NATIONAL HEALTH LABORATORY SERVICE
NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES

Communicable Diseases Communiqué

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Rabies

KwaZulu-Natal Province

Rabies has been confirmed as the cause of death in a 29-year-old farmer from Underberg (a small rural farming community located approximately 200km west of Durban), KwaZulu -Natal Province (KZN). He was admitted to a hospital in Pietermaritzburg on 2 May 2012 with an acute illness characterised by migratory pain in the arm and shoulder, followed shortly by the onset of hypersalivation and hydrophobia. Rabies was considered in the differential diagnosis when the patient reported contact with a stray dog 2 months before the onset of symptoms. He had provided shelter for the stray animal, which initially appeared well, but reportedly developed signs and symptoms consistent with rabies within a few days. The dog subsequently died and was buried on the farm. The patient did not report any bites or serious injuries from the animal and therefore did not seek medical attention or receive any rabies post-exposure prophylaxis (PEP) at the time. It is, however, likely that the patient was exposed to the dog's saliva through broken skin, mucous membranes, or a scratch that went unnoticed. Once rabies was suspected in the patient, the dog was exhumed and a specimen collected from the decomposing brain tested positive for rabies by PCR.

On admission the patient received rabies immunoglobulin and rabies vaccine. Once the diagnosis of rabies was deemed likely, the patient was admitted to the Critical Care Unit and managed according to a modified Milwaukee protocol (http://www.chw.org). Pending laboratory confirmation of rabies, he was treated empirically with acyclovir and fluoroquinolones for possible herpesvirus and rickettsial infections. Ante-mortem PCR tests on multiple samples of saliva, skin and cerebrospinal fluid over the course of his illness were consistently negative. Rabies-specific IgG was positive in serum, likely reflecting the recent passive and active immunisation of the patient. Initial serological tests on cerebrospinal fluid were negative, but rabies-specific IgG was detected at low titres on repeat samples, without an increase in titre over 4 weeks. Extensive testing for other infectious causes of encephalitis (West Nile fever, Rift Valley fever, herpesvirus, malaria, enterovirus) yielded negative results. The patient died on 8 June, >4 weeks after admission. Life support was discontinued when a SPECT scanner confirmed the absence of cerebral blood flow. Rabies was confirmed by a fluorescent antibody test on a post-mortem brain biopsy specimen.

An additional rabies case from KNZ was confirmed during May. A 52-year-old woman from Ezingonyameni (near Umlazi, Durban) was bitten by a neighbour's dog on her right forearm, for which she apparently did not seek medical care. Approximately two months later she complained of itchiness and pain at the site of the healed bite wound, and thereafter presented with hydrophobia, hypersalivation, confusion, weakness and vomiting. She was admitted to Prince Mshiyeni Memorial Hospital where she died the following day. Rabies was confirmed by a fluorescent antibody test and PCR performed on a post-mortem brain specimen.

Investigations are ongoing in a 3-year-old child with possible rabies currently admitted in a Durban hospital. He was bitten on the left ankle by a neighbour's dog on 23 April 2012 and taken to Umlazi Clinic for treatment. The patient received wound treatment and rabies vaccination, but did not receive rabies immunoglobulin. He was subsequently admitted on 21 May with weakness, confusion and depressed level of consciousness. Laboratory investigations for rabies on CSF, nuchal biopsy, and three saliva specimens have yielded negative results to date, and the child's clinical condition remains serious.

A recent outbreak affecting mainly dogs in the Winterton/Bergville area of the province has been ongoing since January 2012 and has

already claimed one life. A seven-year-old child was exposed to a neighbour's dog, which died shortly thereafter. The child did not receive rabies PEP at the clinic due to incorrect assessment of the risk 'since the dog had been vaccinated'. Although the dog had in fact been vaccinated during the rabies outbreak response vaccination campaign, it was already infected at the time and therefore the vaccine offered no protection.

Limpopo Province

A ten-year-old boy from Mukulamukondeni, Thohoyandou was admitted to Tshilidzini Hospital on 13 May 2012 with a six-day history of fever, confusion and inability to walk or sit. Rabies was confirmed by PCR on a saliva specimen. No definite history of a dog bite could be elicited, but the neighbour's dog was suspected to have had rabies. Two other people were bitten by this dog and did receive rabies PEP. The dog was euthenased, but no diagnostic results are available for the animal.

