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Division of the National Health Laboratory Service

Communicable Diseases Communiqué

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CONTENTS

1 ZOONOTIC AND VECTOR-BORNE DISEASES

a Crimean-Congo haemorrhagic fever

The NICD has confirmed a third case of Crimean-Congo haemorrhagic fever (CCHF); the previous cases were reported late in 2016 and early in 2017 respectively.

The patient is a 54-year-old farmer from Steynsrus, Free State Province. The man developed fever and headache on 23 January and epistaxis about a week later. He reported to his local general practitioner, who suspected CCHF. CCHF occurs most frequently among farmers and agricultural workers in South Africa, following the bite of an infected tick or to a lesser extent, from exposure to blood during slaughter of livestock animals. A petechial rash was noted on his lower limbs. On the basis of his clinical presentation and profound thrombocytopenia (platelet count $5x10^9$/L), elevated transaminases and exposure to animals, CCHF testing was carried out. The diagnosis of CCHF was confirmed on 1 February by positive PCR and serology (IgG 1:1000, IgM 1:100) results at the NICD. The patient made an uneventful recovery and there were no secondary cases.

Since 1981, when CCHF was first recognised in South Africa, on average 5 to 6 (range 1-15) sporadic cases have been confirmed each year.

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

b Rabies

No cases of human rabies have been confirmed in South Africa for 2017 to date. Animal rabies cases continue to be reported from several locations in the country. During the month of February, several cases of rabies in bovines have been reported from the North West and Mpumalanga provinces (data source: ARC-OVI). Such cases are often associated with occurrence of rabies in jackals with spillover into cattle. In the Northern Cape Province, rabies was confirmed in a serval (also commonly known as "tierboskat"; data source: ARC-OVI). Several cases of rabies in domestic dogs, bovines and jackals have been reported in February from the south-eastern districts of KwaZulu Natal (KZN), bordering on Lesotho and the Eastern Cape (data source: APVL). A case of rabies in a dog was also reported from Heatonville (KZN), located close to Empangeni on the eastern seaboard. Cases were also reported from the Eastern Cape, Province, respectively from Mtatha (dog) and Nyandeni (bovine).

For more information regarding prevention of human rabies cases through the application of rabies post-exposure prophylaxis, please visit the NICD website at www.nicd.ac.za

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

c Yellow fever

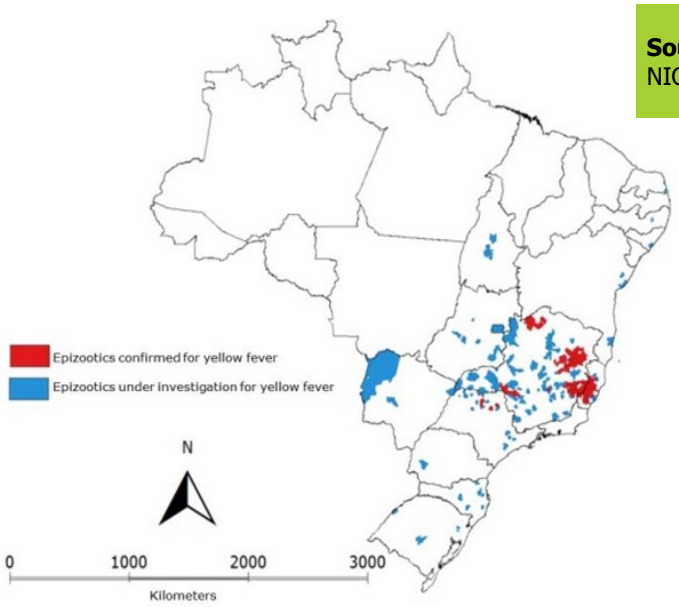
Yellow fever is endemic in the Amazon Basin in South America that comprises much of northwestern Brazil, about 40% of the country. In the rain forest the virus circulates in monkeys, transmitted by *Haemagogus* mosquitoes. Human infection associated with this sylvatic cycle occurs at low frequency in unimmunized people when they are exposed to infected mosquito vectors through working in forested areas. Periodically, approximately every seven years, there are 'spillover' epidemics in rural areas bordering the endemic enzootic forest during hot and rainy periods, from September to March.

