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1 ZOOTIC AND VECTOR-BORNE DISEASES

a An update on rabies in South Africa, 2017

A total of three human cases of rabies has been laboratory-confirmed in South Africa for 2017 to date. Two of these cases were reported from the Eastern Cape Province, whilst the most recent case was reported from KwaZulu-Natal Province. A fourth human case was confirmed in a child hospitalized in Johannesburg, but the patient acquired rabies in Zimbabwe.

Reports of dog rabies along the coastline of KwaZulu-Natal remain a concern (Figure 1). Whilst dog vaccination campaigns are being conducted to bring the outbreak under control, healthcare workers need to be aware of the increased risk of rabies in dog bite cases and provide rabies post-

exposure prophylaxis in accordance with national guidelines. Continued reporting of animal rabies cases is also noted from the eastern districts of the Eastern Cape (Figure 2).

For additional information regarding rabies post-exposure prophylaxis please visit the NICD website: www.nicd.ac.za

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

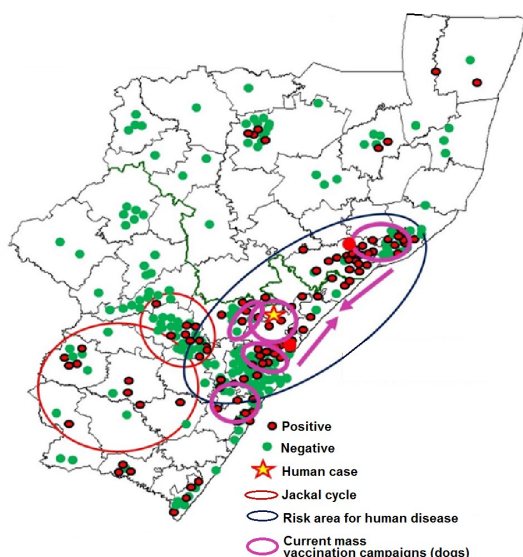


Figure 1 (above left). Map indicating the animal rabies cases (red dots) in the KwaZulu-Natal Province, year-to-date (source: Allerton Provincial Veterinary La-

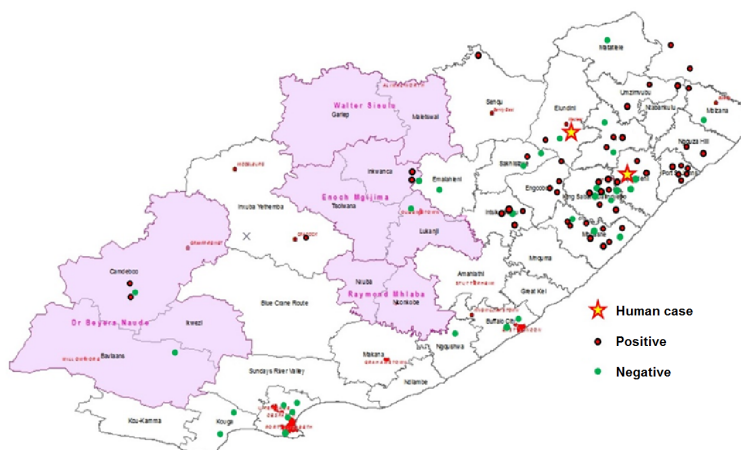


Figure 2 (above right). Map indicating the animal rabies cases (red dots) in the Eastern Cape Province, year to date. (source: Allerton Provincial Veterinary Laboratory)

b Plague outbreak in Madagascar

Plague is an endemic disease in Madagascar, where plague cases account for over 80% of the world's cases. Since 1991, 300 to 600 cases of predominantly bubonic plague have been reported every year from September to April. The unexpected feature in this year's epidemic season is a high number of cases of primary pneumonic plague, which is transmissible by humans through respiratory droplets produced during coughing. Pneumonic plague can also be secondary to untreated bubonic or septicemic plague. Usually, the majority of plague cases in Madagascar are bubonic, and occur following bites from *Yersinia pestis*-infected fleas or contact with carcasses of small mammals, especially

black rats, in the rural highlands in central and northern Madagascar.

