CHALLENGES IN RABIES CONTROL –GAPS AND NEEDS

A DESCRIPTIVE STUDY IN KERALA

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Dissertation submitted in partial fulfillment of the requirements for the award of the degree of Master of Public Health

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DECLARATION

I here by declare that this dissertation titled **'Challenges in Rabies control-gaps and needs: A descriptive study in Kerala'** is the result of original research and has not been submitted for the award of any degree/diploma at any other university or institution of higher education.

Thiruvananthapuram, Kerala S.S.Rani

October 2008

CERTIFICATE

Certified that the dissertation titled **‘ Challenges in Rabies control-gaps and needs: A descriptive study in Kerala’** is a bonafide record of original research work undertaken by Dr.S.S.Rani in partial fulfillment of the requirements for the award of the degree of Masters of Public Health under my guidance and supervision.

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CONTENTS

ABBREVIATIONS USED

ABC	--	Animal Birth Control
ADCP	--	Animal Disease Control Project
AHD	--	Animal Husbandry Department
APL	--	Above Poverty Line
BPL	--	Below Poverty Line
CME	--	Continued Medical Education
ERIG	--	Equine Rabies Immuno Globulin
EU	--	European Union
FGD	--	Focus Group Discussion
HDCV	--	Human Diploid Cell Vaccine
HRIG	--	Human Rabies Immuno Globulin
IDRV	--	Intra Dermal Rabies Vaccination
IEC	--	Information Extension and Communication
LSGD	--	Local Self Government Department
LSGI	--	Local Self Government Institutions
NGO	--	Non -Governmental Organization
NIH	--	National Institutes of Health
NTV	--	Nerve Tissue Vaccine
OIE	--	Office des International Epizooties
OVD	--	Oral Vaccination of Dogs
PCA	--	Prevention of Cruelty to Animals
PEP	--	Post Exposure Prophylaxis
PHC	--	Primary Health Centre
SDCMC	--	State Disease Control and Monitoring Cell
SPSS	--	Statistical Package for Social Sciences
TCV	--	Tissue Culture Vaccine
USA	--	United States of America
WHO	--	World Health Organization
WSPCA	--	World Society for Prevention of Cruelty to Animals

ABSTRACT

Background: Dog bites and rabies threat continue to be a public health problem in Kerala though animal rabies control had been carried out under decentralised planning since 1996. Government spends huge amount from the health budget for post exposure prophylaxis but deaths are also not uncommon in the most literate state. This study aims to unveil the real challenges in rabies control and to make recommendation based on the findings.

Objective: to identify the major policy barriers in achieving rabies control in the state and to evaluate the current control programme under decentralised planning

Methods: Indepth interview with key stakeholders of the policy and Focus Group Discussion with implementing officers as key tools and to corroborate the findings with secondary data collection on rabies control under decentralised planning, analysis of epidemiological characteristics of animal bites in human, other secondary data from major stakeholder departments, document analysis & case studies.

Results: Dog bites and rabies threats are identified as important public health problems to be controlled by all stakeholders but nobody owned the control initiatives. Only 18% of Local Self Government Institutions provided funds and less than 15% purchased vaccine during the last three years though there were no financial challenges with them. Main finding of this study is that rabies control programme under decentralised planning is not effective and needs urgent correction to control the disease in animals and man. There is no consensus among the stakeholders about the strategies. Post exposure prophylaxis (PEP) is not decentralised and gross inequity exists in access to the majority of bite victims, seventy percent being rural.

Conclusion: Given the increasing public health expenditure for PEP, rabies control demands priority as a social welfare programme. There were no efforts taken for enforcement of a comprehensive and sustainable programme in the state. With strong policy decision and multi stakeholder participation, an effective rabies control programme is possible in Kerala under decentralised planning through the wide network of transferred institutions.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Rabies or Hydrophobia is a viral zoonosis distinguished as the infectious disease with the highest case fatality rate in human race. Though there is no proven treatment for the clinically manifested disease, post exposure prophylaxis (PEP) is a life saving treatment in rabid animal bites but which is not always available and affordable in developing countries. The majority of people who die of rabies are people of low socioeconomic status. Social cost of dog bites and disease is very high with mental, physical and financial trauma to the bite victims. This is a vaccine preventable disease both in animals and human. India is far ahead in various sectors of science and technology, still we have the highest number of rabies deaths in the world.

Rabies is a disease of all warm-blooded animals. In India, transmission to human is mainly through dog bites. Vaccination coverage up to 70 percent is a proven method to break the transmission cycle of rabies in dogs. Canine (dog) rabies elimination has been demonstrated in countries like North and South America, Western Europe, Japan and Malaysia. Thailand and Srilanka have demonstrated themselves as role models in rabies control for developing countries.

Kerala produced Nervous Tissue Vaccine (NTV) in the Public Health Laboratory, Thiruvananthapuram since 1937 and offered free treatment upto 1998. This was discontinued and switched to the safe Tissue Culture Vaccine (TCV), while rest of the country continued with NTV till the Hon. Supreme Court of India ordered a ban in December 2004. TCV is not

produced in the state and the cost is escalating year by year. A substantial reduction in the treatment cost is possible only through an effective animal control programme. In the absence of National Rabies Control programme, it is a requisite to have efficient regional programmes to control this most dreaded disease to the mankind.

1.2 LITERATURE REVIEW

1.2.1 Rabies - public health and economic burden

World Health Organization (WHO) counts rabies as an important public health problem and estimates around 55,000 human deaths every year world wide.[1-3] A majority (99%) of these deaths happen in the developing world and of which 84 percent occur in rural areas in Asia and Africa.[1, 4] Asia alone contributes around 32000 deaths and conducting more than 8 million PEP/year.[1, 5] Total deaths averted by the PEP globally account for 2,80,000/year.[6] More than 80% of people in developing countries are living at the risk of exposures.[1, 5] About 40 percent of the bite victims are children under 15 years and chances of under reporting are also more among this group. The estimated annual cost of rabies in Asia is US$563 million for PEP costs. Psychological burden is extra.[3] Suspected rabies exposures exert sizeable economic burden on local government as well as bite victims in endemic areas for treatment cost, animal control, livestock losses, surveillance cost (diagnosis), patient cost like travel cost and wage loss .[7]

1.2.2 Rabies in India

As per the WHO sponsored national multicentric Rabies survey in India (2003), the frequency of death from rabies is 1 in every 30 minutes and the frequency of dog bite is 1 in every 2 seconds. The projected animal bite incidence in India is 17.4 million and administration of PEP about 18 lakhs PEP/year.[5] India has the highest mortality, 20,000 per

year contributing 62 percent of Asian deaths. Except in Andaman & Nicobar Islands and Lakshadweep, the disease is endemic through out India.[8] Since rabies is not a notifiable disease in India, there is no organized surveillance system of human rabies. So the actual number of deaths may be much higher. Ignorance, poverty and seeking traditional or alternate medicines are the major reasons quoted for high mortality in India.[9] Country spends around 1500 crores for rabies vaccines for human treatment, still biologicals are in short supply.[10]

1.2.3 Human rabies control

- **Rabies – the fatal disease**

Rabies or Hydrophobia is an acute viral encephalomyelitis and transmission happens mainly through dog bites and contact with their saliva. Once rabies encephalitis develops, death is almost inevitable but its long incubation time in most cases, usually 20-90 days, leaving a window for rabies post exposure prophylaxis, which is highly effective if given promptly, includes wound cleansing, active immunization with a modern cell culture vaccine, and passive immunisation with rabies immunoglobulin, where ever necessary.

Many countries like Japan, Malaysia, Singapore, North Korea could achieve rabies free/controlled status through comprehensive rabies control programme.[11, 12] Thailand could reduce the number of human deaths steadily from 400 in 1978 to 19 by 2004.[5,13] Sri Lanka is another country in the region, which is a success story, total deaths are just 55 by 2005.[14] Vaccination of dogs and adoption of cost effective intradermal vaccination for PEP in human were the important strategies. China could reduce Rabies deaths from over 5000/year in 1989 to 200 in 1995 and became almost Rabies free.[12, 15] But slowly by 2002, Rabies re-emerged

and reached a level of above 2000 deaths per year and country had again taken strict control policies to bring down the mortality due to rabies. Though cost effective control measures exist, their application needs considerable efforts from all stakeholders.[5] Absence of rabies control policy/programme can be due to the lack of political will; dedication of the public health leadership[6] etc but it is reckoned a violation of ethics and human rights.[16]

1.2.4 Animal rabies control

Japan acquired rabies free status not by its geographical isolation alone but through strict enforcement of rabies prevention law.[17] Canine vaccination programme has made good results in Thailand.[5, 12,18] .In Tanzania, vaccinating domestic dogs has proved to be a very effective way of fighting rabies. Because almost all human deaths in India happen from dog bites, effective canine rabies control programme can reduce human deaths and reduce over all cost of rabies prevention.[5, 19] India has 27 million dog population and about 80% are reported as stray dogs, the major animal vector in the transmission of the disease.[10] WHO recommends mass vaccination of accessible dogs and humane removal of unvaccinated ownerless dogs for effective animal control.[1] Rabies control is a public good with little direct benefit to an individual dog owner unless herd immunity could be achieved through vaccination of atleast 70% of dogs.[20, 21] Sustained vaccination is recommended along with movement control and stray dog control. [3, 5]

1.2.5 Successful models

a. Thailand Rabies Control Programme (country level model)

In Thailand, National Rabies Control Programme was implemented in a phased manner to increase the probability of success. Involvement of multisectoral agencies like Ministry of Livestock Development, Public Health, Metropolitan Administration, Thai Red cross society

and Local administrations were ensured. Monitoring committees were formed at different level. Trained village volunteers, one per village were enrolled to assist the programme and they did annual dog population survey. Free vaccination extended to public areas, tourism centres, remote areas and to poor dog owners. Annual vaccinations were conducted during the months of March-April. Mobile squads were available in all districts. Destruction of stray dogs was also part of the programme but cultural resistance to killing was strong. People were encouraged to submit exposed animals for epidemiological surveillance.[13]

b. Serengeti model in Tanzania (Local level model)

Serengeti project was carried out during 2003-06 in two districts of Tanzania- Serengeti and Ngorongoro in partnership with local Animal Husbandry wing and funding sources like Wellcome, NIH, WSPCA and WHO .The control programme was initiated with collection of base line data, surveillance and diagnostic facilities, training of veterinarians etc. Empowerment of community was done through local leaders, teachers and veterinary officers assured their participation. Intersectoral co-operation was ensured through inter ministerial task force on Rabies control at high level and locally. Free vaccine delivery was done to increase vaccination coverage and to avoid misperception about the efficacy of the programme. Awareness programme on first aid, PEP and dog vaccination was done through community leaders, school teachers etc and publicity as in Pulse Polio programme. Impact of the programme was clear after 2-3 vaccination campaigns in two years and this in turn increased community participation further. With in two years, human deaths decreased from 11/100000/year to zero in Ngorongoro and to reduce suspected dog bites. With this success, the inter ministerial task force involving Livestock Development, Health, Wild life and

Tourism, Finance, Regional Administrations, Local Governments, Justice and Home Affairs had developed draft Rabies control policy for the country.[20]

1.2.6 Major policy related issues with disease control

i. Low priority for control

Neglected diseases identified by WHO are those affecting mainly the poor and powerless in rural areas of developing countries and Rabies is one among them.[22] One of the major reasons for negligence of control is believed to be the low level of political commitment, partly arising from the lack of quantitative data about the true public health impact of the disease and failure of public health experts to convince the policy makers.[3, 5] Exhorbitant cost for PEP of animal bites is not considered as criteria for control measures.[7] On the contrary country like Sri Lanka aim to become the first Asian country in more than 30 years to become rabies free by implementing a National Rabies control programme.[23] Most of the public health experts consider it as a rare disease, since less mortality. Being the disease of an economically unimportant animal (dogs), it receives low priority for control in animals too.[2, 24] The perception of Rabies being a rare disease itself hampers the control measures[25]. Integration of sectors like Health, Veterinary and Civic authorities was demonstrated in Central and South America, where medical authorities took lead role for animal control programme.[9, 25] Though rabies is a 100% fatal disease and highly endemic in India, it not a notifiable disease here and hence the problem of poor disease surveillance.[26]

Rabies satisfies all the WHO criteria for priority for control and has safe and effective animal and human vaccine. As per the WHO Vaccine Preventable Categorization Project, Rabies is ranked as " high priority disease" behind 'very high priority diseases' Malaria and Pneumococcal disease, based on ten criteria.[27]

ii. Human Post Exposure Prophylaxis (PEP) and risk management

PEP is highly effective if given promptly, but availability and accessibility are not satisfactory in developing countries. This makes rabies a disease of rural poor.[23] Major cost associated with Rabies control is human PEP According to WHO estimates, a full course of PEP with Tissue Culture Vaccine (TCV) is equal to 31 day's wages for an average Asian citizen.[3] A Thailand study puts the figure to around 20 days wages of a Thai labourer, even after using many low cost methods including intra dermal vaccination regime. Dog bites can even pull poor families into financial disasters, if not provided free of cost.[15] But this could be saved by interventions to control animal rabies by reducing rabid animals and human exposures. [11,12,15,23,28,29] Improved physician compliance with WHO guidelines in risk assessment and management is crucial in avoiding over treatment .[20]

Animal observation and testing of brain samples would be other steps in saving the scarce biologicals.[14] Use of less expensive second-generation vaccines, use of purified Equine Rabies Immuno Globulin (ERIG), intradermal vaccination etc are some of the options to reduce the cost of PEP.[12, 15] Thai Red Cross National Blood Centre provide RIG free to public hospitals and also calls for the production of Human Rabies Immuno Globulin (HRIG) by large blood banks in public interest[18]. Public health education is extremely important to create awareness on importance of first aid and PEP.[24]

For high-risk group persons like those who are working in rabies diagnostic/research laboratory, pre exposure vaccination is recommended with periodic sero- monitoring and

boosters.[8] But age stratified incidence shows greater risk of exposure in children and pre exposure vaccination is recommended in children by WHO.[12, 27]

iii. Adoption of intra dermal vaccination regime

Use of Intra Dermal Rabies Vaccination (IDRV) is found to be equally efficacious and can reduce the cost upto one fifth of current regime. Implementation of IDRV in Thailand and Sri Lanka made PEP more affordable and helped to reduce human mortality significantly. [5,15] Strategic Advisory Group of Experts, WHO also endorsed the successful shift of IDRV in Sri Lanka even in rural areas and recommends as an alternate to intramuscular regime in developing countries.[21, 27] A survey during 1998 in Thailand indicates practice of this regime in 42.4 percent of hospitals.[18] WHO approved this regime as early in 1992. Agencies like National Human Rights Commission[30] and Jan Swasthya Abhiyan[31] were exhorting policy makers about the need of IDRV in India and Government of India approved this in 2006.[32] Efficacy of IDRV has been studied in India also.[33, 34] Indian states like Delhi, Uttar Pradesh, Karnataka (Sept 2007), Tamil Nadu (Sept 2008), Andhra Pradesh (June 2007), West Bengal (Jan 2008), Orissa (April 2007), Himachal Pradesh (Aug 2008) have already started the new regime and are at different stages of implementation. Government of Kerala is formulating guidelines for implementation.[35]

iv. Canine rabies control

a. Vaccination of domesticated dogs

Canine (dog) rabies is almost limited to developing countries. 70-80 percent canine vaccination has proved effective in reducing the disease in animals and preventing human

cases dramatically. This is also the most cost effective and ethical way for rabies control.[19, 29] A pilot dog vaccination programme in Chad, African urban city also proved this.[36]

National Rabies Control Programme exists in Nepal, Thailand, and Srilanka.[3, 5,13,14,29] among the South East Asian countries. China's one dog policy with strict guidelines for dog rearing, heavy fine for defaulters etc are some firm steps taken towards rabies control. A joint OIE/WHO/EU International Conference urges Governments to consider investing in canine rabies control as the best way to reduce escalating cost of PEP, as it is 20-100 times than vaccination cost of dogs.[39] Effective dog rabies control programs not only serve to reduce human deaths but also can reduce the overall costs associated with rabies prevention.[37, 39]

b. Rabies control in stray dogs

- **Removal of stray dogs**

With rapid turn over and short life expectancy, it is difficult to control stray dogs. The highest recorded stray dog elimination was 15 percent annually, but this rate is proved ineffective with the increased survival rates of dogs.[3] Rather than killing, it is important to remove the conducive conditions for propagation of stray dogs.[5]

- **Animal Birth Control programme (ABC)**

An American study reveals that unneutered male dogs constitute 80 percent of aggressive dogs in USA.[38] WHO recommends ABC for accessible dogs and humane removal of inaccessible and ownerless dogs. In India, following the inception of the Animal Birth Control (Dog) rules 2001 under the Prevention of Cruelty to Animals Act 1960 [40], stray dogs are to be neutered, vaccinated and released. There are very few success stories in India .The ABC programme in Jaipur, (during 1994-2002) was reported successful. [41] Audit of the ABC

programmes conducted by the Bangalore Mahanagara Palike advocated proper planning and execution of the scheme with better monitoring and supervision.[26]

