coordinated efforts
- Programme management structure
- Capacity building
- Innovative use of available technology
- Community-based actions by people through effective risk communication
- Applied research for appropriate use of technology
- Cross-border collaboration and role of international agencies
- Resource mobilization

These were further categorized into four broad areas:

- (1) Political commitment, programme management and multisectoral coordination
- (2) Control of rabies in animals
- (3) Prevention of rabies in humans
- (4) Risk communication to obtain community participation in implementation of the programme.

4.4 Group Work

Political commitment, programme management and multisectoral coordination

Dr Rajesh Bhatia introduced this subject and emphasized the importance of obtaining political commitment, establishing infrastructure for programme management and involving all sectors in developing and implementing the programme.

The following were the terms of reference (ToR) for the group work and formulation of recommendations:

- Develop a draft generic national strategy for rabies control based upon the rabies burden
- Identify innovative means to apply available tools
- Formulate key elements of a national programme to cover:
 - Intersectoral coordination
 - Capacity building
- Suggest a programme management structure with indicators to monitor progress
- List potential donors in the South-East Asia Region
- Propose a mechanism for international exchange of information with SEAR countries

The salient issues which emerged from the group work were as follows:

The goal of the generic national strategy should be time-bound human and animal rabies elimination under the national rabies control programme in every affected country. The objectives should be:

- (1) Reducing the number of human exposures by all possible means
- (2) Preventing animal rabies
- (3) Increasing accessibility of PEP

- (4) Developing risk communication
- (5) Strengthening surveillance with an inbuilt system for response to rabies outbreaks

Several key elements of a national programme were proposed. This included:

- (1) Establishment of a high-power national committee to develop strategies; to establish inter-sectoral cooperation between identified stakeholders
- (2) Defined role for each ministry with detailed action plan showing clear responsibilities and time frame at every functional level and availability of commensurate resources to implement the action plan
- (3) Capacity building in development of new vaccine and their use in a most cost-effective manner, through intradermal route
- (4) Animal birth control through various options that are appropriate to local socio-economic and religious context
- (5) Improvement of communication skills, especially in relation to strengthening mass communication/ diagnostic services
- (6) Tapping additional resources, if needed from international donor agencies (ADB, JICA, and others)
- (7) Intercountry exchange of information within SEAR countries should be undertaken through WHO Rabnet (www.who.int/rabnet)

Control of rabies in animals

The subject was introduced by Dr (Mrs) Suseema Kodituwakku, Director Animal Health, Department of Animal Production, Colombo and Dr Harishchandra. Both the speakers discussed the success story of Sri Lanka and provided insights into the process of establishing the National Programme and tackling the problem of mass vaccination of dogs using a community approach and effective vaccines.

The groups discussed the issue of rabies control in animals with the following ToR:

- Strategies to ensure vaccination of dogs
- National strategy on canine vaccination
- Appropriate methods and strategies for dog population management
- Production capacity: feasibility of indigenous production or import of vaccines
- Phasing out of nervous tissue vaccines
- Mandatory requirements: legal enforcement
- Surveillance
- Diagnostic facilities
- Sharing of data with health sector
- Priority areas for research

The following issues emerged from the group work and discussions.

Vaccination of dogs is the mainstay of any dog rabies control programme. A national strategy on canine vaccination should be developed, articulating the use of cell culture vaccines only with annual or more frequent vaccination through parental delivery system, and establishment of a cold-chain system. Any cost-effective, indigenous production of a cell culture veterinary vaccine should be encouraged. For successful implementation of the canine vaccination programme, it is essential to estimate the size of the dog population. Several methodologies for a dog census have been documented.

Community awareness and involvement is essential for dog population management. Killing of dogs has not been shown to make any significant difference in epidemiology of rabies. The conditions conducive to the propagation of dog species should not be allowed to persist. The approaches need to be site-specific and appropriate to dog population ecology. Early-age neutering techniques are recommended. It was also agreed that, generally, there is no cultural resistance to dog birth control.

Adequate surveillance of rabies is a pre-requisite for an elimination programme. All dog bites should be reported and investigated including dog-to-other animal bites. Surveillance of rabies in animals is a critical tool to monitor the situation of rabies on a continuous basis and to initiate action wherever needed. It is important to develop standard guidelines for outbreak response in dogs and monitor eventual adverse event following chemical or surgical sterilization. Country-wide submission of animal brain samples for laboratory analysis should be encouraged. There is an increasingly felt need of raising laboratory diagnostic capacity including establishment of additional reference laboratories.

Several research areas that need to be explored include evaluation of impact of animal birth control methodologies on dog population and dog behaviour; development of cheaper methods for dog sterilization as well as humane methods of euthanizing sick dogs.

Prevention of rabies in humans

Dr Veera from Thailand and Dr Omala from Sri Lanka briefed the participants about the recent developments in effective use of PEP in their respective countries. Both detailed the mechanisms they used for introduction of intradermal vaccination through intensive training and evidence-based advocacy.

For group work, the participants were provided with the following ToR:

- Recommend appropriate prophylaxis schedules ideal for SEAR countries
- Steps to ensure availability of safe vaccines
- Phasing out of nervous tissue vaccines
- Post marketing surveillance mechanism
- Improvements in management of hydrophobia patient
- Role of traditional medicine
- Research to identify priority areas

The group work yielded a consensus on the following issues:

Pre-exposure prophylaxis should be given to the high-risk group. Since children bear the major brunt of disease, pre-exposure prophylaxis should be considered for them. For PEP, separate clinics should be established in hospitals with facilities to provide emergency management.

