

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

Durban, South Africa, 22–24 September 2014



BILL & MELINDA
GATES *foundation*

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Abbreviations and acronyms

ABTC	animal bite treatment centre
BMGF	Bill & Melinda Gates Foundation
CCG	Community Care Givers
CDC	Centres for Disease Control, South Africa
DoA	Department of Agriculture
DoH	Department of Health
DVO	District Veterinary Officer
GARC	Global Alliance for Rabies Control
dRIT	direct rapid immunohistochemical test
FAT	fluorescent antibody test
ICG	International Coordinating Group
ID	intradermal
IM	Intramuscular
KZN	KwaZulu-Natal
LGU	local government unit
MLFD	Ministry of Livestock and Fisheries Development
NARIS	National Rabies Information System
PEP	post-exposure prophylaxis
PLDP	Peer Learning District Programme
PreEP	pre-exposure prophylaxis
RIG	rabies immunoglobulin
SOPs	standard operating procedures
WAP	World Animal Protection
WCO	WHO Country Office
WHO	World Health Organization

1. Purpose and objectives

The sixth meeting of the International Coordinating Group (ICG) of the World Health Organization (WHO) and the Bill & Melinda Gates Foundation (BMGF) project on eliminating human and dog rabies was held in Durban, South Africa, on 22–24 September 2014. Its purpose was to determine the way forward as the projects draw to a conclusion, with focus on their sustainability, expansion into other geographies and the dissemination of results and information to catalyse progress beyond the project sites. Rabies elimination is possible and requires working across different sectors.

Dr Tsakani Furumele, Director, Communicable Disease Control, National Department of Health, South Africa, welcomed the participants (Annex 1). She highlighted the low perception of the risk of rabies in South Africa and the world. The key lies in raising awareness about rabies risks as well as medical care if people are exposed. So much attention is being given to Ebola virus disease and yet the risk of rabies is a real threat in many African countries, especially in rural communities. She acknowledged the generous contribution of BMGF and WHO to the elimination of rabies in KwaZulu-Natal and the positive results as an expansion of the “One Health” approach to the whole country.

Ms Lani Wepener, International Relations and donor fund coordination, Department of Agriculture and Environmental Affairs, welcomed the group to KwaZulu-Natal and expressed the need for sustainability, resources and awareness-raising. The most important factor moving forward are the people on the ground required to do the necessary work.

The new project coordinator, Ms Molly Mort, Neglected Infectious Diseases Department, Global Health Programme, BMGF, and Dr Bernadette Abela-Ridder, Team Leader, Neglected Zoonotic Diseases, WHO Department of Control of Neglected Tropical Diseases, welcomed the participants and outlined the objectives of the meeting.

The objectives were to:

- Report and review the progress of each project site
- Determine the way forward
- Ensure sustainability
 - continuing successes at the project sites
 - expanding projects to neighbouring countries
- Ensure data collation for reporting and to support advocacy messages

2. Project reports

National coordinators and advisers to the three project sites (KwaZulu-Natal, South Africa; the south-eastern United Republic of Tanzania; and the Visayas, Philippines), WHO staff from country offices and headquarters and the BMGF representative participated in the meeting.

2.1 KwaZulu-Natal

2.1.1 Project implementation

The KwaZulu-Natal (KZN) project site has improved over the past year, with the number of animal rabies cases decreasing to approximately 2 cases per month. This progress has reflected in the province not having a human rabies case in the past 22 months (since the writing of this report) (Figure 1). Political buy-in followed the death of a prominent sports star in the province. Unfortunately, the remaining animal cases can be attributed to a single individual who has not provided the required support in order to successfully control rabies in their area of responsibility.

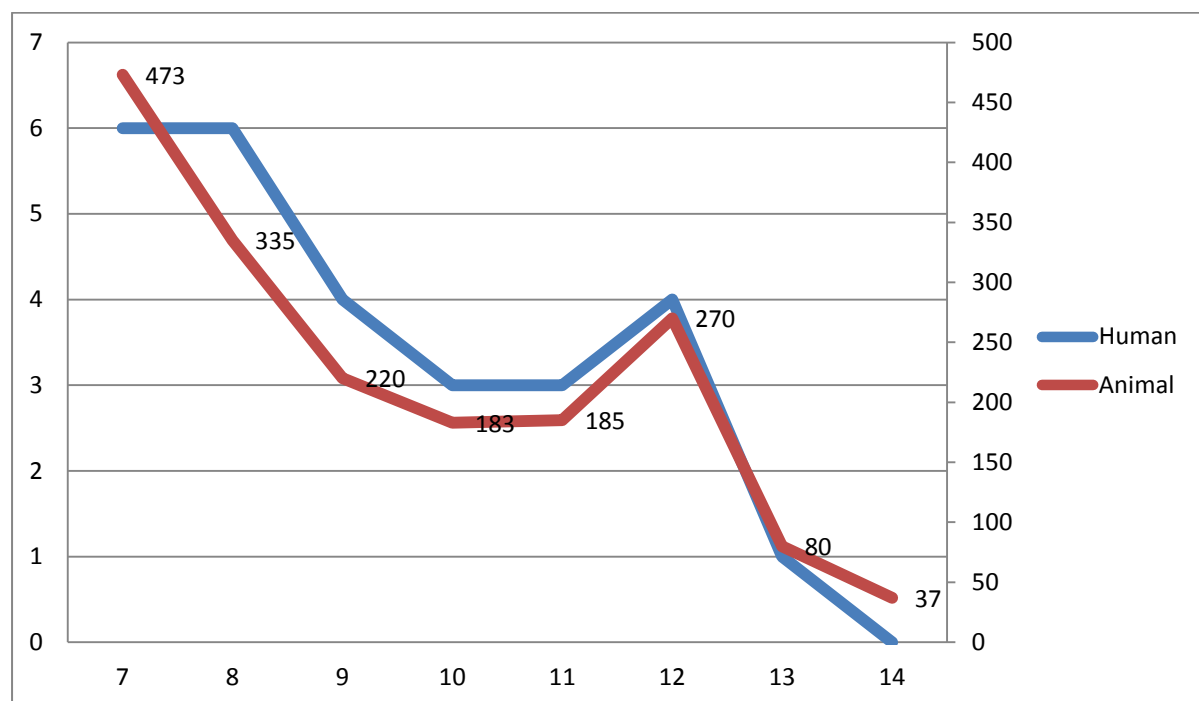


Figure 1. Reduction in the number of human and animal rabies cases, KwaZulu-Natal, 2007–2014

In 2014, the Department of Agriculture (DoA) was audited following fraud and corruption charges, which led to major challenges for the vaccination campaigns that resulted in lower vaccinations being administered (an estimated 300 000 vaccinations will be administered by the end of 2014) and the risk of the disease resurging in the province. Staff fatigue has also been a challenge for the campaign. KZN is looking to develop a maintenance plan following the “rabies-free” status of the province. This maintenance plan would scale down the intensity of annual mass vaccination campaigns while maintaining rabies-free status.

2.1.1.1 Project data

A new project-specific database has been implemented in the KZN project site aimed at gathering information from all sectors and collating these data to provide accurate, useful information that can aid in focussing the efforts of vaccination teams as well as highlighting possible challenge areas in the province. The database has been expanded to include information on dog bite cases, human population size, epidemiological data on human rabies exposures and the administration of post-exposure prophylaxis (PEP) to assist the Department of Health (DoH) and accelerate the stagnant progress. Accurate data are now readily available and easily accessible.

A fairly comprehensive estimate of the dog population has been performed in KZN using several different methods. Official national data were used and this information was bolstered by a PhD dog ecology study that has been completed. The ecology study has also provided human:dog ratios and other important information. The final estimation for the dog population size in KZN is 1.2 million dogs.

2.1.1.2 Decentralization

The proposed laboratory in Vryheid has now been completed and is fully equipped, yet the accreditation process has been lengthy and is delaying the laboratory from becoming fully functional. Technical staff will be trained.

2.1.1.3 PEP

A network of Rabies Action Groups (RAGs) has been established or revived throughout the province. These groups serve as the platform from which training can be launched into the field. Training days run by the local Centers for Disease Control (CDC) on PEP administration have been held at centres across the province. A toll-free helpline for vets and medics has been established and new vaccination posters have been printed for distribution to clinics and hospitals. The human vaccine stocks for 2014 have been increased and there have been no shortages of vaccine thus far in KZN. Additionally, human rabies immunoglobulin (RIG) is also available upon request; however, more efforts on training and administration are being implemented to reduce the amount of unnecessary vaccination and HRIG being administered. The database is being used to monitor PEP administration and usage in hospitals and clinics. The project has also tried to get the intradermal (ID) route for vaccination accepted by the Medicines Control Council, but its application was rejected. The proposal will be amended and resubmitted in the hope of establishing the ID regimen in high throughput clinics.

2.1.1.4 Research

Immunocontraceptive

trial

The immunocontraceptive trial was unsuccessful, possibly due to too high immunogens being administered. However, many lessons were learnt from the experience. One of the challenges was keeping dogs in kennels, including training the animals and keeping them mentally stimulated. It was important to ensure that the dogs would be successfully re-homed after the study. Homing challenges included the time taken (over 4 months) to re-home all of the dogs after the trials. A possible learning outcome would be to ensure that willing homes are identified before trials begin in

order to ensure a smooth process after their completion. The difficulties in obtaining import permits as well as clearance from the Medicines Control Council also delayed the trials significantly.

