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

Communicable Diseases Communiqué

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CONTENTS

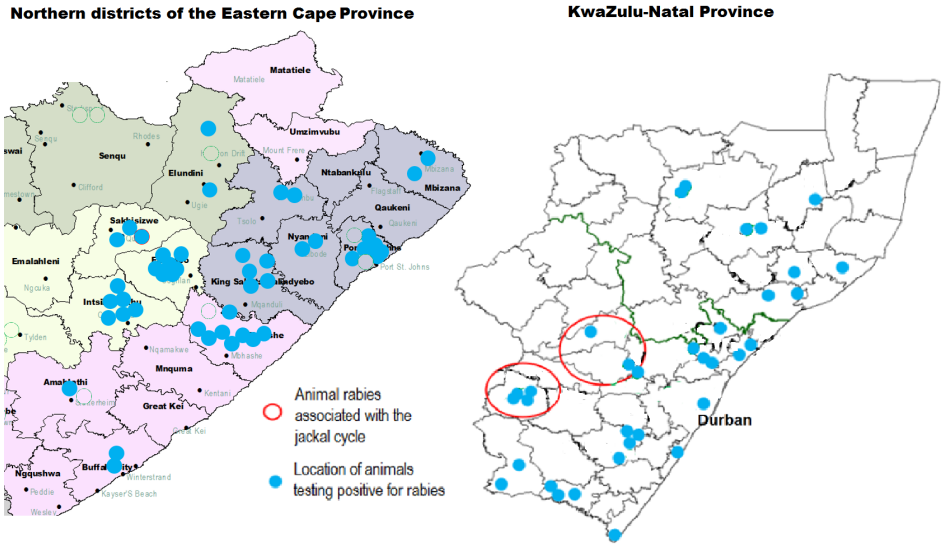
1 ZOONOTIC AND VECTOR-BORNE DISEASES

a Rabies in Gauteng, KwaZulu-Natal and Eastern Cape provinces

In Gauteng Province, animal cases in the West Rand and in northern Tshwane continue to be detected. The cases have mainly occurred in black-backed jackals, but dogs, cats, cattle, sheep and goats, horse and honey badgers have also been implicated. No human cases have been reported in the province.

In KwaZulu-Natal and Eastern Cape provinces, canine rabies continues to circulate (Figure 1). Rabies in dogs has been increasingly prevalent in November 2016 in the iLembe area, 65 km north of Durban, as well as districts south of Duban proximate to Eastern Cape Province (Figure 1). Two epicentres of rabies associated with the jackal cycle are present in inland KZN districts. Ongoing collective efforts to vaccinate dogs in KwaZulu-Natal and Eastern Cape provinces have lead to a substantial reduction in canine rabies cases over the last 10 years, and a consequent decrease in human cases in the provinces.

Human rabies cases in South Africa occur almost every year, with median of eleven cases annually from 1983 to 2015. People acquire rabies mostly following exposure to rabid dogs, however from 1983 until 2015, nine cases of human rabies have occurred following exposure to rabid cats. Exposure to non-domestic animals accounts for very few human rabies cases (3%). However, domestic animals such as cattle, dogs and cats are sometimes infected by wild animals that enter farms, gardens, and homes. Post-exposure prophylaxis following exposure to rabid animals will prevent rabies in humans. For guidelines on post-exposure prophylaxis see www.nicd.ac.za



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

Figure 1. Location in KwaZulu-Natal and Eastern Cape provinces of animals testing positive for rabies in October and November 2016. Data and map courtesy Veterinary Services, Department of Agriculture, KZN (K.LEROUX@kzndard.gov.za)

b Zika virus no longer a 'Public Health Emergency of International Concern'

The World Health Organization Emergency Committee on Zika and microcephaly convened for the fifth meeting under the International Health Regulations (2005) on 18 November 2016. The committee rescined the status of the Zika virus outbreak and associated neurological complications as a 'Public Health Emergency of International Concern' (PHEIC). Although there is no longer a PHEIC, the committee recognized that the situation remains a public health challenge that can be adressed by sustained, well resourced research programmes and public health interventions. Countries at risk of Zika virus introduction need to remain vigilant. Travellers to Zika-affected areas including pregnant women, or women wishing to conceive, should remain aware of risks, and apply measures to prevent being bitten by mosquitoes.

