Alliance for Rabies Control

RABID BYTES

The Newsletter of
The Alliance for Rabies Control

Issue 12 April 2009

Photo by Dr. David Nyoagbe

Editorial

On behalf of the Alliance, I would like to express our appreciation to our two guest editors, Jane Coutts and Pete Else for their support in helping us to publish this month's issue of Rabid Bytes. Jane and Pete are helping us out with the Newsletter while our Editor-in-Chief, Louise Taylor, takes some time off to be with her family after giving birth to Nicholas Alasdair Taylor, who was born on February 11, 2009. We are happy to report that Mom and baby are both doing well!

In this month's edition of our Newsletter, we bring you new information and stories from several personal heroes who have been working on different aspects of rabies prevention. We want to especially bring your attention to the article written by Jeanna Giese, who continues to be an amazing role model for all of us. Jeanna is a University student and one of the very few survivors of rabies. She continues to touch the lives of an untold number of people around the world who are living at risk of contracting rabies by telling her personal story and teaching others about how to avoid exposure and what to do when an exposure does occur.

In addition, in this issue we include information from a few of our many partners, for example, Dr Peter Maina and the team in Kenya, who are working on a project aimed at protecting their fellow citizens. Their efforts have included the development and implementation of unique educational programs for their own community.

In this issue you will also read about the remarkable ongoing efforts by the dedicated team in Bohol, Philippines, and the achievements that they are making toward reaching the goal of a truly 'Rabies Free Bohol'. But rabies is not only a problem in Africa and Asia. As you will read in the article from Dr Brek Steele and colleagues, rabies continues to threaten humans and animals living in remote regions of Alaska where they are working to provide free veterinary care and education about rabies prevention. Each one of the devoted individuals that you will read about in this issue is truly making a difference in the lives of others by dedicating part of their time, talent and efforts to improving the quality of life for others who are living with the threat of rabies on a daily basis. Clearly, every one of us can help to spread the word that no one need die of rabies anymore! If you have stories or articles that you would like to share with the rest of the world through our Newsletter, please send them to our guest editor at: jane.coutts@rabiescontrol.net.

Dr. Deborah Briggs, Executive Director of The Alliance

Rabies project Kibera, Nairobi, Kenya

"Rabies is a killer, together we can fight it and win". Those are the words from the slogan echoed in local dialect in Kibera every weekend during the ongoing public awareness campaign against rabies. This grass root campaign is the first of its kind in the field of veterinary public health in Kenya and has been well received by the community. Many thanks to the Alliance for Rabies Control whose financial support has enabled the project to take-off.

Campaigners in an interactive kindergarten session.

Kibera, just like many other parts of Africa consists of a large number of dogs and lacks proper public health structures. This innovative campaign, spearheaded by Kibera youths is a positive approach aimed at providing the public with accurate information concerning rabies to reduce the risk of infection. This information is expected to trickle down to those who have not heard of rabies.

The activities conducted include education campaigns in schools, door-to-door home visits, public clinics and open air market where there is an interactive question and answer session. Other activities include dog vaccination, public demonstrations and distribution of posters. The education aspect of the project emphasizes responsible dog ownership, the threat posed by rabies and appropriate management and treatment of dog bites. Through this initiative and many others being conducted in other parts of the world, I believe the realization of a rabies free world is possible.

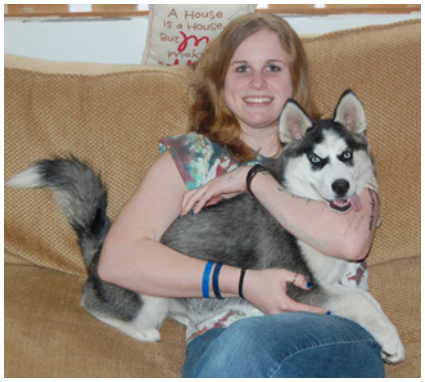
Project information and additional photos available on the ARC web site: http://www.rabiescontrol.net/EN/Programs/Projects-Overview/projects-kenya.html

Dr Peter Maina, Ruheni Veterinary Services

Rabies. What is it? How could I get it? Will it hurt? Will I die?

These questions can be simply answered by just being rabies aware, and education would provide the awareness needed. Every day, approximately 100 children lose their lives to rabies. These children, our future, could have been saved. If they knew to have caution to not get bitten, or if they or their family knew to get shots after they were bitten, rabies-caused tragedies would not happen so often.

