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

Communicable Diseases Communiqué

JANUARY 2018, Vol. 17(1)

CONTENTS ***Page***

1 ZOONOTIC AND VECTOR-BORNE DISEASES

a Rabies in South Africa in 2017

A probable case of human rabies was reported from the Free State Province in December 2017. The 67-year-old female was bitten on the leg by a cat in November 2017. She presented to a local health care facility, lethargic and with convulsions. She became comatose and died shortly thereafter. The case was not confirmed by laboratory testing as appropriate specimens were not submitted to the NICD.

Six laboratory-confirmed rabies cases were reported in 2017. These cases originated from the Eastern Cape (n=2), KwaZulu-Natal (n=1), Limpopo (n=2) and Mpumalanga (n=1) provinces.

Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD/NHLS; (johnf@nicd.ac.za)

b East African trypanosomiasis in a tourist, acquired in Zambia

Trypanosomiasis was confirmed on peripheral blood smear from a 52-year-old tourist who visited South Luangwa National Park, Zambia. He stayed in three of the park's lodges between 26 December 2017 and 10 January 2018, and was bitten numerous times by tsetse flies. Ten days after entering the park, he developed an acute, severe febrile illness. He received antibiotics for suspected bacterially-infected insect bites, and was airlifted to a hospital in Johannesburg, South Africa, for investigation and management. A typical trypanosomal chancre was observed and a peripheral blood smear showed numerous trypomastigotes of *Trypanosoma brucei rhodesiense*. There was laboratory evidence of leukopenia, moderate thrombocytopenia, liver dysfunction with raised transaminases and bilirubin, and mild renal dysfunction. The patient was conscious with no evidence of central nervous system involvement. Suramin treatment commenced after an initial test dose was well tolerated. Five days after admission, when the patient's clinical condition was stable and the peripheral blood was clear of parasites, cerebrospinal fluid examination showed four leukocytes, normal protein and glucose levels, and no trypanosomes. The patient continues to improve clinically.

Since 2004, the NICD has reported 20 previous cases of trypanosomiasis in the Communique. Including the present patient, seven infections were acquired in Zambia, six in Malawi, three each in Zimbabwe and Tanzania, and two in Uganda. Two infections had a fatal outcome, one following central nervous system involvement, and the second due to probable acute myocarditis. Although several cases have required prolonged ICU admission and ventilation, there have been no deaths since 2005, largely due to the ready local availability of suramin from a strategic WHO-maintained supply in Johannesburg, which allows prompt treatment following diagnosis.

Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; (johnf@nicd.ac.za)

c Fatal tick bite fever, Western Cape Province

The patient, a 40-year-old male farm-worker from the Cape Winelands District was admitted in the first week of January to a public hospital in Cape Town. He had apparently been unwell for up to four weeks, but had deteriorated over the past 14 days, with altered mental status. He was apyrexial at the time of admission, but the referral letter noted a temperature of 38 °C, and he had conjunctivitis and a maculopapular rash. No petechiae or purpura were present. A skin lesion compatible with a rickettsial eschar was found on one of his legs, but no lymphadenopathy was noted. His haemoglobin concentration was 11 g/dL, leukocyte count was 14 x 10^9/L (85% neutrophils), the platelet count was 46 x 10^9/L, the urea was 47 mmol/L, and creatinine was 1 126 µmol/L. He was jaundiced (total bilirubin 155 µmol/L, mainly conjugated), liver transaminases were raised (ALT 255 U/L, AST 511 U/L), and CRP was 322 mg/L. Malaria, HIV, hepatitis B, leptospirosis and RPR tests were negative. Treatment with doxycycline (2 doses) and ceftriaxone was started. The patient rapidly became confused, had seizures, and demised. Tests for Crimean-Congo haemorrhagic fever were negative, but IgM and IgG assays for tick bite fever (TBF) were positive. Although PCR on a dry cotton-tipped swab of the lesion was negative for rickettsiae, PCR on the serum was positive, indicating active rickettsial vascu-

litis at the time of sampling. Preliminary sequencing results indicated that the pathogen was *Rickettsia conorii*, which is associated with more severe disease than the other common cause of African TBF, *R. africae*. The apparent prolonged illness in this patient is atypical of TBF.

Delayed diagnosis and inadequate treatment of TBF can contribute to increased severity of infection. These cases may clinically resemble viral haemorrhagic fever with multiorgan failure and bleeding. Deaths from severe TBF occur every year in South Africa.

Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; Division of Public Health Surveillance and Response, NICD-NHLS; Division of Infectious Diseases, Tygerberg Hospital & Stellenbosch University, Western Cape Province. (johnf@nicd.ac.za)

d Crimean-Congo haemorrhagic fever in South Africa

A case of Crimean-Congo haemorrhagic fever (CCHF) was confirmed in a 73-year-old farmer from the Dr Kenneth Kaunda District in North West Province. The case was confirmed at the NICD by RT PCR and serological testing in the first week of January. The patient reported a tick bite in the axilla during the last week of 2017. The patient was admitted to the district hospital with muscle pain, jaundice and confusion. Blood results indicated a decreased platelet count ($50x10^9$/L), leukopenia ($2.46x10^9$/L) and elevated liver enzymes (AST and ALT about 100 U/L). The leukopenia worsened in subsequent days and the platelet count decreased to $12x10^9$/L. The patient made a full recovery. During 2017, a total of eight CCHF cases was reported, respectively from the Northern Cape (n=6) and Free State (n=2) provinces. For more information on CCHF, please visit www.nicd.ac.za

Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; (januszp@nicd.ac.za)

2 SEASONAL DISEASES

a Increase in pertussis cases in the Western Cape Province

The NICD has observed an increase in the number of pertussis cases that have been notified from the Western Cape Province. This has been corroborated by an increase in pertussis cases diagnosed in pneumonia surveillance programmes in the Western Cape Province amongst children aged <5 years, and particularly amongst infants 1 year and younger. There has been no corresponding increase in the number of pertussis cases from pneumonia surveillance programmes in other provinces (Gauteng, Mpumalanga, KwaZulu-Natal and North West).

As of 18 January 2018, of the 3 794 cases enrolled from Western Cape as part of pneumonia surveillance since March 2015, 89 (2%) tested positive for *B. pertussis* on real time PCR (Figure 1). Case numbers started to increase in 2017 from week 34 (the week starting 21 August 2017). Of the 52 cases identified from August onwards, 63% (33/52) were children less than 3 months. Of the 62 cases identified in 2017, 93% (51/62) were children aged less than 1 year, of which 76% (39/51) were less than 3 months.

Pertussis, commonly known as 'whooping cough' is a vaccine-preventable disease caused by *Bordetella pertussis.* Pertussis is notifiable according to the Health Act. Immunity following vaccination lasts for 8-10 years. Episodic increases in pertussis cases occur in vaccinated populations every 3-5 years. Clinicians are advised to be on the alert for cases, to conduct diagnostic testing where appropriate, to notify cases and prescribe post-exposure prophylaxis to contacts of suspected or confirmed cases.

Recommendations for diagnosis, management and public health response for pertussis are available at http://www.nicd.ac.za/wp-content/uploads/2017/03/Guidelines_pertussis_v1_20-December-2017_Final.pdf

Source: Centre for Respiratory Diseases and Meningitis, NICD-NHLS; (cherylc@nicd.ac.za)

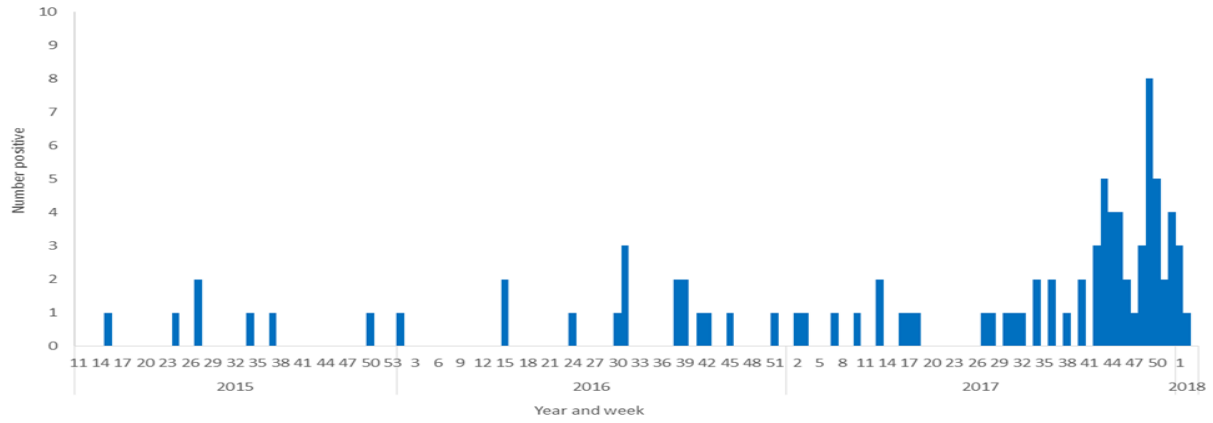

Figure 1. Number of laboratory-confirmed pertussis cases from the NICD pneumonia surveillance programme, Western Cape Province, 2015-2018 by epidemiological week of the year.

b Odyssean malaria in Gauteng Province December 2017-January 2018

Several cases of odyssean ('airport', 'suitcase' or 'taxi' malaria) have been reported recently in Gauteng Province. This is unsurprising in the context of the general increase in malaria transmission in Limpopo and Mpumalanga provinces.

