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

Communicable Diseases Communiqué

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CONTENTS

1 VECTOR-BORNE DISEASES

a Malaria

South Africa is currently experiencing its malaria season, which typically extends from September to May each year. Cases of both local and imported disease can be expected, especially as travellers return from festive season holidays. The malaria-endemic provinces within South Africa are KwaZulu-Natal (north-eastern part), Mpumalanga and Limpopo. Neighbouring countries such as Zimbabwe and Mozambique also have malaria-endemic areas and are an important source of imported malaria into South Africa. Chemoprophylaxis is highly recommended for individuals travelling into malaria-endemic areas. Mefloquine (Lariam®, Mefliam®), doxycycline, and atovaquone-proguanil (Malanil®)) are recommended chemoprophylactic agents for Southern Africa. Guidelines can be accessed at: http://www.doh.gov.za/docs/policy/2011/malaria_prevention.pdf.

Odyssean malaria cluster in Gauteng Province

On 15 January 2014, two cases of *Plasmodium falciparum* malaria were reported from a private hospital in Gauteng Province. In both cases, there was no history of recent travel to a malaria-endemic area, and no common exposures were found.

A 28-year-old female from Lenasia (City of Johannesburg Metro), who was one month post-partum, presented with lower abdominal pain, high fever, vomiting and severe headache that began on 6 January 2014. The initial diagnosis was pyelonephritis; she was hospitalised and received antibiotics for three days. However, her condition deteriorated, necessitating transfer to the ICU for further management. An astute laboratory technologist noted the presence of malaria parasites on a routine haematology differential smear. *P. falciparum* was confirmed on malaria smear, with 17.9% parasitaemia. Given the severity of illness and presence of numerous complications, intravenous artesunate was sourced for the patient. She has responded very well to treatment.

A 16-year-old male residing in Eldorado Park (<10 km from the first case-patient's residence) experienced the onset of abdominal pain, nausea and fever on 9 January 2014 whilst on holiday in Kimberley. He had travelled with family by car to

Kimberley on 4 January 2014 and returned on 11 January 2014. He was hospitalised for investigation. An astute physician considered the possibility of malaria despite the absence of travel to a known malaria transmission area. *P. falciparum* with 12.2% parasitaemia was confirmed on the malaria smear. He was admitted to ICU and treated with intravenous quinine, and has since recovered and been discharged.

An entomological investigation was conducted at both case-patients' residences and surrounds. All mosquitoes captured were identified as *Culex* species, *Anopheles* species were not found at any of the sites sampled.

These are two examples of unusual malaria cases in a non-endemic area due to importation of infected mosquitoes from endemic areas. The transmission of malaria outside endemic areas is usually unexpected, resulting in delayed diagnosis and treatment, and is therefore often associated with severe illness or a fatal outcome. It is likely that road traffic arriving from endemic areas in and around South Africa is the source of most of the infected mosquitoes responsible for odyssean malaria cases.

Healthcare workers need to maintain a high index of suspicion for malaria in all patients presenting with fever >38^{0}C, headache and flu-like illness, or fever >38^{0}C with impaired consciousness where no obvious cause is evident, and in whom no recent history of travel to a malaria area is forthcoming.

A single negative malaria test does not exclude malaria. If clinical suspicion for malaria is high and the first test negative, repeat tests every 12-24 hours until the patient is better or an alternative diagnosis is confirmed. Low platelets that are otherwise unexplained may indicate the possibility of malaria.

Malaria is a notifiable medical condition and must be reported to local health authorities.The South African National Malaria Treatment Guidelines can be accessed at:
http://www.doh.gov.za/docs/policy/2011/malaria_treatment.pdf

Source: Division of Public Health Surveillance and Response, and Centre for Opportunistic, Tropical and Hospital Infections, NICD-NHLS

b Tick bite fever alert

A marked seasonal increase in tick bite fever cases has been noted over the past month. While most infections have been uncomplicated with favourable response to doxycycline treatment, a number of severe infections has been reported to NICD-NHLS.

Severe disease with complications (including encephalitis, bleeding, DIC, hepatorenal failure, ARDS, digital gangrene and myocarditis) may mimic other diseases, including Crimean-Congo haemorrhagic fever, meningococcal septicaemia, or fulminant Gram-negative septicaemia. While malaria is always a critical consideration at this time of the year in travellers returning from malaria-endemic areas, healthcare workers should be aware that tick bite fever must feature in the differential diagnosis of acute febrile illness in at-risk persons. Risk factors include travel in Southern Africa, hiking in rural areas, living on small holdings in peri-urban areas, and living/working on farms. However, even persons living in urban areas who are exposed to ticks in the home setting may potentially be at risk. An eschar, often located by finding tender regional lymphadenopathy, together with fever and headache, should prompt treatment with doxycycline, which is considered the most effective antibiotic. A maculopapular rash, typically including the palms and soles, may be noted in infections with *Rickettsia conorii* but is generally absent in *Rickettsia africae* infections. For pregnant women and

children <8 years of age, an initial 48 hours of therapy with doxycycline should be given followed by a macrolide such as clarithromycin or azithromycin to complete the course of therapy. Laboratory testing, including PCR and serology, is not sensitive for the diagnosis in acute disease; antibodies are generally only detectable from day 10 of illness.

