



Rabies: case report, outbreak in KZN and update on Johannesburg

Case report

Six human rabies cases were confirmed in South Africa during 2011. An additional clinical case of rabies has occurred in Eastern Cape Province and was reported to the NICD on 19 January 2012. The patient, a 16-year-old male from the village of Centani, sustained category 3 wounds from a dog bite on the left calf muscle while sleeping outside at night on 20 December 2011. The next day the patient presented to the local hospital, where he was commenced on a course of rabies vaccine. Although rabies immunoglobulin (RIG) would be indicated in such a case, it was not given. The dog was found dead a few days after the attack. The patient developed fever and headaches on 4 January and was admitted the same day – 1 day before the fourth vaccine dose was due and two weeks after exposure. His condition worsened to an inability to talk or walk, confusion and coma within a week of admission at the local hospital, and he was transferred to Frere Hospital, East London on 10 January. The clinical presentation and history of an unprovoked attack from a dog that later died, were suggestive of rabies. Extensive clinical and laboratory investigations were completed for other treatable causes of illness (e.g. meningitis); however, these were all negative. The patient died on 29 January – 5 weeks after exposure and 26 days after the onset of illness.

A cerebrospinal fluid (CSF) specimen, two saliva specimens and two nuchal excision biopsies (i.e. taken without a punch biopsy needle) were taken ante-mortem at Frere Hospital, and transported to NICD for rabies testing. Rabies serology on CSF was positive for anti-rabies IgG and IgM. Although this patient had received rabies vaccines resulting in some immune response prior to illness onset (possibly contributing to the long duration of survival of this patient), the presence of anti-rabies IgG and IgM in the CSF is highly suggestive of rabies infection. The saliva specimens and nuchal biopsies were all PCR negative for

rabies. Failure to identify the virus on a nuchal biopsy is commonly linked to insufficient depth of the excision, which do not include cutaneous nerves. Detailed guidelines on the collection of specimens for rabies investigations can be found on the [NICD website](#).

Outbreak in KZN

An outbreak of rabies among animals is currently ongoing in the areas surrounding the towns of Bergville, Winterton, Emmaus, Colenso and Loskop in KwaZulu-Natal Province (KZN). A number of human exposures have been reported; however, no clinical cases of suspected human disease have been received to date. Local and state veterinarians are responding to the outbreak with mass animal vaccination campaigns. Healthcare workers in the affected area, as well as clinics and hospitals in surrounding areas, are encouraged to familiarise themselves with the guidelines for post-exposure prophylaxis (PEP) of rabies, including:

- Prompt wound care: copious washing of the wound with soap and water, and application of antiseptic
- Administration of rabies vaccine: 4 doses administered intramuscularly in the deltoid muscle (NOT BUTTOCK) as per protocol
- Administration of RIG in category 3 exposures. In patients with multiple wounds, RIG should be diluted with normal saline and infiltrated into all wounds.

Rabies disease should be suspected in any patient presenting with an acute neurological syndrome (encephalitis). Early symptoms may include a sense of apprehension, headache, fever, and hyperaesthesia at the bite site, progressing to hallucinations, hypersalivation and hydrophobia. Initially patients are lucid, but spasms, coma and death follow within days after the onset of the symptoms. The incubation period for rabies is typically 1-3 months, but may vary from <1 week to >1 year. Obtaining a thorough history about bites or scratches is important. In such cases, attempt

to confirm the diagnosis through appropriate laboratory investigations, exclude other treatable causes of illness, notify the Department of Health, and contact the NICD hotline (082-883-9920) to discuss the case and arrange for laboratory testing.

Update on rabies in Johannesburg

Over the past 2 years, the greater Johannesburg region has experienced repeated outbreaks of rabies in domestic animal populations. During 2010, 42 cases of dog rabies were confirmed in Gauteng Province, which resulted in one human case – a two-year-old child with reported exposure to a rabid puppy. Molecular characterisation of these viruses identified them as canid biotype with origin in KZN. During 2011, cases of rabies in local domestic dogs were also reported in March and again in October (see Communiqué Vol. 10(3 and 11)). Recent characterisation of viruses

recovered in October 2011 found these were identical to viruses circulating in KZN, as well as earlier isolates from Johannesburg. While the rabies risks following dog exposures has decreased in recent months, careful risk assessments must continue to be done for patients presenting following exposures in the greater Johannesburg area. Abnormal behaviour, illness or acute death of implicated animals can provide clues in the clinical assessment for administered PEP. At the same time, pet owners must ensure their dogs and cats receive regular boosters to prevent reintroduction of rabies to the province.

