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 Update on rabies in Gauteng Province

In the past month, two dogs and one honey badger from the Mogale City and Randfontein surrounds were confirmed rabid (Data source: Agriculture Research Council — Onderstepoort Veterinary Institute/ARC-OVI). The honey badger (*Mellivora capensis*) attacked three dogs and two people in Swartkrans. The dog owners received rabies post-exposure prophylaxis, whilst the dogs were revaccinated against rabies. In a seperate incident on a nearby farm in Krugersdorp West, a Jack Russell terrier was found dead and subsequently tested positive for rabies. Another Jack Russell terrier found on the property was sick and euthenased on suspicion of rabies, which was later confirmed by laboratory testing. The remaining three dogs residing on the property were also euthenased. None of the animals had been vaccinated against rabies. Three members of the family residing on the farm were given rabies post-exposure prophylaxis. A total of 47 animals (5 dogs, 28 jackals, 2 cats, 1 horse, 9 livestock and 2 honey badgers) have been confirmed rabid in Gauteng since May this year to date (Data source: ARC-OVI MalepeK@arc.agric.za). No human cases have been associated with the increase in reports of animal rabies in the Province. Many potential cases of exposure have been reported and received rabies post-exposure prophylaxis. To date, a total of two human cases have been confirmed in South Africa, one case from KwaZulu-Natal Province and another from Free State Province.

It remains urgent that pet owners vaccinate their domestic animals (cats and dogs) against rabies and that persons who are exposed to sick animals seek immediate medical attention in order to assess the risk for rabies. For rabies post-exposure guidelines and more information on rabies in South Africa, visit www.nicd.ac.za

Source: Centre for Emerging and Zoonotic Diseases, NICD-NHLS; (januszp@nicd.ac.za); Agriculture Research Council — Onderstepoort Veterinary Institute/ARC-OVI

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

In Angola, between 5 December 2015 and 11 September 2016, the yellow fever outbreak has resulted in approximately 400 deaths amongst 4 100 suspected cases, 884 of which were laboratory confirmed. More than 2 000 suspected cases were reported from the Democratic Republic of Congo, of which approximately 60 laboratory confirmed cases were associated with travel to Angola. A rapid vaccination response was launched in Angola and DRC, but faced challenges on account of vaccine stock availability and production, and logistic resources to reach the large non-immune population quickly. This situation allowed the outbreak to spread for a period when there was not adequate vaccination coverage in the outbreak-affected areas.

Although there have been no new confirmed yellow fever cases in Central Africa in the past three months, the WHO has not yet declared the outbreak over. Mop-up vaccinations and surveillance of febrile encephalitis syndrome are ongoing, and a prospective coverage survey is to be implemented in selected districts of Angola. In addition, stringent implementation of vaccination requirements in travellers to and from yellow fever endemic areas will limit the spread of yellow fever and reduce the risk of importation into adjacent countries.

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

c Zika virus update

No new countries have been added to the list of countries reporting local Zika virus (ZKV) transmission. A total of 105 locally acquired ZIKV cases has been reported in Miami, Florida, United States of America since July 2016. ZIKV outbreaks and associated congenital brain abnormalities continue to be reported in the Latin American and Caribbean region, recently Saint Kitts and Nevis in the Caribbean.

In the Western Pacific Region outbreaks continue in 2016 in seven countries including Singapore with more than 200 cases confirmed. Seven other countries in the Western Pacific and South-East Asia Regions, including recently New Caledonia and the Maldives, have reported local mosquito-borne infections for which increased surveillance may partially account for. Guinea-Bissau and Cape Verde off the western coast of Africa remain the only African countries reporting outbreaks in 2016.

No ZIKV cases resulting from attendance at the 2016 Summer Olympics and Paralympics Games in Rio de Janeiro, Brazil, have been reported by any country. A number of members of the South African Olympic and Paralympic teams (symptomatic and asymptomatic) requested ZIKV testing upon return, with no evidence of infection detected in any tested thus far.

In accordance with WHO guidance, men and women returning from areas with ZIKV active transmission areas should adopt safer sex practices or consider abstinence for at least 6 months upon return and apply insect repellent for at least 3 weeks upon return to reduce the risk of onward transmission. Pregnant women and partners living in or visiting areas of active transmission must take preventive measures to avoid mosquito bites.

