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

COMMUNICABLE DISEASES

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COMMUNIQUÉ

CONTENTS

Editor's Note

Prof John Frean

Typhoid fever (enteric fever) has been prominent in the South African news recently, with social media speculation and misinformation about alleged contamination of municipal water supplies in various parts of the country. However, NICD has pointed out that although there have been small clusters of enteric fever cases reported in the Western Cape and North West provinces recently, there is no evidence that these are linked to contaminated municipal water, and no evidence of contaminated municipal water supplies anywhere in the country has been found (see https://www.nicd.ac.za/no-evidence-that-recent-cases-of-typhoid-fever-are-linked-to-contaminated-municipal-water-in-any-part-of-the-country/). While South Africa does have a low background incidence of enteric fever, on average fewer than 100 cases are notified annually (see https://www.nicd.ac.za/update-on-enteric-fever-in-south-africa-18-feb-2022/).

This issue of the Communiqué highlights the concerning situation around human rabies currently, with a laboratory-confirmed case in the Eastern Cape Province in January 2022. The resurgence of dog rabies in KwaZulu-Natal and Eastern Cape provinces resulted in at least 19 laboratory-proven cases of human deaths from rabies in 2021, with several probable additional cases. The public health imperative is clear: dog rabies urgently needs to be brought under control. Another viral disease, but with a completely different epidemiology, namely Rift Valley fever, is threatening to emerge in parts of South Africa because of the widespread rainfall of recent months. This is a mosquito-borne infection that typically causes livestock losses, and in an epizootic situation, some human infections can be anticipated, some of which can have serious health consequences. A different mosquito-related infection, malaria, can sometimes be unexpectedly acquired in non-endemic areas, when infected vector mosquitoes secretly hitchhike in vehicles arriving from malaria transmission zones. Most of these incidents are recognised in Gauteng Province; this issue of the Communiqué reports a near-fatal case in Cape Town, investigated by City of Cape Town and Provincial health authorities. The usual seasonal transmission pattern of respiratory syncytial virus (RSV) was disrupted over the past two years by the COVID-19 pandemic control measures; with easing of some of those restrictions and the return of young children to school, it is possible that the recent transmission trends may change in future. 'Beyond our Borders' features anthrax in the Democratic Republic of the Congo, syphilis in Milwaukee, and enterohaemorrhagic *Escherichia coli* (EHEC) cases in Canada, linked to a traditional Korean food.

ZOONOTIC AND VECTOR-BORNE DISEASES

An update on rabies in South Africa

For January 2022 to date, one human case of rabies has been laboratory confirmed in South Africa. This case was from the Eastern Cape Province. During 2021, a total of 19 human rabies cases was laboratory confirmed. These cases were reported from the Eastern Cape (n=9), KwaZulu-Natal (n= 6) and Limpopo (n=4) provinces. In addition, three probable cases were reported from KwaZulu-Natal (n=2) and Eastern Cape (n=1) provinces. These are ones that fit the clinical case definition of rabies but could not be verified by laboratory testing. During 2021, the resurgence of dog rabies in locations of the KwaZulu-Natal and Eastern Cape provinces has been reported (see https://www.kzndard.gov.za/latest-news/item/327-rabies-update). The epizootics have not been brought under control at the time of this report (see https://www.kzndard.gov.za/latest-news/item/327-rabies-update).

Nearly all human rabies cases in South Africa are associated with exposures to rabid domestic dogs. As such, rabies is most effectively prevented through control in domestic dog populations. This is achieved through parenteral rabies vaccination. The latter is mandated by law as the responsibility of pet owners. Pet owners in rabies affected communities are urged to ensure that their animals are vaccinated against rabies. Rabies vaccination for dogs and cats can be accessed through private veterinary care services, but provincial veterinary services and several non-profit animal welfare organization are providing such services in affected areas (https://www.kzndard.gov.za/latest-news/item/327-rabies-update). When possible exposures to rabid animals have occurred, individuals should seek urgent medical attention. The development of rabies infection in humans can be prevented through rabies post-exposure prophylaxis. It is imperative that all wounds, however small, are washed copiously with water and soap. This is followed by administration of rabies vaccine and immunoglobulin therapy based on the risk associated with the exposure. For more information on rabies and disease prevention, please visit the NICD website: https://www.nicd.ac.za/disease-a-z-index/rabies/.