Source: Division of Surveillance, Outbreak Response, Travel Health and FELTP, Centre for Emerging and Zoonotic Diseases.

Avian influenza (H7N1) detected in ostriches during routine surveillance

Ostriches testing seropositive for avian influenza H7 (likely H7N1) have been identified in the Heidelberg area, Hessaqua Sub-district, Eden District, Western Cape Province. Avian influenza H7 was first detected on ostrich farms on 19 December 2011, confirmed on 9 January 2012 and reported to the World Organization for Animal Health (OIE) on 1 February 2012. Although reported as highly pathogenic avian influenza (HPAI) by OIE, no virus has been isolated on this farm to date to confirm the pathogenicity. A few commercial ostrich chicks were found to be seropositive for H7N1 during routine surveillance for avian influenza, with no clinical signs and deaths reported. Precautionary measures have been put into place and include quarantine and movement control of ostriches inside the country, and screening of ostriches.

Available information indicates a low risk of transmission of H7N1 from ostriches to humans. Serological studies conducted on veterinarians, technicians, farmers and abattoir employees who were exposed to avian H7 influenza viruses during an epidemic in Italy, showed no evidence of infection with H7N1. There is also no evidence that avian influenza H7N1 is transmitted from person-to-person. Clinical illness has, however, been described

from other sub-type H7 infections in humans, specifically H7N3. This ranges from conjunctivitis to a mild upper respiratory illness to pneumonia.

Despite the apparent low risk of transmission of H7N1 from ostriches to humans, general preventive measures (good respiratory etiquette, personal protective equipment) are recommended for personnel who work closely with poultry (e.g. farm, abattoir, animal health workers) to reduce risk of acquisition of avian influenza virus infections. Healthcare workers should consider possible infection with avian influenza viruses in persons who regularly work in close contact with poultry and present with an influenza-like illness, pneumonia and/or conjunctivitis. Specialised testing of such cases can be arranged with the Centre for Respiratory Disease and Meningitis, NICD-NHLS on 011-386-6412, or via the NICD Hotline on 082-883-9920 (for use by health-care professionals only).

Source: Division of Surveillance, Outbreak Response and Travel Health, Centre for Respiratory Disease and Meningitis, NICD-NHLS.

Typhoid fever update: Zimbabwe and Zambia

The ongoing typhoid fever outbreak reported on 10 October 2011 in Harare, with the suburb of Dzivaresekwa previously being worst affected, has shifted to the suburb of Kuwadzana. As of 22 January 2012, 1 865 suspected typhoid fever cases have been detected. The outbreak is centred in the north-western region of Harare. Interventions already in place include continuous health education on safe water collection and storage, safe food preparation, and improved hygiene and sanitation practices. Harare City Council has also introduced the closure of food stands across the city in an attempt to interrupt transmission.

In a separate large typhoid fever outbreak reported in Zambia, a total of 4 396 cases and nine deaths have been reported since the start

of the outbreak in December 2011.

These large outbreaks in neighbouring countries require healthcare workers in South Africa to maintain a high index of suspicion for typhoid fever among travellers returning from these areas. Symptoms may include fever, headache, gastrointestinal symptoms (abdominal pain, nausea, constipation and/ or diarrhoea) and other non-specific symptoms. Clinically suspected cases must be notified to the Department of Health and should be investigated for *Salmonella* Typhi infection through blood cultures.

Source: Division of Surveillance, Outbreak Response, Travel Health and FELTP, NICD-NHLS

Malaria

We are currently in the malaria season in southern Africa. Malaria is of particular concern in returning travellers from high risk areas and who present with fever or flu-like illness. High risk areas include part of the lowveld in Mpumalanga and Limpopo provinces, northern KwaZulu-Natal Province, and most importantly Mozambique, parts of Zimbabwe and other tropical African countries. Flooding in the lowveld (areas bordering Limpopo and Mpumalanga provinces) has also sparked concerns about the increased risk of malaria transmission.

