

# Rabies control in Bangladesh: human behaviours following dog bites

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## Introduction

Rabies is a public health problem in Bangladesh, with poorer people and children being mainly affected. Every year more than 300,000 people in the country receive post-exposure prophylaxis (PEP) rabies vaccination; however, many victims of animal bites remain untreated and more than 2000 people a year die from rabies.

In Bangladesh, domestic dogs are the main rabies transmitters, and dog bites are common due to the large number of stray dogs. However, few initiatives have been taken to increase public awareness of rabies and there are misconceptions about dog bites among the general population, which result in dog bite victims responding to a bite in different ways.

A national rabies elimination program has recently begun that has introduced a new cell culture vaccine into 64 districts in the country. The effectiveness of this elimination program relies on people visiting health centres for PEP vaccination following a dog bite. The aim of this study was to investigate the incidence of dog bites and the behaviours of dog bite victims following a bite.

## Objectives

- Assess the incidence and epidemiological pattern of dog bites in seven study areas in Bangladesh.
- Determine behavioural responses of people following a dog bite, regarding wound care, seeking health care services, and behaviours towards the biting dog.
- Develop hypotheses regarding risk factors associated with dog bites.
- Determine factors associated with failure to complete the full schedule of PEP.
- Produce policy recommendations for a strategy to reduce the number of dog bites and provide the most cost-effective procedures for preventing rabies in people who are bitten by dogs.

## Methods

This study took the form of an epidemiological case series. The epidemiological units of interest were people who had been bitten by a dog and who attended one of the seven participating health centres providing rabies PEP vaccination services. The study took place in three administrative divisions, and two districts per

division were randomly selected for inclusion. Data collection occurred between April and July, 2013.

Data were collected from consenting participants using a standardised questionnaire administered by post-graduate data collectors who were hired and trained to recruit participants into the study. The data collectors were present at their designated vaccination centre on every day that the centre was operating during the study period.



Figure 1. Dog bite wounds on the neck of one of the study participants.

Individual bite victims receiving their first dose of PEP vaccine were followed during subsequent visits until they had received their final dose. If they did not attend for the whole course of vaccinations, a follow-up phone call was made to acquire information as to why they had discontinued the course of vaccines.

## Results

Eight hundred and eighty five dog bite victims were included in the study. Demographic features of respondents are shown in Table 1. A higher proportion of victims was male (70%). Most of the victims (93%) completed full course of vaccination.

Knowledge about appropriate wound care was found to be inadequate. Only 14% victims washed their wound with soap and water, and 22% applied antiseptic (including Dettol and Savlon) to the wound. Application of indigenous products like lime (4%), soda (4%), salt (0.9%), kerosene oil (0.6%), and others (4%) were also reported.

Table 1. Demographic features of dog bite victims who participated in the study and epidemiology of their dog bites.

Demographic features of dog bite victims		Total	%
Sex	Male	617	69.7
	Female	268	30.3
Age (years)	0–20	452	51.2
	20–40	248	28.1
	40–60	163	18.5
	>60	20	2.3
Education	Primary	343	38.8
	No education	283	32.0
	Secondary	133	15.0
	Hsc, graduate and other	126	14.2
Location	Rural	545	61.6
	Urban	327	37.0
	Slum and other	13	1.5
Religion	Islam	817	92.3
	Hindu	67	7.6
	Christian	1	0.1
Dog bite epidemiology		Total	%
Body part bitten	Leg	705	79.7
	Hand	114	12.9
	Body neck	74	8.4
	Head	6	0.7
Area where bitten	Outside home (street, market, school & other)	524	59.2
	At home	361	40.8

About 10% of dog bite victims went to a traditional healer like Ojha, kobiraj, or village doctors before visiting the hospital for PEP.

Regarding biting dogs, in 68% cases no action was taken. Only 2% dogs were confined to check for rabies and 5% dogs were killed. Of the dog bite victims, 82% were annoyed with dogs and 96% wanted to control dogs by killing (51%), vaccination (17%) or sterilization (12%).

Based on hospital records, the annual estimated incidence of people who having been bitten by a dog visit a hospital for PEP in the participating districts was lowest in Habigonj (38 per 100,000 people), similar in Sirajgonj (57), Dhaka (56), Rajshahi (50), Sylhet (49) and Narshingdi district (47), and highest in Mymensing (61).

## Discussion

Variation in the annual incidence of dog bites between areas indicates that control measures should get special attention in areas with a higher incidence. This study identified that gender (male > female), children (< 20 years), and the number of stray dogs in an area are possible risk factors for human dog bites.

Understanding the knowledge about rabies among bite victims is important when planning control programs. This study showed that most victims didn't take any washing measures before visiting to hospital, which is one of the most important measures recommended by WHO.

## Lessons learned

This was a collaborative study the human and animal health sectors, which provided the opportunity to complete a joint project design, implementation plan and budget. Learnt lessons will help in future to combat any zoonotic disease by taking effective preventive and control measures. Also regional collaboration between countries will provide a platform upon which to work together by exchanging knowledge and information. Disease epidemiology of different countries can be understood by using Hubnet as a network for the region. All these measures will help to recommend disease control policies and decision making criteria to the policy makers on order to take sustainable disease control measures.

## Recommendations

Gaps in people's knowledge, attitude, and practices about dog bites and their management can be reduced by appropriate strategies like increased awareness using mass media, printing media, etc. Education about dog behaviour, wound management, fatality of disease among the children can be increased by including these topics in school curricula. Stray dog population control can be important to reduce bite incidence. There should be a good surveillance system to monitor dog bite information from all over the country for sustainable rabies control strategy.

## Acknowledgments

We would like to acknowledge the support and assistance of Massey University, World Bank and European Union for Regional One Health Epidemiology Training Program in South Asia. We are thankful to Ministry of Health and Family Welfare, and Ministry of Livestock, Bangladesh for selecting us for the mentioned program and continuous support. We also acknowledge the kind cooperation of Prof Mahmudur Rahman and Prof Nitish Debnath who gave their valuable time for supervising the project activity.