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CONTENTS

Measles alert

There is an urgent need to heighten awareness amongst healthcare professionals for measles surveillance. A laboratory-confirmed measles case was detected through the measles surveillance programme, that of a 16-year-old female from Pretoria with onset of illness on 4 November 2013, presenting with encephalitis and pneumonia requiring intensive care. The patient and her sister were not immunised as children since their mother is an anti-vaccinationist. Outbreak response and investigation following notification of the case led to the retrospective identification of a further four suspected cases but unfortunately no specimens were taken for laboratory testing at the time of illness.

There have been five laboratory-confirmed measles cases in South Africa for 2013 to date. This is of concern, since the pattern of cases is similar to that observed in the early stages of our most recent national measles outbreak in 2009 - 2011, where 18 699 laboratory-confirmed measles cases were reported. As the number of measles-susceptible persons in the population increases due to suboptimal routine vaccination and decreased natural infection rates, the likelihood of an outbreak increases.

There is also ongoing concern about measles cases being imported from countries experiencing outbreaks/sporadic cases. A German national diagnosed with measles on return from a short holiday in South Africa had toured in Gauteng and Mpumalanga provinces during his measles incubation period in October 2013, but was likely infected prior to travelling. Much closer to home, healthcare professionals should be aware of the current measles outbreak in the Ohangwena Region of northern Namibia which began in September 2013.

South Africa is in the elimination phase for measles, where every case requires notification and investigation. There is an urgent need to strengthen surveillance and vaccinate children against measles at 9 months and again at 18 months of age as recommended in the South African Expanded Programme on Immunisation schedule.

Clinically, measles can be difficult to differentiate from rubella, which is currently circulating throughout the country. Any suspected measles case meeting the case definition should be notified immediately to the Department of Health and a blood sample collected and sent to the NICD for measles testing. The case definition for a suspected measles case is as follows: a patient of any age presenting with fever, rash and at least one of the following: cough, coryza or conjunctivitis. The clotted blood specimen for measles testing should be accompanied by a suspected measles case investigation form (CIF) which can be obtained from the Department of Health or the NICD.

Parents should be advised to vaccinate their children against measles if they are not up to date

with their measles vaccination series. Healthcare professionals are advised to take each contact with children as an opportunity to check vaccination status and road-to-health cards.

Source: Centre for Vaccines and Immunology and Division of Public Health Surveillance and Response, NICD-NHLS; Tshwane Municipality and Tshwane District Department of Health

Rabies update and alert

A 22-year-old male from Msogwaba in Mpumalanga Province presented to a local hospital during October 2013 with delusions, hiccoughs, drooling, and inability to swallow. The patient was constantly scratching a healed wound on his left leg. He was initially admitted to the psychiatric ward, but following progression of his clinical presentation with the onset of seizures he was admitted to an intensive care unit. Initially, meningitis was the presumptive diagnosis, but laboratory investigations were negative. The patient's family was not able to verify a recent dog/animal exposure, or whether the patient had previously presented to a healthcare facility and received rabies post-exposure prophylaxis (PEP).

A number of specimens including saliva, cerebrospinal fluid and blood were submitted to the NICD for rabies investigation. The saliva and cerebrospinal fluid specimens tested negative for rabies by reverse transcription PCR. Of note is that anti-rabies virus IgG and IgM antibodies were detected in both the blood and cerebrospinal fluid specimens. Interpretation of this result is problematic since it has not been possible to verify if the patient had previously received rabies PEP; however, the detection of anti-rabies antibodies in the cerebrospinal fluid is suggestive of rabies disease. The gold standard for the laboratory diagnosis of rabies remains the detection of rabies virus antigen in a brain specimen. Regrettably, the patient's family denied post-mortem sampling and therefore no further specimens were available for investigation.

The patient's clinical presentation, together with the fatal outcome and the serological findings in the cerebrospinal fluid support a diagnosis of rabies. Rabies is an endemic disease in Mpumalanga Province with an average of 100 dog cases reported annually throughout the province. The area surrounding Mbombela currently represents one of the most densely-infected rabies areas in the country. Since 2008 when rabies re-emerged in domestic dogs in Mpumalanga Province, a total of six human rabies cases (not including the case discussed here) has been confirmed. All but one of these cases had a history of exposure to domestic dogs.

