

Benchmarking document – includes the findings of the questionnaire based survey covering rabies control activities in ten regional members and the abstracts of technical presentations delivered at the “Regional Training on Rabies”.

This training was conducted under the OIE/JTF Project on Controlling Zoonoses in Asia under the One Health Concept

# Regional Training on Rabies

5 – 8 August 2014,  
Tokyo & Yokohama, JAPAN

OIE Regional Representation for Asia & the Pacific





This Benchmarking document includes the findings of the questionnaire-based survey covering rabies control activities in 10 regional members, namely Bangladesh, Bhutan, China PR, Chinese Taipei, India, Korea RO, Mongolia, Nepal, Pakistan and Sri Lanka. The abstracts of technical presentations delivered at the “Regional Training on Rabies” held in Tokyo & Yokohama from 5 – 8 August 2014 are also included in this document.

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# ABBREVIATIONS

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ABC	Animal Birth Control
AQS	Animal Quarantine Service
DFA	Direct Fluorescent Antibody Test
dRIT	Direct Rapid Immuno Histochemical Test
ELISA	Enzyme Linked Immunosorbent Assay
EU-HPED	European Union-Highly Pathogenic Emerging Disease Project
FAO	Food and Agriculture Organization of the United Nation
FAT	Flourescent Antibody Test
FAVN	Fluorescent Antibody Virus Neutralization
MAFF	Ministry of Agriculture, Forestry and Fisheries
MHLW	Ministry of Health, Labour and Welfare
OIE	World Organisation for Animal Health
PEP	Post Exposure Prophylaxis
PVS	Performance of Veterinary Services
RABV	Rabies Virus
RT-PCR	Reverse Transcription Polymerase Chain Reaction
VNT	Virus Neutralisation test
WAHIS	World Animal Health Information System
WHO	World Health Organization

# SUMMARY

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Laboratory scientists representing 9 countries of East and South Asia namely: Chinese Taipei, Korea RO, Mongolia, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka participated in the “Regional Training on Rabies”. The objectives of the training were to provide the participants with the followings;

1. a clear understanding of the OIE Standards on rabies,
2. the technical skills required for rabies diagnostic tests,
3. an understanding of the rabies situation and the control programmes of the participating countries, and
4. an opportunity for enhancing laboratory networking and information exchange.

Prior to the training, information regarding rabies from participating countries was collected utilising a structured questionnaire. The questions focused on; (1) Rabies prevention and control (legislation, vaccination of animals, vaccine supply and quality assurance), (2) Rabies diagnosis and surveillance (diagnosis and laboratory capacity, surveillance), (3) Rabies reporting and information sharing, and (4) Rabies control in wildlife.

The 4-day workshop was grossly divided into a couple of different sessions. The technical sessions mainly focused on the discussion of the OIE Terrestrial Animal Health Code on international standards relevant to rabies; Rabies (Ch. 8.12), Notification (Ch. 1.1), Surveillance (Ch. 1.4) and Stray dog population control (Ch. 7.7) and the rabies relevant sections (Ch. 2.1.13) of the OIE Manual on diagnosis and standards for vaccines. The laboratory sessions demonstrated the standard laboratory diagnostic methods, such as fluorescent antibody test (FAT), fluorescent antibody virus neutralisation (FAVN) test and the RT-PCR.

During the technical session of the workshop, two working group discussions were held to provide the participants a platform to share their country experience and update the laboratory diagnostic procedures at country level, as well as to review the different issues including but not limited to the process of vaccine authorization, vaccination policies practiced, the current status of rabies control programme and the ways forward.

Towards the end of the training, the participants agreed on the following key conclusions:

1. Definitive diagnosis of rabies in animals should be conducted using laboratory tests described in the OIE Terrestrial Manual,
2. Laboratory training programme should be encouraged to strengthen laboratory diagnostic capacity in participating countries,
3. Laboratory networking for rabies should be established for enhancement of proficiency testing as well as technical information and resource sharing, etc., and
4. Participants recognised the requirement of improvements of national rabies control programmes under “One Health” concept and requested the OIE to facilitate a regional level rabies review session with the participation of the public health sector.

# REGIONAL TRAINING ON RABIES

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## BACKGROUND

Rabies is considered an important zoonosis as it is widespread in the world. Two-thirds of the countries continue to be affected by the disease and half of the world's population lives in an endemic zone. The disease contributes to 70,000 fatalities annually, with Africa and Asia account for over 95% of fatal human cases of rabies in the world. More than 80% of rabies deaths occur in rural areas, where access to health information campaigns and post-exposure prophylaxis (PEP) is limited or non-existent.

In the vast majority of cases, rabies is transmitted to humans through the bite of a rabies-infected dog, mostly affecting children in developing countries. Controlling and eradicating rabies therefore means combatting it at its source in animals. Over 95% of human cases are infected via the bite of a rabies-infected dog.

The OIE has been committed to work against rabies for decades. The disease has also been identified as a priority by the FAO/OIE/WHO under the framework of “One Health” approach developed through the “Tripartite Alliance”. In this context, the FAO/OIE/WHO Global Conference on Rabies Control, held in Incheon (Seoul, Korea RO) in 2011, provided the opportunity to develop a joint strategy to control the disease worldwide. Priority was given to good governance regarding the distribution of public and private, local, national and international resources targeted at priority prevention actions to be taken in animals. In light of the above, OIE Regional Representation of Asia and the Pacific organised a regional training on rabies to progress rabies management further in Asia.

## OBJECTIVES

The objectives of the regional training were to provide:

- a clear understanding of the OIE Standards on rabies,
- the technical skills required for rabies diagnostic tests,
- an understanding of the rabies situation and the control programmes of the participating countries, and
- an opportunity for enhancing laboratory networking and information exchange.

## THE PARTICIPANTS

A total of 40 participants attended the 4-day “Regional Training on Rabies”, representing 9 OIE Members of East and South Asia; namely: Chinese Taipei, Korea RO, Mongolia, Bangladesh,

Bhutan, India, Nepal, Pakistan and Sri Lanka. All the country representatives were laboratory scientists who are involved in rabies diagnosis at the country level. In addition, there were host country observers representing the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Ministry of Health, Labor and Welfare (MHLW) and the Consortium of Pharmaceutical Manufacturers, Japan.

Experts from the MAFF-Japan, the MHLW-Japan, the Tokyo University and OIE Rabies Reference Laboratory in Korea RO participated as speakers. Laboratory experts at the Animal Quarantine Service (AQS), Yokohama-Japan provided their services as trainers in the laboratory sessions.

## THE TRAINING

The 4-day training consisted of a mixture of lectures, laboratory demonstrations and working group discussions. The lectures and the working group discussions were held at the Nakashima Hall of the Tokyo University, whereas the laboratory demonstrations were held at the AQS in Yokohama. The final agenda is attached in this document as **Annex 1** for easy reference.



Prior to the training, rabies-related information from participating countries was collected using a structured questionnaire. The questions focused on:

- (1) rabies prevention and control (legislation, vaccination of animals, vaccine supply and quality assurance),
- (2) rabies diagnosis and surveillance (diagnosis and laboratory capacity, surveillance),
- (3) rabies reporting and information sharing, and
- (4) rabies control in wildlife.

A sample questionnaire is attached as **Annex 2**. Ten countries namely; Bangladesh, Bhutan, China PR, Chinese Taipei, India, Korea RO, Mongolia, Nepal, Pakistan and Sri Lanka responded to the questionnaire. The information gathered through the questionnaire formed the background for the training, discussions and the working group sessions.



The technical sessions (day 1 and day 4) were divided into 5 sessions, an opening session and a wrap-up session. The first session set the scene, with presentations on the rabies situation in Asia and OIE's perspective on rabies control. A summary of the questionnaire survey was presented to depict the current situation with respect to rabies control in the participating countries. In the second session, the relevant chapters of the OIE Terrestrial Animal Health Code were presented to provide participants, who were mainly laboratory scientists, with a clear

understanding of the international standards relevant to rabies. The chapters presented were: Rabies (Ch. 8.12), Notification (Ch. 1.1), Surveillance (Ch. 1.4) and Stray dog population control (Ch. 7.7). In session three, the relevant sections of the OIE Manual on rabies diagnosis and standards for rabies vaccines were presented. Session four addressed the practical aspect of rabies control and presentations, with discussion on the challenges and risks for rabies-free countries, enhancing laboratory networking and use of laboratory data to optimise vaccination and zoning for the participants, providing an insight to the applications of technical materials and the responsibilities of laboratory scientists. Session 5 provided a platform for the participating countries to share their experience on different aspects of rabies control activities, including laboratory involvement in surveillance, animal health sector involvement in rabies diagnosis and stray dog population control strategies.

Another two days of the training programme (day 2 and day 3) were allocated for laboratory demonstrations, which mainly focused on demonstrating the standard methods of performing the FAT, the FAVN test and RT-PCR. The objective of this laboratory session was to harmonise the procedures for performing these techniques.

Two working group discussions were organised on the first and the fourth day of the programme for the country representatives to share their experiences. The aims of the first working group discussion were to update the laboratory diagnostic procedures at country level, review the process of vaccine authorisation and the vaccination policies practiced in the participating countries. The second working group discussion on the fourth day covered a wider scope aimed at reviewing the current status of rabies control programmes in the participating countries and also to discuss the way forward.



