



RABID BYTES

The Newsletter of
The Alliance for Rabies Control

Issue 11 February 2009

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Editorial

In our first issue for this year, I would like to send best wishes from the Alliance to all of you for 2009. There has been a lot of news about rabies since we issued our last Newsletter. The recent introduction of canine rabies onto the previously 'rabies-free' island of Bali has resulted in much work for the people involved in trying to eliminate the disease from the dog population. The recent human rabies death in 'rabies-free' Ireland and the deaths of 42 children from rabies in Angola are just a few stories in the ongoing saga of rabies.

Every time that I read of another rabies case, I seriously wonder what each of us can do to stop the ongoing and unnecessary tragedy of human rabies. Clearly, we urgently need to increase the educational awareness of this disease because those living in a rabies endemic country (almost every country in the world) can be protected if they have the correct information on how to avoid being infected with rabies and what they should do if they are exposed. We are grateful to Dr Mary Warrell, from the Oxford Vaccine Group, for her very informative article explaining options to be considered for patients that require post-exposure prophylaxis.

My friend and colleague Dr Anthony Fooks from the WHO Collaborating Centre in Weybridge, UK has indicated to me on many occasions that the globally estimated "55,000 human deaths" that occur every year is simply a figure written on a page that has little or no emotional impact. The horrific tragedy of rabies becomes only too real when one of those estimated 55,000 human victims is a member of our own family. Each of the 42 children that died of rabies in Angola, the 6 people reported to have died on Bali, the lady from Ireland, and Zach Jones, the young man who died in the United States and whose parents have kindly written an article for our Newsletter this month, were all people who had hopes and dreams that they are no longer here to fulfill.

With the limited resources at our disposal, we are unlikely to eliminate rabies virus in every animal species where it is currently circulating anytime soon. We can however work toward the ultimate goal of preventing human rabies, even in high risk areas, by continuing to educate the public through as many avenues as we can find.

Dr Deborah Briggs, Executive Director of The Alliance

Rabies Control Program in Kwa-Zulu Natal, Republic of South Africa

Most cases of rabies in the Republic of South Africa occur in the KwaZulu Natal (KZN) Province (highlighted red on the map of S.Africa). Based on the eminence of the ongoing rabies control effort in KZN and driven by a global initiative to increase global support for rabies prevention activities involving the Alliance for Rabies Control, Partners for Rabies Prevention and the World Health Organization, the Bill and Melinda Gates Foundation recently announced that their Foundation will help to fund a five year demonstration rabies control program in the KZN province of South Africa.

This is one of three project areas chosen to demonstrate that a strategy based on increased awareness and dog rabies control can lead to effective prevention and potential elimination of rabies in humans. To combat the rise in cases of rabies in KZN, an aggressive rabies control campaign is now underway, led by Kevin Le Roux of the Department of Agriculture. The campaign includes house to house vaccination of dogs, remote injections of dogs when they are not readily handled, live oral vaccination of stray dogs, contraception, and euthanasia of dogs with behavior indicative of possible rabies. Surveillance using fluorescent antibody (FA) tests for suspect dogs and more detailed molecular serotyping for unusual FA positive cases such as wildlife is also being used. Education and advocacy will be key elements for the success of the rabies control program in KZN where despite past efforts, many have never heard of rabies.



Even with increased awareness, better surveillance, and enhanced efforts to vaccinate a larger proportion of dogs, attempts to eradicate rabies in KZN will be very difficult. Much has changed since 1976 when rabies was absent from KZN. There has been increased viral pressure on wildlife and increases in populations of key wildlife species susceptible to the disease, such as black-backed jackals and spotted hyenas. AIDS is also contributing significantly to the incidence of rabies. In some villages, the rate of HIV infection is 60-80%, and dogs are often abandoned when their owners die of AIDS (See ARC newsletter 10). There is widespread poverty and a lack of primary health care for animals. Even owned dogs wander as packs searching for scraps of food. Sustaining mass vaccination campaigns is an expensive exercise, and financial pressures due to other disease outbreaks have been a major factor in hampering rabies control in KZN in recent years.

On the positive side, there is a strong determination to eradicate the threat of rabies in KZN. The rabies control project will bring together a team of key players such as SPCA; Department of Health; Local and National Government; Veterinary Services; Wildlife; Private sector veterinarians; Diagnostics; Media; Education; and national and international experts and advisors. Having a single empowered Project Manager is instrumental in standardising the control measures, researching new technologies and to maintain the priority of rabies in the face of other potential disease outbreaks. International funding from the Bill and Melinda Gates Foundation will help contribute to improved sustainability. In summary, it is feasible—theoretically, technically and logistically—to consider elimination of human rabies a realistic goal for KZN. Lessons learned from the campaign, hopefully, will serve as a model for eradication of rabies in Africa and beyond.