Gauteng Province

Three people were exposed to a rabid dog in Chartwell, a semi-rural area on the outskirts of Johannesburg, and received rabies PEP two days after the incident. The dog was a stray puppy found in rural Eastern Cape Province four months prior, and had not been vaccinated against rabies. Several other dogs may have been exposed to this animal in Kingfisher Park, Fourways and Sandton on the weekend of 26-27 May 2012 but no further human contacts have been reported. A dog vaccination campaign has been organised by Gauteng Veterinary Services in response to this event.

The rabies outbreak reported in the Johannesburg Metropolitan area in 2010/2011 affected 42 domestic dogs and claimed one human life. An intensive vaccination campaign was successful in controlling this outbreak.

Concluding remarks

As of 14 June 2012, a total of six laboratory-confirmed human rabies cases has been reported for South Africa, 3 each from KwaZulu-Natal and Limpopo provinces. In addition, one clinical case from Eastern Cape Province was reported to the NICD-NHLS, but it was not possible to obtain specimens for testing.

Rabies can be controlled by vaccination of dogs and cats. This is a legal requirement in South Africa and the onus is on pet owners to ensure compliance. Pets should be vaccinated at the age of three months, again at 12 months and receive a booster every 3 years thereafter. Dogs remain the primary source of rabies transmitted to humans. Rabies may be prevented after an exposure (i.e. bites/scratches/licks on mucous membranes from dogs or other possibly rabid animals) by prompt rabies PEP. The guidelines for appropriate rabies PEP is available at: http://www.who.int/rabies/human/postexp/en/. Further information regarding rabies in South Africa is available in the national guidelines document available at: http://nicd.ac.za/assets/files/Rabies-Guide-2010-small.pdf

Source: Centre for Emerging and Zoonotic Diseases, and Division of Public Health Surveillance and Response, NICD-NHLS; Department of Health: KwaZulu-Natal, Limpopo and Gauteng Provinces.

Influenza

The number of specimens submitted for respiratory virus testing to the Viral Watch (VW) programme has continued to increase slowly with 222 specimens in May 2012 compared to 125 in April 2012. During May, influenza A (H1N1)pdm09 was detected in one patient from Eastern Cape Province, influenza A(H3N2) in 1 patient each from Eastern Cape, KwaZulu-Natal and Mpumalanga provinces and from 5 patients in Gauteng Province, and influenza B from 14 patients countrywide. This brings the total this year to 42 influenza cases i.e. 1 unsubtyped influenza A, 2 influenza A(H1N1)pdm09, 13 influenza A(H3N2), and 26 influenza B viruses.

The detection rate from the VW programme rose to 21% in week 21 (week ending 27 May), and remained above 10% in week 22 (week ending 3 June). If this trend is sustained then this will indicate that the influenza season has started.

A recent questionnaire about various aspects of the VW programme was completed by 80/191 (42%) of VW practitioners. The responses showed that access to expertise at the NICD came up as the most valued benefit acquired through participation in the programme. This was followed by knowing when the annual influenza season had started, obtaining individ-

ual results for patients, and knowing which influenza strains were circulating.

For the Severe Acute Respiratory Illness (SARI) programme, 2005 specimens were received from patients in the period January to May 2012. Of the 1927 that have been tested for influenza so far, 15 were influenza positive: one influenza A (H1N1)pdm09, one influenza A(H3N2) and 13 influenza B. The timing of the annual influenza season as measured through the SARI programme usually lags approximately 2 weeks behind that of the VW programme.

Healthcare workers are reminded to vaccinate individuals recommended for seasonal influenza vaccination as soon as possible. Healthcare workers should have an increased index of suspicion for a diagnosis of influenza in patients with respiratory tract infection. Antiviral agents should be considered for use in all patients with complicated or severe disease due to influenza, and therapy should be initiated as soon as possible and not be delayed pending laboratory results. Detailed information on the prevention and management of influenza can be found in the 'Healthcare workers' handbook for influenza' available at http://www.nicd.ac.za.

Source: Centre for Respiratory Diseases and Meningitis, NICD-NHLS.

Meningococcal disease

Sporadic cases of meningococcal disease continue to be reported across the country, but as yet there has been no noticeable seasonal increase of laboratory-confirmed cases. Meningococcal cases are expected to increase during June and July, and to peak during the months of August to October. Laboratory-based reporting has inherent delays, so although clinical cases may be increasing already, these may not yet be reflected.