This year's epidemic season took a different turn following the death of an infected patient on 28 August during an 8-hour journey in a shared public taxi from plague-endemic Central Highlands via the capital Antananarivo to the east coast port city, Toamasina. Within 24 hours of infection, two more people who had travelled in the same taxi died of pneumonic plague. The outbreak was only detected on 11 September, following another death caused by pneumonic plague in Antananarivo. Subsequently cases were detected in areas not previously

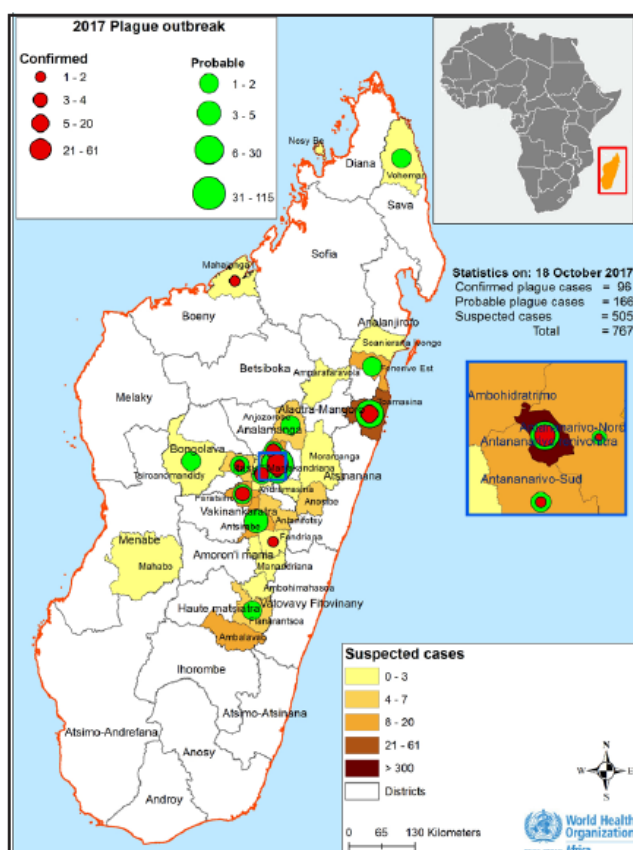
known to have endemic disease.

As of 20 October 2017, the WHO indicates that 1 297 suspected, probable, and confirmed cases of pneumonic (n=846; 65%) and bubonic (n=270; 21%) plague, including 102 deaths (case fatality rate 7.9%), have been reported in Madagascar. The three most affected districts include the outskirts of Antananarivo (with 64% of pneumonic plague cases), Toamasina, and Faratshio (Figure 3). The WHO has indicated that nine countries, namely South Africa, Mozambique, Tanzania, Ethiopia, Mauritius, Comoros, Seychelles and La Reunion, are at risk for plague importation on account of trade and travel between Madagascar and these countries. A single suspected case in a traveller from Madagascar, and which later tested negative, was identified in the Seychelles. To date there have been no import-

ed cases to any of these 'at-risk' countries.

Historically, plague was endemic to South Africa. However, presently it is rarely detected in rodent surveillance specimens. The last human case was identified in 1982. The South African National Department of Health together with the WHO regional office has put in place measures to ensure public safety including entry screening of travellers for fever, public awareness messaging, alerting of provincial and district outbreak response teams, and SOPs on specimen collection and diagnosis.

South African travellers to Madagascar are advised to avoid crowded areas, avoid close contact with ill persons, rodents and dead animals, and to apply DEET-containing insect repellent to prevent flea bites. **Clinicians are advised to be vigilant to consider a diagnosis of plague in persons who have returned from Madagascar within the previous 10 days and who present with sudden onset of fever, chills, painful and inflamed lymph nodes, or shortness of breath with coughing, chest pain and bloody sputum.** More information is available at <http://www.nicd.ac.za/index.php/plague/>



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

Figure 3 (left). Geographical distribution of cases of plague in Madagascar as of 20 October 2017 (Plague Outbreak Madagascar 05 External Report World Health Organization Regional Office for Africa.)

c A severe case of tick bite fever in the Eastern Cape Province

In September 2017, a 28-year-old farm worker from Bathurst was admitted to a regional hospital in the Eastern Cape Province following a week-long history of a flu-like illness, fever and a widespread petechial rash. On admission, he reported having had a seizure, and was bleeding from the mouth after having bitten his tongue. He had no travel history, but reported multiple tick bites and an eschar on his left ankle. The time from development of the eschar to systemic symptoms was approximately four days. Laboratory investigations revealed thrombocytopenia, hepatitis and elevated bilirubin levels.