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

d A suspected case of MERS-CoV

Background

The Middle East respiratory coronavirus (MERS-CoV) syndrome is a viral respiratory illness with a high mortality that was first reported in Saudi Arabia in 2012. MERS-CoV infections are characterized by inter-personal spread through droplet and airborne routes and frequent nosocomial transmission.

On the 5 October 2016, the NICD received three specimens (induced sputum, a naso-phyaryngeal swab and blood) from a 63-year-old female admitted to ICU at a private hospital in KwaZulu-Natal Province. She had presented with a two-week history of cough, shortness of breath, and fever. Her symptoms had started a week after she had returned from Saudi Arabia where she hadworked as a nurse managing an isolation unit in a tertiary-care facility. The facility had managed over a hundred cases of MERS-CoV since 2012. On admission, her white cell count was $10.5x10^6$/ml, C-reactive protein was 10 mg/l, and a throat swab was negative for influenza, RSV and other respiratory viruses.

After being alerted to the possibility of MERS-CoV, the hospital placed the patient in a negative-pressure isolation room, implemented airborne infection prevention measures, and made a line-list of health care workers exposed to the patient. The patient was treated with broad-spectrum antibiotics, and later with a macrolide antibiotic. Following testing at the NICD, sputum, blood and nasopharyngeal swabs were negative on polymerase chain reaction for MERS-COV and other respiratory viruses. However specimens were positive for *Chlamydia pneumoniae*. The patient made an uneventful recovery.

This case underscores the need for a high index of suspicion for MERS-CoV infection amongst persons developing lower respiratory tract infections within 14 days of return from the Middle East, and the importance of implementing appropriate infection control measures until MERS-CoV infection is ruled out.

In South Africa, 19 samples have been tested for MERS-CoV in 2016 and none of these have been positive. Globally, the World Health Organization (WHO) has been notified of a total of 1806 laboratory-confirmed cases of infection with MERS-CoV from 27 countries, including 643 deaths, as at 21 September 2016. To date all cases reported have been linked to countries in the Arabian Peninsula, with majority of cases reported from Saudi Arabia.

Indications for testing

Guidelines for the diagnosis (including case-definitions), case management and infection control and prevention of MERS-CoV in health care facilities can be accessed at the NICD webpage: http://www.nicd.ac.za/?page=guidelines&id=73

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

2 VACCINE-PREVENTABLE DISEASES

a Tetanus in an unvaccinated 11-year-old child from Free State Province

In August 2016, an 11-year-old child presented to a Free State district hospital with a two-day history of generalised body pain, particularly in her trunk and back. She was also experiencing episodes of spasms and cramps which were initially thought to be seizures. However an experienced doctor observed that she remained fully alert during the episodes, and suspected tetanus. The patient was referred to a tertiary hospital where a clinical diagnosis of tetanus was made.

On admission, the patient was acutely ill, in opisthotonus, had a clenched jaw and increased oral secretions. A healing wound with scar tissue was found on the sole of her foot. Tetanus toxoid and immunoglobulin were administered. She was lethargic, and during spasms, she developed laryngospasm and became hypoxic. Benzodiazepines were initiated but frequent spasms necessitated muscle relaxation and intubation. Excessive secretions threatened airway (endotracheal tube) patency and she developed obstructive apnoea and respiratory acidosis. She developed cardio-respiratory arrest on two occasions, necessitating reintubation and cardio-pulmonary resuscitation.

While in ICU she developed generalised convulsions. Autonomic instability with severe hypertension (systolic blood pressures reaching 200 mmHg) was managed with amlodipine and labetalol. Other complications included urinary tract infection (*Enterococcus*), multiple ventilator-associated pneumonias (*K. pneumoniae, Pseudomonas, A. baumanni* only sensitive to colistin) and two failed extubation attempts after 4 weeks' ventilation. Six weeks after admission she was extubated and had a tracheostomy inserted in October 2016.

Week eight post-admission, the patient is in the general ward, alert and able to communicate. Despite daily physiotherapy and occupational therapy she has developed contractures, lost muscle mass and will require intensive rehabilitation. Full recovery is expected to take months.

