

**Report of the Fourth meeting  
of the International  
Coordinating Group of the Bill & Melinda Gates  
Foundation–World Health Organization project  
on eliminating human and dog rabies**

**Cebu City, Philippines, 2–4 October 2012**

**BILL & MELINDA**  
**GATES** *foundation*



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## **1. Opening remarks, purpose and objectives**

The meeting was opened by Dr Nyunt Soe (Representative of the World Health Organization (WHO) in Manila, Philippines) who welcomed participants on behalf of Dr Shin Young-soo (Regional Director, WHO Western Pacific Region) and Dr Margaret Chan (Director-General, WHO). He confirmed WHO's commitment to eliminating human and dog rabies in the Visayas and beyond in the region, and thanked the national, regional and provincial governments of the Philippines, Department of Health Region 7 and Cebu respectively for agreeing to host the meeting. Dr Soe acknowledged the excellent cooperation among the Department of Health, the Department of Agriculture and WHO within the project's framework, and thanked Dr Raffy Deray (Project Coordinator, Department of Health, Philippines) and regional health authorities for organizing the meeting, especially Ms Joy Tabotabo (Regional Rabies Coordinator) and Ms Jessa Kristine Pis-an (support staff). Finally, he thanked the Bill & Melinda Gates Foundation (the Gates Foundation) for their generous contribution to the project and WHO headquarters for assisting with its management.

Dr Anastasia Pantelias (Neglected Infectious Diseases Department, Global Health Programme, Gates Foundation) and Dr François-Xavier Meslin (Team Leader, Neglected Zoonotic Diseases, WHO Department of Control of Neglected Tropical Diseases) welcomed participants on behalf of their respective organizations.

The purpose and objectives of the meeting were to review progress, identify challenges and opportunities, and discuss the fifth year of the project's implementation with national coordinators and advisers to the three project sites (in KwaZulu-Natal, South Africa; the south-eastern United Republic of Tanzania; and the Visayas, Philippines), WHO staff in countries, regions and at headquarters, and the responsible officer at the Gates Foundation.

The meeting was held in Cebu city, Cebu Province, Region 7, Philippines, in order to share experiences among project sites during a field visit on 3 October 2011.

Dr Raffy Deray (Department of Health, Philippines) was nominated as Chairperson of the meeting and Dr Sunny Townsend (Glasgow University, Scotland) as its rapporteur. The agenda (Annex 1) and List of participants (Annex 2) are attached to this report.

## **2. Progress reports and specific results by project sites (see also Annex 3)**

### **2.1 KwaZulu-Natal**

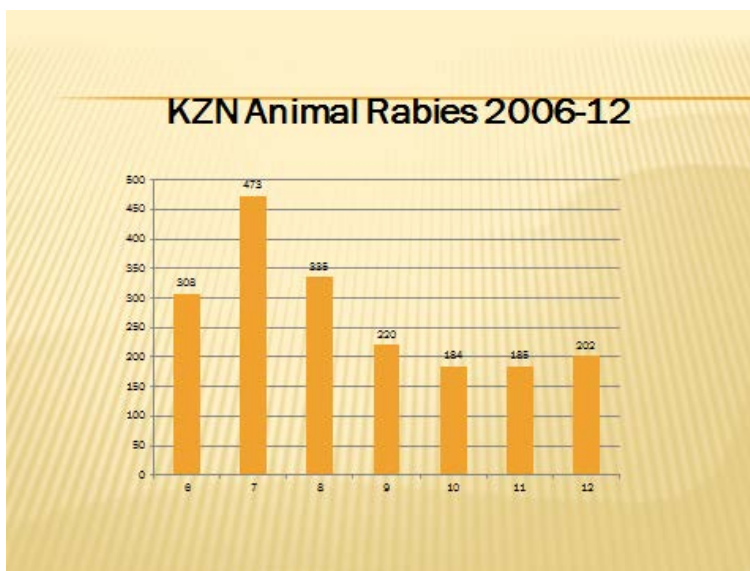
#### **2.1.1 Human and dog rabies control (K. Leroux)**

The main objective at the beginning of the 4th year of implementation was gaining lost ground from the outbreak of foot and mouth disease in 2011. Although dog vaccination campaigns had progressed well, the situation became tense following three rabies fatalities in rapid succession, another confirmed rabies case and a child in a long coma suspected of being caused by rabies.

Progress was recorded in other areas, with the appointment of a new Provincial Minister of Agriculture whose enthusiasm about communicating through the media resulted in one of the most important events in the project's history. Extensive rabies media coverage (one rabid

person was a prominent sportsman on whom the experimental ‘Milwaukee protocol’ for treatment of clinical rabies was attempted) raised interest among senior politicians and precipitated a landmark decision to grant huge support to the elimination programme in KwaZulu-Natal. Media coverage extended beyond KwaZulu-Natal as the national government requested a plan for dog rabies elimination in all endemic provinces. The Provincial Coordinator of the project (Mr Le Roux) was invited to address a meeting of the South African Development Community to discuss a possible strategy for the entire region.

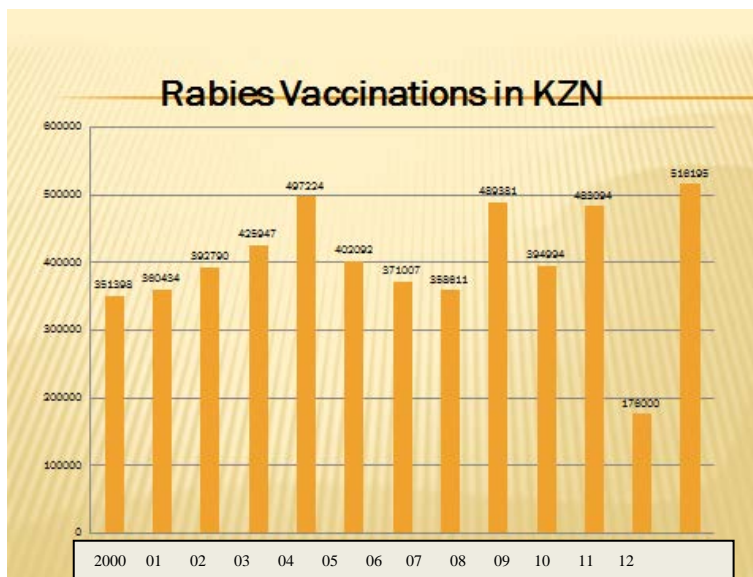
A rabies outbreak in a state veterinary area (Uthukela) that had been unwilling to participate in the provincial rabies project represented a further setback. The outbreak resulted in decreasing vaccination coverage and the spread of rabies into a previously rabies-free area. By July 2012, the number of cases in dogs in Uthukela accounted for 43% of the total number of cases in KwaZulu-Natal; in most other areas, rabies cases were declining. This situation gave the false impression – echoed by the international press – that rabies was re-emerging throughout KwaZulu-Natal, when in fact it was highly localized. In 2012, the total number of rabies cases in KwaZulu-Natal increased by an estimated 31%, mostly due to the localized outbreak



Number of animal rabies cases in KwaZulu-Natal, 2006–2011 and first months of 2012. The increase was mostly due to the localized outbreak in Uthukela recorded during 2012, which may reach 31% of the total number of rabies cases in the province at the end of the year.

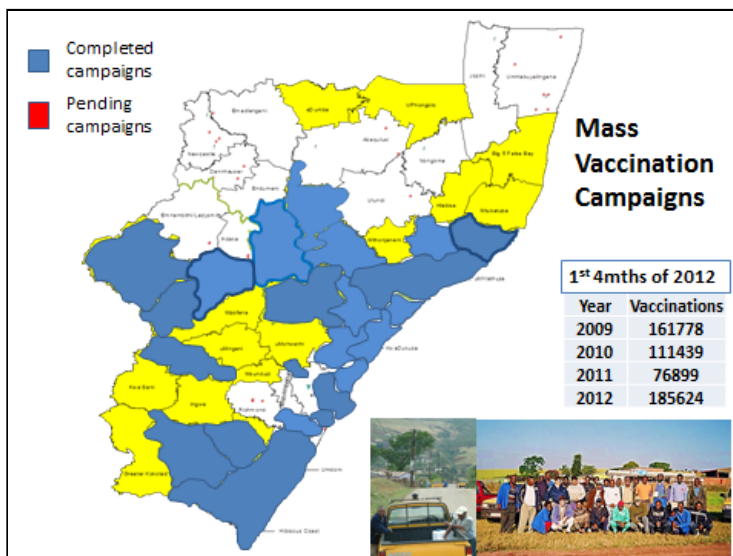
When a rabies fatality in Uthukela was buried at the State’s expense and MEC instructions, the media storm intensified. The rabies project was invited to carry out activities in the area, doubling vaccinations figures in a short time and removing rabies rapidly. In recent months, however, three jackals have tested rabies-positive and cases of bovine rabies have increased, suggesting that a jackal-to-jackal transmission cycle may exist in the area. The laboratory is attempting to validate this finding through sequencing.

In 2012, a total of 516 195 dogs were vaccinated, a record for the province. Activity is focusing on the northern part of KwaZulu-Natal, which has been significantly affected by the disease. An important development is the newly introduced system of follow-up vaccinations; previously, follow up was not done because of the small number of staff and the overwhelming size and limited accessibility of the dog population. Community health workers from the health department (each being responsible for 50 households) are requested to visit all houses, record unvaccinated dogs and report them to the veterinary services for follow up. The pilot area has been rabies-free for 2 years and the system is being expanded across the province.



Annual numbers of dog vaccinations in KwaZulu-Natal, 2000–2013. In 2012, a total of 516 195 dogs were vaccinated, a record for the province. In 2011, an outbreak of foot and mouth disease mobilized all veterinary services and interrupted dog vaccination activities.

What started as a tragedy ended in success, and is a tribute to the value of the Gates Foundation/WHO project. Initially, the contribution of the Gates Foundation represented a significant percentage of the operational costs of the provincial project. Further to the events described above and the decision by the government to allocate the necessary resources to achieve the goal of rabies elimination, the Gates Foundation’s contribution to the overall project budget has decreased from 23% in 2010 to 4% in 2012.



Total number of dogs vaccinated during the first four months, by year, 2009–2012

Blue shading: mass dog vaccination campaigns completed in 2012

Yellow shading: zero rabies cases reported for a year or more

White shading: dogs vaccinated outside mass campaigns, mostly in sparsely populated farming areas.

The momentum created by the Gates Foundation/WHO project has exceeded expectations and will leave a lasting legacy in South Africa and neighbouring countries. More and more organizations are joining to support what they consider a successful concept. Two ‘sister’

projects are starting in Mozambique and Swaziland, with Lesotho making enquiries for assistance.

### *2.1.2 Primary animal health care and research (D. Stewart)*

Activities during 2012 were expected to revitalize an aspect of rabies elimination from a large sponsorship (South African Rand 20 million (US\$ 2.2 million equivalent) for a dog sterilization project initially intended to be coordinated by the Primary Animal Health Care Coordinator of the KwaZulu-Natal rabies project. Although the funds arrived at the end of October 2011, the contract signed was found to be illegal and the Pietermaritzburg Society for the Prevention of Cruelty of Animals (SPCA), the implementing agency of the funds, had to make changes and sign a new document. As a result, the outreach project in KwaZulu-Natal started sterilizing only around mid-May. Unfortunately, the state-appointed project manager decided to remove the rabies project from outreach clinics and concentrate on other aspects of the project. The involvement of the outreach project was thus reduced to a seat on the committee of the implementing agency; to date, just over 2000 animals have been sterilized through the project.

At the beginning of 2012, the outreach project assisted with and was closely involved in three primary animal health-care mobile clinics, sterilizing an additional 556 animals. In March, it started a static primary animal health-care clinic in the north of the province in Hluhluwe, where the state vet provides basic rural veterinary services, now including sterilization.

Tracking of dogs in 'townships' was more difficult than anticipated: one collar was lost but subsequently found (it had detached from a dog going through a fence), 'stray' dogs were caught (a challenging task since trapping systems are not dog specific) and a number of cats were trapped. Oral drugging was also difficult, and outcomes varied with doses. Despite these challenges, the average movements of dogs were influenced by humans, corresponding to the distances travelled and the timing of activities.

Relationships among animal welfare (SPCA) and rabies projects were maintained through visits, staff training and vaccine delivery and by the enthusiasm generated by vaccination days at SPCA offices during a 2-week period in which nearly 4500 dogs and cats were vaccinated in four centres.

New vaccinators were trained either in SPCAs or as state officers, doubling the number of eligible staff for mass vaccination campaigns. The total of new vaccinators and rabies-free promoters in KwaZulu-Natal now numbers 284, of whom 40 are community volunteers spreading the word and mobilizing their communities; this marks a real breakthrough. An outbreak of rabies in the north-west provoked anger among farmers because their farms had not been vaccinated and teams were presumed to be working too slowly. In response, these farms were visited during one week, and all the farmers and staff compounds were checked; those not vaccinated were vaccinated (a small number of dogs had not been vaccinated). The exercise was a worthwhile follow-up of the original vaccinating team.

The research facilities for the Gonacon trial are available for the first dogs. The end of 2012 concludes the advanced diploma in companion animal behaviour begun in 2010 to better understand dogs and their behaviour, improve disease control and enhance training of vaccinators.

The year ended with a positive visit on International Rabies Day in Swaziland when 250 dogs were vaccinated; the rabies project was invited to communicate a positive message to a community that had unfortunately lost an 8 year-old boy to rabies. A primary health-care sterilization clinic will be organized in the future through Swaziland welfare, Swaziland state vets, KwaZulu-Natal animal welfare services and the rabies project.

## 2.2 *Philippines (R. Deray)*

The first year of project implementation was 2009. Mass dog vaccination campaigns started in 2010 only according to the master plan. From 2010 to the end of October 2012, dogs have been vaccinated for 2.5 years in the Western Visayas and parts of Central Visayas (Negros Oriental, Bohol<sup>1</sup>) and for 1.5 years in the Eastern Visayas. Vaccination has significantly decreased the number of human rabies deaths in the project sites, from 48 cases in 2008 to 13 cases in 2012 (as of October), a reduction of >70% (Table 1).