- **Oral Vaccination of Dogs (OVD)**

For increasing vaccination coverage of inaccessible free roaming dogs, oral vaccines, as bait is an option. This is a proven method for wild life rabies control in developed countries like European countries and North America. Usually OVD is very expensive and not an option for developing countries. [15,18] ABC is not an easy solution in India, since the ownerless dogs are more in the 27 million total dog.. Government of India had approved a pilot project on oral vaccination of stray dogs for five years in five Indian states. Safety and efficacy studies of oral vaccine, SAG-2 has already been tested in stray dogs and the vaccine trial so far concludes that the vaccine is safe in both dogs and for people who live close to these dogs as there is no salivary excretion. WHO recommends different stages of research before implementation and now the bait vaccine-Rabidog is officially authorized in India. [42-45] The Govt of India is yet to approve the use of oral vaccine within the country.

v. Disease surveillance

Surveillance is the critical tool for monitoring the disease. WHO recommends surveillance of animal exposures, and rabies cases in man and to exchange the information with animal health surveillance wing to take control measures. Animal surveillance information also should be exchanged with health authorities.[1, 3,5] Laboratory based surveillance in animals should be enhanced. Testing of samples from animals with neurological signs is mandatory in countries with strict control measures.[42] A recent case of Rabies in a person in Germany, who had visited India, remained unidentified until the soft tissue transplantation from the

patient resulted in rabies to organ recipients. Importance of laboratory diagnosis atleast in organ transplant was highlighted.[46]

vi) Awareness programmes

- **Training of health staff**

Risk assessment and management according to WHO guide lines is necessary in saving life as well as to avoid over treatment. A study in India shows apparent lack of awareness among doctors regarding appropriate management of animal bite wound and PEP necessitating Continuing Medical Education programme (CMEs).[47]

- **Public awareness**

Misconceptions and myths centres round this disease and more than the disease, these perceptions render members of the community vulnerable.[48] Educational outreach programmes for community regarding first aid, post exposure treatment, responsible dog ownership, spay-neuter programme, dog vaccination, etc are important. [38] Community control programme need to be planned and executed at government initiative as did in Thailand.[5, 13] Along with capture of stray dog and removal of food waste, health education was found to be effective as a long term preventive programme for both animal and human Rabies control as demonstrated in Thailand, Japan, Nepal etc.[12], [46] Awareness to children is particularly important.[49] Travellers to endemic countries need pre travel health advises and pre exposure vaccination depending on the country, duration of stay, type of travel in the visiting country PEP availability etc. [50]

1.3 ABOUT THIS STUDY

1.3.1 RATIONALE FOR THE STUDY

Rabies has no effective treatment and therefore arouses considerable psychological trauma and economic burden to the bite victims. But this remains a neglected disease in Kerala also. The authorities continue to rely on human death statistics while ignoring the financial burden resulting from an enormous increase in PEP and need of the root cause elimination. Despite being the most literate state within the country, people still die of Rabies. The disparities in the awareness, accessibility and affordability of PEP can be possible reasons. But it is unethical to leave a community at the risk of this most feared disease when there are proven cost effective control measures. Kerala could prove successful in improving various health indicators comparable to developed nations. Under decentralised planning in Kerala, rabies control is the mandatory duty of Local Self Government Institutions. Absence of an effective policy for a sustainable control programme can be the major underlying cause. This is the motivation for doing a policy analysis for finding out the major challenges in rabies control.

1.3.2 OBJECTIVES

i. Major objective

To identify the major policy barriers in achieving rabies control in Kerala

ii. Minor objectives

- To assess the impact of decentralised planning in rabies control during the last three years
- To document the public expenditure on rabies control by major stakeholders like Health, Animal Husbandry and Local Self Government departments for the last three years
- To describe the epidemiological characteristics of animal bites during 2008

CHAPTER 2

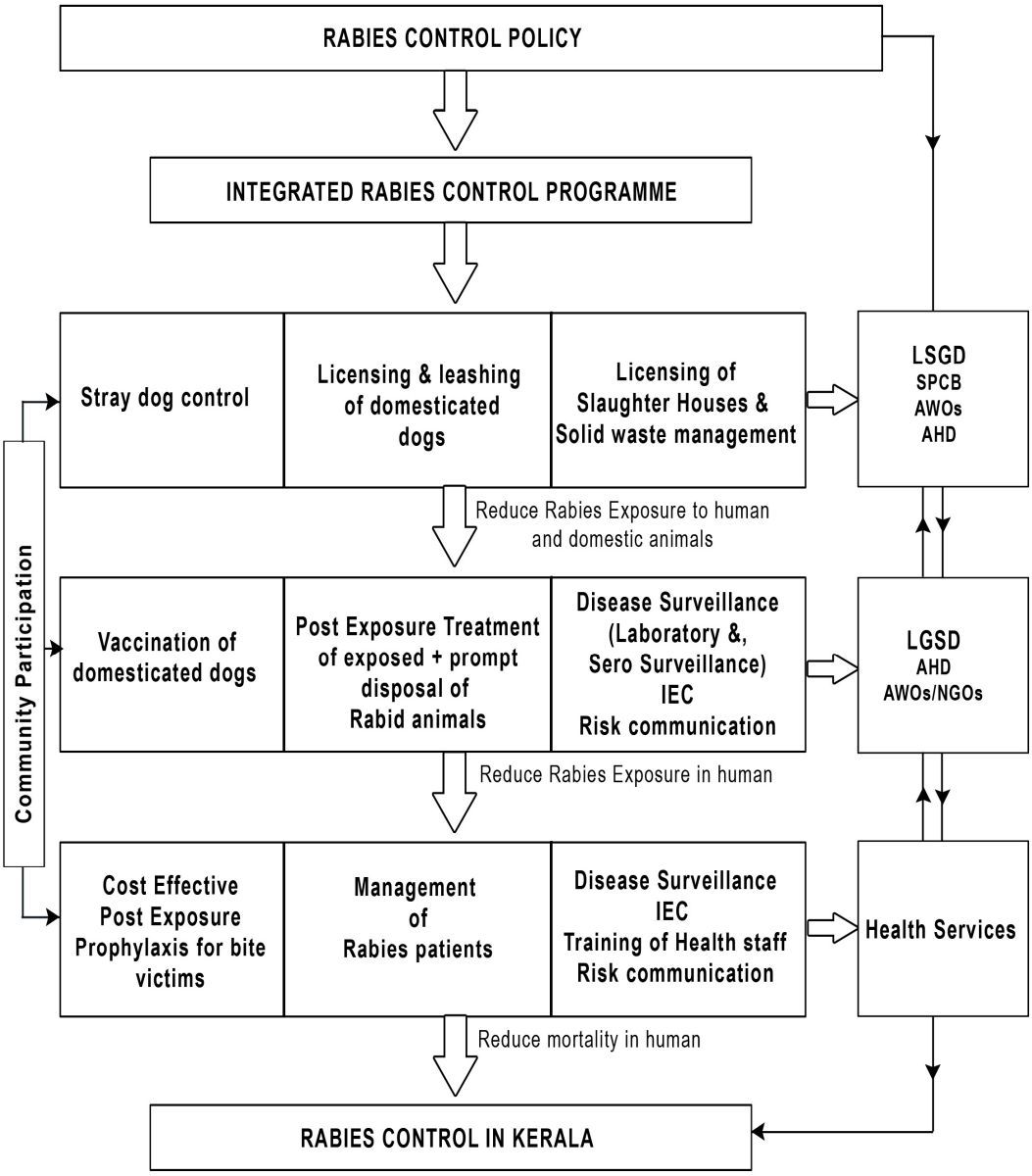
METHODOLOGY

2.1 CONCEPTUAL FRAMEWORK

Rabies control needs an integrated policy and sustainable and effective programme, which is to be implemented by different stakeholders through various activities. Roles and responsibilities of different stakeholders should be well defined. Unless rabies control activities start from dogs, the disease control in human is difficult and cost of treatment would increase substantially though deaths could be averted by timely and appropriate PEP. Dogs being the major animal vector in rabies transmission in Kerala, rabies control in stray and domestic dogs is only included in the framework. Intersectoral co-ordination and community participation are important for the success of any multisectoral programme.

More than disease control and treatment in man and animals disease surveillance, IEC activities, risk communication are also integral components of an ideal rabies control programme. With this framework, I have analyzed the current policy and programme to understand the status of the rabies control, the major policy challenges and the possible ways to go for a successful control programme.

Fig No.1 Conceptual Framework for Rabies Control in Kerala



Abbreviations used:

LSGD – Local Self Government Department
AHD – Animal Husbandry Department
AWOs – Animal Welfare Organizations
NGOs – Non-Governmental Organizations
IEC - Information Extension & Communication
SPCB – State Pollution Control Board

2.2 OPERATIONAL DEFINITIONS USED

2.2.1 Rabies control policy

As used in this document refers to any national/regional/local or institutional programmes/project, law, regulation, rule, court orders/ Ombudsman's order, government decisions at any level related to Rabies control applicable in the state of Kerala

2.2.2 Stakeholders[51, 52]

Stakeholders are actors (persons /organizations) with a vested interest in the policy that is being promoted for Rabies control or who are affected positively or negatively by the policy.

2.3 STUDY DESIGN

This study included a combination of methods to triangulate the findings from various sources. It is designed as a policy analysis study by qualitative methods [53,54] with secondary data analysis. Methods used are

- In-depth interview with key informants of different stakeholders
- Focus Group Discussion
- Document analysis
- Analysis of secondary data
- Case studies

2.4 STAKEHOLDER ANALYSIS

In-depth interviews and Focus Group Discussions (FGDs) were conducted with key informants from groups of important stakeholders of rabies control policy/programme. From all the possible stakeholders identified, a priority list has been prepared to select key informants at various levels of policy formulation and implementation and beneficiaries for

indepth interviews. This would facilitate to explore their response about the existing policy and programme, recommendations for improvements etc

2.4.1 Stakeholder Identification

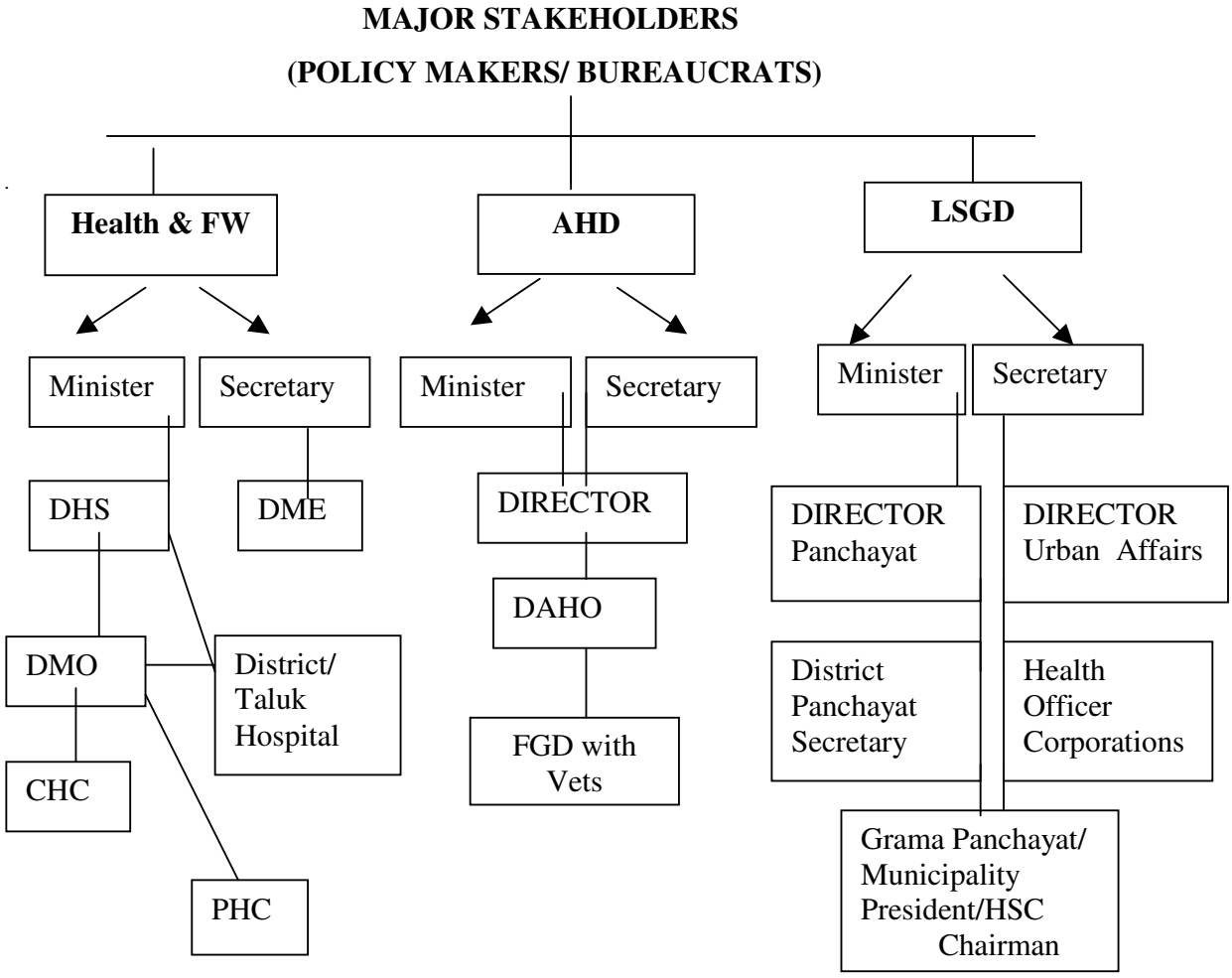
Table No.1. Possible stakeholders related to rabies control policy

Major Stakeholders	Minor Stakeholders	Beneficiaries of policy /affected by the policy
-Local Self Government Department (LSGD) -Animal Husbandry Department (AHD) -Health Services Dept	-Animal Welfare Organization -Pollution Control Board -Media -Public -Pet owners -Residents Associations/ NGOs	-Public -Tourism -Education

2.4.2 Stakeholder Selection

The list of priority stakeholders were identified from document analysis, literature review and input from experts. Stakeholders, both major and minor involved at policy formulation to implementation and beneficiaries were included in the priority list. Purposive sampling was done from the network of key informants identified for selection.

Fig no.2 Network of key informants identified for selection



Key informant interviews also with minor stakeholders & beneficiaries

Education Senior Bureaucrat	**Tourism** Senior Bureaucrat	**Pollution Control Board** Senior Bureaucrat	**AWO** Office bearers	**Bite victims**

Abbreviations used:

Health & FW- Health & Family Welfare
AHD-Animal Husbandry Department
LSGD-Local Self Government Department
DHS-Director of Health Services
DME-Director of Medical Education
NRHM-National Rural Health Mission
AWO-Animal Welfare Organization
DMO-District Medical Officer
CHC-Community Health Centre
PHC- Primary Health Centre
DAHO-District Animal Husbandry Officer
Vets-Veterinarians
HSC-Health Standing Committee Chairman

2.4.3 Sample size

Table No.2 No.of stakeholder interviews planned and conducted

Sl no	Stakeholders	Interviews planned	Interviews conducted	Rationale for selection
1	Animal HusbandryDept	4	3	Rabies control in domestic animals
2	Local Self Government Dept	6	7	For stray dog management, licensing of dogs, Slaughter houses, solid waste disposal etc
3	Health Services Dept	6	6	Post bite treatment and management of rabies confirmed patients
4	Bite victims	8	6	To know their attitude, knowledge and about the service received
5	Pollution Control Board	1	1	Law enforcing agency on solid waste disposal
6	Education	1	1	30-40% of bite victims are children under 15yrs
7	Tourism	1	1	Foreigners against killing of dogs & impact on tourism
8	Animal Welfare Organizations	2	1	Animal protection group and against killing of stray dogs
	Total interviews	29	26	
9	FGD with Vety doctors	1	1	Implementing officers in AHD & LSGI
10	Case studies	2	2	

Table no. 3 Position of stakeholders interviewed

Stakeholders interviewed	Nos
Policy makers at Government level (Minister/ Secretary)	3
Senior bureaucrats	5
Middle level bureaucrats	3
Implementing officers (Health, LSGD)	4
Implementing officers- (AHD)	8 (FGD)
Elected members & authorities of LSGIs	4
Bite victims representing community	6
Animal Welfare Organization representative	1

2.4.4 Data collection technique used

Identified key informants were interviewed after getting prior appointments at their convenient time and place. Informed consent was obtained from all and permission to record the interviews except in three cases. Separate interview guidelines were prepared for different stakeholders and for key informants at different levels depending on their involvement with the policy/programme. Interview guidelines and informed consent used for the indepth interviews and FGD are attached as Annexure (1)

2.5 SECONDARY DATA COLLECTION

2.5.1 Secondary Data Collection from Local Self Government Institutions (LSGIs)

To assess the status of Rabies control under decentralised planning, rabies control activities under LSGIs for the last three years were collected, as those details were not available either at Directorate of Panchayats or Animal Husbandry. Since the programme implementing officers are veterinary doctors working in the respective LSGIs, decided to collect it through Animal Husbandry Department. The proforma was circulated to all veterinary institutions from the Directorate of Animal Husbandry through District Animal Husbandry Officers with instruction to forward the reports directly to Epidemiology unit, Thiruvananthapuram. The principal investigator collected the reports for data entry and analysis. Proforma enclosed as Annexure (2). Similarly, a proforma to all Municipalities and Corporations was forwarded from Directorate of Urban Affairs. Filled up proforma were collected from the Directorate for doing analysis. Proforma attached as Annexure (3)

2.5.2 Epidemiology of animal bites from General Hospital, Thiruvananthapuram

To understand the epidemiological characteristics of animal bites and treatment pattern, available details of persons undergone Post Exposure Prophylaxis at General Hospital,

Thiruvananthapuram for three months (February to May 2008) were collected from the daily issue register of vaccine and serum.