This piece was contributed by Louis Nel, University of Pretoria, South Africa, Kevin Le Roux, Department of Agriculture, Directorate of Veterinary Services, KZN, South Africa and Ronald Atlas, University of Louisville, Kentucky USA.

New Directions in Rabies Ecology

Studying rabies through an ecological lens provides researchers and public health practitioners with a better understanding of the remarkable emergent (and re-emergent) properties of the rabies virus. The human health hazard and economic expense of control make rabies an insidious disease worthy of elimination; nonetheless, the very properties that make it a tenacious and dangerous disease, also make rabies ecology fascinating. Rabies is a remarkably resilient disease for such a fragile RNA virus, exemplified by its persistence in North American wildlife. Despite elimination of rabies in domestic dogs in the US and hundreds of millions of dollars spent on control efforts each year, the virus continues to circulate among multiple wildlife species including skunk, gray fox, raccoon, mongoose, and bat. The success of the rabies virus hinges on 2 factors: 1) rabies can persist in wildlife reservoirs for decades, despite high morbidity and mortality rates, and 2) rabies can successfully switch reservoir hosts to occupy empty host niches. By studying the ecological and virological factors that promote the emergence and re-emergence of rabies, we can advance our understanding of how to control rabies outbreaks.

Our understanding of rabies disease ecology has increased substantially with the advent of molecular ecological techniques. Host ecology has benefited from supplementing traditional radio-telemetry studies of habitat use with population genetic approaches. With these techniques, we can more accurately estimate population wide dispersal, as well as identify barriers to dispersal across the landscape to predict the potential emergence of rabies. Similarly, using molecular epidemiological approaches with the virus, we can reconstruct the history of an outbreak, infer the source of the outbreak, and trace how rabies spreads across the landscape. The molecular ecology of both host and pathogen can be placed in a geographical context so that we can predict how land use and land cover affect rabies emergence. Although these factors have been investigated separately, a holistic approach to the study of rabies is missing; thus, it is unknown how virus, host and environment interact to maintain rabies on the landscape.

Ecological genomics provides a new frontier in which we can study the ecology of rabies. As whole genomes become cheaper and easier to sequence, our understanding of the molecular underpinnings of transmission and immunology advance. Bridging our knowledge of how rabies genes function in a laboratory setting with our understanding of how the virus propagates in nature is the challenge for the next generation of rabies ecologists. How different genotypes and phenotypes of host and pathogen interact with the environment will inform our ability to predict disease outbreaks, and ultimately assist us in controlling rabies.

Contributed by Dr. Samantha M. Wisely, Asst. Professor and Director, Conservation Genetics and Molecular Ecology Lab, Kansas State University, USA. One example of a study combining rabies genetics with geographic models is Biek, R. et al. (2007) Proc Natl Acad Sci, vol 104, p7993-7998, the full text is available at www.pnas.org/content/104/19/7993.full.pdf+html

Losing Zach

In March 2006, our 16 year old son, Zach, came home from school and went to his room to take a nap. About an hour later, he came downstairs and said that a bat, flying around his face, had woken him up. We went upstairs, found the bat, put a towel over it and threw it out the window. We asked Zach if the bat had bitten him and he said he didn't think so. We checked and there were no bite marks, nothing that we could see.

Then on May 5th, Zach came into our room at about 3 o'clock in the morning and said that there was something very wrong with him. Over the next 8 days we witnessed our child go through the horrors of rabies until he passed away on May 12th. No words can describe what it was like to lose your only child. Zach was the light of our lives and we miss him more than can be imagined. A day does not go by that we don't think of him and also ask ourselves a very difficult question - "what if"? If we had known that bats could carry rabies, we would have captured the bat, had it tested and our precious son would be alive today. But, we didn't know. We made a solemn promise to ourselves that we were going to do everything in our power to educate the public about rabies because no child should have to go through what our son went through.

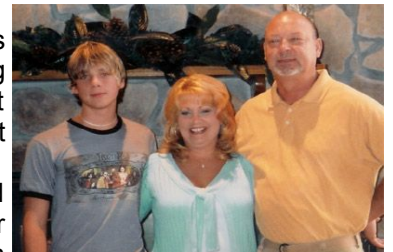
The Zach Jones Memorial Fund, www.zachjonesmemorial.com, was established to not only remember our son and to celebrate his life, but also to educate others, on the dangers of rabies with a public awareness campaign. In our research, we have learned that we were not alone – most people in the U.S. think rabies does not exist in our country. And, most do not understand that bats can carry rabies. We built another website, www.rabiesaware.org, to educate the general public.