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

ZOONOTIC AND VECTOR-BORNE DISEASES

Rift Valley fever infections in South Africa

The increased rainfall experienced in many parts of South Africa in recent months (and as forecast for the coming months) may result in an increased risk for exposure to mosquitoes and other arthropod vectors, and therefore the risk of endemic arboviral disease. Rift Valley fever (RVF) is an endemic mosquito-borne viral disease in South Africa. The disease affects both animals (wildlife species and domestic ruminants) and humans. This virus causes outbreaks of abortions (so-called 'abortion storms') and deaths of livestock (predominantly involving sheep, goat and cattle). The disease occurs throughout Africa and especially when heavy rains (similar to the increased rainfall experienced in many parts of South Africa in recent months and as forecast for the coming months) favour the breeding of mosquito vectors.

During RVF outbreaks reported from east or southern Africa, humans become infected primarily from contact with infected tissues and/or blood of livestock (and wildlife), and less frequently from mosquito bites. As such, veterinarians and other veterinary professionals, farmers and farm workers present higher risk groups for RVF. Cases of human RVF infections are generally recognized when epizootics are reported in livestock, and few cases are diagnosed during the so-called inter-epidemic period and often only confirmed with serological testing. RVF has been known to occur in South Africa since the 1950s, with large outbreaks being recorded during the 1970s and 2010-2011. Widespread RVF epizootics from 2008 to 2011 with more than 14,000 animal cases recorded in eight of nine provinces, were reported in South Africa. During this period, a total of 302 human cases was laboratory-confirmed, of which 25 were fatal.* About 83% of human cases were associated with confirmed exposures involving direct handling of animal tissues and/or blood. These cases involved the aforementioned risk groups for RVF and were mostly male. In May 2018, an isolated epizootic of RVF was reported in sheep on a farm in the Jacobsdal area in the Free State Province and related to the laboratory confirmation of four human cases, all involving farm workers.** Overall, human infections via mosquitoes and raw (unpasteurised/uncooked) milk were noted infrequently, although such cases may be under-recognised.

The majority of RVF infections in humans are subclinical and self-resolving, with a small number of severe and fatal cases. Mild illness presents as fever with influenza-like symptoms (including myalgia, arthralgia and headache) and symptom onset can range from two to six days after exposure. Some patients may also develop neck stiffness, photophobia, pain behind the eyes, loss of appetite and vomiting. In such patients, the clinical presentation may be mistaken for meningitis. Severe illness can manifest as one of the following: ocular disease (retinitis), meningoencephalitis, hepatitis, renal failure or haemorrhagic fever. Mortality rate in cases presenting with haemorrhagic features approach 45%.

Specialised laboratory diagnostic investigation for RVF is required to confirm or exclude diagnosis. The Centre for Emerging Zoonotic and Parasitic Diseases at the NICD performs the function of the national reference laboratory for RVF in humans in South Africa. Blood samples should be submitted to the NICD for investigation. A repertoire of serological and molecular tests is available for investigation of cases. Refer to the NICD website for sample submission and test information (www.nicd.ac.za/rift-valley- fever/).

Rift Valley fever in humans is a Category I notifiable medical condition in South Africa. For more information on notifiable medical conditions, https://www.nicd.ac.za/wp-content/uploads/2018/10/Notifiable-Medical-Condition_Z-foldBleed20-July2018.pdf. For more information about RVF in South Africa, www.nicd.ac.za; see A-Z disease webpages.

* Archer et al. Epidemiologic Investigations into Outbreaks of Rift Valley Fever in Humans, South Africa, 2008-2011. Emerg Infect Dis. 2013 (12):1918–25.