2.5.3 Secondary data from Departments

Related details were also collected from Health, Animal Husbandry, Local Self Government, and Pollution Control Board.

Documents like relevant acts, rules, court orders etc were compiled for understanding the legal support for rabies control.

2.6 CASE STUDIES

- 'Suraksha'-Integrated Rabies control programme initiated by the Thiruvananthapuram Corporation
- Experiences of suffering of a rabies patient

2.7 STUDY SETTING

Study setting is Kerala, utilizing the information and data from various stakeholders of rabies control policy.

2.8 TOOLS FOR DATA ANALYSIS

Coding and analysis of the transcripts of indepth interviews and Focus Group Discussion was done to identify the key themes. The data were organised theme wise and stakeholders wise to understand similarities and contradictions. It was done manually by the Principal Investigator to ensure consistency, reliability and comparability of data. Secondary data collected from animal husbandry institutions, municipalities and epidemiology data from General Hospital, Thiruvananthapuram were entered in Microsoft Excel and analysed using SPSS 15.0 version.

2.9 ETHICAL CONSIDERATIONS

- Confidentiality of the stakeholders was maintained strictly and written informed consent was obtained before conducting the interviews
- Privacy was ensured strictly while conducting the interviews
- Confidentiality of the information obtained from key informants and departments was strictly maintained
- Obtained clearance from the Institutional Ethics Committee of SCTIMST, Thiruvananthapuram, Kerala.

CHAPTER 3

RESULTS AND DISCUSSION

Results of analysis are discussed under three sections. Section (1) deals with the scenario of rabies control in Kerala and stakeholders' perspective. Stakeholder analysis was conducted to identify the major policy barriers in rabies control in the state, the major objective of the study. Rabies control under decentralised planning is discussed in section (2) to analyse the status of current animal control programme. The PEP details available at General Hospital, Thiruvananthapuram during first quarter of 2008 was analysed to understand the demographic profile and epidemiological characteristics of animal bites and PEP delivery from a district hospital and discussed under section (3).

Section (1)

3.1 Scenario of rabies control in Kerala and stakeholders' perspectives

In-depth interviews were conducted with 26 selected key informants belonging to eight sectors of governance and one FGD was conducted with eight (8)veterinary doctors of AHD as part of the stakeholder analysis. The interview guidelines contained questions on public health importance of rabies, activities of statkeholders in rabies control, difficulties identified in implementation, policy change required or not, public spending on rabies control, inter sectoral co-operation obtained etc. Important themes related to rabies control policy were identified and coded from the interviews and FGD transcripts by type of stakeholder and theme wise. This helped to understand the stakeholders' knowledge about the policy, interest in the policy, their position for or against the policy, ability to affect the policy process, difficulties faced during implementation strategies for improvements etc. Major stakeholders included are the Health, Animal Husbandry and Local Self Government Departments.

The important themes identified are

- Animal bites and rabies as public health problem
- Issues with human Post Exposure Prophylaxis
- Stray dog control
- Rabies control in domesticated dogs
- Status of slaughter houses and solid waste disposal,
- Legal frame work and enforcement
- Reasons for low priority in control

3.1.1 Animal bites & Rabies

a. As a public health problem in the state

Public Health Experts at different levels considered the disease as an important public health threat due to the 100 percent fatality, tragic death and absence of effective treatment. Other stakeholders also perceived it as an important public health problem that needs control with priority. A policy maker of LSGD felt that even the small numbers of deaths due to rabies creates fear among all. The elected leaders of LSGIs viewed it as a priority issue because it mainly affects the poor. All the stakeholders except the LSGD felt that the action in most cases is restricted to temporary corrections following an episode. Two senior bureaucrats also cited that stray dogs were a persistent problem for the civic administration. Data regarding animal bites and PEP for rabies are not documented routinely by the Health Dept. Indirect information of the extent of the problem is reflected by the total annual expenditure for antirabies vaccine which amounts to around rupees 8-10 crores (for 3.5 to 5.5 lakh doses) Mortality data available is in a decreasing trend but deaths recorded at Government Medical colleges is not available except from Kottayam.

Table No. 4 Human Rabies mortality from 2005-06 to 2007-08

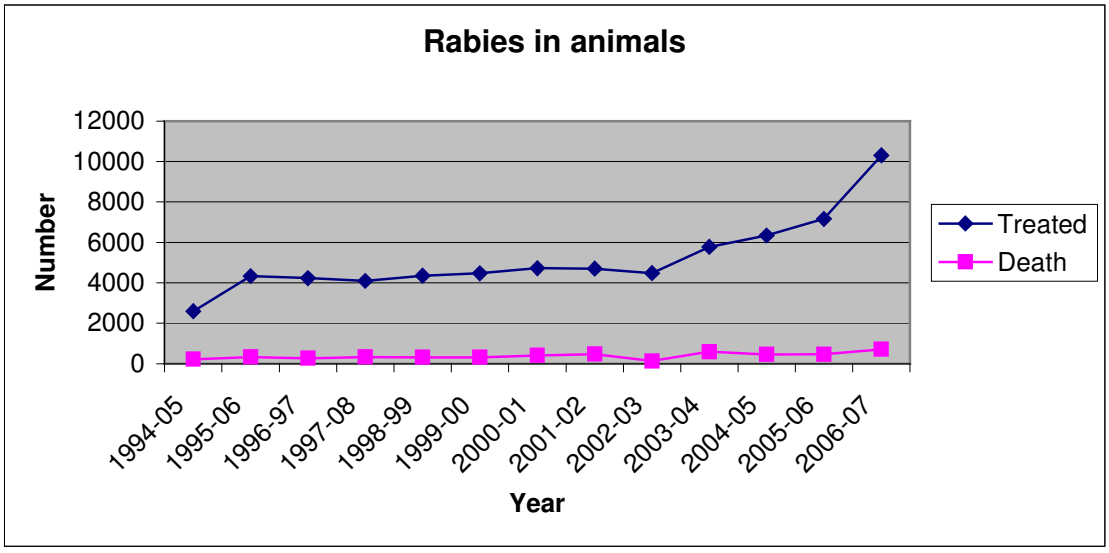
Year	2005-06	2006-07	2007-08
Total reported to Health Services Department	20	27	10
Medical College, Kottayam	11	8	6

(Source-Directorate of Health Services Dept and SDCMC, Thiruvananthapuram)

b. Animal bites and rabies in animals

Veterinary doctors noticed that the bite cases and deaths in animals are increasing and only a small portion is brought for treatment and very few deaths in animals reported. Statistics also supported this statement and that there was a steep increase in the number of animal bites treated. The total animals treated for dog bite during 2002-03 was 4484 and increased to 10311 by 2006-07.Death increased to 717 from 137.Economic loss to animal husbandry sector also is important. When the disease is highly prevalent in animals, risk to human also is high. Details of animal rabies are attached as Annexure (4a &b).

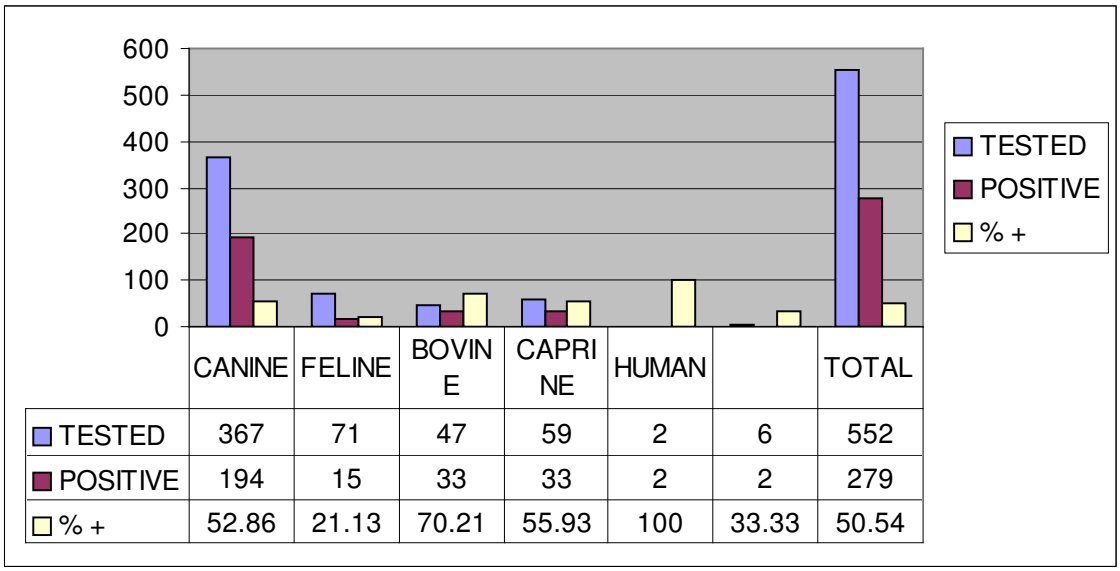
Fig. No.3 Rabies in animals-Post exposure treatments and deaths



(Source- Annual Administration Report, AHD, Kerala)

The rabies diagnosis under the two diagnostic laboratory of AHD revealed that 51 percent of the total samples tested were positive for rabies and maximum samples tested from dogs (53%) and most of them were not vaccinated. Regional access to laboratory facilities is also not available at present. The laboratories located at Thiruvananthapuram and Kollam get samples from northern districts also. This makes it extremely difficult for the public when a carcass is to be tested for rabies. Cost of testing (Rs 200/- per sample) and transportation cost are additional burden to public. Laboratory surveillance is an essential component to evaluate the rabies situation in human and animals. Successful countries in rabies control promote public to send the sample for testing when animals die with neurological symptoms.

Fig.No.4 Rabies diagnosis in animals in two laboratories (2003-04 to 2007-08)



	CANINE	FELINE	BOVINE	CAPRINE	HUMAN		TOTAL
TESTED	367	71	47	59	2	6	552
POSITIVE	194	15	33	33	2	2	279
% +	52.86	21.13	70.21	55.93	100	33.33	50.54

Source-Chief Disease Investigation Laboratory, Thiruvananthapuram & Clinical Lab District Veterinary Centre, Kollam, AHD, Kerala

3.1.2 Post Exposure Prophylaxis (PEP) in human

a. Availability, accessibility and affordability of PEP

Government policy for PEP is to give the first dose free to all bite victims and rest of the doses as free only to Below Poverty Line (BPL) patients, subject to the availability of vaccine at government hospitals. Health Services department offers PEP provision up to Taluk Head Quarter Hospitals. But when vaccine goes out of stock, only District/General Hospitals can replenish through Hospital Development Committees to an extent. So doctors from peripheral hospitals refer patients directly to the District hospitals. According to a senior bureaucrat of the Health Services dept, decentralisation of the treatment is not feasible at present. The various reasons cited included technical difficulties to ensure cold chain in rural PHCs, lack of specialists below Taluk hospitals, lack of ear marked funds to purchase more biologicals etc and hence store the costly and scarce biologicals in very few higher hospitals to ensure steady supply and treatment. But it is understood that specialists are not required for risk assessment and PEP with vaccine and only those PEPs requiring serum treatment need to be referred to higher hospitals. Affordability to the government was mentioned as the most serious barrier to PEP coverage till PHC level.

Doctor in rural PHCs observed that poverty was an important reason for the inability of some bite victims to avail the free treatment available at district hospital. Unable to afford the transportation cost and wage loss for 3 days in the first week, some choose to avert or delay the treatment. One of the senior officers in Health Services divulged that the vaccine purchase is not based on actual requirement but a fixed portion of funds allotted for costly medicines is used for vaccine and serum purchases. Sometimes even the tendered quantity will not be available with the suppliers.

Health Standing Committee Chairman of one LSGI identified non-availability of vaccine at hospitals and not having BPL cards to many BPL families, are some important issues to be addressed.

An expert from the Medical College advocated that treatment necessitating serum especially HRIG should be given free of cost to some bite victims in APL category also, as it is unaffordable to many. Treatment cost can vary from Rs 1500-20,000/- depending on the quality and quantity of biologicals prescribed for a bite victim.

Importance of refresher training to doctors was also stressed because over treatment happening at hospitals results in wastage of costly and scarce biologicals. Awareness amongst public about availability of treatment at Taluk hospital also is found to be less.

b. Cost of treatment to Health Sector

Health Services Department had spent Rs. 11.5 crores during 2006-07 for vaccine purchase alone. The above cost does not include the purchases made by Medical Colleges, Hospital Development Committees, Private Hospitals and private purchases by Above Poverty Line(APL) patients. Hence the total cost of biologicals is estimated around 25-30 crores in the state.

Table No. 5. Details of Rabies vaccine purchase under Health Services Dept

Year	TCV (doses)	HDCV (doses)	Total vaccine (doses)	Funds utilised (Rs)
2005-06	1,21,275	2,58,345	3,79,620	8,55,87,705
2006-07	2,48,308	3,04,595	5,52,903	11,55,27,115
2007-08	2,45,106	71,952	3,17,058	6,87,38,399

(Source- Directorate of Health Services Department, Kerala)

(TCV-Tissue Culture Vaccine, HDCV-Human Deploid Cell culture)

The amount spent by five Government Medical Colleges is not available, but the PEP details shows that a total of 20,000 patients were given PEP annually and only a small portion of

vaccine could be delivered from their supply. Details of PEP have been attached as Annexure (5).

c. Trend in the Post Exposure Prophylaxis

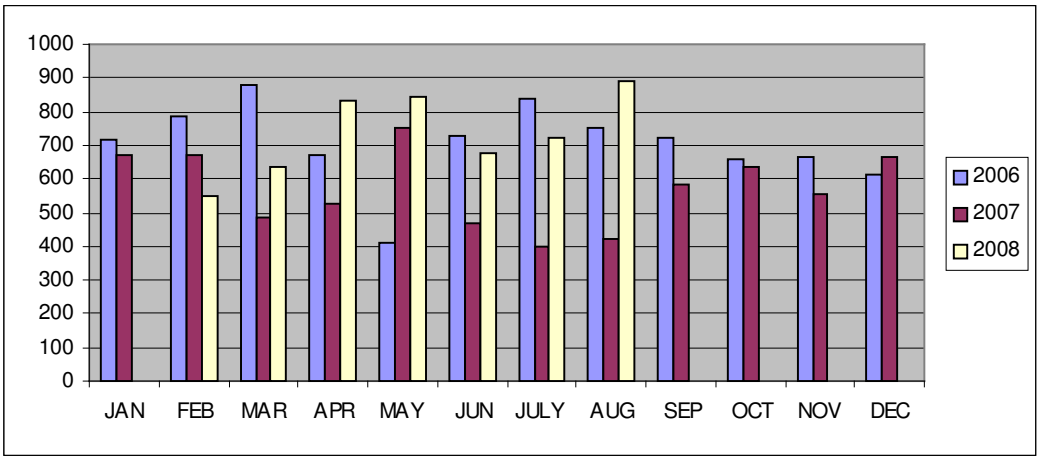
As there was no information on the number of PEPs attended or treated for the state, statistics of PEP in a District Hospital was analysed as a proxy. It did not confirm a decreasing trend, though a decrease was noticed during 2007. In Figure(3), the monthly pattern of PEPs shows an increasing trend during 2008 in a district hospital. The availability of vaccine at hospital and number of PEP treated are directly proportional as noticed at the PEP status during three months in General Hospital, Thiruvananthapuram.

Table No. 6 Annual PEP cases treated in a District Hospital for 3 years

Year	2006	2007	2008(up to August)
Fresh PEPs given vaccine+/- serum	8436	6831	5799

Source: General Hospital, Thiruvananthapuram

Fig No. 5 Monthly pattern of Post Exposure Prophylaxis for the last three years



Source: General Hospital, Thiruvananthapuram

d. Introduction of cost effective IDRV regime

Regarding the introduction of intradermal rabies vaccination (IDRV) for PEP, senior bureaucrats of Health Services were sceptical about its efficacy, as a change in the route of administration will affect the effectiveness of the treatment.. But experts from the Medical College await the introduction of the cost effective IDRV regime, which requires only one fifth of the vaccine with comparable efficacy.

e. Training of health staff

Training of doctors in Health Services has never been taken except for those in Anti Rabies Vaccine (ARV) clinics of referral hospitals and the reason cited was lack of ear marked funds for rabies surveillance. But the experts from Medical College reinforced the requirement of CMEs to improve risk assessment and management skills according to the latest WHO guidelines. The service of Medical College faculties could be arranged along with monthly conference of doctors without any additional expenses.

3.1.3 Stray dog control- Killing or Sterilization

The major difficulty raised by the LSGI authorities in stray dog management was in the availability of dogcatchers. They admitted that the remuneration fixed by government is too small for a person to accept this risky and undignified job. The present rate is Rs 20/- for catching, killing and disposal including the cost of medicine or poison or whatever they use to kill the dog. They also observed that after the Animal Birth Control (dogs) rules 2001 came into force, there is confusion whether to implement killing or sterilization. Later on contradictory court orders and interference of Animal Welfare Organisations prompted the LSGIs to opt for inaction with respect to stray dog control.

