



**World Health  
Organization**

Regional Office for South-East Asia

# ***Rabies***

**in the South-East Asia Region**



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# 1. Introduction

Rabies, an invariably fatal viral disease, is transmitted to humans through animal bites, most commonly dogs. The disease is preventable through timely pre-and post-exposure vaccination. However, once the disease occurs, death is inevitable.

# 2. Burden of disease

More than 1.4 billion people are at potential risk of rabies infection in the South-East Asia (SEA) Region. Each year, 23 000 – 25 000 people die in the SEA Region due to rabies. This accounts for approximately 45% human deaths due to rabies worldwide. However, the actual numbers are not known since all cases of rabies are not notified or reported. It is estimated that 3.8 million patients receive post-exposure rabies prophylaxis (PEP) after being exposed to animals that are suspected of rabies annually in countries of the SEA Region. The estimated/reported human rabies mortality data is presented in Table 1:

**Table 1:** Human rabies, South-East Asia Region

Countries	Number of estimated/ reported cases	Rate (Human cases per 100 000)
Bangladesh	180 (reported in 2008) Estimation: Approx. 2000	0.14
Bhutan	Sporadic (Two cases in 2008)	0.28
DPR Korea	Sporadic	N/A
India	Approx. 20 000	3
Indonesia	Approx. 100	0.045
Myanmar	Approx. 1000	0.35
Nepal	32# (2007)	0.21
Sri Lanka	51^ (2008)	0.26
Thailand	8* (2008)	0.012

N/A: Not available

#Personal communication, Epidemiology and Disease Control Division, Ministry of Health and Population, Kathmandu, Nepal

^Weekly Epidemiological Report, <http://www.epid.gov.lk/wer.htm>

\*<http://thaigcd.ddc.moph.go.th>

### **3. Children : Major victims of rabies**

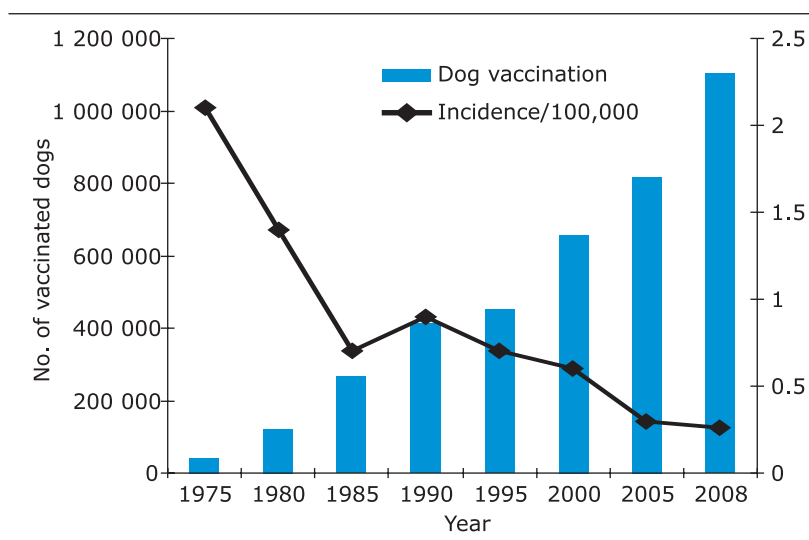
According to data available, children in the 5-15 year age-group represent about 40% of people exposed to dog bites in rabies-endemic areas. The majority of bites that occur in children go unrecognized and unreported and, consequently, exposed children do not receive the benefit of timely and complete course of post-exposure treatment. Thus, there is the possibility of a disproportionately high number of young children contracting and dying of undiagnosed rabies.