Each year, about 55,000 deaths caused by rabies occur in Asia and Africa alone. Rabies can be thought of as running free through these countries. Not enough information about rabies is known by the people to protect them from this disease. Rabies affects the entire world, not just its victims. The families, friends, significant others, acquaintances, and even strangers are hurt by the loss of someone to rabies or any other disease.



Jeanna and her dog Mavah, which means 'close to God' in Hebrew.

With every death that I hear about since I have been a victim, I feel the pain. I know the pain that rabies can cause. I know the trauma that is suffered. I know the saddened looks on the people's faces that rabies affects. I know how each shed tear has its own voice of pain. I know what it is like to reach the end. I know the hardships that this disease spreads. I know things that no one should have to know, and these things should not have to be experienced by anyone. A person may pass, but the memories and pain will never die away. This pain can be prevented if people only knew about the dangers of rabies. Awareness and prevention need to be practiced by every person.

One death that will always cause me tears is that of Zach Jones. He was a victim of rabies in 2006. I never knew him, but when I learned of his death part of my heart went with him. It is an odd thing, but very real. He is one of the many boys who should not have died. But his passing, along with others, raises the need to educate people to become rabies aware.

Educational awareness is the most important prevention of rabies. If I had known more about rabies and its dangers, my life would still be how it was 4 ½ years ago before I contracted the disease. I survived, but I know that too many people don't because they simply did not know the rabies-facts. Too many people fade from this world because of a lack of education. I have to convince myself every day that I was allowed to stay on this earth for a reason, and that the suffering is worth it. I love my life and the people in it, but the physical and emotional scars will always be present because I was simply not aware. Awareness is the first step to a cure; we must conquer this before anything else.

By Jeanna Giese

The elimination of canine rabies on Bohol: Making progress toward the future

The Alliance is helping to support an exciting canine rabies elimination project on the island of Bohol in the Philippines. The Philippines has long suffered under the burden of canine rabies and this particular project is aimed at proving that the ultimate solution to reducing the burden of human rabies is to eliminate the source of the disease in dogs. The Alliance has been working with several partners on this project, including the Government of Bohol, a private Swiss Foundation and the University of Texas Health Science Center at Houston. This is definitely a team effort and could never be accomplished without the dedicated efforts of professionals and many people working together including: Dr Stella Lapiz, Provincial Veterinarian of Bohol, Dr Betsy Miranda, Veterinary Public Health Specialist and partners in the local government from the Governor to the village chiefs and their health and livestock volunteer workers.

Dr Kristy Murray, Associate Director for Research at the Center for Biosecurity and Public Health and a member of the Alliance, will be taking four of her graduate students to Bohol this summer to take part in the ongoing activities associated with this project. They will be studying important knowledge barriers that may exist in the population that could limit canine rabies vaccination coverage and how to better overcome these barriers to achieve the ultimate goal of a rabies free Bohol. These data will eventually provide information about how to improve rabies educational messages and methods of delivery in other regions of the world where there is a desperate need to overcome incorrect information about how to prevent rabies. For example in many rural areas, traditional healers utilizing ineffective medicines and incantations still exist and are often the first sought after by the rural community when a dog bite occurs thus delaying appropriate treatment.

The Bohol project has been underway for approximately one year, and the progress to date has been very encouraging. For example, the team in Bohol has managed to train 1094 new "Village Rabies Guardians" across the island who are now able to translate and execute the rabies program on the front lines of rural areas. Additionally, 1116 village leaders have participated in 9 rabies training sessions, thus increasing educational awareness locally, 73 village orientation meetings have been held, and candlelight vigils have been held by students in public schools in memory of their family and friends who have died of rabies.

Regarding the situation in dogs, the team has conducted an island wide dog population estimate, and the first mass vaccination campaign has been completed with the second round ongoing this March and April. The Alliance is pleased to announce that in less than one year of this ongoing three year program, over 1.4 million citizens of 47 municipalities and the main city in Bohol have already received rabies educational messages. Your support of this project can help to improve the lives of the citizens of Bohol and to prove that canine rabies can be eliminated in Asia.