Most of the LSGI authorities still prefer killing, as ABC is considered as an unnecessary spending on an unwanted animal, which is creating only menace. Even if the LSGIs want to implement ABC, inadequacy of resources like trained dogcatchers, trained veterinarians for ABC surgery, facilities for surgery, people and place for post operative care, resistance of public in releasing back the dogs etc were said to be major handicaps. According to a policy maker from LSGD, abundance of edible food waste particularly in urban areas together with absence of control of dog population had resulted in a definite increase in the stray dog population though animal husbandry census showed a decline. A senior bureaucrat of AHD assured the department's technical support to the LSGIs for taking up ABC programme, though one of the LSGIs complained about the non-cooperation of implementing officers. A novel programme initiated by Thiruvananthapuram Corporation –Suraksha, the integrated rabies control programme was well appreciated by the policy maker of AHD and he was of opinion that it is not beneficial to release the sterilized dogs again to streets. Instead the policy should promote adoption or sheltering. He also committed his departmental (AHD) participation in LSGIs' initiatives.

The priority of Animal Welfare Organization is to work for animal rights and to act against cruelty issues. They do not have the facilities to take up ABC programmes here even though there are success stories in ABC programmes by AWOs in metro cities like Chennai, Hyderabad and Jaipur. The AWO representative complained that the policy makers do not envisage ABC programme as a public health management programme, though it helps in rabies control.

The present style of activities from LSGI authorities is reported to be often a top dressing of the problem

"One stray dog was killed and hanged in front of Panchayat President's room in Kollam District. Panchayat authorities rushed to Thiruvananthapuram Corporation for getting the service of dog catchers .The dog catchers were given all facilities and good remuneration for 2-3 days and they killed some dogs and there ended the rabies control in that Panchayat.This kind of attitude won't help in rabies control"

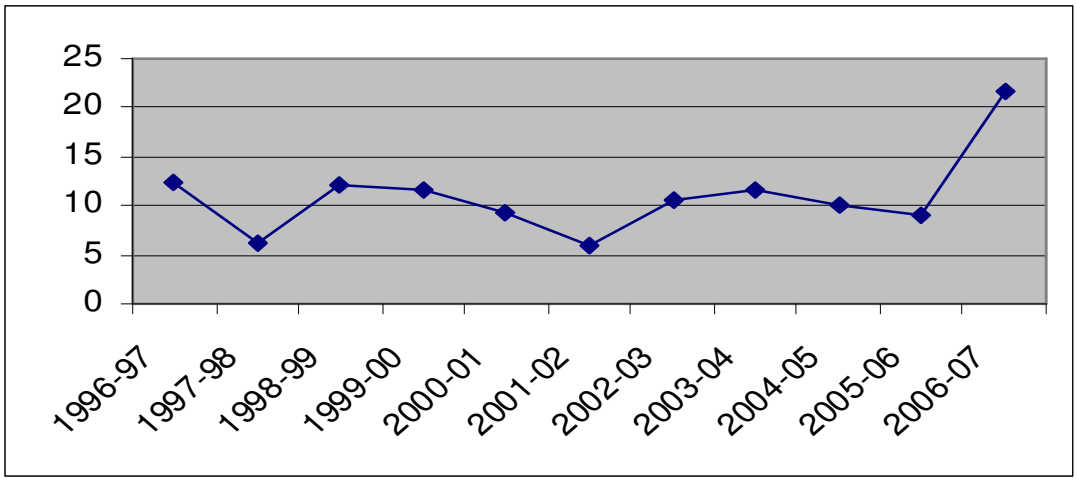
– Senior Veterinary Officer in charge

A policy maker from LSGD reported that the killing of stray dogs in cruel manner created lot of hue and cry among animal loving tourists and threats on anti Kerala tourism campaigns in and outside the country. Since the state promotes tourism as an important industry, he recommended a balanced strategy for stray dog control. A senior bureaucrat of tourism department also underscored this as an important problem they faced. But scare of dog bites or rabies among tourists was not reported so far. At the same time he foresaw that a single case of rabies among foreign tourists could also affect the sector very badly, as happened during Chikungunea outbreak.

3.1.4 Rabies control in domesticated dogs

The expert from Medical College observed that the dog bites treated at hospital are many or more from domesticated dogs as strays. PEP to such bites could be avoided, atleast in category II bites (low risk bites requiring treatment with vaccine alone and if the biting animal is alive on 10^{th} day, the treatment could be discontinued), if the dogs were properly vaccinated and leashed. This expert also demanded evidence to prove the quality of veterinary vaccine used. Vaccination strategy was also said to be not proper and adequate. The senior bureaucrat of AHD reported that AHD has only a minor role after decentralisation and are not getting funds for rabies control. It is the mandatory duty of LSGIs to implement rabies control through transferred institutions of AHD.Even then AHD has complemented with vaccine purchase in the last three years to improve vaccination coverage.

Fig No.6 Prophylactic Anti Rabies Vaccination in dogs (PAR) in percentage



Source- Annual Administration Reports, Animal Husbandry Department

Vaccination programme details after decentralisation have been attached as Annexure (6). Veterinary doctors, who are the implementing officers of rabies control, demanded a change in the vaccination strategy. According to them the programme should become a compulsory social welfare programme under decentralisation or other wise as a statewide programme under AHD to increase the scale of coverage and for better monitoring. Panchayat (LSGI) authorities who participated also desired to have it as a compulsory programme with monitoring from government. Poor participation of elected members and pet owners were said to be important hindrances in the implementation according to veterinary doctors. The veterinary doctors felt that the AHD was not giving adequate importance to veterinary public health programmes. A policy maker of LSGD also supported that vaccination of domestic dog is a possible intervention and not considered seriously. It is not the cost of vaccination but a system to ensure the service at the owners' convenience is the important. According to him motivation of LSGI to take up programmes will work better than compulsory programmes.

3.1.5 Status of slaughter houses and solid waste disposal

All other stakeholders felt that it is the responsibility of LSGIs to enforce licensing of slaughter houses and solid waste management, which they were not doing properly. Though funds were available for construction of waste treatment plants and modernization of slaughter houses, LSGIs found it difficult to locate suitable places for treatment plants due to public resistance. State Pollution Control Board (SPCB), which is responsible for enforcement of provisions of Water Act and supervision of the Municipal Solid wastes (management and handling) Rules 2000 admitted that efforts for solid waste disposal had been strengthened only after the arrival of epidemics like Chikungunea and Dengue. Only waste collection and dumping happens and no waste treatment now.

According to SPCB, around 15-20 slaughterhouses in the state have the bare minimum facilities for waste disposal. Though they had closed those not having any waste disposal facilities, no shortage of meat could be noticed in such areas, pointing to the illegal slaughter sector in the state. They charged that some LSGI authorities themselves facilitate the illegal slaughtering.

> *For getting a piece of meat with LSGI's seal, butchers go to slaughter house and balance they do it in their premises. In some areas, authorities from local body travel with the seal and do the sealing wherever slaughter happens."*
>
> - Official from State Pollution Control Board

3.1.6 Legal framework and enforcement

a. Review of existing legal framework

Kerala does not have a single comprehensive rabies control policy but a battery of central and state government acts, rules, government regulations, court orders etc connected to

rabies control and implemented through different agencies like LSGD, AHD, Health Services department and SPCB for achieving different goals. Documents that could be identified with rabies control were compiled and attached as Annexure (7).

Most important legal frameworks directly/indirectly assisting rabies controls are

- The Kerala Municipality Act 1994
- The Kerala Panchayat Raj (licensing pigs and to dogs) Rules, 1998
- Animal Birth Control (dogs) Rules, 2001(under Section 38(1) of PCA Act 1964)
- Decentralisation and transfer of institutions, programmes and responsibilities of Government to Local Self Governments
- Decentralised planning-Guidelines for 10^{th} five year plan for LSGIs-for rabies control projects
- The Kerala Panchayat Raj (Slaughter Houses and Meat stalls) Rules, 1996
- The Municipal Solid wastes (management and handling) Rules, 2000 under Environment (Protection) Act 1986

According to the provisions of these Acts/rules/guidelines, licensing of dogs, destruction/population control of stray dogs, fine to defaulters, licensing of slaughter houses and solid waste management are to be implemented by LSGIs. SPCB also supervises solid waste management under the Municipal solid wastes (management and handling) Rules, 2000 under Environment (Protection) Act and The Water (Prevention & Control of Pollution) Act 1974. Later on, Animal Birth Control (dogs) Rules, 2001 authorizes Local Authorities to sterilize, vaccinate and release stray dogs into its habitat instead of killing. But after the introduction of this rule there were several court orders for and against killing of stray dogs on the merits of human and animal welfare. But latest court orders in 2006

directed to give priority for human welfare than that of stray dogs. After that some LSGIs have slowly resumed stray dog killing. Even now, the availability of persons willing to be trained as dogcatchers is a major hurdle either to catch for killing or sterilization.

All stakeholders pointed out the absence of active machinery for enforcement of existing laws. A policy maker of Animal Husbandry insisted a comprehensive enforcement of these rules since many important activities are at high risk including meat sector. He said that possible collaboration would be decided in discussion with LSGD. Awareness regarding the different legal provisions amongst the local authorities was also in doubt, according to some stakeholders.

A rural panchayat authority said that the rule of compulsory licensing of domesticated dogs has never been considered seriously and suspected whether a single dog has been licensed in any of the panchayats. The panchayat authorities opted for a compulsory programme with monitoring for better results.

> *"Though we speak about decentralised planning, most of the programmes go as per the directions from top. Now compulsory provisions have to be made for programmes like for Akshaya, EMS bhavana nirmana padhathi etc. Since they are having clear guidelines and co-ordination, will work everywhere. Rabies control also should come as a compulsory programme as it is a common problem"*
>
> - Policy maker of a Grama Panchayat

At the same time, a policy maker of LSGD remarked that many panchayats resist compulsory programmes for freedom to select their priorities. He also pointed out that the licensing of dogs has never been enforced as a compulsory one. Non-availability of actual database of total dogs though census is being taken by AHD and absence of inspection regime with insufficient staff to fine the defaulters were cited as the reasons. The veterinary

doctors had difficulties with the existing guidelines (issued by State Planning Board) for programme implementation. The major difficulty is with the APL/BPL criteria in programme implementation Absence of provisions for licensing and stray dog control were other deficits pointed out by the veterinarians.

3.1.7 Reasons for the low priority in control

A middle level officer of Health Department raised doubt whether the higher authorities are informed about the depth of this problem (increasing PEPs), as there is no mechanism to measure the actual magnitude of this problem now. A senior bureaucrat of the Health Dept also felt that control of rabies is not seriously considered here though it calls for priority for control. Since morbidity and mortality are the two criteria considered for disease surveillance and control, rabies does not get priority. Increased awareness about PEP could decrease mortality considerably. Economic impact on cost of treatment has not been considered as criterion for control. The influence of social status of the affected and public and media attention were also cited important in decision making for control measures. Lack of need-based programmes formulated locally was another reason raised for low priority by a PHC doctor.

Rabies is causing problem in domestic animals causing economic loss but AHD gives priority to the production sector and associated disease control programmes and now it is LSGI‘s duty to undertake rabies control under decentralised planning. However the senior bureaucrat of AHD asserted that the department would take lead role for animal control once the state government starts a comprehensive control programme. Paradoxically, a policy maker of LSGD confirmed that neither he nor his colleagues had been informed that Rabies was considered an alarming problem either in animals or man by AHD or Health department.

"There was no articulated demand either from Animal Husbandry or Public Health Department projecting it as a major problem for Government to respond".

-A policy maker of LSGD

A policy maker of AHD commented that rabies control cannot be implemented as a compulsory government programme but should arrive as a public need, as their support is crucial for the success of any government programme. But a political leader and elected representative consider the negligence is just because it is not the problem of any enforcing/implementing officer.

"Problems like water shortage, electricity failure, waste disposal etc get priority. But dog bites are not the direct problems of all members of community or implementing officers and so not getting priority, but it is a problem of poor people. So it should be considered with top priority considering its impact on public expenditure and nuisance for the public"

- Elected representative of LSGI

Absence of state level initiative for control was cited as an important reason by a panchayat authority. A AWO representative blamed that public health experts do not conceive rabies control in animals as a public health intervention. Implementing officers of AHD remarked that no co-ordination exists with Health Department at present. A middle level bureaucrat of Urban Development has mentioned that government priority on policy making and implementation was always based on public demand and lobbying. There is no lobbying for rabies control. A policy maker of LSGD also cited this as an important element in low prioritizing of rabies control. Excepting few Animal Welfare Organisations, demand is for killing of stray dogs, but which is not possible always under legal frameworks.

3.1.8 Gaps and needs identified from the stakeholder analysis

a. Major gaps identified in rabies control

- Deficiency of funds with sectors other than LSGD/LSGIs
- Absence of articulated demands from AHD/Health
- Absence of advocacy groups from public health or animal protection groups
- Non availability of PEP below Taluk hospitals
- CMEs/refresher training to doctors and nurses
- Absence of terminal care facility in all districts
- Poor surveillance system
- Absence of effective animal control to reduce treatment cost in human
- Dual agency involvement in canine vaccination programme
- Difficulty to get dog catchers
- Untrained dog catchers and cruel methods of dog killing
- Nominal remuneration for dog catchers and no efforts taken to correct it
- Lack of inter sectoral co-ordination
- Absence of clarity on roles and responsibilities among stakeholders
- Lack of interest among elected leaders and public
- No enforcement of required legal statutes
- Weak interventions in solid waste management and slaughter house licensing
- Absence of regional access to diagnostic laboratory under AHD
- Vacancies of doctors and veterinary doctors under Urban Affairs Department

b. Needs identified for rabies control

- Integrated policy
- Comprehensive and sustainable animal control programme
- Resource pooling/prioritised allocation

- Decentralisation of PEP and referral only those PEPs require serum treatment
- Training of health staff and better surveillance in Health sector
- Co-ordination of Health, Animal Husbandry and LSGD
- Better strategies to get persons willing to be trained as dog catchers
- Promote adoption/sheltering of sterilised dogs and not to release back to streets
- Compulsory programmes under LSGIs / state wide programme under AHD
- Government level initiative and monitoring
- Awareness and motivation of local leaders to take local initiatives
- AWOs to with holistic approach in rabies control
- First aid education, a part of School health programme/curriculum
- One diagnostic laboratory per district under AHD & free testing or at a subsidized rate
- Technical monitoring and evaluation by AHD in animal control

Table No.7 SUMMARY OF STAKEHOLDER ANALYSIS

	THEMES	HEALTH SECTOR	ANIMAL HUSBANDRY	LOCAL SELF GOVERNMENT
1	**As a public health problem**	Important	Important	Important
2	**Role in control programme**	Only minor role- PEP and management of rabies patients	Only a small role after decentralisation	Mandatory duty- implementation through transferred staff
3	**Interest in control**	AHD & LSGD to act	When active control programme comes, AHD will take lead role in animal control	No articulated demand either from AHD or Health
4	**Low priority**	Not come as epidemics, low mortality rate, problem of low socio-economic group	Not a compulsory programme in LSGIs AHD not giving priority VPH activities	No demand, no advocacy groups
5	**Public spending**	Average 10-15 crores for PEP	20-30 lakhs for vaccine	Data not readily available
6	**Need for control**	To be controlled as huge health expenditure & most fatal disease	Prevalence in animals high, animal control is needed	No impediments for control (state level) no state level initiative (LSGIs)
7	**Stray dog control**	To be done by possible means	Dept will support to LSGIs for ABC programme	Demand is for killing, difficulty to get dog catchers, wasteful spending on sterilization, contradictory court orders
8	**Strategies suggested**	Effective and sustainable control programme in place	Resource pooling and a joint programme of all the 3 sectors	Arrange trained vaccinators for timely vaccination to dog owners
9	**Resource challenge**	No ear marked funds	No allotment for the department	Funds not a problem
10	**About the programme**	Should be effective	State wide programme /as compulsory under LSGIs	Not as compulsory, but to motivate LSGIs to take control programme /different profile depending on the severity of problem
11	**Need for policy change**	Need a comprehensive and integrated policy	Comprehensive programme, modified guidelines as a social welfare programme	Programme with three angles-public health, animal health and local govt's angles

Section (2)

3.2 Rabies control under decentralisation

The data received in response to the proforma forwarded to Municipalities, Corporations and Veterinary hospitals in the state through the Directorate of Urban Affairs and Animal Husbandry respectively were analysed to evaluate the rabies control programme in the state implemented under decentralised planning for the last three years.

3.2.1 Scope of Rabies control under decentralisation

After the 73rd and 74th constitutional amendments in 1992, Government of Kerala had decentralised power as early as in 1996 and transferred health, educational, agricultural, animal husbandry institutions to Local Self Government Institutions for administrative and political process from bottom.[55] A good network of Health and Veterinary institutions is available in all panchayats with atleast one Veterinary Dispensary manned by a veterinary doctor and a PHC with an allopathic doctor. Risk communication of the problem to the LSGI in human or animal can elicit control measures locally. The very first objective of decentralisation was to formulate need based programme at grass root level.

3. 2.2 Guidelines issued for Rabies control

The guidelines issued after decentralisation are

GO (P) No.189/95/LSGD dated 18-9-1995- Decentralisation and transfer of institutions, programmes and responsibilities of Government to Local Self Governments

No.11783/A1/2003/Plg dated 29-9-2003- Decentralised planning-Guidelines for 10th five year plan for LSGIs on animal rabies control programmes.