The WHO reports that cases of congenital Zika syndrome have been reported from Cabo Verde (Africa), Marshall Islands (Western Pacific Ocean Region) and Thailand. Vietnam reported its first case in November 2016. Canada, Europe (Spain and

Slovenia) and USA have reported travel-related microcephaly. The magnitude of the risk for Zika virus infection associated malformations remains largely unknown at present due to both uncertainty about the risk associated with different strains and the prevalence of immunity to Zika in different populations.

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

c A case of human brucellosis in Mpumalanga Province

On 23 September 2016, the NICD was informed of a confirmed case of brucellosis in an eight-year-old boy from Mpumalanga Province. *Brucella melitensis* was isolated from a blood culture bottle and identified on the Vitek 2 system. The identification was confirmed by the NICD. The patient initially presented to the clinic in June 2016 with night sweats and secondary enuresis and was referred to a tertiary hospital in Gauteng Province where the diagnosis was made.

Upon further questioning, the family reported consuming unpasteurised milk from a local dairy farm since February 2016. There was no report of direct contact with any animals including cows, sheep, goats and pigs. No family members reported signs and symptoms suggestive of brucellosis. Serology tests done on three family members were negative for *Brucella* antibodies. However, at the farm, 13 out of 68 cattle tested positive for *Brucella* spp. These animals were isolated and later slaughtered.

Following the diagnosis, the patient was treated with doxycycline and rifampicin. Health facilities in the area were requested to have a high index of suspicion in patients presenting with pyrexia of unknown origin or fever not responding to empiric treatment. Health promotion was done in the community regarding heating of fresh milk before consumption. The farmer has stopped selling the milk to the community. Health promotion was also done at other farms in the community and the Department of Agriculture, Forestry and Fisheries plans to test samples of milk being produced at farms in the sub-district where this community is located.

Brucellosis infection in humans can be caused by *Brucella abortus* (cattle), *B. melitensis* (sheep and goats), *B. suis* (pigs) and *B. canis* (dogs). *B. melitensis* causes the vast majority of human brucellosis cases. The usual reservoirs of *B. melitensis* in South Africa are goats and sheep; occasionally, cattle are also affected. *Brucella* infection in humans is acquired through ingestion of contaminated animal products such as milk, or direct contact with infected animals. Symptoms are non-specific and include profuse sweating mostly during the night, fever, arthralgia, myalgia and fatigue. The incubation period is 2–4 weeks but may range from five days to five months.

Source: Centre for Emerging and Zoonotic Diseases, NICD-NHLS; Division of Public Health Surveillance and Response, NICD-NHLS; Steve Biko Academic Hospital NHLS Laboratory; Mpumalanga Department of Health; Emalahleni Veterinary Unit. (outbreak@nicd.ac.za)

2 VACCINE-PREVENTABLE DISEASES

a An update on measles surveillance —November 2016

A high index of suspicion should be maintained for new cases countrywide. Since the beginning of 2016, South Africa has had 15 laboratory-confirmed cases. A measles diagnosis requires a serum sample for serological confirmation, as a measles rash can mimic other viral infections. Any patient with fever, maculopapular rash and one of the '3 Cs' (cough, coryza, conjunctivitis) should have a blood sample sent to NICD for measles testing, together with a completed case investigation form. Only 39% of districts in the country have adequately investigated at least one suspected measles case this year, below the target of 80%, according to the World Health Organization October Bulletin for Eastern and Southern Africa.

The South African measles vaccination schedule includes two doses, now given at 6 months and 12 months of age. Any children admitted to hospital should have their road to health cards checked for completeness of measles vaccination. Measles vaccines are safe and highly effective at preventing measles infection in both children and adults. If a dose has been missed, it is never too late to catch up measles vaccination.

Source: Centre for Vaccines and Immunology, NICD-NHLS; (melindas@nicd.ac.za)

b A case of fulminant hepatitis B at a home for mentally impaired persons

In October 2016, a mental health institution in Gauteng Province requested assistance from the Department of Health and the NICD following the death of a resident due to hepatitis B (HBV). An investigation was conducted with the aim of identifying susceptible persons for hepatitis B vaccination.

