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Division of the National Health Laboratory Service

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CONTENTS

1 ZOONOTIC AND VECTOR-BORNE DISEASES

a Crimean-Congo haemorrhagic fever

Two cases of Crimean-Congo haemorrhagic fever (CCHF) were confirmed in mid-September 2014. The first case-patient, a 48-year-old man from a farm situated between Prieska and Niekerkshoop in Northern Cape Province, removed a bontpoot tick (*Hyalomma* sp.) on the same day that he became ill with fever and malaise. He presented on 09 September to a nearby hospital with epistaxis, bleeding of the gums and haemoptysis. Blood tests done on admission revealed abnormal findings as follows: thrombocytopenia (platelet count 3 x 10^9/L on admission, which subsequently improved to 121 x 10^9/L); elevated hepatic transaminase levels (ALT 180 IU/L); leukopenia (white cell count 2 x 10^9/L, rising to 3.58 x 10^9/L). The patient recovered uneventfully. Blood samples tested for CCHF at the National Institute for Communicable Diseases (NICD) were negative on CCHF-RT PCR, but positive for anti-CCHF IgG and IgM antibodies as demonstrated via indirect immunofluorescence testing. Seroconversion at this stage of illness is generally a good prognostic indicator for recovery.

The second case-patient, a 40-year-old male farming with cattle and sheep in Namibia, was admitted to a hospital in Northern Cape Province. He reported a tick bite three days before falling ill. Blood tests done on admission revealed a platelet count of 170 x 10^9L (which subsequently decreased to 26 x 10^9/L), and elevated hepatic transaminase levels (AST 200 IU/L, later increasing to 300 IU/L). The patient was transferred to a hospital in Bloemfontein for further management. Serial blood tests showed a further increase in transaminasemia (AST 589 IU/L, ALT 295 IU/L) and an increase in the white cell count to 11.05 x 10^9/L. Blood samples submitted to the NICD tested positive for the presence of CCHF virus RNA by RT-PCR. Anti-CCHF virus IgM antibodies were also detectable. The patient continued to deteriorate and died a few

days after admission.

Including the two cases presented here, a total of three cases of CCHF has been reported in South Africa for 2014 to date. The other case of CCHF was confirmed in a patient from Free State Province in January of this year; the case-patient recovered uneventfully.

CCHF was first recognised in South Africa in 1981. Since then, cases are reported almost every year, mostly from the semi-arid farmland areas of Northern Cape (61 of 195 cases to date) and Free State (45 of 195 cases) provinces. Cases of CCHF have, however, been reported from all nine provinces of South Africa. Farmers are more prone to CCHF virus infection than the general population because of their higher likelihood of exposure to ticks. Almost two-thirds of confirmed CCHF cases in South Africa are associated with direct tick exposures. Livestock and certain wildlife species may also be infected with CCHF virus, although they will not develop overt disease. These animals are only viraemic for a short period during which contact with their blood and tissues may also transmit the virus to humans.

More information on CCHF can be sourced from the NICD website www.nicd.ac.za.

Source: Division of Public Health Surveillance and Response and Centre for Emerging and Zoonotic Diseases, NICD-NHLS

b Chikungunya fever and Angola

Since May 2014, six cases of chikungunya disease (including one death) have been reported by the NICD. All case-patients acquired infection with this mosquito-borne virus in Angola. Most of these cases were referred to the NICD as suspected dengue fever, but tested positive for chikungunya virus-specific IgM responses. A dengue outbreak has been raging in Angola since early 2013 with evidence of co-circulation of dengue subtypes 1 and 4. Evidence of co-circulation of chikungunya and dengue viruses has been documented, with cases of patients with co-infection reported. The presence of chikungunya virus in Angola was first reported in the 1960s, but the geographic distribution and burden of disease in the country is not well described. It is likely that the current outbreak of dengue may also coincide with an increase in chikungunya cases, since the same mosquitoes are involved in transmission of both viruses.

Chikungunya virus is widely spread in sub-Saharan Africa, but is also reported from countries in South East Asia and the Pacific. Chikungunya is considered an emerging disease. Since 2004, massive outbreaks of the fever have occurred in India and several islands in the Indian Ocean. During 2005-2006, more than a million cases of the disease were reported from India alone. Autochthonous outbreaks have also been reported in recent years from Italy and France. Since late 2013, reports of chikungunya have been confirmed from French Guiana and a number of Caribbean islands, marking the first reports of local (and extensive) transmission of the virus in the Americas.

Chikungunya (which translates as 'disease that bends up the joints') is characterised by an abrupt onset of fever with severe joint pain 3-7 days after infection. The joint pain is symmetrical, usually affecting wrists, knees, ankles, and hands. In some cases, headache, muscle pain, joint swelling and rash may also be noted. Although most infections are self-limited, severe disease can occur with neurological and cardiac manifestations which may be fatal. Neonates, persons >65 years, and those with underlying medical conditions are at greatest risk for severe disease and death. Chronic chikungunya disease, manifested by chronic joint pain/arthritis, can be highly debilitating. There is no specific treatment, and management is supportive. Diagnosis requires specialised testing, including RT-PCR and serology; virus isolation may also be performed.