** Jansen van Vuren et al. Human cases of Rift Valley fever in South Africa, 2018. Vector-Borne and Zoonotic Dis. 2018, 18(12): 713-715.

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

SEASONAL DISEASES

Odyssean malaria: Western Cape Province

On 18 January 2022 a seven-year-old female was diagnosed with cerebral malaria in the Cape Town Metro, a non-endemic malaria area. She presented to healthcare services numerous times between end December 2021 and January 2022. Her initial presenting features were fever, seizures and diarrhoea. She had had two short generalised tonic-clinic seizures at home, and then a third seizure, now focal in nature, at a clinic. On examination she was febrile (38.4°C) and had mild dehydration, with the rest of examination being normal. She was admitted to Red Cross Hospital for a CT brain scan, which was normal. Blood work was congruent with the clinical picture of mild dehydration. She was discharged on 28 December 2021. On 14 January 2022 she presented to Red Cross Hospital, complaining of diarrhoea and vomiting again. The only clinical finding was pyrexia (39.8°C) and she was discharged home on oral rehydration therapy. On 17 January she presented again to Red Cross Hospital with ongoing vomiting and fever, was diagnosed with otitis media, and discharged home with amoxicillin. An outpatient EEG was performed on 18 January 2022 (to exclude epilepsy) and she was subsequently found to have moderate encephalopathy. Blood work showed anaemia, thrombocytopenia, and *Plasmodium falciparum* parasitaemia of >9%, with a subsequent diagnosis of cerebral malaria. She commenced IV artesunate and recovered fully. As she had no recent history of travel to a malaria-endemic area, her illness was termed Odyssean malaria.

A full environmental investigation was initiated to attempt to identify the source of infection. No vector source was found at the patient's usual places of residence and the only potential link to a source was a neighbour who was confirmed to have travelled from Mozambique in the last week of December. Thankfully, no additional malaria cases were diagnosed in the area. As a precautionary measure, healthcare facilities in the district were advised to be suspicious of malaria in individuals presenting with 'flu-like illnesses.

This presentation of delayed diagnosis of malaria, as well as complicated malaria, is typical in Odyssean malaria cases. Health care workers should check for malaria in patients with recurrent unexplained pyrexia even with no history of travel, to prevent delayed diagnosis and subsequent complications.

Source: City Health, City of Cape Town; Red Cross War Memorial Children's Hospital; Provincial Communicable Centre Control, Western Cape Government Health (Charlene.Lawrence@westerncape.gov.za); Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; johnf@nicd.ac.za

Respiratory syncytial virus – defining the start of the season

Respiratory syncytial virus (RSV) is a common cause of morbidity and the most common viral cause of acute respiratory tract infection in children under the age of five years. Over the last 10 years, data from the syndromic syndromic surveillance for severe respiratory illness has been used to define the start and end of the season. The epidemic threshold for RSV was calculated using the Moving Epidemic Method (MEM), a sequential analysis using the R language, available from: http://CRAN.R-project.org/web/package=mem) designed to calculate the start, duration and end of the annual RSV epidemic. MEM uses the 40th, 90th and 97.5th percentiles established from available years of historical data to calculate thresholds of activity. To set thresholds, data collected in 2010 to 2019 was used and seasons for 2016 to 2021 were described.

Up until now, to define the start and the end of RSV season, we used weekly detection rate of RSV in all cases enrolled in surveillance and defined the season to have started when the detection rate among hospitalised cases crossed the below threshold level and was maintained above it. Using this method, on average the RSV season started in week eight and continued through autumn.

However, with the introduction of SARS-CoV-2 in 2020, using all cases irrespective of age, RSV season was not declared for two consecutive years, 2020-2021, with low RSV activity reported compared to previous years. In 2020, increased RSV transmission shifted from being in autumn months to spring and summer months (Figure 1). In 2021, although there was an increase in transmission during autumn, the overall activity was mostly below threshold and therefore season was not declared (Figure 1). This may have been due to the denominator of hospitalised cases, specifically adult COVID-19 cases increasing.