The institution did not have a consistent policy regarding hepatitis B vaccination of residents or staff. A total of 194 persons (94 residents, eight care facilitators and 92 day workers and auxiliary staff members), out of an estimated 200 persons living or working on the premises, consented to HBV serological screening. Amongst 192 persons for whom results were available, 63 (33%) were immune, and 127 (66%) were susceptible to hepatitis B and required vaccination. Five (2.6%) persons, all females and aged between 23-43 years, had evidence of chronic hepatitis infection and were referred for chronic care. All but one of these patients had low copy numbers of circulating hepatitis B DNA, and all had only slightly raised or normal alanine transaminase levels. Vaccination of susceptible persons was commenced using vaccine provided by the Gauteng Department of Health, and to date, there have been no further cases of acute HBV.

HBV is spread by contact with infected blood, semen and other body fluids via sexual transmission, contact with blood or vertically from mother to child. HBV vaccination was incorporated into the routine childhood immunisation schedule (Expanded Programme on Immunisation) in South Africa in 1995. Institutionalized persons older than 21 years are unlikely to have been vaccinated. This investigation highlights the importance of vaccination against hepatitis B, particularly amongst health care workers and institutionalised persons. Institutions should review their policies and vaccinate staff and residents who lack documented evidence of receipt of vaccine.

Source: Division of Public Health, Surveillance and Response, Centre for Vaccines and Immunology, Field Epidemiology Training Programme, NICD-NHLS; Gauteng and West Rand Departments of Health. (outbreak@nicd.ac.za)

c Vaccine information handbook for parents and care-givers

The Centre for Vaccines and Immunology of the NICD has compiled a vaccine information handbook for parents and care-givers. The booklet provides information about vaccines that are currently part of the state-sponsored 'Expanded Programme on Immunisation' (EPI) as well as those that are available in the private sector.

The booklet also answers frequently asked questions that parents and care-givers have about vaccines. Vaccines included in the booklet are polio, BCG (against tuberculosis), measles, diphtheria, tetanus, whooping cough, and newer vaccines, such as those against *Streptococcus pneumoniae*, rotavirus, hepatitis B, *Haemophilus influenzae* type B, *Neisseria meningitidis* and chickenpox. The measles, mumps, rubella (MMR) vaccine is also included. The handbook can be downloaded from the NICD web page www.nicd.ac.za on the 'Resources' tab.

Source: Centre for Vaccines and Immunology, NICD-NHLS; (melindas@nicd.ac.za)

3 SEASONAL DISEASES

a The influenza season, South Africa, 2016

The 2016 influenza season started in week 19 (the week starting 09 May 2016, Figure 2), when the Viral Watch detection rate rose to 19%, and peaked late in the season, in week 35 (week starting 29 August). The season ended in week 40 (week ending 9 October). Over the past 12 years the season has on average peaked in week 29 (second last week of July).

To date (19 November) influenza has been detected in 982/5967 individuals tested from three surveillance programmes (influenza-like illness (ILI) at primary health care clinics; ILI at general practitioners; national syndromic surveillance for pneumonia) carried out by the NICD. The season started with

influenza B accounting for the majority of detections until week 28 (week ending 17 July). After this time point, influenza A(H3N2) has accounted for the majority of detections apart from weeks 32 (8 August) and 37 (12 September) when A(H1N1) pdm09 accounted for the largest proportion.

Data on vaccine effectiveness for this year's season will be available at the end of 2016. The WHO recommendations for the 2017 vaccine have included an updated strain of influenza A(H1N1)pdm09 compared to the 2016 southern hemisphere influenza vaccine.