There are no registered chikungunya virus vaccines, so prevention of mosquito bites is essential. The virus is transmitted primarily by day-biting mosquitoes. Standard measures include wearing long-sleeved shirts and long trousers, and using DEET-containing repellents.

Source: Division of Public Health Surveillance and Response and Centre for Emerging and Zoonotic Diseases, NICD-NHLS

c Tick bite fever

Tick bite fever was confirmed as the cause of illness in a 28-year-old man from the Kempton Park area in Gauteng Province, where he lives on a plot. The patient had been on a fishing trip one week before falling ill. He was admitted to a Tshwane hospital with fever and headache; clinical examination showed features of encephalopathy. He was initially treated with antibiotics for suspected otitis media,

but deteriorated over the following week, developing a maculopapular rash (including palmar lesions, but sparing the soles), confusion and delirium.

Initial laboratory test results were misleading, with a positive PCR result for enterovirus infection and negative rickettsia serology. Two eschars (characteristic of tick bite fever) were noted on further examination and prompted empiric tick bite fever treatment with oral doxycycline. His condition continued to deteriorate; mucosal bleeding was noted, and he required intubation and inotropic support. Treatment was changed to intravenous ciprofloxacin as an assured alternative to oral doxycycline in critically ill patients with tick bite fever. The clinicopathological findings were as follows: white cell count = 12.68 x 10^9/L with an absolute neutrophilia; platelets = 43 x 10^9/L; CRP = 327mg/L; ALT and AST both >200 IU/L; CSF monocytes = 47/mm^3, CSF protein = 0.65g/L and CSF glucose = 2.5mmol/L. The patient responded well to treatment. The diagnosis of tick bite fever was confirmed by PCR on a dry swab collected from one of the eschars. Anti-rickettsia IgG and IgM antibodies were detectable using an indirect immunofluorescence assay on serum collected more than a week after onset of illness.

Tick bite fever must be considered in the differential diagnosis of all patients with acute febrile illness plus headache - not only in those who have visited a rural area, but also those with a history of possible exposure to dog ticks in the urban setting. The spectrum of illness may vary from mild to severe multisystem disease closely resembling Crimean-Congo haemorrhagic fever or bacterial septicaemia. The diagnosis is primarily clinical, supported by the presence of an eschar, and doxycycline treatment should be instituted immediately. PCR for rickettsia on eschar swabs is very useful and sensitive for diagnosis in early disease, given that serology in the first week of illness is often negative, and PCR on blood samples is frequently negative.

Source: Division of Public Health Surveillance and Response and Centre for Emerging and Zoonotic Diseases, NICD-NHLS

d Fatal case of West Nile fever

A 38-year-old man from Nelspruit (Mpumalanga Province) presented late July 2014 with fever and neurological symptoms in keeping with encephalitis. He sustained a dog bite in December 2013 when trying to separate fighting dogs (his own dog and an unknown stray dog). He was bitten on the finger, but did not receive rabies post-exposure prophylaxis at the time. It was initially reported that the patient suffered from hydrophobia, a characteristic sign of rabies disease. In retrospect, this presentation was likely due to a severe allergic response to non-steroidal anti-inflammatory drug treatment with difficulty in swallowing and angioedema. Rabies was considered as a potential diagnosis for this patient given the exposure history and clinical presentation. Serial saliva specimens, cerebrospinal fluid (CSF) and a skin biopsy specimen collected over the course of three weeks tested repeatedly negative for rabies by RT-PCR. Blood and CSF specimens also repeatedly tested negative for the presence of anti-rabies virus antibodies. MRI scans were consistently normal. Guillain-Barré syndrome was considered as an alternative diagnosis. Later, a history of travel to Estcourt in KwaZulu-Natal Province came to light; the patient had contact with horses during his visit there. Based on the history and the clinical presentation of encephalitis, arboviral disease was suggested as a possible diagnosis. Blood specimens collected over the course of the patient's illness were tested for anti-West Nile virus antibodies and seroconversion was demonstrated. RT-PCR testing on the earliest collected blood and CSF specimens were, however, negative for West Nile virus. The patient progressively deteriorated and required intubation and ventilation. He died about three weeks after onset of illness.

West Nile virus (WNV) is a mosquito-borne arbovirus and is widely distributed throughout Africa, the Middle East, Asia, parts of Europe, Australia, North and South America, and the Caribbean. The WNV transmission cycle involves birds as vertebrate hosts and ornithophilic mosquitoes as maintenance vectors. The presence of WNV has been documented in South Africa for many years, and one of the largest outbreaks in humans, affecting reportedly tens of thousands of people, was reported from the Karoo during the mid 1970s. Since then, WNV has been reported almost annually in humans and horses, which both serve as incidental hosts of the virus. Clinical recognition of WNV disease is challenging. WNV infection may induce one of three clinical outcomes in humans: the vast majority of cases are asymptomatic, with a minority presenting with a mild febrile illness often accompanied by a maculopapular rash. In rare cases, WNV may present as neuroinvasive disease (meningitis or encephalitis) which may be fatal. WNV infection should be confirmed by specialised

laboratory testing, which includes serological, molecular and virologic screening. The clinical presentation together with exposure and travel history assist in the presumptive diagnosis of WNV disease. In addition, since considerable clinical overlap exists with other endemic arboviral diseases, particularly Sindbis, laboratory screening should include testing for a panel of likely arboviruses. There is no specific treatment for WNV disease, and management is supportive care.

