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

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CONTENTS

1 SEASONAL DISEASES

Influenza

Two influenza surveillance programmes provide data for influenza activity in South Africa: influenza-like illness (ILI) is monitored in sentinel primary healthcare clinics and Viral Watch sites, and severe respiratory illness (SARI) is monitored in hospitalised patients at four sentinel sites.

In the first thirteen weeks of 2015, 53 specimens were received from Viral Watch sites. Influenza A (H3N2) was detected in three patients who had recently returned from Europe. In addition, influenza A(H1N1)pdm09 and influenza B were detected in one patient each with no travel history.

During the same period 207 patients with ILI were tested at two primary healthcare clinic sentinel sites. Influenza B has been detected in four of these specimens. In this period, 535 patients with SARI were tested; influenza A(H3N2) was detected in one, and influenza B in two of these specimens. In addition, 239 other respiratory viruses were detected in the specimens of 195 patients, rhinovirus (126/195, 65%) accounted for the majority followed by RSV (31/195, 16%), and enterovirus (23/195, 12%).

Influenza vaccine for the 2015 influenza season has been delayed but has became publically available in the last week. This is later than in previous years when influenza vaccine was usually available from health facilities and pharmacies during March. The reason for the delay in influenza vaccine availability is that there has been change (drift) in influenza viruses circulating during the 2014 influenza season. Therefore the influenza strains included in the 2015/2016 influenza vaccines had to be changed from the strains used in previous years. This change in strains has resulted in manufacturing and quality control delays of the 2015 southern hemisphere vaccine globally, and subsequently delayed delivery and availability of the vaccine.

Fortunately, the influenza season has not yet started, so health workers should alert their patients of vaccine availability and encourage them to come in for vaccination as soon as possible. It is important to remember that it takes about two weeks from time of vaccination for a protective antibody response to develop.

Groups recommended for influenza vaccination include:

1. Pregnant women irrespective of stage of pregnancy, or postpartum (within 2 weeks after delivery)
2. Persons (adults or children) who are at high risk for influenza and its complications because of underlying medical conditions and who are receiving regular medical care for conditions such as chronic pulmonary (including tuberculosis) and cardiac diseases, chronic renal diseases, diabetes mellitus and similar metabolic disorders, individuals who are immunosuppressed (including HIV-infected persons with CD4 counts >100 cells/µl), and individuals who are morbidly obese (body mass index ≥40 kg/m^2)
3. Healthcare workers
4. Residents of old-age homes and chronic care and rehabilitation institutions
5. Persons over the age of 65 years
6. Children aged 6 months - 59 months
7. Persons aged 6 months to ≤18 years on long-term aspirin therapy
8. Adults and children who are family contacts of high-risk cases
9. Any persons wishing to minimise the risk of influenza acquisition, especially in industrial settings, where large-scale absenteeism could cause significant economic losses.

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

2 VACCINE-PREVENTABLE DISEASES

Diphtheria outbreak in eThekwini, KwaZulu-Natal Province

A case report published in the March 2015 issue of the Communique detailed the first case of respiratory diphtheria caused by laboratory-confirmed toxigenic *Corynebacterium diphtheriae* identified in the Durban area since 1989.

Subsequently, two further cases of respiratory diphtheria caused by laboratory-confirmed toxigenic *Corynebacterium diphtheriae* have been identified in Durban, resulting in the declaration of an outbreak.

All three laboratory-confirmed diphtheria case-patients have been children (two aged eight years and one aged nine years) presenting with clinical features suggestive of typical respiratory diphtheria. All developed severe disease requiring high or intensive levels of care. Two patients developed systemic complications (including myocarditis, acute congestive cardiac failure and neuropathy). The first case-patient died following systemic complications; the second and third case-patients are currently still hospitalised but recovering. All three case-patients were not up to date with their diphtheria immunisations according to age; whilst all three children had received the primary series of diphtheria-containing vaccine at 6, 10 and 14 weeks of age, one child did not receive any booster doses and the other two children received the first booster dose at 18 months but missed the second booster dose at 6 years of age.