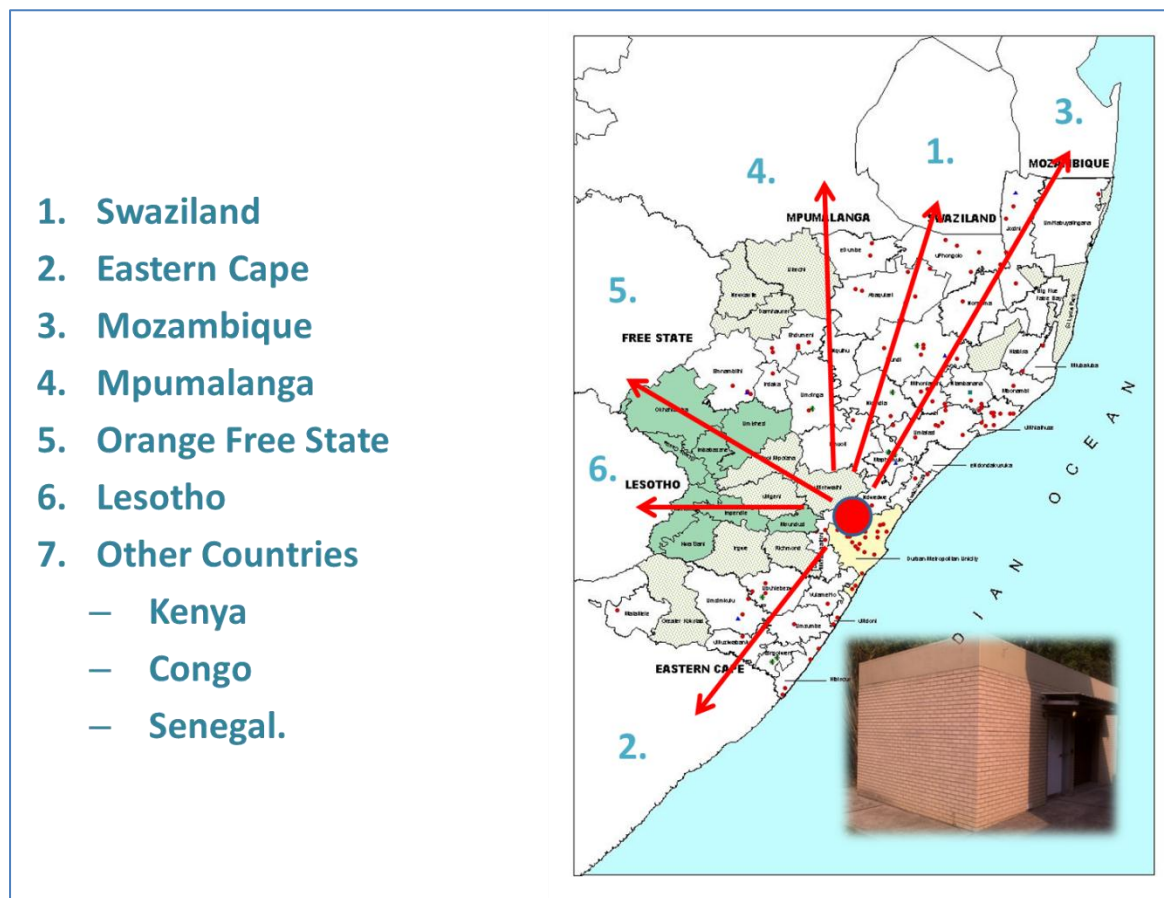
Rabies-related lyssaviruses

Mokola virus – a rabies-related lyssavirus – has been identified in a cat case near Pietermaritzburg. In response, active surveillance for Mokola virus in cats is being undertaken as part of an MSc (University of KwaZulu-Natal) and a PhD (University of Pretoria). A retrospective study is also being performed and has found that 33% of all previous cat rabies cases are due to Mokola virus infection. Lagos bat virus has been identified recently in some cats in KZN. These rabies-related lyssaviruses therefore pose a new potential challenge to the rabies elimination campaign.

2.1.1.5 Sustainability

The strategy adopted by KZN to safeguard the sustainability of the results towards rabies elimination and prevent the importation of rabies cases from bordering regions has been to conduct border vaccination campaigns and expand them into other provinces and countries. Vaccination campaigns on the border of Mozambique–Northern KZN have been completed. An animal welfare group in Mozambique has also begun vaccinating unrestricted dogs along the southern beaches of Mozambique. Additionally, the Mpumalanga province has removed the disease from one of the areas of the province with the support of the KZN project. A champion in that region has been identified and is looking to expand the Mpumalanga campaign to cover the entire province. Swaziland has also been involved in several mass vaccination campaigns and has been supported by the KZN rabies team through training on animal handling and correct capture techniques, and 50 000 more vaccine doses have been donated. The Free State province and Lesotho collaborations with KZN were initiated in September 2013, but little more has come from these initiatives. Lesotho is currently in a civil war, which has hampered all efforts to control rabies. The Eastern Cape Province collaboration is also under way. Dr Yonela, who attended the ICG, has been a champion in this region. Vaccine, equipment and training have been provided and the border regions with KZN are the initial focus areas with Eastern Cape. KZN is leading the drafting of a rabies national strategy and training programme. Many of the standard operating procedures (SOPs) written by the team are being used internationally (Blueprint for Rabies Control <http://www.rabiesblueprint.com>) and in other African countries including the Congo, Kenya and Senegal.

Figure 2. Expansion and sustainability of the KwaZulu-Natal rabies elimination project



2.1.2 Plans for the next reporting period

2.1.2.1 Maintenance phase

As the project comes to a conclusion and the numbers of rabies cases in animals continue to decrease, focussed mass vaccination campaigns must continue in problem or target areas. Following this, KZN is looking to move towards a 3-year maintenance plan for dog vaccination with yearly follow-up of any new dogs (including puppies) in the region that also involves the private sector. Community caregivers will determine whether there are new dogs or puppies in their community in order to vaccinate them. Improving primary animal healthcare to prolong the lifespan of vaccinated animals and also ensure that animals are sterilized or bred responsibly is an important adjacent component to rabies elimination. Funding for procurement of more “stimulation packages” to help other countries or provinces in starting their mass vaccination campaigns. The BMGF and WHO have added important weight to proposals and helped to secure outside government funding.

2.1.2.2 Bite prevention and reduction of PEP

Rabies education and awareness campaigns have resulted in an increased demand for PEP, which has subsequently resulted in massive costs and expenses to the province for rabies treatment. Although rabies cases have almost been eliminated in animals in the province, many people still seek rabies PEP treatment. In order to combat this challenge, dog bite prevention campaigns have been initiated to educate the public on dog behaviour and prevention of dog bites. In the long term,

prevention of dog bites from suspect and non-suspect animals should reduce the number of PEP treatments. Posters have been produced in isiZulu and English for distribution throughout the country, for example in minibus taxis (the main form of public transport in the region). Community caregivers have been educated in bite prevention – mainly for their own protection – and encouraged also to educate people about bite prevention in the households that they visit. One of the main challenges of PEP administration is the responsibility shouldered by the health-care provider, especially at clinic level, in assessing whether a patient is at risk of rabies and requires PEP. This results in all dog bite patients receiving PEP. Some suggestions from the meeting include a potential PEP helpline for clinicians, veterinarians and other professionals, and refresher or training courses for PEP providers driven by the medical sector. As KZN approaches freedom from rabies, this must be assertively communicated and SOPs for bite management appropriately modified and implemented.

2.1.2.3 Final report

The final report has been drafted, with the basic outline and some sections already completed. Most topics have been discussed in detail and most annexes written. More raw data are being analysed, with a special focus on the data from the health department. The KZN project plans to hire a person in order to capture the data.

2.1.3 Financial report

The auditing of the DoA halted its procurement processes and virtually no spending was possible from December 2013 until August 2014. This, coupled with the disruption from the national elections and the subsequent changes in management of the department, has led to massive delays and the department not having funds to continue mass mobile campaigns. This has impacted significantly on the vaccinations for the 2013–2014 season. As a result, only 85% of the funds transferred late last year have been utilized as at the ICG meeting. However, the effects of this were partly offset due to enough equipment being available from the end of 2013. Most of the operational costs are currently being placed into education, bite prevention and awareness campaigns. The department has injected – in addition to normal operational spending – an additional US\$ 650 000 into rabies control for the remainder of 2014, ending in March 2015. It has also pledged to continue supporting the control efforts into the future, committing US\$ 450 000 per year for the next 2 years. Some 290 000 doses of additional vaccine have been acquired through the department and an additional US\$35 000 was added by the KZN veterinary epidemiology budget. This, despite all of the problems, clearly shows the department's commitment to the success and future of the project. The vaccine bank has already distributed 70 000 doses of vaccine to neighbouring provinces and countries (Figure 2.) for the continued expansion of the project.

2.2 Visayas, Philippines

2.2.1 Project implementation

As of 2014, three island provinces, five island municipalities and four other islands have been declared rabies-free by the Government of the Philippines – the majority of these regions are project sites (

Figure 3). This enormous success can be attributed to the key strategies and interventions that have been utilized in partnership with other national agencies (Department of Agriculture, DoA; Department of the Interior and Local Government, DILG; Department of Education, DepEd) and the local government units (LGUs). The DoA and the DoH have provided important support for rabies vaccination and prevention, which has helped to decrease the numbers of human deaths in the Philippines from 285 to 187 in 2013. Rabies has been declared a priority disease for the next 3 years (2014–2016) with the goal of no human cases by the end of 2016. In the project sites in 2014, there have been 9 suspected rabies cases compared with the 43 cases in 2009. Thus, mass dog vaccination and adequate training of new volunteer dog vaccinators have contributed greatly to this success. On the contrary, the number of suspected human rabies cases has spiked in region VI, from 1 case in 2013 to 8 cases in 2014. These cases originated from rural areas away from the main roads. Government officials have admitted that they have not been vaccinating sufficiently in these “hard to reach areas” rural areas. This is an observed decrease in vaccination coverage (from 80–70% to 30–20%) as one moves away from the main road. These problem areas are being addressed and local government is willing to support “touch-up” campaigns in these areas.

2.2.1.1 Dog bite management and prevention

Doctors and nurses are being trained on the latest management guidelines on how to manage rabies exposures. PEP is also more readily available. New educational videos on pre- and post-exposure prophylaxis (PreEP and PEP) are also being prepared to improve education and awareness.

New animal bite treatment centres (ABTCs) have been established in the project sites as well as throughout the country and are in the process of being accredited for the Philippine Health Insurance Corporation (social health insurance). Accreditation is a prerequisite to making the PhilHealth-outpatient animal bite package available. Unfortunately, a dramatic rise in the number of dog bite cases has been reported (287 to 484). It is unclear whether this increase is due to the improved reporting system and improved access to ABTCs, as the number of bites correlates with the number of ABTCs around the country. The national rabies information system (NARIS) has been an important tool for data submission and has enabled the transfer of patients from one bite centre to another. This system also ensures that records are more easily accessible and are less likely to become lost.