Source: Division of Public Health Surveillance and Response and Centre for Emerging and Zoonotic Diseases, NICD-NHLS

e Rabies

There were no additional reports of laboratory-confirmed cases of human rabies in South Africa for the month of August 2014. For 2014 to date, a total of five rabies human cases has been laboratory confirmed at the National Institute for Communicable Diseases (NICD). These cases involved four South Africans who acquired rabies within the country in Eastern Cape (n=2), Limpopo (n=1) and North West (n=1) provinces. The fifth case was a South African citizen who acquired the disease in Angola but was medically evacuated to South Africa for care.

In the past decade, a total of 138 rabies deaths was confirmed by specialised diagnostic testing at the NICD, which is the only facility in the country that performs rabies testing for human cases. Rabies is fully preventable if correct post-exposure prophylaxis (PEP) is administered, and yet human deaths occur every year - of which many are undiagnosed and go unnoticed in South Africa, as elsewhere in the developing world. Many countries in Africa and elsewhere lack adequate laboratory confirmation and reporting systems as a result of logistic and financial constraints. In South Africa, despite having the necessary laboratory expertise, rabies remains under-recognised and under-reported even though it is a notifiable disease.

Rates of dog bite injury consultations at healthcare facilities are high in both the public and private South African health sectors. Despite these figures being poorly documented, it suggests that the reported human rabies cases are only the 'tip of the iceberg'. The lack of accurate data has rendered rabies a low public health and veterinary priority. Under-reporting in South Africa is compounded by other factors. Rabies is difficult to diagnose clinically and has a broad spectrum of differential diagnosis, including tetanus, bacterial meningitis, other viral encephalitides, and non-infectious aetiologies (such as drug reactions, poisoning and delirium tremens), which complicates clinical recognition of rabies in human patients. The clinical presentation of rabies is also not consistent and may present as encephalitic or paralytic forms. The encephalitic form may include the characteristic signs of hydrophobia, hallucinations and aggression (although these are not universally present); whilst the paralytic form includes ascending paralysis from the site of the original injury. Furthermore, ante-mortem testing is often inconclusive. These laboratory investigations includes PCR applied to saliva, cerebrospinal fluid (CSF) and skin biopsy specimens. An intermittent pattern of virus shedding in saliva mandates testing of multiple specimens. CSF specimens are also tested, but these tests are not sensitive. Post-mortem confirmation requires testing of brain biopsy specimens with a direct fluorescent antibody assay as the gold standard. Obtaining consent for invasive necropsy is often problematic, and contributes to the number of clinically suspected cases which remain unconfirmed. Skin biopsies are additional specimens that may also be tested for post-mortem confirmation of cases. A major challenge in the prevention of human rabies is poor public awareness of the risk of rabies. This results in many animal exposure victims not presenting to healthcare facilities for consideration of rabies PEP.

This month the world celebrates World Rabies Day with the theme of '*Together Against Rabies!*". This theme reiterates the importance of cohesive activities to control and prevent rabies in all sectors. Events and programs for World Rabies Day are aimed at increasing awareness for the prevention and control of this deadly disease. More information regarding World Rabies Day may be found at http://rabiesalliance.org/world-rabies-day/.

Health professionals and members of the public can access more information on rabies through the NICD website: www.nicd.ac.za in order to prevent human cases.

Source: Division of Public Health Surveillance and Response and Centre for Emerging and Zoonotic Diseases, NICD-NHLS

2 INTERNATIONAL OUTBREAKS OF IMPORTANCE TO SOUTH AFRICAN TRAVELLERS AND HEALTHCARE WORKERS

Ebola virus disease outbreak: update

Situation update in West Africa

Since the last update (access updates on www.nicd.ac.za), additional new cases and deaths continued to be reported in all affected countries in West Africa (Guinea, Liberia, Sierra Leone and Nigeria). In addition, an imported EVD case has been reported in Senegal. The case-patient is a 21-year-old Guinean national who is reported to have travelled by road from Guinea to Dakar (Senegal) on 20 August 2014. Three days later he sought medical care at a healthcare facility in the area. He presented with fever, diarrhoea and vomiting and was treated for malaria. However his condition did not improve and on 26 August 2014 was referred to an infectious disease facility where he was hospitalised and subsequently tested positive for EVD. The case-patient turned out to be a close contact of a confirmed EVD case in Guinea. To date, no further EVD cases have been reported in connection with this case. As at 14 September 2014, a cumulative total of 5 325 EVD cases (laboratory-confirmed, probable and suspected) including 2 622 deaths with a case fatality rate of 49% have been reported in the current EVD outbreak in West Africa (Table 1).