Since December 2016 there has been an outbreak in southeastern Brazil, predominantly in Minas Gerais State (84% of cases), and to an extent in the states of Bahia, Espirito Santo, Rio Grande do Norte, São Paulo and Tocantins. Between 1 December 2016 and 22 February 2017, there were more than a thousand suspected cases of yellow fever reported of which 292 were confirmed, with 101 deaths amongst confirmed cases (35%).

These rural outbreaks typically decline spontaneously after some time as population immunity increases. The decline is normally hastened by mass yellow fever vaccination. Of concern is the risk of urban 'spillover', with infection of *Aedes* mosquitoes and rapid spread in densely populated urban areas. A mass vaccination campaign is ongoing in affected areas. A yellow fever vaccination is a requirement for all travellers between South Africa and Brazil.

For more information on the yellow fever outbreak in Brazil visit PAHO/WHO website at: http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=38226&lang=en

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



Source: Published by Brazil Ministry of Health

Figure 1.
Distribution of yellow fever epizootics. Brazil, 1 December 2016 to 22 February 2017

d Tick bite fever

A 36-year-old teacher from Kroonstad, northern Free State Province, developed fever, myalgia, headache, abdominal pain two weeks after camping in a rural area, east of Kroonstad. On day 5 of illness he consulted a medical practitioner, was prescribed antibiotics, did not improve and was hospitalized on 9th of February 2017. On admission, he had a leucopenia (white cell count of 3.26 X 10^9/l), worsening thrombocytopenia (from 132 X 10^9/l to 100 X 10^9/l) and marginally raised liver enzyme levels (AST, 79 U/l and ALT 120 U/l). Both Crimean-Congo haemorrhagic fever (CCHF) and tick bite (TBF) fever were considered as possible causes based on the epidemiology and results of the full blood count and liver function tests. Laboratory tests for CCHF were negative by PCR and serology. Acute febrile illness 2 weeks post-camping together with a key finding of an eschar on the patient's leg supported the diagnosis of tick bite fever, despite negative molecular tests on blood and a swab taken from the eschar and negative serology for rickettsial infection taken during the acute phase of the

illness. Antibiotics may have affected the molecular test results. Serology testing on convalescent serum is recommended to confirm the diagnosis.

The patient recovered on doxycycline treatment. Tick bite fever is a fairly common bacterial disease transmitted by ticks in South Africa (and elsewhere). *Rickettsia conorii* and *Rickettsia africae* are known causative agents of tick bite fever in South Africa, the latter usually being associated with milder disease. *R. africae* is typically associated with ticks that may be found on cattle and wildlife (such as African 'bont' ticks) and as such more frequently reported from rural settings in the country. *R. conorii* on the other hand can be transmitted by dog ticks and can be found in peri-urban and peri-domestic settings. Given prevailing weather conditions in many parts of South Africa (increased rainfall and warm temperatures), an increase in tick populations constitute an increased risk of exposure to the disease.

The recommended treatment of tick bite fever is doxycycline, which should be provided on clinical suspicion of the disease. Diagnosis is often made on clinical grounds only, particularly in the presence of an eschar accompanied by acute febrile illness. Serological testing is only useful after the first week of illness. PCR for rickettsiae on an eschar swab is helpful during the acute phase of illness.

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

Figure 2.
A course maculopapular rash often associated with tick bite fever. The rash may also be noted on the palms and soles.