A fourth suspected diphtheria case presenting as possible cutaneous diphtheria in an adult patient presenting to a hospital in Durban was investigated, but the causative organism shown to be a non-toxigenic *C. diphtheriae* on Elek testing. Cutaneous diphtheria is a common clinical manifestation of non-toxigenic *C. diphtheriae* infection, presenting typically as chronic ulcers. Non-toxigenic *C. diphtheriae* do not cause typical respiratory diphtheria disease or outbreaks, and do not warrant any public health response.

In response to the outbreak, the Department of Health authorities undertook a number of public health interventions, many of which are ongoing. The interventions to date include:

- Tracing of household and household-like contacts, for administration of post-exposure prophylaxis and collection of clinical samples for culture to detect secondary cases/carriers
- Mop-up vaccination campaigns were conducted at schools in the areas where the case-patients resided
- A catch-up vaccination campaign was conducted in Umlazi C-section on 10 April 201, which was very well attended by the community
- All healthcare facilities and a range of healthcare workers were alerted to the outbreak and provided with information regarding the disease
- Social mobilization and health promotion activities included the provision of pamphlets (in English and Zulu) and information education communication (IEC) materials to communities

All healthcare workers should familiarise themselves with the varied clinical presentations of diphtheria,

and be on the alert for suspected cases in both children and adults. A brief description of clinical features, laboratory investigation and management of diphtheria is available, in the 'Focus on respiratory diphtheria' feature in the March 2015 issue of the Communique (which can be accessed on www.nicd.ac.za).

Source: Division of Public Health Surveillance and Response, NICD-NHLS; Microbiology Laboratory, NHLS KwaZulu-Natal Academic Complex; Diagnostic Media Production Laboratory, NHLS Green Point Complex; Clinicians at Inkosi Albert Luthuli Central and R.K Khan Hospitals, KwaZulu-Natal Province; KwaZulu-Natal Province Department of Health; eThekwini Municipality

3 ZOONOTIC AND VECTOR-BORNE DISEASES

a Rabies

Two cases of human rabies have been laboratory confirmed at the NICD-NHLS for South Africa in 2015 to date. The case details are reported below.

Human rabies cases in KwaZulu-Natal Province and Limpopo Province

Case one

A 57-year old man from the KwaHlabisa area in Umkhanyakude District Municipality, northern KwaZulu-Natal Province (KZN). The patient's home village is located between the Hluhluwe and Umfolozi game reserves, about 40 km north-west of Mtubatuba. In February 2015, a stray dog entered his yard and attacked his dogs. Whilst trying to separate the fighting dogs, he was scratched on his right hand. Thereafter, the stray dog repeatedly entered his yard, and eventually he killed the dog. The patient self-treated his injury at home and did not present to a healthcare facility for rabies post-exposure prophylaxis (PEP). In mid-March, he complained of headaches and pain at the healed wound site; he consulted a traditional healer who suspected rabies and referred him to a hospital in Empangeni, about 85 km south-east from the patient's home. He was admitted on 20 March 2015 with clinical symptoms suggestive of rabies, including anxiety, confusion, hydrophobia, restlessness and pain at the healed wound site. He deteriorated rapidly and died on 22 March. The diagnosis of rabies was confirmed after testing of post-mortem brain and skin samples at the NICD. Rabies antigen was observed in brain sample using the direct rabies fluorescent antibody test, and a RT -PCR test performed on the skin sample was positive

Case two

A 70-year-old male who lived and worked at a church in Polokwane, Limpopo Province, was bitten by a dog at the church premises on 16 February 2015. The case-patient did not seek medical treatment following the dog bite and therefore did not receive rabies PEP. He presented to a hospital in Polokwane on 04 April 2015 with nausea, vomiting and confusion. On examination, the patient was reported to be very anxious and irritable, with and features suggestive of encephalitis. He also showed typical hydrophobic spasms when offered a drink of water. The patient developed seizures and rapidly progressive encephalopathy and died two days later. Post-mortem brain samples were submitted for rabies testing, and tested positive confirming the clinical diagnosis.