SEASONAL DISEASES

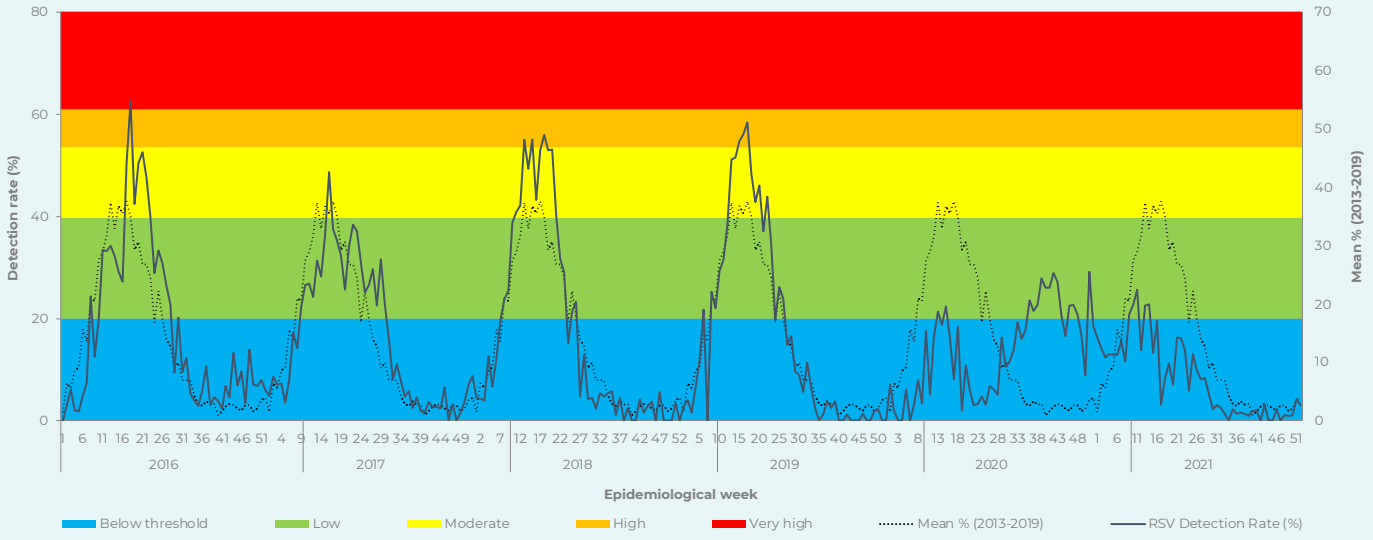

Figure 1. RSV detection rate and epidemic thresholds among cases of all ages hospitalised with severe respiratory illness, pneumonia surveillance, South Africa, 2016-2021

When applying the same MEM method and restricting it to children <5 years of age, in 2020, there were two waves of increased RSV transmission. First wave was in week 13-16 and the second was in week 29 of 2020 to week 16 of 2021 (Figure 2 and Table 1). In 2021, there was an additional period of increased activity from week 21 to week 29 (Figure 2 and Table1). In addition, with restricting to children <5 years, the impact of RSV reached very high levels for four of the years before the COVID-19 pandemic included in the period under review. In two of the four years, the season started a week early when restricting to cases aged <5 years (Table 1).

Including all ages in the RSV detection rate increases the denominator resulting in lower detection rates. For this reason, going forward we propose to only include cases aged <5 years when reporting on RSV activity for South Africa.