This article was contributed by Drs Kristy Murray, Betsy Miranda, and Cecell Onyot. For further information, please contact the Alliance for Rabies Control

Looking at rabies through different lenses

How do we begin to change the way the world views rabies? This is a question we asked ourselves a little over two years ago. In this modern age of vaccines and biologicals, how could it be that millions of people were still receiving vaccine produced from the brains of rabies-infected sheep or perhaps even worse, were receiving no vaccine at all? Why, in these times of instantaneous communications, are dog bite victims still visiting traditional healers whose popular methods of treatment include rubbing chilli powder into open bite wounds, or placing a coin over an unwashed wound and then covering it with a leaf from a special plant or tree, or placing a magic string on the leg or arm of the bite victim as a means to ward off the evil and 'cure' them of rabies?

Over the past two years, our aim has been to transform the mostly token participation of governments, health institutions, and funding agencies into one of action when it comes to rabies prevention and control.Our goal was to reduce the global burden of human and animal rabies. One of the most important keys to rabies prevention is improved educational awareness on all levels of society in all countries where rabies is endemic; but how could we do this when there are hundreds of different countries in the world with different customs and languages?

We found the answer to this question in partnerships, and looking at the problem of global rabies awareness through different lenses. Instead of a 'top down' method of disseminating information, our idea has been to focus on methods of empowering the people living at daily risk of rabies to make a difference in their own villages, cities, countries and regions. For the past two years, the Alliance has been providing educational material and support to those who request help, and has been working with partners to distribute the information throughout the world. The results have been phenomenal and provide an indication of how local communities can improve their own situation if they are given the correct information and educational tools that they need.

Through the outreach of World Rabies Day and other activities coordinated by the Alliance, our data indicate that educational messages have been sent to over 55 million people across the world living at daily risk of rabies. Partnerships have helped distribute resources where they were most needed, and made sure supplies were available where they were scarce or had never previously existed. Partnerships from the local level to the government level have proven to be the key to overcoming so many different cultural barriers to rabies education. We know there is much more we can do. Please help us to continue this work.

Dr. Deborah Briggs, Executive Director of The Alliance

Calling all vets!

We are currently working on special resources for vets to distribute important information on rabies , some of which you can already access through www.rabiescontrol.net/EN/Vets.. As a vet, you are in a better position than most to help educate people about how to prevent rabies, and we invite you to join our efforts in helping to make rabies history.

Operation Arctic 2009

In remote western Alaska the Yukon-Kuskokwim Health Corporation hosted Operation Arctic Care this year. Operation Arctic Care is a training mission that provides free health care services to underserved arctic locations and is sponsored by the Innovative Readiness Training Program under the Office of the Assistant Secretary of Defense for Reserve Affairs. Included in Operation Arctic Care this year were four veterinarian teams, each consisting of two vets, four vet technicians (U.S Army Vet Corps) and four Environmental Health Officers (U.S Public Health Service Commissioned Corps).

These four teams traveled in the harsh winter conditions to twelve remote Native Alaskan villages in ten days, delivering basic veterinarian care free of charge that is otherwise nearly impossible to receive in the region. They vaccinated over 1000 dogs and cats for rabies and distemper and also treated them for worms. 71 animals were spayed or neutered, 320 children received education on dog bite prevention and 178 were educated on basic hygiene practices.

Landing in Quinhagak

In an area where rabies is endemic in over 20% of the fox population, over 120 dog bites are reported each year and an average of a dozen people are treated for post exposure to rabies each year, the services rendered during Operation Arctic Care were vital to protecting public health.

Brek Steele, REHS, LTJG, U.S Public Health Service. Further details are at www.ykhc.org and www.usphs.gov.

Mass Exposure to a Rabid Puppy in United States

The prevention of human rabies over the last forty years is a monumental public health achievement in Kansas. It is a shining example of One Health, a collaborative effort between local and state public health officials, veterinarians, animal control officers and pet owners. The cornerstone of this achievement includes pet vaccination, stray animal control and appropriate use of rabies postexposure prophylaxis (PEP). Although the canine rabies variant has been eliminated in the United States, continued vaccination of dogs provides a crucial barrier between humans and rabies from wildlife.

On the evening of February 23, 2009 a three month old mixed breed puppy in Southeast Kansas was attacked by a skunk (*Mephitis mephitis*). The next morning the owner noticed a strong skunk odor on the puppy and began to bathe it. While cleaning the puppy the owner noticed minor cuts along its eyes and nose. The puppy was not currently vaccinated against rabies nor was it examined by a veterinarian.