**Table 1. Number of human rabies cases in the Visayas regions, Philippines, 2008 and by year during project implementation, 2009–2012**

Region	2008	Year of project implementation				% reduction in average number of deaths, 2009–2012, compared with 2008
		2009 year 1	2010 year 2	2011 year 3	2012 year 4	
Western Visayas	14	14	15	8	3	29
Central Visayas	20	17	12	11	5	44
Eastern Visayas	14	12	13	10	5	20
Total	48	43	40	29	13	Average 35

Of the 8 islands declared ‘rabies-free zones’ jointly by the Department of Health and the Department of Agriculture, 6 belong to the project area (Biliran and Siquijor provinces and the smaller islands of Apo, Camotes, Limasawa and Malapascua). As of October 2012, no human rabies deaths had been reported or notified in 9 out of 17 provinces and 4 out of 6 major cities (Table 2).

<sup>1</sup> Bohol island belongs to the Central Visayas, where dog vaccination campaigns were conducted using vaccines not purchased under the Gates Foundation project but provided by the Bureau of Animal Industry of the Philippines.

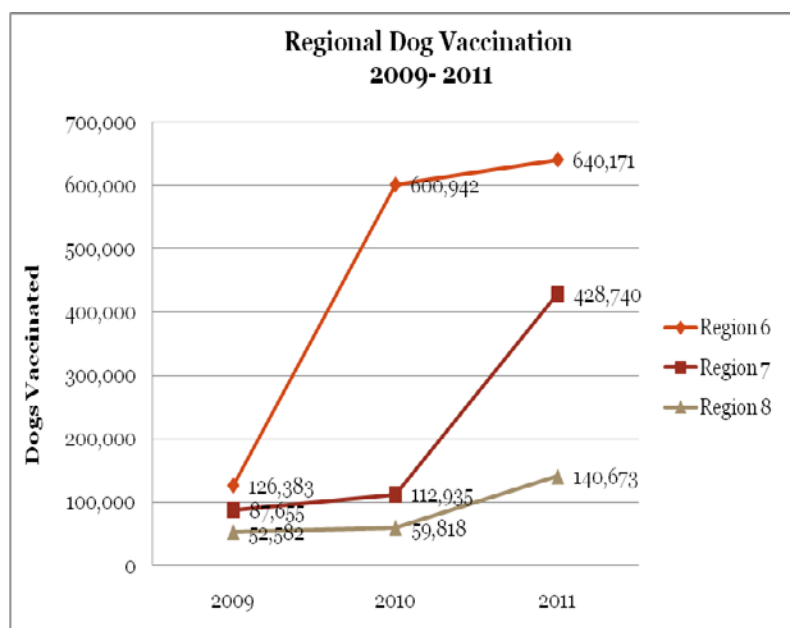


**Table 2. Number of human rabies cases by province or city in the Visayas regions, Philippines, 2012**

Province or city	No. of cases	Province or city	No. of cases	Province or city	No. of cases
Western Visayas		Central Visayas		Eastern Visayas	
Province		Province		Province	
Aklan	1	Bohol	1	Leyte	1
Antique	0	Cebu	4	South Leyte	0
Capiz	0	Negros Oriental	0	Biliran	0
Guimaras	0	Siquijor	0	Samar	2
Iloilo	0			Eastern Samar	0
Negros Occidental	1		0	Northern Samar	1
City		City	0	City	
Iloilo City	1	Cebu City		Tacloban City	1
Bacolod City	0	Mandaue City		Ormoc City	
Total	3		5		5

Dog vaccination coverage improved significantly when the project started assisting local government units with their dog vaccination campaigns in the entire Western Visayas (Region 6) plus half of Central Visayas (Region 7) in 2010 and the remaining province of Cebu in Central Visayas (Region 7) plus the entire region 8 in 2011. In Region 6 alone, the number of dogs vaccinated increased by more than 300% in 2010 and 2011 compared with the 2009 baseline. A similar increase was also recorded in Region 7 (Figure 1). The increase in coverage in Region 8 is not as marked as in Regions 6 and 7 (Figure 2). The Regional Rabies Programme Coordinators in Region 8 have been made aware of this observation and asked to consider the possibility that local government units might have underestimated the size of their dog populations.

**Figure 1. Dog vaccination coverage in the Visayas regions, Philippines, 2009–2011**



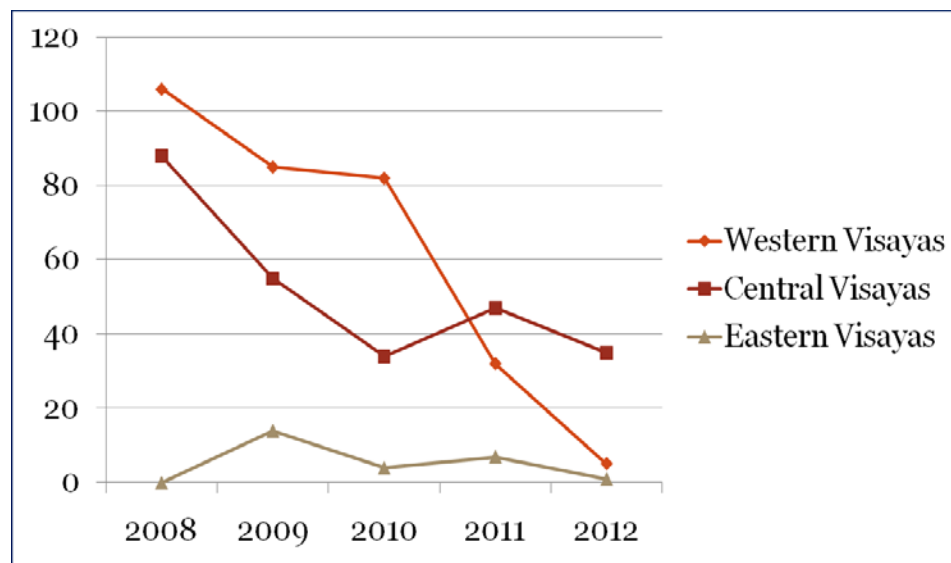
The increase in dog vaccination coverage can be attributed to the increased availability of dog rabies vaccines, better health information and education campaigns, increasing support from the local government units and pet owners, waiving of fees (in areas requiring it) and an increase in the number of volunteer dog catchers and vaccinators involved in the project.

In 2011, more than 10 000 volunteers, most of whom had received formal training, were involved in the dog vaccination campaign: 5242 in Western Visayas, 1130 in Central Visayas and 1138 in Eastern Visayas. In 2012, dog vaccination is still below the target, with 343 453 dogs vaccinated in Western Visayas, 133 576 in Central Visayas and 51 731 in Eastern Visayas. Coverage is expected to have significantly improved by the end of 2012, although annual activity reports have not been completed and dog vaccination activities are still ongoing.

To ensure that the cold-chain is maintained during mass dog vaccination activities, all municipalities received new vaccine carriers similar to those used by the Department of Health's expanded programme on immunization. This practically replaced all ice boxes, coleman jugs and similar items used by local vaccinators in previous years. The procurement of vaccine carriers was made possible when the Department of Health approved the request for additional funds for the procurement of the carriers in 2011.

The number of dog rabies cases reported by Animal Diagnostic Laboratories is apparently decreasing except in Region 8, where there are no baseline data. However, of the three regions, only Central Visayas (Region 7) receives sufficient samples for surveillance despite the project's providing support to surveillance to all regions. This is probably because Region 7 has two functional rabies diagnostic laboratories whereas Region 8 has one and Region 6 has none. All specimens from Region 6 are sent to Manila for diagnosis and laboratory-confirmation.

**Figure 2. Trends in canine rabies cases in the Visayas regions, Philippines, 2008–2012**



Cases of rabies exposure or animal bites are managed in more than 80 animal bite treatment centres (ABTCs) geographically located in the project sites: 38 in Western Visayas, 27 in Central Visayas and 16 in Eastern Visayas and some animal bite centres (ABCs). ABTCs are

government-owned and managed treatment centres, whereas ABCs are privately owned. All rabies exposures are managed using the ID regimen recommended by WHO. In 2011, at least 71 090 rabies exposures were managed and reported in the project sites: 34 453 in Western Visayas, 29 064 in Central Visayas and 7463 in Eastern Visayas. Cell culture vaccines were administered in about 80% of these exposures (categories II and III) while rabies immunoglobulin was used in only 25% of category III exposures. In the Philippines, some exposures are not given post-exposure prophylaxis immediately, especially in rabies-free zones, in accordance with the Joint DOH-DA Administrative Order on *Managing rabies exposures secondary to Bite/s from vaccinated dog, cats and other animals*. As of October 2012, more than 35 000 rabies exposures had been reported in the three regions.

### 2.3 United Republic of Tanzania (M. Maziku, E. Mbunda and G. Mchau)

This section reports on: (i) activities delayed from the 2011 plan of work implemented during October 2011 to May 2012, mostly in February–April; (ii) activities from the 2012 workplan implemented during May–September; and (iii) project performance and expenditures in 2010–2011. During this reporting period, collaborations between the WHO Country Office and line ministries of livestock and fisheries development, health and social welfare and the 24 implementing local government authorities were effective and permitted achievement of the below outputs.

#### **Implementation of activities delayed from the 2011 annual plan**

The infectious disease weekly ending (IDWE) reports of the Ministry of Health and Social Welfare provided data on incidences of human animal bites and rabies cases, whereby data on dog vaccinations, surveillance and diagnostic tests, supply and utilization of anti-rabies vaccines and anti-rabies sera were obtained during supportive supervision visits, district veterinary officer (DVO) reports and mobile-phone reporting. These data represented key information not only for assessing the severity of human and animal rabies but also for monitoring project results.

Other activities carried out between late October 2011 and July 2012 included:

- implementing the second phase of mass dog vaccination campaign in 7 local government authorities of Dar es Salaam and Morogoro regions (late October 2011);
- conducting two sensitization seminars for 114 Shehiya (ward) leaders, 15 district officials and 120 teachers from primary and secondary schools shortly after the 3rd ICG meeting (Pietermaritzburg, South Africa, 19–21 October 2011) to improve dog vaccination performance in the next campaign in Pemba;
- convening technical and steering committee meetings to report on project results, challenges and ways forward. The steering committee meeting was held with an advocacy meeting attended by 52 government leaders, (3 Regional Veterinary and Medical Officers, 12 Directors of local government authorities (LGAs) with respective DVOs and DMOs; others were 6 Ministries' officials (from livestock, health and natural resources), 2 Directors from Zanzibar (for veterinary and medical services) and 2 focal persons from Pemba (livestock and medical) (in March and May 2012 respectively);
- carrying out the (delayed) second phase of mass dog vaccination campaign in 17 LGAs in Mtwara, Lindi, Coast regions and Pemba, preceded by pre-vaccination regional planning meetings involving 17 DVOs and 40 vaccination team leaders from 17 participating LGAs in order to improve dog coverage during the planned dog vaccination campaign (July 2012).

The second phase of dog vaccination campaigns planned for 2011 in Mtwara, Lindi, Coast regions and Pemba were delayed because of the time taken to transfer funds from the WHO Office to the Gates Foundation (funds were eventually recalled at the end of the 2010–2011 biennium by central financial services before being transferred) and comply with procedures for procuring vaccination equipment.

### **Activities from the 2012 workplan implemented during May–September 2012**

- Activities started in April 2012. Collection of data continued throughout the year, whereas data on incidences of human animal bites and rabies cases were collected from the IDWE reports, data on supply and use of anti-rabies vaccines and anti-rabies sera for post-exposure prophylaxis; surveillance and diagnostic results were obtained through mobile-phone reporting and conventional surveillance methods. Surveillance is done in collaboration with LGAs and the Central Veterinary Laboratory and Veterinary (virology) Laboratory of the Faculty of Veterinary Medicine at Sokoine University of Agriculture.
- Although not embodied in the main 2012 annual plan, an ‘emergency’ national review meeting was organized on 22–24 February in the United Republic of Tanzania in accordance with the observation of the 3rd ICG meeting that the current dog population size ranges from 152 045 to 217 207 and not 400 000 as indicated in the original plan. The review meeting was attended by the International Coordinator (WHO), technical advisors (University of Glasgow), staff from the UBS Rabies Surveillance Project (Ifakara), directors and DVOs (from selected LGAs) and focal persons from ministries of livestock and health. On the basis of the deliberations of this meeting a revised (lower) annual budget (based on an agreed dog population size) was prepared by the WHO Secretariat for 2012 activities (original 2012 budget reduced by >12 % corresponding to about US\$ 100 000).
- Funds for 2012 (US\$ 632 260) were transferred from WHO headquarters to the WHO Country Office in April to support all 2012 activities specified in the revised plan of work including (i) procurement of vaccination equipment for the mass dog vaccination campaigns in 24 LGAs during 2012; (ii) training for 5 regional and 24 district cold chain coordinators (RCCOs and DCCOs) from 24 LGAs; (iii) payment of staff incentives and supervisory or technical missions in 101 health facilities; and (iv) provision of post-exposure prophylaxis in all 24 districts.
- At the time of reporting, only 15% of these funds had been used; implementation of the remaining activities planned during 2012 started in November and is expected to be completed in May 2013.

### **Project performance and expenditures in 2010–2011**

During 2010–2011, the cost per dog vaccinated was inversely related to the number of dogs vaccinated; that is, where dog density and vaccination coverage were high, the cost per dog vaccinated was low. In the 4 LGAs, most of the dogs (>80%) were vaccinated at low cost (<US\$ 3) in Morogoro (4 LGAs), Coast (2 LGAs) and Mtwara (1 LGA) (Figure 3). In about 15% of dogs vaccinated, the cost per dog vaccinated ranged from US\$ 3.5 to US\$ 7, while in <5%, dogs vaccinated (from low dog density areas per km<sup>2</sup>) costs exceeded US\$ 8 (in Kilwa, Liwale and Tandahimba districts). There is therefore potential to improve the project’s performance by mobilizing communities and their involvement and enforcing dog vaccination bylaws in 80% of the LGAs with high dog densities. The targeted dog vaccination coverage of at least 70% can be attained at a cost of <US\$ 2.5 as recommended by WHO.