Figure 3. Map of the Philippines showing the Visayas and listing of locations declared rabies-free by the Department of Health and the Department of Agriculture



Source: <http://en.wikipedia.org/wiki/Philippines>

2.2.1.2 Dog vaccination

In 2013, dog vaccination coverage decreased significantly throughout the region, primarily due to the late arrival of the vaccines, which arrived in the country on 17 June 2013 and reached the project implementers only in August. The rainy season (June–November) compromises mass dog vaccination campaigns especially in rural and flood-prone areas where monsoons and typhoons hamper coordination and execution of the dog vaccination campaigns. Other contributing factors include the local elections (May) and extraordinary natural disasters, notably the earthquake in central Visayas; the Haiyan, which severely affected the catch-up dog vaccination in all parts of the Visayas; and floods resulting in the destruction of vaccines due to loss of electricity and water damage. Improved coverage is expected in 2014 in most areas of the project sites because dog vaccination started early in many parts of the project and enough dog vaccines were available for the campaign. Additionally, a buffer stock of vaccine is available for 2014 in order to compensate for any possible delays in new vaccine delivery. A “Rabies Caravan” has also been created to aid the mop-up campaigns and the mass vaccination campaigns.

2.2.1.3 Challenges

Veterinarians are typically assisted by a large number of volunteers (dog catchers and vaccinators) who are unable to vaccinate animals in the absence of a vet. The vet has to directly supervise the vaccinators (i.e. to be physically present at the vaccination site), posing challenges to vaccination campaigns due to the lack of vets, especially in rural areas (most vets are situated in the cities). Some of the vets who do not allow vaccinators to vaccinate independently of them are concerned about adverse events that may arise during vaccination as well as the signing of vaccination certificates. One possible solution is to provide vaccination cards only rather than complete vaccination certificates, thereby eliminating the need for a vet to be present at each site.

Dog population data to determine vaccination coverage are insufficient.

Lastly, seasonality affects vaccination campaigns adversely. Specifically, summer is the ideal time to vaccinate as students are on holiday and are thus available to bring their dogs to vaccination centres. Contrarily, the rainy season is in June and does not allow for efficient and easy movement, and August to September are parvovirus months. Parvovirus infections draw vets away from the rabies vaccination campaigns in order to deal with the parvovirus cases. Unfortunately, the parvovirus season has additional negative effects on the rabies vaccination campaigns as dogs sometimes die during this time and some owners believe that the death is related to the rabies vaccine and not due to parvovirus.

2.2.1.4 Sustainability

Quarantine services have been strengthened at seaports, particularly in rabies-free zones, to prevent the reintroduction of animal rabies. Port personnel involved in animal quarantine are being oriented on the Rabies Prevention and Control Programme to assist in preventing the reintroduction of rabies into those areas that have been declared rabies-free. Private veterinarians are also being oriented on the current Rabies Prevention and Control Programme, and teachers are becoming more involved, encouraging advocacy and intersectoral cooperation.

2.2.2 Plans for the next reporting period

2.2.2.1 Project wrap-up

The no-cost extension period will focus on the project's sustainability at the national, regional and local levels, improving surveillance and documenting, sharing and publishing best practices and success stories, conducting mopping up operations in selected areas and validating project accomplishment reports.

LGUs have been requested to intensify their dog vaccination campaigns, especially in hard-to-reach areas and in areas with low vaccination coverage in 2013. The call for intensified dog vaccination campaigns is not limited to 2014 but extends until the end of the first semester of 2015. Included in this will be investigations into all suspected human rabies cases and operationalization of the NARIS system in all regions by the end of 2015. New ABTCs will be established in areas where they are lacking. Continued support for surveillance will be provided through the allocation of funds for the transport of samples (suspected cases) to the laboratory for diagnosis. This alleviates the costs for pet owners and encourages people to submit more samples of suspected cases. Outpatient benefit packages will also be provided to those receiving PEP – making PEP more affordable to the patient.

2.2.2.2 Final report

The compilation of the final report will be a major task for the next reporting period and the final wrap-up of the project. The overall results will be compared with the initial baseline data and best practices and success stories documented. Detailed accounts of the activities will also be documented, including yearly trends and improvements. The official project end-date is scheduled for World Rabies Day (September 2015) after which the project will be handed over to the DoA. Before the project ends, a final zonal meeting will be held (March 2015) at which the project will be reviewed at regional and provincial levels.

2.2.3 Financial report

This year (2014) has been severely impacted by hurricane Yolanda in the Philippines. As a result, approximately 50% of the funds allocated to Central Visayas and 50% of the funds to Western Visayas were not spent. The Eastern Visayas implemented vaccination campaigns as planned.

A portion of the DoH budget will be given to the dog vaccinators to lead the catch-up campaigns for several regions, following the delays caused by the hurricane. These campaigns will be conducted in early 2015 because of the massive measles vaccination campaign held in the latter part of 2014.

During 2014, US\$ 60 510 was available for year 5, broken down as follows: NCDPC, US\$ 7333; Western Visayas, US\$ 17 465; Central Visayas, US\$ 20 100; and Eastern Visayas, US\$ 15 612. To date, only Eastern Visayas has been able to utilize and liquidate their year 5 fund. The other regions in the project site have been utilizing their year 4 fund and have yet to liquidate it before the year 5 fund is released by the WHO Country Office. This has been the case for the past 4 years because the budget for the first year was delayed for 1 year. However, the year 5 money has been requested by the

three other offices, but the release is pending until all of the year 4 funds are fully liquidated. Table 1 shows the Direct Financial Cooperation for year 4 and 5.

In 2014, the DoA, DoH and other stakeholders signed a Memorandum of Understanding to extend the rabies-free Visayas project to 2015. In 2013, the DoH gave about US\$ 1.5 million to the DoA for the purchase of dog rabies vaccine. A further approximately US\$ 9.2 million budget has been approved by Congress for the 2015 rabies control programme budget, of which about US\$ 780 000 will be delegated to the DoA for the purchase of dog vaccine in 2015.

Table 1. Fund utilization for years 4 and 5 (Direct Financial Cooperation for years 1, 2 and 3 was fully utilized)

Region	Year 4 (2012)*			Year 5 (2013)			
	Approved budget (US\$)	Amount utilized (US\$)	% of utilization	Approved budget (US\$)	Amount utilized (US\$)	% of utilization	Remarks
NCDPC	11708	9 951.18	85%	7 333	–	–	Requested; release pending submission of year 4 liquidation
Western Visayas	67651	33 827	50%	17 465	–	–	
Central Visayas	27201	16 206	60 %	20 100	–	–	
Eastern Visayas	32612	32 612	100%	15 612	9 367	60%	Second tranche of budget requested
TOTAL	134 392	92 596.18	68.90%	60 510	9 367	6.45%	

* Year 4 budget: 50% was released to Central Visayas; for NCDPC and Western Visayas the full budget was released.

2.3 United Republic of Tanzania

2.3.1 Project implementation

2.3.1.1 Surveillance

The data presented below are compiled from the mobile phone-based surveillance system that operates across the project area and is in use by almost 200 health workers and livestock field officers. A few gaps in data have resulted from staff turnover but, where possible, the surveillance team collected these data from paper records in clinics and livestock offices to cover these gaps. The data presented here are summarized at the district level; more detailed geographical information is available (for example on the villages of bite patients and human death cases and where vaccination campaigns took place) for future analysis.

2.3.1.1.1 Bite incidence and human rabies deaths

The numbers of patients reporting to hospitals with animal bites varied considerably by district and over time. The annual incidence of bites per 100 000 people varied from more than 200 to fewer than 5 (Figure 4; mean = 18/100 000 people, 6417 bites total). Bite incidence in 2014 is summarized in Table 2, with the highest incidence in Morogoro rural districts (41/100 000) and the lowest incidence on the island of Pemba and in rural districts in Mtwara (<1/100 000). Overall, the average

bite incidence in districts decreased from 2011 to 2014 from 26/100 000 to 12/100 000, with substantial differences between districts.

Use of rabies PEP varied considerably geographically and through time (Figure 5). Most doses were delivered in the cities of Dar es Salaam and Morogoro; however, many patients who received treatment had travelled from other districts outside the project area. Shortages of PEP were common throughout the 4-year period, particularly in 2013 across many districts and in rural districts of Morogoro in 2014 (Ulanga and Kilombero). Vaccine supplies have very recently been delivered to all regions. It is urgent that PEP supply and distribution procedures be reviewed to prevent the reoccurrence of shortages in future.

Human rabies deaths were recorded in most districts during the 4-year period of surveillance and usually occurred during periods of relatively high bite incidence in focal districts and when vaccines were in short supply (Figures 4 and 5). This further highlights the need for more responsive distribution mechanisms for these life-saving treatments. The human deaths recorded represent only those who attended a health facility and likely underrepresent the true number of deaths in the area.

The majority of clinics now administer PEP intradermally (ID) rather than through intramuscular (IM) administration (Figure 7) as a result of training established by the BMGF/WHO programme. ID use is inconsistent, however, with IM administration common in some areas. These patterns are likely driven by clinic differences in PEP use and may relate to turnover of health workers. However, these inconsistencies indicate the need for further training and proficiency testing in PEP administration.

2.3.1.1.2 Animal rabies incidence

Suspect rabies cases in animals were recorded in all districts throughout the 4-year period, although much fewer samples were collected (Figure 8). Surveillance effort that generates records of suspect rabid animals and numbers of samples collected is not currently sufficient to assess epidemiological trends or determine freedom from disease. Difficulties in accessing surveillance resources (e.g. sampling kits, and funds to reach cases for sampling and delivery of samples to laboratories for diagnosis) have been reported by veterinary/livestock officers conducting rabies surveillance on the ground. Intensified surveillance coupled with simplified mechanisms for accessing essential resources will be needed for areas that have brought rabies under control and are aiming to eliminate infection (e.g. Pemba).

2.3.1.1.3 Mass dog vaccination

Mass dog vaccination campaigns were carried out in all districts under the project over the 4-year period, but their extent and regularity varied (Figures 9, 10 and 11). In some districts, vaccination campaigns were delayed, resulting in prolonged periods without any campaigns and declining vaccination coverage. For instance, as at November 2014 the 4th round vaccinations had not been completed in Dar-es-salaam region, (Ilala, Temeke and Kinondoni) and in Morogoro region (Morogoro Urban, Rural and Ulanga and Kilombero) since mid-2013 (Figures 10 and 11).

With sufficient resources, district veterinary officers were able to organize comprehensive campaigns that reached all villages and achieved high levels of coverage, but simplified logistical and financial mechanisms and supervision were critical for completion. For example, in the past 12 months, more than half the campaigns organized achieved at least 60% coverage in the villages that

were vaccinated (Table 3; Figure 11), although not all villages in each district were reached. Planning should be carried out to schedule campaigns in all villages and sufficient resources must be available for these campaigns to be completed.