For 2013 to date, a total of seven human rabies cases has been confirmed (not including the case discussed here), originating from Mpumalanga (n=1), KwaZulu-Natal (n=1), Limpopo (n=3) and Free State (n=2) provinces.

Alert: exposure to rabid cat in Sedibeng District, Gauteng Province

On 20 November 2013, rabies was confirmed in a domestic cat by fluorescent antibody testing (FAT) on a post-mortem brain sample submitted to the Agriculture Research Council - Onderstepoort Veterinary Institute. The cat was a previously healthy animal that resided in a church property situated in agricultural holdings in the Rosashof area west of Vanderbijlpark city centre (Emfuleni Municipality, south of Johannesburg), Gauteng Province. The animal was euthanased on 19 November 2013 after displaying symptoms compatible with clinical rabies, including aggression and three unprovoked human attacks. The source of the cat's rabies infection is not clear. However, there is a possibility of exposure to potential rabid wild animals as there have been two confirmed cases of rabies in meercats in the Vanderbijlpark area during 2013 (in March and August), and history of the cat's rabies vaccination status is not known. Further typing of the virus may reveal whether the virus is of the mongoose or canid biotype, which would suggest the likely source and potential for further cases in the area. Rabies post-exposure prophylaxis (PEP), including rabies vaccine and rabies immunoglobulin (RIG) was administered to three humans who were bitten or had contact with the cat.

Healthcare professionals should be aware of the possibility of rabies when dealing with any animal-exposures in the area. Rabies disease is universally

fatal, but may be prevented by PEP which is almost 100% effective if given timeously and correctly.

Dog/cat bites are common in Gauteng Province and generally follow provoked attacks, most commonly related to dogs 'protecting their territories'. Rabies PEP biologicals need to be used judiciously and the decision whether to give PEP must be based on a thorough assessment of the risk of rabies transmission. A provoked attack from an otherwise healthy animal in most urban settings in Gauteng Province is highly unlikely to carry a risk of rabies.

Relevant information for assessing the risk of exposure includes the species of the animal (there is no risk from small rodents), whether it was an unprovoked attack, whether the animal was visibly ill or exhibiting unusual behaviour (e.g. aggression, salivation, weak limbs, or snapping at imaginary objects), and the category of exposure. While dogs are the most common source of rabies for humans, other animals that need to be considered as possible rabies sources in this area include cats, livestock (which typically appear to choke and appear to have a 'bone in the throat') and mongoose. If the animal is well with no symptoms 10 or more days after the exposure, rabies is not likely and no PEP is needed. There are no laboratory tests that can confirm whether rabies has been transmitted and a decision to administer PEP is made on the risk assessment as detailed above. Rabies PEP is a life-saving intervention for an otherwise untreatable and fatal disease.

Health professionals and members of the public can find more information on rabies available on the NICD website: www.nicd.ac.za. The national rabies guideline document may also be downloaded from the NICD website: http://www.nicd.ac.za/?page=guidelines&id=73.

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

Malaria: advice for travellers and healthcare professionals

The malaria season in Southern Africa is from September to May each year, and an increase in both local (from malaria-endemic areas in South Africa) and imported (from other malaria-endemic countries) cases can be expected over the upcoming holiday season.

Malaria is endemic in three South African provinces: Limpopo, Mpumalanga, and north-eastern KwaZulu-Natal (KZN). South Africa has made major strides in malaria control with a marked decrease in the number of cases being reported, from 64 622 in 2000 to 5 248 in 2012 (Figure 1), 60% of which are imported cases. This has been accompanied by a decrease in malaria-related mortality from 459 deaths in 2000 to 42 deaths in 2012.

Travellers to malaria-endemic areas within South Africa or other malaria-endemic countries (notably Mozambique) need to take appropriate preventative measures. Mefloquine (Lariam®, Meflam®), doxycycline, and atovaquone-proguanil (Malanil®) are recommended chemoprophylactic agents for Southern Africa where chemoprophylaxis is indicated, and the choice of agent needs to be individualised. For advice on preventive measures, access the following link: http://www.doh.gov.za/docs/policy/2011/malaria_prevention.pdf. Malaria must be considered in the differential diagnosis of acute febrile illness in returning travellers; diagnostic tests for malaria should be done urgently, since prompt and appropriate management is critical to improving patient outcomes. Delays in diagnosis, misdiagnosis (most commonly as influenza), and delayed treatment are the most common factors associated with adverse outcomes. Healthcare workers, especially those in areas/provinces not endemic for malaria, must ensure that any case of malaria is notified to the Department of Health.