e Cluster of Sindbis cases in northern Johannesburg, January-February 2017

Predominantly adult cases presenting with a generalised maculopapular rash were reported by several dermatologists from the northern suburbs of Johannesburg starting late January 2017. Additional clinical signs may include a mild fever, arthralgia, headache, nausea, myalgia and/ or severe fatigue. An outbreak investigation was initiated by the Outbreak Response Unit (ORU) of the National Institute for Communicable Diseases (NICD). Several viral agents could be implicated in such a clinical presentation. Differential laboratory diagnosis concerned hand, foot-and-mouth disease (caused by a Coxsackie virus) and arthropod-borne virus (arbovirus) infections. Laboratory testing performed at the Arbovirus Reference Laboratory, Center for Emerging and Zoonotic Diseases, NICD confirmed infection with Sindbis virus in middle February. A total of 29 suspected cases has been subjected to laboratory testing, of which 9 have been confirmed by serological results as Sindbis virus infection. Further analysis and molecular testing are underway. The viremia caused by Sindbis virus infection is low and transient, necessitating rather the testing of paired patient samples (collected 14 days apart) by serological assays in most suspected cases. The disease caused by Sindbis virus is generally self-limiting and mild in nature. Sindbis virus transmission has most probably increased due to an increase in the mosquito population after the heavy rains received during November to January after the 2016 drought. The affected area is suburban with numerous green areas and water sources.

West Nile virus was confirmed by PCR and serology in a farmer's wife, resident on a farm in the Northern Cape Province, who presented with fever, myalgia, arthralgia and a diffuse maculopapular rash. The patient made an uneventful recovery.
Cases of West Nile fever are well described in South Africa and are typically mild and self-limiting, with only rare cases of encephalitis reported.

Sindbis and West Nile fever are commonly reported simultaneously since the viruses are transmitted by the same mosquitoes.

There is no specific treatment for these arbovirus infections and patients are managed symptomatically. Prevention hinges on the use of insect repellents particularly to avoid daytime exposures.

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

f A case of suspected MERS CoV

On 10 February the NICD received a request for Middle East respiratory syndrome coronavirus (MERSCoV) laboratory testing from a private laboratory. The patient was a previously healthy 50 -year-old male, who had returned to South Africa 10 days previously. He had travelled to Jeddah, Mecca and Medina for 3 days and did not report any exposures to health care facilities or camels. He developed upper respiratory tract symptoms 5 days after his return that did not respond to antibiotic treatment. He was admitted on 8 February with fever and pneumonia. Blood cultures and influenza PCR on respiratory samples were negative. A nasopharyngeal aspirate was sent to NICD for testing for MERSCoV and tested negative on 11 February. By 13 February the patient was clinically improved and was discharged well.

MERSCoV is an emerging infectious disease which causes severe respiratory illness. It was first identified in September 2012 in a 60-year-old patient from Jeddah, Kingdom of Saudi Arabia, who died from a severe respiratory infection in June 2012. It is important to consider MERSCoV in the differential diagnosis of patients with pneumonia who have a travel history to the Arabian Peninsula within the last 14 days. A history of admission to or working within health care facilities, or close contacts with camels, are additional factors that may increase the index of suspicion. If MERSCoV is suspected, early isolation with strict airborne precautions is essential until the diagnosis has been excluded. The NICD offers free testing for MERSCoV for any suspected cases meeting the case definition. The preferred specimen is a lower respiratory tract sample such as sputum or bronchoalveolar lavage but upper respiratory tract specimens such as nasopharyngeal aspirates can be tested. All cases must be discussed with the NICD doctor on call to confirm if testing is indicated, before specimens are submitted. There is no specific therapy and treatment is supportive. Detailed guidelines for MERSCoV case finding can be found at http://www.nicd.ac.za/assets/files/Guidelines%20for%20MERS-CoV%20_24%

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

2 VACCINE-PREVENTABLE DISEASES

a Measles in Western Cape Province

The NICD, National Department of Health (NDOH) and Western Cape provincial and district authorities are working together to contain a measles outbreak in the Stellenbosch sub-District of the Cape Winelands. A single case in a high school learner in a Stellenbosch school was diagnosed and reported in mid-January 2017, followed by 5 cases within the next two weeks. Three schools were identified for an immediate measles vaccination campaign and over 2,000 consenting learners and staff members were vaccinated on Friday 3rd February 2017. As of 22 February, 22 laboratory-confirmed cases have been identified (Figure 3), all but one of which have an identifiable association with the school. A provincial wide vaccination campaign is currently being planned by the Western Cape Provincial government together with the support of the NDOH, starting with children under-five in high-risk communities.