### **4. Rabies : A neglected disease in some countries and success story in others**

In the absence of any successful medical treatment for clinical rabies, and because of the severe nature of the disease and the inevitability of death, most rabies victims die at home rather than being admitted to a hospital. These circumstances add to the general lack of surveillance data and under-estimating of the health and economic implications of rabies among public health policy-makers. Thus, rabies is perceived as a rare disease resulting from the bite of a neglected animal (dog), and does not receive the priority or attention it deserves. Rabies comes under the purview of two or more ministries in most countries of the Region – Health, Agriculture and Local Government. There is a lack of coordination and collaboration among these agencies and inadequate technical and financial resources for rabies control. There is no national rabies control programme as such in most countries and the ever-increasing dog population is a big challenge to prevent human exposure and to achieve the desired level of dog vaccination coverage.

In the SEA Region, Sri Lanka and Thailand have registered a sharp decline in the number of human rabies deaths through mass dog vaccination campaigns, improved accessibility to human post-exposure prophylaxis and an effective vaccine delivery system. Both countries have adopted cost-effective intradermal rabies vaccination to control human rabies. The impact of dog vaccination on human rabies incidence in Sri Lanka is presented in Figure 1.

**Fig. 1: Impact of mass dog vaccination campaign on human rabies incidence, Sri Lanka, 1975-2005**



In India, intradermal rabies vaccination schedule has been promoted at the state level. Animal birth control and anti-rabies vaccination of dogs have been carried out by animal welfare and nongovernment organizations (NGOs). The Rabies in Asia Foundation, Association for Prevention and Control of Rabies in India and Animal Welfare Board of India and numerous NGOs have been involved in rabies advocacy, awareness and pilot projects at state levels.

## 5. Rabies vaccine, demand, production and supply situation

Sir David Semple developed the sheep-brain vaccine for human use in 1911 in India. Since then, technological advancement has been made to produce less reactogenic nerve-tissue vaccine (NTV) such as suckling mouse brain vaccine in Indonesia and Thailand. Nerve-tissue vaccine was produced for pre-exposure vaccination of dogs and post-exposure vaccination of food and companion animals in many countries in the past. WHO has been encouraging Member countries in the SEA Region to phase out production and use of NTV. Bangladesh, India, Indonesia, Myanmar, Nepal, Thailand and Sri Lanka had been producing nerve-tissue vaccine and all countries except Bangladesh and Myanmar phased out or abandoned the production and use of NTV for post-exposure rabies prophylaxis in humans in the following years:

- Nepal (2006);
- India (2005);
- Indonesia (1996);
- Sri Lanka (1995); and
- Thailand (1992).

India is the only country in the Region producing modern rabies tissue-culture vaccine such as Human Diploid Cell Vaccine (HDCV), Purified Verocell Rabies Vaccine (PVRV), Purified Chick Embryo Cell Vaccine (PCECV) and Purified Duck Embryo Vaccine (PDEV). India produces more than 15 million doses of human rabies vaccines annually. Other countries are importing human rabies vaccines. The details regarding the demand and costing of tissue-culture rabies vaccines in countries of SEA Region are presented in Tables 2 and 3.

**Table 2:** Approximate requirement of post exposure prophylaxis with tissue-culture rabies vaccine (TCV)

Country	Estimated number of persons seeking post-exposure prophylaxis	Requirement of TCV (Quantity)	
		IM(5 ml)	ID(1 ml) + Expected wastage (10%)
Bangladesh	60 000	300 000	66 000
Bhutan*	2 000	10 000	2 200
India*	3 000 000	15 000 000	3 300 000
Myanmar	50 000	125 000	55 000
Nepal*	30 000	150 000	33 000
Indonesia*	12 000	60 000	13 200
Thailand*	400 000	2 000 000	440 000
Sri Lanka*	200,000	1 000 000	220 000
<b>Total</b>	<b>3 754 000</b>	<b>18 645 000</b>	<b>4 129 400</b>

\* Use only TCV

**Table 3:** Anti-rabies vaccines: Cost considerations

Type of Rabies Vaccine	Single Dose	IM Full Course		ID Full Course(1/5 <sup>th</sup> )*	
		Quantity	Cost in US dollars	Quantity	Cost in US dollars
Purified Chick Embryo (PCECV)	1 ml	5 ml	35	1 ml	7
Purified Verocell (PVRV)	0.5 ml	2.5 ml	35	0.5 ml	7
Purified Duck Embryo (PDEV)	1 ml	5 ml	35	1 ml	7
Human Diploid Cell (HDCV)	1 ml	5 ml	90	1 ml	18