Table 1: Number of Ebola virus disease cases and deaths in West Africa as at 14 September 2014

Country	Total cases (laboratory-confirmed, probable and suspected)	Total deaths	Case fatality rate
Guinea	942	601	64%
Liberia	2 710	1 459	54%
Sierra Leone	1 673	562	34%
Nigeria	21	8	38%
Senegal	1	0	0%
Totals	**5 347**	**2 630**	**49%**

Situation in Democratic Republic of Congo (DRC)

In August 2014, another EVD outbreak was reported in Djera, Equateur Province. Increases in number of cases presenting with Ebola-like symptoms were reported between 28 July and 18 August 2014. EVD was confirmed in some of the case-patients. The index case was a pregnant woman who resided in the village of Ikanamongo. She was a wife of a hunter, who became ill after handling bushmeat. Subsequent to this, transmission among healthcare workers and local community was established. The index case and subsequent cases had no travel history to or contact with people from affected EVD countries in West Africa (Guinea, Liberia, Sierra Leone, and Nigeria). As at 15 September 2014, a cumulative total of 71 EVD cases (53 confirmed and 18 suspected) including 40 deaths with a CFR of 56% have been reported. Of the 71 EVD cases, nine were healthcare workers seven of whom died. To date all EVD cases have been localised in Boende, Boende Muke, Lokolia and Watsikengo in Equateur Province.

This is the seventh confirmed EVD outbreak in DRC, close to where the virus was first identified in 1976 in Yambuku near the Ebola River. The recent outbreak in DRC is unrelated to the current outbreak occurring in West Africa affecting Sierra Leone, Guinea and Liberia or the focal outbreak in Nigeria.

Situation in South Africa

The risk of Ebola being introduced into South Africa remains low. As at 23 September 2014 there have been no cases of Ebola virus disease in South Africa associated with the current outbreaks in West Africa and DRC. There are no suspected cases of EVD in South Africa at present. For the suspected EVD case

Laboratory testing

Testing for viral haemorrhagic fever viruses (including Ebola virus) in South Africa is only available at the NICD. EVD testing is neither warranted nor useful for persons that are not suffering from a clinical illness compatible with EVD, even in the event of compatible travel histories. The tests cannot be used to determine if the patient has been exposed to the virus and may develop the disease later. Requests for testing (with a detailed clinical, travel and exposure history) should be directed to the NICD Hotline at 082 883 9920 (a 24-hour service, for healthcare professionals only)

Recommendations for travellers

The World Health Organization regularly reviews the EVD outbreak public health situation and recommends travel or trade restrictions if necessary. At present, no travel or trade restrictions are recommended. However individuals who have been confirmed or are suspected of being infected with EVD or have had contact with cases of EVD should not be allowed to travel unless the travel is part of the medical evacuation (www.who.int). Travel restrictions are in place for South Africans wishing to travel to the affected sub-region, as well as for all persons wishing to travel from the affected sub-region to South Africa. Refer to the Department of Health website (www.doh.gov.za) for more information.

Source: Division of Public Health Surveillance and Response and Centre for Emerging and Zoonotic Diseases, NICD-NHLS

Figure 1. Geographical distribution of current Ebola virus disease outbreaks in Africa as at 15 September 2014

3 FOOD- AND WATER-BORNE DISEASES

Cholera

Cholera was confirmed in a 37-year-old male Zimbabwean national who has been residing in South Africa since 1997. The patient was admitted to Helen Joseph Hospital (Gauteng Province) on 28 August 2014 following a two-day history of diarrhoea, vomiting, fever and cough. *Vibrio cholerae* was isolated on a stool specimen submitted to the NHLS laboratory on admission, and was confirmed at the NICD Centre for Enteric Diseases as toxin-producing *V. cholerae* O1 serotype Ogawa. The patient was severely ill and required intensive care for severe dehydration and renal failure.

A comprehensive outbreak response was instituted including case investigation, active surveillance, contact tracing and testing of environmental water samples. The patient lives in the informal settlement of Diepsloot in Gauteng Province. He is a taxi driver by profession, travelling mainly around the areas in close proximity to Diepsloot; however, he occasionally travels further. On 22 August he drove a group of passengers to Zimbabwe. The taxi broke down at the Beitbridge border with Zimbabwe. He spent the night at the border post and hitch-hiked to Johannesburg the following day.

Twenty-three people reside in the same yard as the patient, and share one flushing toilet facility with a single potable water stand-pipe. Active surveillance identified three other household residents with recent/ongoing diarrhoea. Stool specimens were collected from these three persons as well as eleven other asymptomatic household contacts, who voluntarily agreed to provide samples. All fourteen clinical samples as well as communal tap water samples were negative for *Vibrio cholerae*. A definitive source of the patient's infection is yet to be confirmed but current evidence supports the possibility of infection being acquired whilst staying at the Beitbridge border area.

Health promotion was provided to household members. Health education remains an essential measure to reduce the likelihood of a local outbreak following the identification of a single cholera case.

Source: Division of Public Health Surveillance and Response and Centre for Enteric Diseases (Bacteriology) NICD-NHLS; Helen Joseph Hospital NHLS; Disease Surveillance and Outbreak Response, City of Johannesburg Department of Health

4 SEASONAL DISEASES

a Influenza

The influenza season which started in week 21 (week ending 25 May) continues, though the number of specimens received and number testing positive for influenza has declined. The influenza season peaked at 80.4% in week 27 (week ending 6 July). Over the past 30 years, the mean duration of the influenza season has been 12 weeks (range 7 to 25 weeks).