Discussion

In South Africa (as in the rest of Africa), infected dogs are the major source of human rabies cases. Control of rabies in dogs is therefore a critical intervention in preventing rabies in humans, and vaccination of dogs is more cost-effective overall compared to other preventive interventions. However, adequate vaccine coverage (≥70%) in dog populations must be maintained in order to effectively reduce the circulation of rabies virus. At present, vaccine coverage rates in dog populations within peri-urban and rural communities are usually low, given prevailing technical and financial resource constraints. This constitutes a major challenge in such areas; the typically high dog population turnover seen in such communities coupled with low dog rabies vaccine coverage has resulted in the increased risk and incidence of human rabies in peri-urban and rural areas. In addition to routine dog vaccination activities, annual mass vaccination programmes are encouraged to boost overall vaccine coverage to ensure rates of ≥70%. The phenomenon of increasing numbers of animal and human rabies cases directly following a decrease in vaccination efforts is unfortunately a well-established fact and has been proven numerous times in the South African context. For example, in 2012 a serious outbreak of canine rabies in the Ladysmith area of KZN resulted in at least four fatal human cases. Rabies vaccination campaigns in the area had been disrupted for several months the previous year owing to the diversion of resources to manage an outbreak of Foot and Mouth Disease in early 2011. Dog rabies

vaccination campaigns resumed in response to the outbreak, resulting in a dramatic decrease in animal cases. The number of confirmed dog rabies cases in KZN has declined from 473 cases in 2007 to 38 in 2014 Case one in this report is the first laboratory-confirmed human case from KZN reported since March 2013. It is important for government, veterinary and human healthcare professionals, and members of the public to be aware of and vigilant for rabies. Rabies PEP is almost 100% effective at preventing rabies in humans, and any rabies death represents a healthcare system failure. In the event of exposure to a suspected rabid animal, members of the public should know to seek treatment regardless of the severity of the injury, and healthcare professionals need to be able to perform a risk assessment and decide on appropriate management.

Dog rabies case in Gauteng Province, April 2015

In the week of 20 April 2015, rabies was laboratory-confirmed as the cause of illness in a dog resident in Helderkruin (Roodepoort area), Gauteng Province. Rabies virus was isolated on post-mortem brain specimens, and molecular typing of the virus is underway. The dog-owner's son was identified as the only possible human exposure associated with this case; although he had no obvious injuries or bites, he was possibly exposed to the rabid dog's saliva. He received rabies PEP immediately. It was reported that during the past seven years the dog remained on the owner's property and had never left the property. A sudden change in the dog's behavior prompted the suspicion of rabies, given that the animal's rabies immunisation was not up to date.

Further investigations with regards the source of rabies infection in this case and search for other possible exposures related to the dog are underway. Animal rabies vaccination campaigns in and around the Roodepoort area are ongoing and pet owners are encouraged to take their pets to the nearest veterinary clinic to ensure that they are vaccinated accordingly. The expanded rabies vaccination campaign will take place during the week of 11 May 2015.

Although Gauteng Province is a rabies non-endemic area, in 2010-2011, an outbreak of rabies occurred with 42 domestic dogs and one human case identified. The outbreak was sparked by a single rabid dog originating from KwaZulu-Natal Province.

Healthcare workers are urged to consider the possibility of rabies infection in people presenting with unexplained encephalitis, paralysis or other rabies-like symptoms even when the history of an animal bite/exposure is unknown. A thorough exposure-risk assessment of patients presenting with animal bites or injuries must be conducted to inform whether rabies PEP is indicated, as per the National Rabies Guidelines. Dog and cat bites are common in Gauteng Province and many of these exposures do not present a rabies risk as these encounters are usually provoked (e.g. entering a dog's territory, young children 'playing' with animals not accustomed to children etc). Rabies PEP biologicals are a limited commodity and must strictly be reserved for those cases who satisfy the criteria as per the guidelines.

The National Rabies Guidelines and more rabies-related information can be accessed on the NICD website: www.nicd.ac.za.

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

b Crimean-Congo haemorrhagic fever (CCHF)

Crimean-Congo haemorrhagic fever (CCHF) is a tick-borne viral zoonosis in humans which is endemic to South Africa. Human disease is sporadic and uncommon, but may have a severe clinical course with haemorrhagic manifestations. Usually, less than ten human CCHF cases are reported per year for South Africa, based on the number of cases confirmed by laboratory testing at the NICD. However, case numbers are underrepresented since systematic surveillance of human CCHF in South Africa is lacking and mild cases are certainly missed.