2.3.1.1.4 Overall epidemiological patterns

There is evidence for declines in dog bites over the 4-year period, although there is considerable spatial and temporal variation in Tanzania mainland especially in urban setting which are easily accessible and hence do receive bite victims not only from the WHO BMGF project area but also outside the project area. Gaps in data submissions (particularly in 2013) also complicate deciphering incidence patterns. The surveillance team is revisiting districts to collect missing records and conduct retraining to improve recording. Further analyses of these data at higher geographical resolution (village scale) are likely to reveal clearer patterns of persistent endemic foci and the impacts of dog vaccination. Rabies may have been eliminated from Pemba (Figure 1) or be circulating at only very low levels. Intensified surveillance is being carried out by one of the surveillance team members (Kennedy Lushasi) as part of his MSc, to confirm the status of rabies on Pemba.

Table 2. Summary of bite incidence, post-exposure prophylaxis (PEP) use and human rabies deaths in districts within the Project area in 2014 (up to 1 November 2014). Doses delivered correspond to doses delivered in clinics in the specified district, including doses given to patients travelling from outside the district. Shortages refer to visits by bite patients who did not receive PEP due to a lack of vaccine. District-specific bite incidence and death cases are calculated according to the origin of patients, even if those patients sought PEP from a district in the Project area outside of their district of origin. Bite incidence and deaths by district in 2014 are shown in Figure 3.

Region	District	No. of doses delivered	% intradermal	Shortages of vaccine	Bite incidence / 100 000	No. of deaths
Coast	Kibaha rural	2	0%	0	2.85	0
Coast	Kibaha urban	0	0%	0	2.33	0
Coast	Kisarawe	10	100%	9	22.64	0
Coast	Mkuranga	107	100%	1	16.60	0
Coast	Rufiji	194	99%	6	33.60	4
Dar es Salaam	Ilala	333	100%	3	12.62	0
Dar es Salaam	Kinondoni	9	100%	0	3.72	0
Dar es Salaam	Temeke	0	0%	0	2.85	0
Lindi	Kilwa	0	0%	10	6.82	0
Lindi	Lindi rural	0	0%	1	3.09	0
Lindi	Lindi urban	26	100%	0	7.61	0
Lindi	Liwale	15	100%	0	8.75	0
Lindi	Ruangwa	29	97%	0	3.05	0
Morogoro	Kilombero	170	48%	48	22.56	0
Morogoro	Morogoro rural	345	99%	0	41.92	0
Morogoro	Morogoro urban	314	100%	6	15.83	0
Morogoro	Ulanga	92	62%	116	26.02	1
Mtwara	Masasi	37	100%	10	6.84	0
Mtwara	Mtwara rural	3	67%	0	0.44	0
Mtwara	Mtwara urban	58	98%	0	22.16	0
Mtwara	Nachingwea	6	100%	0	0.56	0
Mtwara	Nanyumbu	21	95%	0	10.61	1
Mtwara	Newala	4	0%	1	2.43	0
Mtwara	Tandahimba	128	98%	0	13.19	0
Pemba	Pemba	2	50%	2	0.98	0
		1905	69%	213	11.60	6

Table 3. Vaccination coverage achieved and completeness of campaigns conducted since November 2013. Coverage was estimated from post-vaccination transects completed the day after vaccination campaigns based on observations of vaccinated (collared) and nonvaccinated (uncollared) dogs. The proportion of villages where campaigns were conducted is also recorded, as well as the proportion of villages where transect observations were conducted but no dogs were observed. Coverage is calculated for each district as a whole (collared dogs/total dogs observed) and as the average of each coverage estimate at the village level (average village coverage).

Region	District	Villages	% villages vaccinated	Collars	Total dogs	% villages with no dogs seen	Average village coverage	Variance in village coverage	Coverage (95% CI)
Coast	Kibaha rural	50	82	437	564	2	78	0.04	77 (74-81)
Coast	Kibaha urban	53	94	660	845	0	74	0.05	78 (75-81)
Coast	Kisarawe	77	60	531	749	0	71	0.04	71 (68-74)
Coast	Mkuranga	116	98	751	1126	17	64	0.10	67 (64-69)
Coast	Rufiji	104	72	257	449	15	55	0.12	57 (53-62)
Lindi	Kilwa	102	76	327	606	4	62	0.07	54 (50-58)
Lindi	Lindi rural	134	60	456	877	3	61	0.08	52 (49-55)
Lindi	Lindi urban	30	100	184	294	3	62	0.11	63 (57-68)
Lindi	Liwale	76	96	179	531	8	38	0.10	34 (30-38)
Lindi	Ruangwa	89	89	498	758	1	61	0.08	66 (62-69)
Mtwara	Mtwara rural	156	54	176	427	10	37	0.09	41 (37-46)
Mtwara	Mtwara urban	15	100	87	148	7	47	0.11	59 (51-66)
Mtwara	Nachingwea	117	98	1255	1576	3	82	0.01	80 (78-82)
Mtwara	Nanyumbu	89	65	284	415	11	74	0.08	68 (64-73)
Mtwara	Newala	153	54	319	626	1	48	0.06	51 (47-55)
Mtwara	Tandahimba	156	83	273	360	27	74	0.11	76 (71-80)
Pemba	Pemba	121	100	458	875	5	46	0.09	52 (49-56)

2.3.1.2 Dog vaccination

No new dog vaccine was procured in 2014 as enough was available from 2013. These 200 000 doses were placed under MLFD control and their usage is jointly being monitored by District Veterinary Officers (DVOs), MLFD and WCO protocols. The third phase of the mass dog vaccination campaigns shows that 33 424 dogs and 7531 cats were vaccinated in 17 LGAs in the Coastal, Mtwara and Lindi regions as well as in Pemba. However, despite these efforts, two rabies outbreaks were contained in Rufiji and Morogoro rural districts. The sensitization meetings – aimed at creating awareness about the mass dog vaccination campaigns – were conducted in 99% of the villages in 17 LGAs that implemented mass dog vaccinations in 2014. Training for the vaccination campaigns was also carried out where 17 DVOs and 34 vaccination team leaders participated. These personnel, in turn, trained 200 vaccinators in the targeted 17 LGAs. SOPs for dog vaccination campaigns have also been developed and are in use by the vaccination teams; however, protocols and SOPs on dog population

management have not yet been finalized. As of September 2014, a total of 11 of 24 LGAs and lead ministries had set aside funding for the purchase of rabies vaccines and supplies.

2.3.1.3 PEP

More than 85% of people going to clinics are now able to receive PEP according to the WHO guidelines. All bite victims are treated as potentially infected individuals and receive PEP. Because of this, as well as improved education, the demand for PEP has increased not only within the WHO BMGF project area but outside the project area. As result of this there is an influx of bite victims from outside the project area coming to PEP health facilities within the project area especially in those areas which are easily accessible. Educational flyers have been produced and distributed to educate the public on treatment of bite injury. Additionally, educational posters have also been developed and distributed, informing medical practitioners on how to effectively deliver PEP. In order to ensure that PEP is being delivered as per specified WHO guidelines, 101 health facilities in 24 LGAs were assessed and monitored for the availability of PEP and its specified delivery. Many districts are using the ID regimen for PEP delivery (more than 75% of the project area) but are unable to as a result of insufficient numbers of syringes. In order to combat this problem, 30 000 syringes were ordered and 17 500 have been distributed throughout the LGAs. Another challenge with using the ID regimen is that a lot of wastage is occurring as the vials are too large (1ml). Thus, it is suggested that smaller vials be procured and distributed (0.5ml).

Figure 4. Bite incidence per 100 000 people and human rabies cases in the WHO BMGF project areas from January 2011 to November 2014. Incidence is calculated from the human population size in each district based on the 2012 census data (National Bureau of Statistics, 2012). Human deaths are indicated as red dots and represent only cases where the rabies victim attended a health facility.

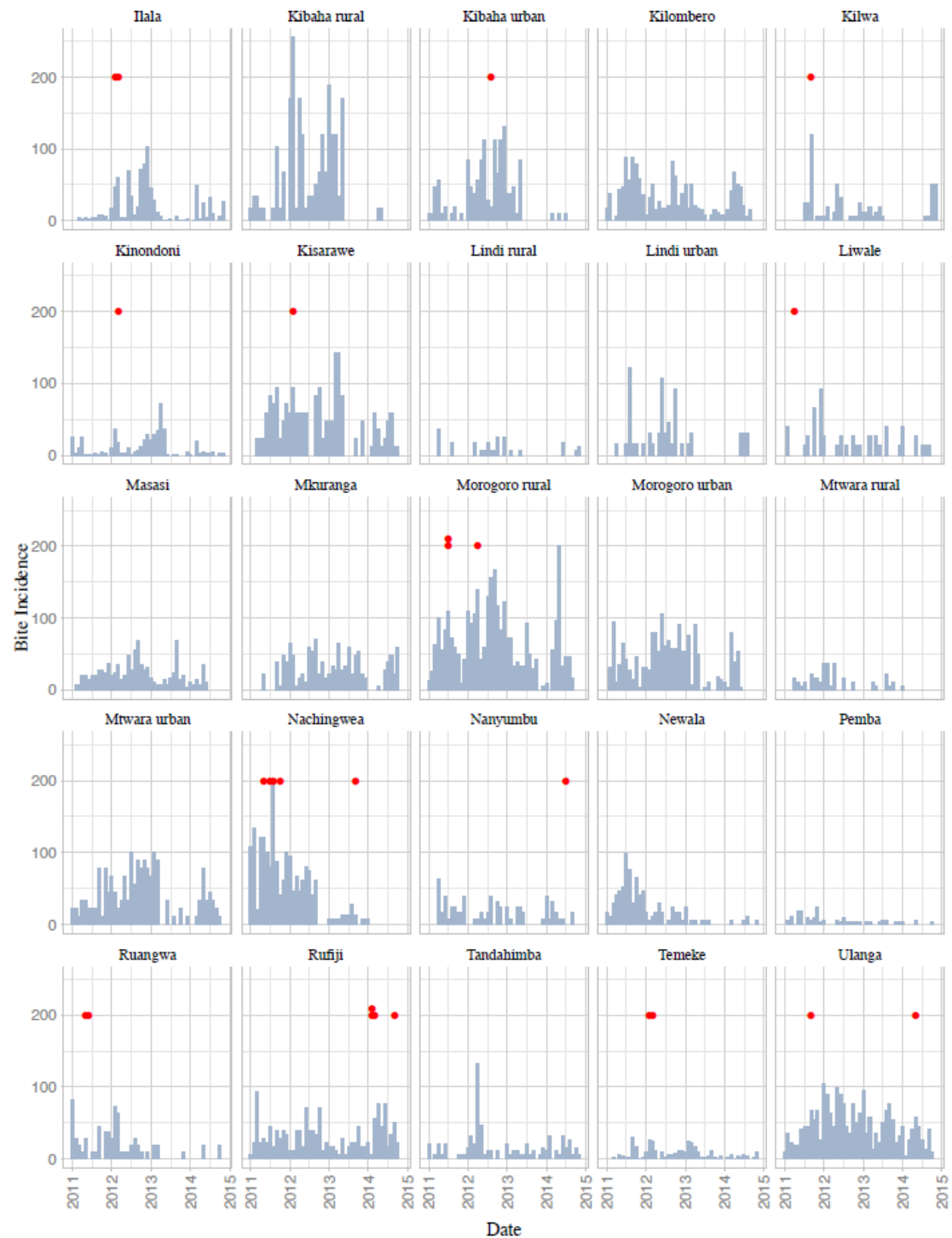


Figure 5. Post-exposure prophylaxis (PEP) vaccine use in the WHO BMGF project areas from January 2011 to November 2014. Total doses delivered each month are shown in blue and shortages are plotted as negatives in red. PEP use is shown by district and includes patients attending clinics within the focal district who originate from elsewhere. During periods of PEP shortages, some health workers did not submit any records (for example, some clinics in Kibaha urban and rural from 2013 onwards). The surveillance team is currently retrospectively collecting records and completing retraining to ensure data submissions.