As per the first guideline, stray dogs and licensing of slaughterhouses are the mandatory duty of LSGIs. Second letter contains the directives for formulating programmes for rabies control in animals under LSGIs.

3.2.3 Analysis of rabies control programmes under decentralised planning

Data from both departments were analysed separately as the activities and priorities are different in panchayats and municipalities and reporting officers were different.

Details of rabies control programme implemented through AHD institutions

Out of 1140 Veterinary hospitals all over Kerala, reports received from 340 institutions representing 340 LSGIs, mainly from Thiruvananthapuram, Pathanamthitta, Alappuzha, Kottayam, Idukki, Malappuram and partly from Ernakulam, Thrissur and Kasargod.

Table No. 8 Status of Rabies control under decentralised planning

	2005-06	**2006-07**	**2007-08**
Total no.of LSGIs	1057	1057	1057
Report received from	340	340	340
Response rate (%)	32.2	32.2	32.2
No.of LSGIs took programme	54(16)	63(19)	64(19)
Project cost -Minimum (Rs)	100	250	300
Project cost -Maximum (Rs)	25000	25000	47600
Average cost (Rs)	9237	9147	8274
Up to 5000	19(35)	22(35)	33(52)
5000-10000	17(32)	20(32)	16(25)
>10000	18(33)	21(33)	15(23)
Vaccine purchased	54(16)	40(12)	22(6)
Up to 250doses	24(45)	18(45)	12(55)
251-500 doses	18(33)	13(33)	6(27)
>500 doses	12(22)	9(22)	4(18)

(Figures in brackets are percentages)

Among the 340 LSGIs responded only 54 LSGIs (16%) took rabies control projects during 2005-06 and 63 & 64(19%) during 2006-07 and 2007-08 respectively. An average amount

provided per project was Rs 9237/-, 9147/- and Rs 8274/- respectively in the last 3 years. Vaccine purchase through LSGIs were carried out in all 54(16%)reported during 2005-06 but the number decreased to 40 and 22(6%) in the subsequent years. Annual vaccine intake by 75 percent of the LSGIs was less than 500 doses. During 2007-08, around 52 percent of LSGIs allotted only less than Rs 5000/- for the conduct of control programme. AHD supplemented with vaccine purchase to improve the vaccination coverage from 2005-06 but then LSGIs discontinued vaccine purchase.

3.2.4 Analysis of Rabies control programme under 4 Districts

The project implementation from four districts is analysed further to correlate with animal bites treated and rabies deaths in those districts.

Table No. 9 Analysis of Rabies control programme under four Districts

District	Year	Total Vety hospitals	Reports received (%)	No.of LSGI with funds provision (%)	No.of LSGIs purchased vaccine	Average Qty of vaccine (doses)	No. of LSGI did dog stray destruction	Dogs vaccinated	Animals treated	Rabies death
PTA	05-06	60	58(97)	8(14)	8	323	0	5248	223	9
	06-07			11(19)	3	425	5	15820	296	94
	07-08			16(28)	4	329	4	NA		
KTM	05-06	74	64(86)	10(16)	9	236	1	8032	442	28
	06-07			12(19)	3	121	1	18447	186	7
	07-08			21(33)	4	335	7	NA		
MLPM	05-06	108	59(55)	4(7)	4	218	1	1514	422	75
	06-07			3(5)	3	223	1	4279	651	61
	07-08			1(2)	0	0	4	NA		
TVPM	05-06	97	46(47)	14(30)	18	504	1	8829	408	27
	06-07			22(48)	24	460	2	18385	645	91
	07-08			6(13)	8	287	5	NA		

(TVPM-Thiruvananthapuram, MLPM-Malappuarm, KTM-Kottayam,PTA-Pathanamthitta)

Among the four districts, animal bites treated and rabies deaths are significantly large in all 4 districts. When the control programmes were examined, more LSGIs (30% & 48%) in Thiruvananthapuram allotted funds and purchased vaccine during 2005-06 and 2006-07. But during 2007-08, only 6 LSGIs allotted funds probably due to the provision of vaccine from AHD. Less than 20 percent of LSGIs had taken rabies control projects in Kottayam and Pathanamthitta in the first two years. But more LSGIs in these districts allotted funds (for the conduct of vaccination with vaccine from AHD) in the last year. Malappuram had programme only in 3-4 institutions out of 55 reported. Animal bites and rabies deaths more in the district.

Media analysis indicated that during April first week (6th April 2008), 57 bite victims from different parts of Kottayam district were brought to Medical College for PEP and it was pointed out that stray dog menace is intense but no trained dog catchers available for killing. On 7th April, leading daily's editorial urged the Government to do the state responsibility with compulsory rabies control programmes, as safety to life is a fundamental right of people. But when analyse the programme implementation in the district, it is clear that out of 64 responded, only 10,12,and 22 LSGIs had made provision for Rabies control in the last three years. Vaccination coverage between 2005-06 & 2006-07 in all the four districts indicates the difference between the programme under LSGIs and vaccine supplied from AHD.

3.2.5 Result of survey among veterinary doctors about the reasons for not taking programme

A survey questionnaire part was included along with the proforma to understand the major reasons for not having an effective control programme in the LSGI.Eight reasons were listed with option to write any other reasons. Response from the veterinary doctors is as follows

Table No.10. Reasons for not having an effective control programme in your LSGI

Reasons	Pathanamthitta (n=58)	Kottayam (n=64)	Idukki (n=52)	Malappuram (n=59)	Alappuzha (n=31)	Thrissur (n=14)	Kozhikkode (n=51)	Kasargod (n=13)	Trivandrum (n=46)	TOTAL (n=388)
Not a problem in the area	13	12	17	14	6	3	11	1	15	92
Lack of proper planning	8	4	11	21	1	8	26	3	1	83
Lack of proper funding	17	10	18	23	6	10	31	6	6	127
Lack of political will	10	7	15	13	8	6	31	4	10	104
Lack of expertise and human resource	10	8	11	13	6	7	19	7	4	85
Lack of adequate community participation	23	20	32	25	6	10	43	8	16	183
Lack of adequate inter sectoral co-ordination	11	1	7	8	3	6	19	1	2	58
Lack of awareness	20	9	24	28	4	4	42	4	3	138

Source: Collected from Veterinary doctors through AHD

Major reason quoted was lack of adequate community participation (183), followed by lack of awareness (138), lack of proper funding (127), lack of political will (104), not a problem in the area (92), lack of expertise and human resource (85), lack of proper planning (83), and lack of adequate intersectoral co-ordination (58).

3.2.6 Analysis of rabies control under Municipalities and Corporations

Details of rabies control in Municipalities and Corporations were collected by forwarding a proforma through Directorate of Urban Affairs.

Table No. 11 Rabies control under Municipalities and Corporations

Sl.no		2005-06	2006-07	2007-08
1	Total Nos of LSGI with fund provision Rabies control	15(58%)	18(69%)	24(92%)
2	Total amount spent (Rs)	187287	355675	585,483
3	Average amount per LSGI (Rs)	12485	19760	24,395
4	Stray dogs killed &(no.of LSGI)	7163(11)	16343(16)	28599(22)
5	Av; no of dogs killed per LSGI	478	908	1192
6	LSGIs purchased vaccine for dogs	5	4	2
7	Av.qty purchased (doses)	266	420	800
8	LSGIs with ABC programme	1	1	1
9	Total dogs licensed	350(1 Mc)	0	0
10	LSGIs with licensed SHs & solid waste disposal facilities	11 out of 26		

Source: reports received through Directorate of Urban Affairs

Out of the total 53 municipalities and 5 corporations, details received from 25 municipalities and one corporation. During 2005-06, 58 percent LSGIs allotted funds and average comes to Rs 12485/-per municipality and which was mainly used for stray dog elimination. Conducted vaccination programme in 5 LSGIs, ABC in one LSGI, in a small way in 2005-06 and licensing of dogs in one municipality. There is a gradual increase in the number of dogs killed from 478 to 908 and 1192/year /LSGI in the three years analysed and the number of LSGIs took killing of stray dogs increased from 11 to 16 and 22. Number of LSGIs with vaccination programmes decreased from 5(2005-06) to 4 and just 2 in 2007-08.It may be due to AHD vaccine purchase.

Section 3:

3.3 Epidemiology of animal bites in Thiruvananthapuram during 2008

Epidemiology of animal bites among the bite victims undergone PEP at General Hospital, Thiruvananthapuram February to April 2008 is analysed here. Total number of fresh PEPs were 549 (February), 637(March), 831(April) and total 2017. Available details of 2005 bite victims were collected from the Issue registers of vaccine and serum during the period. Only fresh PEPs attending daily for the first dose of PEP is considered. There was no information on bite history, details of completion of treatment etc as the source of data is issue register of vaccine and serum.

3.3.1 Results of data analysis

Table No.12 Demographic and epidemiologic profile of PEP

Demographic Profile of bite victims (n=2005)			
Gender		Number	Percentage
	Male	1184	59.1
	Female	820	40.9
Urban/Rural Status	Urban	571	29.9
	Rural	1337	70.1
Age (yrs)	Median age	Minimum	Maximum
	30	1	92
Agegroup (yrs)	1-15	593	29.6
	16-45	911	45.4
	>45	501	25.0
Epidemiology of animal bites			
Biting animal	Dog	1702	91.1
	Cat	130	7.0
	Others	36	1.9
Vaccine supply	Hospital	1843	91.9
	Own	162	8.1
Serum Treatment	Yes	438	21.8
	No	1567	78.2

Serum supply	Hospital	310	72.4
	Own	118	27.6
Allergy to ARS	Yes	36	8.22
	No	402	91.78

Source: PEP details from General Hospital, Thiruvananthapuram

The median age of bite victims was 30 and range is 91years. Among the bite victims 60 percent were male and 70 percent of total belong to the rural areas of Thiruvananthapuram district. Males have more exposures both in urban /rural settings and in all age groups. About 30 percent belongs to less than 15 age group and another 45 percent in 16- 45 yrs group, the productive age groups. 91 percent of the total PEP attributed to dog bites and 7 percent to cats bite/scratches. More dog bites to males but cat bites/scratches more in females (78/130). Other biting animals (1.9%) were wild rat, goat, monkey and tiger. Among the 2005 bite victims given PEP, 438(21.8%) were given serum treatment with Equine Rabies Immuno Globulin (ERIG) also, but 36(8.22%) showed allergic symptoms and referred to Medical College for Human Rabies Immuno Globulin (HRIG) treatment. Serum intake as well as allergic reactions were more among 1-15 yrs age group as they usually get more high risk bites, followed by the > 45 yrs agegroup. During this period, vaccine from the hospital supply (free) was given to 91.2 percent patients and serum (ERIG) to 72.4 percent victims.

Table 13.Bite victims from same place & same day, who took PEP during the three months (February-May 2008)

No.of persons attended together	2	3	4	5	6	7	8	9	11
No.of times this had occurred in the last three months	30	17	17	4	3	1	3	3	1

Source-General Hospital ,Thiruvananthapuram

This type of bites could be an indication of bites from rabid dogs or aggressive stray dogs.

3.4 DISCUSSION

Though identified as an important public health problem causing economic burden to both government and bite victims, data on the actual magnitude of rabies is not available in Kerala. This in turn results in an underestimation of the problem. Health Services department spent up to Rs 11.5 crores for the vaccine purchases for PEP in 2006-07, and yet the vaccine was inadequate to treat BPL bite victims. Government policy is to give first dose free to all considering its medical emergency. During the analysis it was noticed that almost all bite victims from entire Thiruvananthapuram district reach General Hospital or Medical College for the first dose. Since continous availability is not ensured at Taluk hospitals, doctors refer directly to the above higher hospitals. The rural poor, those who cannot afford the transportation charges for atleast two persons and wage loss for three days in the first week, may delay or avoid treatment or opt for alternate medicine. Some of them eventually surrender to death.

The details of deaths reported in the rabies cell of GH, Thiruvananthapuram showed that 25 patients came from Thiruvananthapuram (11), Kollam (11), Pathanamthitta (1) and Kanyakumari district (2) of Tamil Nadu had died during the last three years. For giving palliative care and also to ensure the safety of caretakers, the patients would be put in isolation ward/rabies cell. But the above data shows that the cell is not available in all the districts. Atleast one centre should provide this facility though number of rabies patients is less compared to other diseases. In the above 25 deaths, maximum numbers of deaths were reported in the 20-39 age group. This indicates the vulnerability as well as lack of awareness among youth. One of the bite victims interviewed at GH, Thiruvananthapuram and who have come from the territory of a Taluk hospital, was not aware about the availability of PEP at

the Taluk hospital. Knowledge about first aid was also not uniform among the six bite victims interviewed. Shortage of health staff at the hospital did not allow expected counseling for the bite victims. Distribution of IEC materials on rabies among the bite victims is highly recommended.

FINAL SUFFERINGS OF A RABIES PATIENT

Sri. S (55 years) was from the outskirts of a neighboring district. He was an alcoholic and admitted to a nearby private hospital with symptoms of fever. When he developed alcohol withdrawal symptoms and delirium, he was referred to the District Hospital, where he started showing symptoms of hydrophobia. He or his relatives could remember no known history of animal bite. His sons think he might have ignored, as he is an alcoholic addict. Sri.S believed somebody did black magic to him in water. Again he was referred to Medical College in the adjacent district for confirmation. After confirmation, he was once again referred to the rabies cell of District Hospital in that district.

Inside the rabies cell, the patient was seen under sedation but with respiratory distress. The cool tiled platform, on which he was lying down, was the only comfort available in the cell. After all he was going to die within one or two days! The patient was like an exhibit for other patients and bystanders in the hospital campus .It was tragic to see the helplessness of his sons while others rushed to see their father in the cell. This could be the story of all those who develop rabies. Almost all who died inside the cell are from rural areas and are poor voiceless people.

The epidemiological study also brought out the importance of vaccine availability in rural setting considering the possible absenteeism in school (30%), work place (45 percent bite victims between 16-45 years agegroup) and the related financial loss to bite victims and government. Inclusion of first aid management in school health programme should be an

important activity. Using suitable IEC materials through school health programmes, vulnerability among children could be reduced and children could also be used as agents of change as tried in other programmes. (Doctor/Teachers →child→family→community)

Usage of RIG in the WHO sponsored multicentric study during 2004 was 2.1 percent but the data of Thiruvananthapuram shows that 22 percent of bite victims were given serum treatment (ERIG). This is good, as half of the bites are category III-high risk bites requiring serum treatment. The bite data from GH, Thiruvananthapuram revealed that annually around 7000-8500 PEPs were treated. Cost of biologicals required for a day range from 15,000-20,000/-Details of PEPs was not collected and compiled by the Health department. This information is important not for case management alone, but for identifying high-risk population, for proper planning and implementation of control programmes and for targeting IEC activities. By identifying the high-risk areas, limited biologicals could be appropriately distributed. This base line data would also help to assess the impact of animal control programmes.

Absence of ear marked funds as in Polio control was cited as the major reason for low priority in control measures including disease surveillance and training of health staff in Health sector. But a National rabies control programme has not been started in India. In the absence of national programme, the state government needs to allocate more funds for prioritized activities

Introduction of IDRV atleast in major centres could save a good amount of costly biologicals. But again training of health staff is crucial in IDRV treatment regime. Funds should not be limiting factor in surveillance and training as it could be met through the existing training and reporting system. Statistics available about animal rabies revealed that the problem is increasing among animals. Animals treated for dog bites had increased more than double within the last four years from 2002-03. This is a clear indication of increased risk to humans also. Comparable statistics in humans are not available. Number of LSGIs taking rabies control projects is decreasing for the last three years.

The vaccination coverage in the state was below 10 percent till 2005-06 and increased upto 18 percent in 2006-07 with the intervention of AHD with vaccine purchase but proportionate increase could not be found on total vaccination numbers. Usage of the vaccine for post bite treatment could be a possible explanation. Lack of awareness and lack of public participation were reported as the two important reasons for ineffective programmes. Strategies should be changed to make the programme client friendly. Awareness on dreaded rabies could be used as an incentive for vaccination of pets.

National rabies control programme: -Government of India has just started a pilot project on PEP improvement, launched in March 2008 in five Indian cities- Delhi, Ahmedabad, Bangalore, Madurai and Pune.There is a small veterinary component for strengthening diagnostic laboratory for disease diagnosis also. It is difficult to foresee major change in the rabies control in the near future as nothing planned and systematic happens towards rabies control.(Personal interview with Dr.M.K.Sudarshan, Member, WHO expert consultation on rabies).

Laboratory finding of animal rabies diagnosis also confirmed the necessity of control programme concentrating on dogs. More samples were from dogs and 53 percent samples tested were positive for rabies. Majority of those dogs (90 percent) were not protected by vaccination. But regional access for the testing facility is not available at present. Laboratory surveillance is an essential component in rabies control programme and indicates the necessity of more diagnostic laboratories in the state with regional access to public. Fee for testing a sample also need to be reduced to induce the public to send more samples. .