A clinical diagnosis of severe tick bite fever was

made, and as the patient was critically ill, he was started on intravenous ciprofloxacin and a cephalosporin antibiotic. However, in view of his dramatic clinical presentation and uncertain exposure history, Crimean-Congo haemorrhagic fever (CCHF) was considered as a differential diagnosis. The patient was isolated as a precautionary measure until two sets of serology and reverse transcriptase PCR tests for CCHF were confirmed negative by NICD.

The patient subsequently developed multi-organ dysfunction requiring ventilation and dialysis, and was admitted to ICU for care and management. Rickettsial infection was confirmed by PCR from a dry swab taken from the eschar.

Tick bite fever due to *R. conorii* has the potential to cause severe systemic disease that may mimic severe bacterial sepsis or CCHF, especially following delayed presentation. Complications include encephalitis, confusion, or coma, pneumonia, pulmonary embolism following deep vein thrombosis, bleeding, gangrene, hepatorenal failure, myocarditis and death.

Source: The clinicians, Livingston Hospital; Centre for Emerging Zoonosis and Parasitic Disease (CEZPD), NICD-NHLS. (Janusz@nicd.ac.za)

2 VACCINE-PREVENTABLE DISEASES

a Update on measles surveillance and outbreaks in South Africa, 2017

Measles outbreaks have occurred in three provinces of South Africa since January 2017; Western Cape Province (WCP), Gauteng Province (GP) and KwaZulu-Natal Province (KZP). The outbreak in KZP was declared in August 2017. As of 26 October 2017 there has been a total of 45 laboratory-confirmed cases, one epidemiologically linked and eight compatible measles cases in KZP. The ages of these cases range from eight months to 51 years. The measles cases detected during all three outbreaks have occurred mostly in communities with large groups of unvaccinated individuals.

Outbreak response activities such as contact tracing and measles vaccination have been carried out in schools, health facilities and households. Community mobilisation is being actively carried out via a number of communication channels including face-to-face meetings and radio interviews to encourage persons to participate in vaccination activities.

Health care workers all over South Africa should look out for suspected measles cases, and confirm these through submission of blood and a completed case investigation form to the National Institute for Communicable Diseases (NICD). The case definition

for a suspected measles case is any person with fever and rash, and one of the following: cough, coryza and conjunctivitis.

Between 1 January and 20 October 2017, a total of 4 510 samples has been received for measles serology and molecular testing. Among these, 185 tested positive for measles IgM and/or PCR from eight provinces; five in Eastern Cape, one in Free State, 92 in Gauteng, 45 in KwaZulu-Natal, three in Limpopo, two in Mpumalanga, nine in North West and 31 in Western Cape (Figure 4).

Source: Centre for Vaccines and Immunology, NICD-NHLS; Division of Public Health Surveillance and Response, NICD-NHLS; (melindas@nicd.ac.za)

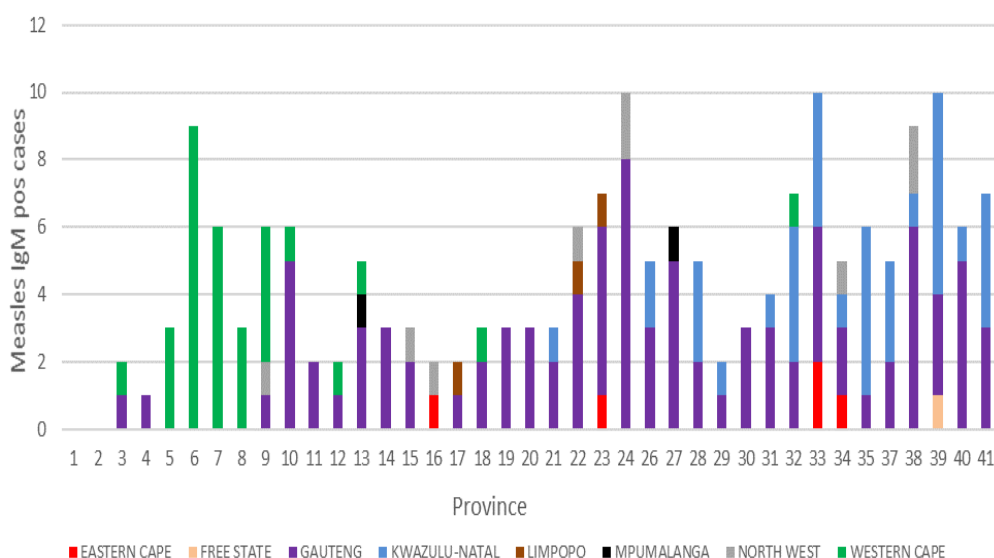


Figure 4. Number of laboratory-confirmed measles cases by province in South Africa (1 January to 20 October 2017).