Figure 6. Map of the WHO BMGF project areas with dog bite incidence and human rabies cases in 2014 (until 1 November 2014). Black dots are scaled by bite incidence and red dots are scaled by the numbers of human rabies cases in 2014, corresponding to data presented in *Table 1*.

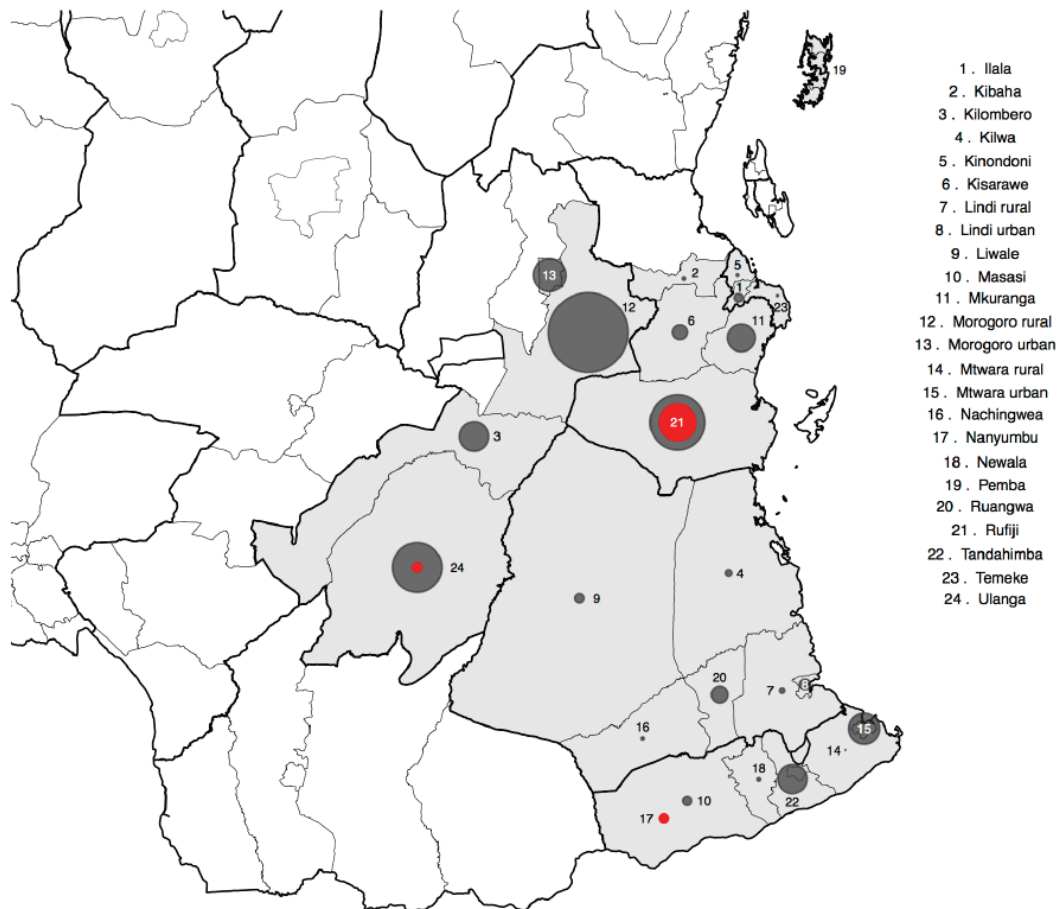


Figure 7. Post-exposure prophylaxis (PEP) vaccine doses delivered in the WHO BMGF project areas from January 2011 to November 2014 according to route of administration. Intradermal (ID) vaccination is shown in blue and Intramuscular (IM) in red.

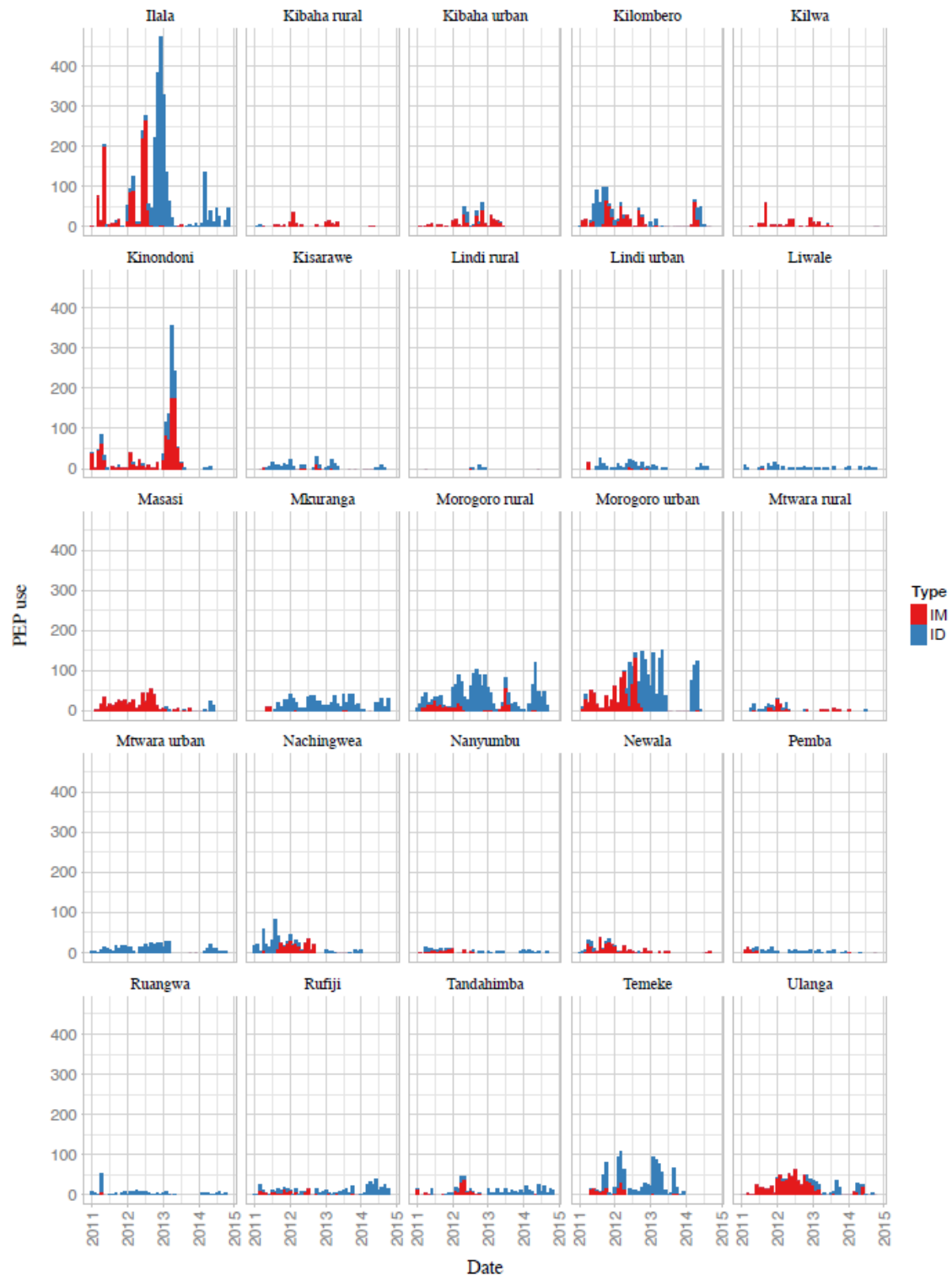


Figure 8. Suspect rabies cases in animals reported by livestock field officers in WHO BMGF project areas from January 2011 to November 2014. Grey bars indicate possible rabid animals as defined by at least one of the following clinical signs: aggression, biting, behavioural changes, strange vocalizations, salivation and death within 10 days; and by the animal's history: bitten by a suspect animal, being of unknown origin or disappearing after showing signs. The black bars indicate suspect cases from which samples were collected, whereas suspect cases for which it was not possible to retrieve samples are indicated in red.