On detailed enquiry, it was established that the patient's 'Road to Health Card' had been lost, and apparently no immunisations had ever been given. A catch-up programme of immunisation will be administered prior to discharge, including diphtheria-tetanus vaccine (TdaP-IPV, if possible), measles, hepatitis B, and the 13-valent conjugate pneumococcal vaccine.

This case highlights the importance of adherence to the expanded programme of immunisation, and clinician awareness regarding the diagnosis and management of tetanus.

Source: Attending clinicians.

3 SEASONAL DISEASES

a The influenza season, South Africa, 2016

The 2016 influenza season which started in week 19 (the week starting 09 May 2016), when the Viral Watch detection rate rose to 19%, has peaked in week 35 (week starting 29 August) and is beginning to decline.

To date (14 October) influenza has been detected in 532/1105 (48%) individuals who presented with influenza-like illness (ILI) and were tested for influenza at the viral watch sentinel surveillance sites. The 2016 influenza season has been dominated by influenza B, comprising 40% (213/532) of detections, with majority of the influenza B cases detected during the 1st part of the season. There has also been co-circulation of influenza A(H1N1)pdm 09, influenza A(H3N2) and influenza B during the latter part of the season.

The WHO has made the recommendation for the composition of influenza virus vaccines for use in the 2017 southern hemisphere influenza season. The following strains are recommended for the vaccine:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
- an A/Hong Kong/4801/2014 (H3N2)-like virus; and
- a B/Brisbane/60/2008-like virus

These recommendations include an updated strain of influenza A(H1N1)pdm09 compared to the 2016 southern hemisphere influenza vaccine. The update includes a replacement of the A/California/7/2009 (H1N1)pdm09-likevirus component with an A/ Michigan/45/2015 (H1N1)pdm09-like virus.

Recommendations can be accessed at: http://www.who.int/influenza/vaccines/virus/recommendations/201609_recommendation.pdf?ua

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

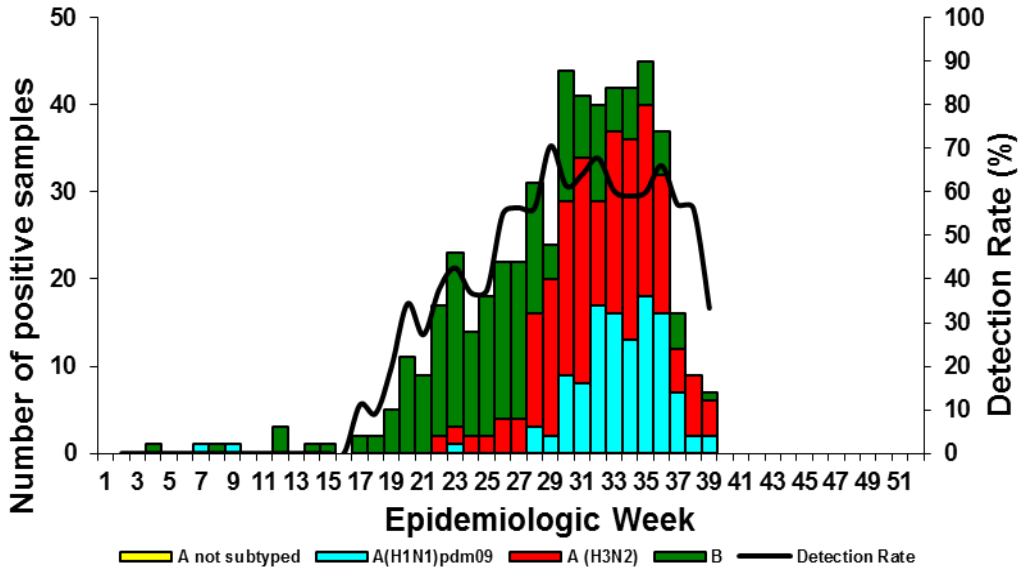

Figure 1. Number of influenza types and subtypes and detection rate by week, influenza–like illness surveillance, Viral Watch, 2016

b Rotavirus season 2016

The 2016 rotavirus season began in week 28 (11 Jul) and ended in week 36 (11 Sep). The 2016 season started later (week 28 in 2016 compared to week 20 (11 May) in 2015) and was shorter (9 weeks in 2016 compared to 20 weeks in 2015) than the 2015 season.