The majority of the influenza detections made to date from specimens submitted to the viral watch programme (influenza-like illness) have been influenza A(H3N2) i.e. 349/487 (72%). In addition influenza A(H1N1)pdm09 has been detected in 61 patients, the majority 42 (69%) from the Eastern and Western Cape provinces, one patient was dual positive A(H1N1)pdm09 and A(H3N2), and influenza B virus was detected in 76 patients. Influenza B has been the predominant detection since the second half of August i.e. 25/37 (68%) detections.

In addition 43 specimens have been received from patients at a point of entry into South Africa. Influenza A(H1N1)pdm09 was detected in two patients, influenza A(H3N2) in seven, and influenza B in 11 of these patients.

As at 06 July 2014, 1 261 patients hospitalised with severe acute respiratory illness were tested for respiratory viruses at five sentinel sites. Of these, 48 patients tested positive for influenza. The majority, 41 (70%), of the influenza detections were influenza A(H3N2) followed by influenza B (14/58, 24%) and influenza A(H1N1)pdm09 (3/58, 5%). In addition, 43% (322/746), 27% (199/746) and 14% (108/746) were positive for rhinovirus, RSV and adenovirus, respectively.

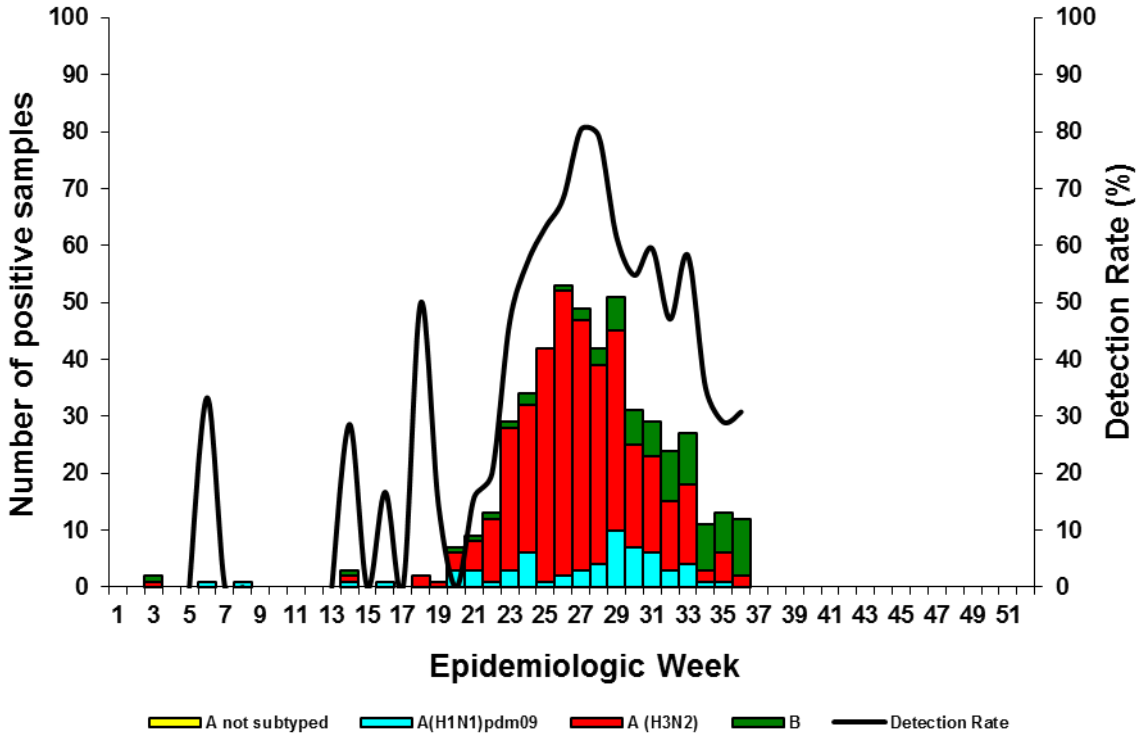

Figure 2. Influenza detections by type and subtype: Viral Watch surveillance programme 2014

Table 2. Cumulative number of identified influenza types and subtypes and total number

Hospital	A not subtyped	A(H1N1)pdm09	A(H3N2)	B	Total samples
Edendale (KZ)	0	0	13	0	379
Helen Joseph-Rahima Moosa (GP)	0	2	1	3	101
Klerksdorp-Tshepong (NW)	0	0	15	10	585
Mapulaneng (MP)	0	0	11	1	132
Matikwane (MP)	0	1	1	0	64
Total:	0	3	41	14	1 261

GP: Gauteng; KZ: KwaZulu-Natal; NW: North West; MP: Mpumalanga

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

b Meningococcal disease

In South Africa, meningococcal disease is endemic and cases occur year-round, but with seasonal peaks in winter and early spring. In addition, there is a natural cyclical pattern of meningococcal disease with peaks of disease occurring every 5 to 10 years. Current rates of meningococcal disease in South Africa are at a nadir and we are expecting an increase in rates based on known periodicity.