3 SEASONAL DISEASES

a The influenza season, 2017

The 2017 influenza season that started in week 21 (week ending 4 June) is coming to an end. The season peaked in week 26 (week ending 2 July) when 106 specimens were received, with 72 (68%) positive for influenza. A total of 661 influenza detections has been made, the majority of which has been influenza A(H3N2) which was detected in 491 (74%) of patients. Influenza A(H1N1)pdm09 has been detected in 35 (5%), and influenza B in 135 (20%) patients. In addition dual infection of influenza A(H1N1)pdm09 and A(H3N2) was detected in two, and influenza A(H3N2) and B in one patient. The proportion of specimens positive for influenza B has risen from below 20% in the first 3 months of the season, to 70% - 100% per week during September. Although the detection rate for the week ending 15 October has risen, this is mainly due to the decline in the number of

specimens received.

In the first three months of the year, influenza A (H3N2) was detected in five patients who had either travelled abroad, or had contact with travellers from the northern hemisphere. Additionally, 96 specimens have been received from patients at a point of entry into South Africa, and influenza was detected in 40 of these patients.

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

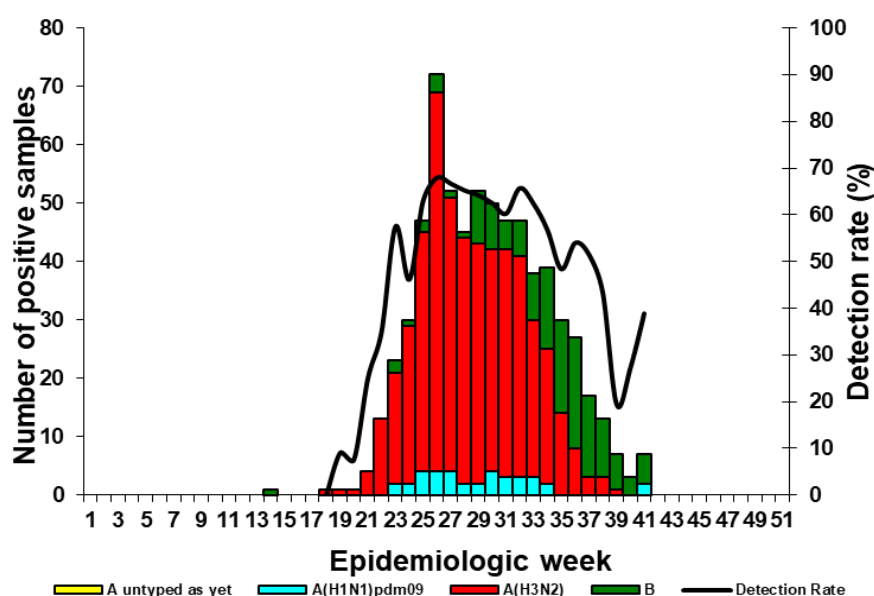


Figure 5. Viral Watch 2017: Number of positive samples by influenza types and subtypes and detection rate*

* Only reported for weeks with >10 specimens submitted. Patients known to have acquired influenza abroad or from contact with travellers are not included in the epidemiological curve.

b An update on avian influenza in South Africa

Since the first confirmed case of highly pathogenic avian influenza A(H5N8) in poultry in Mpumalanga on 19 June 2017, the outbreak has spread widely throughout the country to include other bird species and provinces.

As at 18 October 2017, 92 localized outbreaks in birds (29 commercial poultry farms, 23 wild birds, 16 birds kept as hobby/zoo and eight backyard farms) have been reported by the Department of Agriculture, Forestry and Fisheries (DAFF). Seven of the nine provinces (Mpumalanga, Gauteng, KwaZulu-Natal, Western Cape, North West, Eastern Cape and Free State) have been affected. The majority

of outbreaks were reported from Western Cape Province (61/92, 66%). The latest World Organisation for Animal Health (OIE) reports, with maps of areas with reported outbreaks may be found at <http://www.oie.int>.

While the risk of transmission to humans is exceedingly low, surveillance to detect possible human infections in persons exposed to the virus from affected farms is ongoing. To date, 74 workers who had been exposed to infected birds in Gauteng and the Western Cape provinces and who reported respiratory symptoms have been tested by PCR and none have tested positive for avian influenza A

(H5N8).