The South African national guidelines recommend the use of artemether–lumefantrine (Coartem®) or quinine plus doxycycline/clindamycin for uncomplicated falciparum malaria. Severe falciparum malaria is treated using quinine plus doxycycline/clindamycin or intravenous artesunate where available. An initial loading dose of 20 mg/kg of quinine is required for all cases of severe malaria to rapidly reach a therapeutic level. Chloroquine and sulphadoxine-pyrimethamine are not to be used in the treatment of falciparum malaria due to high-level resistance. Non-falciparum malarial infections are less common in sub-Saharan Africa; artemether-lumefantrine or quinine as above can be used for treatment of acute non-falciparum malarial illness. Chloroquine should only be used if there is reliable

laboratory confirmation of non-falciparum species. The addition of primaquine to the above initial treatment is indicated for *Plasmodium ovale* or *P. vivax* infections to prevent relapse.

The South African malaria treatment guidelines can be accessed through the following link: http://www.doh.gov.za/docs/policy/2011/malaria_treatment.pdf.

Source: Division of Public Health Surveillance and Response, NICD-NHLS; Malaria Directorate, National Department of Health

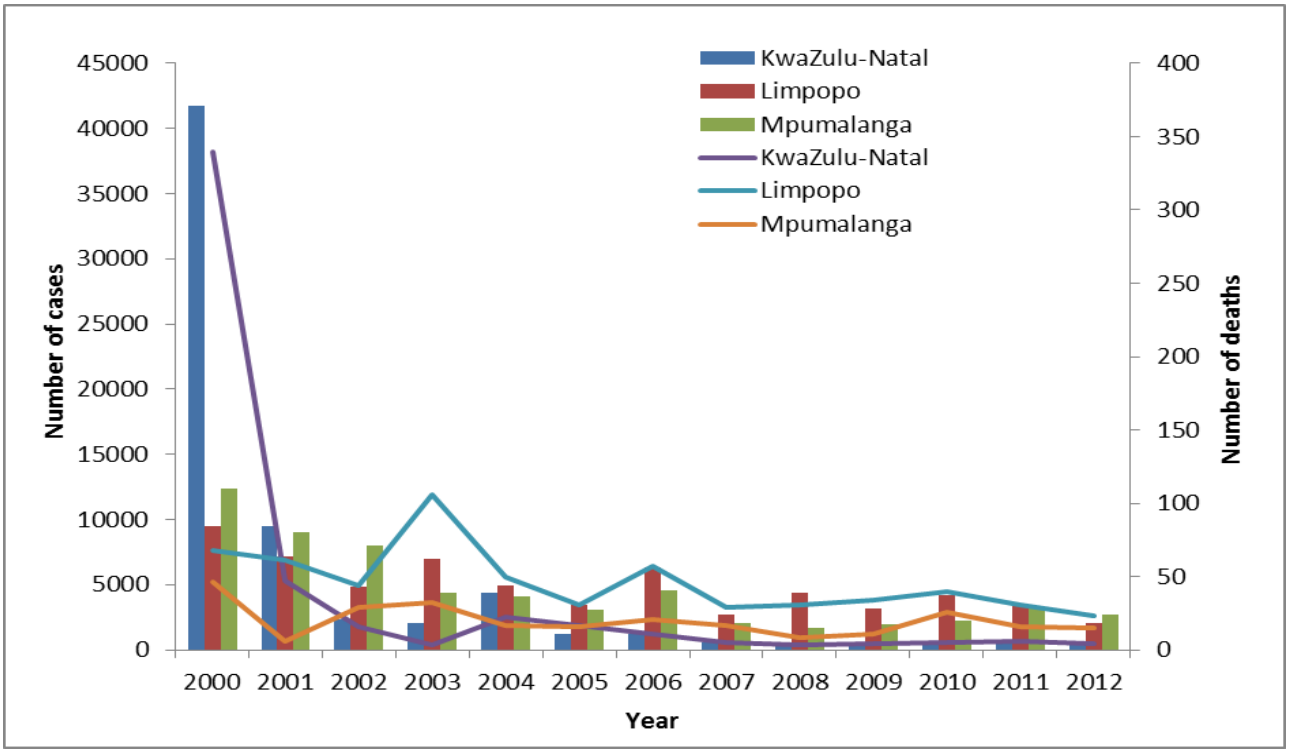

Figure 1. Malaria cases and deaths by year and by malaria-endemic province, South Africa, 2000 - 2012