The meningococcal season is underway with an increase in case numbers reported over the last few months. There are inherent delays in laboratory-based reporting, which lags behind clinical reports; in addition, because our laboratory-based surveillance system excludes disease diagnosed clinically without laboratory confirmation, reported rates represent a minimum estimate of the true burden of disease.

By the end of epidemiological week 35 (week ending 31 August 2014), a total of 114 laboratory-confirmed cases was reported to the Centre for Respiratory Diseases and Meningitis (CRDM), NICD-NHLS (Table 3). The highest burden of disease is

among the <1 year age group, where 19 (17%) cases have been reported so far. This is lower than the number of cases reported for the equivalent time period and age group in 2013 (n=29, 20%). The reported cases were caused by diverse serogroups, which is in keeping with sporadic endemic disease in the country. Serogroup data were available for 61/114 (54%) of cases. Serogroups B, W* and Y have been identified most commonly this year (19/61, 31% serogroup B; 18/61, 30% serogroup W* and 14/61, 23% serogroup Y). There were also 9 cases of serogroup C and 1 case of serogroup X disease. Clinicians should have a high index of suspicion for meningococcal disease in patients who present with an acute febrile illness and 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 and/or confirmed meningococcal disease (meningitis and sepsis) should be notified telephonically to the Department of Health.

Table 3. Number of laboratory-confirmed meningococcal disease cases reported until end of week 35, 2013 and 2014, by province

	Year	
Province	**2013**	**2014**
Eastern Cape	29	25
Free State	10	4
Gauteng	35	33
KwaZulu-Natal	26	12
Limpopo	1	0
Mpumalanga	3	1
Northern Cape	2	0
North West	4	0
Western Cape	33	39
	143	114

*Previously known as serogroup W135. Harrison OB, EID 2013: 19(4) 566-573

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

5 ANTIMICROBIAL RESISTANCE

The Johannesburg and Cape Town Antimicrobial Resistance Reference Laboratories (AMRRL) of the Centre for Opportunistic, Tropical and Hospital Infections (COTHI) at NICD/NHLS have been testing referred isolates of suspected carbapenemase-producing Enterobacteriaceae (CPE) for the presence of selected carbapenemase genes. For August 2014, a total of 39 Enterobacteriaceae isolates was screened, 24 of which were carbapenemase-producing Enterobacteriaceae. Most isolates were *Klebsiella pneumoniae* (23) followed by *Enterobacter cloacae* (9) (Figure 3). Ten NDM positive isolates were identified (6 from private hospitals in KwaZulu--Natal and 4 from public hospitals from KwaZulu-Natal and Gauteng). Six OXA-48 positive isolates were identified (2 from private hospitals in Gauteng and KwaZulu-Natal and 4 from the public sector in the Eastern Cape and Gauteng). One KPC positive isolate and 1 GES positive isolate were identified from the private sector in KwaZulu-Natal. Five VIM positive isolates were identified (4 from public hospitals in Gauteng and 1 from a private hospital in KwaZulu-Natal).

It is important to note that these figures do not represent the current burden of CPEs in South Africa. Given that CPE infections are currently not reportable or notifiable in South Africa, there is no platform for appropriate surveillance reports and consequently no locally representative data is available. This is of major concern, since meaningful data can inform public health policy and highlight priorities for action. Controlling the spread and limiting the impact of CPEs in South Africa will require intensive efforts in both the public and

private healthcare sectors going forward. NHLS and private laboratories are encouraged to submit suspected CPE isolates based on antimicrobial susceptibility testing (AST) criteria to the AMRRL, NICD/NHLS. Please telephone (011) 555 0342/44 or email ashikas@nicd.ac.za and olgap@nicd.ac.za for queries or further information. In the Western Cape area, please email colleen.bamford@nhls.ac.za.