Individuals working in close contact with potentially infected birds and presenting with influenza-like illness (cough, fever, sore throat, runny nose), conjunctivitis or difficulty breathing, are encouraged to consult with a health care provider and to inform the health provider of the potential exposure to infected birds. Healthcare workers who encounter patients meeting the above case definition can access case investigation forms and sample collection materials by calling the NICD doctor on call at 082-883-9920.

Control measures, including the humane culling of infected and potentially-infected poultry are implemented in affected farms. Poultry and poultry prod-

ucts that are available for sale in retail outlets are safe for human consumption. Additional information can be accessed at www.nicd.ac.za

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

c Odyssean malaria in Pretoria and Kempton Park, Gauteng Province, October 2017

Seven malaria cases affecting persons with no recent travel to malaria transmission areas were reported during October in Kilner Park, Pretoria (four patients in two families), Theresa Park, Akasia, Pretoria (one patient) and Kempton Park, Ekurhuleni (two patients, who were friends). Some patients required intensive care, and unfortunately, one patient died. The NICD is assisting district and provincial health authorities with entomological and epidemiological investigations. No vector mosquito-breeding around the patients' residences was evident. It is therefore likely that *Anopheles* malaria vector mosquitoes which were accidentally transported by vehicles from malaria areas, were responsible. This is called Odyssean malaria, also known as airport, suitcase, minibus, or taxi-rank malaria.

The occurrence of these cases does not mean that malaria is spreading to new areas. However, local residents should take preventive measures against mosquito bites in and around their homes, and seek medical attention for rapidly worsening 'flu-like illness (fever, chills, headache, muscle and joint pains).

Since 2007, 72 cases of Odyssean malaria have been recorded in South Africa, mostly in Gauteng Province. Absence of a travel history often leads to delayed diagnosis of malaria, with influenza most commonly assumed as the cause of illness. The case fatality rate of 14% is about ten times that of the national average for malaria. Medical practitioners should be aware of the similar presentation of influenza and early malaria infection, understand that a negative malaria test does not necessarily rule out the diagnosis, and be aware to re-test if illness persists or gets worse. The chance finding of abnormally low platelet counts in blood samples tested for unexplained illness, may indicate malaria infection and should be urgently investigated for this possibility.

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

d Anticipating the summer malaria season, 2017

Although it is early in the season, unusually high numbers of malaria cases are being reported from malaria transmission areas in Mpumalanga (including the Kruger National Park, Bushbuck Ridge, Komatipoort), Limpopo (Mopane, Vembhe districts), and also from the Waterberg (along the Lephalala river). The malaria control programme has commenced household spraying in these areas with long-acting residual insecticides (IRS) which targets indoor-feeding mosquitoes.

Early diagnosis and treatment of malaria essential strategy to reduce morbidity and mortality. Coartem is the drug of choice for uncomplicated malaria. Intravenous artesunate (Garsun®) has been licenced and is available, and recommended as the

drug of choice for the treatment of complicated or severe malaria.

Travellers from or residents of malaria transmission areas in South Africa or countries north of our borders who present with fever and flu-like illness should have a malaria test. Travellers to malaria areas including the Kruger National Park should take precautions to prevent mosquito bites, and consider chemoprophylaxis.

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

4 BACTERIAL OUTBREAKS

a An outbreak of *Streptococcus pyogenes* at a long-term residential care fa-

On Monday 9 October 2017, NICD was notified of three residents living in a long-term care facility in Johannesburg who died of necrotizing fasciitis due to laboratory-confirmed group A streptococcus (GAS) infection. All three cases were resident in the same 27-bedded section of the facility and presented with a similar clinical picture; namely the sudden onset of cellulitis, which rapidly progressed to extensive necrotising fasciitis and death within 12 hours. All cases were ≥ 65 years, and presented within a few days of each other. A fourth case presented more than a week after the other cases with clinical symptoms suggestive of cellulitis. This patient was immediately started on antibiotics and admitted to hospital where her condition remained stable until she was discharged. GAS was not confirmed on this patient.

On 9 October 2017, following a meeting with facility management team and clinical staff, NICD conducted an outbreak investigation. The investigation included screening for GAS carriage by culturing oropharyngeal swabs and collection of epidemiologic and clinical data. Swabs and data were collected from residents and staff members who worked in the affected unit or had contact with residents from the affected unit. In response to the outbreak, the facility intensified the infection control procedures and provided prophylactic antibiotics to staff and residents to eradicate potential carriage of GAS infection. No new cases have been identified since the 7 October 2017.