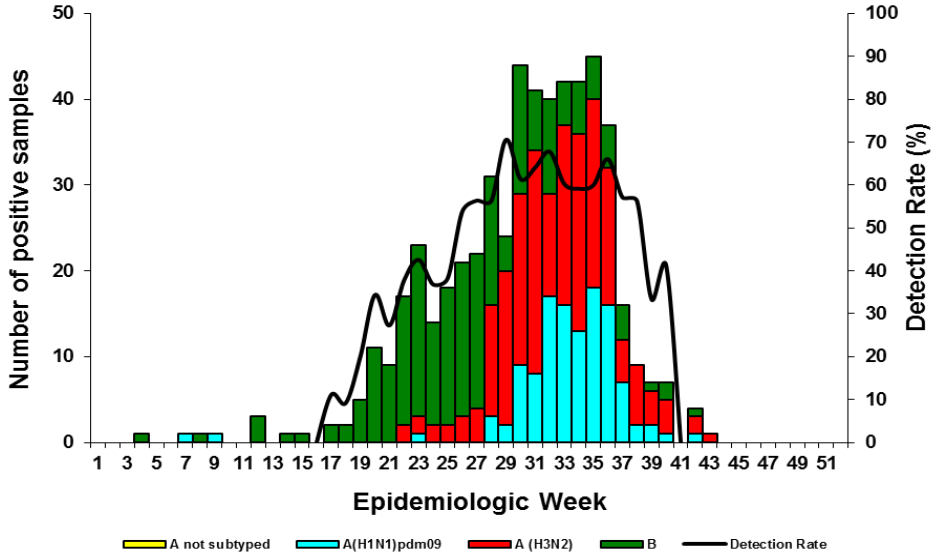


Figure 2. Number of influenza types and subtypes and detection rate by week, Viral Watch: 2016

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

b Investigation of influenza cases at a school in the Eastern Cape Province

On 14 July 2016 the National Institute for Communicable Diseases (NICD) of the National Health Laboratory Service (NHLS) was contacted by the resident doctor at a boarding school in the Eastern Cape Province, who requested public health advice. A significant proportion of pupils had developed influenza-like symptoms and school activities had been cancelled. The NICD together with the National and Provincial Departments of Health conducted an investigation including a medical record review of pupil consultations at the school sanatorium and completion of case investigation forms by consenting pupils.

Laboratory results from 38 pupils from whom nasopharyngeal swabs were collected revealed that 23 (61%) were positive for influenza A (H3N2). Among 308 boarders, 82 (27%) pupils reported symptoms compatible with influenza, including at least one of fever, cough, coryza, pharyngitis or headache over a 14-day period (Figure 3). Thirty-eight pupils (12.9%) had fever and cough (influenza-like-illness, ILI) and had sought medical care (MED-ILI). Amongst boarders, influenza vaccine coverage was 19% (57/308) and vaccine effectiveness against MED-ILI was 13% (95% confidence interval -68% to 55%). Scholars were more affected than the teachers (attack rate 24% (36/152) vs. 5% (3/63)). The impact on the school was significant: the mean time missed from school was 3.4 days (range 1 – 11). Sport practices, matches, cultural activities and routine school activities such as assembly and chapel services were postponed or cancelled.

This investigation describes the significant impact of seasonal influenza in a 'closed' community. It illustrates the amplifying role that schools play in influenza transmission and highlights the importance of prevention measures, including vaccination, self-isolation and hand washing. We were not able to demonstrate statistically significant vaccine effectiveness, most likely related to imprecision of the clinical case definition for influenza. In addition, subtle changes in the seasonal circulating influenza strain may have altered vaccine effectiveness. The NICD advises seasonal vaccination against influenza particularly for persons in high-risk groups, as described in guidelines for influenza vaccination available at www.nicd.ac.za

Source: Centre for Respiratory Diseases and Meningitis, NICD-NHLS; Division of Public Health, Surveillance and Response, NICD-NHLS; National and Eastern Cape Department of Health. (cherylc@nicd.ac.za)

