NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division in the National Health Laboratory Service

Communicable Diseases Communiqué

FEBRUARY 2013, Vol. 12(2)

CONTENTS

COMMUNICABLE DISEASE SURVEILLANCE DURING AFCON 2013 TOURNAMENT

The 2013 African Cup of Nations (AFCON) football tournament was held from 19 January to 10 February 2013 in South Africa, with 16 countries competing for the coveted title. For the duration of the tournament, the National Institute for Communicable Diseases (NICD) assisted the Provincial and National Departments of Health (DOH) with an enhanced surveillance programme focused on communicable diseases considered as potential threats for the tournament. This enhanced surveillance was facilitated using data gathered from public and private healthcare facilities, as well as laboratory data from NHLS and participating private pathology laboratories (Pathcare, Vermaak en Vennote, Lancet and Ampath). Numbers of laboratory-confirmed cases of selected communicable diseases (including hepatitis A, influenza, malaria, measles, meningococcal disease, and typhoid fever) were collated and reported to the Public Health Cluster each day.

For the duration of the enhanced surveillance reporting period (18 January 2013 – 12 February 2013), the following laboratory-confirmed cases were reported: moderate numbers of hepatitis A cases (n=260), sporadic cases of meningococcal disease (n=12) and typhoid fever (n=14), few sporadic cases of measles (n=3), and 3 imported (travel-related) cases of influenza. There was moderate seasonal activity of malaria (n=961 cases countrywide), including two clusters of odyssean malaria in Gauteng Province in patients with no travel history (details previously reported in January 2013 Communicable Diseases Communiqué).

A total of four suspected outbreaks of gastrointestinal illness were reported to the NICD during the tournament, two presumed to be foodborne and two possibly related to poor water supply quality. The *Shigella flexneri* 1b outbreak in Nelson Mandela Bay (which began in mid-November 2012 and ended early February 2013) totalled 70 cases including one death; it was suspected that water supply quality to some areas of the district had been compromised. Fortunately, the Nelson Mandela Bay Health District Outbreak Response Team had been addressing the issue of water quality and the outbreak was waning by the time the district hosted tournament matches.

One of the reported foodborne illness outbreaks occurred at an AFCON-designated stadium and affected five of 505 volunteers at a football match. This outbreak posed a potential risk to the AFCON games due to the possibility of negative media reports and adverse publicity regarding the quality of food available for spectators at the football events. An environmental audit and assessment of catering facilities and food handling processes at the stadium was performed and recommendations were made where non-conformances were identified. No foodborne pathogen was identified amongst the food samples taken, and no likely pathogen identified from the clinical samples submitted.

There were fortunately no major communicable disease events associated with the tournament, but it afforded many healthcare professionals the opportunity to increase the collective experience of health event monitoring and preparedness related to mass gathering events.

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

UPDATE ON ODYSSEAN MALARIA CLUSTERS, GAUTENG PROVINCE

Two clusters of odyssean malaria (acquisition of malaria in a non-endemic area by the bite of an imported mosquito) were discussed in the January 2013 Communicable Diseases Communiqué. An interesting subsequent development was the identification of a fourth case linked to the cluster of three cases reported from a Kempton Park suburb. A 12-year-old male haemophiliac (factor VIII deficient), resident within walking distance of the other 3 cases, developed fever on 14 January 2013, initially thought to be associated with intra-articular injections administered the day before. He was subsequently admitted to a private hospital in Johannesburg on 30 January 2013, and diagnosed with uncomplicated *Plasmodium falciparum* malaria. Despite the delayed diagnosis, he responded well to treatment and was discharged.

All malaria vector species belong to the genus *Anopheles*. In southern Africa, *Anopheles arabiensis* and *An. funestus* are the principal vectors of malaria, and are the most likely cause of odyssean malaria cases recorded in Gauteng Province (GP). However, the importation of the major vector *An. gambiae* from the tropical belt is also possible.