While GAS can be carried asymptomatically in the throat or on the skin, this organism is also responsible for infections ranging from mild pharyngitis and local skin infection to severe or life-threatening necrotising fasciitis and streptococcal toxic shock syndrome. GAS infections are associated with high morbidity and mortality among the elderly and outbreaks in long-term care facilities have been reported. Health care workers are encouraged to maintain a high index of suspicion for GAS in individuals who present with pharyngitis, skin infections and sepsis in this setting. Early antibiotic treatment should be initiated in patients with suspected GAS. Adherence to infection control practices are essential for prevention and control of severe or ongoing outbreaks.

Source: Centre for Respiratory Disease and Meningitis; Division of Public Health Surveillance and Response, NICD-NHLS (annev@nicd.ac.za)

b Increasing detection of *Listeria monocytogenes* from adult meningitis cases: ampicillin and gentamicin should be included in empiric treatment of adult meningitis

The incidence of listeriosis in South Africa has increased 10-fold since 2016, from fewer than 30 cases per year, to well over 350 in 2017. The demographic distribution appears to be changing from neonatal to adult predominance. As of 20 October 2017, 383 cases of listeriosis have been laboratory-confirmed across the country with the majority (n=243) reported from Gauteng (Figure 6). Of the 243 Gauteng cases, 124 (51%) were adult cases, and 88 (36%) were neonates. The balance were cases occurring in children and adolescents. The sex ratio amongst all cases is approximately 1:1. The districts in Gauteng reporting the largest number of cases are City of Johannesburg (n=127), City of Tshwane (n=64) and Ekurhuleni (n=36). Cases are being reported by both public (n=175) and private (n=68) sectors.

On account of this, the NICD together with infectious diseases physicians released a clinical advisory suggesting that ampicillin and gentamicin should be included in empiric treatment of adult meningitis in

areas where listeriosis in adults is highly prevalent. The advisory, together with dosages, is found on the NICD website at www.nicd.ac.za under the 'Alerts' section.

The Centre for Enteric Diseases, has received a limited number of *L. monocytogenes* isolates from across the country, on which they have conducted molecular typing including whole genome sequencing. To date, the majority of isolates submitted to their laboratory are of a single highly virulent epidemic-related strain type, which is suggestive of a common source. However, clinical laboratory information alone is limited in terms of decision-making for public health action.

GERMS-SA has initiated enhanced surveillance at a number of hospitals nationally to gather additional case information. The main focus of the ongoing outbreak investigation remains collection of clinical data, outcome and food histories from as many cases as is possible so as to be able to direct food test-

ing and detection of the source. All clinicians, infection control nurses and environmental health officers are being encouraged to assist in improving case investigation form (CIF) completion and history taking. Clinicians are requested to support data collection through completion of CIFs and submission by email to outbreak@nicd.ac.za. CIFs may be found on the NICD website 'Diseases A-Z' section, under 'Listeriosis'

Source: Division of Public Health Surveillance and Response; Centre for Enteric Diseases, NICD/NHLS (outbreak@nicd.ac.za)

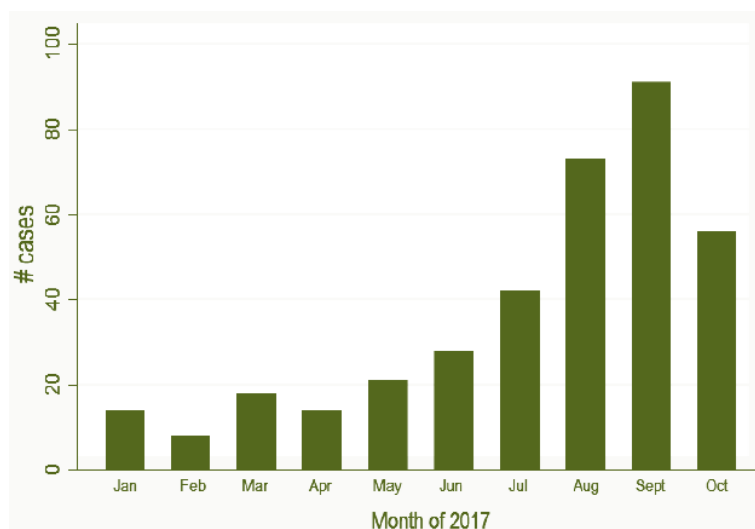


Figure 6. Number of isolates/cases of *Listeria monocytogenes* from public and private sector laboratories, January to 24 October 2017