Source: Centre for Opportunistic, Tropical and Hospital Infection, NICD-NHLS

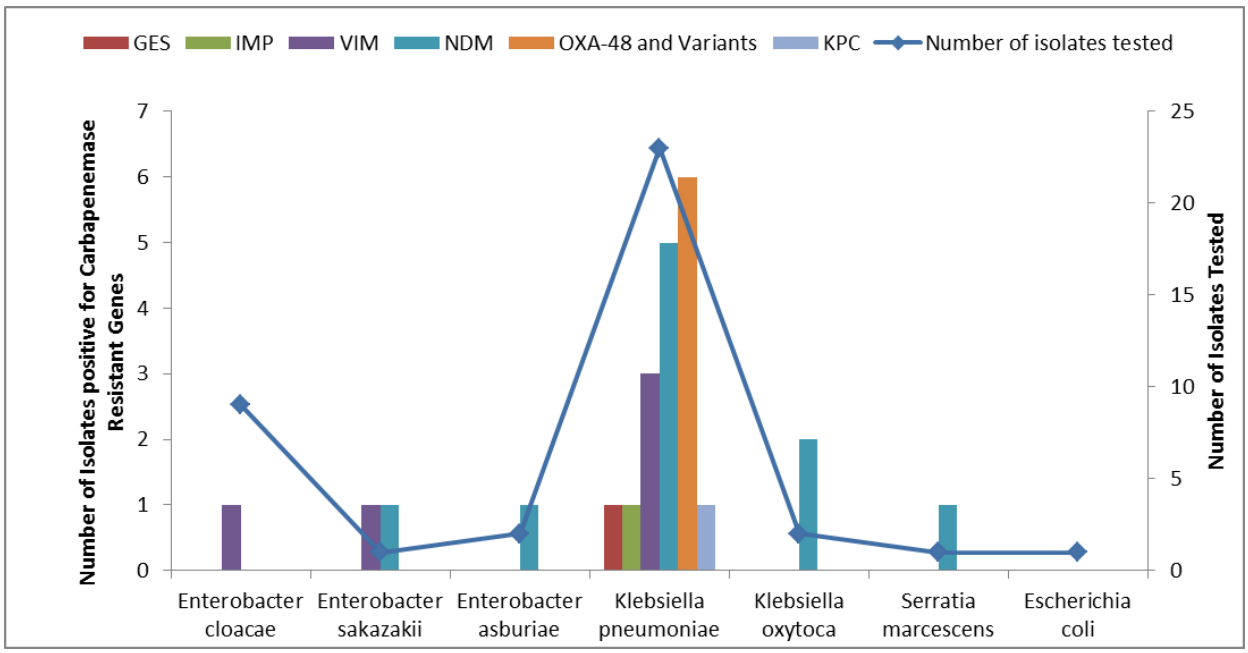

Figure 3. Enterobacteriaceae isolates screened (n=39) and confirmed CPE (n=24) during August 2014 at AMRRL (NICD-NHLS)

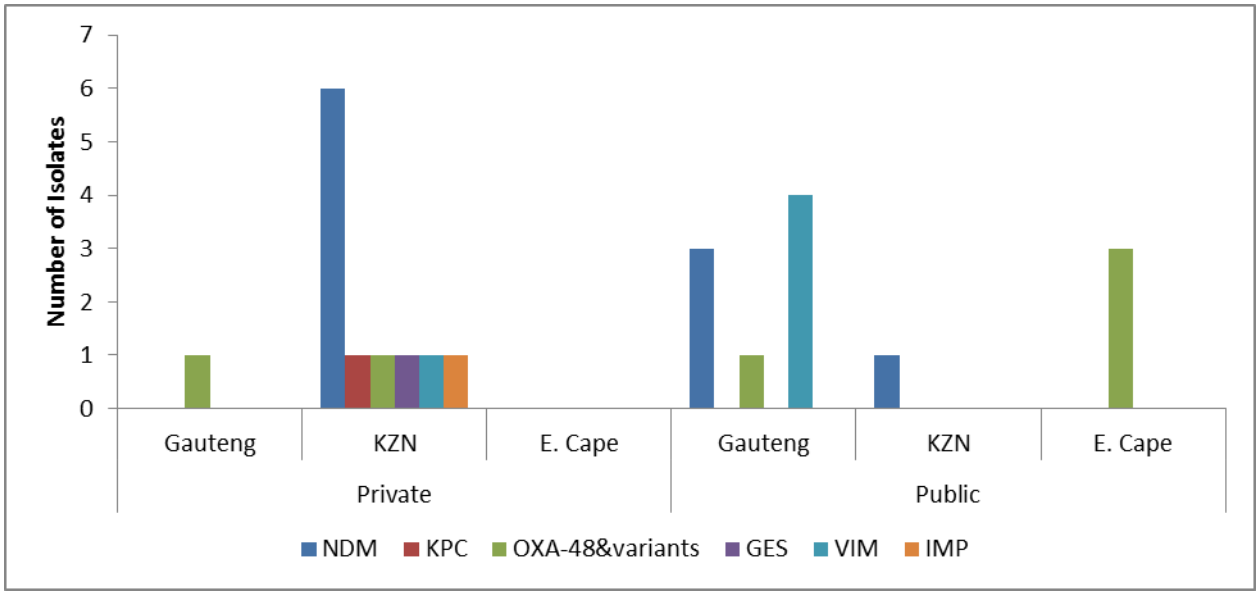

Figure 4. Distribution by province of CPEs (n=24), August 2014

6 BEYOND OUR BORDERS

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
1. Vector-borne diseases		
Crimean-Congo haemorrhagic fever Pakistan (Karachi)	As of 09 September 2014: 2 confirmed cases, 1 death.	Crimean-Congo haemorrhagic fever is transmitted to people from ticks and livestock animals. Human-to-human transmission can occur from contact with blood and body fluids of infected persons. Avoid tick bites by wearing long-sleeved shirts, long pants, and light-coloured clothing to deter ticks.
Chikungunya North America Canada	As of 01 September 2014: 8 confirmed cases.	Chikungunya is a mosquito-borne viral infection transmitted by *Aedes* spp. mosquitoes, which bite mostly during the day. Travellers should wear long-sleeved shirts and long pants during the day and stay in well-ventilated (fan/air-conditioned) rooms.
United States of America	As of 01 September 2014: 690 confirmed cases.	
Caribbean	As of 01 September 2014: 6 047 confirmed cases across 8 Latin and 11 non-Latin Caribbean countries; 37 deaths across the 8 Latin Caribbean countries.	
Central America El Salvador	As of 22 August 2014: 8 confirmed cases.	
Nicaragua	As of 29 August 2014: 9 confirmed cases.	
South America Venezuela	As of 22 August 2014: 125 confirmed cases.	
Argentina	As of 1 September 2014: 125 confirmed cases.	
Brazil	As of 22 August 2014: 12 confirmed cases.	
Samoa	As of 09 September 2014: 700 confirmed cases.	