We previously reported the diagnosis of malaria in six persons in Gauteng Province without recent travel history (see Communiqué Vol. 11(1)). Investigations revealed no evidence of local transmission, but suggested that these cases acquired infection via the bites of infected mosquitoes translocated from endemic areas in vehicles, containers or suitcases.

We urge healthcare workers throughout the country to maintain a high index of suspicion for malaria. Malaria should always be considered in febrile patients post-travel to a malaria-risk area, as well as in patients with unexplained fever even in the absence of a travel history. Malaria cannot be excluded on clinical grounds alone and a blood test is urgently required either by smear microscopy or by rapid diagnostic test. An initial negative result does not exclude infection and successive testing should be carried out every 12-24 hours until the patient recovers or an alternative

diagnosis is confirmed. Malaria should be considered in any febrile patient in whom an alternate diagnosis is not readily apparent, especially if the patient's platelet count is low. Thrombocytopenia is a very common (but not invariable) finding in patients with both uncomplicated and severe malaria.

Without appropriate treatment, malaria can progress rapidly to severe disease and death. Confirmed malaria cases must be notified to the Department of Health. Artemether-lumefantrine (Coartem®) is first-line treatment for uncomplicated falciparum malaria (except in children <6 months of age and in the first trimester of pregnancy). Alternatively, quinine plus either doxycycline or clindamycin can be used. Quinine plus clindamycin is the treatment of choice in uncomplicated malaria cases for those in the first trimester of pregnancy and in children ≤5 kg. Intravenous quinine should be used for cases of severe malaria. Where available, intravenous artesunate should be used for non-pregnant adults and children with severe malaria. It is important to exclude hypoglycaemia in patients with a depressed mental state. Detailed information on the clinical presentation, diagnosis and management of malaria cases, as well as the South African malaria risk areas, can be found in the Department of Health Guidelines for the Treatment of Malaria in South Africa, 2010 ([available online](#)).

Source: Division of Surveillance, Outbreak Response, Travel Health and FELTP, NICD-NHLS

Tetanus

An 11-year-old Gauteng girl stepped on a sharp object in January 2012, sustaining an open wound in the right foot. She was treated at the local clinic with tetanus toxoid (TT), antibiotics and analgesia, and the wound was sutured. On review 7 days later, the wound was septic and she was given Betadine dressings to use at home. Ten days later she presented with generalized twitches and inability to open the mouth. A clinical diagnosis of tetanus was made and she was referred to hospital. On examination she had trismus and generalized spasms at the slightest provocation. She was admitted to ICU, elective intubated and ventilated. Sedation and medical paralysis were maintained and she was covered with metronidazole and cloxacillin. The patient recovered over a period of three weeks. The case was notified to the local Department of Health; however, her immunization records were unfortunately not available.

Tetanus-causing bacteria, *Clostridium tetani*, occur freely in the environment. The spores of the organism are typically introduced into the body through injury. The disease process is toxin-mediated, presenting after an incubation period of 3-21 days with muscle rigidity and painful spasms, often starting in the jaw and neck. Severe disease can lead to respiratory failure and death. Diagnosis is purely clinical and there are no confirmatory laboratory tests. It is a medical emergency requiring ICU admission with sedation, the use of muscle relaxants and ventilation.

The disease is preventable through routine immunization and adequate wound management. In South Africa, children receive DTaP-IPV (diphtheria, tetanus, acellular pertussis, inactivated polio vaccine) at 6, 10, 14 weeks and 18 months of age, as part of the Expanded Program on Immunization (EPI). Booster doses of Td Vaccine (tetanus and reduced-strength diphtheria) are given at 6 years and 12 years. Furthermore, adults should receive TT boosters at 10 year intervals after receiving a primary series of vaccines. Routine vaccination of pregnant women with TT has been highly effective in reducing cases of neonatal tetanus in South Africa; only seven cases were notified from 2009-2011.

Minor clean wounds should be thoroughly cleaned and TT given unless the patient has completed a TT course with the last booster within the past 5 years. With dirty wounds, tetanus immunoglobulin (TIG) should be given if immune status is unknown, if the patient has not completed a course of TT, or if the last booster was received more than 5-10 years earlier. As a rule, TT must always be given unless the patient has completed a TT course with the last booster within the past 5 years. Contaminated wounds or wounds with devitalized tissue should be widely debrided and excised if possible. TT and TIG should be given at the same time and the course of vaccination completed.