The first cluster of cases involved a family in Katlehong, Ekurhuleni. A 43-year-old father and his two sons (aged seven and 12 years) became ill on 15 December 2017. All were initially treated with home remedies, which delayed diagnosis. Influenza was the initial assessment by a general practitioner, who saw the younger child on 18 December 2017. The children were finally diagnosed with falciparum malaria on 26 December, after admission to a provincial hospital. Unfortunately, by then the father had travelled to Tugela Ferry, KwaZulu-Natal Province, to visit his parents. He was admitted to hospital there on 31 December and died on 3 January. Malaria was not suspected and therefore not tested for, but other laboratory results were compatible with malaria, showing anaemia (Hb 10.2 g/dL), thrombocytopenia (platelets 31 x 10^9/L), and acute renal compromise (creatinine 148 µmol/L).

The second episode involved a 27-year-old woman, who was admitted for a planned caesarean section on 11 January 2018. She had a known diagnosis of idiopathic thrombocytopenic purpura (ITP), and therefore, her low platelet count (37 x 10^9/L) was not investigated. On 12 January she had an uneventful delivery by caesarean section. Her platelets had decreased to 29 x 10^9/L. Malaria parasites (0.1%) were seen on routine examination of her peripheral smear, and the rapid malaria antigen test indicated presence of *Plasmodium falciparum.* The diagnosis was surprising, as the patient had not reported symptoms. Falciparum malaria was confirmed by PCR. The patient was treated uneventfully with Coartem. She and her healthy baby were discharged home.

None of the patients or their family members had a significant travel history, and none had had recent blood transfusions or injections. Inspection of the patients' homes did not reveal any potential vectors. The most likely explanation for the malaria transmission is the importation by road transport of infected mosquitoes. Healthcare workers are reminded again that malaria should be considered in all patients with an unexplained progressive febrile illness, regardless of travel history, and that malaria tests should be repeated until either malaria, or an alternative diagnosis, is confirmed.

Source: Centre for Emerging Zoonotic and Parasitic Diseases, Field Epidemiology Training Programme, NICD-NHLS; Gauteng provincial CDCs, (johnf@nicd.ac.za)

c Influenza in the northern hemisphere

Most countries in Europe have reported influenza activity rates in the low to medium ranges except for the United Kingdom and Italy, which reported high levels of activity, with predominantly influenza A(H3N2) and B/Yamagata detections. France reported levels higher than in the previous five seasons with predominantly influenza A(H1N1)pdm09 and B/Yamagata circulating. Influenza activity remains low in eastern Europe. Influenza activity in North America remains high, with Canada reporting higher than expected levels for this time of the year. In the USA influenza activity continues to increase with influenza A(H3N2) being most frequently detected. Clinicians should have a high index of suspicion for influenza in returning travellers from the northern hemisphere.

Source: Centre for Respiratory Diseases and Meningitis, NICD-NHLS; (cherylc@nicd.ac.za)

3 CURRENT OUTBREAKS

a An update on the listeriosis outbreak, South Africa

As of 23 January 2018, 820 laboratory-confirmed listeriosis cases have been reported to NICD since 01 January 2017 (Figure 2). Most cases have been reported from Gauteng Province (59%, 486/820) followed by Western Cape (13%, 105/820) and KwaZulu-Natal (7%, 59/820) provinces. Cases have been diagnosed in both public (66%, 542/820) and private (34%, 278/820) healthcare sectors. Diagnosis was based most commonly on the isolation of *Listeria monocytogenes* in blood culture (71%, 579/820), followed by CSF (23%, 188/820). Where age was reported (n=784), ages range from birth to 93 years (median 18 years) and 42% (329/784) are neonates aged ≤28 days. Of neonatal cases, 96% (317/329) had early-onset disease (birth to ≤6 days). Females account for 55% (431/783) of cases where gender is reported. Final outcome data is available for 29% (238/820) of cases, of which 34% (82/238) died.

Whole genome sequencing (WGS) of currently available clinical, food and food production facility environmental isolates, is ongoing. Of the clinical isolates received since 01 January 2017, 400 have been sequenced to date. Although the isolates belong to 20 sequence types (ST), 90% (358/400) are sequence type 6 (ST6) and are very closely related, representing a single strain of *L. monocytogenes*. This ST6 strain continues to be identified in isolates from all nine provinces, which supports the current hypothesis that a single contaminated food commodity, or multiple food commodities produced at a single contaminated food production/processing/facility, are responsible for the outbreak. A total of 111 food and 22 food production/processing environmental isolates have been sequenced. Whilst 24 sequence types have been identified amongst these, to date none of them have been ST6.