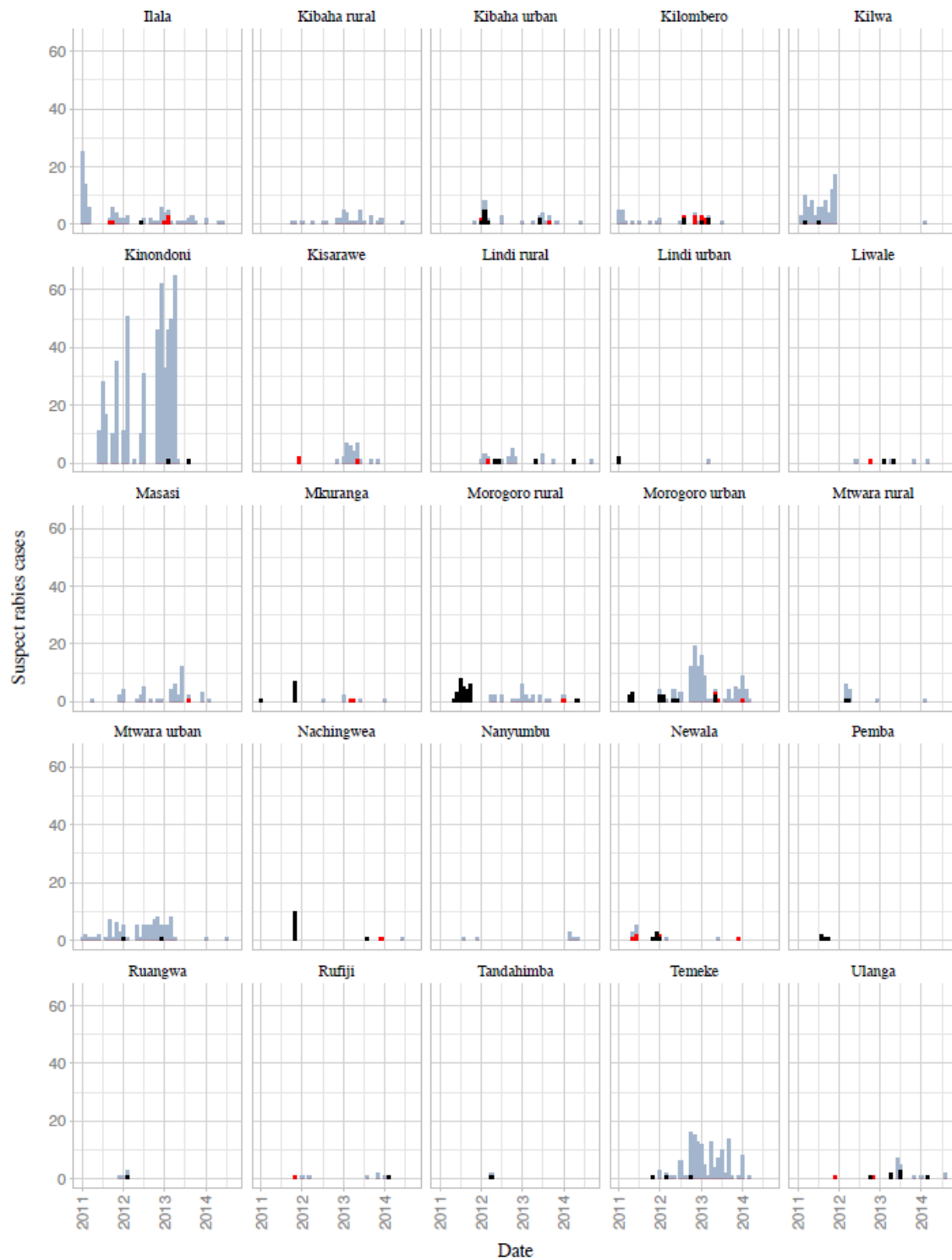
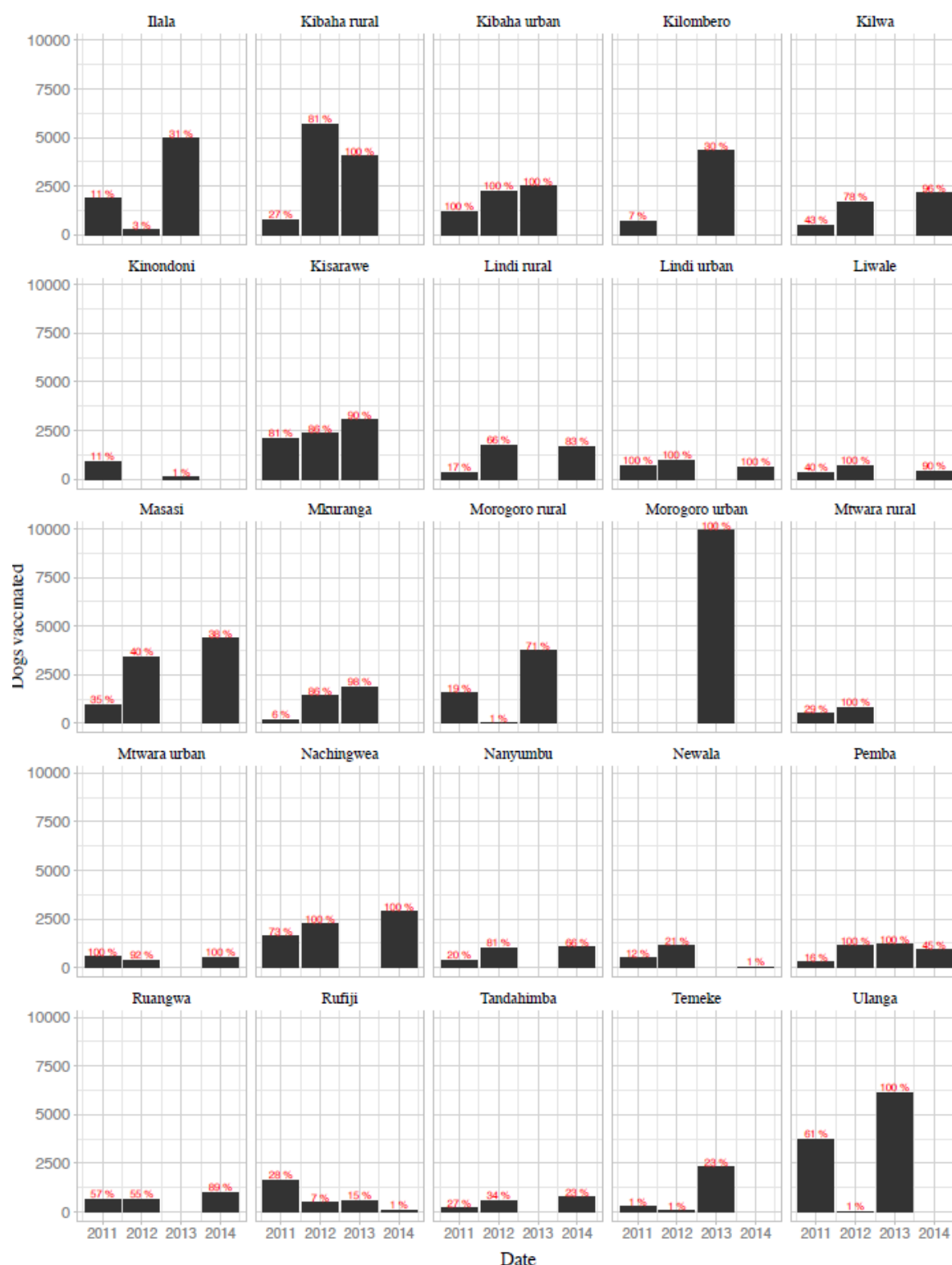
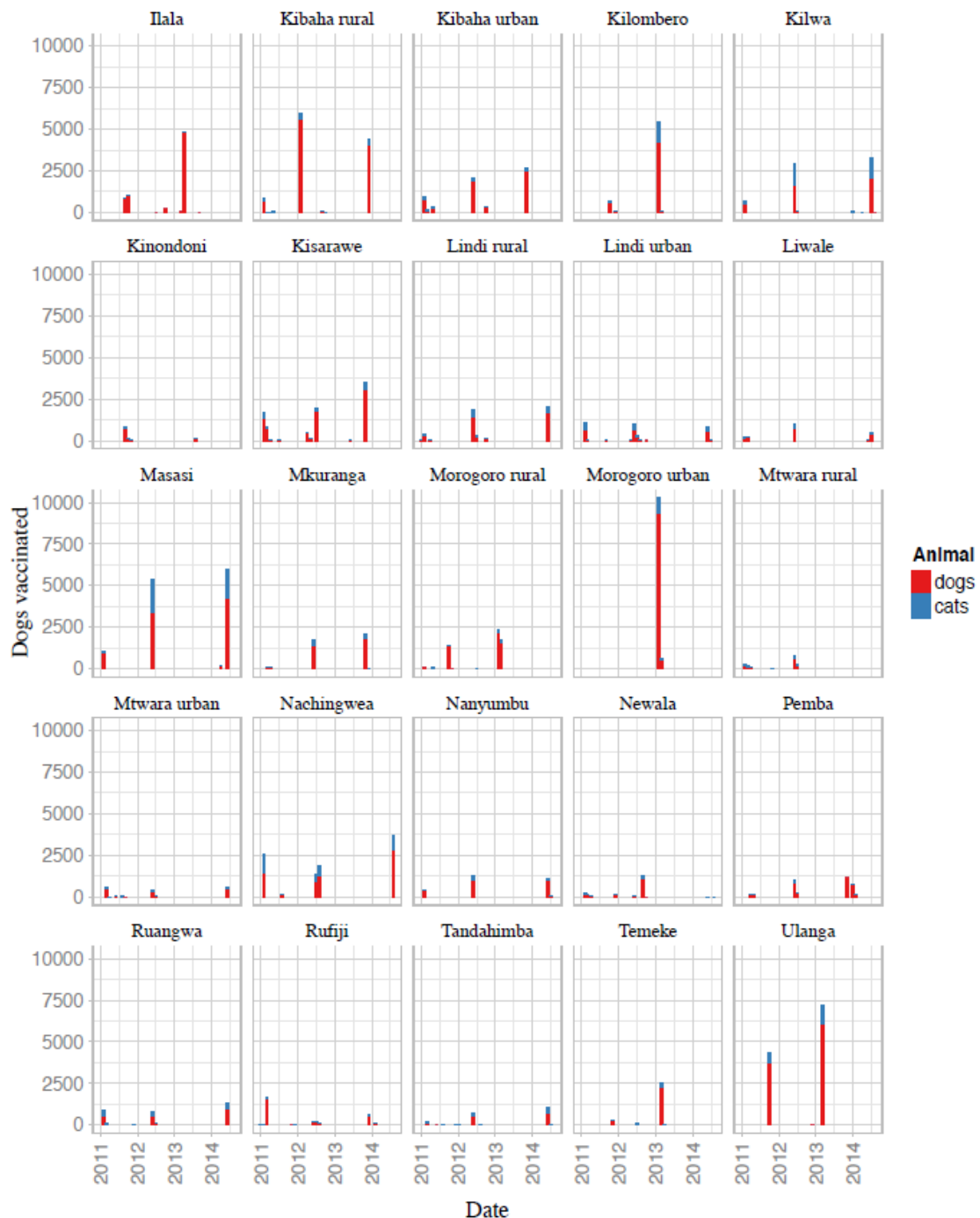


Figure 9. Dogs vaccinated in the Gates zone from 2011 to 2014 (until 1 November 2014). Total dogs vaccinated each year are shown, with the percentage of villages reached in each district during these campaigns indicated above bars in red.