## THE OUTCOMES

The participants of the training:

- gained improved knowledge on OIE Standards relevant to rabies, rabies diagnosis and vaccines,
- gained an awareness of the rabies situation and key issues related to rabies control and diagnosis in participating countries,
- gained experience and practice in laboratory diagnosis of rabies using standard methods according to the OIE Terrestrial Manual,
- supported the development of the meeting report and agreed that the report be the benchmarking document based on the comments, conclusions, survey data and information provided in the training,
- agreed that this benchmarking document will form a useful tool in identifying the gaps, issues and will also provide baseline information in support of making progress, monitoring and evaluation of rabies control programmes in the participating countries,

- proposed that surveillance and reporting of rabies in domestic and wildlife be continually improved in the participating countries,
- agreed that definitive diagnosis of rabies in animals should be conducted using the laboratory tests described in the OIE Terrestrial Manual,
- emphasised that a laboratory training programme should be encouraged to strengthen laboratory diagnostic capacity in participating countries,
- recommended India to apply for the "OIE Laboratory twinning programme" with the aim of the Southern Regional Disease Diagnostic Laboratory (SRDDL) in Bangalore becoming an OIE Reference Laboratory for Rabies,
- reiterated the importance of establishing a laboratory network to improve the proficiency test, plus share technical information and resources related to rabies,
- underscored the requirement to improve operational aspects of national rabies control programmes under a "One Health" concept and requested the OIE to facilitate a regional level rabies review session with the participation of the public health sector, and
- expressed gratitude towards the MAFF and the AQS, the Government of Japan for organising the regional training.

# Section 1

ABSTRACTS OF THE TECHNICAL PRESENTATIONS

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# SESSION 1

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## 1.1 RABIES CONTROL IN ASIA: OIE PERSPECTIVE

*Dr Dong-kun Yang, Senior Researcher, Animal and Plant Quarantine Agency, Korea RO.*



Rabies kills someone, somewhere in the world, every 10 minutes and claims about 70,000 human lives a year. Around 56% of human deaths due to rabies occur in Asia, mainly affecting rural poor populations. Ninety six percent of documented human cases are attributed to contact with infected dogs. Analysts have estimated with only 10% of the expenditure on the the resources spent to treat humans after rabid or suspected rabid dog bites would be sufficient to eliminate rabies in dogs. Hong Kong (1988), Japan (1958), Macao, Malaysia (2000) and Singapore (2000) are the only rabies-free countries/terretories in Asia.

The global burden of canine rabies falls most heavily on Asia, where over half of the human and cattle deaths occurred. Countries in Asia mainly rely on Post-Exposure Prophylaxis (PEP) to protect people from rabies, which accounts for around 90% of the global PEP treatments. On the contrary, the region delivers just under half of the global dog vaccinations. The high number of human and cattle deaths within the region indicates the efforts in preventing rabies prevention at sources i.e. dogs still fall short and inadequate.

Vaccinating dogs against rabies has been identified as the most cost-effective single intervention to protect humans from contracting canine rabies. The OIE Terrestrial Animal Health Code (Terrestrial Code) and the Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (Terrestrial Manual) provide global standards for rabies control, dog population management, surveillance, vaccines and diagnostic techniques. The diagnosis of rabies using OIE prescribed diagnostic tests and reporting cases in domestic and wild animals, preferably through the World Animal Health Information System (WAHIS) is promoted. OIE Reference Laboratories and WHO Collaborating Centers are working towards the goal of international harmonisation on laboratory methods for rabies diagnosis and quality control of vaccines. The OIE Evaluation of the Performance of Veterinary Services (PVS) Tool and OIE Laboratory Twinning Programme provide support to OIE Member Countries to control zoonoses, including but not limited to rabies. The European Union-funded Regional Cooperation Programme on Highly Pathogenic and Emerging and Re-emerging Diseases in Asia (EU-HPED) supports the OIE Regional Vaccine Bank for Rabies, which was established in 2011 and has already distributed 2,690,400 doses of rabies vaccine in Asia for dog vaccination. The Regional Vaccine Bank has been established to facilitate the rapid dispatch of low cost yet high-quality vaccines that comply with international standards, minimizing administrative delays.

China had experienced three rabies epidemics since 1949 and is currently in the midst of the third epidemic. Indonesia has set a goal to eliminate rabies by 2020 and has already maintained five provinces free of rabies. Rabies control in Bali has gained success in rabies control via mass dog vaccination and integrated bite case management.

## 1.2 EPIDEMIOLOGY AND CONTROL STRATEGY OF RABIES

*Dr Satoshi Inoue, Laboratory Chief, National Institute of Infectious Diseases, Japan.*



There are a number of distinguishable rabies virus variants that adapted to and maintained either by a single or a few mammalian species in different regions. The predominant host by the regions listed in Table 1.

**Table 1:** List of predominant host by regions

Region	Host
Africa	Dog, jackal
Asia	Dog
East Europe	Fox, raccoon, dog
Latin America	Mongoose, bat
North America	Raccoon, skunk, fox, bat

More than 99% of human rabies cases are due to canine rabies, with more than 40% of deaths occurring in children under 15 years old. Children are most commonly bitten on the head and neck.

Given 99% of human cases are transmitted by dogs, the management of dog rabies is an indispensable component in the disease control programme, with vaccination and management of dog populations the most effective control methods. Achieving a 70% vaccination coverage of dog populations in endemic areas has been demonstrated to be sufficient to intervene the transmission of rabies virus among dogs. There are reports of successful Animal Birth Control (ABC) and Anti-Rabies programmes in some areas. However, it is important to note that the actual dog population in countries is usually unknown and difficult to estimate, making it difficult to determine whether the appropriate vaccination coverage has been achieved or not. As the supply of vaccines is limited, it is important to use vaccines in the most effective way to control rabies. If each country already has a rabies-free zone, it is a good idea to establish how to maintain and expand their free zone, one by one.

Rabies was introduced to Bali in 1997. At some stage, China was successful in controlling rabies but later rabies emerged again and at present it spreads throughout the country. It is possible to spread rabies through free roaming dogs as they move around without any limit. The free-roaming dogs are also close to the human life. Even in countries with wildlife rabies, successful dog control often not enough to prevent accidental and unnecessary human deaths by rabid-dogs. Recently Vietnam has imposed a regulation to vaccinate owned dogs and to keep dogs on a leash while they are in public areas in order to reduce the number of dog bites and thereby rabies deaths.

Laboratory analysis is useful in identifying the particular viral strain circulating in specific geographic areas. This knowledge will provide an opportunity to make a model plan of strategic control of rabies by using limited vaccine<sup>1</sup>.

<sup>1</sup> Ref: WHO technical report series 982

# SESSION 4

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## 1.3 CHALLENGES AND RISK FOR RABIES FREE COUNTRIES

*Prof Akio Yamada, Professor, the University of Tokyo, Japan.*



Japan implements several laws to control rabies, namely the Rabies Prevention Law, Domestic Animal Infectious Disease Control Law, and the Infectious Disease Control Law. Rabies Prevention law enforces various measures including the followings:

- compulsory registration of dogs with local government,
- mandatory annual vaccination of dogs,
- compulsory wearing of tags on dogs to certify registration and vaccination and capturing of dogs without tags, and
- dogs and other animals including cats, foxes, raccoons and skunks can

only be imported into or exported from Japan with proper quarantine.

Japan is currently rabies free. However, the disease could be re-introduced to the region via imported human rabies cases, entry of rabid dogs through the quarantine system and illegal introduction of rabid animals. Rabies-free countries maintain their free status through verification and appropriate action at ports of entry for the importation of dogs, cats and wild animals. It is important for all countries and territories that are rabies-free or have had no reported rabies cases to develop a contingency plan for containment of rabies in the animal population. Under the current quarantine regulation of Japan, an unpublished study has shown that the probability of introducing rabies through importation of dogs is estimated to be once in 1,000 years. However, if smuggling or submission of fraudulent document occurred at a rate of once in 7 importations, as estimated in Chinese Taipei, the probability would be once in 13 to 14 years<sup>2</sup>. The UK is free from rabies, and it was achieved by investigation of every suspected case of the disease and strict controls on animal movements through quarantine. In the case of Japan, future rabies control measures should be based on evidence-based risk assessment, and risk communication is considered indispensable to maintain its free status.

Even though many rabies-free countries already have efficient quarantine system, the possibility of incursion of canine rabies still remains. Therefore, to mitigate the impact of an introduction of rabies, effective surveillance should be in place, and early detection of the index case is required. The surveillance programme has to be supported by laboratory diagnosis. Additionally, an effective as well as humane quarantine system with high compliance is important for maintenance of rabies-free status.

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<sup>2</sup> Ohkusa and Inoue, unpublished study

## 1.4 ENHANCING LABORATORY NETWORK

*Dr Satoshi Inoue, Laboratory Chief, National Institute of Infectious Diseases, Japan.*

It is important to understand what aspects of laboratory networking can strengthen rabies control and how to create this. Laboratory diagnosis should be accurate and validated. It is also useful to identify the vaccination coverage, endemicity of the disease, and the confirmation of freedom from the disease.

In Japan, there is a scheme for confirming and reporting rabies by medical hospitals, veterinary hospitals and local governments. Recently, wildlife has been included in the scheme. There are three guidelines already in place including; 1) Confirmation of rabies in a suspected case, 2) measures to control an outbreak, and 3) monitoring of rabies in animals including wildlife. As rabies is a typical zoonosis, it is essential in terms of public health that any suspected animal cases are reported by veterinarians. Laboratory diagnosis is essential for confirmation of the disease. The quality of laboratory data is dependent on knowledge on collection of a suitable sample. Infected materials must also be handled and shipped in a safe way to prevent any spillover cases.

The National Institute of Infectious Diseases (NIID) in Japan has established both local and international network. At present, the local government laboratories are connected in a local network where laboratory techniques, and materials are shared. Technical support, positive controls, blind testing as external quality assessment as well as new techniques are provided among the laboratories within the network. In addition, NIID has been working together with the national laboratories in the Philippines, Vietnam, Thailand, Mongolia, and Chinese Taipei.

This Regional Training on Rabies provided a good opportunity to establish a laboratory network among participating laboratories. For instance, it has been suggested that the laboratory in India could be an ideal candidate to function as the central laboratory, where validated diagnostic reagents can be prepared at a most economic price. They can then provide routine activities such as surveillance to the sub-region. In the long run, receiving the support from an intergovernmental organisation such as FAO/OIE/WHO would be useful to sustain as well as to facilitate the functions of the laboratory network (lab-net).