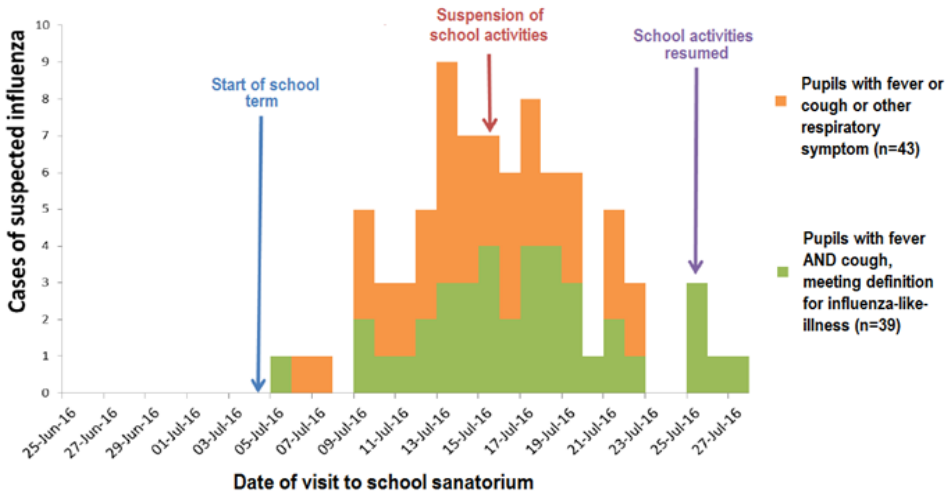


Figure 3. Cases of suspected influenza identified at a school in the Eastern Cape Province from 4th to 27th July 2016. Pupils that met the case definition for influenza-like-illness (i.e. with fever and cough) are shown in green.

c A malaria update for South Africa, early summer 2016

Malaria is endemic to three of South Africa's nine provinces and local transmission is restricted to the low-altitude border regions of Limpopo, Mpumalanga and KwaZulu-Natal provinces. However, significant numbers of imported cases are reported from non-endemic areas, particularly Gauteng Province.

South Africa committed itself to halt local malaria transmission within its borders by 2018. Elimination strategy objectives are to strengthen passive and active surveillance, improve capacity to coordinate and implement malaria interventions, appropriately educate the population about malaria, and reduce the human malaria parasite reservoir. The mainstay of malaria control continues to be indoor residual insecticide spraying to substantially reduce the density of mosquito vectors in transmission areas, while limited larviciding is done in selected places.

Cellular phone-based reporting of malaria cases (MalariaConnect) has been implemented over the recent malaria season to speed up the process of investigating and responding to malaria cases.

When compared with August, there was a steady increase in notified cases in September and October 2016, most notably in Limpopo. However, malaria incidence was approximately 35% lower compared with the corresponding period (September and October) of 2015. This is probably related to the present drought (Figure 4, courtesy of the Malaria Directorate, NDoH).

In the current malaria season there will be increased scrutiny of identified foci of transmission in endemic provinces, characterised by active case finding using sensitive molecular methods to detect submicroscopic parasite carriers, and intensified vector surveillance and control.

Source: Centre for Opportunistic, Tropical and Hospital Infections, NICD-NHLS. Malaria Directorate, National Department of Health (basilb@nicd.ac.za)

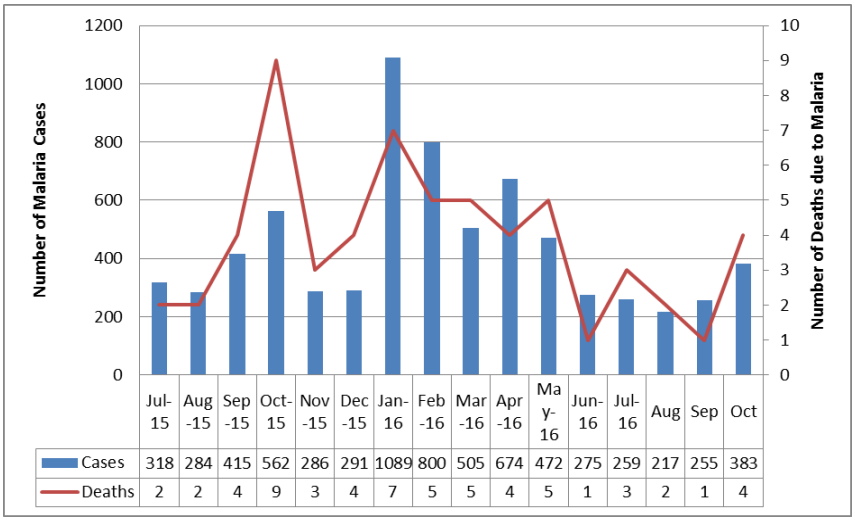


Figure 4. Malaria cases and deaths, all provinces, South Africa, July 2015-October 2016