Symptoms and signs early in the course of CCHF disease is often difficult to distinguish from a host of other febrile illnesses. Depending on the geographic locale, the differential diagnosis may include tick-bite fever (TBF), malaria, leptospirosis, typhoid fever and meningococcemia. When a history of tick exposure is reported, the incubation period, clinical features and response to antibiotics may provide clues as to whether disease is more likely TBF or CCHF. The incubation period for tick-associated CCHF is short (1-3 days), while African TBF typically has an incubation period of 6-7 days. The treatment of choice for TBF in South Africa is doxycycline or tetracycline. Failure to respond to appropriate antibiotics within 24-48 hours suggests an alternate diagnosis, and CCHF must be considered. Resistance to doxcycline or relapses after antibiotic course completion for TBF have not

been documented. Clinical signs such as an eschar with localised lymphadenopathy and rash may be more suggestive of TBF. Thrombocytopenia, elevated hepatic transmaminase levels and hyponatremia may be present in both severe TBF and CCHF, but are more common findings in CCHF. Several tests are used in combination to confirm or exclude infection with *Rickettsiae* spp. or CCHF virus. If TBF is a differential diagnosis, appropriate empiric treatment for TBF must always be given and must never be delayed pending laboratory test results.

In 2015 to date, four patients in South Africa were tested for suspected CCHF, and all tested negative. TBF was confirmed as the diagnosis in three cases, and meningococcemia was proven in the fourth case. The TBF cases were reported from Johannesburg (Gauteng Province), Jagersfontein (Free State Province) and Witbank (Mpumalanga Province). A total of six cases of CCHF were reported in South Africa for 2014. All case-patients were farmers who acquired the disease indirectly from livestock via tick exposure in farming areas within the Northern Cape and Free State provinces (one case was also potentially exposed to CCHF virus in Namibia). Ticks spread CCHF virus to domestic livestock, who are transiently and asymptomatically viraemic but play an important role in transmission to humans. The mortality rate reported for CCHF is variable, but may be up to 30%. Three of the six cases in 2014 were fatal.

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

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

Ebola virus disease (EVD) outbreak: update

Ebola virus disease (EVD) outbreak: situation update

The outbreak continues in the three affected countries (Guinea, Liberia and Sierra Leone). However the number of new cases reported has declined to relatively low numbers.

1. Countries with widespread and intense transmission

As at 19 April 2015, a cumulative total of 26 044 EVD cases (laboratory-confirmed, probable and suspected) including 10 808 deaths with a case fatality rate of 41% has been reported in Guinea, Liberia and Sierra Leone. A summary of case numbers and deaths reported is shown in Table 1.

As at 19 April 2015, the number of new cases reported in the previous 21 days for Guinea (n=70) and Sierra Leone (n=30) are still cause for concern as it represents ongoing EVD transmission in the community.

In Liberia, however, the last confirmed case died on 27 March 2015 and was buried on 28 March 2015. Forty-two days will have elapsed since burial of the last confirmed case on 09 May 2015; the outbreak In Liberia will then be declared over should no cases be identified in the interim.

Table 1: Number of Ebola virus disease cases and deaths in Liberia, Guinea and Sierra Leone as at 5 April 2015

Country	Total cases (laboratory-confirmed, probable and suspected)	Total deaths	Case fatality rate	Number of cases among healthcare workers (number of deaths)
Guinea	3 565	2 358	66%	187 (94)
Liberia	10 212	4 573	45%	375 (189)
Sierra Leone	12 267	3 877	32%	303 (221)
Total	**26 044**	**10 808**	**41%**	**865 (504)**

Source: World Health Organization Global Alert and Response: Ebola situation report of 22 April 2015 (www.who.int) .

2. Countries with an initial case or cases, or with localised transmission

To date six countries (Nigeria, Senegal, Spain, United States of America, Mali and United Kingdom) have reported localised transmission or imported a case or cases from Guinea/Liberia/Sierra Leone. Nonetheless the EVD outbreaks in these countries have been declared over.