Dogs and cats vaccinated in the Gates zone from 2011 to 2014 (until 1 November 2014). Total animals vaccinated each month are shown with dogs in red and cats in blue.

Figure 10. Vaccination coverage achieved in districts during campaigns since November 2013 estimated from village-level post-vaccination transects. Pie charts for each vaccinated district are scaled according to the number of dogs observed (which is assumed to be proportional to the overall dog population size), with the vaccinated (collared) proportion shown in black and unvaccinated (uncollared) proportion shown in red. Data are currently being compiled for Masasi district in Mtwara region, and campaigns in 2014 have yet to be completed in Morogoro region and Dar es Salaam (see Figures 6 and 7).



2.3.1.4 Sustainability

As the project draws to a conclusion, the United Republic of Tanzania aims to declare and define the areas that are rabies-free in 2015. Border control regions are also important areas for attention to assure that no incursions occur. Another aim is to strengthen border control with Mozambique. This will include training and vaccination campaigns that will be carried out in 2015. The border control programme will be run in collaboration with the University of Glasgow, World Animal Protection and other organizations. There is some risk that sustained funding for rabies elimination will not be forthcoming from the government authorities and sustainability of rabies elimination will remain dependent on external sources of funding.

2.3.2 Plans for the next reporting period

The next period of the project will focus on completing the fourth phase and subsequently the fifth phase of the mass dog vaccination campaigns. In May 2015, the project will implement the fifth phase of mass dog vaccination campaigns in all 24 LGAs as well as in Pemba. Subsequently, the National Rabies Control and Elimination Strategy (NARCES) will be developed and formalized, then rolled-out from the project site and used to catalyse elimination plans and efforts in neighbouring regions throughout the United Republic of Tanzania. The plan will ensure formalized governmental support – especially through “buy-in dialogue” meetings – and will also aim to promote the “Peer District Learning Approach” that will be used to create buffer zones around the project site. Technical support will be provided for dog vaccination in the Tanga, Coast, Iringa, Njombe and Ruvuma regions in order to protect the project area by creating buffer zones. Additionally, improved PEP delivery will be provided in these regions – as well as in Zanzibar – bordering the project site. Education programmes will be continued in order to promote public education and awareness on rabies, and the importance of PEP treatment and dog vaccinations as key disease prevention methods, using school-based and community-based approaches, e.g. local radio, TV, media education and advocacy to policy-makers.

2.3.3 Financial report

The project budget in 2013–2014 was US\$ 690 000 and the project has spent a total of US\$ 228 112 to date. This means that only 33% of the budget was used up until mid-2014. Funds contributed to support mass dog vaccination conducted by ministries, the procurement of equipment and human vaccines and the delivery of PEP services. Administrative barriers have been responsible for some of the delays in implementation. Because of the improved funding disbursement, the fourth phase of the campaign will be completed by the end of December 2014, utilizing US\$ 285 000 of the remaining US\$ 461 888 left from the 2014 budget. Some of the funds will be put towards project evaluation, procurement of vaccine, surveillance and training. The expenditure of the remaining budget will ensure the 2015 campaign (fifth phase), including a mass dog vaccination campaign in all 24 LGAs before July 2015.

3. Highlights of lessons learnt

- *Dog bite data for PEP provision decision-making.* It is extremely important that each programme consider what data will be required from the beginning at the planning stage of the programme, e.g. dog bite cases sorted by suspected rabid animals compared with dog bite cases from vaccinated dogs – the requirement for administering PEP to individuals.
- *Raw data.* Both raw data and metadata are important for studies and for other analyses. Keeping the raw data from the beginning will ensure that no vital data are lost should they be required at a later stage.
- *Improve and assess capacity when designing the project (e.g. staff competence, training, diagnostic capacity).* It may be beneficial to begin the project with training programmes to ensure that sufficient, adequately trained staff members are available. This will help to prevent personnel shortages and relieve any potential challenges further into the project. A training programme for project leaders may also be important – especially for potential challenges that may be faced. This training could be provided by project leaders from other projects.

4. General summary of discussions

The discussions from the meeting are summarized below by theme to supplement reports provided from each project site.

4.1 Raising the status of rabies

At the international level, FAO, OIE, WHO and GARC are working to motivate governments and other stakeholders to prioritize and coordinate action towards rabies elimination and control strategies. GARC could play a central role in global advocacy. GARC will endeavour to motivate key countries to send letters to WHO's Director-General Dr Margaret Chan to consider a resolution on rabies for adoption by the World Health Assembly. Such a resolution would elevate the status of rabies among the neglected zoonotic diseases. Resolution WHA66.12 on neglected tropical diseases included rabies as one of the 17 NTDs.¹ Dr Deray will receive a letter from the Philippines and Dr Blumberg will follow up on a potential letter from South Africa to bring to the Executive Board. However, with Ebola virus disease currently dominating global attention on public health, there may not be uptake.

BMGF invests in transformational change, and this proof of concept project is both evidence of such change and demonstration that rabies elimination is possible in different contexts. BMGF does not support routine programme implementation. At the launch of the results of this project (end of 2015), there will be an opportunity to showcase the projects and gain more support from other donors for their expansion into other adjacent geographies. The advocacy department of BMGF could help in contacting potential interested parties.

¹ http://www.who.int/neglected_diseases/mediacentre/WHA_66.12_Eng.pdf?ua=1

Rabies is not included in the London Declaration on neglected tropical diseases² endorsed in 2011 by Bill Gates (BMGF) and Dr Margaret Chan (WHO), as well as CEOs from 11 different pharmaceutical companies committed to its implementation. WHO will work with BMGF to raise this topic for consideration on the agenda of the CEO roundtable.

BMGF is committed to providing additional support for advocacy and dissemination to strategically promote the results from these pilot projects. The final project report should clearly advocate more support for “start-up packages” for interested countries or adjacent geographies. The project provides a basis for developing country and regional plans for Africa and Asia.

In the meantime, WHO, FAO, OIE and GARC are drafting a rationale for investment in the global elimination of dog-transmitted rabies. Linking the different regional strategies to progressively achieve the elimination objective will be important in demonstrating coordination. GARC would play an important role in bringing the different countries and strategies together.

4.2 Rabies-free status

The Philippines uses the report of the WHO Expert Consultation on rabies (Technical Report Series No. 982) as a guide to determine rabies-free areas. There is a need to improve the guidance for countries on how to become rabies-free. Chapter 8.12 of the OIE Terrestrial Animal Health code stabilised the intergovernmental standards on the declaration of a rabies free country³.

The criteria for declaring an area as rabies-free were the focus topic of this sixth ICG meeting. Several suggestions were made on the phrasing of the term “rabies-free” status. It may be more beneficial to have categories of “rabies-free”, e.g. level 1 for 1 or fewer cases per year. A country can thereby be deemed rabies-free on different levels, aiding in the future with the depiction of progress to policy-makers and funding bodies (including governmental support). It is still unclear to most countries what adequate surveillance entails in order to attain rabies free status. Surveillance tends to be a challenge as it is difficult to get government buy-in for surveillance. WHO should lead work on clarifying the process.

Assembling data from the projects but also from other countries working towards rabies control are important to track trends and target high-risk areas, and for monitoring and evaluation of programmes, advocacy and future investment.

4.3 Sustainability and reducing costs

KZN and the Philippines have secured governmental support for the rabies elimination programme and are expanding beyond the project sites. In the United Republic of Tanzania, engagement with local governments will be vital to sustaining the programmes in LGAs. This is extremely important as the veterinary laws in the United Republic of Tanzania are very strict and this poses many challenges to running a rabies elimination campaign. In Zanzibar it may be feasible to approach the private sectors. Rabies could be promoted as a risk to tourism and therefore obtaining funding and backing from hotels, resorts and tour operators would be beneficial in order to protect tourists. It can be

² <http://unitingtocombatntds.org/resource/london-declaration>

³ http://www.oie.int/en/international-standard-setting/terrestrial-code/access-online/?htmfile=chapitre_rabies.htm

considered a social responsibility to aid in the vaccination campaigns as well as education in dog bite prevention and primary animal healthcare. The government can also contribute to ensure that the private sector participates and helps to protect tourism.

More clarity is needed also with regard to what constitutes a maintenance phase of a rabies elimination programme as freedom from rabies is attained.

KZN is considering downscaling activities in KZN to a maintenance phase with a likely 3 yearly cycle. Community Care Givers (CCGs) will determine whether there are any new puppies or dogs in the area and report these animals to the state veterinarian for follow-up and vaccination. Problem areas would maintain a yearly elimination phase. Improved primary animal health would ensure that vaccinated animals live longer and therefore the population turnover is slowed down. Education will play an important role in this aspect.

The issue of non-veterinarian vaccinators being able to vaccinate independently of a veterinarian has been a major limiting factor. KZN overcame this problem by approaching the veterinary council to allow trained non-veterinarian vaccinators to vaccinate without supervision. Unfortunately, in the Philippines, the veterinary council does not allow non-veterinarians to vaccinate without the physical presence of the veterinarian. Veterinarians are able to provide vaccination certificates while vaccinators are not. One possible solution would be to simply use vaccination cards as opposed to certificates.

WHO is now procuring all dog vaccine via the OIE procurement mechanism. Regional and national elimination programmes are able to purchase vaccine through the OIE or WHO at a negotiated price.

The physical vaccine bank in Allerton Laboratories (Pietermaritzburg, KZN) has been instrumental in catalysing start-ups in adjacent geographies (Figure 2). The vaccine bank can also be used in outbreak control where a large amount of vaccine is required at short notice (RIG as well as other equipment such as syringes, needles, control-poles could also potentially be added to the this supply). RIG would be an important addition as it is typically expensive and difficult to obtain.

1.1.1 Reduction in PEP and associated costs

The trend in all project sites has been an increased demand for PEP due to improved awareness and education of individuals. PEP delivery in areas of low rabies risk could be adjusted by assessing the risk that bite victims were indeed bitten by a rabid animal, in order to reduce PEP usage and therefore cost. Currently, KZN is focussing on bite prevention to minimize the number of potential exposures rather than clinically assessing the need for PEP, as tracing of dogs is difficult and places a heavy responsibility on the treating health-care workers. A helpline was proposed to aid health-care workers assess the situation and the need for PEP. Another important point was that it is extremely important to publicize that rabies is under control (in the rabies-free areas) in order to reduce the number of requests for PEP.

