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1 ZOOBOTIC AND VECTOR-BORNE DISEASES

a Update on rabies in South Africa

From mid-April 2016 an increase in the number of confirmed animal rabies cases in Gauteng Province has been noted. Gauteng Department of Agriculture and Rural Development (GDARD) reported 22 cases involving jackals (n=13), domestic dogs (n=6), cattle (n=5) and a single case in a honey badger. These cases were respectively reported from Randfontein, the Muldersdrift/Kromdraai/Lanseria area of Mogale City, Carletonville and northern Pretoria. In response, GDARD have vaccinated more than 4000 domestic dogs and cats, 500 head of cattle and 150 sheep in the Province.

No human cases of rabies have been associated with this outbreak, but several exposures have been reported. The public is urged to seek immediate medical advice if exposed to potentially rabid animals. Routine vaccination of domestic dogs and cats is not only required by law, but is essential to reduce the risk of exposure to humans. Where rabies is reported in jackals, local farmers should consider vaccinating cattle against rabies. In July 2016, a report of at least seven cases of rabies in cattle on a farm in the North West Province was

reported to the NICD. There had been multiple exposures to farmers and farm workers. Delayed recognition of rabies as the cause of death in the cattle delayed post-exposure management of the human contacts. The North West Departments of Health and Agriculture, together with the NICD conducted a site visit and provided health promotion to farmers and workers in the area.

Rabies in animals is characterized by behavioural changes. Wild animals become tame whilst pets can become aggressive. For the national guidelines for rabies post exposure prophylaxis please visit www.nicd.ac.za/?page=guidelines&id=73

To date a total of two human cases of rabies has been confirmed in South Africa. These cases were reported from KwaZulu-Natal and Free State Provinces.

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

b The yellow fever outbreak in Angola and Democratic Republic of Congo

The yellow fever (YF) outbreaks in Angola and the Democratic Republic of Congo (DRC) have claimed nearly 400 (369 and 16, respectively) deaths and resulted in suspected YF in more than 6000 people (3867 and 2269, respectively) in the past eight months. The YF outbreak was first detected in Angola in January 2016 (with cases dating back to December 2015), and then spread to DRC with cases notified from late March 2016. More than 16 million people have been vaccinated in Angola and the DRC in an attempt to control the outbreak. Mass vaccination campaigns have covered most of the affected parts of Angola, but additional vaccination campaigns are currently underway to maximize coverage in the two affected countries. Fractional dosing of the vaccine is being implemented in the campaigns in Kinshasa to increase coverage with limited vaccine stocks available. As a result, the outbreak appears to be declining in Angola where no new cases were confirmed in the past six weeks, during the month

of July until 12 of August 2016. No deaths were reported amongst the suspected cases since the week of 29 July to 4 August.

Travellers to the affected countries and other yellow fever endemic areas are required to be vaccinated with YF vaccine at least 10 days before departure or risk being denied entry into South Africa upon return.

The World Health Organization situation report on the outbreak is available on the following link: <http://who.int/emergencies/yellow-fever/situation-reports/8-july-2016/en/>

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

c Zika virus update

Following the Zika virus disease (ZVD) outbreak in north-eastern Brazil in February 2015, the virus dramatically expanded its geographic boundaries and is now actively transmitted in more than 60 countries in South, Central, and North Americas, the Caribbean region and Pacific Ocean islands. It has also recently been reported from the Cape Verde islands and Guinea-Bissau in West Africa. It is yet unclear if the ZVD cases in West Africa resulted from the introduction of the Asian lineage of the virus on African continent.

Zika virus (ZIKV) infection causes mostly asymptomatic or mild febrile illness, and it has been positively identified as a cause of microcephaly and Guillain-Barre syndrome. Zika virus is usually spread from human to human by the bite of infected mosquitoes, but it can also be transmitted sexually, through blood transfusions and from mother to child.

Sixty-five persons with a travel history to a Zika virus endemic country have been investigated by the NICD from December 2015 until 15 August 2016. One case was confirmed by PCR and serology testing, two cases were positive by PCR on acute sera, and two additional cases had antibodies against Zika virus.