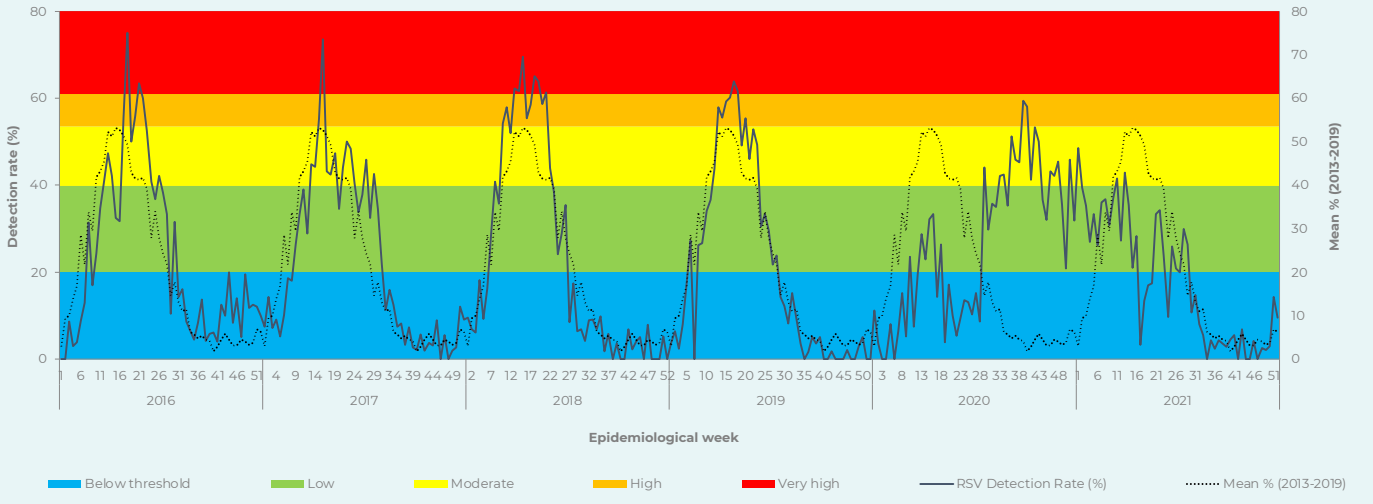

Figure 2. RSV detection rate and epidemic thresholds among cases aged <5 years hospitalised with severe respiratory illness, pneumonia surveillance, South Africa, 2016-2021

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

SEASONAL DISEASES

Table 1. RSV seasons defined using hospitalised cases of all ages and children aged <5 years, pneumonia surveillance, South Africa 2016-2021

Year	Start of season using all ages	RSV season duration using all cases	Start of RSV season (aged <5 years)	RSV season duration (aged <5 years)	Difference in start of season (weeks) using all ages vs aged <5 years
2016	Week 8	Week 8-28	Week 8	Week 8-28	0 week
2017	Week 10	Week 10-30	Week 9	Week 9-31	1 week
2018	Week 8	Week 8-23	Week 7	Week 7-26	1 week
2019	Week 8	Week 8-26	Week 8	Week 8-28	0 week
2020	Week 39	Week 39-43	Week 13 & 29	Week 13-16 & Week 29 (2020) – Week 16 (2021)	26 weeks (overlapping to 2021)
2021	No season	N/A	Week 21	Week 21-29	N/A