Gnathostomiasis outbreak, Okavango Delta

An outbreak of probable gnathostomiasis recently occurred in staff and South African visitors on a houseboat that was cruising the Okavango Delta, northwestern Botswana. Four persons on board ate freshly-caught raw bream, marinated in lemon juice, on August 28 in the mid-Delta area, west of Moremi Game Reserve. Three of the four developed signs and symptoms of gnathostomiasis, including painful cutaneous larva migrans. Detailed clinical features are only known for one adult male patient, who returned to Pretoria on 31 August. On 2 September he developed severe diarrhoea and vomiting, followed by headaches and mild fever. Laboratory investigations were negative for malaria and schistosomiasis, and full blood count and liver function tests were normal. The headaches, mild fever and fatigue persisted. On 13 September the patient developed severe pains in his right flank and right axilla, spreading to the scapula area. A clinical diagnosis of gnathostomiasis was made and treatment with albendazole (400 mg daily) was started on 16 September. Pain and headaches subsided quite quickly, but fatigue persisted until almost the end of the 21-day treatment period. Two other patients who respectively received ivermectin and albendazole also recovered well. Ivermectin appeared to be more rapidly effective than albendazole.

Several previous outbreaks of gnathostomiasis acquired in the Okavango and western Zambia regions have been reported in the Communiqué and other publications, and it is probably more common than is realised, being relatively unknown and not recognised locally. The disease is caused by invading larvae of nematode (roundworm) parasites of Gnathostoma species (see http://www.cdc.gov/parasites/gnathostoma/). These parasites have a complicated life cycle involving a variety of mammalian and other hosts, including snakes,

birds, frogs, eels, crustaceans and freshwater fish (see http://www.dpd.cdc.gov/dpdx/HTML/gnathostomiasis.htm). Humans are typically infected when they eat raw or undercooked fish, crabs, or crayfish. The southern African cases have usually acquired the infection by eating raw bream (*Tilapia* species) that has been marinated in lemon juice (that is, a version of ceviche), apparently a popular delicacy among tourists to the Delta. The larvae migrate through skin and subcutaneous tissues (the most common presentation), but sometimes also through internal organs, including the central nervous system in the most serious form of the disease. Effective treatment (albendazole) for cutaneous infection is available in South Africa, but treating central nervous system invasion is more difficult. Gnathostomiasis is well known in Southeast Asia, and Central and South America, and is regarded as an emerging imported disease resulting from increasing international travel and adventurous eating. We strongly advise that freshwater fish caught in southern Africa should not be eaten raw, and that lemon or lime juice does not render raw fish safe to eat.

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

Enhanced respiratory illness surveillance in Hajj pilgrims

Hajj is the annual pilgrimage to Mecca in the Kingdom of Saudi Arabia (KSA). Each year, 2 to 3 million Muslims attend the Hajj, coming from over 180 countries worldwide. In 2013, the Hajj took place during 13 to 18 October, and 2 000 South Africans undertook the pilgrimage. Extended stays at Hajj sites, physical exhaustion, extreme heat and crowded accommodation encourage disease transmission. Various infectious disease outbreaks have been reported during previous Hajj events, including polio, meningococcal disease, cholera, viral hepatitis (A, B and C), diarrhoeal and foodborne diseases, and a range of respiratory diseases (including influenza, *Haemophilus influenzae*, *Streptococcus pneumoniae*, and TB).

In recent years, respiratory disease has been identified as the most common cause for hospital admission whilst attending the Hajj. Worldwide, the majority of Middle East respiratory syndrome coronavirus (MERS-CoV) cases to date (127/157, 81%) has been reported from KSA. The 2013 Hajj is the first mass gathering to take place in KSA since September 2012, so enhanced respiratory illness surveillance was extended to returning Hajj pilgrims.

Surveillance took place during 20-28 October 2013 at OR Tambo International Airport (ORTIA), where 74% (1 471/2 000) of returning South African pilgrims arrived. All returning pilgrims who met the case definition of cough plus another symptom (fever, myalgia, chest pain, sore throat, shortness of breath/pneumonia, rhinorrhoea, or headache) or hospitalisation in KSA were encouraged to have samples collected for PCR testing for the following: MERS-CoV, influenza, *Bordetella* spp and *Neisseria meningitidis*.