For epidemiological weeks 1 - 41, the numbers of stools testing positive for rotavirus continues to be lower in 2016 (17.7%; 107/605) compared to 2015 (22.4%; 160/715).

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

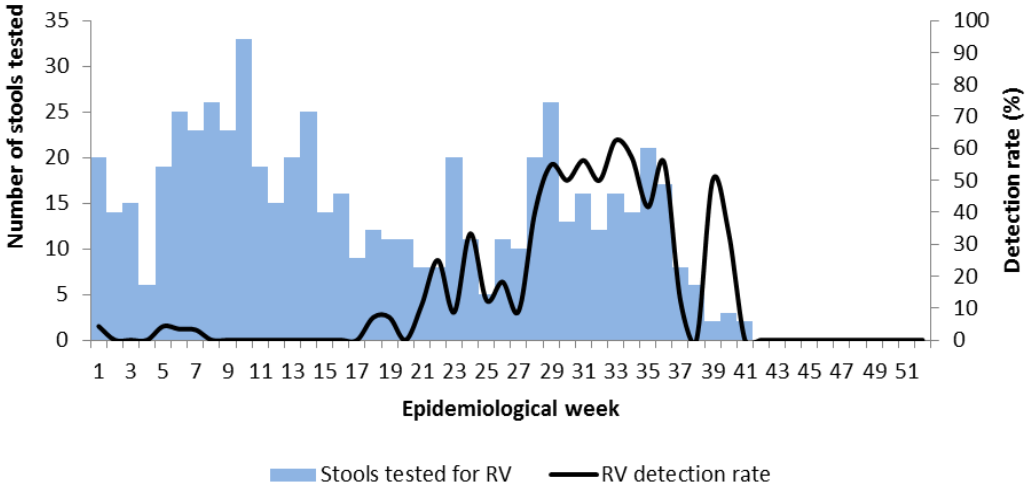

Figure 2. The rotavirus detection rate and the numbers of specimens tested by week for 9 sentinel surveillance sites in South Africa.

c Malaria: update on elimination campaign

The Malaria Control Programme of the National Department of Health indicates that 255 malaria cases with a single fatality were reported in September 2016, compared with 415 cases and 4 deaths in the same time period 2015. Amongst these 255 cases, 225 (88%) were imported, 17 (6%) cases were locally acquired and the remaining cases were unclassified. During the same time period in 2015, 134 cases (32%) were locally acquired. The distribution of locally acquired *vs* imported cases is shown in Figure 3.

These data bode well for South Africa's commitment to halting local malaria transmission within its borders by 2018. Cellular phone-based reporting of malaria cases (MalariaConnect), implemented over the recent malaria season has contributed to the objectives of the elimination strategy – namely, 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 reduce mosquito vector density in transmission areas, while larviciding is conducted in some breeding sites.

With the anticipated rainy season, it is likely that the number of cases will increase. Travellers to malaria-endemic areas are advised to take chemoprophylaxis and implement measures to prevent mosquito bites (such as application of DEET -containing mosquito repellent, covering skin at dawn and dusk and sleeping under insecticide-impregnated bed nets).

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

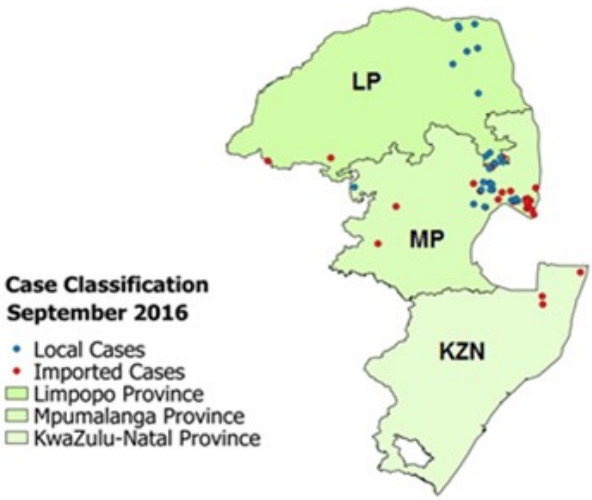

Figure 3. Distribution of imported (red dots) and local (blue dots) of malaria cases in three RSA provinces in September 2016. Cases are geolocated based upon the place of notification. Only cases that have been notified from a facility with known coordinates are included. (LP=Limpopo Province; MP=Mpumalanga Province; KZN=KwaZulu-Natal Province)