Listeriosis can be classified into five clinical manifestation categories, with varying incubation periods and clinical presentation (Table 1). Typically, persons at higher risk for developing invasive listeriosis include pregnant women, neonates ≤28 days of age, persons >65 years of age, and persons with immunosuppression (due to HIV infection, cancer, diabetes, chronic renal disease, chronic liver disease, transplantation and immunosuppressive therapy).

There is no serological test to determine exposure/infection due to *L. monocytogenes* in asymptomatic persons.

The multisectoral national outbreak response team with representatives from the National Department of Health (NDoH), the Department of Agriculture, Forestry and Fishery (DAFF), the Department of Trade and Industry (DTI), the NICD, the World Health Organization and other relevant stakeholders continues to coordinate the outbreak response activities. Municipal environmental health practitioners in all provinces have embarked on systematic inspection and sampling of meat & poultry production, processing, and packaging facilities, which will be expanded to include production, processing, and packaging facilities for other food commodities.

Listeriosis is now a Category 1 Notifiable Medical Condition, and as such requires immediate reporting by the most rapid means available upon diagnosis, followed by a written or electronic notification to the Department of Health within 24 hours of diagnosis by healthcare providers, private health laboratories or public health laboratories.

Healthcare workers are requested to complete listeriosis case report forms (found on the NICD web-

site at www.nicd.ac.za, Diseases A-Z, under 'Listeriosis') and submit these to outbreak@nicd.ac.za. Members of the public are advised to practice the WHO '5 keys to safer food' principles, which is available on the NICD website (Diseases A-Z, under 'Listeriosis').

Source: Centre for Enteric Diseases, and Division of Public Health Surveillance and Response, NICD Provincial Epidemiology Teams; NICD-NHLS; Provincial CDCs; (junot@nicd.ac.za; outbreak@nicd.ac.za)

Table 1. Clinical manifestations of listeriosis

Manifestation	Incubation period	Clinical features	Laboratory investigations
Febrile gastroenteritis	Median 24 hours (range 6 hours – 10 days)	Fever and non-bloody diarrhoea; may be accompanied by arthralgia, headache, or vomiting. Typically of 1-3 days' duration and self-limiting. Affects both healthy persons and those in high risk groups	• Stool culture with specific request for *L. monocytogenes* culture. This is NOT routinely indicated, unless there is exposure to a known contaminated food source, or a cluster of cases with suspected exposure to a common contaminated food source. Consider stool culture in addition to blood cultures in persons at high risk (e.g. pregnant women, immunosuppressed patients) presenting with febrile gastroenteritis • Blood culture*
Pregnancy-associated	Median 21 days (range 7 – 67 days)	Can manifest as maternal listeriosis, fetal listeriosis or neonatal listeriosis	• Maternal listeriosis: blood cultures are suggested for febrile gastroenteritis or nonspecific febrile flu-like illness in pregnant women*. • Consider stool culture in addition to blood cultures in pregnant women presenting with febrile gastroenteritis • Blood, CSF, amniotic fluid or placental tissue cultures as indicated for suspected neonatal/ fetal listeriosis*
Bacteraemia	Median 5 days (range 1 – 29 days)	Fever; may be accompanied by diarrhoea, flu-like symptoms, decompensated comorbidity, sepsis	• Blood culture*
Central nervous system	Median 10 days (range 1 – 16 days)	Protean manifestations, including: meningitis, meningoencephalitis, rhombencephalitis, cerebral abscesses	• Blood culture* • CSF culture*
Other	Variable, depending on site of infection	A wide range of infections are described, including: mycotic aneurysms (mostly of the abdominal aorta), septic arthritis (including prosthetic joint infections), endocarditis, endophthalmitis, and osteomyelitis	• Blood culture* • Culture of other sample sites depending on presentation (e.g. pus, tissue, synovial fluid)*

*In cases where cultures remain negative for *L. monocytogenes* but there is a high index of suspicion for listeriosis, PCR testing should be considered. PCR testing is offered by private sector laboratories, and at the NICD.