## 1.5 RABIES CONTROL STRATEGY— USE OF LABORATORY DATA TO OPTIMIZE VACCINATION AND ZONING

*Dr Dong-kun Yang, Senior researcher, Korea RO.*

Different types of laboratory data could be utilised to optimize vaccination and zoning. It is important to make available a vaccine that is safe to use while producing the appropriate level of antibodies that is protective. Hence, laboratory testing of vaccines for safety, potency, stability as well as immunogenicity are important contributions. Laboratory support will also be required for detecting antibodies in the blood of different animals. Some examples are: bats in China and ferret badgers in Chinese Taipei. In addition, the governmental effort should be directed towards increasing vaccination rate with accurate information, as well as to improve the public awareness towards rabies.

Performing phylogenetic characterisation of rabies viruses is important in understanding the distribution of rabies viruses. Only rabies virus (RABV) of lyssavirus genus has been identified in Asian countries. In China, RABV is divided into six lineages whereas RABV affecting ferret badgers in Chinese Taipei is another distinct lineage.

Detection of antibody response in animals inoculated with rabies vaccines through regular sero-surveillance after vaccination (annual), and sero-epidemiology studies of sylvatic rabies are some other uses of laboratories for rabies control. Recent monitoring of Trapped-Vaccination and Release (TVR) programme for racoon dogs in Korea has been quoted as an example. Rabies-specific antibody titres were measured by FAVN test at 14 and 28 days post immunisation. Most of the racoon dogs inoculated with inactivated rabies vaccine except one showed virus neutralising antibody titres (VNT) ranging from 0.5 to 13.77 IU/ml. On the other hand, it is equally important to perform sero-surveillance of randomly selected animals residing in the surrounding region after primary vaccination and redirecting vaccination to those regions showing a lower seropositive rate plus conducting an epidemiological survey to investigate reasons for low rates.

## SESSION 5

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### 1.6 COUNTRY CASE STUDY – CHINESE TAIPEI

#### Management of recent rabies outbreak (with an emphasis on the laboratory involvement in surveillance)

*Dr Yang-Chang Tu, Assistant Researcher, Animal Health Research Institute, Chinese Taipei*

Since 1961, Chinese Taipei has been recognised as one of the ten rabies-free countries. The Council of Agriculture has implemented rabies surveillance programmes on dogs and bats, and no rabies was found. The council has tested 7,351 dog samples since 1999 and 361 bat samples since 2008. Since 2012, Bureau of Animal and Plant Health Inspection and Quarantine, Council of Agriculture, has supported National Taiwan University and the National Pingtung University of Science and Technology to conduct disease surveillance in wildlife. In 2013, the “targeted wildlife pathogen surveillance” was launched to obtain information about rabies and other epidemic diseases. Samples were taken from dogs, cats, bats, carnivores, and other wildlife. One dog, 276 carnivores and one house shrew were tested positive for rabies in 2013. In total, 1,564 samples were tested with 381 rabies positive including 379 ferret badgers, one house shrew and one puppy up to June 2014. Ferret-badger has been shown as the majorly affected species in Chinese Taipei and may show neurological signs or attack human or pets.



In Chinese Taipei, three subgroups of RABV among ferret-badgers were found due to geographical barriers in the island. The most recent common ancestor of RABV of Formosan ferret-badger was originated from 91 to 113 years ago. Phylogenetic tree of Taipei rabies virus (N gene) has shown two clusters and three subgroups: Central (Nantou, Taichung), South (Yunlin,

Chiayi, Tainan, Kaohsiung), and East (Hualien, Taitung, Pingtung). The rabies virus could be cryptically circulating in ferret badgers in Chinese Taipei for a long time. However, the rabies epidemic is under control, and the disease is restricted only to ferret badgers.

Main control measure adopted to control rabies in Chinese Taipei was vaccination of dogs and cats. In high-risk areas (rabies-positive mountainous areas) the vaccination coverage was around 90% of the dog and cat population while it was around 70% in the other areas. Chinese Taipei has stockpiled 250,000 doses of rabies vaccines for emergency response, and these vaccines would be given to dogs & cats in high-risk areas & animal shelters free of charge. The government has launched a scheme starting from 2014, imposing fines ranging from US\$ 350 to US\$ 1,700 to the owners whose dogs and cats have not been vaccinated against rabies. Additionally, the government encourages owners to sterilize and register their dogs & cats. It assists animal protection NGOs to establish shelters for stray dogs. The competent authorities also work with veterinary practitioners to improve rabies vaccination coverage in dogs & cats. Setting up animal rabies notification hotline, monitoring wild animal downers or those with abnormal behavior and continuing rabies surveillance on dogs, cats, bats, and those animals had a history of bitten human are among the other control measures.

Continual Research efforts include performance of a feasibility study on oral rabies vaccines for ferret badgers, epidemiological studies on ferret badger rabies and pathogenicity of RABV-TWFB. The country has also invited international experts to provide prevention strategies and expertise on oral vaccination for wildlife.

## 1.7 COUNTRY CASE STUDY – SRI LANKA

**Important aspects of national rabies control programme (with an emphasis on laboratory involvement and recent development of the animal health sector in diagnosis)**

*Dr Sumathy Puvanendiran, Veterinary Research Officer, Department of Animal Production and Health, Sri Lanka*

Department of Animal Production and Health (DAPH) is a major player in controlling animal diseases in the country. Faculty of Veterinary Medicine also provides services to control animal diseases and Public Health Veterinary Services (PHVS) of the Ministry of Health has been assigned for preventing zoonotic diseases. However, rabies control is the main zoonotic control programme conducted by PHVS, and the Provincial Health Services are responsible for field implementation.



Rabies is a notifiable animal disease in Sri Lanka. Canine rabies is endemic in the area and remains a significant public health hazard. In 2013, 783 animal rabies cases were reported, with 87% of them in dogs that are the main rabies reservoir. The other important species include cats, domestic ruminants, and mongooses. Sylvatic rabies virus variant was only found in golden palm civet but not reported in human. Estimated dog population in the country is around 2.5 million, and the dog to human ratio was estimated at 1:8 in 2011. Twenty to thirty percent of the dog population are considered as stray dogs. Animal bite incidence amounts to around 1500 per day. Number of human rabies deaths has shown a declining trend, and it was 38 in 2012 and 28 in 2013. The age distribution of human rabies are different from the world trend and

observed mainly in people between the age of 15 to 59. Currently circulating Sri Lankan rabies viruses originated from a single ancestor, and it is unique and originated from a common ancestor. Based on the G–L region there are seven clades of rabies virus

Important legislations governing rabies control are Rabies Ordinance (1896) and Dog Registration Ordinance (1908). Veterinary Public Health Unit was established in 1953 under the Ministry of Health and rabies was declared as a notifiable disease in 1971. Government has approved an "Island Wide" 5-year rabies eradication programme in 1975 and the rabies control programme continued for another 5 years, and priority was given to eliminate stray dogs. In 1989, rabies control activities were decentralized to the provincial level. "No-kill Policy" was adopted in 2006, and sterilisation and vaccination of both owned and roaming dogs was started. Despite numerous effort, the vaccination coverage is still less than 70%. In 2012, the Cabinet of Ministers decided that the Animal Health Sector should be responsible for animal rabies control. In 2013, OIE provided approximately 300,000 doses of rabies vaccine, and DAPH has already utilised 200,000 doses of vaccines for vaccination of dogs at the field centers until June 2014.

Medical Research Institute (MRI) is a long-term player in rabies diagnosis that tests both human and animal samples and also is the National Reference Laboratory for rabies. MRI possess the facilities to perform Direct Fluorescent Antibody test (DFA), histopathological tests to demonstrate Negri bodies by Sellers staining, mouse inoculation, and ELISA. Additionally MRI is in the process of establishing RT-PCR and Cell culture too. In addition, Karapitiya General (Teaching) Hospital in the southern province also has the facilities for rabies diagnosis. Recently, Animal Health Sector started engaging in rabies diagnosis by establishing a rabies diagnosis unit at the Faculty of Veterinary Medicine & Animal Science with the availability of facilities to perform DFA, histopathological tests to demonstrate Negri bodies by Sellers staining, mouse inoculation, histopathological examination of characteristic cell lesions and ELISA. In addition, 5 veterinary investigation officers attached to Veterinary Investigation Centers of the DAPH from different provinces were also trained to perform dRIT at regional laboratories.

Island wide extensive veterinary network and the capacity of Veterinary Research Institute and Veterinary Investigation Centers could contribute to the elimination of rabies. However, inadequate coordination among relevant sectors and lack of laboratory networking have been identified as the major drawbacks.

## 1.8 COUNTRY CASE STUDY – MONGOLIA

Strategy for stray dog control

*Dr Batkhuyag Sandag, Department of veterinary and animal breeding Government Implementation Agency, Mongolia.*

Mongolia has a set of laws governing livestock health, namely livestock health and genetics, Guideline (SOP) of diagnostic confirmation, movement restriction and zoning for reportable diseases, Guideline (SOP) of rabies control, the list of reportable disease, Rabies diagnosis standard MNS and Guideline (SOP) for sample collection and submission. In relation to human health "Standards of rabies diagnosis, control and surveillance (MNS-



5348-42:2010)” and SOP for rabies control and prevention are the important legislation.

Specific guidelines for rabies control are in place for the purpose of; (1) Rabies surveillance, (2) Vaccination of reservoir animals, (3) Animal disposal and environmental decontamination, (4) movement control, and (5) Vaccination of susceptible animals. There is a “National vaccination strategy” and the main components include vaccination programmes for domestic animals, population control and vaccination programmes for stray animal population, destroy or de-sex stray dogs in urban area, movement restriction, culling and disinfection, cooperation of animal and human health, police, emergency, inspection and environment departments, public awareness and education and vaccine supply. In the case of human patients, both inactivated and live vaccines against rabies, as well as human rabies immunoglobulin, are used. For animals mainly live vaccine against rabies are used.