**Figure 3. Relationship between cost per dog and number of dogs vaccinated, United Republic of Tanzania, 2010–2011**

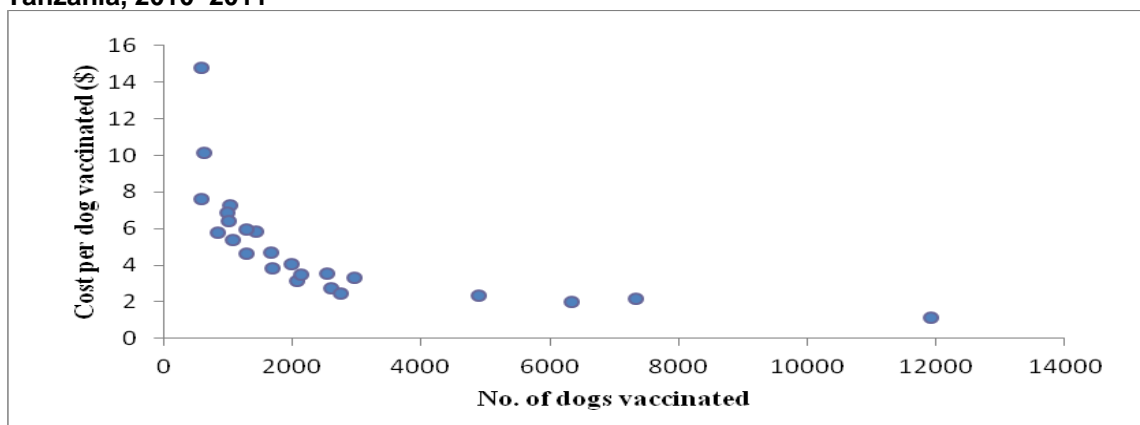
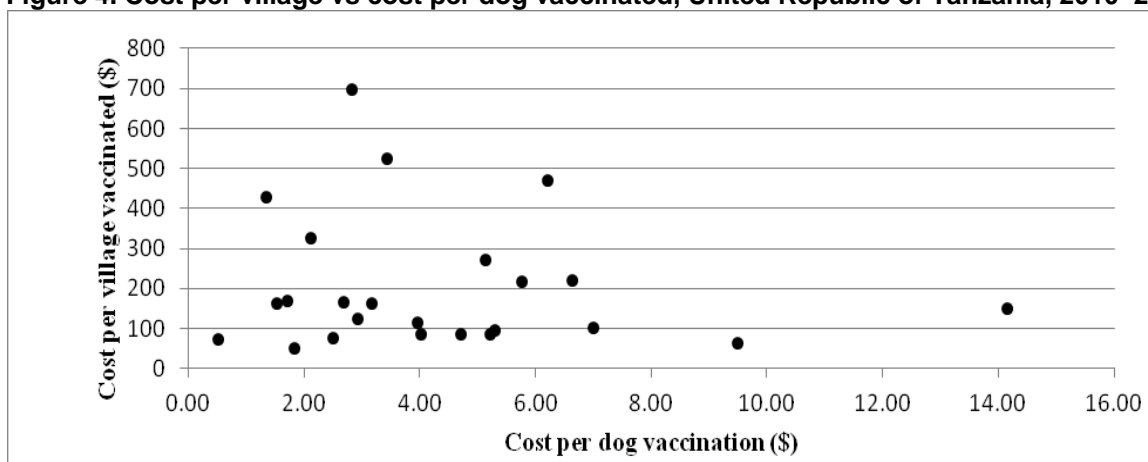


Figure 4 substantiates these observations by showing that vaccination teams reached more than 50% of the villages at an average cost of below US\$ 200 (a few cost more than US\$ 200); however, many dogs were vaccinated in each of these villages, resulting in a cost per dog vaccinated of equal to or below US\$ 3.

**Figure 4. Cost per village vs cost per dog vaccinated, United Republic of Tanzania, 2010–2011**

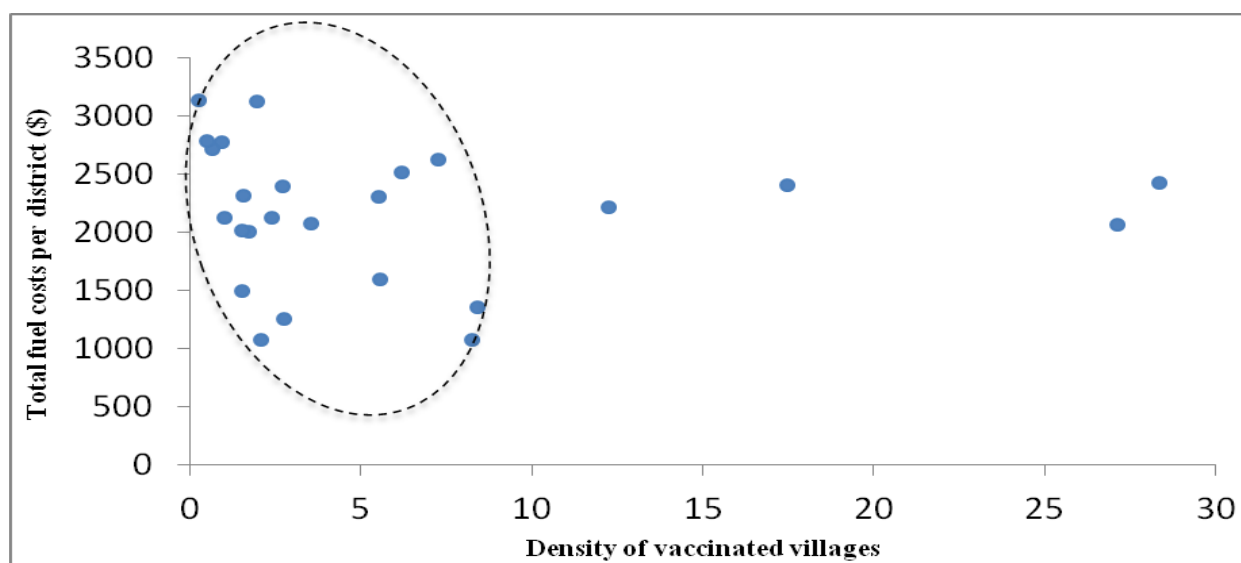


Where the cost per dog vaccination exceeded US\$ 3, the effect on the costs of transporting vaccination teams to villages were minor, but the cost per dog vaccinated distorted the overall cost effect because fewer dogs were vaccinated from these villages (or had fewer dog populations, as in Kilwa, Liwale and Tandahimba districts) (Figure 4).

The practical implications are that future campaigns will focus on reducing the cost per dog vaccination in 80% of regions with high dog densities (change strategy, reduce per-diems and fuel costs) while maintaining increased vaccination coverage and without affecting performance results in order to reduce the average cost per dog vaccination to the recommended US\$ 2–2.5.

Logically, the costs of fuel decline as the density of villages increases; this trend generally held true (dashed circle) except for in four urban districts (solid circle) that are associated with high fuel costs; the Project will investigate the source(s) of anomalies depicted in Figure 5.

**Figure 5. Total fuel costs per district and density of villages vaccinated, 2010–2011**



#### **2.4 International coordination (F.X. Meslin)**

WHO headquarters received the fourth installment of the award (US\$ 2 085 758) from the Gates Foundation in January 2012. Access to funds (minus the total indirect costs of US\$ 80 944) by the Department of Control of Neglected Tropical Diseases for project implementation was immediate. The International Coordinator issued the first requests for distribution to subgrantees during the second half of January.

Between 16 January and 12 August 2012, WHO headquarters transferred US\$ 1 677 413, representing 90% of the 2012 total monies destined for the field projects. The International Coordinator's Office made arrangements (product identification and appropriate quantity reservations) for procuring dog and human rabies vaccines and rabies immunoglobulin in collaboration with national coordinators and WHO procurement services at headquarters. The relevant WHO country offices processed final orders upon request by the national competent authority in the three project sites except the Philippines, where arrangements for procuring 110 000 vials of dog vaccine were initiated in November 2011 and corresponding orders were issued directly by headquarters with the aim of ensuring delivery by mid April 2012 at the latest. For various reasons, however, delivery could not take place until late April for the additional 10 000 vials and in mid-May for the first batch of 100 000 vials (see HQ report in IV financial update).

The Special Services Agreement funded by the project to contract the Tanzanian project Coordinator in the WHO Country Office was extended by 6 months from 1 February to 31 July 2012. In April 2012, we were informed that the Coordinator had decided not to accept a new agreement. First- and second-level supervisors in the Country Office and the Regional Office swiftly initiated a selection process and a new Coordinator was identified in July 2012, became operational in September 2012 and actively participated in the fourth ICG meeting. In the Philippines and Kwa-Zulu Natal, the rabies programme managers paid by their respective authorities continued to act as Coordinators of the Gates Foundation/WHO project. The International Coordinator's time is part of the WHO contribution to the overall project. The

Special Services Agreement in the Central Visayas left the project at the end of the first semester of 2012 and a new person was recruited by the Country Office in Manila.

In February 2012, the contract with Glasgow University was renewed to provide advisory services to the Tanzanian project, with the same focus as in 2011 on dog population surveys for better evaluating dog population size and analysing dog vaccination delivery cost structure. Dr Sunny Townsend presented a report of the work carried out by Glasgow University advisors at the 4th ICG meeting. The agreement between WHO and an expert in dog handling and welfare to assist the Coordinator of the KwaZulu-Natal project in developing a primary animal health-care strategy was also renewed. The specialist is also involved on behalf of the project coordinator in a number of applied research projects within the framework of the rabies elimination project.

In April 2012, WHO extended the agreement for performance of work with the World Society for the Protection of Animals (WSPA) for one more year. Under this agreement the WSPA will continue to provide technical assistance and training to improve adherence to animal welfare principles in the project areas. The International Coordinator delivered a summary of the WSPA 2012 activity report at the 4th ICG meeting: in the United Republic of Tanzania, WSPA joined the February 2012 review meeting and the mission to Pemba. They had some welfare concerns, but they were minimal and mostly associated with euthanasia and strategies to avoid dog fighting at vaccination points. In the Philippines, the WSPA has been active, and identified challenges in implementing rabies control legislation to impound and destroy dogs humanely. The law needs to be changed as it currently allows 'inhumane' methods of euthanasia, although there has been a decline in the use of euthanasia.

During the second semester of 2012, an agreement for performance of work (non-renewable) was signed with the President of the South Eastern Africa Rabies Group to secure international participation (particularly from ministries of health from South Eastern African countries) at the next meeting of the Group to be held in February 2013 in Dar es Salaam, United Republic of Tanzania. The participation of staff from the Tanzanian rabies project will be secured through a special contribution from the Gates Foundation budget allocated to the Tanzanian Ministry of Livestock and Forestry. These four contracts represent a total of US\$ 79 370 incurred partly from the International Coordinator's budget (APW with WSPA), KwaZulu-Natal (APW with the PAHC coordinator) and the United Republic of Tanzania (APW with Glasgow and Pretoria universities for SEARG 2013) budgets.

The WHO Country Office in Pretoria supported the KwaZulu-Natal project by ensuring transfer, supervision and administration of funds under a Direct Financing Collaboration agreement with the provincial veterinary services and procuring rabies vaccine for dogs and dog vaccinators.

The WHO Regional Office in Brazzaville through the Professional Officer in charge provided support to the WCOs in Pretoria and Dar es Salaam particularly for the latter in recruiting the new national coordinator.

The WHO Country Office in Manila through the National Professional Officer in charge provided support to the project by ensuring supervision and administration of the 4 SSAs and the secretary in the ESR unit of the WCO (one each in 3 regions and one in DOH CO)

including the recruitment of a new SSA for Region 7. The NPO also provided technical support during the following activities:

- 2012 national Post Implementation Review meeting (PIR);
- 2011 Region 6 and Region 7 PIR;
- 2011 provincial PIR for Cebu, Negros Oriental;
- training and orientation for quarantine measures in ports and airports by DARFU 7;
- project operations in Region 7 to improve implementation of planned activities and budget management;
- World Rabies Day celebration and the awarding of rabies-free areas including two areas in Eastern Visayas, Biliran province and the island municipality of Limasawa;
- non-Gates Foundation rabies activities that may be useful guidance for the project, such as finalizing the MOP and developing MTP for 5 years, and local rabies elimination initiatives in selected provinces;
- advocacy to the National League of Mayors on implementing rabies prevention and control especially to municipalities in project sites;
- procurement: rabies vaccine for dogs, offices, computers and computer supplies, communication supplies, dog registry booklets and IEC materials;
- proposal review for phase two of implementing the national rabies information system (NaRIS).

### **3. Activity plans for year 5 (2012–2013) and budget allocations per project sites and WHO (see Annex 4)**

#### *3.1 KwaZulu-Natal (K. Leroux)*

The ultimate goal of the project is preventing all human rabies deaths due to a dog virus strain through dog rabies elimination within 5 years. The year 2013 will be the fifth year of implementation, although the project is one year behind.

The main activities to accomplish during the 5th year of implementation are:

- human post-exposure prophylaxis:
  - train human health practitioners (ongoing);
  - secure approval of intradermal pre-exposure (PrEP) immunization and ID post-exposure prophylaxis in four pilot sites.
- Awareness and education
  - ensure mass media coverage.
- Surveillance (activity 4.4.4)
  - open a satellite laboratory in the northern part of the province;
  - improve collection and submission of samples
- Control campaigns
  - evaluate successes and challenges from the 2012 season;
  - reshuffle campaigns according to priority areas and secure signed commitment to campaigns;
  - train SPCA, municipal and military volunteers;
  - expand follow-up vaccination campaigns across the province.
- Primary animal health care
  - monitor PAHC, rabies outreach project;



- provide support to static clinics;
- improve holistic PAH care during campaigns;
- introduce responsible pet ownership to communities through awareness teams.
- Research
  - finalize ecology study findings.
  - evaluate GonaCon;
  - continue dog behaviour study;
  - evaluate PEP in KwaZulu-Natal;
  - explore transmission pathways.