The state of Florida in the United States is currently reporting increased ZVD cases, including non-travel associated cases, which resulted from either bites of local *Aedes aegypti* and *A. albopictus* mosquitoes or from sexual transmission. The state of Texas reported 108 cases associated with travel to areas with active ZIKV transmission but so far there is no evidence of local transmission by indigenous mosquitoes.

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

2 VACCINE-PREVENTABLE DISEASES

a Detection of wild polio virus in Nigeria

In August 2016 Nigeria reported two case of wild poliovirus type 1, after more than two years without any case of wild poliovirus in the African region (last case of wild poliovirus in Nigeria was July 2014). The cases were from Borno state in Jere and Gwarzo local government areas with dates of onset of paralysis on the 06 June 2016 and 13 of July 2016 respectively. One case was detected through finding wild poliovirus type 1 in the stools of a close contact. Genetic sequencing of the viruses suggests that the new cases are most closely linked to a wild poliovirus strain that was last detected in Borno in 2011. Subnational surveillance gaps persist in some areas of Borno, as well as in areas of neighbouring countries, due to inaccessibility.

For the whole year 2016 to date, these cases bring the number of wildtype polio cases globally to 21. The finding is a setback to the goal of polio eradication by 2018. The Emergency Committee under the

International Health Regulations has advised to extend the declaration of polio as a Public Health Emergency of International Concern. Immunization responses are planned in the Lake Chad subregion. The committee recommended specific guidelines for countries exporting polio virus (Pakistan, Afghanistan), countries infected with wild poliovirus (Nigeria) or vaccine-derived poliovirus (Nigeria, Guinea, Madagascar, Lao Peoples Democratic Republic, Myanmar) and vulnerable countries at risk (Equatorial Guinea, Cameroon, Somalia, Ukraine). People who are travelling to these countries are advised to be vaccinated at least 4 weeks before they travel.

For further information, please refer to <http://www.polioeradication.org/>

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

3 SEASONAL DISEASES

a The influenza season, South Africa, 2016

The influenza season which started in week 19 (week ending 09 May) continues. The first part of the season was dominated by influenza B, with increasing detections of influenza A(H3N2) as the season progressed. Recently a number of influenza A(H1N1)pdm09 cases were detected. Influenza A(H1N1)pdm09 has been amongst strains isolated during the South African influenza season since 2010. The public often refer to this strain as "swine flu". A number of enquiries have been made to the NICD regarding management and infection control of these cases. Influenza A(H1N1)pdm09 ("swine flu") has become established in South Africa as seasonal influenza and should be managed as described in current seasonal influenza guidelines. (See Healthcare workers handbook on influenza in SA-2016 available at www.nicd.ac.za)

To date (07 August 2016), influenza has been detected in 41% (293/711) of samples received from patients presenting at Viral Watch sentinel surveillance sites with influenza-like illness. Influenza A (not subtyped) was detected in one patient, influenza A(H1N1)pdm09 in 24, influenza A(H3N2) in 92, and influenza B in 176 patients. During the same period, influenza was detected in 6% (123/2231) of patients hospitalised for severe respiratory illness at 6 sentinel sites. Amongst these

patients, influenza A(H1N1)pdm09 was detected in the specimens of five, influenza A(H3N2) in 26 and influenza B in 92 patients.

The NICD is aware of at least two schools that have experienced an outbreak of confirmed influenza infection. One of these has been extensively investigated and will be reported on in the next Communiqué. Institutional outbreaks of influenza are not uncommon, and can impact the functioning of institutions. Persons with underlying risk factors including pregnant women, the elderly and those with underlying illness should receive pre-season vaccination.

The vaccine viruses recommended by World Health Organization (WHO) for the 2016-17 northern hemisphere influenza season are the same as those for the current southern hemisphere season, and include influenza A and B strains. The full report of the recommendations for the southern influenza vaccine can be accessed at: http://www.who.int/influenza/vaccines/virus/recommendations/201509_recommendation.pdf?ua=1