Currently, animal rabies surveillance system is less than ideal as only limited antibody monitoring and pathogen monitoring are conducted. Inadequate number of samples, inadequate investigations on the rabies virus infection in wild animals and need for identifying risk areas are major concerns.

At present, there is a strong mechanism for “One Health” coordination which includes; Ministry of Industry and Agriculture, Veterinary and Animal Breeding Agency, State Central Veterinary Laboratory, Ministry of Nature and Environment, Ministry of Education and Science, Institute of Veterinary Medicine, Ministry of Health, National Centre for Zoonotic Diseases, National Centre for Communicable Diseases, National Centre for Public Health, National Emergency Management Agency and State Specialized Inspection Agency.

Strategy for stray dog control consists of schemes such as dog breeding license and registration system, control and eradication of stray dogs or wild dogs (only in Ulanbaatar), strict immunization measures and establishing provincial level RABV testing laboratories at the provincial veterinary quarantine station (to carry out epidemiological monitoring). The government provides administrative and financial support and also technical training to the staff on RABV Control (provincial and county level). In addition, community and rural education also carried out.

Mongolia has high risk of rabies, and there are currently no rabies control measures for wildlife. There is no movement control in wild animals with nomadic herding system (Common wildlife attack to human and animals). There are large number of stray dogs in urban areas, No legislation for pet ownership, animal identification or movement control are in place. Lack of preparedness and technical capacity for diagnosing rabies in county level would be the main areas that require major improvements. Education of human resource in province and county level would be essential and should be carried out.

# Section 2

FINDINGS OF THE QUESTIONNAIRE-BASED SURVEY

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## 2.1 RABIES PREVENTION AND CONTROL

This section of the document summarizes the responses to the questionnaire based survey received from 10 Regional Member countries: Bangladesh, Bhutan, China PR, Chinese Taipei, India, Korea RO, Mongolia, Nepal, Pakistan and Sri Lanka.

### 2.1.1 Legislation

#### 2.1.1.1 National legislation in force for human and animal rabies prevention and control and the agencies involved in implementing

In 7 participating countries, there are some form of legislation covering animal and human rabies control separately. The countries that have rabies control legislation are: Bhutan, Chinese Taipei, India, Korea RO, Mongolia, Pakistan and Sri Lanka. However, Bangladesh, China PR and Nepal indicated that they have no legislation covering animal and human rabies control in their countries. **Table 2** summarises the findings.

**Table 2:** Country status of legislation to control rabies and notifiability

Country	Legislation – animal rabies	Legislation – human rabies	Animal rabies notifiable
<i>Bangladesh</i>	X	X	X
<i>Bhutan</i>	√	√	√
<i>China PR</i>	X	X	√
<i>Chinese Taipei</i>	√	√	√
<i>India</i>	√	√	√
<i>Korea RO</i>	√	√	√
<i>Mongolia</i>	√	√	√
<i>Nepal</i>	X	X	X
<i>Pakistan</i>	√	√	√
<i>Sri Lanka</i>	√	√	√

√ - Yes X - No

## Organisations responsible to implement the legislation

**BHUTAN** – MINISTRY OF HEALTH, MINISTRY OF AGRICULTURE & FORESTS  
**CHINA PR** – STANDING COMMITTEE OF PEOPLE'S CONGRESS PRC  
**CHINESE TAIPEI** – MINISTRY OF HEALTH & WELFARE, BUREAU OF ANIMAL & PLANT HEALTH INSPECTION AND QUARANTINE, COUNCIL OF AGRICULTURE, EXECUTIVE YUAN  
**INDIA** - DADA  
**KOREA RO** – MINISTRY OF HEALTH & FAMILY AFFAIRS, MINISTRY OF AGRICULTURE, FOODS & RURAL AFFAIRS  
**MONGOLIA** – MINISTRY OF INDUSTRY & AGRICULTURE, MINISTRY OF HEALTH (NATIONAL CENTER FOR ZOOLOGICAL DISEASES)  
**PAKISTAN** – MINISTRY OF NATIONAL FOOD SECURITY AND RESEARCH  
**SRI LANKA** – DEPARTMENT OF HEALTH, DEPARTMENT OF ANIMAL PRODUCTION & HEALTH

### 2.1.1.2 The imports covered by the law

The participating countries from both East and South Asian sub-regions have a different rabies status and varying degrees of prevalence. To mitigate the risk of rabies to both humans and animals as well as to prevent international spread, Chapter 8.12 of the OIE Terrestrial Animal Health Code outlines the international standards for control of rabies in dogs, country requirements to be considered free of rabies and recommendations for importation of various animal species from rabies-free and infected countries. In order to examine the current status of participating countries with the objective of understanding their compliance with the OIE Code, a set of questions was asked in the questionnaire and the responses are summarised in **Table 3**. The responses reflect that 90% of the countries put more focus on the importation of dogs, cats and ferrets than ruminants, equids, camelids and suids (60%) from rabies infected countries. Importation of wildlife from rabies infected countries has the least attention and only 40% of the countries have laws that cover wildlife imports.

**Table 3:** Compliance of country legislation with the OIE Code

Country	Domestic and wild captive animals from RFC <sup>1</sup>	Wild mammals from RFC	Dog, cats, ferrets from RIC <sup>2</sup>	Ruminants, equids, camelids, suids from RIC	Rodents, lagomorphs from RIC	Wildlife from RIC
<i>Bangladesh</i>	√	√	√			
<i>Bhutan</i>	√	√	√	√	√	√
<i>China PR</i>			√	√	√	√
<i>Chinese Taipei</i>	√	√	√	√	√	√
<i>India</i>			√			
<i>Korea RO</i>			√			
<i>Mongolia</i>	√					
<i>Nepal</i>			√	√		
<i>Pakistan</i>	√	√	√	√		
<i>Sri Lanka</i>			√	√	√	√

<sup>1</sup> RFC; Rabies free countries, <sup>2</sup> RIC; rabies infected countries

### 2.1.1.3 National Rabies Committee or a similar mechanism and the composition, nature of operating mechanism

There are specific National Committees to deal with rabies in 7 participating countries. However, there is no above mentioned committees in Chinese Taipei, Nepal and Pakistan. The operation of the specific committee is supported by the law only in Bangladesh, Bhutan, China PR and India. In addition, several questions in the questionnaire aim to understand the operational aspect of the committee in the participating countries and the overall responses received are summarised in the **Table 4**.

The structure of the “National Rabies committee” or a similar committee, differ among countries. However, it is common to engage at least human and animal health sectors in such committees. In several countries, the committee included members from multiple sectors, and the below box provide some examples from the participating countries.

**Table 4:** Country status of Joint National Rabies Committee

Country	There is a Rabies National Committee	Operation support by law	Meets regularly	Meets as needed	Review or monitor rabies situ.	Plans strategies on rabies	Manages allocation or distribution of resources
<i>Bangladesh</i>	√	√			√	√	√
<i>Bhutan</i>	√	√			√	√	√
<i>China PR</i>	√	√	√	√	√	√	√
<i>Chinese Taipei</i>	X						
<i>India</i>	√	√		√	√	√	√
<i>Korea RO</i>	√		√		√	√	√
<i>Mongolia</i>	√			√	√	√	
<i>Nepal</i>	X						
<i>Pakistan</i>	X						
<i>Sri Lanka</i>	√			√			

## Composition of National Rabies Committee

**BANGLADESH** - MINISTRY OF HEALTH & FAMILY WELFARE, CIVIL SURGEON, UH & FPO SADAR/MOCS, MINISTRY OF FISHERIES & LIVESTOCK, DISTRICT LIVESTOCK OFFICER, MINISTRY OF LOCAL GOVERNMENT, RURAL DEVELOPMENT & COOPERATIVE, MAYOR, SECRETARY

**BHUTAN** – DIRECTOR/DEPARTMENT OF PUBLIC HEALTH, DIRECTOR/DEPARTMENT OF LIVESTOCK, PROGRAM DIRECTOR/NATIONAL CENTER FOR ANIMAL HEALTH, CHIEF PROGRAM OFFICER/DEPARTMENT OF PUBLIC HEALTH, HEAD/PUBLIC HEALTH LABORATORY, CHIEF VETERINARY OFFICER/ANIMAL HEALTH DIVISION, ONE HEALTH FOCAL POINT FROM HEALTH SECTOR, ONE HEALTH FOCAL POINT FROM VETERINARY SECTOR

**KOREA RO** – KOREAN CENTER FOR DISEASE CONTROL & PREVENTION AND ANIMAL & PLANT QUARANTINE AGENCY ORGANISE MEETINGS ANNUALLY

**MONGOLIA** – MINISTRY OF INDUSTRY & AGRICULTURE, VETERINARY & ANIMAL BREEDING AGENCY, STATE CENTRAL VETERINARY LABORATORY, MINISTRY OF NATURE & ENVIRONMENT, MINISTRY OF EDUCATION & SCIENCE, INSTITUTE OF VETERINARY MEDICINE, MINISTRY OF HEALTH, NATIONAL CENTER FOR ZOOLOGICAL DISEASES, NATIONAL CENTER FOR COMMUNICABLE DISEASES, NATIONAL CENTER FOR PUBLIC HEALTH, NATIONAL EMERGENCY MANAGEMENT AGENCY, STATE SPECIALIZED INSPECTION AGENCY

**SRI LANKA** – OFFICERS OF DEPARTMENT OF HEALTH, DEPARTMENT OF ANIMAL PRODUCTION & HEALTH, LOCAL GOVERNMENT

## 2.1.2 Vaccination of animals

### 2.1.2.1 Presence of a national vaccination strategy/plan in the country

As shown in Table 5, vaccination strategy as part of the rabies control programme exists in 6 out of 10 member countries, with the exception of China PR, Nepal, Pakistan and Sri Lanka. The governments of Bhutan, Chinese Taipei and Korea RO are involved in dog vaccination in the whole country, while the involvement of governments is limited to vaccination of dogs in some parts of the country in Bangladesh, China PR, India, Mongolia, Nepal, Pakistan and Sri Lanka. Stray dogs were also included in the vaccination programme in Bangladesh, Bhutan, Chinese Taipei, Korea RO, Nepal and Sri Lanka.