By the end of week 22 (week starting 28 May), a total of 58 laboratory-confirmed cases had been reported to the bacteriology laboratory at the Centre for Respiratory Diseases and Meningitis, NICD-NHLS (Table). Sixteen cases have been reported in children <1 year of age this year so far, similar to the number of cases for the equivalent time period and age group in 2011 (n=16).

The reported cases have diverse serogroups, which is in keeping with sporadic endemic disease in the country. Serogroup data were available for for 44/58 (76%) of cases. Serogroup B and W135 have been identified most commonly this year (15/44, 34% serogroup B and 17/44, 39% serogroup W135). Other serogroups included C (16%, 7/44) and Y (13%, 5/44).

An increase in the number of meningococcal cases are usually identified in the winter and spring seasons, so there should be a high index of suspicion for meningococcal disease in patients who present with nonspecific early signs and symptoms. Disease typically has a rapid progression and should be managed as a medical emergency in order to reduce morbidity and mortality. All cases of suspected meningococcal disease (meningitis and sepsis) should be notified telephonically to the Department of Health.

Table: Number of laboratory-confirmed meningococcal disease cases reported until end of week 22, 2011 and 2012, by province

Province	2011	2012
Eastern Cape	15	8
Free State	5	0
Gauteng	52	23
KwaZulu-Natal	6	9
Limpopo	3	1
Mpumalanga	8	1
Northern Cape	4	0
North West	0	1
Western Cape	14	15
South Africa	**107**	**58**

Source: Centre for Respiratory Diseases and Meningitis, NICD-NHLS.

Hand-foot-and-mouth disease (HFMD)

During the month of May 2012, the Outbreak Response Unit (NICD-NHLS) received multiple requests for advice regarding management of HFMD outbreaks in pre-primary schools/crèches, especially relating to interventions for limiting transmission of infection amongst individuals in these settings.

HFMD is a fairly common and unique syndrome caused by enteroviruses, which predominantly affects children aged <5 years. It is typically associated with coxsackievirus A16, but can also result from infection with other coxsackievirus and enterovirus serotypes (in particular EV 71). Most infections are asymptomatic; in persons who develop signs and symptoms, HFMD is characteristically a self- limiting disease which usually resolves within 7-10 days. However, HFMD associated with EV 71 has been reported to cause more severe disease (including encephalitis and aseptic meningitis) and can be fatal in young children (see Communicable Diseases Communiqué, March 2009).

Following an incubation period of 3-5 days, early symptoms of the disease include sore throat ± low-grade fever. Painful vesicles develop in the oral cavity one to two days after the onset of fever. Scattered lesions are commonly located on the tongue, gingivae, and buccal mucosa, but may also occur in the pharynx and on the lips. They typically begin as small vesicles that often ulcerate, leaving shallow lesions. Up to 85% of cases will also develop a non-pruritic rash with vesicle formation primarily on the dorsum of the fingers (particularly in periungual areas) and on the margin of heels. In young children, palmar, plantar, groin or buttock lesions may also appear. HFMD outbreaks are often associated with crèches/day-care centres, and are most common during summer and autumn months. It is spread from person-to-person by direct contact with respiratory secretions, vesicle fluid, and faeces. The virus may also be spread through contaminated objects (such as toys or stationery).

Complications from HFMD are rare, the most common being dehydration resulting from odynophagia/dysphagia due to painful oral/ pharyngeal lesions. Rarely, fatal aseptic meningitis and encephalitis may occur, particularly in EV 71 outbreaks.

The management of HFMD is symptomatic and supportive, since there is no specific antiviral therapy. A small minority of individuals may need to be admitted to hospital for management of complications.

Transmission of HFMD can be reduced by maintaining good hygiene. Educators and parents should encourage hand hygiene, and discourage sharing of utensils (e.g. cutlery, cups, toothbrushes). Environmental surfaces and other potential vehicles of transmission, such as toys and stationery, should be regularly disinfected. Persons with HFMD do not have to be excluded.

Source: Division of Public Health Surveillance and Response, NICD-NHLS .

Loiasis in Johannesburg

A 68-year-old man presented with non-specific abdominal pain of 6 months' duration. There were no associated symptoms such as nausea or vomiting. He also complained of long-standing itching of the head and legs. Past medical history included diabetes and hypertension, for which he was receiving treatment. He was a temporary visitor from a West African country, and was worried that he might have trypanosomiasis, because of a recent case of a Gabonese patient that had been diagnosed in Johannesburg. On examination his blood pressure was 182/99 mmHg, and he had a fungal infection of his scalp and nails. There was evidence of a possible diabetic neuropathy. Laboratory investigations showed normal blood chemistry and liver function tests. Glycosylated haemoglobin level was 8.2 %, consistent with poor glycemic control.