Our goal in attending the Rabies In The Americas (RITA) meeting last September was multifold: we wanted to learn firsthand what is happening in the world of rabies from the top researchers, clinicians and health officials. We also wanted to interview as many people as we could to post on our new You Tube Channel - www.youtube.com/rabiesaware

While attending the RITA conference we had the pleasure of meeting Jeanna Giese. It was a comfort to us - we hugged, cried and spent time getting to know Jeanna, her parents and her brother BJ. We also met Dr. Rodney Willoughby for the first time. After we lost Zach, Dr. Willoughby was so kind in giving us his time and expertise in answering our many questions.

As parents, we saw first hand the horrors of rabies. We never want anyone to go through what we went through losing our child to a disease which could have been prevented. A lot of people in the U.S. believe that rabies has been eradicated here, but we know better. We want to do everything we can to educate the general public.

Written by Connie and Larry Jones. Their website www.rabiesaware.org has information on rabies transmitted from wildlife in the US, especially bats and how to protect people from the disease.



Zach with Connie and Larry



Connie and Larry with Jeanna Giese and Dr Willoughby

Working Together to Build Rabies Awareness in Mozambique

The Alliance works with many people around the world to prevent rabies. Here, we highlight the work of Mrs Moira Felgate in Mozambique, a story of how one person can make a difference through determination and collaboration.

Moira was born in Zimbabwe and has also lived in South Africa. For the past 7 years, she has been living in the Maputo area of Mozambique, working for a company called TEMOC. She has previously been involved with the Society for the Prevention of Cruelty to Animals and conducted many rabies prevention clinics and animal education programs.

In Mozambique, Moira is constantly confronted with a large, uncontrolled dog population and a low level of rabies awareness. Most dogs are tied up on short chains with no shelter and only occasional food and water. At night, many dogs are released "to guard the premises", but instead roam freely looking for food. Very few are vaccinated against rabies, partly due to a local superstition that a vaccinated dog is no longer vicious, and therefore not a good watchdog. Consequently, human rabies cases, particularly in children, are high. The Alliance helped Moira with practical advice to help persuade dog owners to vaccinate their animals (for example, police guard dogs are vaccinated against rabies but still maintain their instinct to protect their "own" property).



Moira (far right) with some of her team.
Photo: Ana Lobo of MOZAL

To increase national awareness, Moira contacted Dr Fernando Rodrigues (Head of Veterinary and Public Health) and Dr Olga Amiel (Ministry of Health). These two dynamic professionals invited her to help develop a Strategy for Rabies Control in Mozambique. The team started to use the Ministry of Health's regular TV and radio features to educate the public about rabies. Focussing on World Rabies Day (Sept 28th, 2008), letters were sent to all towns and cities in Mozambique and to businesses to encourage them to incorporate rabies education material into their Health and Safety Education programs. The Alliance was pleased to supply rabies educational posters for these events. With only 100,000 doses of canine rabies vaccine available for the entire country, a woefully inadequate supply for Mozambique's dog population, vaccination clinics for WRD were focussed in the Tete and Zambezi provinces where most human rabies cases are reported, and in Maputo and Matola Cities, close to the companies involved. Many companies promoted WRD by displaying banners, handing out information, presenting talks, producing computer screen savers featuring rabies, and telling employees about dog vaccination clinics.

There were disappointments, some clinics had low turnouts for pet vaccinations. However, fantastic progress has been made and the Alliance is proud to have played a role in this wonderful initiative. Most importantly, Moira is determined to continue her efforts and is forming an animal welfare NGO, to be called the Mocambique Animal Protection Society (MAPS). One major sponsor, MOZAL, a local aluminium smelter, has made 'rabies education' their first outreach program in Mozambique, and will continue by encouraging staff to talk about rabies prevention to their friends and neighbours. Moira also hopes to bring together informed pet owners and a local veterinarian volunteer, to persuade others to vaccinate their dogs and cats. Several other companies have expressed interest in supporting these projects. The Alliance congratulates Moira and her team on being an inspiration for others to work together to make a difference.

Written by Louise Taylor, Community development officer for the Alliance, from correspondence with Moira Felgate.