In Bangladesh, Bhutan, Chinese Taipei, Korea RO and Mongolia, dog vaccination is compulsory nationwide, while in India it is compulsory only in some areas (Table 6). Pakistan and Sri Lanka indicated that they practice dog vaccination around the country although it is not mandatory under the law. In China PR, vaccination is not compulsory but only implemented in some areas. In Nepal, dog vaccination is neither compulsory nor practiced on a routine basis.

Cattle vaccination for rabies is not compulsory at country level in any of the participating countries (Table 7). In Korea RO and Mongolia, cattle vaccination is compulsory in some areas. In Bangladesh, cattle are vaccinated against rabies in some areas despite it is not required by law.

**Table 5: Country overview of vaccination for rabies**

Country	Vaccination strategy exists	Govt. implement dog vaccination some areas only	Govt. implement dog vaccination whole country	Stray dogs included in vaccination programme
<i>Bangladesh</i>	√	√		√
<i>Bhutan</i>	√		√	√
<i>China PR</i>	X	√		
<i>Chinese Taipei</i>	√		√	√
<i>India</i>	√	√		
<i>Korea RO</i>	√		√	√
<i>Mongolia</i>	√	√		
<i>Nepal</i>	X	√		√
<i>Pakistan</i>	X	√		
<i>Sri Lanka</i>	X	√		√

**Table 6: Country status of dog vaccination**

Country	Compulsory – whole country	Compulsory – some areas	Not comp. - do countrywide	Not comp. - do some areas	Not compulsory
<i>Bangladesh</i>	√				
<i>Bhutan</i>	√				
<i>China PR</i>				√	
<i>Chinese Taipei</i>	√				
<i>India</i>		√			
<i>RO Korea</i>	√				
<i>Mongolia</i>	√				
<i>Nepal</i>					√
<i>Pakistan</i>			√		
<i>Sri Lanka</i>			√		

**Table 7: Country status of cattle vaccination**

	Compulsory – whole country	Compulsory – some areas	Not compulsory - do countrywide	Not comp. - do some areas	Not compulsory
<i>Bangladesh</i>				√	
<i>Bhutan</i>					√
<i>China PR</i>					√
<i>Chinese Taipei</i>					√
<i>India</i>					
<i>Korea RO</i>		√			
<i>Mongolia</i>		√			
<i>Nepal</i>					√
<i>Pakistan</i>					√
<i>Sri Lanka</i>					√

Vaccination of cats for rabies is compulsory for the whole country in Bangladesh, Bhutan, Chinese Taipei and Korea RO, and in India it is compulsory only in some areas (Table 8). It is not compulsory in the other participating countries. In Pakistan and Sri Lanka, it's claimed that cat vaccination is practiced country wide although it is not compulsory.

**Table 8:** Country status of cat vaccination

	Compulsory – whole country	Compulsory – some areas	Not compulsory - do country-wide	Not comp. - do some areas	Not compulsory
<i>Bangladesh</i>	√				
<i>Bhutan</i>	√				
<i>China PR</i>					√
<i>Chinese Taipei</i>	√				
<i>India</i>		√			
<i>Korea RO</i>	√				
<i>Mongolia</i>					
<i>Nepal</i>					√
<i>Pakistan</i>			√		
<i>Sri Lanka</i>			√		

A question on cost bearing of vaccination for dogs and cattle against rabies was asked. Bhutan and Mongolia bear the entire rabies vaccination cost for dogs and cattle by National Administration. The responses are summarised in **Table 9** and **10**.

**Table 9:** Cost bearing for dog vaccination

	Owner	National Admin	Local Government	Provincial or Regional Admin	NGO
<i>Bangladesh</i>	√	√	√		√
<i>Bhutan</i>		√			
<i>China PR</i>	√	√			
<i>Chinese Taipei</i>	√	√	√		
<i>India</i>	√	√	√	√	√
<i>RO Korea</i>	√	√	√		
<i>Mongolia</i>		√			
<i>Nepal</i>	√	√	√		√
<i>Pakistan</i>	√				
<i>Sri Lanka</i>	√		√		√

**Table 10: Cost bearing for cattle vaccination**

Cattle vac cost	Owner	National Admin	Local Government	Provincial or Regional Admin	NGO
<i>Bangladesh</i>	√				
<i>Bhutan</i>		√			
<i>China PR</i>					
<i>Chinese Taipei</i>					
<i>India</i>					
<i>RO Korea</i>			√		
<i>Mongolia</i>		√			
<i>Nepal</i>	√				
<i>Pakistan</i>					
<i>Sri Lanka</i>					

### Organisations implementing rabies vaccination

**BANGLADESH** – DLS, DGHS, LGRD, FAO, WHO, NGO

**BHUTAN** – HUMANE SOCIETY INTERNATIONAL IN PARTNERSHIP WITH THE GOVERNMENT

**CHINA PR** – ANIMAL PROTECTION ORGANIZATIONS OR ANIMAL WELFARE ORGANIZATIONS

**CHINESE TAIPEI** – LOCAL (PREFECTURE)/COUNTRY VETERINARY MEDICAL ASSOCIATION

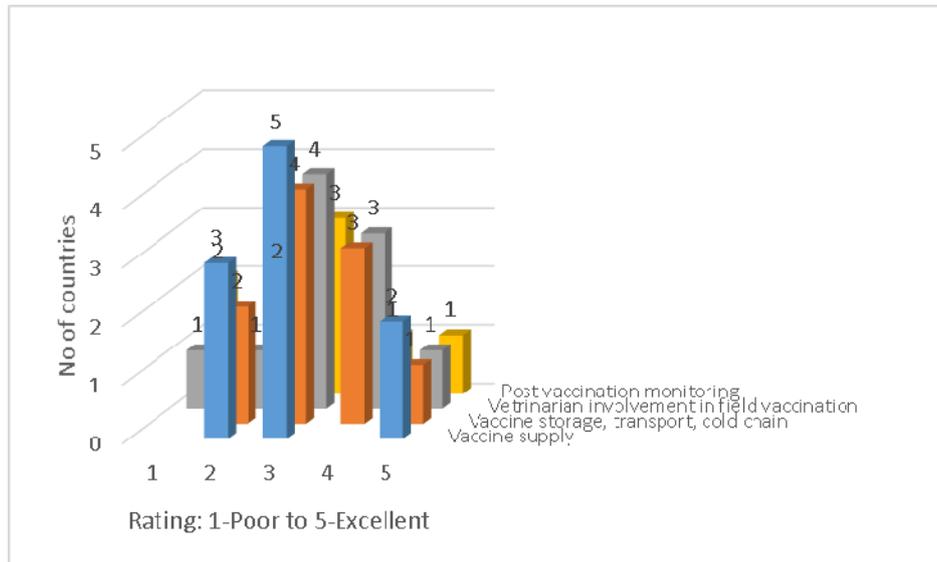
**INDIA** – NGO, APCRI, LOCAL ADMINISTRATION

**MONGOLIA** – MUNICIPAL

**NEPAL** – DEPARTMENT OF HEALTH, MUNICIPALITIES, VILLAGE DEVELOPMENT COMMITTEES, NGO

**PAKISTAN** – NGO FOR ANIMAL WELFARE

To understand the national capacity for rabies vaccination respondents rated the following vaccination-related activities from 1-poor to 5-excellent: (1) vaccine supply, (2) vaccine storage, transport, cold chain management (3) veterinarian involving in field vaccination and (4) post vaccination monitoring. The responses indicated that national capacity remains at an average level in the participating countries as shown in **figure 1**.



**Figure 1:** Status of practices related to vaccination (1-Poor to 5-Excellent)

### 2.1.2.2 Methods of vaccination and identification of vaccinated animals

The most commonly practiced method for vaccination in 8 countries was having mobile teams conducting vaccination at sporadic locations (Table 11). Continuous vaccination at fixed vaccination points is the second most commonly practiced method by the responding countries. The least practiced method, practiced in Bangladesh and Bhutan, was to have mobile teams working country wide. House to house vaccination is also performed in five countries.

**Table 11:** Methods adopted in vaccination

Country	Continuous at fixed points	Country-wide mobile teams	Mobile teams – sporadic	House to house
<i>Bangladesh</i>		√		
<i>Bhutan</i>	√	√	√	√
<i>China PR</i>	√		√	√
<i>Chinese Taipei</i>	√		√	√
<i>India</i>	√		√	
<i>Korea RO</i>	√		√	√
<i>Mongolia</i>			√	
<i>Nepal</i>	√		√	√
<i>Pakistan</i>	√			
<i>Sri Lanka</i>			√	

Identification of vaccinated animals was considered critical to monitor whether a country has reached adequate coverage to achieve a herd immunity that will eliminate rabies. A question was asked to indicate the methods which countries use to identify vaccinated dogs. In response, 9 countries issue a vaccination certificate, 2 countries perform ear notching, 3 countries use belts, 1 country uses coloring and 3 countries, namely Bhutan, Chinese Taipei and Korea RO, conduct permanent mark and dog registration. The details are shown in the **Table 12**.