WHO AFRO UPDATE

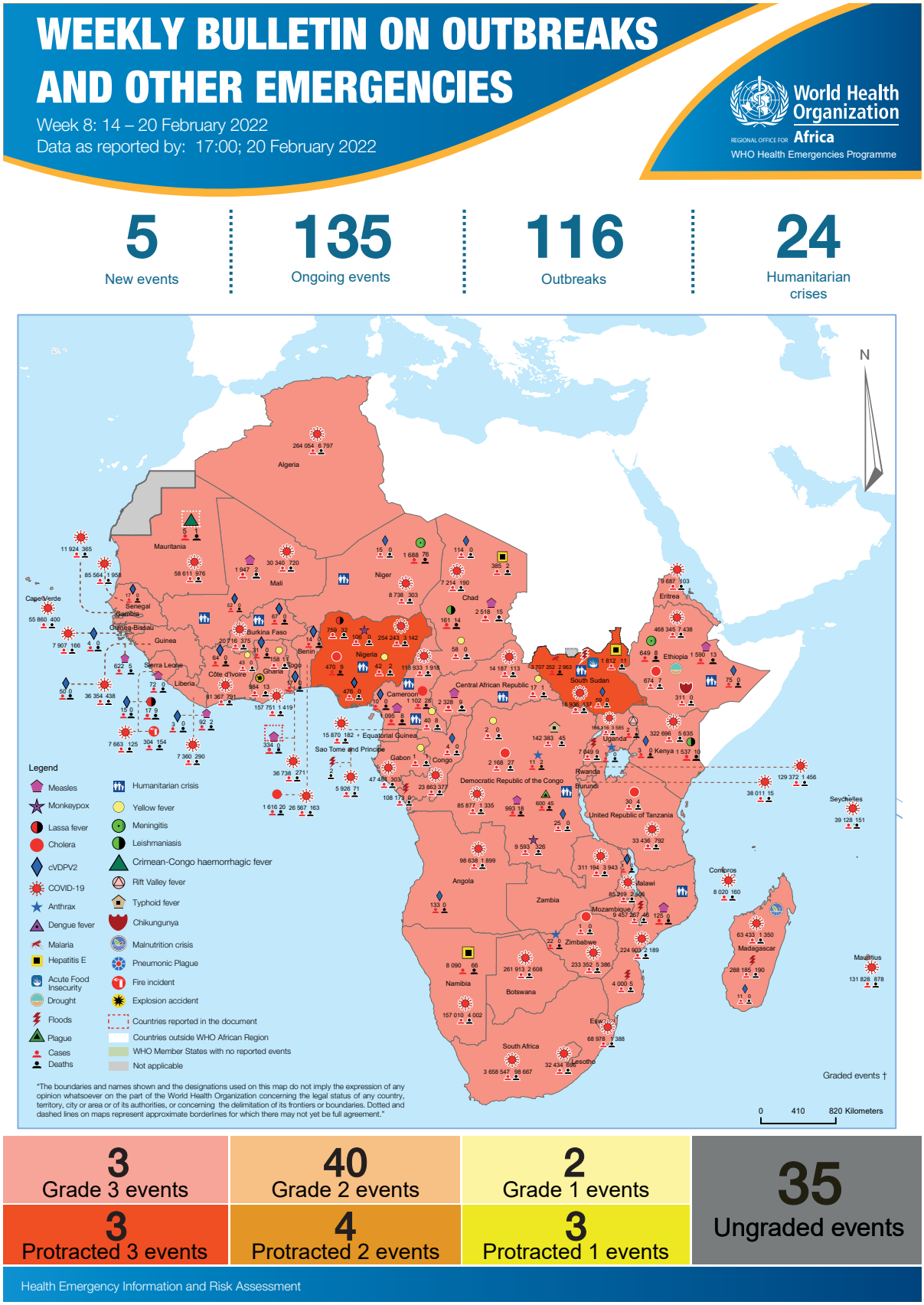

Figure 3. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 140 events. For more information, see link below:
https://apps.who.int/iris/bitstream/handle/10665/352056/OEW08-1420022022.pdf

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 4 on page 9.

Suspected anthrax: South Kivu, Democratic Republic of Congo

There have been eleven people linked to the consumption of guinea pig in South Kivu, Democratic Republic of Congo (DRC). Two people have died and nine have recovered. According to a not-for profit organization "'People in Need' guinea pig consumption has been a popular and an affordable approach to combat malnutrition, because it offers protein and micronutrients, as well as providing better food security than pigs, sheep, and cattle. This is because the guinea pigs are small and easy to hide in conflict zones, where looting of domestic livestock is rife and they also tend to suffer fewer diseases than chickens, pigs, or sheep.

Anthrax is a Gram-positive rod-shaped bacterium (*Bacillus anthracis)* which affects domestic and wild animals. Transmission is through contact with the spores, which germinate and multiply as vegetative bacteria on entry into the body. These bacteria produce toxins. Spores can either be inhaled, eaten from contaminated food, or acquired by skin contact. Signs of cutaneous anthrax can be seen from 1 day up to two months after exposure; these are skin blisters or bumps progressing to superficial painless ulcers with a black centre on the skin, usually of arms or hands. Diagnosis is usually clinical and confirmed by cultures. Anthrax is treated with antibiotics; some individuals may require hospitalization. Anthrax can be prevented by providing antibiotics to those exposed to the bacterium but who have no symptoms, avoiding eating raw or undercooked meat and avoiding contact with affected livestock, animal products or carcasses as far as possible.