4 ENTERIC DISEASES

a *Clostridium difficile* cases at a hospital in the Eastern Cape Province

Clostridium difficile is a Gram-positive, anaerobic, spore-forming bacillus which a leading cause of nosocomial-associated gastrointestinal illness. On 28 August 2016, a TB hospital in the Eastern Cape Province notified the district's Outbreak Response Team of a cluster of eight cases of diarrhoea due to *C difficile*. The presumptive index case (EM001, Figure 4) had presented to the hospital on 22 July 2016 for management of tuberculosis. The patient subsequently developed diarrhoea, and by 24 August 2016, seven patients were symptomatic. Stool specimens were sent to a NHLS laboratory for microscopy, culture and sensitivity testing and yielded no pathogen. It was later decided to test for *C. difficile* by PCR and the diagnosis was confirmed. Figure 4 demonstrates the time between admission of patients (EM001-EM008) and the onset of symptoms. These data, and the location of patients in adjacent wards suggest that the organism was transmitted within the healthcare facility, most

likely through breaches in adherence to infection control.

The facility responded by cohorting patients with diarrhoea in isolation areas until they became asymptomatic. Routine disinfection of the environment and contact infection control measures were strengthened. Awareness was raised regarding basic hand hygiene and disinfection practices. Antibiotic usage in patients was reviewed. Patients were made aware of the need for infection control and handwashing. Nurses were requested to report and monitor loose stools, observed during nappy changes.

The NICD Provincial Epidemiologist, Outbreak Response Unit and a Field Epidemiology Training Programme resident supported the hospital team through provision of information, guidelines on responding to clusters of cases of *C. difficile* cases, training and report writing. This investigation also emphasized the importance of continued diarrhoeal surveillance by the district office surveillance unit.

Source: Field Epidemiology Training Programme, Provincial Epidemiologist, Eastern Cape Province, Outbreak Response Unit, NICD-NHLS; Nelson Mandela Metro Bay Department of Health; Eastern Cape Provincial Department of Health; (outbreak@nicd.ac.za)

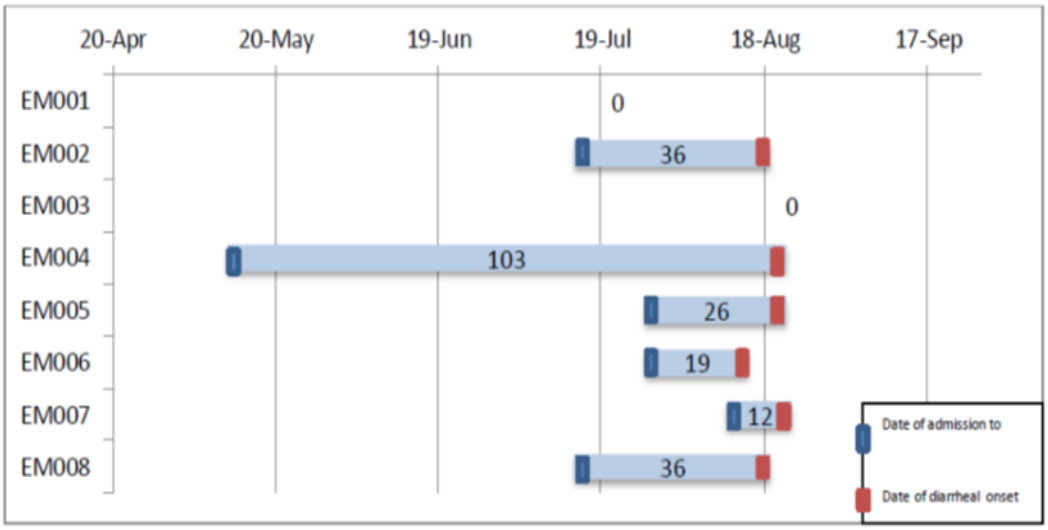

Figure 4. Gannt chart showing the time between hospital admission of the 8 patients (EM001-EM008) and first onset of diarrhoea (at a TB Hospital in NMBM, 2016)