**Table 12:** Methods of identification of vaccinated animals

Country	Permanent mark and registration	Coloring	Belt	Ear notching	Vaccination certificate
<i>Bangladesh</i>		√	√		
<i>Bhutan</i>	√		√	√	√
<i>China PR</i>					√
<i>Chinese Taipei</i>	√				√
<i>India</i>				√	√
<i>Korea RO</i>	√				√
<i>Mongolia</i>					√
<i>Nepal</i>					√
<i>Pakistan</i>					√
<i>Sri Lanka</i>			√		√

### 2.1.2.3 Stray dog population control methods

Eight participating countries practice stray dog population control, with education and public awareness and reproductive control as the main components. The countries that do not control stray dog populations are China PR and Mongolia. Only three countries namely, Bhutan, Chinese Taipei and India conduct registration and identification of dogs. Eight countries perform reproductive control of stray dogs and 5 countries also perform capture, rehome and release. Environment control and dog movement control are also practiced to control stray dog populations in Bangladesh and Bhutan. Regulation of commercial dog dealers is done only in Bangladesh. Chinese Taipei, RO Korea and Pakistan practices euthanasia to control the number of stray dogs. The summary of responses is indicated in **Table 13**.

### 2.1.3 Vaccine supply and quality assurance

**The origin of vaccines:** Mongolia uses locally produced vaccine while the other 9 countries use imported anti-rabies vaccine. Locally produced vaccines are also used in China PR, India, Korea RO, Nepal and Pakistan. Bangladesh, Bhutan, Chinese Taipei and Sri Lanka are totally dependent on imported vaccines.

**The type of vaccines used:** Except Mongolia, 9 countries use killed vaccines. Live vaccines are also used in 5 countries, namely; China PR, India, Korea RO, Mongolia and Pakistan. None of the countries use any type of biotechnology derived vaccines.

**Vaccine certification:** All countries except Bangladesh have a system for vaccine certification. The countries which have a system for vaccine certification follow the standards prescribed in the OIE Manual, with the exception of Pakistan. However only 6 countries, namely: China PR, Chinese Taipei, India, Korea RO, Mongolia and Nepal perform laboratory testing for vaccine certification. The summary of the responses is presented in the **Table 14**.

**Table 13:** Stray dog population control methods

	Bangladesh	Bhutan	China PR	Chinese Taipei	India	Korea RO	Mongolia	Nepal	Pakistan	Sri Lanka
<b>Stray dog population control is practiced</b>	✓	✓	X	✓	✓	✓	X	✓	✓	✓
<b>Education, public awareness</b>	✓	✓		✓	✓	✓		✓	✓	✓
<b>Registration, identification</b>		✓		✓	✓					
<b>Reproductive control</b>	✓	✓		✓	✓	✓		✓	✓	✓
<b>Capture, rehome, release</b>	✓	✓			✓	✓		✓		
<b>Environmental control</b>	✓	✓								
<b>Control of dog movement</b>	✓	✓								
<b>Regulation of commercial dog dealers</b>	✓									
<b>Euthanasia</b>				✓		✓			✓	

**Table 14:** Types of vaccines used and vaccine certification

	Bangladesh	Bhutan	China PR	Chinese Taipei	India	Korea RO	Mongolia	Nepal	Pakistan	Sri Lanka
<b>Types of vaccines use:</b>										
<b>Locally produced</b>			✓		✓	✓	✓	✓	✓	
<b>Imported</b>	✓	✓	✓	✓	✓	✓		✓	✓	✓
<b>Nature of the vaccines use:</b>										
<b>Killed vaccines</b>	✓	✓	✓	✓	✓	✓		✓	✓	✓
<b>Live modified vaccines</b>			✓		✓	✓	✓		✓	
<b>Biotechnology derived vaccines</b>										
<b>System for vaccine certification exists</b>	X	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Certification system follows OIE Manual</b>		✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Perform laboratory testing for certification</b>		X	✓	✓	✓	✓	✓	✓	X	X

## 2.2 RABIES DIAGNOSIS AND SURVEILLANCE

### 2.2.1 Diagnosis and laboratory capacity

**Diagnosis and laboratory capacity:** Eight countries, excluding Bangladesh and Pakistan, have a National Reference Laboratory for rabies diagnosis (Table 15). However, only 5 countries including Bhutan, China PR, India, Korea RO and Nepal found the support of OIE Reference Laboratories for rabies useful. Eight countries, excluding Pakistan and Sri Lanka, indicated that they share laboratory findings with the other countries, mainly through WAHIS.

**Table 15:** Country laboratory status and information sharing

	Bangladesh	Bhutan	China PR	Chinese Taipei	India	Korea RO	Mongolia	Nepal	Pakistan	Sri Lanka
<b>National Rabies RL* exists</b>	X	✓	✓	✓	✓	✓	✓	✓	X	✓
<b>Avail support of OIE Rabies RL</b>	X	✓	✓	X	✓	✓	X	✓	X	X
<b>Share lab findings</b>	✓	✓	✓	✓	✓	✓	✓	✓	X	X

\*RL; Reference Laboratory

As the training mainly focused on rabies diagnosis, participating countries were asked a detailed question on available diagnostic techniques based on the OIE Manual to obtain information on existing rabies diagnostic capacity at the country level. All the participating countries have the capacity to perform the FAT, which is the OIE gold standard for rabies diagnosis. However, only 4 countries, namely China PR, India, Korea RO and Sri Lanka, have the capacity to perform the FAVN test which is the standard serology test used in animal trade or movement. The responses are summarised in the **Table 16**.

**Table 16:** Laboratory tests that could be performed in the participating countries

	Bangladesh	Bhutan	China PR	Chinese Taipei	India	Korea RO	Mongolia	Nepal	Pakistan	Sri Lanka
<i>Fluorescent Antibody Test</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Immunochemical test</i>			✓	✓	✓					✓
<i>Antigen ELISA</i>					✓				✓	
<i>Rapid Immunodiagnostic test</i>	✓	✓	✓		✓	✓	✓	✓		✓
<i>Cell Culture for rabies virus</i>			✓	✓	✓	✓		✓		
<i>Mouse inoculation test</i>		✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Molecular techniques</i>	✓		✓	✓	✓	✓	✓		✓	
<i>Histology-based tests</i>		✓		✓	✓	✓	✓		✓	✓
<i>FAVN</i>			✓		✓	✓				✓
<i>RRFIT</i>		✓	✓		✓	✓				✓
<i>Virus neutralization in mice</i>			✓		✓	✓		✓		

Antibody Elisa			√	√	√	√	√		√	√
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## 2.2.2 Surveillance

All the countries have some form of a surveillance system based on disease reporting or notification that is part of a control program or health scheme for rabies. Only China PR, Chinese Taipei and Korea RO have biological specimen bank. Structured population based surveys and targeted testing or screening are only conducted in 4 countries, namely: Bhutan, China PR, Chinese Taipei and Korea RO. Wildlife data is collected in 5 countries, and 7 countries use laboratory investigation reports for surveillance. The summary of the responses are shown in Table 17.

**Table 2:** Overview of surveillance activities performed in participating countries

	Bangladesh	Bhutan	China PR	Chinese Taipei	India	Korea RO	Mongolia	Nepal	Pakistan	Sri Lanka
Have an ongoing surveillance programme	√	√	√	√	√	√	√	√	√	√
Activities performed:										
<i>Structured population-based survey</i>		√	√	√		√				
<i>Sentinel units</i>										
<i>Disease reporting/notification</i>	√	√	√	√	√	√	√	√	√	√
<i>Field observations</i>		√		√		√	√	√		√
<i>Control programmes or health schemes</i>	√	√	√	√	√	√				√
<i>Wildlife disease data</i>			√	√		√	√			√
<i>Targeted testing/screening</i>		√	√	√		√				
<i>Laboratory investigation records</i>		√	√		√	√	√	√		√
<i>Biological specimen banks</i>			√	√		√				

## 2.3 RABIES REPORTING AND INFORMATION SHARING

Timely reporting of disease status is essential in efficient implementation of any rabies control program. However, rabies has been observed as under-reported worldwide. Nine countries, excluding Sri Lanka, mentioned that notified field rabies data reaches the National Focal Point. Eight countries, excluding Pakistan and Sri Lanka, report data through WAHIS. The details are summarised in the Table 18.

**Table 3:** Rabies reporting status of participating countries

	Bangladesh	Bhutan	China PR	Chinese Taipei	India	Korea RO	Mongolia	Nepal	Pakistan	Sri Lanka
Field rabies data reach OIE FP for Animal Disease Notification	√	√	√	√	√	√	√	√	√	X
Report rabies data to WAHIS	√	√	√	√	√	√	√	√	X	X
Reports submitting										
<i>Immediate notification</i>				√		√				
<i>Monthly reports</i>										
<i>Six monthly reports</i>	√	√	√	√		√	√	√		
<i>Annual reports</i>	√	√	√	√		√	√	√		

## 2.4 RABIES CONTROL IN WILDLIFE

Nine countries, except Bhutan, mentioned that wildlife rabies is present in their countries. Wildlife rabies is a notifiable disease in 6 countries, including Bhutan, China PR, Chinese Taipei, Korea RO, Mongolia and Sri Lanka. However, control programmes for wildlife rabies are only implemented in Chinese Taipei and Korea RO.