Entomological investigations were conducted at the sites of both odyssean malaria clusters in GP. The primary objectives of these investigations were to search for adult *Anopheles* mosquitoes (potential vectors) indoors and for larvae in the vicinity of each case, and to establish risk factors for the importation of infected *Anopheles* vectors.

Donkerhoek & Mooiplaats, Tshwane District

Background: three cases of confirmed *P. falciparum* malaria, residing on adjacent plots. Onset of illness between 22 and 25 December 2012; complicated disease in two cases with one death.

Many larvae identified as members of the *Culex* genus were collected from various sources of standing water that had accumulated in discarded tyres and miscellaneous containers. *Culex* species are not implicated in malaria transmission. No anopheline larvae were found in any of these larval sites. Collection of adult mosquitoes included one adult *Aedes* female from a discarded tyre as well as a few *Culex* females and one anopheline female, *An. pretoriensis*, from inside one of the affected houses (Donkerhoek). All of these species/genera occur naturally in Gauteng and none are implicated in malaria transmission.

In summary, none of the adult specimens collected can be implicated in malaria transmission and no malaria vector breeding sites were found, suggesting that there is no local breeding of a malaria vector population taking place. As the two affected houses are very close together (approx. 300m even though they are on adjacent plots) it is likely that the same infected mosquito/es could have infected all the patients. We cannot say with certainty which patient was infected first. It is entirely possible that the two patients resident in the Donkerhoek house were infected on the same night by the same anopheline mosquito.

The source of the infected mosquito/es is speculative. One possibility is a tyre warehouse situated across the N4 highway (approx. 500m) from the affected sites. These tyres are apparently imported from Zambia which is endemic for malaria. However, it is equally likely that infected mosquitoes were inadvertently transported by car, taxi, bus or luggage from a malaria-affected region.

Glen Marais, Kempton Park, Ekurhuleni District

Background: four cases of confirmed *P. falciparum* malaria, residing in houses within walking distance of each other. Onset of illness for three cases between 13 and 17 January 2013; delayed presentation in fourth case; complicated disease in one case.

The entomological site investigation at residence 1 revealed many accumulations of still water around the property. Some of the accumulated water contained *Culex* larvae. No *Anopheles* larvae were found. During inspection of the bedrooms only one *Culex* adult female was found. A vacant marshy stand is situated directly across the road from this property with small puddles of still water and a slow-moving stream. The stand is surrounded by a palisade fence and access could not be obtained for an entomological investigation.

At residence 2, the affected patient produced a dead *Culex* adult female which she had found in her

house. No mosquitoes could be found in either bedroom of the house. On inspection of the marsh area and small stream that runs through the property (a large housing estate), only a very small number of *Culex* mosquito larvae were identified.

On inspection of residence 3, no mosquitoes could be found. There was a water fountain in the back yard which had been cleaned a few days previously. No other accumulations of water were identified on the property.

All cases could have plausible explanations concerning the importation of infective malaria vectors:

- The cases at residence 1 (father and son) may have been infected by a vector imported in a container originating from a malaria endemic area or a vector could have travelled with the wife/mother from Hoedspruit, Limpopo.
- The case at residence 2 may have been infected at her place of work, a police station, by a vector that had travelled with one of the immigrants detained at the station.
- The case at residence 3 may have been infected by a vector that had travelled with the father from Luanda, Angola, an area endemic for malaria.

Although OR Tambo International Airport cannot be completely ruled out as source of vector mosquitoes linked to these cases, this scenario is highly unlikely. This airport is close to Glen Marais (less than 5 km away) but still a little too far for mosquito dispersal.

The most likely scenario is that one or a few malaria infective mosquitoes were imported into Glen Marais very close to the houses from which these odyssean cases emerged. These houses are in very close proximity to one another and all cases evidently acquired their infections at approximately the same time – late December to early January. There are several possibilities concerning the actual mode of vector mosquito importation but all remain speculative.

All cases and their families were made aware of the symptoms of malaria and that non-infected family members should seek medical treatment if any of the symptoms develop; the families were advised to use mosquito-repellent sprays, lotions and insecticides.