### 3.2 *Philippines (R. Deray)*

Year 5 activities will focus on maintaining good vaccination coverage and validating coverage in selected areas; improving animal rabies surveillance; discussing with all stakeholders measures or strategies to sustain rabies elimination initiatives beyond 2013; strengthening quarantine services in all seaports; and pilot testing NaRIS in the Visayas regions.

To sustain dog vaccination coverage, the project will provide 1.1 million doses of dog vaccine to local government units; however, given the amount allocated for this purpose, some funds intended for other activities may have to be reallocated.

To improve animal rabies surveillance, the project will continue to support rabies diagnostic laboratories by procuring conjugates, dialoging with the Department of Agriculture to provide free diagnostic services in the three regions (DA in Western Visayas has no functional laboratory and is still collecting laboratory fees); exploring the possibility of an additional diagnostic laboratory using LED microscopes instead of the more expensive FAT microscopes; educating and encouraging pet owners to send samples of suspected rabies cases for examination; and reimbursing expenses incurred in transporting specimens to rabies diagnostic laboratories. As elimination status approaches, adequate numbers of appropriate samples must be collected to determine whether the rabies virus is no longer circulating among the dog population in the project sites.

Project implementation and planning workshops will continue to be reviewed at national, regional and provincial levels to evaluate, coordinate implementation of the project, and identify and address implementers' issues and concerns. Monitoring by national and regional rabies coordinators will be strengthened by increasing its frequency to cover more areas. Focus will be on validating dog vaccination coverage by reviewing the dog registry at the municipal or barangay level, and conducting interviews and surveys.

#### **Priority activities**

1. Dog vaccination
  - a) Maintain and achieve good dog vaccination coverage
    - i. ensure adequate dog vaccines to cover at least 70% of the dog population
    - ii. provide incentives for vaccinators
2. Surveillance
  - a) Improve surveillance system
    - i. Ensure availability of conjugates
    - ii. Discuss free laboratory services with the Department of Agriculture (Region 6)
    - iii. Submit more samples; implementers to use budget allotted for this

- iv. Submit high-quality samples
  - v. Seek alternative – field diagnostic examination
- 3. Sustainability
  - a) Advocate support to the programme beyond 2013
  - b) Develop NRPCP 5-year medium development plan (2012–2016)
    - i. Ongoing
    - ii. DOH to procure dog vaccines to be incorporated in the 5-year plan
- 4. Validating results
  - i. Validate dog vaccination coverage in selected areas (highly urbanized cities, municipalities, rural communities by conducting surveys with partner NGOs)
- 5. Policy support
  - a) Advocate and develop policies
  - b) Develop manual of operation
  - c) Update existing policies
- 6. Health education
  - a) Reduce incidence and bites among schoolchildren; promote responsible pet ownership
    - i. Institutionalize curriculum integration in areas where incidence of rabies exposure among schoolchildren is high
    - ii. RPO: print and broadcast
    - iii. Produce and distribute IEC material
- 7. Improving reporting and recording system
  - i. Launch NaRIS
- 8. Funding sources:
  - i. Government of the Philippines
  - ii. WHO–Gates Foundation project
  - iii. Local government units
  - iv. Partner NGOs

### 3.3 United Republic of Tanzania (M. Maziku, E. Mbunda, G.Mchau)

To implement the annual plan in 2013 and beyond, the project will ensure that LGAs carry out effective dog vaccination campaigns (reaching more than 70% vaccination coverage); it will begin with 7 LGAs in the Dar es Salaam and Morogoro regions (October/November 2012) followed by 17 LGAs in Mtwara, Lindi, Coast regions and Pemba (April/May 2013).

To achieve the above targets, the project will scale-up public awareness, community mobilization and advocacy to government leaders and communities for their support through production and dissemination of information, education and communication materials, support of school-based children and community awareness approach, village assemblies, local advertisement systems and local radios and television stations. Others include increased advocacy by promoting the “one-health approach” to increase medical and veterinary sector collaborations for:

- developing effective collaboration structures at all levels
- organizing effective mass dog vaccinations and PEP delivery
- conducting adequate surveillance, information sharing and disease containment at source

The project will strengthen surveillance activities through staff training, supply of reagents and laboratory chemicals, participation of community members in reporting animal bites, suspected

rabid animal cases, notification for availability of animal samples, and in monitoring and evaluation of surveillance activities. It is planned that check-points will be supported to regulate dog movements.

The project also plans to scale-up efforts to ensure sustainability of project results through continued encouragement of line ministries (livestock and health) and LGAs in planning and setting funds in their mainstream health/livestock budgets for rabies elimination. This will ensure that freedom of the disease once achieved is maintained through local resources. Also, in 2013, LGAs will be classified/zoned and mapped into low, moderate and high risk areas and more resources allocated to support continued vaccination, law enforcement and border controls.

For proper management of the project, the coordinating unit at WCO will work closely with focal persons from MLFD and MoHSW and LGAs for data collection, ensuring better performance and reporting to the technical and steering committee meetings, and the WHO and the Funding agency.

The recruitment of a Data Manager is expected to improve data collection, utilization, management and reporting. By using the project indicators' tracking system, data collection, analysis and generation of reports will improve Project Manager's accountability and reporting to coordinating institution and beneficiaries. At local level, the project will encourage LGAs to share local information with all stakeholders and for local, district and national decision-making including policy review.

#### *3.4 International coordination (F.X. Meslin)*

WHO headquarters will continue to provide administrative and technical oversight to the project. The International Coordinator will retire on 28 February 2013. The new incumbent designated by WHO will ensure continuity in managing the project in 2013 and during the no-cost extension period. New APWs will be issued early in 2013 with the same individuals and institutions.

The SEARG meeting sponsored by the project to be held in February 2013 in Dar es Salaam will provide an excellent platform for sharing project results after 4 years of implementation.

The 5th meeting of the International Coordinating Group should take place for the second time (the first was in 2009) in Geneva, Switzerland, in October 2013 as each site has hosted an ICG meeting (United Republic of Tanzania, 2010; KwaZulu-Natal, 2011; Philippines, 2012).

A comparison of the cost per dog vaccinated and further cost-benefit analysis should be carried out among sites. A detailed report covering the 5-year period (2009–2013) should be prepared before the start of the no-cost extension. Manuscripts written in collaboration with national/provincial coordinators dealing with individual project sites as well as the project as a whole should be prepared for submission to journals for peer-review and eventual publication.

#### **4. Challenges, opportunities and threats to project design and implementation**

##### *4.1 KwaZulu-Natal*

- Health education and information about rabies prevention should be strengthened as people are still dying untreated despite the availability of vaccine and RIG in the province.
- The ID route for PrEP and PEP is still not authorized by central and provincial authorities although its efficacy, safety and potential to save lives have been discussed and fully recognized.
- The ‘Bergville’ outbreak skewed the true rabies situation in the province, particularly among foreign observers. The number of cases in KwaZulu-Natal was higher than during the previous 2 years, where 43% of new cases originated from this one area.
- There are concerns about the high numbers of jackal (and associated cattle) cases, and particularly about rabies becoming endemic in the local jackal population.
- Surveillance improved temporarily as a result of the higher level of awareness that accompanied increased media interest, but declined to previous levels within months. The proportion of samples tested positive in the laboratory stayed the same.

##### *4.2 Philippines*

- In a decentralized health system such as that of the Philippines, it is important that local government units take ownership of the project.
- Different initiatives taken at national and local levels are complicating coordination and affecting the project’s overall cohesion; for example, the same forms and certificates are not used throughout the project’s area.
- Effective rabies surveillance remains difficult to implement. Region 6 does not have an operational rabies laboratory. Bohol, further to training provided by CDC in Atlanta, uses direct rabies immunochemistry test (dRIT) for screening and then sends samples to a rabies laboratory for confirmation. Collaboration with the Bohol project and pooling resources (i.e. skilled technicians) was suggested. However, the Bureau of Animal Industry is not willing to use dRIT. Capacity for molecular epidemiology is completely lacking.
- Until recently, pet owners paid for sampling and this payment was used to buy conjugates. Today, related costs are covered by the project; however, rates of sample submission have not improved in Region 8.
- The fluorescent antibody test (FAT) microscope in Region 6 is not working. The Zeiss FAT microscopes developed with the Gates Foundation support are affordable and perform well, and could be purchased through the project although there may be other issues preventing diagnosis.
- The Department of Health anticipates a windfall if the ‘sin tax’ (increased tax on alcohol and tobacco benefitting the health sector) is approved by Parliament. These funds could pay for dog vaccines, although this is not yet guaranteed as there can be difficulties in their procuring dog rather than human vaccine.

##### *4.3 United Republic of Tanzania*

- An unexpected change in project coordination during 2012 delayed implementation at a particularly delicate juncture.
- The ID route is not used systematically as planned in the project area. Numbers of PEP/ID depend on region and staff.

- The number of suspect (clinically diagnosed cases not confirmed by the laboratory) human cases declined during 2009–2011. No cases were detected during the first 9 months of 2012. Only 268 animal bites were recorded, 70 of which followed contacts with jackals.
- As baseline data on rabies deaths in project areas before project initiation were limited, the relative impacts on their numbers of improved PEP delivery, dog vaccination, increased awareness or other causes have to be further elucidated.
- The second vaccination round in 17 local government authorities and Pemba was delayed.
- In those areas covered by the second vaccination round, more dogs were vaccinated than in the first round.
- Human and animal rabies cases were approximately equal in number (when one would expect a ratio of about 1:100 respectively) and the sample positivity rate was high (88%), indicating insufficient rabies surveillance activities particularly in animals.

#### 4.4 *All sites*

- Any external challenges or threats, such as the organization of national and local activities, that will delay project activities or outbreaks of major human or animal communicable diseases, such as the outbreak of foot-and-mouth disease in KwaZulu-Natal in 2011.
- Any reorganization or other change that results in the transfer or replacement of key people involved in the project may significantly affect project implementation.
- Estimating dog population sizes and therefore dog immunization coverage represents a major difficulty for all three projects and in motivating field staff over time.
- Efficient rabies surveillance and diagnosis remains an important issue in the Philippines and the United Republic of Tanzania.
- Transferring funds from WHO headquarters to country offices and thereafter to recipient governmental institutions at national, provincial/regional levels is too lengthy a process.
- Spending funds once they have been received is also delayed by national, provincial or regional financial procedures.
- At country level, additional delays were reported in all sites particularly in conducting dog mass vaccination campaigns, which represent the largest project cost component, and other activities both at national and regional or provincial levels.

#### 4.5 *International coordination*

- Vaccine acquisition for the projects in KwaZulu-Natal and the Philippines was problematic in 2012 for different reasons: in KwaZulu-Natal the manufacturer had a problem with bottling and labelling that delayed shipping by almost 2 months; in the Philippines another order for the same vaccine (and vaccine quantity initially) issued in early 2012 by the WHO Country Office in Manila on behalf of the Bureau of Animal Industry of the Philippines created confusion for the manufacturer and the International Coordinator's Office in Geneva and delayed delivery by a few months. In both situations, the gap was filled with a vaccine stock 'swap' (a loan of vaccine doses available locally) organized with the local representative of the vaccine manufacturer.
- The review meeting in the United Republic of Tanzania was organized in February 2012. This emergency meeting should have been held in January but the International Coordinator was on an involuntary contract break. Her contract was renewed only as from early February 2012.

- WHO headquarters made a number of project-specific fund transfers to benefit coordination by country offices of funds to national provincial or regional institutions in project sites. Some differences in disbursements were recorded among project sites:
  - KwaZulu-Natal: >99% of the provisional project allocation transferred (in February);
  - Philippines: ~100% transferred (from January to May); and
  - United Republic of Tanzania: >92% transferred (from January to end of April).

## 5. Related research projects

### 5.1 'Understanding how a complex intervention works: designing large-scale vaccination programmes' – UK Medical Research Council (MRC) project

- The MRC project runs from July 2010 to July 2014 and aims to provide useful data analysis and modelling support to the Gates Foundation–WHO rabies projects. The goals of this project are set by the requirements of each project, so suggestions of ways in which it can contribute are always welcome. The project is coordinated by Sunny Townsend at the University of Glasgow, working closely with other researchers from Glasgow (Katie Hampson, Dan Haydon, Sarah Cleaveland, Tiziana Lembo) and in collaboration with personnel from all Gates Foundation–WHO project sites.

#### Update on activities in 2012

- The MRC project provides funding support for Professor Louis Nel's MSc student Nardus Mollentze at the University of Pretoria. Between January 2010 and June 2011, Nardus sequenced rabies virus from 192 animals in KwaZulu-Natal; he was hosted for 2 months at the University of Glasgow for support with data analysis. A collaboration was established with Samuel Soubeyrand (researcher at the Institut National de la Recherche Agronomique (INRA), France) to develop new techniques for data analysis. A paper is in preparation on the methods and findings on rabies transmission in KwaZulu-Natal. A video reconstruction of rabies transmission in KwaZulu-Natal is available on request from Sunny Townsend.
- A household survey of Region 6 of the Philippines to assess vaccination coverage has been devised and is under way. The survey is being implemented by Dr Joji Jimenez (Department of Health in Region 6) and supervised by Dr Raffy Deray, with additional support from Mona Consunji and Paul Abara (Animal Welfare Coalition Philippines).
- The project liaison officer in the Philippines resigned.
- An online data management system designed specifically to capture rabies-related data has been developed in collaboration with professional database designer John Friar of the not-for-profit organization Wise Monkey Foundation (<http://www.wisemonkeyfoundation.org/>).
- An article on how surveillance quality can affect prospects for rabies elimination will be published.<sup>2</sup> Its findings are:
  - In endemic countries and areas without a history of rabies, it is likely that only 5–10% of cases are detected.
  - Incidence is likely to be <0.05% per annum or <0.005% of dogs in any one month. This low incidence means that random sampling is not an effective surveillance strategy for rabies. Surveillance should be improved by targeting

<sup>2</sup> Townsend SE et al. Surveillance guidelines for disease elimination: a case study of canine rabies. *Comparative Immunology, Microbiology and Infectious Diseases*, 2012 (available at <http://dx.doi.org/10.1016/j.cimid.2012.10.008>; accessed February 2013).