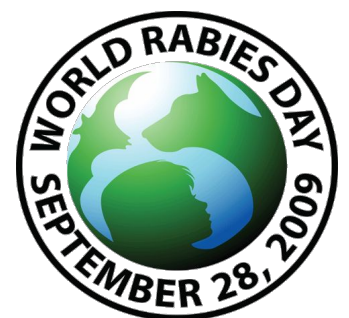
Carl Williams joins WRD Team

The Alliance for Rabies Control would like to express its gratitude to Dr. Cathleen Hanlon for her contribution to the World Rabies Day Team and for her dedicated efforts over the last two years to help make World Rabies Day such a global success. We are well aware that without the untold number of hours and continuous work of Dr. Hanlon, the global success of World Rabies Day would never have been possible. We also want to extend all of our best wishes to Dr. Hanlon as she leaves the World Rabies Day team and continues her rabies research program at Kansas State University College of Veterinary Medicine and we



look forward to our continued partnership with Kansas State University for World Rabies Day activities in the future.

The Alliance is also pleased to announce the appointment of Dr. Carl Williams who will be replacing Dr. Hanlon as our liaison to the Veterinary community including the Student American Veterinary Medicine Association (SAVMA). Dr. Williams received his Doctor of Veterinary Medicine and Masters in Microbiology from North Carolina State University in Raleigh, North Carolina. He is Board Certified in Veterinary Preventative Medicine and currently serves as the state public health veterinarian at the North Carolina Division of Public Health. The Alliance is very fortunate to have Carl on-board and we invite all of you to join us in welcoming Carl as the newest member of our global team!



World Rabies Day 2009

World Rabies Day 2009 will again be on September 28th this year, but remember that rabies is a problem year round, and that events can be held at any time of year!

The WRD website is at www.worldrabiesday.org

The Current Situation of Rabies in Brazil

Human rabies cases transmitted by dogs in Brazil have decreased, however wildlife is becoming the main source of transmission, especially bats and marmosets. Dog-transmitted human rabies has dropped from 150 reported human cases 20 years ago to one case in 2007 and none in 2008. Since 2004, wild animal transmitted rabies is increasing and in 2008, three human rabies cases (two transmitted from bats and one from marmoset) were reported.

In 2008, Brazil registered the first cure of rabies in a 15 year-old patient, who was bitten by a bat, that was confirmed by Reverse Transcription Polymerase Chain Reaction in Instituto Pasteur-Sao Paulo (IP-SP). This patient had received 4 doses of culture cell vaccine, but he did not receive immune globulin as recommended in the national guidelines on rabies prophylaxis. The incubation period was 29 days. The treatment was based on the Milwaukee Rabies Protocol, and the case was treated in the Hospital Universitário Oswaldo Cruz in Pernambuco State with assistance of Secretariat of Health of Pernambuco State, IP-SP, National Secretary of Health Surveillance/ Brazilian Ministry of Health (SVS/MS), Centers for Disease Control and Prevention and Dr. Rodney Willoughby Jr from Medical College of Wisconsin, Milwaukee.

The Brazilian Ministry of Health is responsible for acquiring and distributing culture cell vaccine and immune globulin for rabies prophylaxis. Each year, around 400,000 people seek medical assistance and over 270,000 received at least one dose of rabies vaccine. In 2008, there were 1,476,000 human vaccines distributed and 150,970 doses of rabies immune globulin.

Rabies in dogs and cats has persisted in the Northeastern and Northern Regions of Brazil and municipalities of Mato Grosso do Sul state along the border with Bolivia. To control rabies in this species, two mass campaigns per year are realized and around 26 million dogs and cats have been vaccinated annually since 2003. Rabies in dogs has decreased; in 1998 1,737 rabid dogs were reported and in 2008 just 28 cases. Important activities carried out in 2008 include meetings on surveillance of non-hematophagous bats in urban areas and terrestrial wildlife animals, training for managers of municipalities with a high risk of rabies, the acquisition of culture cell vaccine for dogs and cats, increased laboratory diagnosis, revision of the guidelines on rabies prophylaxis and maintenance of vaccine and immune globulin.

Contributed by Marcelo Yoshito Wada – Responsible for National Program of Rabies/ SVS/MS, Ana Nilce Silveira Maia Elkhoury – Coordinator of Zoonosis and Vectorborne Diseases Branch/ SVS/MS and Gustavo Trindade Henriques Filho – Coordinator of Intensive Care Unit of the Hospital Universitário Oswaldo Cruz/ Universidade de Pernambuco.

'What can be done if rabies vaccine is unavailable or unaffordable'

All human deaths from rabies are preventable. They result from failure to give adequate post-exposure prophylaxis (PEP). In areas where dog rabies is endemic, inoculation of saliva from a rabid animal through the skin, or onto a mucous membrane, may cause rabies encephalitis, which is universally fatal.