Over the nine-day period, of the pilgrims returning to ORTIA screened at the port health clinic, 273 met the case definition, and 63% of these (171/273) agreed to sample collection. A total of 171 oropharyngeal swabs was collected, along with 66 sputum samples from those able to produce sputum. Neither *Bordetella* spp (0/171 oropharyngeral swabs) or MERS-CoV (0/171 oropharygeal swabs and 0/66 sputum samples) were detected. Six oropharyngeal swabs tested positive for *Neisseria meningitidis* on Cu-Zn superoxide dismutase gene (sodC) PCR, but only one tested positive on capsule transport gene (ctrA) PCR and was serogroup B. The remainder were negative on ctrA PCR and classified as non–groupable.

Sixteen samples tested positive for influenza: seven influenza A(H3N2) (four on oropharyngeal swabs, two on sputum and one on both swab & sputum samples); two influenza A(H1N1)pdm09 (one oropharyngeal swab and one sputum) and one mixed infection with influenza A(H3N2) and (H1N1) pdm09 (oropharyngeal swab); and six influenza B Yamagata (four on oropharyngeal swabs, one on sputum and one on both swab and sputum samples).

These results are in keeping with the global experience of respiratory illness surveillance in 2013 Hajj pilgrims, with no reports of MERS-CoV being directly linked to the Hajj and Geosentinel Surveillance sites also reporting similar influenza results. However, healthcare professionals should continue to be vigilant regarding respiratory illness in patients with a recent travel history to the Middle East as cases of MERS-CoV continue to be reported.

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

Update on carbapenemase-producing Enterobacteriaceae (CPE)

The Johannesburg and Cape Town Antimicrobial Resistance Reference Laboratories (AMRRL) of the Centre for Opportunistic, Tropical and Hospital Infections (COTHI) at NICD/NHLS continue to test referred isolates of suspected carbapenemase-producing Enterobacteriaceae (CPE) for the presence of selected carbapenemase genes. For the month of October 2013, a total of 49 isolates was screened and 29 isolates were resistant to one or more carbapenems, the most common referral isolates being *Klebsiella pneumoniae* (n=23) and *Enterobacter cloacae* (n=16) (Figure 2). In total, 15 NDM-positive isolates (6 from private hospitals and 9 from public hospitals, Figure 3), 6 OXA-positive isolates (5 from private hospitals and 1 from a public hospital), 1 VIM-positive isolate (from a private hospital) and 7 IMP-positive isolates (all from public hospitals) were identified.