These cases highlight the need for healthcare workers throughout the country to maintain a high index of suspicion for malaria during the malaria season (September to May for southern Africa). Malaria should always be considered in febrile patients post-travel to a malaria risk area, and also in the absence of a travel history should no alternate diagnosis be readily apparent. Confirmed malaria cases must be notified to the Department of Health for further investigation.

People entering South Africa from malaria-endemic areas should check themselves and their luggage for mosquitoes and should consider the use of insecticides to kill any mosquitoes that may have travelled with them.

Source: Division of Public Health Surveillance and Response, and Centre for Opportunistic, Tropical and Hospital Infections, SAFELTP, NICD-NHLS; Department of Health, Tshwane and Ekurhuleni Districts.

EAST AFRICAN TRYPANOSOMIASIS

East African trypanosomiasis (EAT) was recently confirmed in two South Africans, a pilot working in Zambia and a conservationist undertaking a trans-Africa trip. The pilot, a 26-year-old male, is based in Zambia and regularly flies to a number of game parks, many of which are situated in the Luangwa Valley. In late November 2012 he recalled a large number of tsetse fly bites while visiting the Kasanka National Park (in central Zambia) for the annual fruit bat migration (the largest mammal migration on earth). He presented with an acute febrile illness about ten days later, coinciding with his arrival in France for a skiing holiday. Initial tests for malaria were negative. A history of tsetse fly bites and a progressive febrile illness suggested the possibility of trypanosomiasis in the differential diagnosis, even though a typical trypanosomal chancre could not be found. Trypomastigotes were identified on examination of repeat peripheral blood smears, confirming the diagnosis of EAT. The patient responded well to suramin treatment (despite an initial hypotensive episode related to the drug itself), and fortunately the course of his illness was uncomplicated. Central nervous system involvement was excluded following cerebrospinal fluid (CSF) examination.

The second patient is a 42-year-old conservationist

who spent 13 months travelling from Cape Town to Cairo and back. He recalled experiencing numerous tsetse fly bites whilst travelling in Kasanka National Park (central Zambia). On his return to South Africa he presented with an acute illness characterized by high fever, malaise and gastrointestinal symptoms. He received artemether-lumefantrine (CoartemÒ) as empiric treatment for suspected malaria, but the illness progressed. On admission to hospital, clinical examination revealed mild splenomegaly and hepatomegaly; no skin rashes or chancres were noted. Malaria smears were repeatedly negative. Trypanosomiasis was confirmed on the peripheral blood smear. He responded well to suramin treatment, and besides a transient decrease in absolute neutrophil count (from 2.16 x 10^9/L to 0.77 x 10^9/L) and platelets (from 223 x 10^9/L to 79 x 10^9/L) made an uneventful recovery. Examination of the CSF was normal.

EAT results from infection with the parasite *Trypanosoma brucei rhodesiense*, which is transmitted by the bite of a tsetse fly. Tsetse flies inhabit rural areas, living in woodlands of the savannah and dense vegetation along streams; travellers to urban areas are not at risk. Animal reservoirs (wildlife and domestic livestock) play an important role in the EAT transmission cycle. Tsetse flies bite during daylight hours; bites are usually quite painful, and travellers often recall the bite.

In the human host, trypanosomes can initially be found in the lymph and blood system (haemolymphatic stage), and after penetrating the blood-brain barrier also in the brain and CSF (second stage). Symptoms and signs of EAT generally appear within 1–3 weeks of the infective bite, and may include high fever, a chancre at the site of the infective bite (a tender, erythematous, indurated swelling), headache, facial oedema, a non-specific evanescent erythematous rash, and myalgia. Initial clinical findings may include regional lymphadenopathy and splenomegaly/hepatomegaly; thrombocytopenia may be noted. This haemolymphatic stage may be complicated by multi-organ involvement - notably myocarditis and arrythmias, acute meningoencephalitis, coagulation disorder with profound thrombocytopenia, renal failure, hepatic dysfunction and ARDS. Central nervous system involvement (second stage disease) can occur within the first month of infection.

Examination of routine peripheral smears (as for malaria) may be negative, and examination of buffy coat preparations (wet and stained) for trypomastigotes is more sensitive.