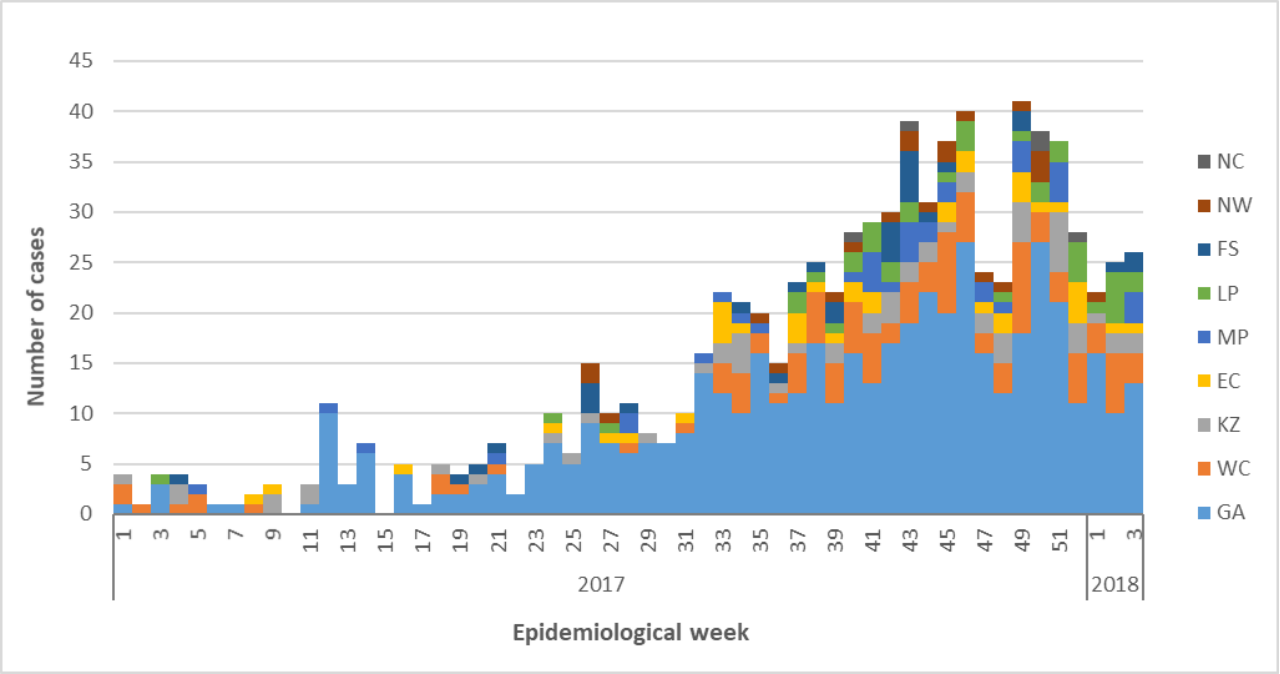

Figure 2. Epidemic curve of laboratory-confirmed listeriosis cases by epidemiological week and date of sample collection and province, South Africa, 01 January to 23 January 201 (n=820)

b Outbreak of hepatitis E virus in Namibia

An outbreak of hepatitis E virus (HEV) is currently ongoing in Namibia. As of January 15, 296 probable and confirmed cases have been reported. Eight patients have been admitted to hospital and a single patient, a 26-year-old pregnant female in her third trimester, died following infection. Namibia currently does not have laboratory capacity to diagnose hepatitis E. To date, 41 specimens have been tested by an international laboratory, of which 21 were IgM positive for HEV. The majority of positive cases were from informal settlements in Windhoek district, Khomas region. Other areas affected were Havana, Goreangab Dam, Hakahana, Greenwell Matongo and Ombili.

Infection with HEV presents with an acute onset of jaundice, fever, malaise, nausea and anorexia. The incubation period ranges from 3-8 weeks. Individuals usually clear the virus spontaneously. However, persons who are immunocompromised, especially individuals with solid-organ transplants, may develop chronic HEV liver disease. Pregnant women who are infected are at risk of fulminant hepatitis. High fatality rates of 20% have been reported for women infected in the third trimester of pregnancy.

HEV is commonly spread by faecal-oral transmission. In many resource-poor countries, open defecation, improper sanitation, poor access to clean water to wash hands and food are contributing factors to the spread of HEV. Like many non-enveloped RNA viruses, HEV is heat-labile and sensitive to chlorination. Therefore, water purification methods, boiling water and cooking food to high temperatures remain good preventative measures. Good hygiene and sanitation practices are key to prevent HEV transmission.

HEV is classified into 8 genotypes, based on viral genetic differences. Whereas all genotypes infect humans, genotypes 1 and 2 are commonly isolated in outbreaks and epidemics and associated with unclean water supply and poor sanitation. Genotypes 3 and 4 infect animals (pigs, deer) and are usually associated with food-borne zoonoses in both developing and developed countries. Genotypes 5 and 6 infect wild boars and genotypes 7 and 8 were recently found in camels.

The outbreak in Namibia is due to poor sanitation, limited access to clean safe water for drinking, overcrowding in informal settlements, poor hygiene and movement of people during the holiday season. Heavy summer rains have contributed to the spread of the virus, as faecal matter is washed into rivers, streams and ponds that are usually used for drinking, bathing, washing clothes and collection of water for cooking (information from WHO disease

outbreak news).

Interventions to contain an outbreak include building of more toilets in the affected informal areas, improvement of water purification facilities, provision of safe water and water tanks in affected areas. In addition, national radio messages on risks and prevention strategies are being broadcast, including an emphasis on hygiene and santitation practices.

At present, prevention is the most effective way against hepatitis E. A single HEV vaccine (HEV 239 vaccine, Hecolin®) has been developed and licensed in China but is not widely available.