Stray dog control was stopped almost fully at one stage with the contradictory court orders and interventions of AWOs. Priority of the LSGIs also changed gradually. The difficulty in getting dogcatchers resulted in the inaction in stray dog management by LSGIs. But the rate fixed was just Rs 20/- for catching, killing and disposal, cost of drug/poison. Better strategies need to be developed for getting persons, as seen in the succesful Thiruvananthapuram Corporation campaign. Their programme can be copied by other LSGIs as it is designed as a comprehensive control programme by an LSGI. But due to some management problems the project could not be successful as anticipated in the initial phase.

Suraksha-Integrated Rabies Control Programme by the Thiruvananthapuram Corporation

Thiruvananthapuram Corporation council had taken a decision to conduct a comprehensive rabies control programme to make the capital city free from stray dogs and rabies threat. Solid waste removal programme was also started. Support from top officials of Animal Husbandry, media, Residents Associations was ensured. The components of the programme were 1) vaccination and licensing of domesticated dogs with health card and brass badge for identification 2) ABC programme for stray & community dogs 3) humane killing of diseased dogs.4) inpatient treatment and dog hostel facility at one veterinary hospital 6) Adoption facility of sterilized and vaccinated dogs for public. Fee for vaccination, licensing and identification badge etc were decided with APL/BPL norms (Rs 50/- and Rs 25/-). The corporation also fixed fees for inpatient and dog hostel facilities.

Innovative part of the programme was the selection of veterinary volunteers in an entrepreneur mode. Around 25 young men had volunteered and were given one week in-house training plus special training on dog catching, pet care. A special government order was obtained for giving enhanced remuneration for catching dogs for ABC surgeries. Required infrastructures like operation theatre with equipments and medicines, kennels, vehicle for transportation of dogs, laparoscope, ambulance were arranged. Vaccination and licensing conducted together through the transferred veterinary hospitals in the Corporation

Though well supported and with no dearth of funds, the programme was not as successful as anticipated. The project could not be institutionalized since the officers did not own the programme in good spirit. Consensus with AWOs could not be ascertained. Residents Associations were not supportive with ABC programme as in vaccination. The programme was not arranged in a phased manner to increase the probability of success. However the Corporation authorities are optimistic about making the programme workable shortly.

Slaughterhouse modernization and solid waste treatment plants need to be installed through consultancies having technology and management expertise, as there is no financial hurdle for these activities with the government.

For rabies control in Kerala, a number of central and state acts, rules, government guidelines, court orders are implemented through different departments. There was no clarity on roles and responsibilities among the different stakeholders. Consensus on strategies also could not be found between the stakeholders. Though all stakeholders identified animal bites and rabies threats as important public health problem to be controlled, there was no ownership for the control initiative. Intersectoral co-ordination was anticipated in decentralised planning, but that did not reflected in rabies control programmes.

Hence a comprehensive rabies control policy based on the existing legal framework would help to improve control measures. Difficulties in achieving the goal with multi stakeholder participation are to be better addressed through legal support and inter ministerial/departmental monitoring committee. Lack of articulated demand and advocacy were identified as reasons for low priority. However, government should not neglect the social and public health importance of this problem.

CHAPTER 4

CONCLUSIONS AND POLICY RECOMMENDATIONS

4.1 CONCLUSIONS

i. All stakeholders individually identify dog bites and rabies threat as an important public health problem to be controlled in the state, but no single stakeholder owned the responsibility for control initiatives.

ii. Though a huge amount of health fund is expended for post bite treatment, disease surveillance and preventive measures are weak. Actual magnitude of the problem is not clear.

iii. Decentralisation of treatment is not considered an option in Health Services department. Though PEP is provided up to taluk hospitals, continous supply (to BPL bite victims) is ensured almost in District Hospitals only. Availability, accessibility and affordability were not adequate. According to experts, decentralisation of PEP is possible and only those necessitating serum need be referred to higher hospitals.

iv. Training of doctors in risk assessment and management will help to avoid unnecessary PEPs also. Refresher training to doctors with the help of Medical College faculty is a possible activity without earmarked funds.

v. Facility for terminal care of rabies patients is not available in all districts. Though effective treatment is not available, these patients have to travel long distances to get admission in to the cell.

vi. Rabies control is the mandatory duty of Local Self Government Institutions. However there is no compulsory enforcement of rules or priority given for the programme,

only interested LSGIs/ veterinary doctors take programmes through veterinary institutions under them. So the programme is not effective.

vii. There were no technical monitoring and evaluation after decentralisation.

viii. Implementing officers prefer a compulsory programme with centralized vaccine purchase from one source or an annual rate contract to improve vaccination coverage.

ix. LSGIs do not have much control over transferred staff. Reluctance of bureaucracy to accept political directions could be one reason. There is an inclination among implementing officers to avoid programmes that are not compulsory to avoid further penalties on procedural errors. Bureaucratic hurdles were evident in the implementation of Rabies control programme by the Thiruvananthapuram Corporation also.

x. Inefficient participation of local leaders results in poor public participation.

xi. Contradictory court orders and interference of AWOs changed the LSGIs'priority on stray dog control. ABC was not considered an easy and practical option instead a wasteful spending on unwanted animals. Though public demand is for dog killing, this results in a negative image of the state and tourism sector may be affected

xii. Weak interventions to control the multiplication of stray dog propagation. Slaughterhouses and solid waste management were not functioning to the required levels.

xiii. No inter sectoral co-ordination and no consensus among the stakeholders on the strategies.

xiv. Absence of advocacy groups for control programme

4.2 SCOPE FOR AN EFFECTIVE RABIES CONTROL PROGRAMME IN KERALA

Some veterinary doctors by their active involvement had showcased success models at local level in Kerala too - in Ponnani municipality of Malappuram, Peringom-Vayakkara Panchayat in Kannur, Perumpalam in Alappuzha etc by the joint efforts of Animal Husbandry Department, Veterinary Associations, Local Body, NGOs etc during late 90's through vaccination and stray dog destruction.

Government of Kerala had decentralised powers by 1996 and issued detailed guidelines to LSGIs for rabies control programme during 2003.But the guidelines were neither comprehensive nor compulsory. Now it runs almost like a small programme of interested veterinary doctors/LSGIs. Advantages of decentralisation have not been used effectively in rabies control. With the status of an optional programme under decentralised planning, it is not possible to achieve the goal; rather it might have aggravated the problem. Strict enforcement and monitoring of licensing of dog rules were never tried in the state to promote responsible ownership of dogs. All the stakeholders have a consensus about the requirement of an effective control programme but are confused as to who should take the initiate and project the problem before policy makers. Difference also exists at present about the strategy for stray dog control: whether to kill or sterilize and release.

Success stories of developing countries like Thailand and Srilanka in rabies control is replicable in Kerala also. Kerala's achievement in health and education is always depicted even in the global scenario. Advantages of high literacy and decentralised planning should be better utilised for controlling this public health menace, literally a disgrace to a civilized society. With strong government policy decision for control and with concerted efforts of all

stakeholders, it is possible to implement a sound rabies control programme in Kerala through the wide network of decentralised institutions, as it is already under implementation in small scale.

4.3 POLICY RECOMMENDATIONS

i. Constitute an inter ministerial/departmental task force of major sectors to ensure inter sectoral co-operation and a state level co-ordination committee with all important stakeholders to frame policy, to make a programme with good strategies and for better high level monitoring and evaluation.

ii. Frame a single comprehensive policy guideline comprising all legal frameworks related to rabies control. Roles and responsibility of each stakeholder to be stated clear.

iii. Disease surveillance system should be strengthened both in Health and AHD for benefiting data for proper planning and impact assessment of animal control programme.

iv. Prepare action plan for a statewide rabies control programme for a minimum period of 5 years through a multisectoral task force constituted. Strategies should be decided in consensus.

v. Next phase for awareness programmes and publicity campaigns covering the entire state as in Pulse Polio programme. Awareness and motivation of elected leaders are to be done. Health education should be taken as an important long-term preventive programme. School health programme/campaign through children, be a strong tool for filtering the message of vaccination and licensing for responsible dog ownership, first aid and post exposure treatment.

vi. Should start with compulsory vaccination programme with licensing of all domesticated dogs .It can be implemented in the pattern of NDDB assisted ADCP vaccination programme implemented by AHD for Foot and Mouth Disease control. Rabies vaccination can be a two-week programme, in the same period every year with atleast 70 percent vaccination of dogs within a month as the ideal target. Identification of vaccinated dogs also to be ensured through badge/collar. AHD can be entrusted with the implementation through LSGIs with uniform guidelines. Can entrust veterinary officers of the transferred institutions to issue licenses acting as ex-officio secretary to the LSGIs with monitoring from both LSGI and AHD. Pilot the programme in one district or a few LSGIs in different districts.

vii. Increase laboratory facilities under AHD at least in four regions, as it is important to establish the rabies transmission status. Testing should be free or subsidized to encourage testing animal samples.

viii. Stray dog control may be taken in the next phase. Humane killing of diseased dogs should be done by trained dog catchers. For the selection of dogcatchers, strategy of Thiruvananthapuram Corporation is replicable with suitable modifications.

ix. Animal Birth Control/Anti Rabic vaccination (ABC/AR) programme of accessible stray/community dogs can be taken up by constituting district mobile surgery squads under AHD and perform with the help of LSGIs, transferred veterinary institutions, local NGO/AWO etc. Priority should be given to public places, school/college/office campuses, tourism destination etc. Oral vaccination can be an easy strategy to protect strays, once Government of India accords permission.

x. Training of doctors for PEP management should be done.

xi. Decentralize human PEP at least up to Community Health Centre to increase availability and accessibility to rural poor with immediate effect.

xii. Adopt IDRV in major PEP centres. This results in cost savings which can make vaccine treatment and serum treatment fully free

xiii. Terminal care facility for the care of confirmed rabies patients in at least one centre in each district (District Hospitals/Medical Colleges).

xiv. Information exchange between major stakeholders of rabies control

xv. Posting of doctors and veterinary doctors in Urban development department in the existing vacancies to monitor public health programmes through LSGIs

4.4 STRENGTHS OF THE STUDY

- Principal investigator has worked for a long time in one of the government departments. This facilitated access and acceptance to policy makers/officials.
- This is possibly one of the first studies on rabies control and the rabies situation to emerge from the state.

4.5 LIMITATIONS OF THE STUDY

- Possible interviewer bias in framing the questions and selecting the stakeholders.
- Impact of rabies control under decentralised planning was assessed based on the reports received with in a stipulated time and not representative samples of all districts. However the districts analysed have regional representation of the state.

- Regional problems, if any could not be captured through the interviews, as apart from the stakeholders at state level and regional levels, stakeholders from local level from Thiruvananthapuram only were included.
- As AHD intervened with vaccine purchase during the last three years, exact pattern of vaccination programme under decentralised planning could not be ascertained.

REFERENCES

1. World Health Organization. Human and animal rabies. Available from: http://www.who.int/rabies/en. (accessed 16 Jan 2008).
2. World Health Organization. Strategies for the control and elimination of Rabies in Asia. Report of a WHO Interregional consultation, Geneva, Switzerland,17-21July2001.Availablefromhttp://www.who.int/rabies/en/strategies_for_the_control_and_elimination_of_rabies_in_Asia pdf. (accessed 16 Jan2008).
3. World Health Organization. WHO Expert Consultation on Rabies 2005. First report: WHO technical report series #931.WHO Press, Geneva: 2005; 2-4.
4. Rupprecht CE.A Tale of Two Worlds: Public Health Management Decisions in Human Rabies Prevention-Editorial. Clin Infect Dis 2004; 39:281–83.
5. World Health Organization, South East Asia. Report of the Workshop on Rabies Elimination in South East Asia, Colombo, Srilanka.10-12 November 2005.Availablefrom:http://www.searo.who.int/LinkFiles/BCT_Reports_HLM-389.pdf.(accessed 16 Jan2008).
6. WHO Global Vaccine Research Forum. Epidemiology of Rabies in Asia.December2006, Bangkok, Thailand. Available from: http://www.who.int/rabies/en.(accessed 16 Jan2008).
7. Knobel DL, Cleaveland S, Coleman G, Fevre EM, Meltzer MI, Elizabeth M, Miranda G, Shaw A, Zinsstag J, Meslin FX. Re-evaluating the burden of rabies in Africa and Asia. Bull World Health Org 2005; 83:321-400.

8. Association for Prevention and Control of Rabies in India. Assessing the burden of Rabies in India: WHO sponsored national multicentric Rabies survey 2003.Progress report. May 2004.Bangalore, India.2004;I-iii.
9. Wilde H, Fox rabies in India. Clin Infect Dis 2005; 40:614-15.
10. Pradhan HK, Gurbuxani JK, Cliquet F, Pattnaik B, Patil SS, Regnault A, Begouen H et al. New Steps in the Control of Canine Rabies in India. Powerpoint.Available from:http://www.oie.int/eng/rabies2007/files/session20%203_dogs/8_Pradhan_Meslin_dogs.ppt (accessed 16 May 2008).
11. Moran GJ, Talan DA, Mower W, Newdow et al. Appropriateness of Rabies Post exposure prophylaxis Treatment for animal exposures. JAMA 2000; 284:1001-07.
12. Wilde H, Hemachudha T, Khawplod P, Tepsumethanon V, Wacharaplusadee S, Lumleridacha B.Rabies 2007:Perspectives from Asia. Review Article. Asian Biomedicine 2007; 1:345-57.
13. Panichabhongse P.The Epidemiology of Rabies in Thailand. Thesis presented for Master of Veterinary Studies.2001, Available from: http://www.epicentre.massey.ac.nz/Portals/0/EpiCentre/Downloads/Publications/Thesis/PraneePanichabhongseMVS.pdf) (accessed 19 Jan 2008).
14. Matibag GC, Kamigaki T, Kumarasiri PVR, Wijewardana TG, Kalupahana, AW, Dissanayake DRA, De Silva DDN, Gunawardena GSPDS, Obayashi Y, Kanda K, Tamashiro H.Knowledge, Attitudes and Practices survey of Rabies in a community in Srilanka.Environ.Health Prev.Med 2007; 12:84-89

15. Wilde H, Tipkong P, Khawplod P.Economic Issues in Post exposure Rabies Treatment. Travel Med 1999; 6:238-42.
16. John TJ. Ethical issues in rabies prevention. IJME. 2000:8.
17. Takahashi-Omoe H, Omoe K, Okabe N.Regulatory system for prevention and control of Rabies, Japan, Emerg Infect.Dis.2008: 9:1-17.
18. Kosiprapa C, Wimalratna O, Chomchey P, Chareonwai S, Benjavongkulchai M, Khawplod S, Wilde H. Problems with Post exposure management: A survey of 499 Public Hospitals in Thailand. Travel Med 1998; 5:30-32.
19. Cleaveland S, Kaare M, Knobel D, Laurenson MK.Canine vaccination-providing broader benefits for disease control. Vet Microbiol. 2006; 18:16-17.
20. Validation of Rabies in the Serengeti region of Tanzania.1994. Available from: http:/www.researchintouse.com/nrk/Topic7/Controlling%20the%20threat%20of%20rabies%2... (accessed 11 Feb 2008).
21. World Health Organisation.Meetings of the Immunisation Strategic Advisory Groups of Experts, November 2007. Weekly Epidemiological Record 2008;83:
22. Hunt P. Neglected Disease: a human rights analysis. World Health Organization, Geneva. 2007.
23. Nanayakkara S, Smith MJ, Rupprecht CE.Rabies in Srilanka: splendid Isolation.
Emerg Inf Diseases 2003; 9:368-71.
24. World Health Organization -55th session of Regional Committee for South East Asia.

September 11-13,2002,Jakartha, Indonesia. Available from: http:// www.searo.who.int/meeting/rc/rc55/rc55-18b.htm (accessed on 19 Mar 2008).

25. Cleaveland S, Coleman PG, Fevre, Eric M. Estimating the public health impact of rabies. Emerg Infect Dis 2004; 10:140-42.

26. Performance Audit of Animal Birth Control (ABC) programme in Bangalore City for Bangalore Mahanagara Palike. A Report; May 2007 by the Department of community medicine, Kempagowda Institute of Medical Sciences, Bangalore.

27. World Health Organisation. Rabies Vaccines WHO Position Paper. Weekly Epidemiological Record 2007; 82:425-36.

28. Kreindel SM, McGuill M, Meltzer M, Rupprecht C, DeMaria A. The cost of rabies post exposure prophylaxis: one state's experience. Public Health Rep.1998 May-Jun;113(3): 247-251.

29. Recuenco S, Cherryand B, Eidson M. Potential cost savings with terrestrial rabies control. BMC Public Health 2007; 7:47.

30. National Human Rights Commission. Ministry of Health and Family Welfare accepts NHRC recommendation on Anti-Rabies Vaccine. August 2007. Available from: http://www. nhrc.nic.in/disparchive.(accessed 19 Mar 2008).

31. Jan Swasthya Abhiyan .New technologies in Public Health –who pays and who benefits?. National Co-ordination Committee, Jan Swasthya Abhiyan.2007.

32. National Institute of Communicable Diseases. National Guidelines for Rabies Prophylaxis and Intradermal administration of cell culture vaccines. 2007.Directorate General of Health Services, New Delhi.

33. Chaabra M, Ichhpujani RL Bhardwaj M, Tiwari KN, Panda RC, Lal.S.Safety and Immunogenicity of the intradermal Thai Red cross Post exposure vaccination regimen in the Indian population using Purified Chick Embryo Rabies Cell vaccine. Indian Journal of Medical Microbiology.2005; 23:24-8.