## ANNEX 1: PROGRAMME



**Regional Training on Rabies: Hands-on Training for Diagnostic Techniques in Collaboration with the  
Animal Quarantine Service (AQS), MAFF  
Nakashima Hall, the University of Tokyo, Tokyo  
AQS, Yokohama, Japan  
5-8 August 2014  
FINAL PROGRAMME**

	Arrival of the participants	
Day 01 – 5 August 2014 – Nakashima Hall, University of Tokyo		
08.30-09.00	Registration	
	<i>Opening Session</i>	
09.00-09.30	<input type="checkbox"/> Opening remarks and introduction to the workshop	Dr Hirofumi Kugita (Regional Representative OIE RRAP)
	<input type="checkbox"/> Welcome by the host country	Dr Toshiro Kawashima, CVO, MAFF-Japan
	<input type="checkbox"/> Introduction of the participants	All
	<input type="checkbox"/> Group photograph	All
09.30-10.00	Break for refreshments	
	<i>Session – 1 – Setting the scene</i>	Chair: Dr Hirofumi Kugita
10.00-10.05	<input type="checkbox"/> Presentation of a film “Fighting the Rabies in Asia”	
10.05-10.30	<input type="checkbox"/> Rabies control in Asia: OIE Perspective	Dr Dong-kun Yang (Rabies Research Laboratory (OIE RL), MAFRA, RO Korea)
10.30-11.00	<input type="checkbox"/> Epidemiology and control strategy of rabies	Dr Satoshi Inoue (Head, Laboratory of Transmission Control of Zoonoses, NIID, Japan)
11.00-11.15	<input type="checkbox"/> Rabies situation and control programmes in participating countries: an overview	Dr Tikiri Wijayathilaka (OIE RRAP)
11.15-11.30	<input type="checkbox"/> OIE SRR SEA activities on Rabies Control and output of the Regional Training on Rabies held in Chiang-Mai, June 2014	Dr Mary Joy Gordoncillo (OIE SRR SEA)

	<i>Session – 2 – OIE Code on Rabies</i>	Chair: Dr Dong-Kun Yang
	☐ Terrestrial Code Chapters related to rabies	
11.30-11.50	○ Control of rabies in dogs – Chapter 8.12	Dr Yooni Oh (OIE RRAP)
11.50-12.10	○ Notification – Chapter 1.1, Surveillance – Chapter 1.4	Dr Mary Joy Gordoncillo (OIE SRR SEA)
12.10-12.30	○ Stray dog population control – Chapter 7.7	Dr Tikiri Wijayathilaka (OIE RRAP)
12.30-13.30	Break for lunch	
	<i>Session – 3 – OIE Manual on Rabies</i>	Chair: Prof Akio Yamada
13.30-14.15	☐ Manual Chapter 2.1.13 on rabies (diagnosis) ○ Diagnostic tests ○ Sample collection and shipment ○ Minimum infrastructure requirement	Dr Yang (Rabies Research Laboratory (OIE RL) MAFRA, RO Korea)
14.15-15.00	☐ Manual Chapter 2.1.13 on rabies (vaccine) ○ Standards for vaccines ○ Methods for vaccine evaluation	Dr Koichiro Gamoh (Senior Researcher, NVAL, Japan)
15.00-15.30	Break for refreshments	
15.30- 17.00	☐ Group work ○ to update the laboratory diagnostic procedures at country level ○ to review the status of vaccine authorization (licensing), evaluation (quality assurance) and vaccination policy	
18.00	OIE Hosted Dinner	
<b>Day 02 – 6 August 2014 – Animal Quarantine Service, Yokohama</b>		
	☐ Moving to Animal Quarantine Service, Yokohama	
09:30-0940	☐ Welcome by Director General of AQS	Dr Hiroaki Ogura, Director General, Animal Quarantine Service
09.40-10.00	☐ Outline of AQS in Japan	Dr Shunei Moriwaki Director, Laboratory Department Animal Quarantine Service
10:00-10.20	☐ Lecture on the outline of the Rabies diagnostic methods (Main Conference Room)	Dr Moriwaki

10:20-10.30	○ Explanation of the schedule of hands-on training and things to be aware of when training: Lecture on the preparation of tissue samples (a case of stray cat accidentally confined into a container) (Main Conference Room)	Dr Kazufumi Kasuya Sub-Chief Pathological and Physiochemical Examination Division
10:30-11.00	Break for refreshments	
11:00-11.10	□ Move to the Inspection Room, 2nd floor of the Main Building	Dr Kasuya
11.10-11.20	□ Dilution of FITC-conjugated anti-rabies antibodies	Dr Kasuya
11.20-11.50	□ Mounting the conjugate on FA control slide	Dr Kasuya
11.50-12.10	□ PBS Washing (5 min x 2 times) and air drying of specimen (direct)	Dr Kasuya
12:10-13.10	Break for lunch	
13:10-13.30	□ Lecture on the rabies FA and the use of a fluorescence microscope. Lecture on preparing FA control slide (Main Conference Room)	Dr Kasuya
13.30-13.40	□ Move to the inspection room, 2nd floor of	
	the main building	
13.40-13.50	□ Explanation of a fluorescence microscope and the fluorescence image	Dr Kasuya
13.50-14.10	□ Observation of FA control slide (group 1)	Dr Akihiro Shibata Officer Microbiological Examination Division
14.10-14.30	□ Observation of FA control slide (group 2)	Dr Shibata
14:30-15.00	Break for refreshments	
15.00-15.10	□ Lecture on the Rabies One Step RT-PCR (Main Conference Room)	Dr Kasuya
15.10-15.20	□ Move to the inspection room	
15:20-15.40	□ Demonstration of RNA extraction from brain tissue (Extracting reagent: RiboPure)	Dr kasuya
15:40-16.20	□ Demonstration of One Step RT-PCR	Dr Kasuya
16.20-16.30	□ Move to the main conference room	
16:30-17.00	□ Summarize the Day 1 (Main Conference Room)	Dr Moriwaki
<b>Day 03 – 7 August 2014 - Animal Quarantine Service, Yokohama</b>		
09.30-09.40	□ Explanation of the schedule on hands-on training day 2 (Main Conference Room)	Dr Kasuya Dr Fukuhara
09.40-09.50	□ Move to the inspection room	

09:50-10.20	☐ Electrophoresis of the RT-PCR products for 30minutes (Lecture on the Rabies one step RT-PCR – supplementation)	Dr Kasuya
10.20-10.30	☐ Observation of the results of electrophoresis	Dr Kasuya
10:30-11.00	Break for refreshments (Main conf. Room)	
12:00-13.00	Break for lunch (Main Conf. Room)	
13.00-13.10	☐ Move to the inspection room	
13:10-14.10	☐ Demonstration of FAVN (Neutralization test)	Dr Hisae Fukuhara Sub-Chief Exotic Disease Inspection Division
14.10-14.40	☐ Demonstration of FAVN (Fixation and dyeing)	Dr Fukuhara
14.40-15.10	Break for refreshments (Main Conf. Room)	
15.10-15.20	☐ Move to the inspection room	
15.20-16.30	☐ Observation of the results of FAVN	Dr Fukuhara
16:30-17.00	☐ Lecture on rabies One Step RT-PCR	Dr Yang
17:00	☐ Summarize the whole training (Main Conference Room)	Dr Moriwaki
<b>Day 04 – 8 August 2014 – Nakashima Hall, University of Tokyo</b>		
	<i>Session – 4 - Applications</i>	Chair: Dr Yumiko Sakurai
09:00-9:30	☐ Challenges and risk for rabies free countries	Dr Akio Yamada (Professor, Laboratory of Veterinary Public Health, The University of Tokyo)
09.30-10.00	☐ Enhancing laboratory network	Dr Inoue (Head, Laboratory of Transmission Control of Zoonoses, NIID, Japan)
10.00-10.30	☐ Rabies control strategy– use of laboratory data to optimize vaccination and zoning	Dr Yang (Rabies Research Laboratory (OIE RL), MAFRA, RO Korea)
	Break for refreshments	
	<i>Session – 5 – country activities</i>	Chair: Dr Satoshi Inoue
11.00-11.20	☐ Country case study – Chinese Taipei – management of recent rabies outbreak (with an emphasis on the laboratory involvement in surveillance)	Dr Yang-Chang Tu (Chinese Taipei)

11.20-11.40	□ Country case study – Sri Lanka – important aspects of national rabies control programme (with an emphasis on laboratory involvement and recent development of the animal health sector in diagnosis)	Dr Sumathy Puvanendiran (Sri Lanka)
11.40-12.00	□ Country case study – Mongolia – Strategy for stray dogs control	Dr Batkhuyag Sandag (Mongolia)
12.00-13.00	□ Group work to review the current status of rabies control programmes in participating countries and discuss the way forward	
13.00-13.15	Sample activities in SEA	Dr Mary Joy Gordoncillo (OIE SRR SEA)
13.15-14.15	Break for lunch	
	<i>Session 6 – Wrap up</i>	Chair: Dr Hirofumi Kugita
14.15-15.15	□ Plenary discussion ○ report from group work ○ need identification	
15.15-16.30	Summary and Closing	OIE RRAP

## ANNEX 2: SAMPLE QUESTIONNAIRE



### **Regional Training on Rabies Tokyo/Yokohama, Japan 5 – 8 August 2014**

#### **Data Collection Form - Rabies Control**

In order to generate productive and effective discussion during the meeting, participants are requested to kindly prepare and submit information regarding Rabies situation, diagnostic capacity, legislation and national prevention and control plan in respective countries, according to the guiding questions. Please mark your answer with (√) or provide with data or narration appropriately. In the instances that the National Rabies Control Programme does not come under the purview of your organisation, we request you to provide the information gathered from the relevant organisation. Please submit the document to Dr Tikiri Wijayathilaka to [asia-pacific@oie.int](mailto:asia-pacific@oie.int) by 25 July 2014.

Your kind cooperation to answer this data collection sheet will be truly appreciated.

**Country (Please indicate your country):**

**Name and details of the contact person filling in the questionnaire:**

**Name:**

**Email address:**

1. Rabies prevention and control

1.1. Legislation

1.1.1. Is a national legislation in force for human and animal rabies prevention and control in your country?

For human	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
For animal	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

Which agencies (Ministry, Service, Organisation, etc.) are responsible for enforcement of the legislation?