Source: Centre for Vaccines and Immunology; NICD-NHLS (melindas@nicd.ac.za); ProMED; WHO disease outbreak news.

4 SURVEILLANCE FOR ANTIMICROBIAL RESISTANCE

a 2017 Update on Carbapenemase-Producing Enterobacteriaceae

The Antimicrobial Resistance Laboratory and Culture Collection (AMRL-CC) of the Centre for Healthcare-associated infections, Antimicrobial Resistance and Mycoses (CHARM) at the NICD has been testing referred isolates of suspected carbapenemase-producing Enterobacteriaceae (CPE) for the presence of selected carbapenemases. CPE have become a threat to healthcare and patient safety worldwide by compromising empiric antibiotic therapeutic choices and increasing morbidity, hospital costs and the risk of death. We are receiving clinically significant isolates from all specimen types based on antimicrobial susceptibility testing criteria, for molecular confirmation. For 2017, a total of 1 454 Enterobacteriaceae isolates was received. One thousand, four-hundred and thirty-nine isolates were screened; 1 215 of which expressed the carbapenemases that were screened for. Forty-six isolates expressed a combination of two or carbapenemases (OXA-48 and variants and NDM, n=37; OXA-48 and variants and VIM, n=5; OXA-48 and variants and GES, n=2; NDM and GES, n=1; NDM and KPC, n=1) and two isolates expressed a combination of three carbapenemases (OXA-48 and variants, NDM and VIM, n=1; OXA-48 and variants, NDM and GES, n=1) (Table 2). The majority of the isolates was *Klebsiella pneumoniae* (1040) followed by *Enterobacter cloacae* (216).

It is important to note that these figures do not represent the current burden of CPEs in South Africa. However, our data reveal the presence of carbapenemases in Enterobacteriaceae isolates from various specimen types, nationally. As a first step, CPE surveillance is required to determine the extent of the problem in order to restrain the emergence and spread of resistance. The AMRL-CC is currently running a surveillance programme at national sentinel sites for CPE infections in patients with bacteraemia which provides representative data. These significant data will inform public health policy and highlight priorities for action. Controlling the spread and limiting the impact of CPEs in South Africa requires 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 AMRL-CC, NICD/NHLS. Please telephone (011) 555 0342/44 or email: olgap@nicd.ac.za; for queries or further information.

Source: Centre for Healthcare-associated infections, Antimicrobial Resistance and Mycoses, NICD-NHLS; (olgap@nicd.ac.za).

Table 2: Enterobacteriaceae by carbapenemase type 2017 at the AMRL-CC, CHARM, NICD

Organism	Class A carbapenemases		Class B Metallo-Beta-Lactamases (MBL)		Class D oxacillinase
	GES	KPC	NDM	VIM	OXA-48 & Variants
Citrobacter amalonaticus	-	-	-	-	1
Citrobacter braakii	-	-	1	-	-
Citrobacter freundii	-	-	8	1	10
Enterobacter aerogenes	-	-	-	-	6
Enterobacter asburiae	-	-	2	-	-
Enterobacter cloacae	-	3	25	1	102
Enterobacter kobei	-	-	1	-	-
Escherichia coli	1	-	12	-	31
Escherichia hermannii	-	-	-	-	-
Klebsiella oxytoca	-	-	5	-	10
Klebsiella pneumoniae	3	5	163	12	794
Klebsiella variicola	-	-	1	-	-
Klebsiella species	-	-	3	-	7
Morganella morganii	-	-	5	-	1
Proteus mirabilis	-	-	1	-	2
Proteus vulgaris	-	-	-	-	1
Providencia rettgeri	-	-	21	-	2
Providencia stuartii	-	-	-	-	-
Providencia species	-	-	1	-	-
Pseudocitrobacter faecalis	-	-	-	-	3
Salmonella enterica	-	-	1	-	-
Serratia marcescens	-	-	6	-	13
Total	**4**	**8**	**256**	**14**	**983**

GES: Guiana extended-spectrum beta-lactamase; KPC: Klebsiella pneumoniae carbapenemase; New Delhi metallo-beta-lacatamase; VIM: Verona integron-encoded metallo-beta-lacatamase; OXA: Oxacillinase-type carbapenemase.
The metallo-betalctamase, imipenemase (IMP) was not expressed in any of the isolates.

5 BEYOND OUR BORDERS

The 'Beyond our Borders' column focuses on selected and current international diseases that may affect South Africans travelling abroad. Numbers correspond to Figure 3 on page 10.

1. Hepatitis E virus: Namibia
See article on page 7

2. Typhoid Fever: Zimbabwe
On 18 January 2018, the Zimbabwean health officials reported that approximately 200 cases of typhoid have been recorded in Harare. The city's water crisis has contributed to the outbreak as people are resorting to unsafe water sources.