Situation in South Africa

As at 23 April 2015 there have been no EVD cases in South Africa associated with the current outbreaks in West Africa. In addition, there are no suspected cases of EVD in South Africa at present. The risk of Ebola being introduced into South Africa still remains low. However a high index of suspicion is necessary given on-going EVD transmission in West Africa.

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).

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

6 ANTIMICROBIAL RESISTANCE

Update on carbapenemase-producing Enterobacteriaceae

The Johannesburg Antimicrobial Resistance Laboratory Culture Collection (AMRL-CC) of the Centre for Opportunistic, Tropical and Hospital Infections (COTHI) at the NICD/NHLS offer testing of referred isolates of suspected carbapenemase-producing Enterobacteriaceae (CPE) for the presence of selected carbapenemase genes. For March 2015, a total of 71 Enterobacteriaceae isolates were received. Sixty-eight isolates were screened, 75% (53/71) of which were confirmed to be carbapenemase-producing Enterobacteriaceae (CPE). The commonest referred isolates were *Klebsiella pneumoniae* (50%, 34/68) followed by *Enterobacter cloacae* (19%, 13/68) and equal numbers of *Serratia marcescens* and *Escherichia coli* (each 10%,7/68) (Figure1).

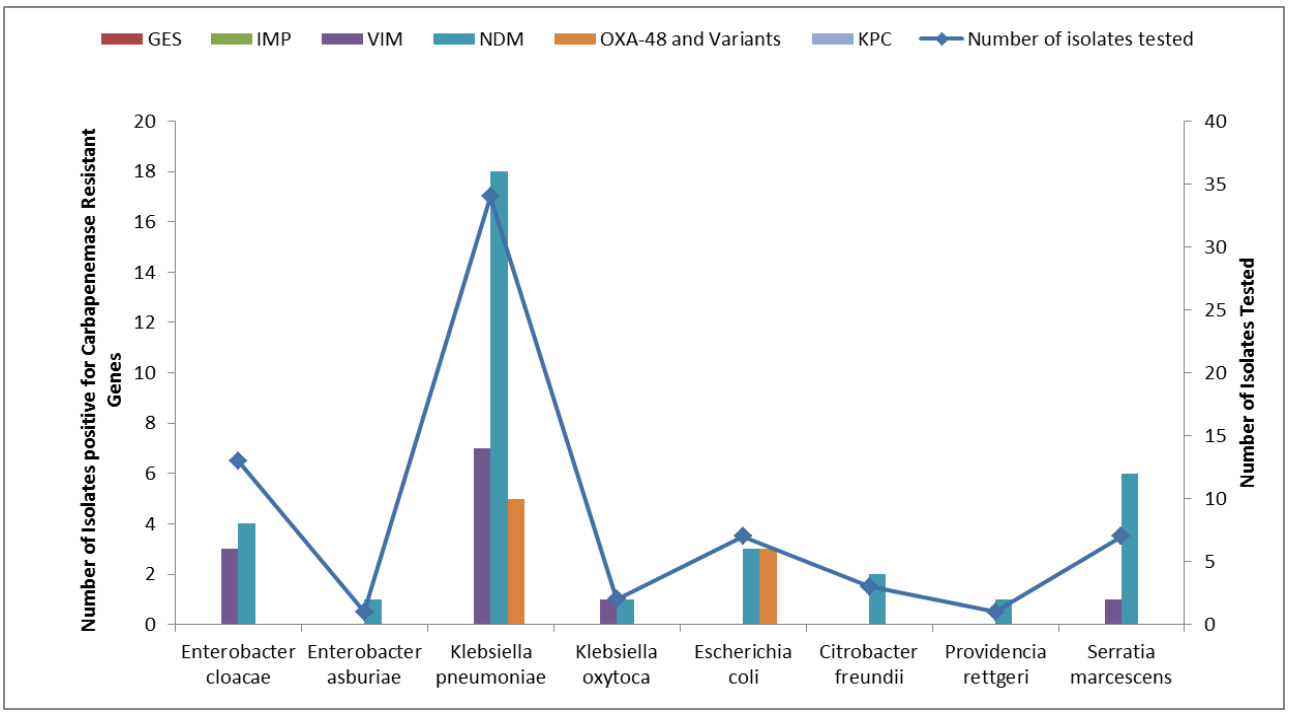

Figure 1. Enterobacteriaceae isolates screened (n=68) and confirmed CPE (n=57) during March at the Antimicrobial Resistance Laboratory-Culture Collection, COTHI (NICD-NHLS)