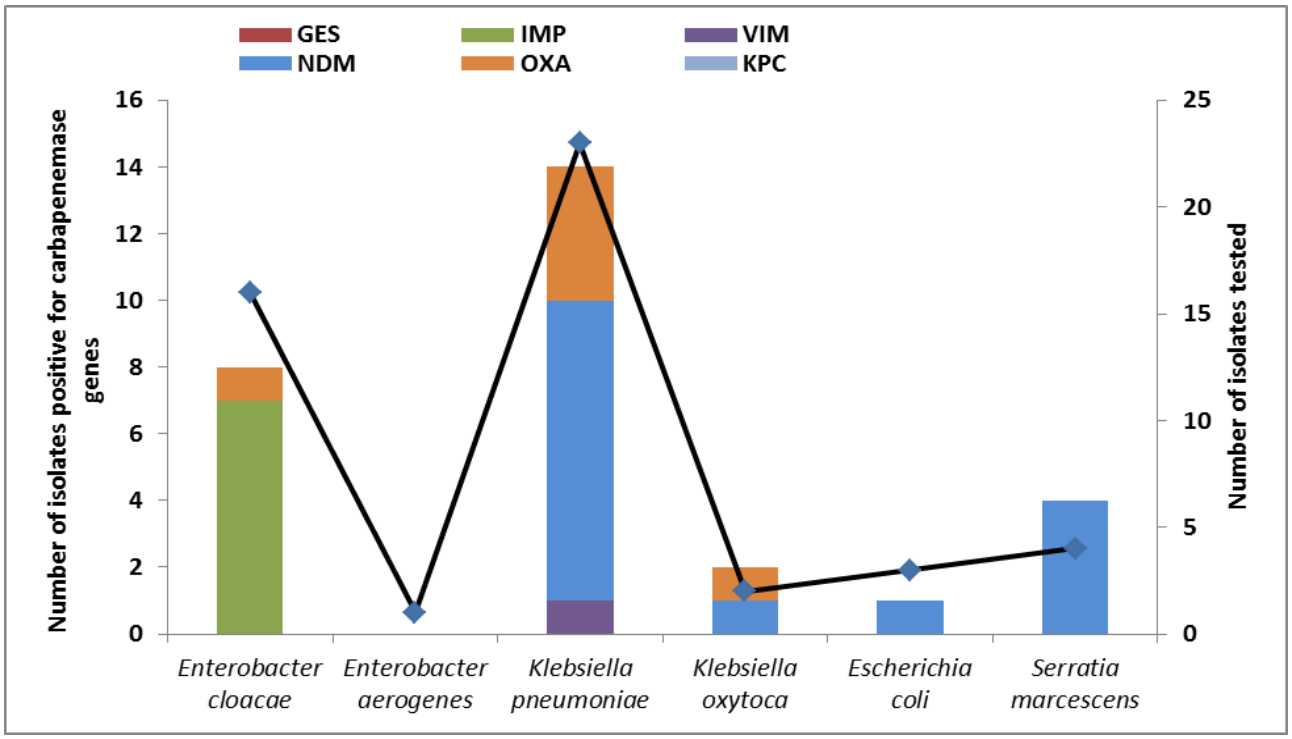

Figure 2. Enterobacteriaceae tested for presence of selected carbapenemase genes (n=49) showing distribution of isolates testing positive (n=29), October 2013, AMRRL (NICD-NHLS)

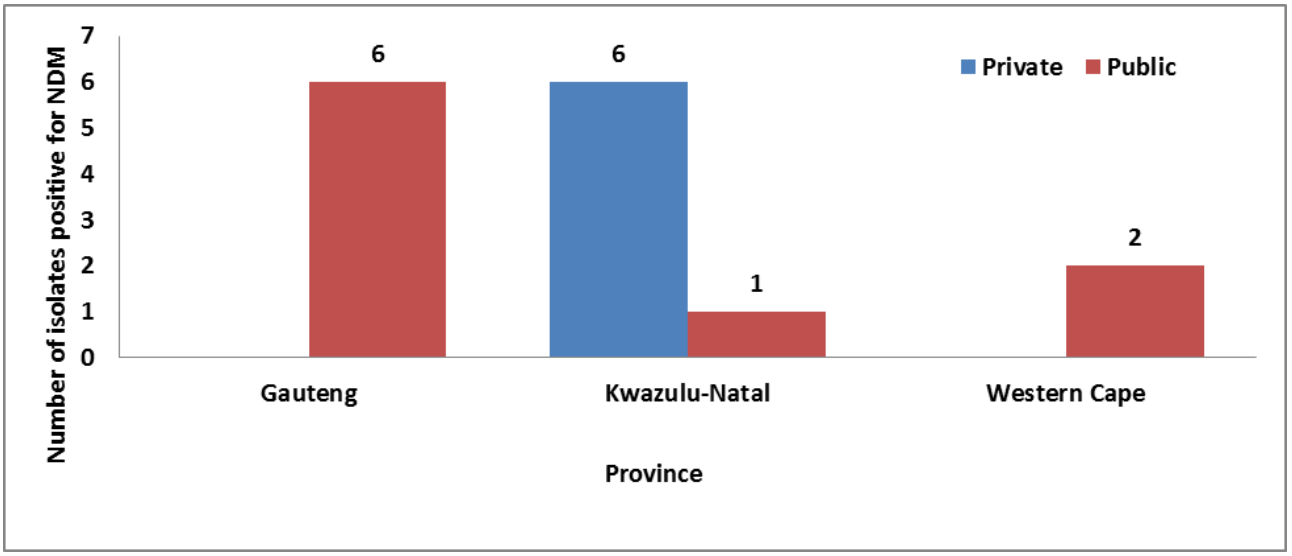

Figure 3. Provincial and healthcare-sector distribution of isolates positive for NDM carbapenemase genes (n=49), October 2013, AMRRL (NICD-NHLS)

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 by 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. More information and the case report form (CRF) can be obtained from NICD/ NHLS web sites. Please telephone (011) 555 0342/44 or email ashikas@nicd.ac.za and olgap@nicd.ac.za for queries or further information; in Western Cape Province, please email: colleen.bamford@nhls.ac.za and clintonmoodley@yahoo.com.