‘suspect’ animals, defined as biting animals or animals behaving strangely that have died or been killed. Where possible, outbreak investigations should be triggered by incidence of bites by suspect rabid dogs, as this should improve case detection and is particularly important once rabies is under control and elevated surveillance is needed to detect remaining foci.

- Proactive mass dog vaccination is much more effective at controlling rabies and no more costly than vaccination campaigns initiated in response to case detection (reactive vaccination).
- If rabies elimination is the aim of the programme, mass vaccinations should be continued for a 2-year period following 6 consecutive months without any detected cases. Should decisions be taken to prematurely discontinue control activities during the 2-year monitoring period, sufficient surveillance mechanisms must be in place to prevent potentially disastrous consequences. These recommendations arise because rabies can re-emerge several years after cases are no longer being detected because persistent foci of infection in pockets of low coverage can spread as herd immunity wanes.

Activities planned so far for 2013

- Dr Matthew Maziku will visit Glasgow for one week to discuss data analysis for the project in the United Republic of Tanzania.
- Professor Sarah Cleaveland and Dr Tiziana Lembo will attend the South East African Rabies Group conference in February to participate in talks on planning a region-wide strategy for rabies elimination, building on the lessons and activities of the Gates Foundation–WHO project.

#### *5.2 ‘Evaluating data on estimating population sizes’ by Katie Hampson, presented by Sunny Townsend*

- All Gates Foundation–WHO rabies project sites have an interest in knowing the size of their dog populations as this determines demand for vaccine and can be used to estimate vaccination coverage. Population size can be estimated in two main ways: by household surveys and mark–recapture techniques. Guidance is lacking on how much effort is needed to ensure reliable estimates and whether this effort needs to vary depending on location, e.g. island vs city.
- The United Republic of Tanzania has been the focus of several studies on its dog population. In the Serengeti district in North Tanzania, a census of the dog population estimated the human:dog ratio (HDR) to be 5.4:1 (7:1 excluding pups). In a household survey of 30 households in each of 5 villages in the district, the HDR estimate was 5.2:1 (6.7 excluding pups), suggesting the survey was sufficient to be consistent with the census. The success of this methodology in estimating HDRs prompted a broader study, estimating the HDR for the United Republic of Tanzania to be 14:1,<sup>3</sup> which formed the basis for the dog population estimate projections used to develop the proposal for the Gates Foundation–WHO project. However, during the course of the project’s implementation, a survey of 30 households/villages and 5 villages in every district of the project site found that dog ownership was much less common than expected based on the projections. In fact, in some

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<sup>3</sup> Knobel DL et al. A cross-sectional study of factors associated with dog ownership in Tanzania. *BMC Veterinary Research*, 2008, 4:5 (available at <http://www.biomedcentral.com/1746-6148/4/5>; accessed February 2013).

districts only a single dog or a handful of dogs was recorded, making it difficult to accurately estimate important measures such as vaccination coverage. Furthermore, the unexpectedly small dog population size prompted a review of the vaccine requirements for the project.

- Lessons learnt from these studies include:
  - Point population estimates should be treated with caution;
  - Surveys need to explicitly include pups;
  - Estimation techniques should be tailored to the environment, culture and politics;
  - Vaccination campaigns should be revised in the light of experience (one-time campaigns are of little value) and post-campaign monitoring;
  - Overestimation is preferable to underestimation: having too much vaccine is better than having too little;
  - It is critical that all (sub)villages are reached for vaccination.

### *5.3 'Detailed surveillance and epidemiological studies' by Katie Hampson, presented by Sunny Townsend*

Work loosely grouped into three fields of study in the United Republic of Tanzania was presented:

- The first area of study is taking place on Pemba, an island within the Gates Foundation–WHO project area that is small enough for every rabies case to be traced. The study aims to identify remaining foci of infection as the island moves towards rabies elimination, how incursions happen and where they originate.
- The second looks at how to improve health services and surveillance.
  - Surveillance in the veterinary sector is being monitored to assess the functionality of the pipeline from sample collection in the field to laboratory confirmation. Where samples were not obtainable, DVOs have been asked to submit a mobile phone report instead. Whilst samples were submitted from most districts (146 in total), many more reports were made of suspect cases for which they could not obtain samples (627), suggesting there are barriers to sample collection that still need to be addressed.
  - In the health sector, monitoring is also being carried out on use of PEP, shortages in its supply and human deaths. Data were presented showing months when at least 1 patient had visited a clinic but had not been treated because no PEP was available, which indicated regions where distribution of PEP was still a problem (Dar es Salaam and Morogoro) and others where it had improved (Mtwara, Lindi and Pwani). The data have been presented and issues discussed (in September 2012) with MoHSW personnel, DCCOs and DMOs throughout the region. One proposed solution was SMS alerts to MoHSW when shortages or deaths occur.
  - An SMS intervention has been trialed as part of the PhD research of Zac Mtema (Ifakara Health Institute and University of Glasgow) to improve patient compliance with the PEP regimen. Data were presented showing the significant improvement in compliance in all patient groups (age, sex, etc.) when they received SMS reminders of their appointments.



- Third, regional patterns in rabies incidence and impacts of interventions are being investigated, largely using mobile phone surveillance data (Zac Mtema PhD research) and virus sequencing and phylodynamics (Kirstyn Brunker PhD research), assisted by the MRC project.

## 6. Conclusions and recommendations

### 6.1 Specific conclusions and recommendations by project site

#### 6.1.1 *KwaZulu-Natal*

- The agriculture sector/veterinary services should focus activities on dogs that were missed or not vaccinated during the annual mass immunization campaign. One area mobilized community health workers (CHWs) to identify unvaccinated dogs and carried out a mop-up after the mass campaign. As a consequence, no rabies cases have been reported for 2 years in this area. This is not a ‘weather-’ or ‘vehicle-’ dependent activity so mop-up activities will be conducted across other areas during the coming months.
- CHWs could also be involved in dog population surveys.
- Conducting mass campaigns over a shorter period should improve staff morale and reduce fatigue. This is planned for March to July 2013. Eventually campaigns could be carried out over a month ‘Mexico-style’.
- The planned creation of 28 000 new jobs in public health in KwaZulu-Natal should provide an opportunity to move from a central towards a community-based vaccination programme.
- Education should precede action: awareness teams providing education across the communities should precede vaccination teams.
- GonaCon trials should go ahead soon, depending on the approval of importation into South Africa.
- One of the major ongoing activities is building border-staff capacity and vaccine donation in border areas. During the SEARG meeting (Bagamoyo, United Republic of Tanzania, 12–14 February), a day will be set aside to discuss strategies for regional pathways, including sharing lessons learnt from the Gates Foundation–WHO project, and the use of molecular epidemiology in determining transmission pathways.

#### 6.1.2 *Philippines*

Improvements are needed to:

- dog vaccination coverage;
- assessment of coverage reports (the MRC project is offering support to conduct a post-vaccination household survey in one region of the project area, similar to that conducted in the United Republic of Tanzania in 2011);
- surveillance capacity and guidelines on samples quality and quantity.

#### 6.1.3 *United Republic of Tanzania*

Areas for improvement:

- delivery of PEP;

- coverage and monitoring (yearly household surveys with help from the UBS project), mapping of coverage and disease with help from the MRC project;
- surveillance through use of dRIT;
- local governments' involvement in funding rabies activities;
- medical-veterinary collaboration;
- sustainability, as the Tanzanian project has not yet received significant governmental financial support. The Government needs to be convinced to become a more active partner; funding should have been a milestone. A meeting with high-ranking officials should be organized by the WHO Country Office before the 2013 SEARG meeting and a visit paid to the permanent secretary of MoLHS to remind them of commitment.
- United Republic of Tanzania project (central and peripheral) staff should be invited to the SEARG meeting and their costs covered as this is a unique opportunity to showcase the project. The Ministry has agreed to support local staff attendance to SEARG meeting. It is critical that key personnel from MoH and MoL attend; if required, Gates Foundation–WHO project funds may be used.

#### *6.1.4 International coordination*

- The report required for the annual report to the Gates Foundation was summarized, partially for the benefit of the new coordinator of the project in the United Republic of Tanzania. Submission is due by 15 November; countries should provide technical and financial reports to WHO headquarters by 31 October 2012.

### 6.2 General conclusions and recommendations

#### *6.2.1 No cost extension*

- The principle of a no-cost extension was discussed by all stakeholders and accepted.
- Length of extension was based on estimated time for the project most delayed (Tanzania) to complete activities and reached objectives set out in the original plan and budget.
- The overall project has therefore been extended by 2 years with an end-date on 31 December 2015. A final review meeting should be held in the Gates Foundation in Seattle at the end of 2015. Annual ICG meetings will continue to be organized by the International Coordinator at the end of 2013 and 2014.
- The extension does not involve additional funding from the Foundation. The unspent monies accumulated during the 5 first years of implementation (2009-2013) amount of which varies greatly per project site, should be used during the extension phase according to the needs of the project and to an agreement between the national/provincial authorities, WHO and the Gates Foundation.
- Individual project sites having achieved the objectives set out in the original plan and budget or used all GF funding before 31 December 2015 may however chose to close their project earlier after providing necessary evidence to the International Coordinator and the Donor ahead of their decision.
- The Gates Foundation strongly recommended updating or modifying existing milestones accordingly.

### *6.2.2 Evaluation of the project*

- An evaluation of the project is required to (i) assess whether objectives are reached; and (ii) learn from achievements and decide how to disseminate results. The Gates Foundation emphasized that the objective of the project is evaluation, not just implementation, and that there is need to discuss what analysis would be useful and what statements the project wishes to share. In KwaZulu-Natal, recording of lessons learnt has started and should be supported by data, not anecdotes. For compilation and analysis of costs and findings and dissemination methods, it was suggested that lessons learnt be disseminated as project publications. The Gates Foundation will advise on this activity in due course.

### *6.2.3 Regional strategy for Africa*

- Regional strategies are needed so that key lessons learnt benefit other countries. However, Africa's commitment to a regional rabies elimination programme still needs to be elicited. A day will be set aside during the Gates Foundation–WHO sponsored SEARG meeting (Bagamoyo, United Republic of Tanzania, 12–14 February 2012, registration open) to discuss a regional strategy and how to make the best use of the lessons learnt during the first four years of the project's implementation.

### *6.2.4 Comparison of dog vaccination, surveillance and registration approaches*

- In KwaZulu-Natal, the centrally-led vaccination strategy causes fatigue in the small number of vaccinators having to vaccinate huge numbers of dogs each year, and the large distances hamper follow-up (e.g. assessing coverage and/or evaluating suspect cases). In the Philippines, implementation at the LGU level is considered key to sustainability. However, this was considered to be easier in the Philippines (urban, suburban and even rural) than in KwaZulu-Natal, particularly rural.
- Under those conditions, the reasons why rabies surveillance is poorer in the Philippines than in KwaZulu-Natal remain unclear, and improvement in the Philippines is encouraged.
- Individual dog registration in the Philippines was commended and there was interest in its use for decisions about PEP administration. It was suggested that data be collected on how much PEP is saved by having access to registration/vaccination records.

### *6.2.5 What constitutes success for the Gates Foundation?*

- Demonstration of the success of the strategy in the project areas is not enough. The Gates Foundation would also like to see that countries are vaccinating their dogs. Success can be claimed if the project reaches beyond its borders.

## **7. Closing remarks**

The International Coordinator reiterated the value of the project beyond its immediate objectives. He praised WHO's Regional Office for Africa for their renewed involvement in rabies control; the growth of the project in KwaZulu-Natal and the good results in the Visayas; the added value of the research in KwaZulu-Natal from the collaboration between the KwaZulu-Natal's project coordinator Mr K. Leroux and Professor L. Nel in Pretoria University; the University of Glasgow's continued support to the project in the United Republic of Tanzania and through the MRC project to the Visayas. Finally, he thanked Dr Raffy Deray, Ms Joy Tabotabo and Ms Jessa Kristine Pis-an for organizing the meeting and Dr Nyunt Soe for participating.

Dr Pantelias concluded that convening the meeting in the Philippines was worthwhile, despite the additional costs, as there was good interaction, enthusiasm and sharing of ideas. The no-cost extension should be used wisely without losing focus on the bigger picture, which is to disseminate models. She closed the meeting by inviting each country to consider the best way of reporting, using available evidence, on the outcome of the project.