Thirty-six *bla*$_{NDM}$-positive isolates were identified; thirteen from private hospitals – twelve from the KwaZulu-Natal province and one from the Gauteng province and 15 from public hospitals – 18 from Gauteng and five from KwaZulu-Natal. Nine *bla*$_{OXA-48}$ -positive isolates were identified; two from private hospitals in Gauteng and seven isolates from public hospitals- three from Gauteng province and four from the Eastern Cape. A total of twelve *bla*$_{VIM}$-positive isolates were identified- one each from public hospitals in Gauteng and KwaZulu-Natal and ten from private hospitals of which nine were from Gauteng and one from the Eastern Cape (Figure 2).

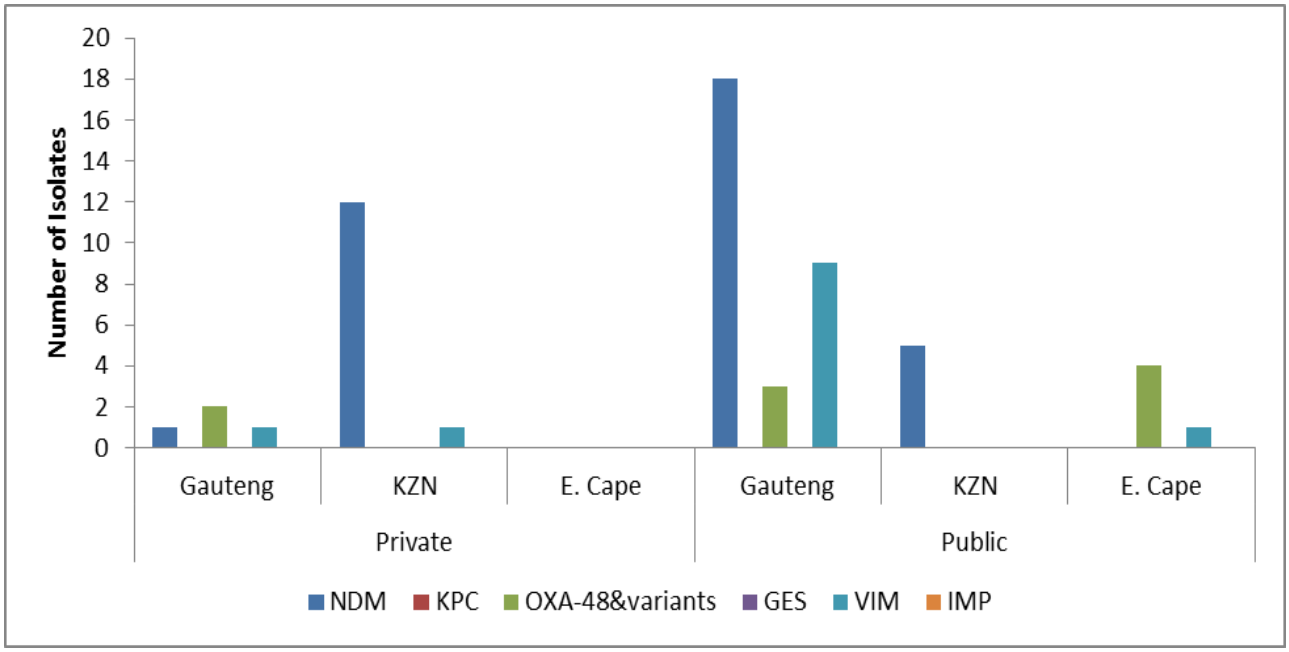

Figure 2. Distribution by province of confirmed CPEs (n=57), March 2015

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 AMRL-CC, NICD/NHLS. Please telephone (011) 555 0342/44 or email: olgap@nicd.ac.za; for queries or further information.