5 SURVEILLANCE FOR ANTIMICROBIAL RESISTANCE

a Carbapenemase-resistant Enterobacteriaceae—a monthly update

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 September 2017, a total of 109 Enterobacteriaceae isolates was received. Seventy-three isolates were screened, 64 of which expressed the carbapenemases of interest. One isolate expressed a combination of two carbapenemases (NDM and OXA-48 and variants) (Table 1). The majority of the screened isolates were *Klebsiella pneumoniae* (61) followed by *Enterobacter cloacae* (7).

It is important to note that these figures do not represent the current burden of CPEs in South Africa. The AMRL-CC is currently running a surveillance

programme at national sentinel sites for CPE infections in patients with bacteraemia which will be able to provide representative data to 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 1. Enterobacteriaceae by CPE enzyme type for January-August 2017 and September 2017 at the AMRL-CC, CHARM, NICD.

Organism	OXA-48 & Variants		NDM		VIM		KPC	
	Jan-Aug 2017	Sept 2017	Jan-Aug 2017	Sept 2017	Jan-Aug 2017	Sept 2017	Jan-Aug 2017	Sept 2017
<i>Enterobacter aerogenes</i>	5	-	-	-	-	-	-	-
<i>Enterobacter asburiae</i>	-	-	2	-	-	-	-	-
<i>Enterobacter cloacae</i>	63	1	14	3	-	-	2	-
<i>Klebsiella pneumoniae</i>	511	51	129	3	7	1	2	3
<i>Providencia rettgeri</i>	2	-	13	1	-	-	-	-
<i>Serratia marcescens</i>	10	1	1	1	-	-	-	-
Total	591	53	159	8	7	1	4	3

NDM: New Delhi metallo-beta-lactamase; **OXA:** Oxacillinase; **VIM:** Verona intergron-encoded metallo-beta-lactamase; **KPC:** *Klebsiella pneumoniae* carbapenemase.

6 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 7 on page 10.

1. Plague: Madagascar and Seychelles

See article on page 2.

2. Cholera: Yemen

The cholera epidemic in Yemen is ongoing. The death toll has risen to 2 151 as of 7 October 2017. A total of 800 626 people from 22 provinces out of total 23 have been infected. Most deaths were reported from the northern province of Hajjah, while most cases were reported from the north-western port province of Hodeidah on the coast of the Red Sea, both under control of Shiite Houthi rebels. The International Committee of the Red Cross/Crescent expected the epidemic to reach one million cases by the end of 2017.

3. Anthrax: Namibia/Botswana

Anthrax has killed over 100 hippos in the Okavango River, which flows through the Caprivi strip in Namibia before entering Botswana. Wild animal anthrax is a natural occurrence in many areas in southern Africa. Outbreaks of anthrax in hippos are well recognised across the region. In dry seasons, there is a concentration of both animals and anthrax spores in reduced volumes of water, and the infection is able to spread rapidly. Tourists and other persons are not at risk for anthrax if they avoid direct contact with the dead hippos. New sightings of hippo carcasses should be reported to

game reserve or public health officials.

4. Marburg virus disease, Uganda

The Ugandan Ministry of Health announced the death of a confirmed case of Marburg virus disease. The case was a 50-year-old female from Chemuron village, Moyok Parish, Moyok sub-county, Kween District in Eastern Uganda. She presented with signs and symptoms suggestive of a viral hemorrhagic fever (VHF) and died on 11 Oct 2017. Subsequently 2 health care workers have developed symptoms and test results are pending. Over 155 persons are under observation.

5. Leptospirosis, Puerto Rico

Puerto Rico has reported at least 76 cases of suspected and confirmed leptospirosis, including a handful of deaths, during the month after Hurricane Maria. Around 50-70 cases of leptospirosis are seen per annum in Puerto Rico. This increase in cases is likely due to disruption of potable water services, and increased exposure to rodent urine-contaminated water following the flooding. Leptospirosis is notifiable in Puerto Rico.

6. Typhoid, Zimbabwe

A localised outbreak of typhoid was reported on 23 October from Mbare's Matapi flats—a densely populated housing establishment in Harare. The

outbreak has been blamed on water shortages, raw sewage spillages and uncollected garbage.