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

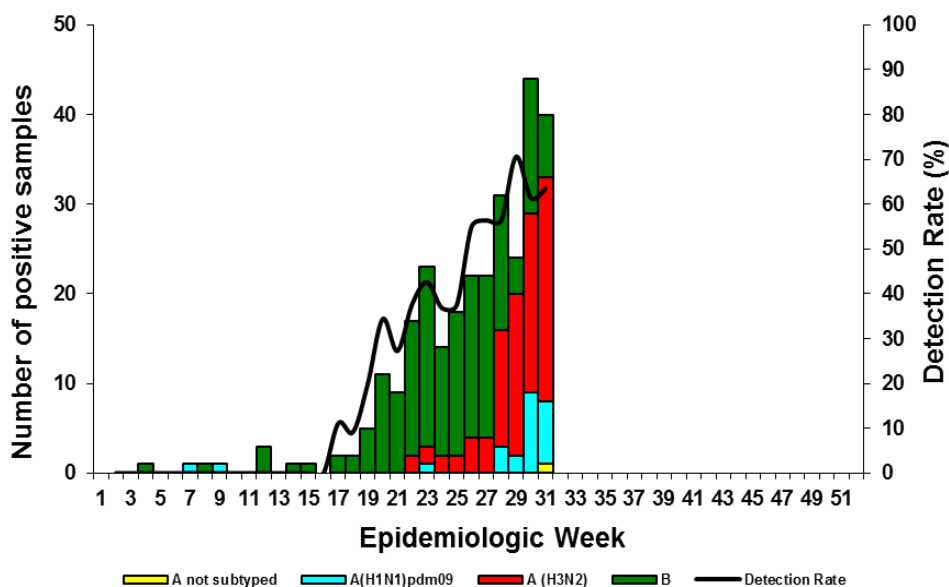


Figure 1. The number of influenza detections made by province as identified through the NICD Viral Watch sentinel surveillance programme 2016

b The rotavirus season, South Africa 2016

The 2016 rotavirus season officially began in week 28 (11 Jul) with rotavirus detected in 50-60% of the stool specimens submitted to NICD between 11 July and 14 Aug 2016 (Figure 1). Rotavirus detection rates above 20% were also noted in week 22 (30 May; 25%; 2/8) with rotavirus-positive specimens from the Eastern Cape site and week 24 (13 Jun; 33%; 4/12) with rotavirus-positive specimens from 4 sites (Eastern Cape, KwaZulu-Natal and Gauteng). The 2016 rotavirus season started much later than the 2015 (week 28 compared to week 20; 11 May).

It is well established that rotavirus diarrhoea will occur despite high vaccination coverage rates. Rotavirus vaccine is approximately 57% effective in preventing severe rotavirus diarrhoea, and 40% effective in children who have received a single dose of vaccine. It is estimated that 13 000-20 000

cases of severe diarrhoea in children under two years were prevented in the first two years after implementation of the vaccine. The rotavirus season appears to peak every 3-4 years, with the last peak in 2013. The periodicity of the rotavirus season may be related to an accumulation of susceptible children due to failure to vaccinate, partial vaccination and incomplete vaccine effectiveness.

Clinicians and parents should ensure that children are vaccinated against rotavirus. Health promotion activities to ensure public awareness of diarrhoea management, including oral rehydration solution during the rotavirus season, is essential.

Source: Centre for Enteric Diseases, NICD-NHLS; (nicolap@nicd.ac.za)