Suramin, given as multiple doses over a period of several weeks, is the treatment for the haemolymphatic stage of EAT. All patients, irrespective of clinical status, should undergo examination of CSF, but only after the peripheral circulation has been cleared of trypanosomes by suramin treatment. Melarsoprol is required for managing laboratory-confirmed central nervous system EAT (diagnosed by the presence of trypomastigotes, raised protein and/or the presence of lymphocytes in CSF), but may be associated with drug-associated encephalopathy that has a high mortality.

T. b. rhodesiense is endemic in 13 eastern and southeastern African countries, but >95% of EAT infections occur in Tanzania, Uganda, Malawi, and Zambia. Travellers become infected mainly during safaris in *T. b. rhodesiense*-endemic game parks or during hunting trips in these countries. A recent review found that exported (i.e. travel-related) cases of EAT contracted infection in the following countries: 59% in Tanzania (mainly from Serengeti, Tarangire and Mayowasi parks/reserves), 19% in Malawi (Kasungu National Park), 12% in Zambia (particularly South Luangwa Valley National Park), 7% in Zimbabwe (Mana Pools National Park) and 3% in Uganda (Queen Elizabeth National Park).[1] EAT must always be considered in persons who present with an acute febrile illness and have visited known endemic areas in Africa, in whom repeated malaria tests are negative.

Preventive measures are aimed at reducing contact with tsetse flies. Tsetse flies are attracted to moving vehicles and bright, dark colours; they can also bite through light-weight clothing – therefore advise travellers to wear clothing of wrist and ankle length made of medium-weight fabric in neutral colors. Limited data suggests that the use of DEET-containing repellents may minimally reduce the number of fly bites.

References

1. Simarro PP, Franco JR, Cecchi G et al. Human African trypanosomiasis in non-endemic countries (2000-2010). J Trav Med. 2012;19(1):44-53

Source: South African National Travel Health Network; Division of Public Health Surveillance and Response, and Centre for Opportunistic, Tropical and Hospital Infections, NICD-NHLS; Physicians in private practice, Johannesburg; Ampath Laboratories.

RABIES UPDATE

There have been no laboratory-confirmed cases of human rabies in South Africa for 2013 to date.
For the period of 2000 to 2012, a total of 155 laboratory-confirmed human rabies cases was reported in South Africa, predominantly in KwaZulu-Natal, Limpopo and Eastern Cape provinces (Figure 1). During the same period, 400 to 800 dog rabies cases were confirmed annually (Onderstepoort Veterinary Institute, Allerton Provincial Veterinary Laboratory, South Africa).