Health care workers across the country are advised to be on the alert and to submit a blood sample together with a completed case investigation form (available on the NICD website) for measles testing to their laboratory for all suspected measles cases. Health practitioners should also notify their district Communicable Diseases Co-ordinator or the Infection Prevention and Control officer of their local private or public hospital telephonically, if they suspect a case.

The case definition of a suspected measles case is: Any person with a fever of 38°C or more,

AND

a generalised maculo-papular rash, with any of:

- cough;
- conjunctivitis (red eyes) and
- coryza (runny nose)

Parents are advised to be sure that their children are up to date with their vaccinations. In the public sector, measles vaccination is given free of charge at 6 months of age, with a booster at 12 months. For persons who have missed a dose of measles vaccine – it is never too late to catch up! In the private sector, measles vaccination is available as part of the 'MMR' (measles, mumps and rubella)

vaccine between 12-18 months of age. For more formation on measles and measles vaccination, please visit the NICD website: www.nicd.ac.za.

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

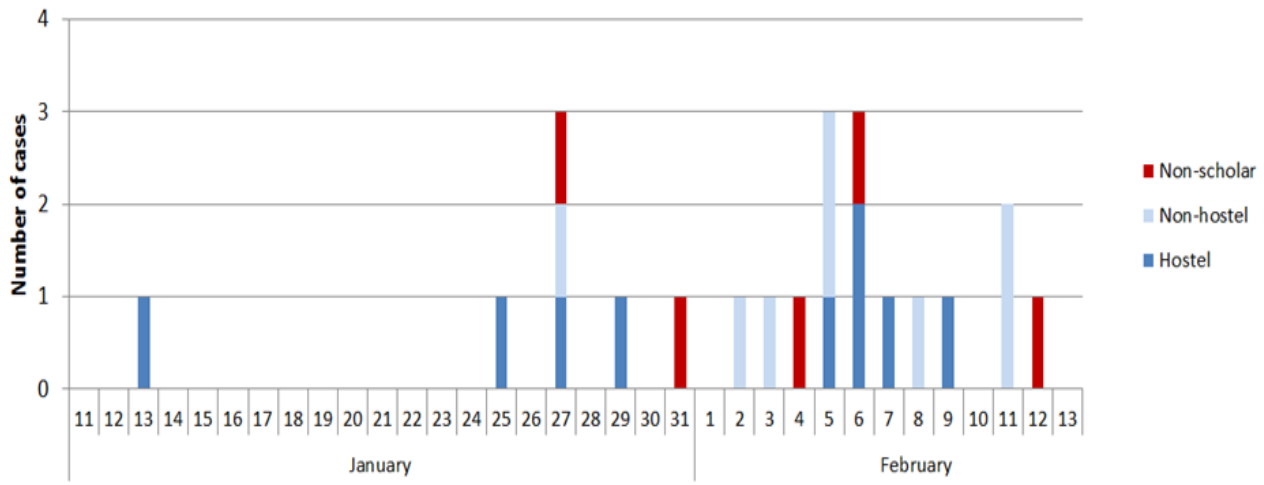


Figure 3. An epidemiological curve illustrating the number of laboratory-confirmed measles cases as of 22 February 2017 identified at a school in the Western Cape Province, January-February 2017.

3 SEASONAL DISEASES

a Global influenza update

Influenza activity in many countries in Europe, East Asia and northern Africa appears to have peaked, but in the rest of the northern hemisphere activity continues to be elevated. Influenza A(H3N2) remains predominant and the majority of influenza viruses characterised were antigenically similar to the reference virus contained in the 2016/17 season vaccine.

In South Africa, the influenza season has not yet started though sporadic detections of influenza A (H3N2) have been made from travellers returning from the northern hemisphere, or persons in contact with travellers.