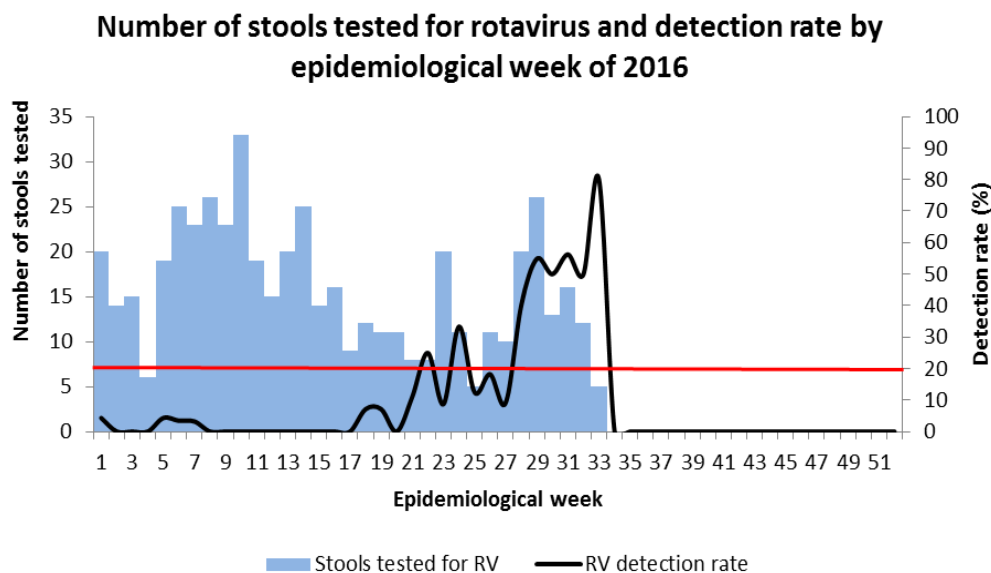


Figure 2. The rotavirus detection rate and the numbers of specimens tested by week for 10 rotavirus sentinel surveillance sites in South Africa.

4 ENTERIC DISEASES

a Typhoid fever cases at a home for mentally impaired persons

On 28 July 2016, the Outbreak Response Unit (ORU) was notified of two confirmed and one suspected case of typhoid fever in a home for mentally impaired persons in the City of Johannesburg, Gauteng Province. The two confirmed cases were diagnosed on blood culture. The ORU from the National Institute of Communicable Disease (NICD) together with the Johannesburg Health District Outbreak Response

team visited the home on 29 July 2016.

Approximately 200 adults live in the home, and sleep in dormitories of three to six beds. There is a kitchen on the premises where food is prepared. Food is served in a common dining hall. Staff members at the home were interviewed and typhoid fever case investigation forms were completed for the two confirmed cases. It was

noted that the two cases, who shared a room, were both transferred from another home for the mentally impaired in the month prior to the onset of illness, along with another 15 – 20 persons. None of the cases had travelled outside the home after admission. One case had been visited daily by a relative in the month prior to the onset of illness. A total of 18 rectal swabs was taken, 13 from close contacts of the cases and five from kitchen staff. Environmental samples were also taken and included water, fingernail swabs of staff members and food preparation surfaces in the kitchen. All rectal swabs were negative for *Salmonella* Typhi. At the time of this report, results of the environmental sampling were not available.

Typhoid fever is caused by infection with *Salmonella enterica* subspecies *enterica* serotype Typhi. It is spread via faeco-oral contamination and may

spread from person to person by direct contact or through ingestion of contaminated food or water. In this investigation, the source of infection has not been confirmed. The home from where the persons were transferred from and the visiting relative of the one case are possible sources of infection. Kitchen staff cannot be excluded since they do shift work and on the day of the visit, only one shift was present. Health promotion was conducted for staff and residents to prevent further spread of infection.

A total of 74 cases of typhoid fever has been confirmed in South Africa in 2016 to date (January to July 2016) with the majority (41, 55%) occurring in January and February 2016.

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

5 SURVEILLANCE FOR ANTIMICROBIAL RESISTANCE

a Update on carbapenemase-producing Enterobacteriaceae

The Antimicrobial Resistance Laboratory and Culture Collection (AMRL-CC) of the Centre for Opportunistic, Tropical and Hospital Infections (COTHI) at the NICD have 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. CPE surveillance is required to determine the extent of the problem as a first step in order to restrain the emergence and spread of CPE. For July 2016, a total of 102 Enterobacteriaceae isolates was received. Sixty isolates were screened, 53 of which expressed carbapenemases. Four isolates expressed two carbapenemases (Table 1). The majority of the isolates were *Klebsiella pneumoniae* (41) followed by *Enterobacter cloacae* (8).

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 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 submitted to the Antimicrobial Reference Laboratory Culture Collection (AMRL-CC), CO THI, NICD, July 2016 and January-June 2016

| Organism | NDM | | OXA-48 & Variants | | GES | |
|------------------------------|---------------|-----------|-------------------|-----------|---------------|-----------|
| | Jan-June 2016 | July 2016 | Jan-June 2016 | July 2016 | Jan-June 2016 | July 2016 |
| <i>Enterobacter cloacae</i> | 21 | 2 | 24 | 4 | - | - |
| <i>Enterobacter kobei</i> | 1 | 1 | 1 | - | - | - |
| <i>Escherichia coli</i> | 7 | - | 43 | 5 | - | - |
| <i>Klebsiella pneumoniae</i> | 171 | 11 | 231 | 29 | 3 | - |
| <i>Serratia marcescens</i> | 18 | 3 | 19 | 1 | 2 | 1 |
| Total | 218 | 17 | 318 | 39 | 5 | 1 |

NDM: New Delhi metallo-beta-lactamase; **OXA:** oxacillinase; **GES:** Guiana extended-spectrum 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 3 on page 8.