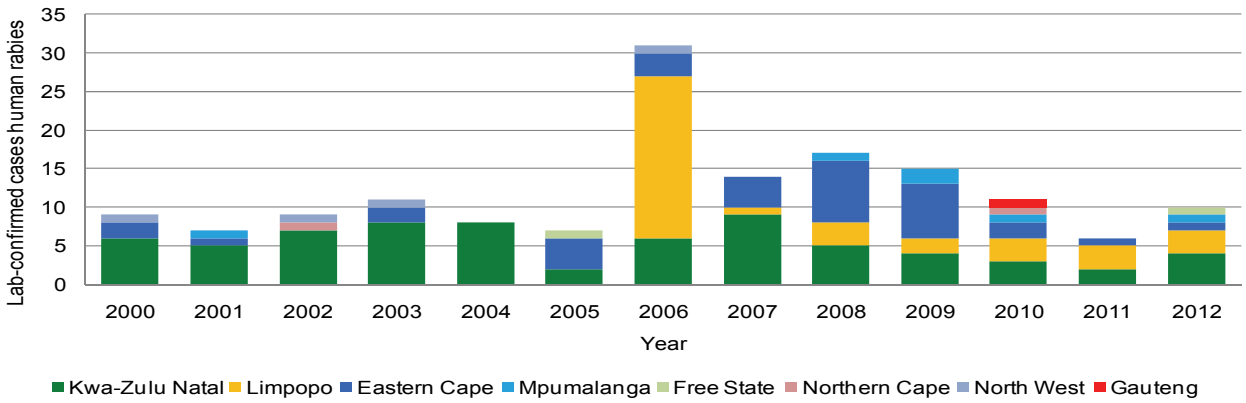

Figure 1. Laboratory-confirmed human rabies cases, South Africa, 2000-2012

Domestic dogs were the source of exposure for 72% (112/155) of the reported human rabies cases. Other vectors included mongooses (n=4), domestic cats (n=2), a caracal (n=1), and a jackal (n=1). A single case in 2006 of confirmed rabies infection was associated with Duvenhage virus infection, transmitted by a bat. As is the case in other rabies-endemic countries, most cases occur in children; during this period, 50% (78/155) cases were children under ten years of age.

All healthcare workers are urged to familiarise themselves with the national rabies post-exposure prophylaxis (PEP) management guidelines, available from the NICD website as follows: http://nicd.ac.za/assets/files/Rabies-Guide-2010-small.pdf (the comprehensive guidelines) and http://nicd.ac.za/assets/files/Rabies%20Poster%202011.pdf (the one-page rabies PEP management guideline).

Source: Centre for Emerging and Zoonotic Diseases, NICD-NHLS

CRIMEAN-CONGO HAEMORRHAGIC FEVER

Crimean-Congo haemorrhagic fever (CCHF) was confirmed in a 37-year-old farmer living on a sheep farm in Free State Province, bordering on Northern Cape Province.

He reported numerous tick bites, although no eschars were detectable on examination. The patient presented with low-grade fever, myalgia, and scattered petechiae. On admission, the patient had a moderately reduced platelet count of 68 x 10^9/L and slightly elevated hepatic transaminases (AST = 64 IU/L, ALT 51 IU/L). The initial diagnosis was tick bite fever based on the history of tick exposure; however, there was no response to doxycycline and ceftriaxone treatment. Alternate diagnoses including CCHF were considered, and ribavirin treatment was added. The diagnosis of CCHF was confirmed by RT-PCR as well as the presence of CCHF-specific IgG and IgM antibodies on repeat serum samples. The patient made an uneventful recovery and no secondary cases were reported.

Three cases of CCHF have been laboratory confirmed in South Africa for 2013 to date. The cases were reported from Free State (n=2) and North West (n=1) provinces. In addition, one case has been laboratory confirmed for Namibia for 2013 to date.

Source: Centre for Emerging and Zoonotic Diseases, and Division of Public Health Surveillance and Response, 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.

Disease & Countries	Comments	Advice to travellers
Novel coronavirus: United Kingdom (travel history to Pakistan and Saudi Arabia)	A further three cases of novel coronavirus were confirmed on 19 February 2013 in a United Kingdom resident who had a travel history to Pakistan and Saudi Arabia, as well as two family members who had no history of recent travel. This suggests that transmission to the two family members occurred in the UK. To date, a total of 12 laboratory confirmed cases (including 6 deaths) have been reported to the World Health Organization.	Coronaviruses are a large family of viruses that cause a wide range of illnesses in humans, from the common cold to SARS. Viruses of this family also cause a number of animal diseases. In the cases reported to date, infection with novel coronavirus has manifested as an acute febrile respiratory infection (presenting as a pneumonia or acute respiratory distress syndrome). Investigations are ongoing with regards to the likely source of infection, route of exposure, and extent of human-to human transmission of the virus. The World Health Organization (WHO) does not recommend any travel/trade restrictions to Saudi Arabia, Qatar or Jordan.
Yellow fever: Sudan (Darfur)	As of 11 February 2013, a total of 851 suspected cases, including 171 deaths, have been reported. The outbreak has affected mostly Central, North, West and South Darfur.	Yellow fever is an acute viral haemorrhagic disease transmitted by infected mosquitoes. Symptoms appear after an incubation period of 3 to 6 days. Symptoms include fever, muscle pain with prominent backache, and headache. Most patients improve and their symptoms resolve after 3 to 4 days. However, 15% of patients enter a second, more toxic phase within 24 hours of the initial remission. High fever returns and is accompanied by severe multisystem illness (including icteric hepatitis and haemorrhagic diathesis).There is no specific treatment. Travellers to at-risk yellow fever areas need to have proof either of yellow fever vaccination or a medical waiver certificate. The vaccine must be received at least 10 days prior to departure. The vaccine is contraindicated in pregnant women, infants <9 months, individuals with egg allergies, and certain immune-suppressed persons. Vaccinated travellers should still take precautionary measures to avoid being bitten by mosquitoes, including use of insect repellents (containing 30-50% DEET), wearing light-coloured clothing, and use of insecticide-treated bed nets.