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

c FOCUS FEATURE: Crimean-Congo haemorrhagic fever (CCHF)

Case report

A 39-year-old previously well female resident of Elgin in Western Cape Province was hospitalised on 5 January 2014, presenting with haematemesis and a petechial rash for investigation. Along with her husband and children, she had travelled to Free State Province from 21 to 29 December 2013 to stay with family on a cattle and sheep farm in the Welbedacht Dam area. On 29 December 2013 she became ill with fever, headache and influenza-like symptoms whilst travelling back to Elgin. She consulted a doctor and began doxycycline therapy for suspected tick bite fever; however, she did not improve on treatment and her illness progressed. On admission she was noted to have extensive petechiae and purpura, haematemesis, and a tendency to bleed from venepuncture sites. Initial laboratory investigations showed leukopenia (2 x 10^9/L), thrombocytopenia (24 x 10^9/L), transaminasemia (AST 13 000 IU/L, ALT 3 000 IU/ L), and a coagulation profile suggestive of DIC. The patient reported that although she had not noticed any tick bites, she had found a 'bontpoot' tick lodged in her navel a few days earlier. CCHF was confirmed by positive RT-PCR and serology testing at the Centre for Emerging and Zoonotic Diseases, NICD-NHLS. The patient developed numerous complications and required supportive care in ICU, but has improved meanwhile.

FOCUS ON CCHF

Epidemiology

The first modern description of CCHF was of an outbreak in the West Crimea region of southern Ukraine during World War II. At that time, agricultural activities were disrupted, pastures were overgrown, and hares with ticks proliferated. During the summer of 1944 about 200 cases of fever with haemorrhage occurred among farmers and soldiers assisting with the harvest. In 1967, an identical virus was isolated from a blood sample taken in 1956 from a patient in the Belgian Congo.

CCHF infection is the most widespread tick-borne viral infection of humans, and occurs across a vast area from Western China through southeastern Asia and the Middle East to southeastern Europe and throughout most of Africa. Since 2000, the incidence and geographic range of confirmed CCHF cases have markedly increased, with disease being reported for the first time in Turkey, Iran, India, Greece, Georgia, and some Balkan countries.

Hyalomma spp. are the only known vectors of CCHF. These ticks transmit the virus to a variety of wild and domestic mammals, which develop an asymptomatic transient viraemia, and therefore also act as reservoirs. Tick larvae and nymphs prefer feeding on small animal hosts (including hares, hedgehogs, rodents and ground-feeding birds e.g. guinea fowl). Adults feed on large mammals, either wildlife (including antelope and buffalo) or domestic livestock (including sheep, cattle, pigs, horses and ostriches). Humans are infected either by tick bites or by exposure to contaminated blood/excreta of the reservoir animals, and human cases often occur during spring and summer months, when the spread of CCHF virus between ticks and mammals is highest. Person-to-person transmission can occur through contact with virus-containing body fluids of a patient; nosocomial outbreaks are well described and have been associated with high mortality rates. The life cycle of *Hyalomma* spp. ticks and transmission pathways of CCHF virus to humans are shown in Figure 1.

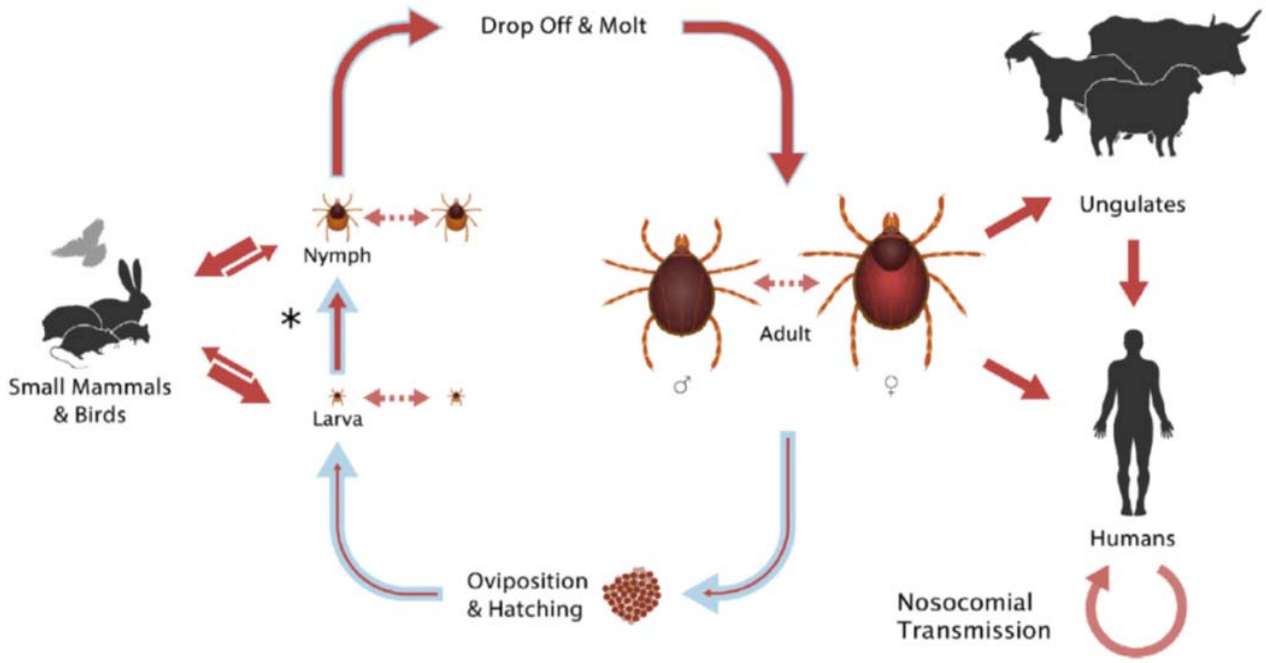


Figure 1. Life cycle of *Hyalomma* spp. ticks, and transmission pathways of CCHF virus to humans.