34. Indian Council of Medical Research (National Institute of Epidemiology). Multicentric study on the use of intradermal administration of Tissue culture antirabies vaccines in India. Available from icmr.nic.in/annual/2004-05/nie/clinical_trials.pdf.(accessed 23 May 2008).

35. National Rural Health Mission, Kerala.Workshop on developing guidelines for intradermal rabies vaccination in Kerala September 20-21,Thiruvaananthapuram. 2008.

36. Kayali U, Mindekem R, Hutton G, Ndoutamia AG ,Zinsstag J. Cost description of a pilot parenteral vaccination campaign against rabies in dogs in N'Djamena,Chad. Trop Med Int Health. 2006; 11:1058-65.

36. Cleaveland S, Fevre E M, Kaare M, Coleman PG. Estimating human Rabies mortality in the United Republic of Tanzania from dog bite injuries. Bull World Health Organ 2002; 80:4.

37. American Veterinary Medical Association. A community approach to dog bite prevention, JAVMA2001; 218:1732-49.

39.A joint OIE/WHO/EU International Conference, Towards the Elimination of Rabies in Eurasia. May 30th 2007, Paris.. Available from: http://www.oie.int/RR-Europe/eng/events/en-Agenda_rabies_2007.doc (accessed 19 Jan 2008).

40.The Gazette of India, Animal Birth Control (Dogs) Rules 2001 under the

Prevention of Cruelty to Animals Act, 1960. Ministry of Culture,Notification No 929,Newdelhi, the 24th December 2001.

41.Reece JF, Chawla SK.Control of Rabies in Jaipur, India by the sterilization and vaccination of neighbourhood dogs. Veterinary Record 2006; 159:379-83.

42. Hostrick P, Toplak I, Maganja DB et al. Control of Rabies in Slovenia. Journal of Wild life Diseases 2006; 42: 459-65.

43. Cliquet F, Gurbuxani JK, Pradhan HK, Pattnaik B, Patil SS et al. The safety and efficacy of oral rabies vaccine SAG2 in Indian stray dogs,Vaccine 2007; 25:3409-18

44. Pradhan HK, Gurbuxani JK, Cliquet F, Pattnaik B, Patil SS, Regnault A, Begouen H et al New Steps in the Control of Canine Rabies in India. Dev.Biol.2008; 131:157-66.

45.World Health Organisation.Guidance for research on oral rabies vaccine and field application of dogs against rabies. Geneva, Switzerland 2007. Available from:www.who. Int/rabies/guidelines% oral % vaccination% dogs% against rabies pdf,20vaccination. (accessed 16 Apr 2008).

46. Nadin-Davis SA, Turner G, Paul JPV, Madhusudana SN, Wandeler AI.Emergence of Arctic- like Rabies Lineage in India. Emerg Infect Dis 2007:13.

47. Bhalla S, Mehta J P, Singh A. Knowledge and Practice among General Practitioners of Jamnagar city regarding Animal Bite. Indian J Community Med 2005; 30: Available from www.indmedica.com. (accessed 6 Oct 2008).

48. Sekhon AS, Singh A, Kaur P, Gupta S. Misconceptions and Myths in the Management of Animal Bite Cases. Indian J Community Med 2002; 27: 9-11.

49.Kato M, Yamamoto H, Inukai Y,Kira S. Survey of the stray dog population and health education programme on the prevention of dog bites and dog acquired infections-a comparative study in Nepal and Okayama, Acta Med.Okayama.2003; 57:261-66.

50.Meslin FX.Rabies as a traveler's risk, especially in high endemicity areas. Travel Med 2005; 12:S 30-S40.

51.Ruhe MC, Stakeholder Analysis in Health Services Management Available from www.case.edu/med/epidbio/mphp439/Stakeholder_Analysis.htm (accessed 20 Oct 2008).

52.Schmeer K.Guidelines for conducting a Stakeholder Analysis. Health Reforms Tools Series. November 1999. Abt Associates Inc.Available from URL:http://www.phrplus.org/pubs/hts3.pdf. (accessed 23 Jun 2008).

53.Rice PL, Ezzy D.Qualitative Research Methods, A health Focus. Oxford University Press.Australia.1999.

54.Majchrzak A. Methods for policy research. SAGE Publications, New Delhi. 1987.

55.Narayana D, HariKurup KK.Decentralisation of Health care Sector in Kerala: some Issues. Working paper 298.Centre for Development Studies, Thiruvananthapuram. January 2000.

ANNEXURE 1

Informed consent for In-depth Interviews with Policy Makers/ Bureaucrats related to Rabies Control

I am Dr.S.S.Rani, MPH Scholar from the Acutha Menon Centre for Health Science Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum and am conducting a study on the 'Challenges in the Rabies control in Kerala. Aim of this study is to find out the major reasons for the Rabies threat and the barriers in implementing an effective Rabies control programme in the state. I would be doing this study as a policy analysis to know why dog bites and scare of Rabies remain as a major threat to public. You are one of the key persons in policy formulation/implementation in Rabies control and hence for this interview. This is an exploratory study and I am only interested in your opinions about the various matters concerning the Rabies control and recommendation to improve the policy/programme.

This study is being undertaken as part of my dissertation work on Master of Public Health. I will be the Principal Investigator of the study and if need any further clarification later in this subject, you are free to contact me at 9847780828, or at the following address: Dr.Anoop Kumar Thekkuveettil, Member Secretary, Institutional Ethics Committee, SCTIMST, Medical College PO, Trivandrum -695 011.,Phone no.0471-2520256

Participation in this interview will involve about 30-45 minutes of your time. You are free to refuse to participate in the interview at anytime during the course of the interview/free to refuse to answer any question at anytime. You may not be benefited due to participation in this study except that the findings of the study may help in general to improve the public health impact of Rabies in the state. The information that you give me will be treated as strictly confidential and use only for purposes of the research.

If you agree to participate in this interview, I would also request your permission to record this interview. Details of this interview will be transcribed and used

exclusively for research and your name and that of your department/institution will not be identified in the transcriptions that will be used for analysis. Records and transcripts of the interviews will be kept under safe custody and analysed by me. After writing the report at the end of the study, the same will be destroyed.

Willing to record the interview Yes ☐ No ☐

If No, are you still willing to be interviewed? Yes ☐ No ☐

Name&Signature of the informant: …….

Name & Signature of the Interviewer: ……
Date:

1.Interview guidelines for policy makers/bureaucrats of Health

1. Burden of animal bites and Rabies in the state
   - Please explain the burden of animal bite problem in man? Approximate volume of cases managed through govt health institutions annually?
   - How do you rate it as a public health problem?
2. Cost of Rabies control
   - How much public health expenditure goes towards treatment of animal bites annually? What are the items in this expenditure? Is it in an increasing/decreasing trend?
3. Cost and availability of Post Exposure Prophylaxis(PEP).
   - Any special programme for the poor, considering its high cost? What are they?

- PEP often comes as a medical emergency-how its geographic availability and accessibility is ensured in the state? Do you consider any policy change in this strategy? If not why?
- What is your opinion about the National Human Rights Commission's recommendation on provision of PEP treatment at PHC level? - about its feasibility?
- How does the shortage of resources-finance/logistics/manpower, affect post bite treatment?
- Are there any measures to reduce the cost of treatment? Any special practice guidelines for PEP? Any move to introduce intradermal route of administration? If not, why & what are the barriers?

4. Training of Doctors and paramedics

- Strategy of the department on training of doctors & paramedics on risk assessment, animal bite management etc

5. IEC activities

- Can you explain the IEC strategies for public? Any special programme to schoolchildren?

6. Surveillance of Rabies

- Rabies is not a notifyable disease- Does it affects the disease surveillance, reporting in any manner?
- About the importance of disease diagnosis and facilities
- Please explain about the treatment facilities available for suspected rabies patients?

7. About inter sectoral co-ordination

- What is your opinion about the control of this problem in the state with the current strategies? Do you have any suggestions to ensure the inter sectoral co-ordination for public health programmes?

8. Policy of the department in human rabies control

- Is there any priority given for this problem considering its high fatality?
- Who should take initiatives to implement an effective policy to control this fatal disease?

- Which is/are the key stakeholder/s responsible for control measures? Do you think health department's initiative would have given more attention to the control measures?
- What would be the major problems for ineffective control of rabies in animal vectors in the state?

9.Any specific recommendations for improving the situation

2.Interview guidelines for doctor in ARV clinic

1. Burden of animal bites and rabies in this hospital
   - Please explain about the burden of animal bite problem in this hospital?
   - Approximate volume of fresh as well as total cases managed in this institution daily /monthly/annually?
   - Can you explain some of your experiences in the ARV clinic handling panic situations
2. Epidemiology of animal bites
   - Who are the major victims of animal bite? Sex, age group, socio-economic class, urban/rural etc
   - Which are the geographic areas covered by this hospital? or proposed to cover? Why people from far off places come to this hospital?
   - Which are the common biting animals? Major reasons for the bites described? What percent of patients need antiserum treatment? What adverse reactions do you notice among the patients treated with vaccine/serum?
3. Cost and availability of PEP.
   - Please explain the average cost of biologicals and medicines to handle the PEP cases for an average day in this clinic?
   - Do you think there is chances to discontinue the treatment, if advise the patients to buy the biologicals from outside?

4. Policy of the department in human rabies control

- What is the current policy of PEP provision? Is there any special priority in management/control strategies given for this problem considering its high fatality? Are there any special programmes for the poor?
- Does the shortage of resources-Finance/logistics/ manpower/administrative, affect post bite treatment in this clinic? How often do you face vaccine shortage here? Which is the most common problem?
- How do you evaluate the current policy of the state for the disease control? What improvements do you consider to be included?
- In your opinion, which agency should take initiatives to implement an effective policy to control this fatal disease in human beings?

5. Training of Doctors and paramedics

- Strategy of the department on training of doctors & paramedics on risk assessment, animal bite management etc. Need for advanced training/exposure to national institutes?

Who else need regular training in this area?

6. IEC activities

- Can you explain the IEC strategies of the department for public awareness? How do you appraise the awareness of common people in wound care, treatment etc.?What else we can do in this matter?

7.Surveillance of Rabies

- What do you think are the reasons for not having sufficient data on this disease? Does it affect the planning process in any manner? PEP costs the larger share of disease management but there is no proper reporting, why?
- Can you explain about the treatment facilities available for suspected rabies patients?

8.About animal disease control and inter sectoral co-ordination

- What is your opinion about the current disease control in the state? What do you think are the important reasons for not having an effective rabies control n animal vectors in the state?Can we control this disease in the state?

- How do you assess the importance of inter sectoral co-ordination for public health programmes? In what way useful

9.Any specific recommendations for improving the situation

3.Interview guidelines for policy makers/bureaucrats of Local Self Governments

1.Stray dog menace, dog bites and Rabies as a public health problem

- How do you evaluate the gravity of this problem in the state-increasing/decreasing? Do you recommend any priority for this problem? If not, why?
- What do you think are the major reasons for this problem in our state?

2.Licensing of domesticated dogs

- How do you appraise the present licensing strategy of domestic dogs?
- What are the roadblocks in the effective implementation?
- Any policy change for improving the situation?

3.Role of LSGD in stray dog management and Rabies

- How do you assess the current stray dog problem in our state? What is the current strategy on stray dog management? Is it working? If not why?
- New central rules for stray dog management - how effective have they been in practice? Barriers, if any?
- Which are other dept/agencies that can associate with the stray dog control? To what extent it is feasible?
- How does the availability/non-availability of resources-finance/logistics/manpower affect this problem management?

4. Solid waste management & stray dog problem

- How do you rate the slaughter practices and waste disposal in our state? Any current programmes to upgrade the facilities of slaughter houses? What changes do you expect and when? Any future plans?
- Which other agency can take productive action/steps in these areas?
- Please explain about the new programmes on solid waste disposal in Kerala?

5. Control programme under decentralised planning

- Advantages of decentralised planning in the implementation of Rabies control programmes? If not, why?

- Is Rabies control, a compulsory/optional programme through LSGDs?
- Do you think decentralisation helped in rabies control, when all the related institutions (Vety hospitals, PHCs etc) are transferred to LSGIs.If not, why?
- What do you think as the most important hurdle for the control measures? Who can take lead role to make a change?

6. Intersectoral Co-ordination

- What is your opinion about the control of this problem in the state with the current strategies?
- Can you explain about the present inter sectoral co-ordination available/utilised for control? Are there some goals in conflict, like who to take action? If yes, how can we resolve the conflicts?
- Do you have any suggestions to assure the same for public health programmes in general?

7. Policy of the sector

- What do you think are the key issues with respect to the current policy, that are good and which need correction?
- What are the major reasons for not implementing an effective animal rabies control programmes in the state, in your opinion?

8. Any specific recommendations for improving the situation?

4.Interview guidelines for policy makers/bureaucrats of Animal Husbandry Sector

1.Rabies as a Veterinary Public Health Problem (VPH)

- Strategy of the dept in Veterinary public health problems? Public health importance of Rabies in the state
- How does the dept give priority for Rabies control among the zoonotic disease?

2.Rabies in Domestic animals, vaccination program and licensing strategy

- Why does the vaccination coverage remain to be low? How does the availability/non-availability of resources-finance/logistics/manpower, affect coverage of vaccination?
- What do you think, are the possible mechanisms of linking the vaccination of dogs and their licensing effectively?

3.Stray dog menace and Rabies

- To what extent can your department support the ABC programme? Is it implementable? In your opinion, how the co-ordination of a total Rabies control programme (in domestic and stray dogs) for the state possible?
- Which you consider would be more effective-state run programme or through LSGIs under decentralised planning? Why?

4.Disease Surveillance

- Geographic accessibility of diagnostic facility is not ensured. How will you respond to this statement?

5.Role of Animal Welfare Organisations

- AWOs have a significant role as per ABC (dogs) Rules? –How do you evaluate the status of AWOs particularly SPCAs in the state?
- How best they can be associated with the rabies control programme here?

6.About inter sectoral co-ordination

- Importance of inter-sectoral co-operation - present status, how does it affect the control?

7.About the current policy

- What do you think are the key issues with respect to the current policy, that are good and which need correction? Why do you say so?
- Which is/are the key sector/s responsible for rabies control, in your opinion?
- What are their responsibilities under the current policies? Is any change in this needed? If so, what?
- What do you think are the major barriers/challenges for animal rabies control in Kerala?

8. Specific recommendations for improving the situation

5.Focus Group Discussion with Veterinary Doctors of Animal Husbandry Department

1. Rabies as a Veterinary Public Health Problem

- What are the major veterinary public health problems? How do you prioritize the problems?What are the major VPH programmes of the department?

2.. Rabies control programme of the department

- What is the intensity of the rabies problem in domesticated animals?
- About the responsibility of AHD in Rabies control? How do you evaluate the rabies control programme of the department?
- What is the approximate vaccination coverage in your area? If low, why? What are the difficulties you face for optimum coverage?
- Do you think with the present coverage rabies control possible? What is feasible? Why? How does the availability / non-availability of resources-finance/logistics/manpower, affect coverage?
- How does the programme run through your institution-under decentralised planning / AHD? What about the support from LSGI? Which is more effective-through AHD/LGI? Does the isolated programmes help in rabies control?
- What else can be done other than vaccination for the control of rabies? What about its implementation?

3. Vaccination and licensing strategy for domestic dogs

- Your opinion about the need of compulsory licensing? What do you think, are the current barriers? Possible mechanisms of linking the vaccination of dogs and their licensing effectively?

4. Stray and wild animal Rabies

- Rules regarding Stray dog management - how effective have they been in practice? If not, Why?
- To what extent this department can support the ABC programme?Is it implementable? Who else can support this programme? Who can co-ordinate the programme?

Suraksha programme of Trivandrum Corporation started with the help of AHD-What went wrong?

5. Disease Surveillance

- Present disease reporting system.Lab facility available only in 3 centres. What do you think about the importance of lab diagnosis? About the geographic access?
- Do you feel any difficulty in sample testing now? If yes, what way? Is it a right policy to do the rabies diagnosis on payment alone? What is dept's role in establishing the epidemiology of Rabies in Kerala?
- Importance of Sero surveillance? Is it possible?

6. Role of Animal Welfare Organisations

- Significance of Animal Welfare Organisations? Their functional status in the state. Possibilities to associate them for rabies control?

7. Training, IEC strategies

- Do you get any CVE on rabies/zoonotic disease control? Are you doing IEC activities on rabies control? If yes, to which section of people and what extent?
- What is your evaluation on public awareness about this problem?

8. About inter sectoral co-ordination

- Importance of inter-sectoral co-operation - present status, how it affect the control & possible pathway to ensure co-ordination?
- What is your opinion about the importance of community awareness? Your experience while doing Rabies control programme?

9. About the current policy

- What do you think are the key issues with respect to the current policy, that are good and which need correction? Why do you say so?
- Which is/are the key sector/s responsible for rabies control, in your opinion? And what are their responsibilities under the current policies? Is any change in this needed? If so, what?
- What do you think are the major challenges/barriers?

10.Specific recommendations for improving the situation

6.Interview Guidelines for Animal Welfare Organisations

1. Animal bites and Rabies as a public health problem

- How do you evaluate the intensity of the problem in state?
- What do you think about the responsibility of different departments?
- What is the role of AWOs in stray dog management/rabies control?