## **Annex 1. List of participants**

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## Annex 2. Agenda

DAY ONE: 2 OCTOBER 2012		
Time	Session	Facilitator
09:00	<b>1: Welcoming addresses</b>	Dr Nyunt-U Soe, WR Philippines Anastasia Pantelias, and François Meslin
	<b>2: Progress reports from the project sites (technical) and WHO</b>	
	2.1. KwaZulu-Natal	Kevin Leroux
	2.2. Philippines	Raffy Deray
10:00–10:30	Coffee break	
	2.3. United Republic of Tanzania	Mathew Maziku
	2.4 WHO (includes Regional Office for Africa, Country Office Manila and headquarters)	L. Bidé, AFRO Nerissa Dominguez, Country Office, Manila and François Meslin
13:00–14:00	Lunch break	
	<b>3: Administrative and financial reports</b>	
	3.1. KwaZulu-Natal	Kevin Leroux
	3.2. Philippines	Raffy Deray
15:30–16:00	Coffee break	
16:00–18:00	3.3. United Republic of Tanzania	Mathew Maziku
	3.4. International coordination	François Meslin

DAY TWO: 3 OCTOBER 2012		
Time	Session	Facilitator
All day	<b>Field visit for all participants</b> 1/ Animal Bite Treatment Center (ABTC) in Madaue City (City Health Office). Important persons met in Mandaue city were: Dr. Edna Seno- City Health Officer of Mandaue City, Dr. Debbie Catulong - Medical Doctor In charge of the ABTC and Ms. Cheryl Tarona- Nurse of the ABTC. 2/ Local government of Lapu- Lapu City for the dog vaccination. Important person met in Lapu Lapu city was Mr. Kirby Meriposque- Barangay Secretary	Joy Tabotabo Raffy Deray
DAY THREE: 4 OCTOBER 2012		
Time	Session	Facilitator
08:30	<b>4: Reviewing project site activity plans for 2011/2012</b>	
	4.1. KwaZulu-Natal	Kevin Leroux
	4.2. Philippines	Raffy Deray
10:00–10:30	Coffee break	
	4.3. United Republic of Tanzania	Mathew Maziku
	4.4. International coordination	François Meslin
13:00–14:00	Lunch break	
	<b>5: Open discussion on challenges, opportunities and threats of project design and implementation</b>	All participants
15:30–16:00	Coffee break	
16:30–17:00	<b>6: Other business</b>	All participants
	<b>7: Conclusions and recommendations</b>	All participants
	<b>8: Closing session</b>	Anastasia Pantelias and François Meslin



### Annex 3. Specific results by project sites and WHO

A3.1 KWAZULU-NATAL (KZN)	
Objective 1: Collect or estimate baseline/denominator	
<b>Activity 1.1 Establish project-specific database to centrally store, manage and analyse data</b>	
<b>Achieved</b>	<ul style="list-style-type: none"> <li>- New database operational and proving invaluable, allowing more efficient analysis of case information and use of GIS.</li> <li>- Information on cases available and up to date.</li> <li>- Another database created for Department of Health to analyse dog bite cases and PEP; data uploading to start soon.</li> </ul>
<b>Activity milestone:</b> 1.1.1. Data on human population size, epidemiological data on human rabies cases and human exposures and resulting PEP administrations available from regional and national records and analysed. <b>Achieved</b>	<ul style="list-style-type: none"> <li>- Baseline data for human population available from 2011 population survey (<a href="http://www.statssa.com">www.statssa.com</a>).</li> <li>- Human case information available and of good quality.</li> <li>- Information on PEP administrations being researched in 2012; accurate information available for vaccine costs and distribution.</li> </ul>
<b>Activity 1.2 Collate data on dog population size</b>	
<b>Activity milestone</b> 1.2.1. Official information from national and international authorities and agencies available and analysed to estimate dog population. 1.2.2. Additional methods (direct observations of marked/unmarked dogs and/or rapid household surveys) implemented to refine estimates. <b>Partly achieved</b>	<ul style="list-style-type: none"> <li>- Dog ecology study by PhD student complete. Dog:per human ratios available and being analysed.</li> </ul>
<b>Activity 1.3 Collate data on animal rabies cases and submissions for diagnosis</b>	
<b>Activity milestone</b> 1.3.1. Epidemiological data on animal rabies cases and sample submissions available from regional and national records and analysed. <b>Achieved</b>	<ul style="list-style-type: none"> <li>- Surveillance of excellent standard; one laboratory accredited for 'control disease' testing.</li> <li>- More than 874 samples processed in 2012 (24% positive).</li> <li>- Systems of sample collection and submission being improved through supply of transport packaging for veterinarians and field staff.</li> <li>- New biosafety laboratory 2 in northern part of the province should become operational soon.</li> </ul>
<b>Activity 1.4 Collate existing geographical information system data, topography and geographical data</b>	
1.4.1. GIS in-country capacity assessed and GIS as well as geographical and topographical data compiled and applied to surveillance. <b>Achieved</b>	<ul style="list-style-type: none"> <li>- Three GIS sections available to the project.</li> </ul>
Objective 2: Improve targeted delivery of PEP	
<b>Activity milestone</b> 2.1 After 3 years 100% of rabid animal-bite victims reporting to clinics within the study area receive post-exposure vaccination according to WHO guidelines. 2.2 After 3 years the number of unnecessary PEP is reduced by half. 2.3 After 5 years the number of unnecessary PEP is reduced by 80%.	<ul style="list-style-type: none"> <li>- Good network of rabies action groups (13) established and/or revived across the province, from where training launched into the field.</li> <li>- 2012 vaccine stocks increased; currently no shortages (John Friggens, head of Provincial Medical Stores).</li> <li>- 5th doses of Essen intramuscular PEP regimen removed; 'short Essen regimen' now part of national PEP guidelines.</li> </ul>

<p>2.4 Build community awareness of methods to prevent rabies infection.</p> <p>2.5 Monitoring and evaluation.</p> <p>As exemplified by the 'Cluster' of rabies deaths reported (some not having received appropriate PEP) during this 4<sup>th</sup> year of implementation achieving these milestones within these timelines is very challenging due in particular to lack of commitment from the human health sector. When delivered PEP is of high standard in KZN</p>	<ul style="list-style-type: none"> <li>- New vaccination posters printed for distribution (minutes of provincial RAG).</li> <li>- Toll-free help line available for medics.</li> <li>- Training days held at provincial centres by local CDC.</li> <li>- Database created to monitor PEP in hospitals and clinics.</li> <li>- HRIG freely available; training provided to ensure efficient use.</li> <li>- Intradermal route (ID for PEP and PreEP) rejected by MCC; new push to approve ID.</li> <li>- New booklets and treatment DVDs produced and distributed to doctors and nurses (400); further 3000 being printed due to high demand.</li> <li>- SOPs for PEP available and agreed nationally.</li> </ul>
<b>Objective 3: Implement domestic dog rabies control/elimination programmes</b>	
<b>Activity 3.1</b> Procure dog vaccines and equipment, and establish systems to monitor their usage.	
<b>Achieved</b>	<ul style="list-style-type: none"> <li>- 10 000 multi-dose vials of dog rabies vaccine received through stock swap with manufacturer's local representative to fill gap; 50 000 vials ordered by WHO country office only received end October 2012; provincial tender made for 20 000 multi-dose vials following shortage from increased vaccinations.</li> <li>- New temperature monitoring system installed at laboratory to monitor and report changes in vaccine storage.</li> <li>- New cooler boxes bought for technicians to ensure better management of cold chain.</li> <li>- All basic equipment in place and provisions being made for 2013.</li> <li>- System of 'compulsory source document' instituted for communities to ensure official recording of completion.</li> <li>- Extra dog catching and control equipment procured for staff.</li> <li>- Pole syringe system improved to ensure humane use.</li> </ul>
<b>Activity 3.2</b> Establish agreed protocols and SOPs for dog vaccination campaigns and dog population management	
<b>Achieved and ongoing</b>	<ul style="list-style-type: none"> <li>- SOPs developed by KZN used internationally (rabies blueprint).</li> <li>- Other SOPs being developed and improved.</li> </ul>
<b>Activity 3.3</b> Carry out training of personnel (vaccination and dog population management).	
<b>Achieved and ongoing</b>	<ul style="list-style-type: none"> <li>- Training course developed.</li> <li>- 47 SPCA members trained throughout province to assist with vaccinations.</li> <li>- 108 people seconded by Durban municipality for training: 8 trained and involved in Durban campaign; approval pending for others.</li> <li>- 125 new vaccinators (extension assistants) trained and integrated into SV offices.</li> <li>- Project played important role in creating new clinics at welfare organizations, which with project support for drugs and training are serving communities in key areas.</li> <li>- ZAR 20 million project to sterilize pets in KZN begun and achieving good results.</li> </ul>

<b>Activity 3.4</b> Build community awareness of dog vaccination and responsible dog ownership	
<b>Achieved and ongoing</b>	<p>Rabies awareness high in 2012 following cluster of human deaths reported early 2012:</p> <ol style="list-style-type: none"> <li>1. ZAR 1.8 million (&gt;US\$ 206 000) spent on formal communication channels.</li> <li>2. First TV commercial produced and broadcast.</li> <li>3. High radio and newspaper coverage (good and bad) doubled vaccination figures in many areas.</li> <li>4. National awareness achieved unprecedented impact and response.</li> </ol>
<b>Activity 3.5</b> Conduct mass vaccination campaigns	
<b>Achieved</b>	<ul style="list-style-type: none"> <li>- In 2011, 170 446 pets vaccinated due to FMD disruption. By September 2012, 516,195 dogs and cats vaccinated, including dramatic increase in coverage in northern areas.</li> <li>- New follow-up strategy for unvaccinated dogs promises to increase coverage, as in Sisonke (rabies-free for 2 years).</li> </ul>
<b>Objective 4: Improve surveillance/diagnostic systems</b>	
<p>Activity 4.1: Procurement of equipment and reagents</p> <p>Activity 4.2 Agree and adopt standard techniques of sample collection and diagnosis</p> <p>Activity 4.3 Carry out training of field and laboratory personnel in sampling techniques and laboratory diagnostics.</p> <p>Activity 4.4 Monitoring and evaluation.</p> <p><b>Achieved</b></p>	<ul style="list-style-type: none"> <li>- Surveillance of a very high standard; laboratory accredited by national department for disease-control testing; preparing for SANAS accreditation.</li> <li>- Of 874 (570 in 2011) samples processed in 2012, 24% (27% in 2011) tested positive.</li> <li>- Of further 121 samples processed from Eastern Cape, 96 tested positive.</li> <li>- All positive cases typed at the laboratory.</li> <li>- Brain and blood bank created for sample storage and testing (2376 samples stored).</li> <li>- Systems of sample collection and submission being improved through supply of transport packaging for veterinarians and field staff.</li> <li>- Serological laboratory established at Allerton for and inter-laboratory quality assurance testing.</li> <li>- All equipment and consumables in place for new laboratory at Vryheid under final renovation.</li> </ul>
<b>Objective 5: Ensure long- term sustainability of the project</b>	
<p><b>Activity 5.2</b> Identify zones for continued vaccination and border control</p> <p><b>Achieved</b></p>	<ul style="list-style-type: none"> <li>- Evaluation of border areas to assess danger of reintroduction of the disease completed.</li> <li>- Collaboration with neighboring provinces established; SOPs shared and training conducted.</li> </ul>
<p><b>Activity 5.3</b> Establish international collaboration</p> <p><b>Achieved</b></p>	<ul style="list-style-type: none"> <li>- Agreements in place with neighbouring countries to improve vaccinations and surveillance in border areas and prevent reintroduction of the disease.</li> <li>- Training of staff across borders to start in November 2012.</li> <li>- KZN supplies vaccine to certain areas in these countries to ensure vaccinations are done.</li> <li>- Further support and funding for continuation of the programme sourced from the private sector.</li> </ul>
<p><b>Activity 5.4</b> Agreed financing between local ministries and local government units <b>Achieved</b></p>	<ul style="list-style-type: none"> <li>- Financial assistance in place adequate for control and programme maintenance.</li> </ul>
<b>Activity 5.5</b> Identify response strategies to new	<ul style="list-style-type: none"> <li>- New cases investigated to establish movement</li> </ul>

cases	pathways.
<b>Achieved and improvement under way</b>	<ul style="list-style-type: none"> <li>- Molecular identification of virus strains involved to trace transmission histories performed to establish appropriate response.</li> <li>- Outbreak response strategies in place; ring vaccinations in 20-km radius of outbreak.</li> </ul>

### A3.2 PHILIPPINES

Philippines	
Objective 1: Collect or estimate baseline/denominator data	
1.1 Collate data on human population <b>Achieved</b>	DOH Circular 2009–0129 “Estimated population for 2008–2010”
1.2. Collate Dog population data <b>Achieved</b>	Data collected from provincial and city veterinary offices and incorporated in annual project report. Dog registry in barangays, some cities and municipalities.
1.3 Collate data on animal rabies and cases submission for diagnosis <b>Achieved</b>	Annual accomplishment report on animal bite cases and human rabies cases. Data collected from provincial and city veterinary offices and rabies diagnostic laboratories and incorporated in annual project report.
1.4 Collate existing geographic information system, data, topography and geography data <b>Ongoing</b>	Data are being collated.
1.5 Collate existing data on dog movement <b>Achieved</b>	Data collected from quarantine service and incorporated in annual project report.
Objective 2: Improve targeted delivery of PEP and PrEP according to WHO guidelines	
2.1 Develop and agree on inter-agency protocols <b>Achieved</b>	2 administrative orders issued (AO 2007-0029 and 2009-0027) by DOH and joint DOH- DA AO on managing rabies exposures from bites vaccinated dogs and cats.
2.1. Procure amount of biological <b>Achieved</b>	NCDPC- IDO regularly procure and provide CCVs and ERIG to all project sites. Validation by procurement order, inspection reports, bill of lading, vaccine and allocation lists, and other documents.
2.3 Training to ensure appropriate administration of PEP and management of bite <b>Achieved</b>	Training on how to manage animal bites/rabies exposures conducted by NCDPC/CHD when needed. Validation by attendance sheets and regional special order confirming participation.
2.4 Build community awareness of methods to prevent rabies infection <b>Achieved</b>	IEC materials produced, health promotion planning and interventions conducted by region to province down to municipalities, cities and barangays; includes health education for schoolchildren.
2.5 Monitoring and Evaluation <b>Achieved</b>	Department personnel order and travel expense vouchers issued for monitoring and evaluation visits; travel reports.
Objective 3: Implement domestic dog rabies control/ elimination programmes	
3.1 Procure dog vaccines and equipment and establish system for their usage <b>Achieved</b>	WHO- procured vaccines received by RITM warehouse and allocated to all provinces/cities/ municipalities through CHDs. Validation by bill of lading and allocation list from all levels.
3.2 Establish agreed protocols and SOPs for dog vaccination campaign and dog population management (DPM) <b>Achieved</b>	Issuances from Department of Agriculture.
3.3 Training of personnel (vaccination and DPM)	Vaccinators trained in all provinces of Western, Eastern and Central Visayas.