On Thursday, March 12th the puppy was taken to a local veterinarian for a routine wellness exam and vaccinations, including rabies. The physical exam was normal and the owner did not mention the incident with the skunk to the veterinarian. The owner, her four children and their extended family spent an enjoyable weekend together which included playing with the very friendly puppy. The following Monday, March 16th, the owner became concerned when she noticed the puppy was having trouble standing and was unable to walk. The owner mentioned the incident with the skunk to the veterinarian and euthanasia was recommended. The puppy tested positive for rabies.

The public health response was immediate. The local health department and the veterinarian began the investigation to determine potential human exposures to the puppy. A total of 35 people, including 21 children under the age of fourteen, were determined to have interacted with the puppy ten days prior to the onset of symptoms. Although the puppy had not bitten anyone, numerous children reported the puppy licking their face, mouth and eyes. An exposure questionnaire was developed by the Kansas Department of Health and Environment and disseminated to local health departments and healthcare providers to assist with determining potential rabies exposure. Four adults, including a veterinary assistant, reported saliva contact with cuts or open wounds on their hands and arms. Sixteen children reported saliva contact including the puppy licking inside their mouth, licking open cuts and abrasions or sharing candy. All twenty were recommended and received PEP.

The One Health community needs to continue to educate pet owners on the importance of rabies vaccination. In addition pet owners should be educated on human and pet interaction with wildlife. This includes securing pets in wildlife-proof enclosures, removing pet food at night and seeking veterinary advice after any pet-wildlife interaction. Healthcare providers understand bite-associated rabies exposures, but may be unaware that rabies virus can be transmitted through saliva-contaminated wounds or intact mucus membranes. In order to ensure appropriate rabies PEP use, public health officials must provide guidance to healthcare providers.

Ingrid C. Trevino-Garrison, DVM, MPH, DACVPM, Kansas Department of Health and Environment

Dog and Cat Butchering Can Transmit Rabies

A recent paper in PloS Medicine reports 2 separate cases of furious rabies in Vietnam associated with butchering dog and cat meat. The patients, 48 and 37 year old males, with no prior medical history, developed symptoms of classic encephalitic (furious) rabies, particularly involuntary inspiratory muscle spasms when presented with a glass of water or a breeze, and an inability to swallow. Other viral and bacterial infections were ruled out, as well as other causes of encephalopathy such as post-vaccination reactions. Rabies was confirmed by RT-PCR on saliva samples in both cases.

The first patient had no history of animal bites, the second a bite from a pet dog one month prior to symptoms, but the dog had remained healthy. Consequently, neither had received post-exposure prophylaxis. Infection probably resulted from butchering a dog and a cat respectively. The dog was a victim of a road accident and the cat had been sick for 3 days, both consistent with rabies, but no samples were available for testing. In both cases, other individuals consumed the cooked meat without ill effects, suggesting that consumption carried less risk. However, the patients had butchered the animals and removed the brains themselves, suggesting that they had been exposed to high viral loads. The authors speculated that transmission occurred via the conjunctiva, oral and nasal mucosae or possibly through unnoticed skin abrasions. Treatment was palliative and the patients were taken home to die within a week of presentation.

Eating dog and, to a less extent, cat meat is common in many SE Asian countries. The authors note that in 2007, 10 cases of rabies were confirmed by the national Institute of Hygiene and Epidemiology in Vietnam, 80% being males over 15 years old. Four cases had no history of dog bites, but of these, three had prepared dog meat from sick animals and the fourth had eaten dog meat prior to the onset of symptoms. In Vietnam, clinicians consider butchering dog meat a risk factor for rabies, and dog slaughterhouse workers are routinely vaccinated by the rabies control program. However, the private slaughter of dogs is common in Vietnam and elsewhere and should be considered a category III exposure if the animal was in a rabies endemic country and unvaccinated.

Summarised by Louise Taylor of the Alliance. The paper is a Learning Forum article with details of the diagnosis process and treatment options: Wertheim et al. (2009) Furious Rabies after an Atypical Exposure, PLoS Medicine, vol6, e1000044, available via www.plosmedicine.org, or from the ARC website.

You are the key to changing the world of rabies

How have you helped us to change how rabies is viewed in the world?

It is a truly wonderful story, but let us start at the beginning. Over the past two years, the Alliance has been working together with its partners to transform the world of those people living in constant risk of losing their life to rabies because they cannot afford the vaccine, do not know what to do to seek proper treatment, or rely on a local healer to save their lives. Together with our partners, the Alliance continues to encourage and advocate governments, health institutions and funding agencies to actively engage in improving rabies prevention and control in their own countries.