The only notable feature of the full blood count was a white cell count of 6.85 x 10^9/L, of which 2.42 x 10^9/L (35.3%) were eosinophils. On the blood smear, no trypanosomes were seen, but numerous microfilariae were present. These were confirmed as microfilariae of *Loa loa* by

their size, the presence of a sheath, and the pattern of nuclei in the tail end (Figure).

Loa loa is a filarial nematode parasite of humans that is endemic in central and West Africa, from northern Angola in the south to Benin in the north. It is transmitted via the bite of infected female flies of the genus *Chrysops*, also known as tabanids. These are day-biting flies whose main habitat is the canopy of the rain forest. Between 3 and 13 million people are estimated to be infected. Most infected people in endemic areas are asymptomatic; usually, it is infected visitors that have the clinical features of itching, urticaria, and transient angioedema – the classic 'Calabar swelling', a localised reaction to the migrating adult worms. Patients with loiasis typically have high eosinophil counts and high IgE levels. Occasionally, worms may migrate across the eye under the conjunctiva. There may be significant local eye inflammation that subsides when the worm migrates or is removed by minor surgery. Complications of loiasis include renal involvement in the form of haematuria or proteinuria; and encephalitis, in persons with high microfilaraemia who are treated with diethylcarbamazine or ivermectin, drugs that target microfilariae. Very high eosinophil counts in loiasis are associated with a risk of endomyocardial fibrosis, due to eosinophil infiltration of the myocardium.

Diagnosis in an exposed and/or symptomatic patient is by detecting microfilariae in the blood; they display diurnal periodicity, linked to the host's circadian rhythm, with highest numbers in the peripheral circulation during the day. Morphological distinctions between microfilariae of the various blood and tissue filarial worms require expertise. Specific tests for antibodies or antigens, or PCR, may be available in specialized laboratories in some countries.

Treatment in South Africa is difficult, as the traditional drug that targets adults worms and microfilariae, diethylcarbamazine, is not available. Ivermectin rapidly kills microfilariae but not adults. Use of either agent in patients with high microfilaraemia carries risk of complications related to rapid death of microfilariae. Prolonged albendazole treatment (3-week course, repeated if necessary) results in a gradual reduction in microfilarial levels and resolution of symptoms, presumably due to a slow effect of the drug on the adults. Two previous cases of loiasis in NICD staff members, acquired during scientific studies in central Africa, have been satisfactorily treated with albendazole. The present case was managed in the same way, although the finding of loiasis was probably coincidental to his main clinical problems. With increasing numbers of West African travellers reaching South Africa, filarial infections are likely to be diagnosed locally more frequently in future.

Source: Morningside Clinic and Lancet Laboratories, Johannesburg; Centre for Opportunistic, Tropical, and Hospital Infections, NICD-NHLS.