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

7 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. Water and food borne diseases		
Cholera Africa Mozambique	Mozambique has reported 7 408 cases and 55 deaths as of 30 March 2015.	The cholera outbreak in Mozambique, Zimbabwe and Malawi is of particular concern given the number of persons travelling between South Africa and these countries. Cholera is an acute diarrhoeal illness that causes severe dehydration. Drink lots of safe water (bottled water with an unbroken seal, boiled water or water treated with chlorine tablets). Strict washing of hands with soap and safe water must be practiced. Food must be well-cooked before eating. Peel fruit and vegetables before eating.
Malawi	The outbreak is ongoing, and as at 20 April 2015 has spread to Chikwawa District.	
Zimbabwe	Zimbabwe has reported a total of 11 cases and no deaths as of 05 March 2015.	
Nigeria	As of 20 April 2015, an outbreak has been confirmed in Ebonyi State (in southern Nigeria) with at least 20 cases reported.	
Kenya	As of 20 April 2015, Kenya has reported at least 11 new cholera cases in Mombasa city and county, confirming spread to this area of the country.	
Ghana	The cholera outbreak that started in 2014 is ongoing, with new cases reported in the Brong -Ahafo region during the first two weeks of April.	
Global Dominican Republic	Between January 2015 and March 2015, a total of 185 cases and 10 deaths were reported.	
Haiti	Between January 2015 and March 2015, Haiti has reported a total of 10 328 cases of cholera and 106 deaths.	
Bangladesh	As of 02 April 2015, Bangladesh has reported about 450 cases of cholera.	

Disease & countries	Comments	Advice to travellers
2. Respiratory diseases		
Avian influenza China (H7N9) Egypt (H5N1)	On 10 April 2015 China reported an additional 20 cases (including 4 deaths) identified during February 2015 and March 2015. As of 21 April 2015, Egypt reported a total of 143 cases since 01 January 2015. This is double the number that any country has ever reported in a single year, and is of major public health concern.	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. Travellers should contact a medical practitioner if they develop acute respiratory symptoms upon return from a known risk area.
MERS-CoV Saudi Arabia	Between 02 and 12 April 2015, Saudi Arabia reported 4 additional cases.	Good hygiene and basic infection prevention measures should be practiced. Travellers with diabetes, chronic lung disease and immune-compromised 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 avoid contact with animals and eat food that is fully cooked. Infection control practices such as regular hand washing must be followed to prevent infection.
3. Vector-borne diseases		
Dengue <u>South America</u> Brazil Argentina Peru Venezuela	As of 16 April 2015, ongoing outbreaks reported in the following areas of the countries as listed: States most affected: Sao Paulo, Goias, Minas Gerais, Parana and Rio de Janeiro Cordoba Province Regions most affected: Tumbes, Loreto, Piura, Ucayali, Junin, San Martin, Lambayeque, and Madre de Dios Tachira State	Dengue fever is a mosquito-borne viral infection transmitted by *Aedes* spp. mosquitoes, which bite mostly during the day. Travellers can protect themselves from getting Dengue fever by preventing mosquito bites. To protect against mosquito bites they can use insect repellent and sleep in an air conditioned room. For those sleeping in an area that is exposed to the outdoors, they can use mosquito nets.

Disease & countries	Comments	Advice to travellers
3. Vector-borne diseases (continued)		
Dengue Asia China Malaysia Philippines Indian Ocean Mauritius	Cases reported in 19 provinces; Guangdong Province most affected Selangor State most affected Zamboanga Peninsula region A total of 45 cases reported; the number of cases increased from 20 to 45 in the first two weeks of April.	Dengue fever is a mosquito-borne viral infection transmitted by *Aedes* spp. mosquitoes, which bite mostly during the day. Travellers can protect themselves from getting Dengue fever by preventing mosquito bites. To protect against mosquito bites they can use insect repellent and sleep in an air conditioned room. For those sleeping in an area that is exposed to the outdoors, they can use mosquito nets.

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 April 2015

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