<b>Achieved</b>	Special order, attendance sheets and expense vouchers for activity.
<b>3.4</b> Build community awareness on dog vaccination and responsible pet ownership (RPO) <b>Partially achieved, ongoing</b>	Orientation on responsible pet ownership conducted in all provinces of Western, Eastern Central Visayas. Special order, attendance sheets and expense vouchers for activity.
<b>3.5</b> Conduct mass vaccination campaign Partially achieved still on-going, dog vaccination is usually carried out until end of November	Report on dog vaccination coverage submitted by respective provincial/city veterinarians.
<b>Objective 4. Improve surveillance/diagnostic system</b>	
<b>4.1</b> Procure equipment and reagents for rabies diagnosis <b>Not achieved</b>	Not requested yet.
<b>4.2</b> Agree and adopt standard techniques of sample collection and diagnosis <b>Achieved</b>	Issuances from Department of Agriculture.
<b>4.3</b> Carry out training of field and laboratory personnel in sampling technique and laboratory diagnosis <b>Partly achieved</b>	Training not requested by all LGUs.
<b>4.4</b> Monitoring and evaluation <b>Achieved</b>	Travel expense voucher, special order and narrative reports for visit.
<b>Objective 5: Ensure long- term sustainability of the project</b>	
<b>5.1</b> Identify and define rabies free zones Achieved	Joint DOH-DA Department Order: <i>Guidelines on declaring areas as rabies-free zone - Declaration of the Province of Biliran and Limasawa Island of North Leyte in September 2012.</i>
<b>5.2</b> Identify zones for continued vaccination and border control <b>N/A</b>	The Philippines is an archipelago and shares no borders.
<b>5.3</b> Establish international collaboration <b>N/A</b>	The Philippines is an archipelago and shares no borders.
<b>5.4</b> Agree financing between local ministries And local government units <b>Achieved, ongoing</b>	<b>To be discussed further at next regional and provincial project review.</b>
<b>5.5</b> Identify response strategies to new cases Partially achieved	Existing national rabies prevention and control program manual of operations being updated; National rabies information system being developed for easy updating of new cases.

### A3.3.UNITED REPUBLIC OF TANZANIA

PART 1: SPECIFIC RESULTS FOR 2011	
Objective 1: Collect or estimate baseline/denominator data	
<b>Activity 1.1</b> Systems established to store and analyse data.	
A functional data management system using Excel and Access software is used to record, analyse, and manage project data. <b>Achieved</b>	<ul style="list-style-type: none"> <li>- IDWE and mobile-phone data reported from most project districts recorded, analysed and stored in Excel worksheets at WCO;</li> <li>- Data on human population for project areas from national bureau of statistics periodically used (at <a href="http://www.nbs.go.tz">http://www.nbs.go.tz</a>).</li> </ul>
<b>Activity 1.2 Collate data on dog population</b>	
Data on estimated dog population and vaccination coverage for each LGA is generated and maintained. <b>Achieved</b>	<ul style="list-style-type: none"> <li>- WCO, ministries and LGAs established baseline dog population during household survey in August 2011: 152 045–217 207 dogs (not 400 000 as previously reported).</li> <li>- These data continually referred to when estimating dog vaccination coverage and budgeting.</li> </ul>
<b>Activity 1.3 Collate data on animal rabies cases and submissions for diagnosis</b>	
Data on animal rabies cases and samples submission from 2005 to date are collected, analysed and used to generate reports for decision-making to eliminate rabies at source. System to collect and submit samples from LGAs to diagnostic laboratories is operational. <b>Achieved</b>	<ul style="list-style-type: none"> <li>- 4 LGAs of Morogoro region submit brain specimens to SUA Vet Lab; 12 LGAs of Lindi and Mtwara region submitted samples to VIC Mtwara; and 8 LGAs in Coast and Dar es Salaam regions submitted samples to VIC Temeke; while Pemba submitted to CVL Temeke.</li> </ul>
<b>Activity 1.4 Collate existing geographical information system, topography and geographical data</b>	
Geographical information is available from all project districts. This information is now applied for rabies surveillance. <b>Partly achieved</b>	<ul style="list-style-type: none"> <li>• A few staff with GPS handsets reported geo-referenced data on village locations, points of occurrence of human bites, rabies cases, mortalities and sample collection points, etc.</li> <li>• CVL Temeke and SUA Vet Labs developed and using SOPs to submit geo-referenced laboratory samples.</li> </ul>
<b>Activity 1.5. Collate data on dog movements</b>	
Locations of zoo-sanitary and police check points for studying dog movements are strengthened and mapped. <b>Not achieved</b>	<ul style="list-style-type: none"> <li>- Strengthening 29 zoo-sanitary checkpoints planned in 2012 and 2013 for monitoring dog movements.</li> <li>- Studying and mapping dog movements and rabies virus genetic translocation; staff training on regulatory control of dog movements planned in 2012.</li> </ul>
Objective 2: Improve targeted delivery of PEP	
<b>Activity 2.1 Training</b>	
Rabies cases and PEP administration improved through short training sessions. <b>Partly achieved</b>	<ul style="list-style-type: none"> <li>- No group formally trained in 2011; however, medical staff trained on the job by 60 fellow health staff trained on ID administration and stock management in 2010.</li> </ul>
<b>Activity 2.2 Develop and agree interagency protocols</b>	

<p>The LGAs adopts the Ministry Order to shift from IM to ID route in administering ARVs as recommended by WHO.</p> <p><b>Partly achieved</b></p> <p>A few of the 60 health staff (nurses and health officers) trained to administer ARV by intradermal route are still using IM.</p>	<p>96 health facilities in entire project area providing PEP services using recommended WHO SOPs and government circular.</p>
<b>Activity 2.2 Vaccines procurement and monitoring</b>	
<p>Government and/or WHO procedures for procurement of biological are followed.</p> <p><b>Achieved and ongoing</b></p> <p>Use of anti-rabies biologicals and equipment in health facilities is monitored quarterly.</p>	<ul style="list-style-type: none"> <li>- report from health facilities and MoHSW supervision missions shows that of 8000 ARV vials procured in 2011, Dar es Salaam and Morogoro regions are leading consumers: ID/IM routes consumption ratios 150/280 vials (Morogoro) and 25/300 vials (Dar es Salaam).</li> <li>- Lindi and Pemba stopped using IM route; similar reductions in Coast and Mtwara regions. Funds and mechanisms set to enable two major consumers of ARV (Dar es Salaam and Morogoro) to shift from IM to ID route.</li> <li>- In collaboration with Ifakara Health Institute, supply and use of biologicals monitored through mobile phone reporting system linked to website accessible also by WCO and MoHSW.</li> </ul>
<b>Objective 3: Implement domestic dog rabies control/elimination programme</b>	
<b>Activity 3.1 Procure dog vaccines and equipment, and establish systems to monitor their usage</b>	
<p>Dog vaccines and equipment for vaccination procured.</p> <p><b>Achieved</b></p> <p>No vaccine was purchased but vaccine in storage and equipment were distributed to field level as required</p> <p>Dog vaccination registers updated for monitoring of vaccine usage</p> <p><b>Achieved</b></p> <p>Mobile phone system to monitor vaccines and equipment usage introduced to the entire project area</p> <p><b>Achieved</b></p>	<ul style="list-style-type: none"> <li>- No animal anti-rabies vaccine purchased; but total of 70 200 doses distributed to 17 LGAs and VIC Mtwara to support second phase of dog vaccination campaign. No vaccination equipment procured from 2011 budget as enough stock in districts and at MLFD stores.</li> <li>- Local use of animal vaccines monitored by field staff with mobile phones. Also, DVO reports final vaccination data to MLFD.</li> </ul>
<b>Activity 3.2 Establish protocols and standard operating procedures (SOPs) for dog vaccination campaigns and dog population management.</b>	
<p>SOPs for mass dog vaccination are available and used during dog vaccination campaigns and population management by each LGA.</p> <p><b>Partially achieved</b></p>	<ul style="list-style-type: none"> <li>- SOPs for guiding mass dog vaccinations and surveillance widely used by LGAs; however, SOP/protocol for dog population management not yet developed.</li> </ul>
<b>Activity 3.3: Carry out training of personnel (vaccination and dog population management)</b>	
<p>Livestock personnel have capacity to execute project activities effectively.</p> <p><b>Partly achieved</b></p>	<ul style="list-style-type: none"> <li>- 57 DVOs and dog vaccinators trained in rabies surveillance, vaccination SOPs and dog population management techniques in 3 regions (17 LGAs) of Mtwara, Lindi and Coast.</li> <li>- DVOs and community leaders in rural and urban communities made aware of rabies prevention and control strategies.</li> </ul>
<b>Activity 3.4 Build community awareness on dog vaccination and responsible dog ownership</b>	
<p>Dog keepers and the general community are aware of rabies and its prevention measures</p>	<ul style="list-style-type: none"> <li>- MLFD, MoHSW and DVOs, wards and village executive officers and Shehiya leaders</li> </ul>



<b>Partly achieved</b>	conducted sensitization meetings and radio/TV programmes to community members in villages and streets before vaccination campaigns in Mtwara, Lindi, Coast regions and Pemba.
<b>Activity 3.5 Conduct mass dog vaccination campaigns</b>	
Ensure that rabies is eliminated by maintaining vaccination coverage equal to or above 75% of dog population in each LGA.  <b>Partly achieved</b>	- Total of 29 819 dogs and 9126 cats vaccinated during second phase in Mtwara, Lindi, Coast regions and Pemba in July 2012, an increase from 23 669 dogs and 6309 cats vaccinated in the same areas in 2010.
<b>Objective 4: Improve surveillance and diagnosis</b>	
<b>Activity 4.1 Procure equipment and reagents</b>	
LGAs and diagnostic laboratories of SUA Vet Lab and CVL Temeke are supported with equipment and test reagents/chemicals. Ensure that LGAs submit brain specimen to recommended labs for testing against rabies.  <b>Achieved</b>	- Various sample collection equipment, parts for microscopes and reagents and chemicals procured for CVL Temeke and SUA Vet Lab. - Sample testing reports from SUA and CVL show total of 76 specimen from 19 LGAs tested at SUA and CVL in 2011–2012 compared with 62 samples in 2010–2011; however, out of 76 collected between November 2011 and September, 2012, only 63 tested at laboratories and 39 were positive (61.9%).
<b>Activity 4.2 Agree and adopt standard techniques of sample collection and diagnosis</b>	
LGAs and diagnostic laboratories are using standard techniques and that field and lab personnel are trained in sampling techniques and rabies diagnostics.  <b>Partly achieved</b>	- 57 DVOs and dog vaccinators trained on SOPs for rabies surveillance, sampling skills and vaccination and dog population management in 3 regions (17 LGAs) of Mtwara, Lindi and Coast.
<b>Activity 4.3 Monitoring and evaluation (submission and positivity rates, bite injuries, human deaths)</b>	
System for surveillance is functional whereby rabies outbreak alerts, sample submissions, animal bites and human mortalities data are reported by staff with mobile-phones and IDWE health information systems.  <b>Achieved</b>	- Data are reported by staff. For example in 2011, of 268 animal bites, dogs responsible for 67.5%, cats 4.05%, livestock 4.8% and wildlife (mainly jackals) 26.5%. - However, the positivity rates in dog samples (44%) remain high, and increased vaccination coverage and reduction in numbers of stray dogs required.
<b>Objective 5. Project coordination, monitoring and evaluation</b>	
The Technical and Steering Committee continues overseeing Project Implementation and Management which include approving annual plans and budget, monitoring performance, and coordination activities.  <b>Achieved</b>	- In 2011 plan, meetings of project technical committee convened in March 2012 and steering committee in May 2012. - Steering committee meeting held alongside advocacy meeting attended by 52 key government leaders.

PART 2: SPECIFIC RESULTS FOR 2012	
<b>Objective 1: Collect or estimate baseline/denominator data</b>	
<b>Activity 1.1 Systems established to store and analyse data</b>	
<p>A functional data management system using Excel and Access software is used to record, analyse and manage project data.</p> <p><b>Partly achieved</b></p>	<ul style="list-style-type: none"> <li>- IDWE and mobile-phone data reported from most project districts continually recorded, analysed and stored in Excel worksheets at WCO.</li> <li>- Data on human population from national bureau of statistics for project areas periodically used (at <a href="http://www.nbs.go.tz">http://www.nbs.go.tz</a>).</li> </ul>
<b>Activity 1.2 Collate data on dog population size</b>	
<p>Data on estimated dog population and vaccination coverage for each LGA is maintained.</p> <p><b>Partly achieved</b></p>	<ul style="list-style-type: none"> <li>- WCO, ministries and LGAs maintain baseline dog population data report (with dog population of 152 045–217 207) for whole project areas as determined by August 2011 households survey.</li> <li>- Other statistically accepted methods for estimating dog vaccination coverage using capture-mark-and recaptured method being learnt for application in future mass vaccination campaigns.</li> </ul>
<b>Activity 1.3 Collate data on animal rabies cases and submissions for diagnosis</b>	
<p>Data on animal rabies cases and samples submission from 2005 to date are collected, analysed and used to generate reports for decision-making to eliminate rabies at source.</p> <p><b>Achieved</b></p> <p>System to collect and submit samples to diagnostic laboratories to diagnostic laboratories is operational.</p> <p><b>Ongoing</b></p>	<ul style="list-style-type: none"> <li>- Information in LGAs continually shared among veterinary and medical public health sections (in line Ministries) and relevant departments.</li> <li>- 24 LGAs in project area to continue to submit brain specimens to SUA Vet Lab and CVL Temeke while observing set SOPs.</li> </ul>
<b>Activity 1.4 Collate existing geographical information system, topography and geographical data</b>	
<p>1.4.1. Geographical information is available from all project districts. This information is now applied for rabies surveillance.</p> <p><b>Partially achieved - ongoing</b></p>	<ul style="list-style-type: none"> <li>• GPS handsets continually used to report geo-referenced human bites, rabies cases, sample collection points, etc.</li> <li>• CVL Temeke and SUA Vet Labs to continue to use SOPs to submit geo-referenced samples.</li> <li>• Extended use of GPS data on mass dog vaccination sites and coverage, checkpoints, clinical animal rabies cases, risk areas (high, medium and low) planned for mapping project impacts.</li> </ul>
<b>- Activity 1.5. Collate data on dog movements</b>	
<p>1.5.1 Locations of zoo-sanitary and police check points for studying dog movements are strengthened and mapped.</p> <p><b>Not achieved</b></p>	<ul style="list-style-type: none"> <li>- Strengthening 29 zoo-sanitary checkpoints planned in 2012 and 2013 budgets for improving regulatory monitoring of dog movements.</li> <li>- Activity to study and map dog movements, rabies virus genetic translocation and staff training on regulatory control of dog movements planned in 2012.</li> </ul>
<b>Objective 2: Improve targeted delivery of PEP and PrEP</b>	
<b>Activity 2.1 Develop and agree interagency protocols</b>	
<p>The LGAs adopts the Ministry Order to shift from IM to ID route in administering ARVs as recommended by WHO.</p>	<ul style="list-style-type: none"> <li>- As per supervision mission in October, 2012, most LGAs in Dar es Salaam and Morogoro still using ID route; however, budget to procure</li> </ul>