The use of intra-dermal route of administration should be encouraged in hospitals anti-rabies clinics serving an adequate number of new and those under treatment patients (at least 5-6/day) to obviate excessive vaccine wastage. The WHO schedules for intradermal administration should be followed. In other settings, intramuscular route of administration should be continued. For proper administration of intradermal vaccination, adequate orientation should be given, before introducing this route in the national programme. The storage of vaccine should be as per WHO recommendations.

Nervous tissue-derived vaccines must be phased out by 2006. Indigenous production of cell- culture vaccines should be undertaken where economically feasible. Import should be encouraged in countries without indigenous production of such vaccine and governments should consider exemption from import duties and other taxes since this is a life-saving biological product.

A post-marketing surveillance mechanism should be instituted for all new vaccines-whether domestically produced or imported and treatment failure and adverse reactions should be investigated fully. The management of hydrophobia patient should be improved by admitting them to designated infectious diseases hospitals with proper infrastructure for isolation and symptomatic treatment to make patients comfortable. Traditional healers/practitioners should be educated about management of animal bites. Research should be undertaken to replace expensive rabies immunoglobulins.

Risk communication

Dr Davison Munodawafa, Regional Adviser, Health Education and Promotion WHO/SEARO, provided a comprehensive overview of risk communication. He provided a definition of health promotion as well as that of communication. He highlighted the importance of risk communication and

drew attention to strategies and tools for implementation of risk communication. He stated that health promotion can be issue-based, population-based and setting-based. Dr Davison also provided a conceptual model which showed various channels of communication.

The group work was designed to address risk communication strategies. Various target groups to which risk communication should be targeted were identified and it was recommended that all possible communication channels should be used to convey the desired messages. The need to use only those media and languages which were appropriate to local settings was expressed.

Diagnosis of rabies in dogs was presented by Dr Veera. Ms Visakha elaborated the role of the private sector in supporting activities for rabies control in the dog population.

The participants discussed all the issues pertaining to rabies control in the South-East Asia Region thoroughly and made the following recommendations.

5. RECOMMENDATIONS

5.1 To WHO

WHO should:

- (1) Undertake advocacy at the highest level to elicit political commitment from Member States to initiate, or strengthen where they exist, a comprehensive National Rabies Control Programme and establish an appropriate veterinary public health infrastructure in the Ministry of Health to implement the Programme.
- (2) Develop generic guidelines for establishment and implementation of a national rabies control programme in developing countries that can be adopted by the Member States.

- (3) Provide technical support in formulation of risk communication strategy which must be integrated into their respective national rabies control programme.

5.2 To Member States

- (1) Member States should establish a comprehensive national rabies control programme with defined objectives, targets and allocation of adequate resources from the national budget and/or other resources. The programme should receive technical guidance and supervision from a national committee or task force that has representatives from all stakeholders.
- (2) The national programme should have an efficient laboratory based surveillance system which facilitates rapid flow and analysis of data on disease and adverse reactions to vaccines and promotes use of laboratory-based surveillance.
- (3) Member States should phase out nervous tissue-derived vaccines for human and veterinary use in a defined period of time and use modern, safe vaccines of proven efficacy.
- (4) Mass vaccination should be the mainstay of the canine rabies control programme. Wherever needed, this methodology should be supplemented with other methods including those for proper dog population management.
- (5) Member States should make cell culture vaccines accessible to the people living in rural areas where the rabies burden is highest. The intradermal route of vaccination administration should be promoted and staff trained in its proper application.
- (6) Member States should develop a risk communication strategy appropriate to settings to obtain active involvement of communities in rabies prevention and control activities.
- (7) Member States should encourage research to develop innovative and efficient methods and tools to reduce the cost of the rabies control programme.

Annex 1

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Annex 2

PROGRAMME

Thursday, 10 November 2005

0830 – 0900	Registration	
0900	Inauguration	
1025 – 1030	Introductions	Dr Rajesh Bhatia, WHO/SEARO
	Objectives and mechanism	
	Election of chairman/rapporteur	
	Administrative announcements	
1030 – 1100	Global Status of rabies in humans	Dr Francois Meslin, WHO/HQ
1100 – 1300	Country presentations	
	Bhutan	
	India	
	Indonesia	
	Myanmar	
	Nepal	
	Sri Lanka	
	Thailand	
1400 – 1445	Country reports continued	
1445 – 1530	Major constraints in control of rabies in SEAR and guiding principles for implementation of rabies elimination strategy	Dr Rajesh Bhatia WHO/SEARO
1545 – 1730	Group work on advocacy, planning, programme and coordination for rabies elimination	Group Work 1* To be guided by all facilitators

Friday, 11 November 2005

0900 – 0930	Control of infection in animal reservoirs	Director Animal Health, Sri Lanka (Dr Suseema Kodituwakku) Dr Harishchandra, Director VPH, MoH, Sri Lanka
0930 – 1300	Group work on innovative methods for prevention and control of rabies in animals	Group work 2* To be guided by Dr Suseema, Director Animal Health, Sri Lanka
1400 – 1445	Prevention of rabies in human beings	Dr Omala Wimalaratne, MRI, Colombo and Dr Veera, Thailand
1445 – 1700	Group work on innovative methods for prevention and control of rabies in humans Integration in National Programme	Group work 3* To be guided by Omala Wimalaratne and Dr Veera

Saturday, 12 November 2005

0900 – 0945	Risk communication: strategies and application	Prof Davidson Munodawafa RA/HPE, SEARO
0945 – 1130	Group work to develop a strategy for risk communication for control of rabies and its integration in national programme	Group work 4* To be guided by Prof Munodawafa
1130 – 1300	Development of generic national programme	Dr Rajesh Bhatia and Dr Harishchandra
1400 – 1500	Finalization of recommendations and strategies	Chairman
1515 – 1700	Way forward and valedictory session	