Source: School of Public Health, University of the Witwatersrand. Division of Surveillance, Outbreak Response, Travel Health and FELTP, NICD-NHLS

Tick bite fever alert

Tick bite fever was the likely diagnosis in a group of four Canadian visitors who returned to various parts of Canada after visiting Hamburg, Eastern Cape Province. They spent time in villages and walked in the veld. Acute febrile illness with one or two skin lesions suggestive of eschars prompted the diagnosis. Early lesions were characterised by slightly purulent areas around depressed erythematous centres that evolved over a day or two to typical infected tick bite lesions with necrotic centres. The diagnosis of tick bite fever was not considered initially. Response to doxycycline was prompt.

As reported in previous Communiqués (Vol. 11 (1), January 2012), a number of cases of tick

bite fever come to the attention of the NICD annually, but notably more so in the last 6 months in South Africa. In a small number of patients, delayed treatment has resulted in severe disease, with elderly persons at particular risk of severe or even fatal complications. Tick bite fever is frequently not recognised in returning international tourists. Furthermore, the risk is not confined to tourists and every year a number of South Africans die from severe tick bite fever.

Source: Division of Surveillance, Outbreak Response, Travel Health and FELTP, Centre for Opportunistic, Tropical and Hospital Infections, NICD-NHLS.

Beyond our borders: infectious disease risks for travellers

The "Beyond Our Borders" column focuses on selected and current international diseases that may affect South Africans travelling abroad.

Legionellosis: Spain

Alert: 15 confirmed cases and three deaths due to legionellosis were reported in a hotel in Calpe (Alicante), Spain.

The disease: Legionellosis (legionnaires' disease) is a waterborne disease caused by the *Legionella pneumophila* bacteria. Legionellas are found in showers, air conditioning cooling towers, humidifiers, whirlpool spas (hot tubs) and respiratory therapy devices. After an incubation period of 2-10 days, patients typically present with symptoms such as anorexia, malaise, myalgia, headache, fever, abdominal pain and diarrhoea. There is no documented transmission of this disease from person to person and the case fatality rate is approximately 15%.

Advice to travellers: There is no vaccine available for legionellosis and antibiotic prophylaxis is not effective. People at increased risk include immunocompromised patients (cancer and HIV) and the elderly. Travellers to the area should avoid high risk areas, such as whirlpool spas. In the event of a suspected infection travellers are urged to seek medical attention.

Trypanosomiasis: Masai Mara, Kenya and Mana Pools, Zimbabwe

Alert: A German national returning from a visit to the Masai Mara was diagnosed with trypanosomiasis. East-African trypanosomiasis (EAT) was also confirmed in a game ranger working in the Mana Pools National Park in Zimbabwe.

The disease: Human African trypanosomiasis (HAT) or African sleeping sickness is a protozoal disease transmitted through the bite of an infected tsetse fly. Approximately 95% of the cases occur in central Africa extending to eastern and south-eastern Africa. The incubation period is 3-7 days and symptoms include fever, headache, myalgia, facial edema, pruritis and lymphadenopathy. Central nervous system involvement may also occur.

Advice to travellers: HAT is a relatively uncommon infection in travellers; however, it remains an important consideration in the

differential diagnosis of acute febrile illness in travellers to affected areas. Visitors should be urged to avoid areas with tsetse fly infestations. Wear medium-weight fabric of wrist and ankle length, in neutral colours, as tsetse flies can bite through light-weight clothing. Avoid bushes as the tsetse flies are less active during the hottest part of the day, but will bite if disturbed. Inspect vehicles before entering as the flies are attracted to the motion and dust from moving vehicles. The use of insect repellents may reduce tsetse fly bites.

Cryptosporidiosis: Queensland, Australia

Alert: 51 laboratory confirmed cases of cryptosporidiosis reported in January 2012.