Ideally PEP should consist of: (1) immediate scrubbing of the wound vigorously with soap / detergent and water, followed by an iodine-based antiseptic, (2) a course of rabies vaccine and (3) injection of wounds with rabies immune globulin (RIG). However, in practice, about 60% of wounds remain unwashed and vaccine and RIG are often unavailable or unaffordable. The medical staff must then **make the best use of the available resources**. People in the community and clinic staff can be taught about the risk of infection and the urgency of wound cleaning. If vaccine or money is in short supply,



Intradermal rabies injection site in deltoid area. The raised bleb shows successful inoculation.

so that the 5 dose intramuscular (IM) vaccine course unaffordable, 60% less vaccine is needed with intradermal regimens using WHO-standard vaccines¹. These have recently been shown to stimulate immunity at least as well as the expensive IM regimen. The latest '4-site' method has only 3 or 4 clinic visits². Locally manufactured vaccines must be used according to manufacturers instructions. RIG is available for less than 2% of PEP patients in developing countries. According to a recent report, only 2 of 6 major Indian anti-rabies treatment centres had any RIG in stock. When in short supply, RIG should be reserved for patients with severe wounds, and the

highest risk of infection: such as bites on the head, face, neck, hand or multiple bites.

The most effective rabies prophylaxis is achieved by using a pre-exposure course of vaccine¹. If exposure to rabies infection occurs, only 2 doses of vaccine are then needed, given on days 0 and 3, and RIG treatment is not necessary. Widespread pre-exposure vaccination of children is an aim for the future. It is already being used in the Philippines (see ARC newsletter 7). No rabies deaths have been reported in people given pre-exposure prophylaxis followed by post-exposure boosting. Although primary PEP (if no previous rabies vaccine) is extremely effective if all 3 components are given on the day of the bite, delay and incomplete treatment are common, and so 'failures' do occur.

Rabies is a hidden disease. The diagnosis is rarely confirmed in the biting animal or in human cases. Because of this lack of data on the prevalence of disease, rabies prophylaxis is a low priority on public health budgets. Resources, including vaccine supply, may be increased when a local risk of rabies is proved. Expert advice is available. Samples can be taken from suspect rabid animals or patients and easily stored for PCR testing. If no local laboratory is available, medical staff can ask for international collaboration from a WHO Collaborative Center for Rabies. The Alliance can help provide contact information and advice via arc@rabiescontrol.net.



Nigerian girl showing bite wounds inflicted by a rabid dog.

This article was contributed by Dr Mary J Warrell, of the Oxford Vaccine Group, University of Oxford, UK. ¹The WHO position paper on Rabies Vaccines (Wkly Epidemiol Rec 2007; vol 82:p425-35) is available free online at www.who.int/wer/2007/wer8249_50.pdf. ²Dr Warrell et al.'s paper on the Simplified 4-Site Economical Intradermal Post-Exposure Rabies Vaccine Regimen (PLoS Negl Trop Dis vol 2, e224) is available free at www.plosntds.org/article/info%3Adoi%2F10.1371%2Fjournal.pntd.0000224. Photos courtesy of DA Warrell.

Rabies and the Ethiopian Wolf

Rabies in wildlife is a thorny issue. When is a disease part of natural selective pressures and when is it a scourge to be controlled? In the case of the Ethiopian wolf, the Ethiopian Wolf Conservation Programme (EWCP) and the Ethiopian authorities have determined that it must be controlled. With only 500 left, in 7 isolated sub populations on high mountains in Ethiopia, the Ethiopian wolf is one of world's most endangered species. Long term threats are conversion of habitat to agriculture and increased pressure from livestock, but canine diseases threaten to immediately depopulate even what habitat remains. Rabies is a naturally occurring disease in much of Africa, including Ethiopia. However, with a burgeoning human population and associated poorly managed and medicated dogs, rabies is increasing. Dogs, wolves and people coexist in the high Afroalpine to such a close extent that wolves and dogs occasionally hybridise, making rabies transmission from dogs to wolves a very real threat. In 1991, 2003 and 2008 rabies wiped out 70% of affected wolf populations, a loss the species can ill afford.



To try to control rabies in wolves EWCP has adopted two approaches; one preventative and one reactive. In Bale (the largest wolf population), EWCP has paraveterinarians vaccinating dogs against rabies in and around the wolf range. Our hope is to create a *cordon sanitaire* of immunised dogs around the wolves to block rabies transmission. Since 1996, the teams have vaccinated more than 50,000 dogs, but not prevented rabies in the wolves. One recurrent problem is rural nomads bringing livestock into the mountains for grazing in the wet season, and with them dogs from outside the immunised cordon and the concomitant risk of rabies. In order to react to the earliest signs of an epidemic, before it gets out of control, EWCP monitors Bale's wolves very closely.