Clearly, the most important keys to rabies prevention are education and vaccination. Education needs to be improved at all levels of society in all countries where rabies is endemic, and the vaccination coverage of dogs needs to be improved where canine rabies continues to take such a heavy toll on human lives. The Alliance for Rabies Control has approached the problem of improving global awareness by finding a solution that includes a network of rabies professionals, advocates, and volunteers including you!

You are, in fact, the reason that we have been so successful. With your help, we have created a global outreach that has sent educational messages to over 55 million people living at risk of exposure to rabies. The results have been phenomenal. The support and individual stories coming back to us on a daily basis clearly prove that each one of us can change the world of rabies for someone who is living at risk or someone who does not know about this deadly disease. We have heard inspirational stories from many individual champions who have become our partners and have joined with us to make a real difference in the lives of their children, families, classmates and fellow citizens.

The list of these local heroes is long and continues to grow. Through the efforts of each one of you over the past two years, untold numbers of lives have been saved. The Alliance is counting on you to continue to help us spread the message of 'educate and vaccinate' to those who need to understand how rabies can be prevented. Please join our life-saving efforts by visiting our website to update yourself as to what we are doing (www.rabiescontrol.net/EN/Programs) or to donate (www.rabiescontrol.net/EN/Give) and help us to continue to educate those living close to you. Your personal efforts could save someone's life.

Alliance for Rabies Control

Johnny the Puppy

Christmas time 2006 was just like any other holiday season at College Road Animal Hospital in Wilmington, NC until New Hanover County Animal Control Services brought in a stray puppy that had been turned over by a Good Samaritan. "Johnny," as he came to be known, had an open fracture of his right radius and ulna. He was such a cute puppy that one of our associate veterinarians wanted to fix his fracture and find him a loving home.

As his fracture healed, and his overall health improved, we all became very attached to him. He was so cute! He loved people; he would kiss the kids who came to see him, hoping to adopt him. He was going to be a great pet for someone. But a few days before Christmas he started getting sick; he started acting agitated. At first we thought that the splint helping heal his leg was too tight, so we changed it. The next day he developed respiratory signs and we were concerned that he may have aspirated when we sedated him to change his bandage. But as his condition deteriorated, it became apparent that it was something much more serious. When I asked the veterinarians to consider rabies, they looked at me like I was crazy. "There hasn't been a case of canine rabies in New Hanover County in sixty years," they said. Could it be distemper; hypoxia from aspiration? When his condition deteriorated, we reluctantly decided to euthanize him and have him tested for rabies.

We got the results the next day. He was positive!

Our first thought was that we had to advise everyone who had contact with him. Did we miss anyone? What about the family moving to Mexico? How could this have happened? The end result was fifty people needing post-exposure prophylaxis at a cost of almost $400,000.

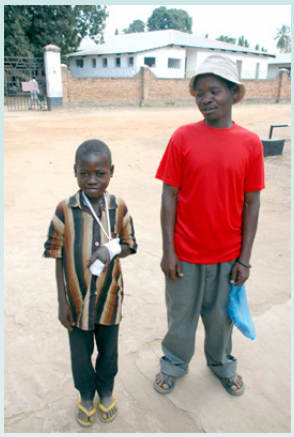
Fortunately, all those exposed were treated and there were no human cases. Dr. Jean McNeil, New Hanover County Animal Control Services Manager, and I vowed not to let Johnny die in vain. He has become the poster child for our rabies awareness campaign. He is the focal point of a presentation that I have given to several veterinary schools to increase the awareness of rabies, entitled "Rabies in practice: a case study about Johnny the puppy." At a public health forum subsequent to Johnny's death, we presented a scenario similar to the events surrounding his death. Only three of thirty-six veterinarians said they would have considered rabies in their differential list. We recognized that because of very successful mandatory rabies vaccination ordinances, the disease wasn't always on our radar screen. Our campaign, as Ambassadors for the Alliance for Rabies Control, is to change that. Our goal is to increase awareness of the disease and to make sure that there are no more Johnnies. Think, for a moment, what would have happened if we had missed the fact that Johnny was rabid. We want to make sure that that never happens.