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

b Malaria

Malaria in South Africa is highly seasonal. Incidence is highest in the summer months during which malaria vector mosquito populations proliferate owing to increased rainfall and higher temperatures. Local transmission primarily occurs in the low-altitude border regions of Limpopo, Mpumalanga and KwaZulu-Natal provinces, while significant numbers of imported cases are reported from non-endemic areas, particularly Gauteng Province. There was a four-fold increase in notified cases in January 2017 compared to December 2016 (Figure 4, courtesy of the Malaria Directorate, NDoH). Although this trend is expected at this time of year, it is of particular concern that the number of cases acquired locally in January 2017 (n=927) is seven times higher than those recorded in January 2016 (n=131). The areas most affected by increased local transmission were the Vhembe and Mopani districts of Limpopo and the Bushbuckridge district of Mpumalanga. Interestingly, no local malaria cases were recorded in KwaZulu-Natal during January 2017. Unfortunately, seven malaria fatalities were recorded during January 2017. Malaria incidence in South Africa may increase

further during the coming months owing to the alleviation of drought conditions and increased summer rainfall.

Source: Centre for Opportunistic, Tropical and Hospital Infections, NICD-NHLS; (johnf@nicd.ac.za)

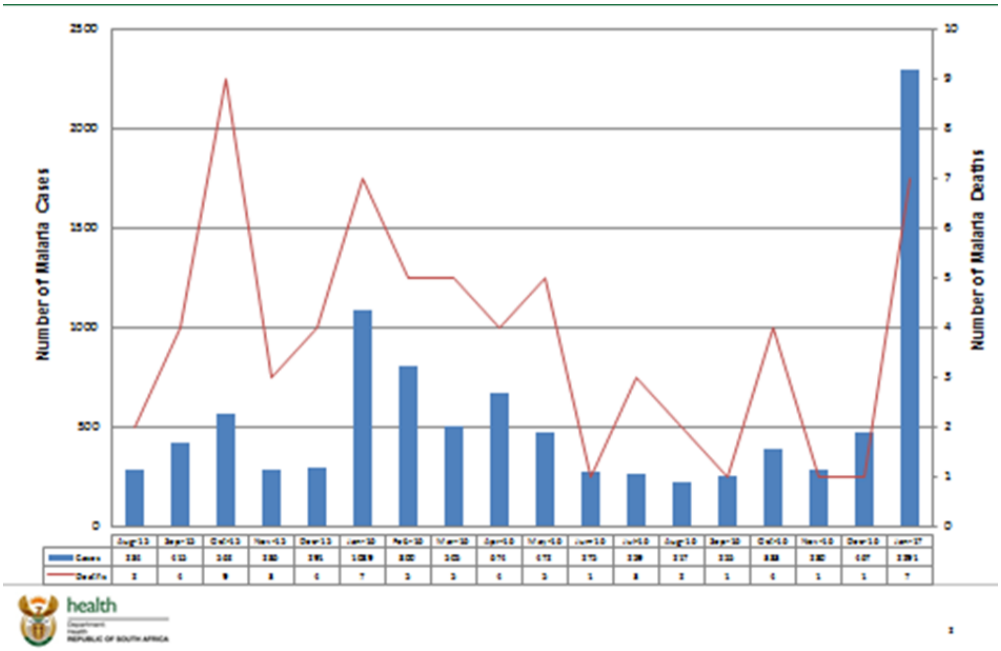


Figure 4. Malaria cases and deaths, all provinces, South Africa, August 2015-January 2017

c Odyssean malaria

On the 18th January 2017, the Outbreak Response Unit was notified of a case of malaria at Dr Yusuf Dadoo Hospital, Gauteng Province. A team comprising members from NICD, District Health Services, Environmental Health and CDC programmes conducted a malaria case investigation at Greenhills and Pelzvale, Randfontein.

The patient, a 16-months-old girl residing at Greenhills, with no history of recent travel to malaria affected regions, presented with fever and vomiting on the 6th January 2017. This was after a short visit to her grandparents in Pelzvale, Randfontein. An astute nurse recommended a malaria test and subsequent tests confirmed presence of *P. falciparum.* She was immediately transferred and admitted at Leratong Hospital for treatment.

An entomological investigation was conducted at the parents' and grandparents' residences and surrounds. All mosquito larvae collected at the case-patient residence were identified as *Culex* spp. and malaria vectors (*Anopheles* spp.) were not found at any of the two sites.