As soon as a carcass is discovered we rush brain samples to labs in Addis Ababa and the UK. Rabies confirmation leads to an emergency planning phase, considering the implications of the epidemic to Bale's linked sub-populations and aiming to limit the disease to a single one. In 2003 and 2008, outbreaks occurred in the Web Valley, which is connected to the rest of Bale's wolves by two narrow isthmuses of wolf habitat. Targeted vaccination of wolves in these necks can stop the virus from spreading, but this risky intervention is not taken lightly. Trapping wolves risks injuring and distressing them, exposing our staff to rabies and public ire if the intervention fails. "Why subject these beautiful creatures to such distress only to have them die a horrible agonising death anyway?"

In late August 2008, we detected a carcass too decomposed to sample and a second in September. Two more followed and we received confirmation of rabies in mid-October. By the 20th, teams were in the field trapping, vaccinating and tagging wolves. In three weeks we vaccinated 50 wolves in the critical isthmuses. Only one wolf sustained more than a minor cut and despite its limp has survived the outbreak. All vaccinated wolves have survived and thus far the disease has not escaped from the Web Valley. Mortality has been high in the valley and is only now burning out having claimed 43 of 63 wolves in the unvaccinated packs (as of Jan 9th 2009). The only silver lining to this cloud is a renewed commitment from the Ethiopian Wildlife Conservation Authority and Veterinary Department to consider empirical research into the feasibility of an ongoing wolf oral vaccination campaign. If viable and successful, such a programme would remove the spectre of rabies-induced extinction from the wolves and allow us to concentrate on alleviating the long term threats.

Contributed by Dr. Graham Hemson, EWCP Field Coordinator based in Ethiopia. For more information or to support the programme see www.ethiopianwolf.org.

2008 WRD Essay Prize Awarded

The Alliance is pleased to announce that Ms. Kelly Ann Patyk, a veterinary and public health dual degree student attending Colorado State University (CSU), has won the 2008 World Rabies Day Internship Essay competition. Students from 14 veterinary schools competed for the opportunity to serve for two weeks as a guest researcher with the rabies program at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia USA.



Ms. Patyk wrote about the role of veterinarians in public health and zoonotic disease control and prevention and drew upon both her academic experience and professional work at the USDA Centers for Epidemiology and Animal Health. Currently, as a component of her degree requirements, she is working on simulating an outbreak of highly pathogenic avian influenza in commercial poultry to evaluate control options. She has also helped to found the One Health Club at CSU and organized local World Rabies Day events.

As part of the prize, Ms. Patyk will meet world-renowned staff at the CDC whose work and research represent the vanguard of rabies prevention, epidemiology and diagnosis. The Alliance congratulates her on her accomplishment and hope she enjoys her time at CDC. Her winning essay can be read by following the link on www.worldrabiesday.org.

Running for Rabies

Two teams of runners from BioBest Laboratories in Edinburgh, UK are currently training to run the Edinburgh Marathon on May 31st 2009 and will be raising funds for the Alliance.



Biobest is a specialist veterinary virology, serology and DNA diagnostics business, and the principle provider of rabies blood test for the PETS travel scheme in Europe. The company pays for the runners' entry fees allowing all sponsorship monies to go straight to charity. Their 'Hairy Haggis' Relay Team completed the Edinburgh marathon last year (see picture) to raise funds for another veterinary charity, VetAid and the Alliance is delighted to have their support this year.

We encourage all of our readers to go online and donate to the cause!! To sponsor the teams go to www.justgiving.com/biobestlaboratories.

Rabies in the news

The Alliance maintains an up-to-date list of news stories about rabies from around the world on their website, at www.rabiescontrol.net/EN/Media-Center/Rabies-in-the-News.html. The Rabies Maps section of the website also has a link to Healthmap (www.healthmap.org/en) where you can select rabies and search for alerts and reports from the last month. Here, news reports on three recent situations have been summarized by Louise Taylor.

Rabies Death in Belfast, UK

A 37-year old Belfast woman, Lisa McMurray, has become the first rabies victim in Northern Ireland for 70 years. Rabies was confirmed on December 15th 2008 and she tragically died on the 6th January 2009. There have been 23 recorded deaths of British people suffering from rabies since 1946, and 3 since 2000, with the most recent case in 2005 after a man was bitten by a dog in Goa.