Reproduced from: Bente DA, Forrester NL, Watts DM, McAuley AJ, Whitehouse CA, Bray M. Crimean-Congo haemorrhagic fever: History, epidemiology, pathogenesis, clinical syndrome and genetic diversity. *Antiviral Res* 2013 Oct; 100

Clinical features

Although most infections with CCHF virus result in a mild, nonspecific febrile illness, some patients do develop severe haemorrhagic disease. The course of CCHF infection is divided into four phases: incubation, prehaemorrhagic, haemorrhagic, and convalescence. The incubation period varies according to the mode of transmission: following a tick bite, it ranges 1-5 days and following contact with infected blood/tissues it usually ranges 5-7 days, with a maximum of 13 days. The prehaemorrhagic phase is characterised by the abrupt onset of fever, malaise and a variety of nonspecific symptoms (including headache, neck pain and stiffness, sore eyes, photophobia, dizziness, somnolence and depression). Examination may reveal a flushed appearance with injected conjunctivae or chemosis; hepatomegaly with right upper quadrant tenderness; lymphadenopathy; and enanthema/petechiae of the throat, tonsils or buccal mucosa. The haemorrhagic phase usually begins on day 3-6 of illness and most often is heralded by a petechial rash appearing first on the trunk and limbs. This may rapidly progress to cutaneous purpura and ecchymoses (particularly in the antecubital fossae, upper arms, axillae and groin) and bleeding from the gastrointestinal and urinary tracts. Hepato-and splenomegaly are common findings. Internal bleeding (including retroperitoneal and intracranial haemorrhage) and vaginal bleeding may also occur. Severely ill patients develop hepatorenal failure and ARDS from about day 5 onwards, with progressive drowsiness, stupor and coma; jaundice may develop during the second week of illness. In fatal cases, death is usually as a result of haemorrhage and DIC, multi-organ failure and shock. The convalescence period in survivors begins about 10-20 days after the onset of illness, and full recovery may take up to a year.

Laboratory findings

Haematology testing shows an early leukopenia, with the development of thrombocytopenia during the first week of illness. Coagulation abnormalities develop, with prolonged prothrombin time (PT) and activated partial prothrombin time (APTT), and detection of fibrin degradation products (FDP) and D-dimers indicative of DIC. Progressive hepatic involvement results in increased transaminasemia

(ALT and AST). As patients become hypotensive, increased urea and creatinine reflect renal insufficiency. During the first five days of illness, any of the following clinical laboratory features are highly predictive of a fatal outcome: leucocyte count ≥10 x 10^9/L; platelet count ≤20 x 10^9/L; AST ≥200 IU/L; ALT ≥150 IU/L; APTT ≥60 seconds; and fibrinogen ≤110 mg/dL. After day five of illness, all clinical laboratory values may be grossly abnormal without necessarily being indicative of a poor prognosis.

Diagnosis

CCHF should be suspected when a person with an appropriate exposure history becomes acutely ill with fever, malaise and other nonspecific signs and symptoms, together with physical findings suggestive of vascular leak and abnormal coagulation. Swanepoel, Mynhardt and Harvey devised a scoring system for the clinical diagnosis of CCHF based on a set of clinical, laboratory and exposure criteria (see appendix). This tool can assist the healthcare worker in deciding whether the patient should be regarded as a suspected CCHF case. Testing for CCHF is done at the NICD-NHLS. CCHF virus RT-PCR is usually positive during the first 7-10 days of illness, with IgM detectable by the end of the first week, followed shortly by the appearance of IgG.

Management

General supportive measures are the mainstay of management. Volume replacement (with careful monitoring to prevent pulmonary oedema) and administration of blood products (platelets, fresh frozen plasma, packed red blood cells) as needed is critical. Prophylactic therapy for stress ulcers with H2-receptor antagonists is advised. If tick bite fever is also a differential diagnosis, empiric doxycycline treatment must be given until the diagnosis is confirmed. The role of the antiviral drug ribavirin in treatment of CCHF is controversial. Randomised controlled trials have not been performed, but some case series and studies reported apparent benefit. It appears that ribavirin is most beneficial when initiated within the first 5 days of illness. Although antibody therapy has been tried, there are no controlled trials or objective data that support its use.

Case fatality rate

The reported case fatality rate of CCHF has varied widely from 3 – 30%, depending on the number of cases in the respective case series/studies, and whether mild illness was included. The case fatality rate in the largest case series described to date (Turkey, >6 000 cases since 2002) has been about 5%, which suggests that the higher rates reported in earlier outbreaks reflect a failure to recognise less severe infection.

Infection prevention and control considerations

All patients with suspected CCHF should be presumed infectious and isolated until a specific diagnosis is made. Although experience with CCHF has shown that routine standard precautions are protective in most cases, specific viral HF isolation precautions are advised (use of surgical mask, double gloves, gown, protective apron, face shield and shoe covers) in order to prevent contact and droplet exposure to blood and bodily fluids. Percutaneous exposure (via needle-stick or sharps injuries) carries a particularly high risk for transmission; safe use and disposal of needles and sharps must be emphasised, and the use of needles/sharps limited as far as possible.

Contact tracing and monitoring

Persons having unprotected direct contact with a CCHF patient during the symptomatic phase of illness should be identified and monitored for 14 days following last contact with the CCHF patient. Temperature should be measured and recorded 12-hourly, and persons who develop fever or other signs/symptoms suggestive of CCHF should be immediately isolated until the diagnosis can be excluded.