It is possible that the case-patient acquired malaria from the bite of an infective *Anopheles* mosquito inadvertently translocated from a malaria endemic area via a vehicle such as a minibus, car or bag – thus this is an odyssean malaria case rather than any evidence of local transmission. Based on the date of onset of illness (3rd Jan 2017), it is likely that she was infected while visiting grandparents from 17-20th December 2016. Of possible relevance is that her visit was just two days after a long-distance minibus was in the area picking up travellers, amongst them a neighbour that was diagnosed with malaria (8th Jan 2017) shortly after his return from Zimbabwe.

The malaria season (Sept-Apr) in South Africa overlaps two festive seasons, characterised by heavy traffic to and from the malaria-endemic areas in South Africa and the neighbouring countries (Mozambique, Zimbabwe). Thus an unusual malaria case in non-endemic area can be expected, particularly when travellers return to Gauteng Province. Healthcare practitioners are encouraged to be vigilant with respect to malaria in all patients presenting with unexplained fever (>38°C) and flu-like illness, even in the absence of a travel history.

Source: Centre for Opportunistic, Tropical and Hospital Infections, NICD-NHLS; (johnf@nicd.ac.za)

4 ENTERIC DISEASES

a Typhoid fever in South Africa

To date a total of 21 laboratory confirmed typhoid fever cases has been reported in four provinces in South Africa: Gauteng, Limpopo, KwaZulu-Natal and Western Cape. The majority of the cases occurred in January in Gauteng Province (Figure 5). One death in an 11-year-old patient from Gauteng Province was reported. Age was reported in 21 patients. Ages ranged between 33 months and 43 years: 0-4 years, n=3 (14.3%), 5-14 years, n=8 (38.1%), 15-54 years, n=10 (47.6%). Females accounted for 57% (n=12). A travel history to Zimbabwe was reported by one patient from Western Cape. Eighteen of 21 patients (85%) were confirmed as typhoid fever on the isolation of *Salmonella enterica* serotype Typhi from blood culture. Molecular subtyping using PFGE analysis is routinely performed on all *Salmonella* Typhi; a database of diverse PFGE patterns has been established, which has proved invaluable in relating isolates and monitoring for emergence of new strains and clusters. PFGE analysis has assisted to show importation of typhoid cases from neighbouring countries and overseas countries, as well as assist in local outbreak investigations. For 2017, PFGE has been performed on 15 isolates and showed a total of eight PFGE patterns; six isolates showed PFGE patterns resembling the Zimbabwean outbreak pattern.

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

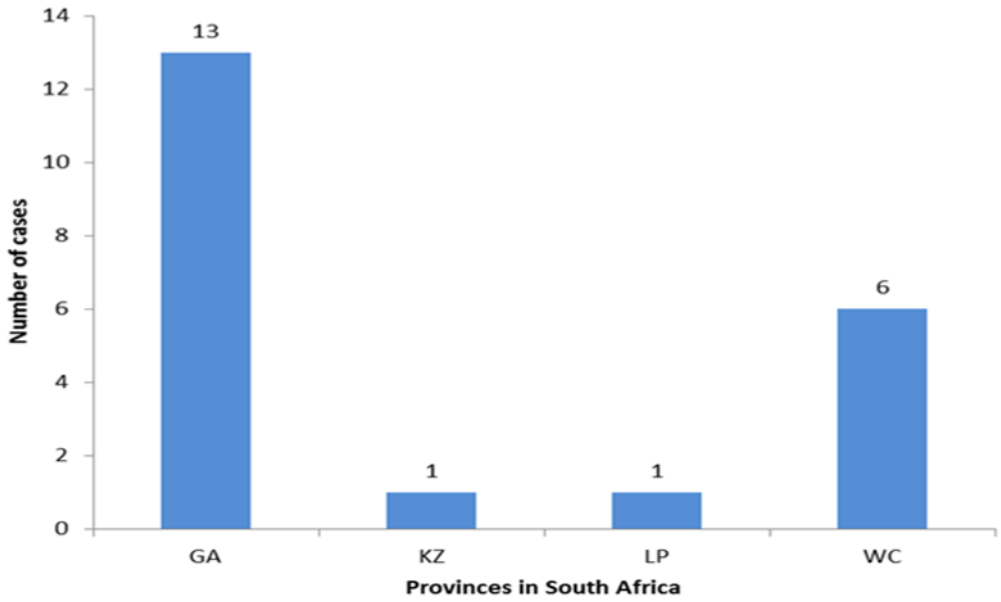


Figure 5.