Ms McMurray is thought to have acquired rabies following a scratch or bite from a dog whilst working at an animal sanctuary in South Africa as long ago as December 2006. The UK Health Protection Agency is working with colleagues in South Africa and Northern Ireland to trace volunteers who have worked at the Centre in Limpopo, South Africa and the Centre has now written to approximately 230 people who have volunteered there since July 2006 as a precautionary measure.

Rabies Outbreak in Bali, Indonesia

The Centres for Disease Control (CDC) in Atlanta, USA and other agencies particularly in Australia have issued travel warnings about rabies on the island of Bali in Indonesia. Bali is heavily reliant on tourism and had been considered rabies-free for decades.

On December 18, 2008, the Indonesian Ministry of Agriculture reported to the World Organization for Animal Health (OIE) an ongoing outbreak of rabies in dogs on the island of Bali. Rabies has been confirmed in dogs from at least two villages near popular tourist destinations on the southern tip of the island. At this stage rabies has been identified in animals in only one district but travellers are being advised to take precautions on the entire island.

Newspaper reports from Indonesia and Australia suggest that at least 6 human deaths following dog bites have been reported, and although rabies confirmation has not yet been obtained, symptoms were typical of rabies. Recent reports suggest that the numbers of infected people may have risen to at least 10 per day during January. Bali Governor, Made Mangku Pastika, has declared South Kuta a rabies-prone area. The province is conducting a mass culling and vaccination program in the area, involving many organisations including the UN, and partly supported by funds from Australia. This was recently expanded to include south Denpasar, the area adjacent to south Kuta. Over 24,000 pet dogs have been vaccinated and supplied with special collars and tags and over 1,000 stray dogs culled. An additional 50,000 doses of canine rabies vaccine have been ordered by the Bali Animal Husbandry Agency from the Indonesian Health Ministry to carry out their 3-stage mass vaccination program. Hope has been expressed by the Ministry of Agriculture's animal husbandry division that with a properly implemented control policy and follow-up, Bali can be rabies-free within a year. The CDC alert is at wwwn.cdc.gov/travel/contentRabiesBaliIndonesia2008.aspx.

Rabies in Angola

An outbreak of rabies in the Angolan capital has resulted in the death of 42 children since October 2008, Luis Bernadino, the Director General of the Pediatric Hospital of Luanda, has revealed. The majority of victims were male children, between 4 and 10 years old and presented too late for Post-Exposure Prophylaxis to be effective. The Luanda Provincial Government has implemented a 12 day mass animal vaccination campaign and collection of strays. A total of 25 brigades, with 80-100 vaccinators for each municipality were formed. All animals are being rounded up, and owners have no more than 24 hours to claim their pets before unclaimed animals are killed. It is estimated that more than 50,000 animals have been vaccinated to date.

World Rabies Day Marked in Turkey

Turkey's WRD event was held on 26th December 2008, at Uludağ University Veterinary Faculty in Bursa Province. It was linked to the mass dog vaccination pilot scheme of the Technical Assistance for Control of Rabies Disease in Turkey Project, which will take place in February 2009. A large number of participants from all relevant parties interested in rabies attended, including the Deputy Governor of Bursa province, representatives of the Ministry of Agriculture and Rural Affairs, the Ministry of Health, several NGOs, the faculty Dean, veterinarians from different municipalities, professors and students and the media.



Speeches focusing on rabies disease and control methods were given by many participants, providing a broad spectrum of knowledge on rabies from a global overview to the specific situation in Turkey. The country faces both dog- and fox-mediated rabies and has a large stray dog population, so control measures are varied and complex.

Interest towards the World Rabies Day panel, during which lively discussions occurred, was high. It was the common view of the speakers and audience that annual

events in the name of the World Rabies Day should definitely continue to inform all parties about the latest developments in the field as well as about recent control measures and to never forget the impact of this disease.

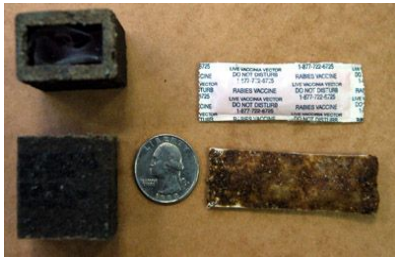
Compiled from a report sent by Begüm Bozkırlı and Dr. Winfried Müller



Managing Wildlife Rabies with Oral Vaccination

“Rabies is low hanging fruit. We can eliminate it in humans, prevent it in domestic animals and control it in free-ranging wildlife.” Dr. Charles Rupprecht, Centers for Disease Control and Prevention (CDC)