Post-exposure prophylaxis (PEP)

Although oral ribavirin has been used as PEP for contacts of CCHF cases, there are no data on efficacy, dose, or duration. The consideration of ribavirin as PEP should be reserved for definitive high-risk exposures, for example needle-stick injuries or mucous membrane exposures.

CCHF in South Africa

CCHF is the commonest viral haemorrhagic fever occurring in South Africa. The first human CCHF

case was reported in 1981: a 13-year-old boy spent a week camping in a nature reserve in the Bloemhof area (North West Province), and on return developed an acute illness with sudden onset of fever and nonspecific symptoms; a *Hyalomma* spp. tick was found attached to his scalp. On the third day he developed a cutaneous petechial rash with profuse gastrointestinal and mucous membrane bleeding; he died on day 6 of illness. Since then, up to 20 CCHF cases have been reported annually, with a total of 194 laboratory-confirmed cases documented to date. Although cases have been reported from all nine provinces, more than half the cases originate from the semi-arid areas of Northern Cape Province and Free State Province (Figure 2), with exposure predominantly in rural farming areas. Although CCHF cases have been reported throughout the year, more than half the cases in the last decade have occured between December and March. In South Africa, the virus is transmitted by *Hyalomma* spp. ticks which have distinctive brown and white bands on their legs; they are known as 'bont-legged ticks' or 'bontpootbosluise' (Figure 3). There are three species of *Hyalomma* genus ticks in South Africa, and although they are widely distributed, the ticks tend to be most numerous in the drier north-western parts of the country – the Karoo, western Free State, Northern Cape, and North West provinces.

Males account for 91% of South African cases, most being farmers and other agriculture-related workers; the occupational risk groups include farmers, herders, abattoir workers, veterinarians/animal health workers, hunters, and persons informally slaughtering domestic/wild animals. Approximately two-thirds of cases have been associated with tick bite exposures, the remainder reporting direct exposure to infected animals. The majority of cases have been sporadic and isolated; however, outbreaks have also occurred, including an outbreak at an ostrich abattoir in Oudsthoorn affecting 17 persons, and a nosocomial outbreak in Cape Town where six healthcare workers contracted disease (one doctor and five nurses, with one fatality) from a single patient. The case fatality rate of South African CCHF cases has been 24%, but this data is biased since only severe cases are tested and detected.

Detailed information for healthcare workers regarding CCHF can be found on the NICD website http://www.nicd.ac.za/ (see FAQ).

Source: Source: Division of Public Health Surveillance and Response, and Centre for Emerging and Zoonotic Diseases, NICD-NHLS; Western Cape Department of Health

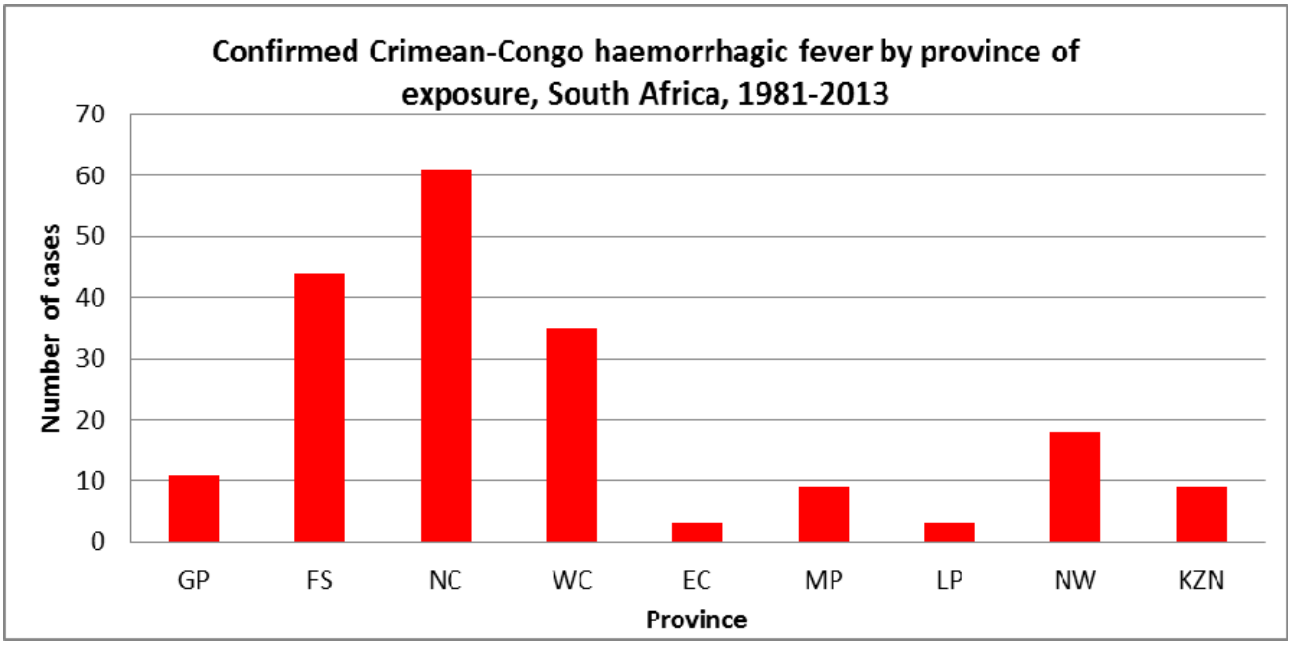


Figure 2. Confirmed Crimean-Congo haemorrhagic fever cases by province of exposure, South Africa, 1981-2013.