Source: (www.promed.org) and the World Health Organization (www.who.int)



Figure 7. 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

7 WHO-AFRO: OUTBREAKS AND EMERGENCIES

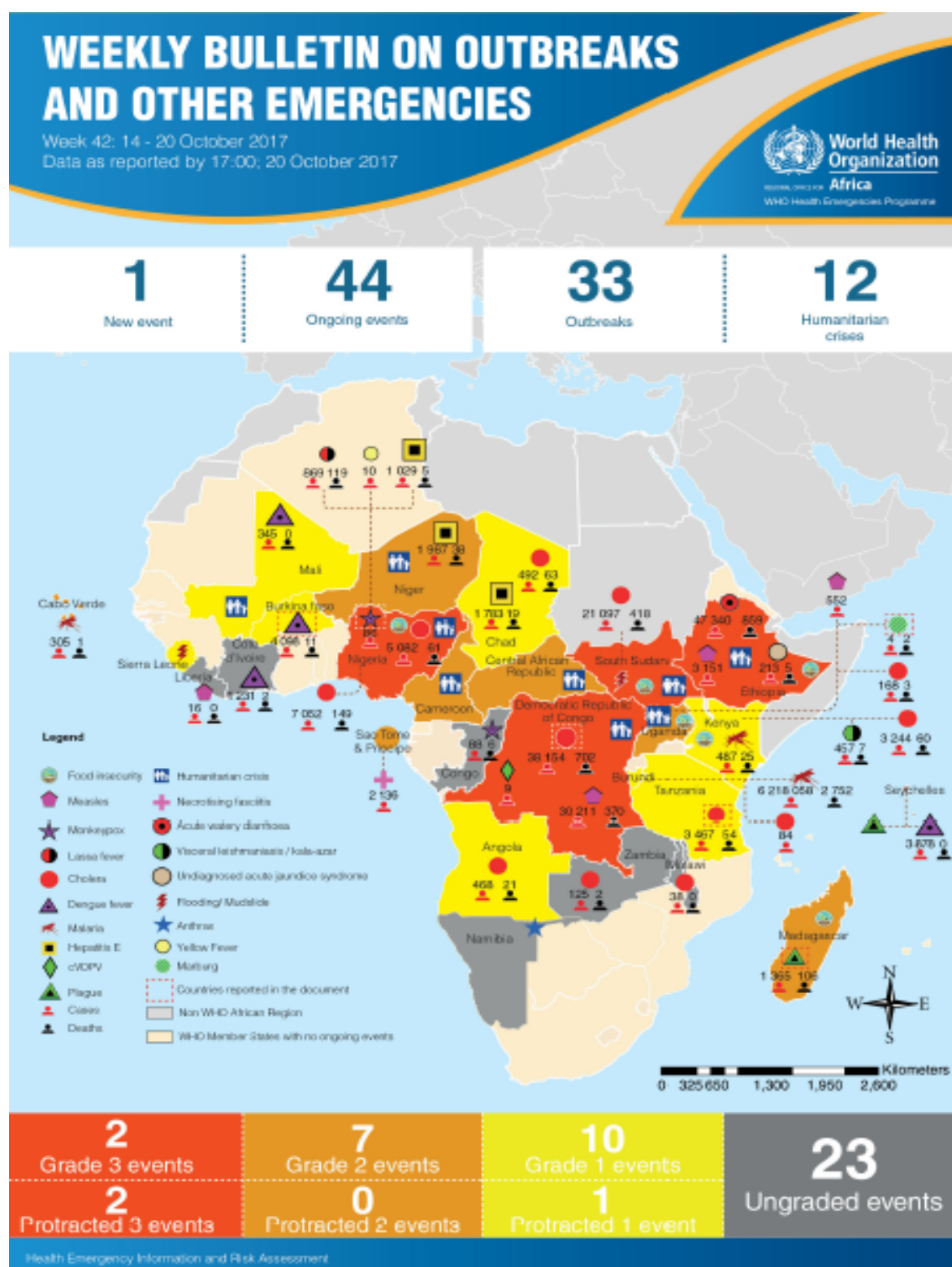


Figure 8. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African region. The African Region WHO Health Emergencies Programme is currently monitoring 45 events of which 33 are outbreaks and 12 humanitarian crises. For more info see link below:
<http://apps.who.int/iris/bitstream/10665/259352/1/OEW42-1420102017.pdf>