<b>Partially achieved</b>	proper syringes for 24 LGAs and Pemba included in 2012 annual plan to facilitate needed shift.
<b>Activity 2.2 Procure necessary biologicals and establish system to monitor utilization</b>	
(a) Government or WHO procedures for procurement of biological is followed. (b) utilization of anti-rabies biologicals and equipment in health facilities is monitored. <b>Partially achieved</b>	<ul style="list-style-type: none"> <li>- No biologicals procured by Ministry of Health and Social Welfare for project districts.</li> <li>- Returns on use of biologicals and report being compiled following supervision in October 2012.</li> </ul>
<b>Activity 2.3 training to ensure appropriate administration of PEP/PreP and management of animal bite injuries</b>	
Training of health staff to ensure appropriate administration of PEP/PreP and management of animal bite injuries has been going on. <b>Achieved</b>	<ul style="list-style-type: none"> <li>- A total of 5 regional and 24 district cold chain coordinators (RCCOs and DCCOs) trained on PEP usage in October 2012.</li> </ul>
<b>Activity 2.4 Build community awareness of methods to prevent rabies infection</b>	
Media campaign on appropriate wound care, assessing need for PEP and control of dog rabies through vaccination conducted and educational materials printed and disseminated. <b>Not achieved</b>	<ul style="list-style-type: none"> <li>• No educational materials produced and disseminated due to delayed approval of funds for 2012.</li> <li>• Plan and funds for production and dissemination of educational materials (6000 posters, 30 000 leaflets, and TV and radio spots for 24 weeks set for 2012.</li> </ul>
<b>Activity 2.5 Monitoring and evaluation</b>	
Data on human delivery of anti-rabies biological (PEP and RIGs) were collected and analysed by the project coordinating unit. Most of data were collected from the MoHSW weekly reporting (IDWE).  Entering of data in the Data software systems (excel and Ms Access) was not consistently done due to absence of data clerk/manager. <b>Partly achieved</b>	<ul style="list-style-type: none"> <li>- Supervision and technical backstopping missions in 101 health facilities providing PEP completed in October 2012. LGA routine reporting of supplies from MoHSW and use of anti-rabies biological at health facilities appears irregular.</li> <li>- Number/incidence of human rabies cases declining from 15 deaths in 2009 to 9 in 2010, 6 in 2011 and none by September 2012.</li> </ul>
<b>Objective 3: Implement domestic dog rabies control/elimination programmes</b>	
<b>Activity 3.1 Procure dog vaccines and equipment, and establish systems to monitor their usage</b>	
<ul style="list-style-type: none"> <li>- Dog vaccines and equipment for vaccination procured.</li> <li>- Dog vaccination registers updated for monitoring of vaccine usage.</li> <li>- Mobile phone system to monitor vaccines and equipment usage maintained in the entire project area.</li> </ul> <b>Partly achieved</b>	<ul style="list-style-type: none"> <li>- No dog vaccines procured in 2011; however, up to June 2012, MLFD had balance of 150 000 doses enough for vaccination cycle in all LGAs.</li> <li>- Total of 150 dog registers and 35 000 vaccination (health) certificates distributed to LGAs in Mtwara, Lindi and Coast regions and Pemba.</li> </ul>
<b>Activity 3.2 Establish protocols and standard operating procedures (SOPs) for dog vaccination campaigns and dog population management</b>	
Protocols for dog vaccination distributed to the districts and were/are used during mass dog vaccination campaigns. <b>Not achieved</b>	<ul style="list-style-type: none"> <li>- No LGAs started mass dog vaccinations as part of 2012 plan of work.</li> <li>- Plan to prepare and implement protocol/SOPs for dog population management and responsible dog management to be developed.</li> </ul>
<b>Activity 3.3 Build community awareness of dog vaccination and responsible dog ownership</b>	
Education materials printed/produced for awareness creation of dog vaccination and responsible dog ownership.	<ul style="list-style-type: none"> <li>- No fact sheets, posters and brochures produced or distributed to communities during reporting period.</li> </ul>

<b>Partly achieved</b>	- Educational rabies films shown in 9 primary and 3 secondary schools in 3 municipalities of Dar es Salaam region during World Rabies Day 'week' (21–28 September 2012).
<b>Activity 3.4 Conduct mass dog vaccination campaigns</b>	
The third phase of mass dog vaccinations is completed in 24 LGAs by July 2013. <b>Not achieved</b>	- Necessary equipment for vaccination campaign in 7 LGAs of Morogoro and Dar es Salaam regions procured in April 2012 ready for distribution. - Other preparations to start third phase of mass dog vaccinations in 7 LGAs of Dar es Salaam and Morogoro regions being completed.
<b>Objective 4: Improve surveillance/diagnosis</b>	
<b>Activity 4.1 Procure equipment and reagents</b>	
Various equipment and laboratory chemicals to facilitate rabies surveillance and diagnosis in project districts available. <b>Not achieved</b>	- No reagents or chemicals purchased.
<b>Activity 4.2 Agree and adopt standard techniques of sample collection and diagnosis</b>	
LGAs and diagnostic laboratories are using standard techniques and that staff are trained in sampling techniques and diagnostics. <b>Not achieved</b>	- Workplan on surveillance activities prepared and shared by ministries.
<b>Activity 4.3 Monitoring and evaluation (submission and positivity rates, bite injuries, human deaths)</b>	
System for surveillance is available whereby rabies outbreak alerts, sample submissions, animal bites and human mortalities data are reported by staff with mobile-phones and IDWE health information systems. <b>Partly achieved</b>	- Monthly and quarterly reports on sample submissions and positivity rates available at country/coordinating office.
<b>Objective 5. Project coordination, monitoring and evaluation</b>	
The Technical and Steering Committees continues overseeing Project Implementation and Management which include approving annual plans and budget, monitoring performance, and coordination activities. <b>Not achieved</b>	- No technical or steering committees convened as part of 2012 plan.
<b>Objective 5: Ensure long- term sustainability of the project</b>	
Activity 5.1 identify and define rabies free zones <b>Not achieved</b>	-
Activity 5.2 Identify zones for continued vaccination and border control <b>Not achieved</b>	-
Activity 5.3 Establish international collaboration <b>Not achieved</b>	-
Activity 5.4 Agree financing between local ministries and local government units	- NA
Activity 5.5 Identify response strategies to new cases <b>Not achieved</b>	-

#### A3.4 INTERNATIONAL COORDINATION

International collaboration	
<b>Objective 6:</b>	
<b>6.1</b> International coordination team and national coordination structure in place and operational <b>Achieved</b>	Operational coordination structures, appropriate fund transfer mechanisms and monitoring systems in place or effectively modified during 2011–2012. Annual technical and financial consolidated report being finalized.
<b>6.2</b> Annual technical and financial reports issued <b>On track</b>	
<b>Activity 6.1 Annual meeting and field visits</b>	
<b>6.1.1</b> National and International coordinators/managers and other positions under the project properly filled <b>Achieved</b>	<b>6.1.1:</b> SSA of National Coordinator in United Republic of Tanzania extended for 6 months to end July 2012. As national coordinator stepped down at end of contract, selection process initiated by WHO Country Offices in collaboration with IC and WHO Regional Office. New National Coordinator selected July 2012 and operational September under SSA; attended ICG4 meeting. Four SSAs in Philippines renewed by WCO Manila; new SSA incumbent in Cebu, Central Visayas hired beginning of 3rd quarter 2012. Coordinators/managers in KZN and Philippines paid by their governments continue to lead the project. WHO HQ continues same staffing arrangements as in preceding years.  <b>6.1.2:</b> ICG4 organized in Cebu, Central Visayas 2–4 October 2012; invitations extended to AFRO and WCO Manila.
<b>6.1.2</b> One annual meeting of the ICG held <b>Achieved</b>	
<b>Activity 6.2 External evaluation</b>	
<b>6.2.1</b> Visits by IC of each of the project areas carried out each year.  <b>Partly achieved</b>	<b>6.2.1:</b> Visits to TZN (February 2012) and PHL (June 2012, Eastern Visayas: Samar and Leyte provinces) and Cebu (October 2012 for ICG4). IC planned trip to TZN as dog vaccination ongoing in Pemba could not take place. IC met PHL Coordinator in Beijing (May 2012) and KZN provincial Coordinator and PAHC Assistant (York, September 2012). Not requested by the national/provincial Coordinators.  <b>6.2.2:</b> Animal welfare visited PHL (particularly Central Visayas) to provide training; advised KZN and TZN under APW signed with WHO HQ (full 2012 WSPA activity report available on request).  <b>6.2.3:</b> Dr Cleaveland and Dr Tiziana visited TZN under new APW with Glasgow University to discuss household surveys for assessing dog population size in project area and cost per vaccinated dog; participated in final discussions on revised budget 2012 after national review meeting.
<b>6.2.2</b> One visit by rabies expert of each project area each year  <b>Not achieved</b>	
<b>6.2.3</b> Ad-hoc expert visits for trouble shooting  <b>Partly achieved</b>	
<b>Activity 6.3 Financial monitoring</b>	
<b>6.3.1</b> Dedicated administrative officer ensuring	<b>6.3.1</b> In 2012 as for previous years, project

<p>day to day monitoring of project</p> <p><b>Monitoring on track</b></p> <p>6.3.2 Financial reports produced every 6 months</p> <p><b>On track</b></p>	<p>receives dedicated services from WHO Secretariat for administrative, financial and procurement related activities. IC's secretary ensured daily monitoring of the project under his supervision.</p> <p><b>6.3.2</b> Financial reports for internal use produced regularly to reflect changes made during IC visits to project areas and produce accurate distribution of funds to various projects/activities in regions and/or country offices. Essential financial data available in the system. Financial reports to be produced according to agreed Gates Foundation requirements.</p>
<p><b>Activity 6.4 Dissemination of results</b></p>	
<p><b>6.4.1</b> Annual technical and financial reports of the ICG shared with GF Secretariat and other stakeholders.</p> <p><b>On track</b></p> <p>Participation of the IC and national coordinators/managers in international rabies and neglected zoonoses meetings to share GF/WHO project experience and results.</p> <p><b>Achieved</b></p> <p>Organization of an expert consultation on rabies partially supported by the BMGF grant particularly to ensure participation of the national and regional rabies project coordinators.</p> <p><b>Achieved</b></p>	<p><b>6.4.1:</b> Reports to be shared mid November 2012 first with GF Secretariat. When approved will be share in parts with other Stakeholders. E-mails on major development sent to stakeholders/rabies experts. A site dedicated to implementation of the project created within the NTD site at <a href="http://www.who.int/neglected_diseases/zoonoses">www.who.int/neglected_diseases/zoonoses</a></p> <p>Report of the Second Expert Consultation on Rabies on 18–20 September 2012 in preparation.</p>

## Annex 4. Budget allocation by project site and WHO for year 5 (2012–2013)

The planned allocation for year 5 is US\$ 1 746 021 (excluding total indirect costs)

Geographic location(s) of work		Geographical area(s) served
Location	Allocation in 2012–2013 (US\$ 1 746 021)	Location
WHO Office, Dar es Salaam United Republic of Tanzania for site in south-eastern Tanzania	US\$ 632 237	<ul style="list-style-type: none"> <li>- Regional Office for Africa: (supplies including human, dog vaccines, and immunoglobulin).</li> <li>- WHO Country Office: (costs of project staff, other coordination activities and training).</li> <li>- Ministries of Livestock Development and Health (direct financing agreement from WHO Country Office).</li> <li>- APW project adviser.</li> </ul>
Provincial veterinary services, Pietermaritzburg, KwaZulu-Natal, South Africa	US\$ 428 078	<ul style="list-style-type: none"> <li>- Regional Office for Africa: (procuring injectable dog vaccines and vaccination equipment).</li> <li>- Dept of Provincial Veterinary Services (direct financing agreement from WHO Country Office).</li> <li>- APW animal PAHC.</li> </ul>
WHO Country Office, Department of Health, Manila, Philippines, for the Visayas (regions 6,7 and 8)	US\$ 441 619	<ul style="list-style-type: none"> <li>- WHO Regional Office (supply including human and dog vaccine and RIG).</li> <li>- WHO Country Office.</li> <li>- (DOH and CHDs SSAs costs, Secretary in WCO).</li> <li>- DOH Manila (financing agreement with WHO Country Office) for staff &amp; staff travel costs, dog vaccination, IEC including support to CHDs 6, 7 and 8).</li> </ul>
Department of Control of Neglected Tropical Diseases, WHO headquarters, Geneva, Switzerland	US\$ 243 913	<ul style="list-style-type: none"> <li>- WHO/HQ- staff costs: (dedicated staff within NTD).</li> <li>- 5th International Coordination Meeting October 2013 WHO-HQ.</li> <li>- International Coordinator's travel.</li> <li>- Ad hoc expert visits.</li> <li>- APW with WSPA.</li> </ul>