Disease & countries	Comments	Advice to travellers
1. Vector-borne diseases (continued)		
Dengue fever Americas United States of America (Florida)	As of 29 August 2014: 3 confirmed cases.	Dengue fever (like chikungunya) is a mosquito-borne viral infection transmitted by *Aedes* spp. mosquitoes, which bite mostly during the day. Travellers should wear long-sleeved shirts and long pants during the day and stay in well-ventilated (fan/air-conditioned) rooms.
Mexico (National)	As of 02 September 2014: 10 910 confirmed cases, no deaths.	
El Salvador (National)	As of 26 August 2014: 15 582 confirmed cases, 4 deaths.	
Asia Malaysia (Perak State)	As of 02 September 2014: 3 657 confirmed cases, 8 deaths.	
Japan (Yoyogi Park)	As of 08 September 2014: 80 confirmed cases.	
Taiwan	As of 02 September 2014: 1 352 confirmed cases, no deaths.	
India (Pune Maharashtra State)	As of 27 August 2014: 495 confirmed cases.	
India (Odisha Sate)	As of 2 September 2014: 572 confirmed cases.	
2. Food- and water-borne diseases		
Cholera Africa Ghana (Western region)	As of 05 September 2014: >10 000 suspected cases, 80 deaths.	Cholera is an acute diarrhoeal illness that causes severe dehydration. Drink safe water (bottled water with an unbroken seal, boiled water or water treated with chlorine tablets). Washing of hands with soap and safe water must be practiced often. Food must be well-cooked and prepared before eaten. Peel fruit and vegetables before eating.
Nigeria (Sokoto state)	As of 06 September 2014: 40 confirmed cases and 16 deaths.	
Zambia (Central province)	As of 09 September 2014: 3 confirmed cases and 2 deaths.	
India Odisha state	As of 12 September 2014: 120 suspected cases and 3 deaths.	

Disease & countries	Comments	Advice to travellers
2. Food- and water-borne diseases (continued)		
South Sudan (7 states)	As of 05 September 2014: 5859 suspected cases and 127 deaths.	
3. Vaccine-preventable diseases		
Polio Cameroon (Eastern region)	As of 06 September 2014: 2 new wild poliovirus type 1 have been reported.	Polio is highly infectious. The virus is transmitted by person-to-person through the faecal-oral route, by a common vehicle (e.g. contaminated water or food). Initial symptoms are fever, fatigue, headache, vomiting, stiffness in the neck and pain in the limbs. Polio can be prevented by vaccination and ensuring that you eat clean well prepared food and drink clean safe water. Travellers can protect themselves by making sure they are vaccinated against measles. Ensure that hands are washed with soap and water or a hand sanitizer (containing at least 60% alcohol). Cover your mouth and nose with a tissue when coughing or sneezing. Avoid close contact, such as kissing, hugging, or sharing eating utensils or cups, with people who are sick.
Measles Nambia (Windhoek)	As of 02 September 2014: 5 confirmed cases.	
Vietnam (National)	As of 05 September 2014: 3 688 confirmed cases, 2 deaths.	
Philippines	As of 04 September 2014: 519 confirmed cases.	
Solomon Islands	As of 01 September 2014: 550 confirmed cases.	
United States of America	As of 07 September 2014: 592 confirmed cases.	
Taiwan	As of 09 September 2014: 19 confirmed cases.	
Papua New Guinea (Madang)	As of 09 September 2014 : >1700 confirmed cases.	
4. Respiratory diseases		
MERS-CoV Global	As of 09 September 2014: a total of 727 laboratory-confirmed cases and 302 deaths.	Good hygiene and basic infection prevention practices can minimise risk of respiratory infections in travellers: • cough etiquette • avoiding contact with sick people • avoid handling of animals • frequent hand washing with soap and water or the use of an alcohol-based hand rub.
Saudi Arabia	As of 13 September 2014: 15 laboratory-confirmed cases, 10 deaths.	

Disease & countries	Comments	Advice to travellers
4. Respiratory diseases (continued)		
		Travellers with diabetes, chronic lung disease and immunocompromised states are at risk of infection and should avoid contact with animals if possible. Strict hand washing must be followed after touching animals. Avoid raw camel milk or undercooked camel meat at all times. Travellers should contact a medical practitioner if they develop acute respiratory symptoms upon return from a known risk area.

References and additional reading:

ProMED-Mail (www.promedmail.org)
World Health Organization (www.who.int)
Centers for Disease Control and Prevention (www.cdc.gov)
Last accessed: 23 September 2014

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