Typhoid cases identified in South African provinces from 1st January to 15th February, 2017

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 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 January 2017, a total of 149 Enterobacteriaceae isolates were received. One hundred and thirty-seven isolates were screened, 117 of which expressed the carbapenemases that were screened for. Eight isolates expressed two carbapenemases (NDM and OXA-48 & variants) (Table 1). The majority of the screened isolates were *Klebsiella pneumoniae* (87) followed by *Enterobacter cloacae* (22). One isolate was not definitively identified at the time of the report.

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 for January 2017 and January-December 2016 at AMRL-CC, COTHI, NICD

Organism	NDM		OXA-48 & Variants		VIM	
	Jan-Dec 2016	Jan 2017	Jan-Dec 2016	Jan 2017	Jan-Dec 2016	Jan 2017
Citrobacter freundii	9	1	8	2	-	-
Enterobacter asburiae	-	2	-	-	-	-
Enterobacter cloacae	32	2	57	11	2	-
Escherichia coli	11	2	91	9	-	-
Klebsiella pneumoniae	287	17	534	65	14	1
Klebsiella species	-	1	6	2	2	-
Morganella morganii	6	1	2	-	-	-
Proteus mirabilis	-	-	2	1	-	-
Proteus vulgaris	1	-	-	1	-	-
Providencia rettgeri	17	3	1	2	-	-
Serratia marcescens	29	-	24	1	1	-
Unknown	-	-	-	1	-	-
Total	**392**	**29**	**725**	**95**	**19**	**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 11.

1. Malaria: Namibia
The Oshikoto Region of Namibia has reported 102 new malaria cases in January 2017 as compared to the 25 cases recorded in the same period in 2016. The rise is attributed to heavy rains and increased mosquito breeding. There have been no reported deaths.

2. Plague: Madagascar
The number of cases of plague in Madagascar has risen to 68 cases with one more death bringing the total number of deaths to 27. These occurred in the mountainous area of Befotaka in southeastern Madagascar, which is an insecure and isolated area that is difficult to reach, thereby making attempts to control the outbreak quite difficult.

There have also been unconfirmed reports of a second cluster of 30 cases in an adjacent area where no plague has been reported since the 1950s.

3. Ebola: West Africa
As per the January 2017 Communique, there are still no new cases of Ebola. Research into an effective vaccine is still ongoing.

4. H7N9: China and Taiwan
The first case of H7N9 was reported by Beijing after a 68-year-old patient from a neighbouring province was transferred to the capital for treatment and remains critically ill.

The death toll has risen to 30 after one person died in February in the Yunnan province. More than 125 cases have been reported for the 2016/2017 flu season, although exact numbers are still to be confirmed.

The Centre for Disease Control in Taiwan reported its first case of H7N9 for 2017 in a man that had travelled from China in January. The man's fever was detected by the airport health services and he is currently being treated in ICU whilst 108 of his contacts are being traced.

5. Lassa Fever: Nigeria
3 more cases of Lassa fever have been reported in the Nimba district, Liberia with 2 resultant deaths and over 100 contacts needing to be traced and observed.
In Nigeria, a new case of Lassa fever has been confirmed by officials in Port Harcourt indicating that the disease has spread to the country's south-east region. In addition, the Nasarawa state government has confirmed the re-emergence of Lassa fever disease in north-central Nigeria. All 16 cases were from Lafia, the state's capital and 36 contacts were being followed up. Four deaths have been confirmed.

6. Yellow Fever: Angola and DRC
One of the largest and most challenging yellow fever outbreaks has been brought to an end through a strong, coordinated response to the outbreak since it arose in Angola in December 2015. Angola declared the end of the yellow fever outbreak their country on 23 December 2016 followed by a similar declaration by the DRC on 14 February 2017 after no new confirmed cases were reported from both countries for the past 6 months. There were 965 confirmed cases of yellow fever across the 2 countries with 137 deaths and more than 30 million people receiving the vaccine in response.

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