Figure 3. *Hyalomma* spp. ticks ('bont-legged' ticks / 'bontpootbosluise')
Reproduced courtesy of Centre for Emerging and Zoonotic Diseases, NICD-NHLS

2 ZOONOTIC DISEASES

a Rabies

A total of seven laboratory-confirmed human rabies cases was reported in South Africa during 2013. These cases originated from Mpumalanga (n=1), KwaZulu Natal (n=1), Limpopo (n=3) and Free State (n=2) provinces. An average of ten cases has been reported annually since 2009, with a peak in 2006 when Limpopo Province experienced a major outbreak (Figure 4).

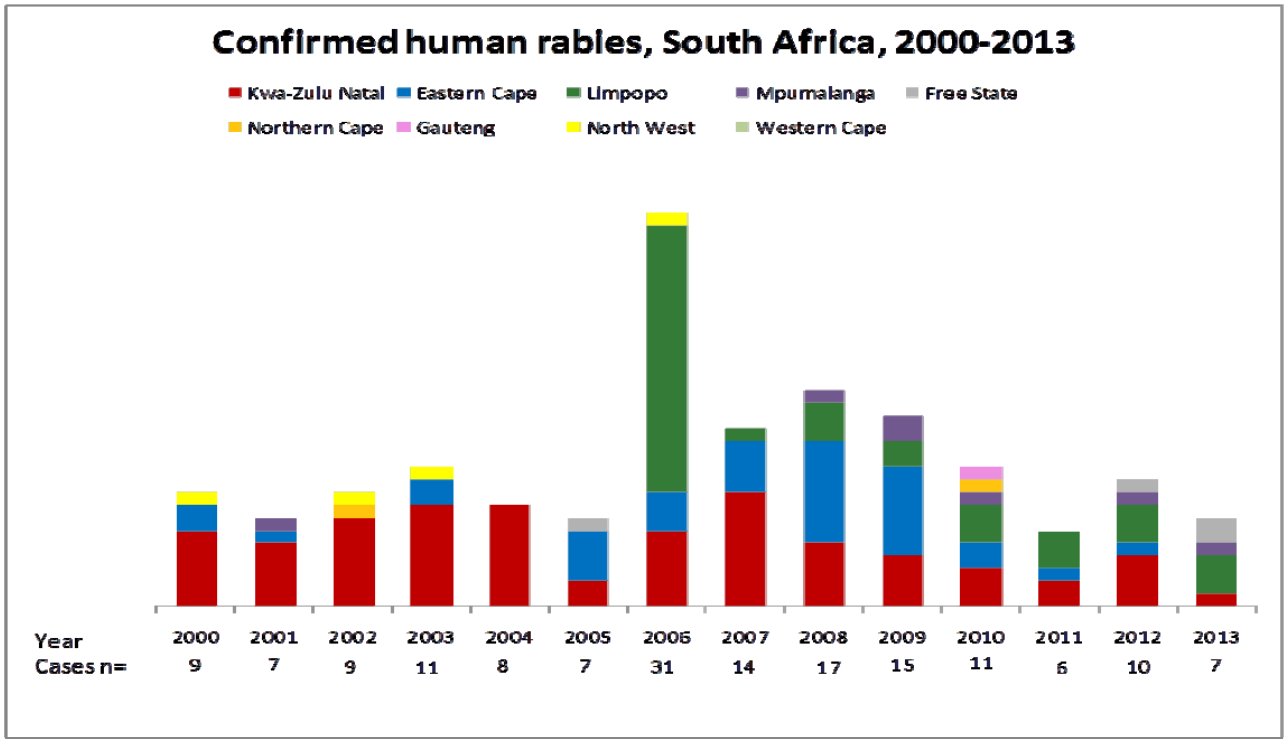


Figure 4. Number and provincial distribution of human rabies cases, South Africa, 2000 – 2013.

Additionally, a total of five clinical rabies cases was documented in 2013. These cases originated from Limpopo (n=2), Eastern Cape (n=2) and Mpumalanga (n=1) provinces. Two of these cases were reported in December 2013, and are discussed further.

A 30-year-old female working in Musina (Limpopo Province) died on 14 December 2013 after a three-day illness of abnormal and aggressive behaviour punctuated by periods of calmness and lucidity, hypersalivation and seizures. On clinical examination, healed scars were found behind the knee, but no history of an animal bite could be established. A post-mortem saliva specimen tested negative for rabies by RT-PCR.

Unfortunately, no other specimens could be obtained for further testing.

A 43-year-old female admitted to an Eastern Cape Province hospital was clinically diagnosed with rabies and died shortly thereafter. Saliva and cerebrospinal fluid (CSF) specimens collected on 23 December 2013 were negative for rabies by RT-PCR, but unfortunately no further specimens were available for testing. No history regarding possible animal bites/exposures was available.

The gold standard for rabies diagnosis remains the fluorescent antibody test performed on post-mortem brain specimens. This test is highly sensitive and allows for the detection of a variety of rabies virus strains. Ante-mortem laboratory diagnosis of rabies is complicated and usually requires multiple tests performed on multiple specimens. RT-PCR on saliva specimens is reasonably sensitive, but repeat specimens have to be tested due to the intermittent shedding of virus in saliva. Negative PCR results from a saliva specimen must therefore not be interpreted as an absolute exclusion of the diagnosis. RT-PCR testing of nuchal biopsy specimens is sensitive, but consent may be required for the procedure. CSF is not the most sensitive specimen for detection of rabies virus RNA but should be included in a battery of tests when investigating suspected cases. Serology for rabies antibodies is not particularly useful for diagnosis of acute cases due to low or undetectable seroconversion in most cases.