4 ENTERIC DISEASES

a A review of foodborne illnesses reported to the NICD in 2015

Foodborne illnesses (FBIs) are a public health concern and are important causes of morbidity and mortality globally. FBIs are a notifiable medical event in South Africa. The National Institute for Communicable Diseases (NICD) Outbreak Response Unit (ORU) assists National Department of Health to collate FBI reports from district and provincial authorities. We conducted a retrospective descriptive review of FBI events reported to NICD-ORU between January and December 2015. The events had been investigated by districts and provincial communicable disease co-ordinators and environmental health practitioners with or without the assistance of NICD-ORU.

In total, 55 FBI events were reported affecting 2 070 patients and leading to 1 714 hospital visits, 104 hospital admissions and four deaths. Age and gender of affected persons were not consistently reported. Temporal and provincial distribution is shown in Figure 5 below. Most outbreaks were reported in warmer months (November 8/55, 15%; December 7/55, 13%; February 6/55, 11% and March 6/55, 11%) (Figure 5). The majority of outbreaks were reported from KwaZulu-Natal (23/55, 42%) and Gauteng (15/55, 27%) provinces (Figure 5). Most outbreaks occurred after consumption of food prepared at institutions (i.e, schools, prisons or hospitals) (23/55, 42%) or at private homes (13/55, 24%). A significant number of FBI events (13/55, 24%) occurred following consumption of meat from an animal that had died or was slaughtered following an illness. Specimens had been collected in 35/55 (64%) outbreaks. Clinical or environmental results were available for 24/35 (69%). The pathogenic bacteria identified were S*almonella* species (7/24, 29%), *Clostridium perfringens* (3/24, 13%), and *Shigella flexneri* (1/24, 4%).

Although FBIs are notifiable, it is highly likely they are underreported. The National Department of Health has rolled out provincial-wide training of environmental health practitioners and communicable disease co-ordinators to strengthen investigation and improve data collection following FBI events.