Source: Centre for Opportunistic, Tropical and Hospital Infection, 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
MERS-CoV Middle East: Jordan, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). France, Germany, Spain, Tunisia and the United Kingdom Kuwait, Oman	As of 18 November 2013, the World Health Organization (WHO) has been informed of a total of 157 laboratory-confirmed cases of infection with MERS-CoV, including 66 deaths. The majority of the cases have been reported from Saudi Arabia (127 cases including 53 deaths). Travel to the Middle East has been associated with all these cases. As of 18 November these two countries have each reported cases of MERS-CoV, joining other Persian Gulf countries that have reported cases except for Bahrain.	Infection prevention and control measures include good cough etiquette, avoiding contact with sick people, and frequent hand washing with soap and water or the use of an alcohol-based hand rub. Travellers should contact a medical practitioner if they develop acute respiratory symptoms upon return from a known risk area.
Cholera Nigeria (Lagos, Zamfara, Plateau, Ogun Nasarawa and Oyo States)	As of 31 October 2013, 1 623 cases including 86 deaths had been reported. The outbreak was first confirmed on 2 September 2013.	Drink and use safe water (bottled with unbroken seal, boiled, or treated with chlorine tablet). Wash hands with soap and safe water often. Eat hot well-cooked food, peel fruits and vegetables. Vaccines offer delayed and incomplete protection and should therefore not be used to substitute infection prevention and control measures.

Disease & countries	Comments	Advice to travellers
Polio (wild-type) Africa (Cameroon, Ethiopia, Kenya, Nigeria)	On 21 November 2013 the WHO announced that two wild poliovirus type 1 (WPV1) cases have been confirmed in Cameroon, the first wild poliovirus in the country since 2009. The cases were from the West Region. Other African countries that have reported confirmed WPV1 during 2013 include Ethiopia, Kenya and Nigeria.	Travellers are advised to ensure that they have completed the recommended age appropriate polio vaccine series. It is recommended for the unvaccinated, incompletely vaccinated, or those whose vaccination status is unknown that they receive 2 doses of IPV administered at an interval of 4–8 weeks, a third dose should be administered 6–12 months after the second.
Eastern Mediterranean region (Syria, Somalia, Pakistan, Afghanistan)	As of 19 November 2013, 13 cases of WPV1 have been confirmed in Syria. Supplementary immunisation activity targeting 1.6 million children across Syria was launched on 24 October and will be rolled out to the entire WHO Eastern Mediterranean region, given that WPV1 cases have also occurred in Afghanistan, Pakistan and Somalia during 2013.	Vaccinated travellers to the area should receive a booster (ideally the inactivated polio vaccine (IPV) or alternatively oral polio vaccine (OPV) booster.
Dengue fever Pakistan (Khyber Pakhtunkhwa, Punjab, and Sindh provinces)	As of 7 November 2013, 12 242 cases including 26 deaths have been reported.	Dengue fever is a mosquito-borne viral infection transmitted by the *Aedes* spp. mosquitoes . Dengue fever symptoms can take up to two weeks to develop from being bitten, and the symptoms include: sudden onset of fever, headache, pain behind the eyes, joint and muscle pain, rash, nausea and vomiting. Severe or complicated dengue fever is uncommon but can occur in the form of dengue haemorrhagic fever and dengue shock syndrome. This is more common in the young and elderly. Travellers should wear long-sleeved shirts and long pants during the day and stay in well-ventilated (fan/air-conditioned) rooms where possible; use mosquito repellents containing DEET to avoid being bitten. The burning of mosquito coils at night and sleeping under a mosquito net in a well-ventilated room are also helpful at preventing other infections transmitted through mosquito bites.
India (Delhi, Maharashtra and Punjab states)	As of 8 November 2013, 4 793 cases including 14 deaths have been reported.	
Nepal (Ratnanagar)	As of 4 November 2013, 150 cases have been reported.	
Malaysia	As of 4 November 2013, 28 200 including 60 deaths have been reported.	

References and additional reading:

ProMED-Mail (www.promedmail.org)

World Health Organization (www.who.int)

Centers for Disease Control and Prevention (www.cdc.gov)

Global Polio Eradication Initiative (http://www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx)

Last accessed: 21 November 2013.