Disease & Countries	Comments	Advice to travellers
Dengue fever: Portugal (Madeira)	As of 6 January 2013, 2 144 cases of dengue fever have been reported in Madeira.	Dengue viruses are transmitted by *Aedes* spp. mosquitoes, which usually bite during daytime. There are no available vaccines. Symptoms of dengue fever can include fever, headache, joint and muscle pain, rash, nausea and vomiting and can take two weeks to develop after being bitten. Uncommon fatal complications include dengue haemorrhagic fever and dengue shock syndrome. When travelling to a dengue-risk area, use mosquito repellents containing DEET to avoid being bitten. Wear long-sleeved pants and shirts during the day and stay in well-ventilated (fan/air-conditioned) rooms where possible. Burning mosquito coils at night and sleeping under a mosquito net in a well-ventilated room is also helpful.
Anthrax: Namibia (Oshikoto region)	As of 5 February 2013, 22 confirmed human anthrax cases including two deaths have been reported in Oshikoto region, Namibia. The outbreak started on 17 January 2013, with 3 000 people having been exposed to meat from infected animals.	Anthrax is a zoonotic disease caused by the bacterium *Bacillus anthracis*. The disease is most common in cattle, sheep, antelope and other herbivores. Infection in humans is usually acquired from occupational contact with infected animals or their products, including touching or consuming contaminated meat. There is no risk of person-to-person transmission. Anthrax infection can occur in three forms: cutaneous, inhalational and intestinal. Symptoms usually occur within seven days of exposure. In cutaneous disease, the characteristic presentation is a small skin lesion that ulcerates, with surrounding vesicles and marked swelling, soon forming a black scab; inhalational disease presents as flu-like symptoms that progress to severe respiratory distress and shock; and vomiting, loss of appetite, fever, abdominal pain and diarrhoea are presenting features of intestinal disease. Travellers should avoid eating undercooked meat from sick animals or animals that were found dead.

Disease & Countries	Comments	Advice to travellers
Cholera: Cuba (Havana) and Zambia (Central Province) and Uganda (Nebbi) and Tanzania (Rukwa Region) and Malaysia (Sabah State, Borneo)	**Cuba**: As of 31 January 2013, a total of 51 confirmed cases in Havana. **Zambia**: As of 30 January 2013, 55 cases in Kapiri Mposhi and Kabwe since September 2012. **Uganda**: As of 30 January 2013, 28 cases registered in Dei parish, Panyimur sub-county in Nebbi district. **Tanzania**: As of 26 January 2013, nine deaths and 300 people receiving treatment for cholera in fishing camps and a village along the Lake Rukwa Basin in Sumbawanga District. **Malaysia**: As of 24 January 2013, 20 cholera cases detected in the Papar district (Sabah State, Borneo).	Cholera is a bacterial disease that can cause profuse diarrhoea and severe dehydration, and is most often spread through eating contaminated food or drinking contaminated water. Travellers are urged to take precautions when consuming food and water, to utilise water purification tablets where needed, and practice good hand hygiene. Cholera vaccine is not routinely recommended for travellers.

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

References and additional reading:

- ProMED-Mail (www.promedmail.org)
- World Health Organization (www.who.int)
- Centers for Disease Control and Prevention (www.cdc.gov)
- Health Protection Agency (www.hpa.org.uk)

Last accessed: 19 February 2013.