2. Role of Animal Welfare Organisations

- How do you evaluate the functioning of AWOs in the state? If not satisfactory, why? If yes, what are the strengths?
- What are the present activities of AWOs in the state?
- Do you feel a responsibility for AWOs in this problem? How best you can contribute to solve this problem?

3. Stray dog management

- Rules regarding stray dog management - how effective have they been in practice? If not, Why? Is it implementable?
- About the implementation of ABC (dog) Rules 2001? How do you visualize the implementation?
- How effectively implemented in Kerala? Problems faced while undertaking ABC programmes. Suggestions to make it workable
- Many are of opinion that the new rule of ABC aggravated the problem, as it is difficult to put in practice? How do you respond to this thought?
- Do you think sufficient dogcatchers would be available to go with the programme?
- Who should co-ordinate the programme? Role of different sectors?

4.Financial Assistance to AWOs from AWBI

- It is understood that AWBI and other agencies offer financial assistance to AWOs for undertaking animal shelters, ABC /AR programmes, Purchase of ambulance etc. Why AWOs are not generally availing such assistance to implement ABC programme? Is there any difficulty to avail?
- Some AWOs like PFA,Blue Cross etc are said to run ABC/AR programmes in fruitful way in other states? Why not in Kerala?

5. Your suggestions /recommendations to control stray dog population?

7.Interview Guidelines for bureaucrat of Pollution Control Board

1.Animal bites and Rabies as a public health problem

- How do you appraise animal bites and rabies as a public health problem in the state? What do you think are the major reasons for this problem?

2.Solid waste management & stray dog problem

- How do you associate solid waste management & stray dog problem
- Can you explain about the activities of your agency in solid waste management?Solid waste management facilities ideally required and available in slaughter houses?

3. Licensing of slaughter houses and waste management

- Which other agency can take fruitful action?Any upcoming programmes for improving the situation?

4. About the current policy

- What do you think are the key issues with respect to the current policy, that are good and which need correction?

5. Specific recommendations for improvement of solid waste management?

8. Interview guidelines for bureaucrat of Tourism dept

1. Animal bites and Rabies as a public health problem

- What do you feel about its public health importance?
- What do you think are the major reasons for this problem?
- Have you had any complaints from tourists so far?

2. Stray dog management

- Stray dogs seem to habitat in some of our famous tourist destinations? Do you have any initiatives for stray dog control in such tourism centres?

3. About the current policy

- How do you evaluate the current rabies control policy? Who do you think are responsible for the control of this problem?

4.Any specific recommendations for stray dog control and dog bites?

9.Interview guidelines for bureaucrat of Education dept

1. Animal bites and Rabies as a public health problem for children

- What is your impression about dog bites and rabies as a problem in state? Do you feel it as an important public health problem?
- Did the high incidence of animal bites among children ever came to your notice as a problem /a cause of absenteeism among school children?

2.Stray dog management

- School campuses are often found as a habitat for stray dogs-is it? If yes, what action would you take/suggest to avoid this problem?

3. Awareness for children and teachers

- How do you consider the need of special awareness about the dreaded disease for children?
- Will you take an initiative from the dept for arranging IEC programmes?

4.Special recommendations for the control of the problem?

Annexure 2

ANIMAL HUSBANDRY DEPARTMENT

DETAILS OF TOTAL RABIES CONTROL PROGRAMME UNDER AHD & LSGI

District…… Name of Vety institution……

Name of LSGI (Pl.tick whether Panchayat / Municipality / Corporation) ----------

Year	Total funds utilised(Rs)		Total vaccine purchased/ received		Total PAR	Total PET	ABC programme		Dogs destroyed
							Castrated	Spayed	
	AHD	LSGI	AHD	LSGI					
2005-06									
2006-07									
2007-08									

(PAR-Prophylactic Anti Rabies vaccination & PET-Post Exposure Treatment)

II.Reasons for not having an effective control programme in your LSGI jurisdiction

Sl no	**Problems**	**Pl.tick the relevant reasons**
1	Not a problem in the area	
2	Lack of proper planning	
3	Lack of proper funding	
4	Lack of political will	
5	Lack of expertise and human resource	
6	Lack of adequate community participation	
7	Lack of adequate intersectoral co-ordination	
8	Lack of awareness	
9	Any other-pl. specify	

Annexure 3

DEPARTMENT OF URBAN AFFAIRS

I. DETAILS OF STRAY DOG / RABIES CONTROL PROGRAMME

District ……...

Name of Municipality / Corporation ……

Year	Total funds utilised (Rs)	Total vaccine purchased (Doses)	No.of dogs Vaccinated	No.of dogs sterilized (ABC programme)	No.of dogs killed	No of dogs licensed
2005-06						
2006-07						
2007-08						

II. SLAUGHTER HOUSES

Total no.of licensed slaughter houses in the Corporation/ Municipality -- No. of slaughter houses with proper solid waste disposal facilities --

Annexure 4(a)

RABIES IN ANIMALS-NUMBER TREATED, DEATH AND PROTECTED

(DISTRICT WISE)

	District	2003-04			2004-05			2005-06			2006-07		
Sl.No		**Treated**	**Death**	**PAR**	**Treated**	**Death**	**PAR**	**Treated**	**Death**	**PAR**	**Treated**	**Death**	**PAR**
1	Thiruvananthapuram	1376	109	18643	1261	21	12891	1991	27	8829	2856	91	18385
2	Kollam	778	43	17494	854	13	12719	1125	29	13528	1456	25	27489
3	Pathanamthitta	231	30	8138	230	15	7379	223	9	5248	296	94	15820
4	Alappuzha	143	13	10044	11	62	13844	228	113	11882	446	59	22761
5	Kottayam	90	13	6666	91	6	7505	442	28	8032	186	7	18447
6	Idukki	46	0	1291	32	0	650	14	0	806	10	0	6150
7	Ernakulam	126	12	18452	161	16	18335	143	14	18256	699	21	30820
8	Thrissur	841	132	18578	665	72	16340	469	53	15049	565	35	21597
9	Palakkad	1019	99	4352	1600	82	3147	871	58	2702	1238	67	6442
10	Malappuram	190	82	1650	320	71	1902	422	75	1514	651	61	4279
11	Kozhikkode	281	12	5484	242	28	5849	545	13	3184	640	45	6765
12	Wayanadu	60	8	8412	198	6	4302	93	10	4934	190	4	6404
13	Kannur	224	7	4966	187	25	3327	103	1	3271	558	181	5055
14	Kasargod	380	34	7642	498	44	4727	493	43	3678	520	27	6248
		5785	**594**	**131812**	**6350**	**461**	**112917**	**7162**	**473**	**100913**	**10311**	**717**	**196662**

(Source-Annual Administration Reports, AHD, Kerala)

NB-PAR-Prophylactic Anti Rabies Vaccination

Annexure 4(b)

RABIES IN ANIMALS-SPECIES WISE													
YEAR	Treated					Total	Death					Total	PAR
Year	Cattle	Buffalo	Goat	Dogs	Others		Cattle	Buffalo	Goat	Dogs	Others		
1994-05	928	74	624	953	16	2595	102	7	24	88	0	221	46,941
1995-06	1519	133	1226	1448	8	4334	158	24	71	74	8	335	1,16,539
1996-97	1390	87	1301	1437	18	4233	128	8	36	100	0	272	1,05,920
1997-08	1317	97	1205	1451	28	4098	136	27	65	96	4	328	68,373
1998-99	1083	58	1269	1941	11	4362	114	34	33	126	6	313	1,31,975
1999-00	1577	48	1460	1373	14	4472	195	9	62	46	4	316	1,25,451
2000-01	1620	65	1441	1594	12	4732	176	10	63	162	3	414	1,00,258
2001-02	1918	33	1381	1369	6	4707	188	2	56	233	0	479	64,808
2002-03	1732	64	1642	1025	21	4484	43	4	40	50	0	137	1,16,024
2003-04	1960	67	2101	1546	111	5785	357	11	120	102	4	594	1,31,812
2004-05	2062	68	2231	1956	33	6350	241	23	124	52	21	461	1,12,917
2005-06	2131	57	2310	2628	37	7163	155	18	100	197	3	473	1,00,913
2006-07	2689	95	4324	3132	71	10311	370	7	138	200	2	717	1,96,662
Source-Annual Administration Reports, Animal Husbandry Department, Kerala													

Annexure 5

POST EXPOSURE PROPHYLAXIS IN GOVERNMENT MEDICAL COLLEGES

Medical College	**2005**		**2006**		**2007**	
	Patients treated	ARV used (doses)	Patients treated	ARV used (doses)	Patients treated	ARV used (doses)
MC, Trivandrum	1439	4540	1685	4550	1446	4662
MC, Kottayam	3100	3223	2900	1604	3120	2590
MC, Alappuzha	3599	4971	4456	7807	3267	6662
MC, Thrissur	3736	979	3846	1640	3753	5000
MC, Kozhikkode	12568	5566	14234	5717	7404	4247
Total	**24442**	**19299**	**27121**	**21318**	**18990**	**23161**

(Source-SDCMC, Thiruvananthapuram)

Annexure 6

PROPHYLACTIC ANTI RABIC VACCINATION IN DOMESTICATED DOGS AFTER DECENTRALISATION				
Sl no	**YEAR**	**Total domestic dogs**	**No.of PAR**	**% of vaccination**
1	1996-97	10,92,935	1,34,672	**12.3**
2	1997-98	10,92,936	68,373	**6.3**
3	1998-99	10,92,937	1,31,975	**12.0**
4	1999-00	10,92,938	1,25,451	**11.5**
5	2000-01	10,92,939	1,00,258	**9.2**
6	2001-02	10,92,940	64,808	**5.9**
7	2002-03	10,92,941	1,16,024	**10.6**
8	2003-04	11,31,035	1.31,812	**11.7**
9	2004-05	11,31,036	1,12,917	**9.9**
10	2005-06	11,31,037	1,00,913	**8.9**
11	2006-07	11,31,038	1,96,662	**17.4**

Source-Directorate of Animal Husbandry, Kerala

Annexure 7

EXISTING LEGAL SUPPORT FOR RABIES CONTROL IN KERALA

I. Acts/rules/orders/guidelines - by Local Self Government Department

Sl. No	Act/Rule/guidelines/Court order	Rule/sub rule no.	Provision	Implementing agency	Department
1	The Kerala Municipality Act 1994	436	*Prohibition of keeping of animals so as to cause nuisance or danger* to any person in his neighborhood	LSGI (Municipalities and Corporations)	Local Self Govt Department (LSGD)
		437	*Licensing of dogs*-No person shall keep any dog except with a license obtaining from the Secretary and every owner shall cause his dog to inoculated against Rabies		
		438	*Power to dispose of stray pigs and dogs*-The Secretary may order for the seizure and destruction of unlicensed pigs or dogs straying in the municipal area shall make such arrangements therefore as he deem fit.		
		452	Arrangement of Municipal Slaughter houses		
		453	Licensing of slaughter houses		

2	Kerala Municipality (Compounding of offences) Rules, 1996	3 4	-The Secretary may prosecute in a competent court any person who has committed an offence punishable. -Notice against offenders and compounding of offences	LSGI (Municipalities and Corporations)	LSGD
		Schedule 436	Unlawful keeping of animals in such a way as to cause nuisance or danger Fine to Rs 250/-		
3	The Kerala Panchayat Raj (licensing pigs and to dogs) Rules, 1998	3	*Control in rearing of dogs and pigs*-Village Panchayat may decide by resolution that no person shall, from the date as may be specified, rear or keep dogs or pigs in the Panchayat area without a license of the Panchayat and not in accordance with the conditions of the license	Panchayats	LSGD
		4	*License*- Once the Panchayat takes decision under rule 3, owners have to take license by remitting Rs.10/- to Secretary, Panchayat		
		5	*Penalty for rearing dogs and pigs without license and violating conditions of the license*-those rear without license or allowing straying –fine up to Rs 250/- and if continue –fine up to Rs 50/- for each day of continuance		

		6	*Power to destroy stray dogs and pigs*-It shall be the inevitable function of every village Panchayat to seize and destroy stray dogs and pigs. Any person obstructing this act, be punished up to Rs 500/-		
4	Decentralisation and transfer of institutions, programmes and responsibilities of Government to Local Self Governments	GO (P) No.189/95/LSGD dated 18-9-1995	Mandatory duties as per Kerala Panchayat and Municipality Acts • Destroyal of stray dogs • Management of Slaughter Houses Also to help in the Control of animal diseases through transferred Veterinary Institutions	LSGIs	LSGD
5	Decentralised planning-Guidelines for 10th five year plan for LSGIs	No.11783/A1/2003/Plg dated 29-9-2003	• Rabies control Project under General category • Detailed guidelines issued • Only vaccination for dogs • APL/BPL subsidy norms –actual cost of vaccine can be given as subsidy to BPL and no subsidy to APL dog owners.	LSGIs	LSGD

CENTRAL ACTS & RULE					
	The Prevention of Cruelty to Animals Act 1960	9(f)	To take all such steps as the Board may think fit to ensure that unwanted animals are destroyed by local authorities, whenever it is necessary to do so.		
		11(3)(b)	The destruction of stray dogs in lethal chambers or (by such other methods as may be prescribed)		
		38(1)	The Central Government may, by notification in the official gazette, and subject to the condition of previous publication, make rules to carry out the purpose of this Act		
	Animal Birth Control (dogs) Rules, 2001 Under Section 38(1) of PCA Act 1964	7	Capturing, sterilization, immunisation and release of healthy dogs	Local Authority	
		9	Incurably ill and mortally wounded dogs as diagnosed by a qualified Veterinarian shall be euthanized		

COURT ORDERS AND GOVERNMENT CIRCULARS AFTER THE ANIMAL BIRTH CONTROL (DOGS) RULES 2001-

(LOCAL SELF GOVERNMENT DEPARTMENT/LSGIs)

Sl. No	Govt Circular/Court order	Circular/court order no.	Content/judgment
1	Government Circular Dated 3-7-2002	25112/D3/99/LSGD	For killing stray dogs till Animal Birth Control programme is effectively implemented in the state considering the public health threat from stray dog bites
2	Govt Circular dated 2-8-2002		Canceling the notification dated 3-7-2002
3	Division Bench of Hon. High Court judgment dated 10-3-2004	W.P(C) No.23543 of 2003 (seeking restoration of stray dog killing)	ABC (dogs) Rules to be strictly observed in its letter and spirit
4	Judgment of Hon.Ombudsman, Local Self Govt Institutions, Trivandrum dated 25-8-2004	OP No.676/2004	The LSGIs are directed to take effective steps for the destruction of the stray dogs with methods with a minimum of suffering on a war footing and save the inhabitants from the fatal health hazards caused by these stray dogs.
5	Hon. High Court Verdict dated 3-3-2006	W.P(C) No.30611 of 2004(S)-seeking whether Ombudsman could pass orders directing local bodies to do destruction when	There should be more concern with the life of human beings than that of stray dogs. The right to live under Article 21 is a fundamental right and it would take precedence over Dog rules

		Division Bench of High Court order dated 10-3-2004 for doing ABC in place	
6	Hon. High Court of Kerala verdict dated 22-8-2006	W.P(C) no.19547 of 2006(S)	To carry out the directions contained in the order dated 25-8-2004 passed by the Ombudsman in O.P.No.676 of 2004 and confirmed by the Court order dated 3-3-2006 in W.P(C) No.30611 of 2004(S)

STATE RULES-ANIMAL HUSBANDRY DEPARTMENT

The Kerala Prevention and Control of Animal Diseases Act, 1967	2(k), 33	• Rabies, a scheduled disease under this Act • Power to prohibit, regulate import, export or transport of animals, for prevention and control of disease	Director of Animal Husbandry	Animal Husbandry Department

HEALTH SERVICES DEPARTMENT

The Travancore-Cochin Public Health Act 1955	Part II 60	• Rabies as Notified Infectious diseases	Medical Practitioners	Health Services Department

ALLIED RULES					
1	The Kerala Panchayat Raj (Slaughter Houses and Meat stalls) Rules, 1996	3 5 11 40 A 40 B 41	-Public to be informed of the prohibition of slaughtering of animals except in a public or licensed slaughter house - Slaughter house shall not be with in 90 meters (m) of any dwelling places or 30 public roads or 150 m of hospital/educational institution - No meat to be sold in slaughter houses - Prohibition on throwing away of debris and wastes - Cancellation of license - Penalty for breach of rules-fine up to Rs 1000/-	Panchayats	LSGD
2	The Municipal Solid wastes (management and handling) Rules, 2000 Under Environment (Protection) Act 1986	4 5	Responsibility of Municipal Authority for the collection, storage and segregation, transportation, processing and disposal of municipal solid wastes. Secretary in charge of Urban Affairs with overall responsibility and District Magistrate for the district	Municipal Authorities	LSGD

STATE POLLUTION CONTROL BOARD (related to solid waste management)

1	The Water (Prevention & Control of Pollution) Act 1974	Sec.18 (1)(b), 33 A	Solid Waste Disposal from slaughter Houses Closure intention notice to non complying units	State Pollution Control Board	Central Pollution Control Board
2	The Municipal Solid wastes (management and handling) Rules, 2000 Under Environment (Protection) Act 1986	6(1) 6(2) -(5)	The State Board shall monitor the compliance of the standards regarding ground water, ambient air etc For grant of authorization and renewal for setting up waste processing and disposal facility to municipal authority/operator	State Pollution Control Board	Central Pollution Control Board