Health professionals and members of the public can access more information on rabies through the NICD website: www.nicd.ac.za.

Source: Source: Centre for Emerging and Zoonotic Diseases, NICD-NHLS

3 ANTIMICROBIAL RESISTANCE

a Update on carbapenemase-producing Enterobacteriaceae

The Johannesburg and Cape Town Antimicrobial Resistance Reference Laboratories (AMRRL) of the Centre for Opportunistic, Tropical and Hospital Infections (COTHI) at NICD/NHLS, test referred isolates of suspected carbapenemase-producing Enterobacteriaceae (CPE) for the presence of selected carbapenemase genes. For December 2013, a total of 42 isolates was screened, 16 (38%) of which were CPE. Most isolates were *Klebsiella pneumoniae* (25/42, 60%) followed by *Enterobacter*

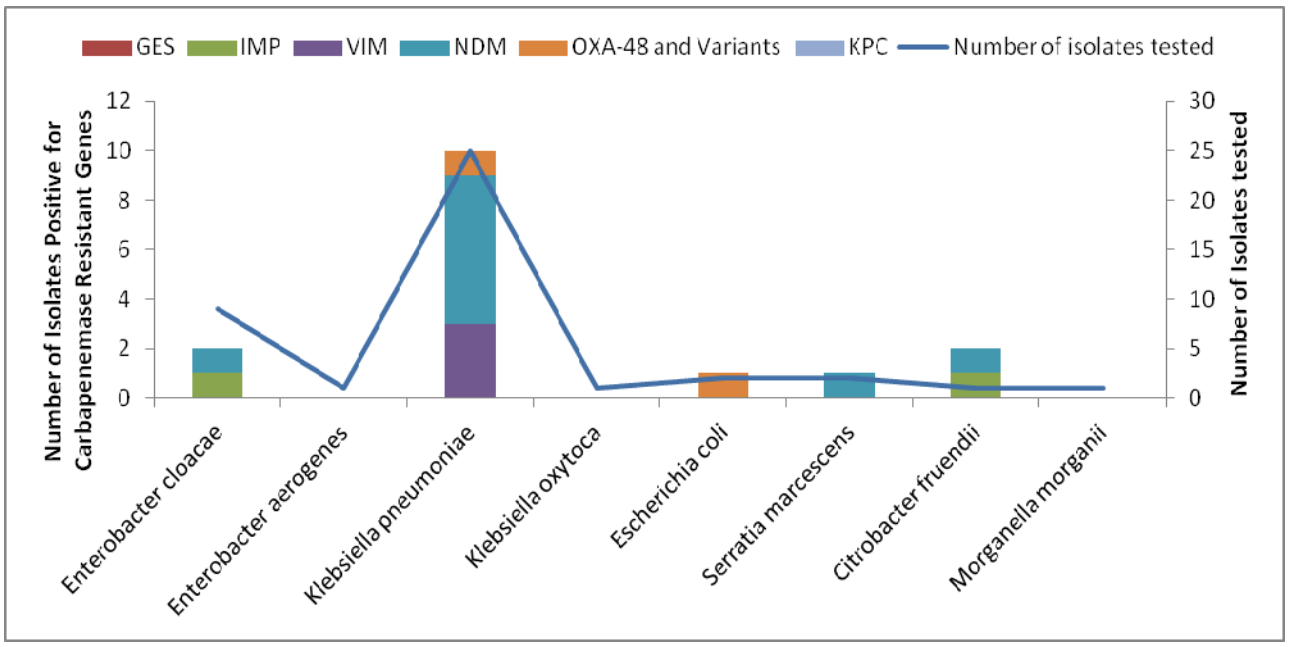


Figure 5. Enterobacteriaceae isolates screened (n=42) and confirmed CPE (n=16) during December 2013 at AMRRL (NICD-NHLS)

Nine NDM-positive isolates were identified (3 from patients in private hospitals and 6 from patients in public hospitals). Two OXA-48 positive isolates from patients in one private hospital in Gauteng Province were identified. Two IMP-positive isolates from private sector patients and 3 VIM-positive isolates from public sector patients were identified (Figure 6). All CPEs were from patients in Gauteng and KwaZulu-Natal provinces only.