1.1.2. Is rabies in animals a legally notifiable disease in your country?

Yes  No

1.1.3. Do you have a National Committee or a similar mechanism that specifically deal with rabies?

Yes  No

1.1.3.1. If yes for 1.1.3, please describe the composition:

1.1.3.2. Please describe the nature of the "Rabies Committee/Mechanism" by selecting the following boxes with  $\checkmark$  (You may select multiple answers)

Operation of the committee/mechanism is supported by law	<input type="checkbox"/>
Meets regularly (Indicate the frequency please)	<input type="checkbox"/>
Meets as needed	<input type="checkbox"/>
Review/monitor rabies situation in the country	<input type="checkbox"/>
Plans strategies on rabies	<input type="checkbox"/>
Manages allocation/distribution of resources for rabies control	<input type="checkbox"/>
Other functions or remarks:	

1.1.4. Which of the following imports are covered by law and the regulations/procedures in your country? (please mark  $\checkmark$  all relevant boxes please)

Domestic & wild captive animals from RFC*	<input type="checkbox"/>
Wild mammals from RFC*	<input type="checkbox"/>
Dogs, cats, ferrets from RIC**	<input type="checkbox"/>
Ruminants, equids, camalids, suids from RIC**	<input type="checkbox"/>
Rodents, lagomorphs from RIC**	<input type="checkbox"/>
Wildlife from RIC**	<input type="checkbox"/>

RFC – Rabies free countries\*

RIC – Rabies infected countries\*\*

1.2. Vaccination of animals

1.2.1. Is there a National Rabies Vaccination Strategy/Plan for animals in your country

Yes  No

1.2.2. Is vaccination of domestic animals compulsory?

Species	Compulsory	If Yes	Not compulsory but practice routinely
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	Yes	No	Restricted areas only	Whole country	Restricted areas only	Whole country
Dog	<input type="checkbox"/>					
Cat	<input type="checkbox"/>					
Cattle	<input type="checkbox"/>					
Other	<input type="checkbox"/>					

If your answer is “Yes” for the above questions, please indicate the party that bear the vaccination cost (More than one option could be selected).

Species	Owner	National Admin.	Local Admin.	Provincial or Regional Admin.	Other (E.g. NGO)
Dog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cattle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.2.3. Does the government implement rabies vaccination programme in dogs?

- Yes, in some areas only  
 Yes, In the whole country  
 No

1.2.4. What other organisations implement rabies vaccination programme in dogs?

- A.  
B.  
C.

1.2.5. Please rate (√) the following activities related to dog rabies vaccination programme in your country (Scale 1-5, poor (1) – excellent (5) – mark with √ in the relevant box).

Activities	1	2	3	4	5
Vaccine supply	<input type="checkbox"/>				
Vaccine storage, transport, cold chain management	<input type="checkbox"/>				
Veterinarian involving in field vaccination	<input type="checkbox"/>				
Post-vaccination monitoring	<input type="checkbox"/>				

1.2.6. What method or strategy use for dog vaccination in your country? (you may mark more than one answer based on the situation)

Continual vaccination at the fixed vaccination points*	<input type="checkbox"/>
Country wide campaign with mobile teams**	<input type="checkbox"/>
Mobile teams** at sporadic locations	<input type="checkbox"/>

House to house campaign***	<input type="checkbox"/>
Other: (E. g.: Follow-up vaccination of offspring missed the routine vaccination)	

\*Fixed vaccination points: Well organised sites to which owners bring their animals for vaccination (including private and government clinics)

\*\*Mobile teams: Temporary vaccination points setup at a central location within individual village or city

\*\*\*House to house campaign: Vaccinators visit individual households for vaccination within a given locality

1.2.7. Are stray dogs included in the methods mentioned in “1.2.6”?

Yes  No

1.2.8. What method/s is/are used to identify vaccinated animals? (you may mark more than one answer based on the situation)

Permanent identification and registration	<input type="checkbox"/>
Coloring	<input type="checkbox"/>
Belt	<input type="checkbox"/>
Ear notching	<input type="checkbox"/>
Vaccination certificate	<input type="checkbox"/>
No method	<input type="checkbox"/>
Other:	

1.2.9. Is there a stray dog population control programme in place?

Yes  No

If “yes”, please mark the control measures implemented (Please mark all relevant options)\*

Education/public awareness	<input type="checkbox"/>
Registration Identification	<input type="checkbox"/>
Reproductive control (Sterilisation)	<input type="checkbox"/>
Capture, and return, rehoming or release	<input type="checkbox"/>
Environmental control	<input type="checkbox"/>
Control of dog movements	<input type="checkbox"/>
Regulation of commercial dog dealers	<input type="checkbox"/>
Euthanasia	<input type="checkbox"/>
<b>Others, please state:</b>	

\*The measures are detailed in article 7.7.6 of the OIE Terrestrial Animal Health Code

1.2.10. How many dogs were vaccinated and what is the vaccination coverage?

Item	2012 (heads)	2013 (heads)
Number of domestic dogs in your country (Estimated <input type="checkbox"/> /Actual <input type="checkbox"/> )		
Number of stray dogs in your country (Estimated <input type="checkbox"/> /Actual <input type="checkbox"/> )		

Number of vaccinated domestic dogs (Estimated <input type="checkbox"/> /Actual <input type="checkbox"/> )		
Number of vaccinated stray dogs (Estimated <input type="checkbox"/> /Actual <input type="checkbox"/> )		
Vaccination coverage (Domestic dogs) (Estimated <input type="checkbox"/> /Actual <input type="checkbox"/> )		
Vaccination coverage (Stray dogs) (Estimated <input type="checkbox"/> /Actual <input type="checkbox"/> )		

(Please mark the inappropriate word – Actual/Estimated)

### 1.3. Vaccine supply and quality assurance

#### 1.3.1. Which of the following animal rabies vaccines use in your country?

Description	√	Approximate No of doses used	
		2012	2013
Locally Produced vaccines	<input type="checkbox"/>		
Imported vaccines	<input type="checkbox"/>		

#### 1.3.2. Please mark (√) the type of animal rabies vaccines use in your country? (you may mark more than one answer based on the situation)

Killed vaccines	<input type="checkbox"/>
Live modified vaccines of Pluri or SAD strain	<input type="checkbox"/>
Bio-technology derived vector vaccines	<input type="checkbox"/>
Other (Specify):	

#### 1.3.3. Is there a system for vaccine certification/licensing

Yes  No

#### 1.3.4. Does it follow the standards of the OIE Manual for vaccines

Yes  No

#### 1.3.5. Do you perform laboratory testing for vaccine evaluation

Yes  No

## 2. Rabies diagnosis and surveillance

### 2.1. Diagnosis and laboratory capacity

#### 2.1.1. How many laboratories in your country routinely accepts samples for rabies diagnosis?

#### 2.1.2. Is there a Rabies National Reference Laboratory in your country?

Yes  No

#### 2.1.3. Have your country ever sought assistance from any of the OIE Reference Laboratories (RL) for Rabies

Yes  No

If yes, please specify the name of the RL often used:

#### 2.1.4. Please indicate which of the following rabies diagnostic test are available in your country capacity of rabies diagnosis: please check (√) in appropriate box [In case if

diagnostic laboratories exists only under the Public Health Sector, please kindly fill the table with reference to that facility and indicate the status under the remarks]

Methods in OIE Terrestrial Manual	Technique available, routinely practice	Technique available, seldom practice	Technique not available	Not available but planning to establish
Fluorescent Antibody Test	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immunochemical test	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antigen ELISA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rapid Immunodiagnostic test	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cell Culture for rabies virus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mouse inoculation test	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Molecular techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Histology-based tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FAVN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RRFIT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vires neutralization in mice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antibody Elisa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others. (Please state)characteristic cell lesions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Remarks:</b>				

(This list is based on the OIE Terrestrial Manual Chapter 2.1.13, accessible using the link [http://www.oie.int/fileadmin/Home/eng/Health\\_standards/tahm/2.01.13\\_RABIES.pdf](http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.13_RABIES.pdf) )

2.1.5. What are the most common constraints encounter in rabies diagnosis in your country?

- A.
- B.
- C.

2.1.6. Do you share laboratory findings with other laboratories (local or international)

Yes  No

If yes, what type of data is shared?

- A.
- B.

2.2. Surveillance

2.2.1. Do you have an ongoing surveillance programme

Yes  No

If yes, which of the following are included (you may mark (v) more than one)

Structured population based survey	<input type="checkbox"/>	Sentinel units	<input type="checkbox"/>
Disease reporting/notification	<input type="checkbox"/>	Field observations	<input type="checkbox"/>
Control programmes or health schemes	<input type="checkbox"/>	Wildlife disease data	<input type="checkbox"/>
Targeted testing/screening	<input type="checkbox"/>	Laboratory investigation records	<input type="checkbox"/>
Biological specimen banks	<input type="checkbox"/>	Others (specify)	<input type="checkbox"/>

**2.2.2. How many animals were submitted for rabies diagnosis?**

		2012		2013	
		Positive	Negative	Positive	Negative
Domestic animals	Dogs				
	Cats				
	Cattle				
	Horse				
	Goat				
	Sheep				
	Others				
Wildlife	Foxes				
	Badger				
	Bats				
	Wolf				
	Raccoon				
	Others				
Total					

**3. Rabies reporting and Information sharing**

**3.1. Which “National Organisation” is responsible for collecting animal rabies surveillance data?**

**3.2. Does this data reach the National Focal Point for Animal Health Information?**

Yes  No

**3.3. Do you report rabies surveillance data through WAHIS?**

Yes  No

If “No” is the answer for 3.3, could you please explain the reason for not reporting.

**3.4. If yes, which of the following are practiced?**

Immediate notification & follow up	<input type="checkbox"/>
Monthly	<input type="checkbox"/>
Six monthly	<input type="checkbox"/>

Annually	<input type="checkbox"/>
----------	--------------------------

**4. Rabies control in wildlife**

**4.1. Do you find wildlife rabies in your country?**

Yes  No

**4.2. Is wildlife rabies a notifiable disease in your country?**

Yes  No

**4.3. What are the animals responsible for WL Rabies?**

**4.4. Is there any control programme for wildlife rabies**

Yes  No

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