\*0.1 mL

Indonesia is still producing NTV for dogs. India and Nepal have been producing tissue-culture rabies vaccine for

dog immunization but it is not sufficient to run the mass dog immunization programme. Countries other than Bangladesh, DPR Korea and Myanmar import tissue-culture rabies vaccines for dog immunization from Europe, United States of America and other countries in Asia.

## 6. Rabies control in the South-East Asia Region

Rabies is a 100% fatal but at the same time, 100% preventable disease. It is a disease of poverty, affecting the very vulnerable populations and children. The necessary tools and methods for control and prevention of human and canine rabies are available and the proof of the feasibility of rabies elimination has been demonstrated in countries like Japan, Singapore and Malaysia. Rabies elimination programme focused mainly on mass vaccination of dogs are largely justified by the future savings of human rabies prevention programme.

A concerted effort between the human and animal health sectors and support from other stakeholders is needed to achieve the goals of rabies elimination. WHO will continue to provide technical inputs and support such effort.

### 6.1 Strategies

WHO recommends the following five major activities to be initiated/strengthened in the Member Countries of the SEA Region :

- (1) Develop a comprehensive national rabies control programme:** Consensus on national strategy and policy and multisectoral and coordinated approach for rabies control at different levels.
- (2) Promote prompt and proper care of dog bite wounds:** Immediate and thorough cleansing and

flushing of dog-bite wounds with simple soap water is the most effective first-aid treatment against rabies. There is a need to educate the public on this important first step in the prevention of rabies.

**(3) Increase access to tissue cell-culture vaccines (TCVs):** TCVs are safe and effective, with very low failure rates. Multi-site intra-dermal administration of TCVs greatly reduces the cost of post-exposure treatment, without sacrificing safety and efficacy. WHO strongly recommends discontinuation of the old nerve-tissue vaccines (NTVs), which are still produced and used in two countries of the Region, viz. Bangladesh, and Myanmar. NTVs have a high rate of adverse reactions and failures, and lower efficacy.

**(4) Prevent dog rabies through dog vaccination and dog population management:** This includes:

- organization of sustainable mass dog vaccination programmes using highly potent tissue-culture rabies vaccine;
- promotion of responsible dog ownership at the community level;
- promotion of oral rabies vaccine for stray dogs to improve vaccination coverage;
- dog population management through animal birth control (ABC) programme, and
- control of trade and movement of dogs.

It has been seen that where >80% community dogs are properly vaccinated against rabies, the occurrence of human rabies cases ceases promptly.

**(5) Public health education and advocacy:** This is an important component of any public health programme and Member States are encouraged to implement public education and awareness campaigns on rabies prevention and control.

## 6.2 Actions needed

### **The following all the actions that are needed:**

- (1) Establish national rabies control programmes, including appointment of National Programme Officers, and develop five-year strategic plans of action.
- (2) Improve rabies surveillance and data collection.
- (3) Initiate measures to phase out nerve tissue vaccines and replace them with modern tissue culture vaccines.
- (4) Promote rational use of TCVs for PEP and encourage the introduction of cost-effective intradermal (I/D) human rabies vaccination schedule in major rabies vaccination centres.
- (5) Strengthen inter-ministerial and intersectoral collaboration for rabies control in canine population through mass vaccination, dog population management and active community participation. Many NGOs and animal welfare groups are interested and involved in rabies control.
- (6) Develop appropriate measures to regulate movement of dogs from one place to another (rural to urban or island to island).
- (7) Community participation

## 7. WHO Collaborating Centres for rabies in the South-East Asia Region

The WHO Collaborating Centre for Research on Rabies Pathogenesis and Prevention

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