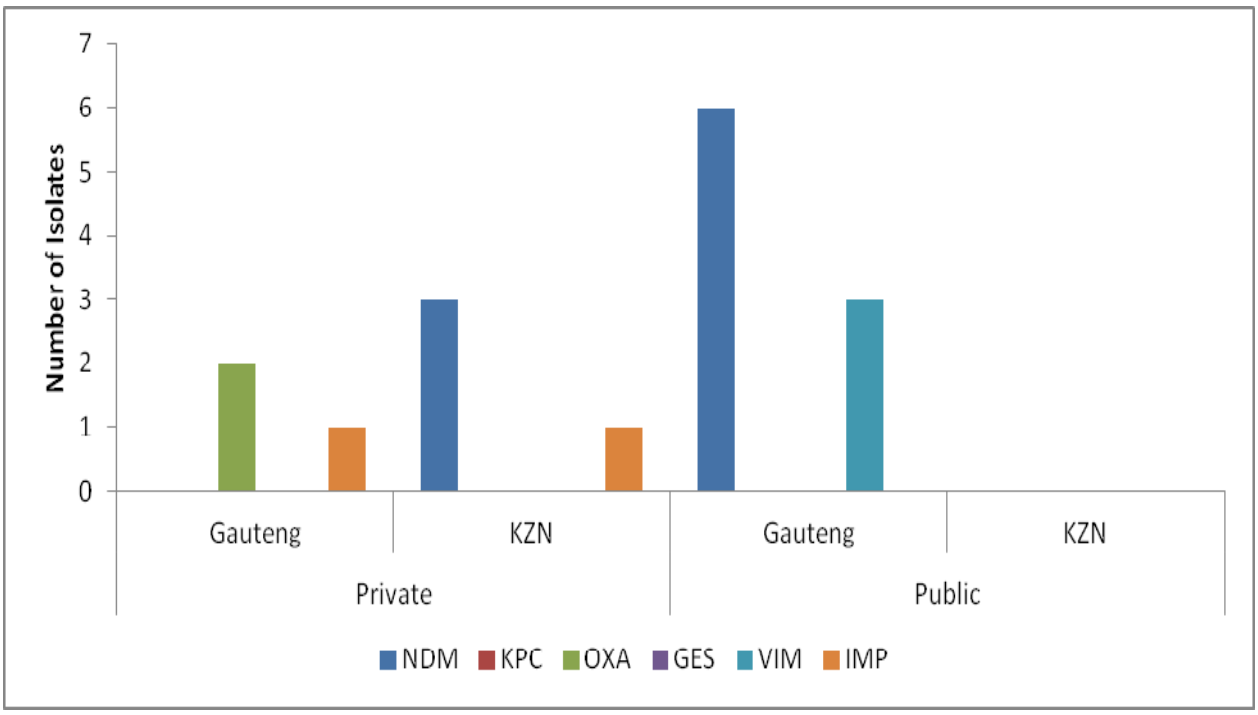


Figure 6. CPEs confirmed at AMRRL (NICD-NHLS), by province and healthcare sector, December 2013

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 reporting 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 the AMRRL, NICD/NHLS.

Please telephone (011) 555 0342/44 or email: ashikas@nicd.ac.za; and olgap@nicd.ac.za; for queries or further information. In the Western Cape area, please email: clintonmoodley@yahoo.com; and colleen.bamford@nhls.ac.za.

Source: Source: Centre for Opportunistic, Tropical and Hospital Infection, NICD-NHLS.

4 BEYOND OUR BORDERS

The 'Beyond our Borders' column focuses on selected and current international diseases that may affect South Africans travelling abroad.

Disease & countries	Comments	Advice to travellers
1. Zoonotic diseases		
Anthrax Zimbabwe	Mashonaland West Province and Karoi: as of 15 January 2014, a total of 6 people have been hospitalised and 33 treated and discharged after they ate cattle carcasses infected with anthrax.	Travellers are at minimal risk for contracting anthrax since cases have been limited to persons having direct contact with or consuming infected animals.
2. Vector-borne diseases		
Chikungunya Philippines (Bataan Province)	Since October 2013, 100 cases have been reported. Officials have declared an outbreak in the town of Mariveles, Bataan Province	Chikungunya and dengue fever are mosquito-borne viral infections transmitted by *Aedes* spp. mosquitoes, which bite mostly during the day. Travellers should wear long-sleeved shirts and long pants during the day and stay in well-ventilated (fan/air-conditioned) rooms where possible; use mosquito repellents containing DEET to avoid being bitten.
Caribbean (British Virgin Islands)	As of 13 January 2014, 3 cases were confirmed in St Martin.	
Dengue fever Americas: Panama, Paraguay, Venezuela Pacific: Fiji, French Polynesia Asia: Pakistan, Philippines, Cambodia, Singapore	Cases of dengue fever continue to be reported or are increasing in several countries in the Americas, Asia and the Pacific.	

Disease & countries	Comments	Advice to travellers
3. Water- and food-borne diseases		
Cholera Africa: Namibia (Kunene Region) Nigeria (Kano State)	As of 6 January 2014, 107 cases including 7 deaths had been reported. The outbreak started in November 2013. The cholera outbreak which began in November 2013 is ongoing.	Drink and use safe water (bottled water with an unbroken seal, boiled water or water treated with chlorine tablets). Wash hands with soap and safe water often. Eat hot well-cooked food, peel fruits and vegetables. Vaccines offer delayed and incomplete protection and should therefore not be used as a substitute for good hygiene and infection prevention practice.
Typhoid fever Zimbabwe	Latest report: 28 cases reported countrywide, 13 of these in Harare.	Wash hands with soap and safe water often. Eat hot well-cooked food. Vaccines offer delayed and incomplete protection and should therefore not be used as a substitute for good hygiene and food safety practice.
4. Respiratory viruses		
Influenza North America China Globally	Activity has increased over recent weeks. Influenza A (H1N1) pdm09 has been the predominant subtype detected. Activity has been increasing with influenza (H1N1) pdm09, A (H3N2) and influenza B co-circulating. Activity remained low for the rest of the northern hemisphere as well as the southern hemisphere. In countries of tropical areas variable influenza activity has been reported.	Northern hemisphere-formulation influenza vaccines are not available in South Africa.