The management of rabies in wildlife remains a complex challenge worldwide. Since 1960, wildlife has replaced domestic dogs as the primary reservoir for rabies in the U.S. In 2007, the CDC reported 7,059 cases of rabies in animals in the U.S. and 93% involved wildlife. Raccoons (*Procyon lotor*), bats (*Chiroptera* spp.), skunks (*Mephitis mephitis*), and foxes (*Urocyon cinereoargenteus* and *Vulpes vulpes*) were the species most commonly reported with the disease. To enhance rabies prevention strategies in humans and domestic animals and address concerns over costs associated with the spread of dog/coyote and gray fox rabies virus variants in Texas, as well as raccoon rabies virus variant in the eastern U.S., a coalition of wildlife, public health and agriculture officials have been cooperatively conducting activities to manage rabies in wildlife populations.



Contemporary management of rabies in terrestrial wildlife in the U.S. involves various methods and strategies to meet short and long-term management objectives. However, at the core of all integrated terrestrial wildlife rabies control is oral rabies vaccination (ORV). Field evaluation of wildlife ORV for rabies control in the U.S. began in 1990. A limited field release of a recombinant rabies vaccine occurred on Parramore Island, Virginia prior to wider use in the U.S. for control of raccoon rabies. Since the first field release of Raboral V-RG® vaccine in 1990, the annual number of vaccine-laden baits (examples pictured) distributed in the U.S. has risen exponentially. From 1995 through 2008 more than 70 million ORV baits were distributed in up to 16 eastern

states, Arizona and Texas.

The mission of the national wildlife rabies management program is to implement a coordinated, cost effective, science-based program to control and eventually eliminate rabies in wildlife in an effort to reduce costs and impacts to human health, domestic animals and wildlife. The three broad management goals as outlined in the U.S. National Plan for Wildlife Rabies Management include: (1) Enhance the coordination of wildlife rabies management, research, and communication among government agencies, universities and private organizations; (2) Prevent the spread of specific rabies virus variants in carnivores in the United States; and (3) Eliminate specific rabies virus variants in carnivores at the local, regional and national level.

In the 2008 fiscal year, the USDA, Animal and Plant Health Inspection Service (APHIS) and cooperators including the CDC and State Agencies conducted rabies control efforts using ORV or enhanced surveillance in 25 states. In 18 states where ORV operations occurred, more than 11.6 million baits were distributed over 222,781 km². In addition, close coordination with Canadian and Mexican counterparts on rabies surveillance and control programs near the U.S. border remained essential as outlined in the recently signed North American Rabies Management Plan. Rabies cases have either decreased in the baited areas or spread of the virus has been slowed or stopped in states where ORV was distributed. While ORV remains essential to control rabies in wildlife over broad landscapes, other strategies are typically integrated into control programs including population monitoring, enhanced rabies surveillance, and public education.



These rabies control efforts support the “One Health Initiative”, a worldwide strategy recognizing that human and animal health are inextricably linked which promotes interdisciplinary collaborations and communications in all aspects of health care for humans and animals. The management of wildlife rabies in the U.S. remains a daunting challenge with diverse rabies reservoirs, technological limitations and a difficult fiscal environment but progress is being made. Enhancing our ability to manage rabies in wildlife may in turn serve as a model for rabies elimination around the globe.

Contributed by Dr Richard B. Chipman, Certified Wildlife Biologist & Assistant Coordinator of the National Rabies Management Program, USDA, APHIS, Wildlife Services. Photos courtesy of APHIS.

Details on the Cooperative Wildlife Rabies Management Program are available at www.aphis.usda.gov/wildlife_damage/oral_rabies.

Funding for Further Pilot Projects

In addition to the project in Kwa Zulu Natal highlighted on p1, the Bill and Melinda Gates Foundation is supporting two other rabies prevention pilot projects in developing countries through a grant to the World Health Organization. These will be based in regional areas in the countries of Tanzania and the Philippines. These projects have been designed by collaborative teams of experts and the Alliance is delighted to support these initiatives as a demonstration of how rabies can be controlled and prevented in developing countries. We will be keeping you up to date with developments in future newsletters.

Newsletter editor

Louise Taylor will be taking a break from the newsletter after this issue to have a baby. Please still let us know what you would like to read about, or about rabies events or developments happening in your lives, via arc@rabiescontrol.net

The editor of the Alliance newsletter is Louise Taylor. If you have news items or information of interest to those working to defeat rabies, please contact arc@rabiescontrol.net. For further information on the Alliance's work is at www.rabiescontrol.net, and to support the work of the Alliance please go to www.rabiescontrol.net/EN/Give.