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

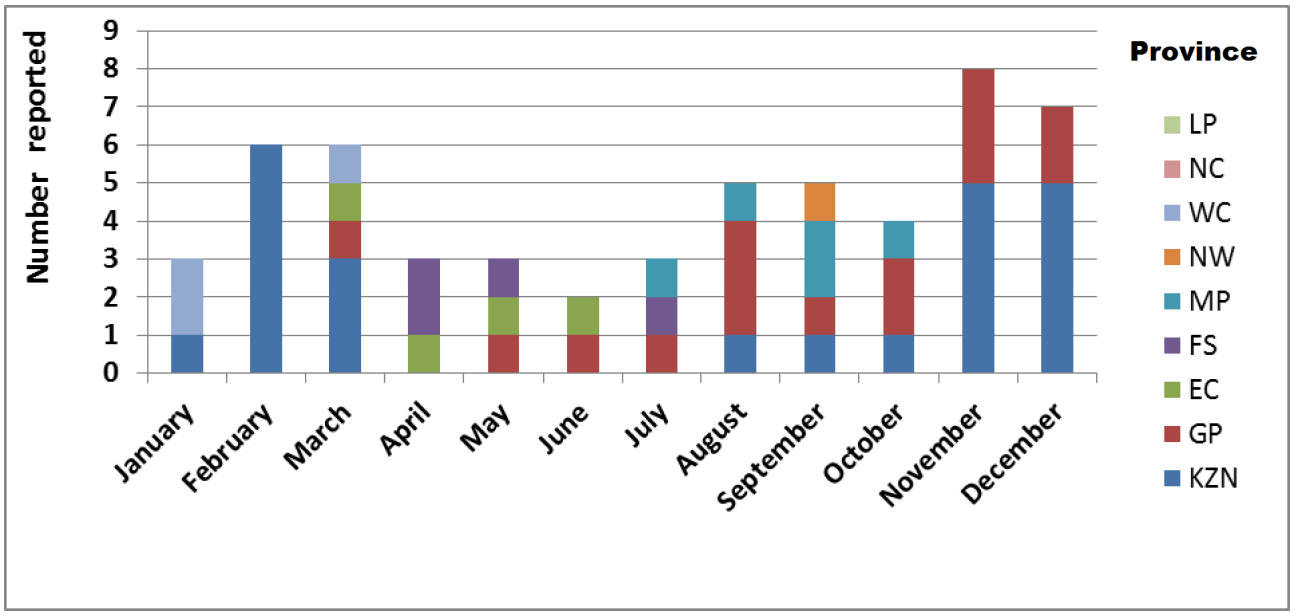


Figure 5. Number of foodborne illness events reported to the NICD-ORU by province per months, January - December 2015.

b Cholera awareness over December 2016 to January 2017

The NICD has received reports of cholera in the Masvingo Province, Zimbabwe, with a total of four confirmed cases by 19 November 2016. Cases were confirmed in Mwenezi District situated in southern Zimbabwe on the border with South Africa's Limpopo Province. As of 23 November 2016, there are no confirmed or suspected cases of cholera in South Africa. However, there is a high risk that travellers from the outbreak-affected areas may present with cholera in South Africa.

Healthcare workers countrywide should be on high alert for suspected cholera cases. The 2014 South African cholera guidelines define a suspected case of cholera as follows:

- In an area where cholera is not known to be present—a patient, irrespective of age, develops severe dehydration or dies from acute watery diarrhoea, or
- In an area where there is a cholera outbreak, a patient who develops acute watery diarrhoea with or without vomiting.

Any suspected case should be immediately notified by telephone to the local and provincial communicable disease control co-ordinator. Healthcare workers should ensure that stools or rectal swab specimens are collected from suspected cholera cases. Specimens should be sent in Cary-Blair transport medium to the laboratory with a specific request for cholera testing. All healthcare facilities, especially those in Limpopo Province, should have adequate resources for specimen collection (rectal swabs, specimen jars, specimen request forms), case management and a copy of the most recent cholera guidelines. Case management should include rehydration therapy according to dehydration assessment protocol. This is the most important lifesaving measure. South African cholera guidelines can be accessed on the NICD website: http://www.nicd.ac.za/?page=diseases_a-z&id=73

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

5 SURVEILLANCE FOR ANTIMICROBIAL RESISTANCE

a An update on carbapenemase-producing Enterobacteriaceae

The Centre for Opportunistic, Tropical and Hospital Infections (COTHI) 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 October 2016, a total of 117 Enterobacteriaceae isolates were received. Eighty-three isolates were screened, 73 of which expressed carbapenemases. Eight isolates expressed two carbapenemases each (Table 1). Majority of the screened isolates were *Klebsiella pneumoniae* (59) followed by *Escherichia coli* (9).

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 all 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. This 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 Opportunistic, Tropical, and Hospital Infections, NICD-NHLS; (olgap@nicd.ac.za)

Table 1. Enterobacteriaceae by CPE enzyme type, AMRL-CC, COTHI, NICD, January-September 2016 and October 2016

Organism	NDM		OXA-48 & Variants		VIM	
	Jan-Sept 2016	Oct 2016	Jan-Sept 2016	Oct 2016	Jan-Sept 2016	Oct 2016
Citrobacter freundii	6	1	5	1	-	-
Enterobacter aerogenes	1	-	6	1	-	-
Enterobacter cloacae	26	-	36	3	2	-
Escherichia coli	8	-	66	9	-	-
Klebsiella oxytoca	2	-	4	2	-	-
Klebsiella pneumoniae	242	14	360	48	11	-
Klebsiella spp.		-	8	1	-	1
Providencia rettgeri	14	-	1	-	-	-
Serratia marcescens	27	-	23	-	1	-
Total	**326**	**15**	**509**	**65**	**14**	**1**

NDM: New Delhi metallo-beta-lactamase; **OXA**: oxacillinase; **VIM**: Verona integron-encoded metallo-beta-lactamase.

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 6 on page 10.