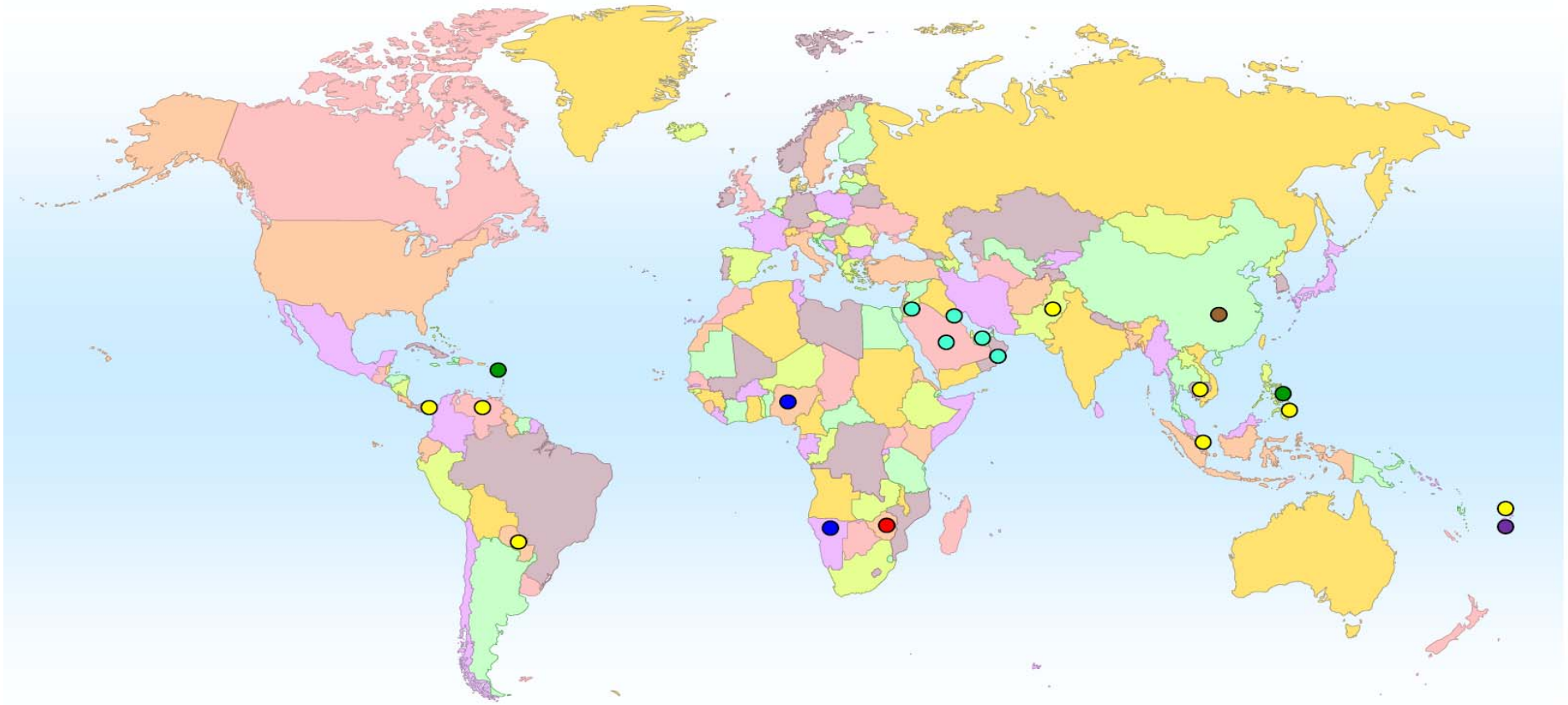
Disease & countries	Comments	Advice to travellers
4. Respiratory viruses (continued)		
MERS-CoV Middle East: Jordan, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). Europe: France, Germany, Italy, United Kingdom Africa: Tunisia	Middle East respiratory syndrome coronavirus (MERS-CoV) infection was first reported in Saudi Arabia in 2012. Most confirmed cases of MERS-CoV infection developed severe acute respiratory illness. At present, the route of transmission to humans and types of exposures that result in infection are not known. Since April 2012, a total of 178 laboratory-confirmed cases, including 76 deaths has been reported. All cases have a link to the Middle East, either through travel to the region or exposure to a patient who acquired infection in the region.	Good hygiene and basic infection prevention practices can minimise risk of respiratory infections in travellers: • cough etiquette • avoiding contact with sick people • avoid handling of animals • frequent hand washing with soap and water or the use of an alcohol-based hand rub. Travellers should contact a medical practitioner if they develop acute respiratory symptoms upon return from a known risk area.
Avian influenza A (H7N9) China	Human cases were first reported in March 2013, and sporadic cases continue to occur. According to the World Health Organization, 147 confirmed human cases including 47 deaths have been reported. No cases outside of China have been reported. All cases reported exposure to poultry. No evidence of sustained human-to-human transmission has been found.	

References and additional reading:

ProMED-Mail (www.promedmail.org)
World Health Organization (www.who.int)
Centers for Disease Control and Prevention (www.cdc.gov)

Last accessed: 21 January 2013

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



	Disease/s	Countries
●	Anthrax and typhoid fever	Zimbabwe
●	Cholera	Namibia, Nigeria
●	Chikungunya	Philippines, British Caribbean
●	Dengue fever	Panama, Paraguay, Venezuela, Fiji, French Polynesia, Pakistan, Philippines, Cambodia, Singapore
●	Zika virus	French Polynesia
●	Avian influenza A(H7N9)	China
●	MERS-CoV	Middle East: Jordan, Kuwait, Oman, Qatar, Saudi Arabia, UAE

Selected communicable disease outbreaks of interest are shown. The markers represent countries/regions experiencing outbreaks of interest; they do not reflect all countries/regions where the respective diseases are known to occur, and do not represent the actual geographical location of the outbreak within the respective countries/regions. The information used to produce this map is current as of 21 January 2014.

Figure 7. Selected communicable disease outbreaks that may affect South Africans travelling abroad, as at 21 January 2014.