1. Influenza (H1N1) – Brazil

As of 17 August 2016, there have been 1233 deaths linked to the ongoing H1N1 influenza outbreak in Brazil. Other strains of influenza have claimed an additional 93 lives in Brazil. This is the largest outbreak of H1N1 influenza in Brazil since the 2009 pandemic, where the country saw 2060 deaths from the virus.

2. MERS-CoV – Saudi Arabia

As of 12 August 2016, there has been a total of 1445 laboratory-confirmed cases of MERS-CoV infection, including 608 deaths [reported case fatality rate 42.1 per cent] 833 recoveries, and 4 currently active cases.

3. Polio (wild poliovirus type 1) – Nigeria

On 11 Aug 2016, two polio cases (wild poliovirus type 1) detected in Nigeria, where it was believed to have been eliminated. See the article on page 3 in this Communiqué.

4. Hand, foot and mouth disease – Malaysia

As of 14 August 2016, a total of 23 454 hand, foot and mouth disease (HFMD) cases were reported throughout the country Malaysia. Selangor recorded the highest number of cases at 7471, followed by Sarawak (3007), Johor (2294) and Kuala Lumpur (2084).

5. Zika – USA

As of 14 August 2016, there were two new confirmed cases of Zika in Miami, Florida, amongst persons with no travel history. There have been 28 confirmed non-travel related cases to date in the area. The WHO has made information available on mass gatherings and information for tourists/athletes for Rio Olympics.

6. Yellow fever – Angola and Democratic Republic of Congo

As of 8 August 2016, the Democratic Republic of Congo has had 2269 suspected cases, of which 74 cases were confirmed and 11.5 million vaccine doses were approved for the DRC. Angola has 3867 suspected cases of which 879 cases were confirmed and 21 million vaccine doses were approved for Angola. See the article on page 2 in this Communiqué.

7. Japanese encephalitis – India

As of 15 August 2016, there have been 295 Japanese encephalitis cases with 66 casualties. Assam state is affected most.

8. West Nile fever – Italy, Israel, Russia and Romania

As of 15 August 2016, there have been 11 confirmed cases of West Nile fever. The origin of the cases was as follows: One case from Italy

(Bologna), one case from Russian, two cases from Romania and several cases from Israel. West Nile virus is a mosquito-borne flavivirus. Most human infections are asymptomatic and the majority of clinical cases of West Nile infections are mild and present with flu-like symptoms, including fever, headache and body aches. Severe West Nile fever

presents with encephalitis, meningoencephalitis or meningitis.

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

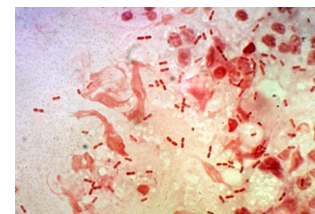
Figure 3. Current outbreaks that may have implications for travellers. Number correspond to text above. The red dot is the approximate location of the outbreak or event



7 PHOTOQUIZ



August photoquiz (left). This 4 year-old girl presented with fever, generalised malaise, and painful blisters in the mouth, palms of both hands, soles of the feet, and some blisters on her knees. What is the likely diagnosis?



July photoquiz (above, right). This 8 month-old infant presented with floppiness, hypothermia and failure to feed. A lumbar puncture was done, and a photograph of the Gram's stain of cerebro-spinal fluid is shown, revealing a polymorphonuclear exudate with Gram-negative coccobacilli. The most likely diagnosis is meningitis due to *Haemophilus influenzae*. Culture and serotyping or PCR will allow identification of the serotype. *Haemophilus influenzae* type b disease has largely been eliminated since the introduction of the vaccine in 2009. Of the 17 cases of *Haemophilus influenzae* type b in South Africa in 2015, 11 (65%) had not received a complete vaccination series. The remaining 6 cases in 2016 had other underlying disorders. This photo is courtesy www.eyemicrobiology.upmc.com