3. Cholera: United Republic of Tanzania
From 15 August 2017 to 7 January 2018, 33 421 cases of cholera and 542 deaths (CFR= 1.62%) have been reported across all regions of the United

Republic of Tanzania, including Zanzibar. Of the total, 11.4% of the cases were children under the age of five. Over 7 000 specimens have been tested for cholera since the beginning of the outbreak, and 47% tested positive for *Vibrio cholera* by culture. Zanzibar's last case was reported on 11 July 2017. However the risk of spread to Zanzibar is high due to the high population movement to and from the Tanzania mainland. WHO advises against any restriction to travel and trade with Tanzania mainland and Zanzibar, based on the available information on the current outbreak.

4. Cholera: Zambia

On 6 October 2017, the Minister of Health declared an outbreak of cholera in Lusaka, the capital of Zambia. From 28 September through 7 December 2017, 547 cases including 15 deaths (CFR = 1.8%), have been reported. The affected sub-districts include Chipata, Kanyama, Chawama, Matero, Chilenje and Chelstone. Two hundred and eighty-two rapid diagnostic tests have been used, of which 230 were positive. Of 310 culture tests, 53 were positive for *Vibrio cholera* O1 Ogawa. Water quality monitoring is ongoing in all sub-districts. The sources of infection transmission in this outbreak have been associated with contaminated water sources, contaminated food, inadequate sanitation and poor hygiene practices.

5. Yellow Fever: Nigeria

As from 2 July through 19 December 2017, 341 cases of yellow fever with 45 deaths (CFR=21%) have been reported to the WHO from 16 states in Nigeria. Amongst the 341 suspected cases, 214 (62.8%) were males, with the most affected age group being people under age 20 years (65.9%). Nigeria introduced the routine yellow fever vaccination in the Expanded Programme of Immunization (EPI) in 2004. Mosquito control and vaccination are the primary means for prevention and control of yellow fever. The World Health Organization and partners will continue to support local authorities to implement these interventions to control the current outbreak. Nigeria is facing several concurrent public health emergencies, including cholera and Lassa fever in other states.

6. Diphtheria: Yemen

The World Health Organization (WHO) representative reported a total of 333 suspected cases including 35 deaths (CFR= 10.5%) from 13 August through 21 December 2017. 79% of the cases are less than 20 years of age and 19% are children under 5 years. Sixty-one percent of suspected cases have never received any vaccination against diphtheria. This outbreak indicates sub-optimal coverage of national immunization programmes, and waning immunity in previously vaccinated individuals. The ongoing transmission poses a risk of further spread of the disease to neighbouring countries with low vaccination coverage.

7. Yellow fever: Brazil

The Brazilian Ministry of Health reported that from 1 Jul 2017 - 23 Jan 2018, there were 130 confirmed cases of yellow fever in the country, with 53 deaths. During the same period last year, there were 381 confirmed cases with 127 confirmed deaths. The MoH will commence with a vaccination campaign using fractionated dose, in line with WHO recommendations.

Source: (www.promed.org) and the World Health Organization (www.who.int) ; Outbreak Response Unit, NICD-NHLS

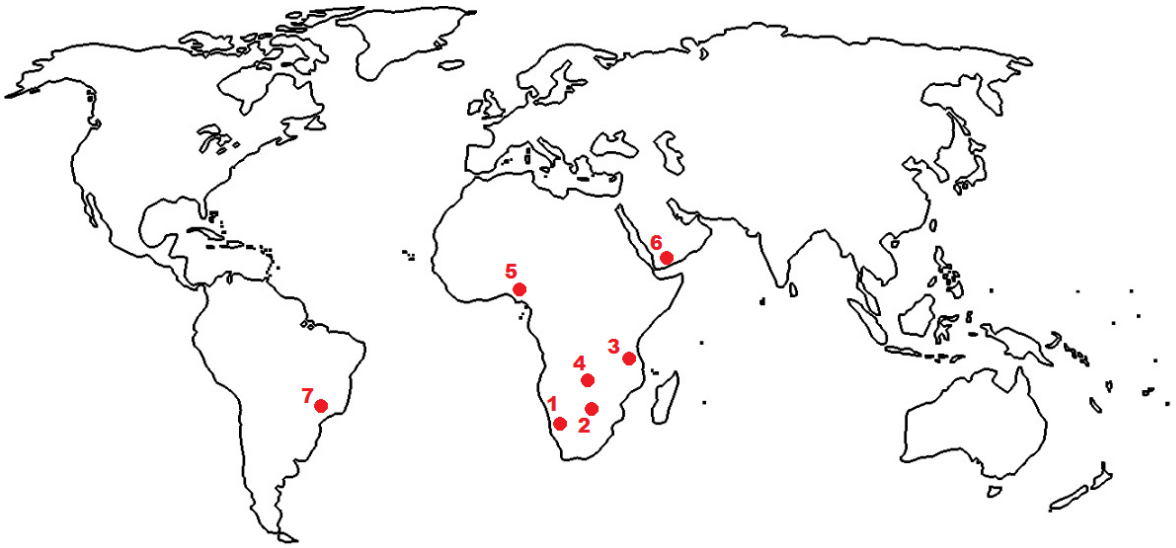

Figure 3. Current outbreaks that may have implications for travellers. Numbers correspond to text above. The red dot is the approximate location of the outbreak or event