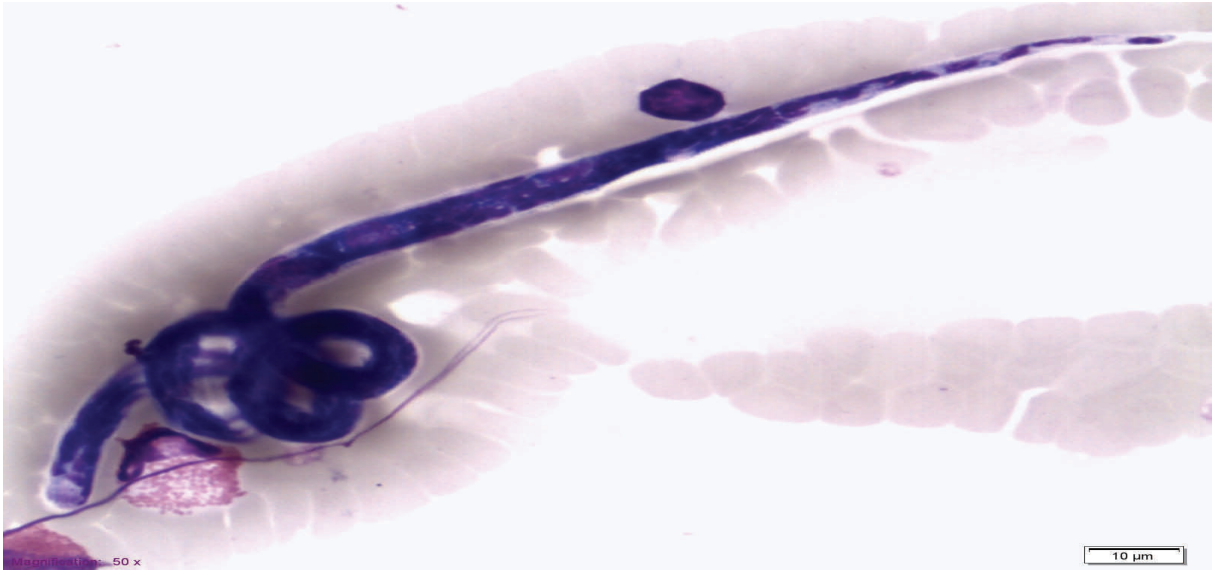

Figure: *Loa loa* microfilaria on blood smear

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.

Disease & Countries	Comments	Advice to travellers
Cholera: Zimbabwe, Ghana, Congo DR, Uganda	Zimbabwe: 100 cases and 2 deaths were recorded in a fresh outbreak in Chiredzi, Masvingo Province since 14 May 2012. Ghana: ongoing outbreak in numerous districts since January 2012, with most cases and deaths reported from the Accra district. Congo DR: More than 19 100 people have been affected since January 2012, with nearly 400 deaths. Uganda: ongoing outbreak since January 2012 in 8 districts	Cholera is transmitted through the faecal-oral route, and primarily through contaminated water. Travellers are advised to take precautions when consuming food or water. Drink bottled water or water brought to a rolling boil for 1 minute before you drink it. Avoid ice or popsicles made from contaminated water. Eat food that has been thoroughly cooked, and eat it while still hot and steaming. Eat fruit and vegetables that can be peeled, peel them yourself after washing hands and do not eat the peelings. Avoid foods and beverages from street vendors. Vaccination may not be completely effective.
Legionnaires' disease: UK (Scotland)	A community outbreak in south-west Edinburgh was first reported on 24 May, with 88 cases (including one death) to date. Seventy of the cases have required hospitalisation. Industrial cooling towers at three facilities have been identified as the potential source of the infection and their cooling systems have been subject to additional chemical treatments, with a number being shut down.	Legionnaires' disease is a common cause of atypical pneumonia caused by *Legionella* bacteria, most commonly the species *L. pneumophila*. It is a waterborne disease, associated with man-made water systems. In conditions that are favourable for *Legionella* growth (e.g. water temperatures of 25–50^{O}C, stagnant water with sediment build-up, and low biocide levels) the bacteria can multiply. Aerosolisation of such a water supply can cause sporadic cases or outbreaks through inhalation of infective aerosols. Cooling towers, evaporative condensers, humidifiers, decorative fountains, whirlpools, showers etc are examples of installations associated with cases/outbreaks. Travellers should avoid aerosol-producing water systems, and seek prompt medical attention if they develop flu-like symptoms and/or lower respiratory tract symptoms. There is no vaccine available.

Disease & Countries	Comments	Advice to travellers
Measles: UK (Ireland, England), Israel	Ireland (West Cork): Cases of measles have more than doubled nationally compared to the same period in 2011. UK (London): 36 cases were reported in Hackney, compared to 7 in the same period in 2011. Israel: By end May 2012, 96 cases were reported, compared to 4 cases in the same period last year.	Measles is an acute, highly communicable viral disease transmitted by direct contact with infectious droplets, or less commonly by airborne spread. It is vaccine-preventable and travellers should ensure their routine immunisations are up to date and consider a measles booster vaccine if appropriate.

References and additional reading: ProMED-Mail (www.promedmail.org); World Health Organization (www.who.int); European Centre for Disease Control (www.ecdc.europa.eu). Last accessed: 2012/06/14.

Source: Division of Public Health Surveillance and Response, NICD-NHLS.

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This communiqué is published by the National Institute for Communicable Diseases (NICD), a division of the National Health Laboratory Service (NHLS), on a monthly basis for the purpose of providing up-to-date information on communicable diseases in South Africa. Much of the information is therefore preliminary and should not be cited or utilised for publication. Questions and comments may be addressed to the Division of Public Health Surveillance and Response: outbreak@nicd.ac.za; Private Bag X4, Sandringham, 2131, South Africa