4.4 Responsible pet ownership and dog population management

KZN has always worked closely with primary animal healthcare and animal welfare organizations to bolster activities led by the project. Much of the documentation generated by the project is being used at national level. A recent direct outcome of the project is that the national DoA has dispatched mobile primary animal health-care clinics to provide services where these would otherwise be hard to come by.

The Philippines has developed videos addressing responsible pet ownership, dog population management, bite prevention and other issues such as PEP usage and potential exposures. These clear, simple and informative videos are in the final stages of production. The Philippines has also moved more towards a quarantine or observation period for suspected animals rather than immediately killing the animals for diagnosis. Dogs from rabies-free areas that bite individuals are preferably placed under quarantine and observed before PEP is administered or stopped.

It was recommended that the OIE definitions for stray dogs and ownerless dogs be used.

4.5 Dog population estimates

Dog population estimates continue to pose challenges throughout all three of the project sites as a variety of methods is used, each with their own pros and cons. Dog population estimates can directly affect vaccination coverage estimates. The United Republic of Tanzania uses data from the DVOs in each of the districts. However, the data from some household surveys performed by Glasgow University are very different from the data obtained from the DVOs. Caution should therefore be exercised. The United Republic of Tanzania says it uses both household surveys as well as DVO data. One effective means to gather dog population data may be to use primary schoolchildren to gather data about the number of dogs at home, as well as the vaccination coverage.

4.6 Diagnostics

The direct rapid immunohistochemical test (dRIT) could potentially replace the fluorescent antibody test (FAT) in certain countries. Several studies have shown promising results with this test. It would be important that the dRIT be officially recognized by the OIE as a validated test for the diagnostic of rabies. This process is under way and the dRIT is being evaluated. One question arose concerning problems with the supply of antibodies, but the polyclonal antibodies that are currently being used for the FAT can also be used for the dRIT. Ideally, a dRIT diagnostic kit would make this test more accessible. Further discussions and work also need to be done with regards to the lateral flow assays which have also shown promise.

5. Follow up

- Further discussion and guidance are needed on the following subjects
 - rabies freedom and criteria around maintenance phase and surveillance
 - Global data assembly and publishing on GHO
 - Diagnostics: dRIT, lateral flow
 - Vaccine banks/stockpiles and engaging the private sector
- United Republic of Tanzania and the Philippines to submit their technical report in the BMGF format (beginning November 2014)
- Complete ICG meeting report (January 2014)
- Require a few (5) slides to sum up the programme for the proof of concept campaigns for 9 October (compiled at this meeting)
- Prepare a timeline for the next year in order to get new partners on board and track progress.
- All three project sites to produce a short report (informal) about challenges, what they need to progress and circulate these
- Conduct final welfare assessments in the United Republic of Tanzania and the Philippines (before June 2015)
- Compile technical reports: first draft (by 15 June 2015); final report (by mid-September 2015).
- Support GARC in preparing the Paracon meeting (scheduled for **9–10 June 2015**) in Durban to:
 - showcase BMGF projects
 - improve coordination of individual groups in Africa towards a unified strategy
- GARC is working with BMGF project leads on finalizing Health Economic Survey
 - Philippines paper needs to be revised to include more work
 - United Republic of Tanzania paper has been circulated for finalization but some of the data need to be re-examined
 - KZN paper has been published <http://www.ncbi.nlm.nih.gov/pubmed/25414096>
- Global rabies meeting with launch of project results **10–11 December 2015**, WHO headquarters.

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Annex 2. Implementation rate (no cost extension end 2015)

	Budgeted	Encumbrances (B)	Expenditure (C)	Balance available	% implementation
International coordination	138 956	22 130	112 181	28 811	97%
South Africa	231 578	13 480	0	218 098	6%
Philippines	423 366	21 977	195 752	205 637	51%
United Republic of Tanzania	894 600	109 368	127 005	658 227	26%
Total	1 688 500	166 955	434 938	1 110 773	

Annex 3. Proposed indicators for evaluating the impact and sustainability of the projects

Indicator	Examples of useful data
Surveillance	
Surveillance quantity	Submitted samples from suspect cases
Dog rabies incidence	Confirmed cases Clinically suspect/unconfirmed cases Visayas: Suspected dogs surviving after quarantine
Dog bite injuries	Clinical records No. of dog bites from suspected cases No. of dog bites from non-suspect cases (optional) No. of bites per exposure category
Prevention	
PEP coverage	No. of clinics providing PEP Time between bite and treatment (not essential) Maintain all raw data
PEP completion	No. of suspect bite injuries receiving full treatment
RIG coverage	No. category 3 bite injuries receiving RIG
Patient details	Age, sex, district/region of origin etc.
Cost analysis	Cost of PEP
Control	
Dog vaccination coverage	Vaccinated dogs
	Doses used
	Target population size*
	Post vaccination survey*
Dog vaccination completeness	% community vaccinated in each district/municipality in each round
Other species vaccinated	e.g. cats
Dog vaccination coverage maintenance	Time between vaccination campaigns in same village/community
Sustainability	
Cost per campaign	Categorize costs individually with a sum total per campaign Include breakdown where possible
% budget from Gates Foundation funding	
% ID use relative to IM	ID vials used IM vials used
External infection rates	Length of borders onto affected areas
	No. of ports of entry
	No. of dogs in quarantine
	No. of dog cases where evidence supports infection occurred from outside
Communication	
Public awareness	Household surveys before and after intervention
	Methods used to raise public awareness
	No. of public awareness materials disseminated
Policy change	Written as a narrative
	How long it took to change legal framework
	No. of policy changes that have taken place
Improved understanding of rabies epidemiology and control	No. of research projects conducted to support, inform or study the rabies programme
Research projects	No. of research papers arising from the rabies programme
Media interactions	Newspaper, radio etc.

* Dog population estimates require the number as well as the method used to obtain that figure, e.g. census.

Annex 4. Draft outline of final report

1. Introduction

Include current public perception via media scanning

2. Surveillance and proof of burden

- Quality of surveillance
 - Dog population estimates
 - Period between no cases detected and declaration of rabies-free zone
- Decentralization of laboratories
 - Diagnostic challenges
 - Costs of freight/transport
 - Increasing diagnostic turnover time

3. Target population

- Dog ecology
- Dog population size
- Coverage

4. Human health

- Animal bite treatment clinics
- Education and bite prevention
- PEP demand
 - Demand initially increases as rabies cases decrease

5. Communication

- Within projects – One Health
- Between projects
- Dissemination plan – packaged differently for different audiences
 - Blueprint for rabies control
- Supporting new projects
- Role of the press

6. Policy change and legal frameworks

- Government/legal structures in different settings
- Individual country experiences and recommendations
- How long has it taken to change legal framework?
- Public/private partnerships

7. Steps to elimination

- Lessons learnt at each step
- Timeline for implication of different steps (e.g. estimate dog population before vaccinating)

8. Sustainability

- Health economics
- Continued vaccination
 - The possibility of biennial vaccination
- Other projects in region and strategies for collaboration/maintenance
- Scaling up
- Champions

9. Key messages

Annex 5. World Animal Protection

World Animal Protection (WAP) is working in three countries in Africa and plans to expand into six countries in Africa. WAP has a total portfolio of approximately 20–25 countries globally; by 2025, it aims to have in-country representatives in all of these countries. The aim of WAP with regards to rabies elimination is to supplement programmes in countries via its own extensive dog population management programme, which includes vaccination and primary animal healthcare. Additionally, WAP aims to help countries to engage corporates and governments in order to obtain funding, as well as to help governments develop and test national action plans. Its engagement with countries is not solely at a policy level but aims to work with the country from the policy level to the ground level. This helps to identify problems throughout the chain of command and also helps to influence the government on how it deals with individuals.

Zanzibar

Through the collaboration of WAP with the Government of Zanzibar, the Government has encouraged the police to allow locals to use the dog dip tanks that the police own. Zanzibar has registered many successes over the past few years, including no single human rabies case in the past 2 years. This achievement is partly due to the rabies control programme obtaining funding from its own government and not relying solely on external funding or contributors. Given these successes, Zanzibar requires specific guidelines on declaring it a rabies-free island. Following the declaration of rabies-free status, Zanzibar is looking to expand its programme by sending paravets and others to support WHO's work in Pemba. Nguja and Pemba also require their own laboratories in order to improve diagnosis and surveillance.

Zanzibar has maintained dog management as a leading priority on all meeting agendas with the Shehas. The communities inform the Shehas about dog pregnancies and new puppies born, who can then predict the number of vaccines required and by whom, thereby addressing the challenges of sufficient rabies vaccine coverage in a growing population. The community meetings also enable community members to highlight irresponsible pet owners, enabling the issues to be addressed directly with the individual. This means that the community members “police” one another and ensure that the entire community is protected. Some concerns in Zanzibar have arisen through the harsh handling of animals at vaccination points. This may be the result of stresses on vaccinators to obtain their target for vaccination. Therefore the programme may therefore be slowed in response. The technicians will require further training in order to be able to vaccinate faster and to vaccinate in different areas of the body. Lastly, the technicians need to improve their communication with owners to ensure that their dogs are handled and controlled before vaccination – this will ensure the safety of the technician and accelerate the vaccinating process.

WAP is funding some of the salaries of the technicians in the Zanzibar programme, but aims to have full government support by the end of 2015. It strives to simply be a catalyst for these programmes and insists that they be owned by the respective government. A suggestion regarding the Zanzibar programme included the need for a way to assess animal welfare at vaccination points.

Other project areas

Dog bite prevention aides have been developed and are being trialled in PAHO countries, and WAP is pursuing translation into English and French. These aides will be uploaded onto the WHO website for free download. WAP has also been working closely with the Government of Kenya in order to aid and supplement their recently launched national strategy. Through its efforts in the United Republic of Tanzania, the Tanzanian elimination programme has been able to vaccinate more dogs as a result of improved animal handling techniques. WAP is also aiding legislation change in order to enable paravets, animal health technicians and others to be able to vaccinate.

WAP attempts to work initially with local NGOs to find locally owned and tailored solutions or approaches to rabies elimination campaigns. It also tries to assist in identifying special skillsets in local NGOs, enabling the government to identify the relevant NGO for the desired purpose. WAP tries not to be an overseeing body but rather to support the competent authorities in the region in order to create national plans.

It was suggested that WAP and relevant countries improve their communication and collaboration with private veterinarians (e.g. AFSCAN) in order to encourage them to work in communities and on mass dog vaccination campaigns. WAP is also looking to get animal welfare higher on the agenda of the OIE, WSAVA and other organizations.