6 WHO-AFRO: OUTBREAKS AND EMERGENCIES

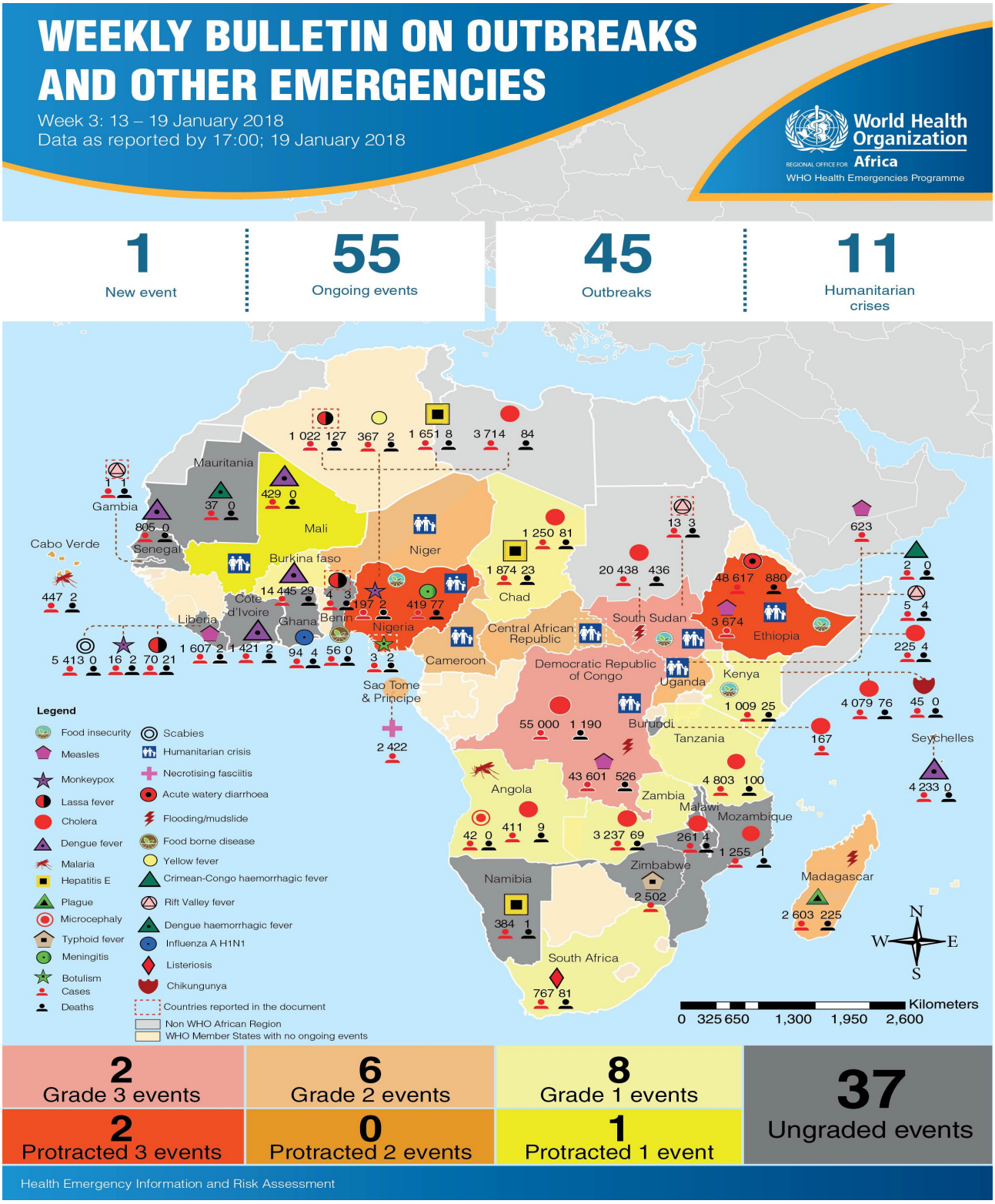

Figure 4. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African region. The African Region WHO Health Emergencies Programme is currently monitoring 56 events, of which 45 are outbreaks and 11 humanitarian crises. For more information see link: http://apps.who.int/iris/bitstream/10665/259885/1/OEW03-1319012018.pdf