1. Yellow fever in Angola and DRC

As of 16 November 2016, no new cases of yellow fever have been identified for the last four months. The outbreak, which started in Angola in December 2015, lead to 962 confirmed cases across both countries, and over 7300 suspected cases. The last confirmed case in Angola was 23 June 2016, and in DRC was 12 July 2016. In the first 6 months of 2016 over 19 million doses of yellow fever vaccine were administered by government and humanitarian agencies.

2. Lassa fever in Nigeria

Epidemiological data on Lassa fever in Nigeria as at 7 October 2016 reveals 841 suspected Lassa fever cases with 83 lab-confirmed, and 98 deaths (case-fatality rate 11.65%) from 137 local government areas (28 states) were reported, compared with 228 suspected cases with 11 lab-confirmed and six deaths (case fatality rate 2.63%) from 21 local government areas (11 states) at the same period in 2015.

3. Cholera in the AFRO region

In addition to cases in Zimbabwe, and as of 16 November, cholera has recently been reported from Yemen (WHO reports (4 825 suspected and 89 confirmed cases), South Sudan (International Organisation for Migration reports 78 suspected and five confirmed cases) and Ghana (172 suspected cases).

4. Avian influenza

WHO reports (as of 17 November 2016) infections due to avian influenza A (H5N8) in the following countries in both Europe and Asia amongst wild birds and/or domestic poultry: Austria, Croatia, Denmark, Germany, Hungary, India, Israel, Netherlands, Poland, Russian Federation and Switzerland. Many of these recent detections were associated with mortality in wild birds. Further

spread along the migratory route of wild birds is likely, and introduction into other countries could occur. Human infection with avian influenza A (H5N8) virus cannot be excluded, although the likelihood is low and generally occurs in individuals exposed to sick or dead infected birds (or their environments).

5. MERS-CoV in Saudi

As of 17 Nov 2016 the Saudi Arabia Ministry of Health reports three newly confirmed cases, amongst adult, non-health care workers. As of 19 November 2016, there has been a total of 1 481 laboratory-confirmed cases of MERS-CoV infection, including 617 deaths (case fatality rate 41.6%), 854 recoveries, and 10 currently active cases.

6. Acute flaccid myelitis (AFM) cases in North America

As of September 2016 the Centers for Disease Control, Atlanta, reports 89 confirmed cases of AFM in 33 states. In addition, five new suspected cases of AFM were investigated by local health officials in states of Arizona (n=2), Navajo county, and Washington state (n=3) during the month of November 2016. The cause of these cases remains unclear, through the symptoms (a sudden weakness in one or more arms or legs, along with loss of muscle tone and decreased or absent reflexes) are in keeping with a number of viral infections including non-polio enteroviruses, adenoviruses, and West Nile virus.

Source: Division of Public Health Surveillance and Response, NICD-NHLS, from Promed (www.promed.org)

Figure 6. Current outbreaks that may have implications for travellers. Number correspond to text above. The red dot is the approximate location of the outbreak or event

7 PHOTOQUIZ

November Photoquiz (above, left). A 25-year-old male presented with a history of acute onset of profuse, watery diarrhoea with flecks of mucous and no blood (as seen in the figure, left). What is your differential diagnosis and how would you manage this patient? Please send an email to kerriganm@nicd.ac.za with the words 'November Photoquiz' in the subject line.

Photo courtesy https://www.flickr.com/photos/sswain_1999/10099271844

October (below, left). This 3 year-old-child presented with spasms, stridor and hypoxia. The photograph illustrates the child in 'opisthotonus' - the classic hyperextended position adopted by persons with tetanus. Tetanus is caused by the toxin produced by the organism *Clostridium tetani*, and leads to neuromuscular spasms. The diagnosis of tetanus is based on clinical presentation. There are no confirmatory laboratory tests. Adults and children present with 'lockjaw' followed by neck stiffness, difficulty swallowing, muscle spasms, sweating, and fever. Infants with neonatal tetanus stop sucking between three and 28 days after birth. They develop rigidity, spasms, apnoea and then death. Tetanus is often preceded by a wound infection, or in neonates, follows the practice of daubing the umbilicus with material contaminated with *C. tetani.* Tetanus is fully preventable by immunisation of children, provision of adult boosters, and immunisation of mothers during pregnancy.