Syphilis: Milwaukee, United States of America

There have been 255 syphilis cases in 2021, affecting mostly women of child-bearing age. The number of cases are higher than the totals from the year 2016 to 2019. This increase has also been associated with higher numbers of congenital syphilis; where on average one case of congenital syphilis is considered concerning, five congenital cases have been identified.

Public health authorities in Milwaukee have noted this with seriousness and have ongoing investigations of the factors contributing to this spike in cases. Some have been linked to the effects of COVID-19, such as worsened financial challenges impacting health seeking behaviour, an increase in trading sex for shelter or even clinics limiting operating hours. The state has implemented interventions, which include adding three disease prevention specialists, expanding guidelines to address syphilis in the clinics, as well as outreach to the areas most affected.

Syphilis is a sexually-transmitted infection caused by the bacterium *Treponema pallidum* and it has various stages; primary, secondary, latent, and tertiary. Each of these stages have differing symptoms and signs. It is transmitted through direct contact with skin or mucocutaneous lesions during vaginal, anal, or oral intercourse. These lesions are usually found on the penis, vagina, anus, rectum, lips or mouths. Furthermore, it can be transmitted from an infected mother to her unborn child, which may result in low birthweight, organ dysfunction or even stillbirth. The correct and consistent used of latex condoms may prevent syphilis.

Diagnosis is through treponemal antibody tests with non-treponemal titers for confirmation. These tests should be offered to women attending the prenatal clinics, and treatment offered where a test is positive.

BEYOND OUR BORDERS

E. coli (EHEC): Canada

As at 7 February 2022, 14 laboratory-confirmed *E. coli* 0157 cases linked to the consumption of commercial kimchi have been reported in two provinces in Canada. Kimchi is a staple food in Korean cuisine that consists of salted and fermented vegetables (nape cabbage, Korean radish, onions, garlic, ginger). On identification of this outbreak, health authorities have recalled the food.

Escherichia coli (E. coli) is a bacterium found in the intestines of people and animals. Most strains are harmless and important part of the healthy human intestinal flora. It is transmitted through faecally contaminated water and food. The common presenting symptoms of EHEC infection are bloody diarrhoea, abdominal cramps, vomiting and fever with chills and the infection can be life-threatening. *E. coli* usually causes a self-limiting illness and people recover without requiring hospitalization. Antibiotics are only prescribed when a definitive diagnosis has been made on stool culture and sensitivity, with the mainstay of treatment being fluid rehydration.

The diagnosis of EHEC is based on isolating the bacterium from stool culture. Prevention is through behavioural change by ensuring proper hand hygiene practices, such as handwashing with soap and water or using an alcohol-based sanitizer before the preparation of meals and after using the bathroom, when preparing formula for babies, after being in contact with animals, ensuring thorough washing of fruit and vegetables, cooking meat thoroughly and avoiding cross-contamination during preparation of food.

Figure 4. Current outbreaks/events that may have implications for travellers. Numbers correspond to text above. The red dot is the approximate location of the outbreak or event.

Source: Promed (www.promedmail.org), Centres for Disease Control and Prevention (www.cdc.gov), Outbreak News Today (www.outbreaknewstoday.com), WHO Regional Office for Africa (www.afro.who.int)

The Communicable Diseases Communiqué offers up-to-date information regarding communicable diseases in South Africa and abroad. It forms part of the NICD's key mandate of disease surveillance, outbreak response and research on communicable diseases. The publication is released on a monthly basis and can be accessed via the NICD website on http://www.nicd.ac.za/publications/internal-publications/

Responsible Authority
National Institute for Communicable Diseases

Editing and Publishing
NICD Division of Public Health Surveillance and Response
NICD Communications Unit
Tel: 011 386 6400
Email: outbreak@nicd.ac.za

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