Dr. Bob Weedon

Rabies Detective work in rural Tanzania

Late one evening last July, I arrived at the hospital which is my research base and was met by Marwa and his father (see picture). They had travelled more than 100km to reach the hospital, because Marwa had been badly mauled by a dog 2 days previously whilst playing outside his house. By now Marwa's wounds had become septic and his fingers had to be amputated. It was clear from interviewing Marwa that the dog which had bitten him was rabid; fortunately anti-rabies vaccines were available and were given to Marwa immediately.

The distinctive clinical signs and memorable mode of transmission makes rabies amenable to a research method typically used for infectious diseases spread by humans. Contact tracing is a medical intervention for disease control based on tracing chains of infection – this medical detective work involves iteratively interviewing infected individuals to identify others that may have been exposed, as well as potential primary (or index) cases of infection. Contact-tracing has been applied to sexually transmitted diseases such as HIV and gonorrhoea, where an infectious contact is well-defined, but has also been used successfully in response to the emergence of SARS and in controlling remnant foci of infection during the final stages of the smallpox eradication campaigns. For rabies, contact tracing involves interviewing animal-bite victims like Marwa to identify the source of the rabid animal, the animal's owner and other people and animals with suspected bites. Two recent scientific papers describe some of the insights gained from contact tracing of rabies in rural Tanzania [1,2].



Marwa leaving hospital with his father after a week long stay (written permission was obtained for this photograph).

The first paper focuses on the burden of rabies within affected communities. Contact tracing can uncover information about the many rabies cases (exposures and deaths) that go unreported in national statistics. More than 20% of victims exposed to suspected rabid dogs in the study were not recorded in any medical facility. The series of investigations spurred by Marwa's case brought to light the case of Mwita. The dog that bit Marwa was likely to have been infected three weeks previously by an unknown rabid dog which had bitten Mwita. Mwita however was much less fortunate; after failing to find vaccines locally he had not sought treatment elsewhere. In August he presented with symptoms of rabies at the local hospital. Despite the prognosis, Mwita headed towards the capital in desperation, but died en route. The research paper highlights the common but completely avoidable obstacles like lack of awareness and difficulties in obtaining vaccine that are typical of victims like Mwita and Marwa.

The second paper investigates the dynamics of infection and identifies the effort needed to control and potentially eliminate rabies based on epidemiological data collected by contact tracing, including the movement and biting behaviour of rabid animals. An important finding was that, on average, rabid dogs appear to only infect a small number of other individuals (many don't bite any animals, or only one or two), which is good news as far as control is concerned. However, a small number of rabid dogs do cause disproportionate amounts of damage. For example, contact tracing revealed that one rabid dog bit 21 people (mostly children) and 11 other dogs during a 2 day, 20-kilometre frenzy before its death. Fortunately, these 'super-spreaders' appear to be the exception, but they clearly contribute to the spread and persistence of rabies and its unpredictability. The take-home message from the data and models presented in the paper is that, because rabies transmission is actually relatively low compared to infections like measles and flu, elimination through vaccination is a feasible objective – but the speed with which domestic dogs reproduce and replace themselves within a population means that vaccination coverage can quickly fall to ineffective levels. Domestic dog vaccination campaigns therefore need to aim for high coverage and, critically, they must be sustained.

Eight week old puppy that was euthanized after biting 5 children in a family and was later confirmed to have rabies.

An attack of a rabid dog can be terrifying and with the disturbing symptoms that lead to inevitable death, there is no doubt why rabies is such a famed and feared disease. After conducting hundreds of contact tracing interviews it becomes apparent that the traumatic and tragic personal stories like those of Marwa and Mwita are commonplace for people living in areas where rabies is endemic in domestic dog populations. Though it is too late for Mwita, with any luck, large-scale vaccination programmes planned for Southern Tanzania will have a major impact on rabies incidence and may help to make their stories a thing of the past.

Dr Katie Hampson, a Henry Wellcome Postdoctoral Research Fellow, University of Sheffield, UK. Names have been changed for confidentiality. Contact tracing research is ongoing in the study areas. The two articles, both by Hampson et al., are available online via http://biology.plosjournals.org and http://www.plosntds.org using 'Rabies' in the search article boxes.

Conference Announcements

Rabies in Asia Conference 2009
September 9th - 11th 2009, Hanoi, Vietnam
details at www.rabiesinasia.org/riacon2009/notice.html

Rabies in the Americas (RITA) XX
October 19th - 23rd, 2009, Quebec, Canada
details at www.rita2009.org

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 her at louise.taylor@rabiescontrol.net. For further information on the Alliance's work see www.rabiescontrol.net.