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. We receive clinically significant isolates from all specimen types based on antimicrobial susceptibility testing criteria for molecular confirmation. For September 2016, a total of 103 Enterobacteriaceae isolates were received. Sixty-eight isolates were screened, 57 of which expressed carbapenemases. No isolate expressed multiple carbapenemases (Table 1). Majority of the screened isolates were *Klebsiella pneumoniae* (49) 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 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, September 2016 and January-August 2016

Organism	NDM		OXA-48 & Variants		KPC	
	Jan-Aug 2016	Sept 2016	Jan-Aug 2016	Sept 2016	Jan-Aug 2016	Sept 2016
Citrobacter freundii	6	-	4	1	-	1
Enterobacter cloacae	26	-	31	1	1	-
Escherichia coli	9	-	56	8	-	-
Klebsiella pneumoniae	222	13	303	31	3	-
Klebsiella spp.	-	-	1	1	-	-
Morganella morganii	4	-	2	-	-	-
Serratia marcescens	26	1	22	-	-	-
Total	**293**	**14**	**419**	**42**	**4**	**1**

NDM: New Delhi metallo-beta-lactamase; **OXA**: oxacillinase; **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 5 on page 9.

1. Diphtheria – Venezuela: (Bolivar) Resurgence

As of 14 October 2016, 13 cases of diphtheria were confirmed in the Bolivar state of Venezuela. To date, 22 children have died in Venezuela since the outbreak was identified. A vaccination campaign is ongoing.

2. Legionellosis – USA

As of 14 October 2016, a total of 23 cases of Legionnaires' disease in Minnesota, USA. The most recent illness onset date for known cases is 22 September 2016.

3. Anthrax- Zambia

On 6 October 2016, a total of 44 hippos was confirmed to be killed by anthrax in the Chama district of Zambia.

4. Polio—Nigeria

On 9 October 2016, an 8-year-old from the Sujawal district of Nigeria was confirmed to have poliomyelitis. There has been a total of four cases to date.

5. Influenza update — international
The WHO global seasonal influenza update on 4 September 2016 reported ongoing influenza circulation in southern hemisphere countries, with influenza activity in the temperate zone of the northern hemisphere at inter-seasonal levels. For more detail refer to http://www.who.int/influenza/surveillance_monitoring/updates/latest_update_GIP_surveillance/en/

6. Crimean-Congo haemorrhagic fever – Pakistan
As of 14 October 2016, 71 confirmed Crimean-Congo hemorrhagic fever patients were reported in Karachi (Pakistan), with nine fatalities.

7. Lassa fever - Nigeria
As of 14 October 2016, seven suspected cases of Lassa fever and three deaths (CFR, 42.86%) were reported in three Nigerian states. As of week 26 (ending 1 July 2016) 823 cases have been reported, of which 80 have been confirmed. There have been 96 reported deaths.

8. Cholera—Africa and Haiti
Following Hurricane Matthew, cases of cholera have been reported in Haiti, but exact numbers are still to be determined. Confirmed cholera outbreaks are ongoing in Nigeria (Lagos State, 155 suspected and 13 confirmed cases), and DRCongo (Maniema Province, 22 144 suspected cases, 669 deaths)

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

Figure 5. 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

Photo courtesy http://www.healthline.com/health/measles

October Photoquiz (above, left). This 3 year-old-child presented with spasms, stridor and hypoxia. What is the diagnosis and how would confirm it? Please send an email to kerriganm@nicd.ac.za with the words 'October Photoquiz' in the subject line.

September Photoquiz (below, left). This 3 year-old girl presented with a fever of 39.5°C, a morbilliform rash, conjunctivitis and a runny nose. This patient could have measles, because she meets the case definition for measles (fever, rash, with one of cough, conjunctivitis or coryza). It is critically important to manage her according to EPI guidelines (page 82). The patient should have blood taken for measles IgM (sent to NICD) and have a case investigation form completed (from NICD website www.nicd.ac.za). Contacts should be investigated, and vaccination of all persons up to 15 years who have been in contact with the suspected measles case should be conducted.