The disease: Cryptosporidiosis is a parasitic infection caused by the protozoan parasite *Cryptosporidium*, and may be transmitted from person-to-person or animal-to-person via contaminated water or food. Control of *Cryptosporidium* in municipal water supplies is a particular challenge due to resistance to chlorination; removal thus requiring adequate mechanical filtration systems. The incubation period ranges from 1-12 days and the most common symptom is watery diarrhoea. Other symptoms may include stomach cramps, dehydration, nausea, vomiting and fever, while some individuals may be asymptomatic. Children under two years, animal handlers and travellers are particularly prone to infection. Immunocompromised patients may also develop chronic and sometimes fatal disease.

Advice to travellers: People travelling to the area should avoid eating raw fruits and vegetables, drinking untreated water and unpasteurized milk or dairy products. Also avoid swallowing water when swimming in lakes, rivers, pools or when using hot-tubs.

Yellow Fever: Cameroon and Ghana

Alert: 23 cases of yellow fever, including 7 deaths, have been reported in Cameroon since October 2011. Three laboratory-confirmed cases, including two deaths were also reported in three districts in Ghana during December 2011.

The disease: Yellow fever is an acute viral infection transmitted to humans through the bite of infective mosquitoes, primarily *Aedes* or *Haemogogus* spp. The disease is endemic to certain parts of central Africa, tropical regions of South America and Caribbean islands. The incubation period is 3 to 6 days, after which patients show symptoms of fever, chills, headache, generalized muscle pain, nausea and vomiting. Approximately 15% of cases progress to further disease including jaundice and haemorrhagic symptoms. The reported overall case fatality rate of this disease is 20% - 50%.

Advice to Travellers: Yellow fever virus vectors (*Aedes aegypti*) feed during the daytime. Travellers should take precautions to protect against mosquito bites, including the use of effective insect repellent (containing $\geq 30\%$ DEET) and wearing protective clothing (long sleeves, pants and socks when weather permits) when outdoors. Travellers to endemic countries (now also including Zambia and Eritrea) must receive yellow fever vaccine at least 10 days prior to departure. Certificates are valid for 10 years. The vaccine is contraindicated in pregnant women, infants <9 months, individuals with egg allergies, and certain immunosuppressed individuals (HIV-infected with $CD4 < 200/mm^3$); however, these individuals still require a waiver certificate.

Dengue Fever: Caribbean, Central America and south-central Asia

Alert:

- Ecuador: Risk areas are no longer restricted to the coast, but now extend to the mountains including Bolivia Province, Cotopaxi and Santo Domingo de los Tsachilas.
- Brazil: The first 2 cases of dengue virus type 4 have been confirmed in Rio de Janeiro.
- Bolivia: There has been an increase in the number of cases with 2 830 suspected cases and 39 confirmed cases in Santa Cruz. The number of deaths has also increased from 3 to 6 in the same region.

- Asia: Sri Lanka has experienced a 50% increase in the number of reported cases in January 2012 compared to January 2011. Three deaths have been reported. Malaysia has also had 6 deaths in January 2012, all from dengue haemorrhagic fever. In the Philippines, Zambonga City has experienced a rise in the number of reported cases from 27 in the first week of January, to 69 two weeks later. Eight dengue fever deaths have been reported in the Jambi Province of Indonesia in January 2012.

The disease: Dengue fever is a viral infection transmitted through the bites of *Aedes aegypti* mosquitoes. This mosquito breeds around households and is most active during the day. Following an incubation period of 3-15 days, the disease presents with sudden onset of fever, frontal headache, retro-orbital pain and myalgia. The fever and symptoms persist for 48-96 hours, after which they subside. 24 hours later, a second rapid temperature rise follows. Dermatological manifestations occur in up to 50% of patients and present as an early facial flushing or erythematous mottling, or an eruption with an intense erythematous pattern with islands of normal skin between. Bleeding tendencies occur in dengue haemorrhagic fever. This can lead to shock, and often occurs 2-6 days after the onset of symptoms.

Advice to travellers: Travellers should take precautions to avoid mosquito bites, including use of insect repellents (containing 30-50% DEET); staying in well screened or air conditioned buildings where possible; and wearing loose, long-sleeved shirts and pants when outdoors.

References and additional reading: [ProMED-Mail](#), [WHO](#), [US Centers for Disease Control and Prevention](#), [European Centres for Disease Prevention and Control](#).

Source: Division of Surveillance, Outbreak Response, Travel Health and FELTP, NICD-NHLS. Public health registrars, University of Witwatersrand.