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

COMMUNICABLE DISEASES

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COMMUNIQUÉ

CONTENTS

Editor's Note

Dr Michelle Groome

September 28 was World Rabies Day, a global health observance started in 2007 to raise awareness about rabies, reflect on how rabies impacts our communities and bring together partners to enhance prevention and control efforts. Several provinces in South Africa have been facing canine rabies outbreaks during 2021. A total of eight human rabies cases have been reported for 2021. While no further cases of animal rabies or human exposures have been reported from the Cradle of Humankind or the Cape Metro, a resurgence of canine rabies has been recorded in the Nelson Mandela Bay and Buffalo City Metropolitan Municipalities. Read more about the outbreaks and ways to prevent and control this disease.

September is also childhood cancer awareness month and it is important to be aware of the early warning signs to ensure early detection.

September has brought some respite from the COVID-19 pandemic and we are finally observing a decrease in the number of laboratory-confirmed infections, hospitalisations and deaths. In this issue we describe the three waves of increase in SARS-COV-2 infections in South Africa, each driven by a different variant, using data from the syndromic surveillance programme for pneumonia. We also provide updates on influenza and respiratory syncytial virus cases, with detection rates of both viruses in hospitalised cases remaining lower than years prior to the COVID-19 pandemic.

While COVID-19 infections are subsiding, the southern African malaria season has started and people intending to visit malaria risk areas should use appropriate malaria prevention measures.

This month saw an end to the Marburg virus disease outbreak in Guinea and failure to confirm the suspected Ebola virus disease case in Cote d'Ivoire. However, the Democratic Republic of the Congo declared an outbreak of meningococcal meningitis. Other international diseases of note include detection of cases of Japanese Encephalitis and Chikungunya in India.

Happy reading, and remember to encourage those around you to vaccinate against COVID-19 disease! South Africa has exited the third wave and we need to use the coming months to increase COVID-19 vaccine coverage, especially among those most at risk of severe disease – the elderly and those with comorbidities.

ZOONOTIC AND VECTOR-BORNE DISEASES

An update on rabies in South Africa, 1 January - 17 September 2021

Several provinces in South Africa have been facing canine rabies outbreaks during 2021. Foci of dog rabies have been occurring in KwaZulu-Natal Province (KZN), mostly in the eThekwini Metropolitan Municipality, which includes Durban, and the King Cetshwayo district municipality (Figure 1a) (see https://www.kzndard.gov.za/latest-news/item/309-rabies-update). As of 17 Sep 2021, more than 200 dogs have tested positive for rabies. A total of two human rabies cases has been confirmed from the province as of 17 Sep 2021, with a further three probable cases reported (cases that fit the rabies case definition but were not laboratory confirmed). In the Eastern Cape Province (EC), a massive resurgence of dog rabies has been recorded in the Nelson Mandela Bay and Buffalo City Metropolitan Municipalities, with more than 150 cases reported in the province (Figure 1b) (see https://www.kzndard.gov.za/latest-news/item/309-rabies-update). Three human rabies cases have been recorded as of 17 Sep 2021: one case from Nelson Mandela Bay (reported here) and two prior cases from Amathole district and the Buffalo City Metropolitan Municipality.

Since the previous report (and included in the cases reported above), an 8-year-old boy from Gqeberha, Nelson Mandela Bay Metropolitan Municipality, EC, has been diagnosed with rabies. The child was bitten in an unprovoked attack by a stray dog, sustaining multiple bite wounds on his arm. The child was not taken to a health facility and hence did not receive post-exposure prophylaxis (PEP). The child presented in early September to a Gqeberha hospital with muscle spasms, aggression, confusion, agitation, hydrophobia, and restlessness. Healing wounds were discovered during the examination, and it was only then that the history of a dog exposure came to light. The patient was given rabies immunoglobulin and a dose of vaccine although not considered to be effective at this late stage. The child demised one day post-admission. A post-mortem brain sample tested positive for rabies. Rabies PEP is only effective if given timeously.

No further cases of animal rabies or human exposures have been reported from the Cradle of Humankind, Gauteng Province, in the past month. No further cases of rabies have been reported from the Cape Metro since rabies was identified in two dogs in Khayelitsha. See previous edition of the NICD Communique (see https://www.nicd.ac.za/wp-content/uploads/2021/08/NICD-Monthly-Communique%CC%81-August.pdf). In addition to the five human rabies cases mentioned above, three cases of human rabies have also been recorded from the Limpopo Province as of 17 Sep 2021. This amounts to a total of eight human rabies cases reported for South Africa as of 17 Sep 2021.

The most important intervention for rabies prevention and control remains vaccination of dogs. Although provincial veterinary teams are involved in rabies vaccination campaigns, the responsibility for rabies vaccination of pets is that of the pet owner in accordance with the law. Pet owners are urged to ensure that their pets are vaccinated for rabies in order to protect their animals and people who may have contact with those animals. Rabies vaccination is crucial in areas where dog rabies outbreaks have been reported, but rabies vaccination of pets is necessary throughout South Africa. When exposure to potentially rabid animals occur, prompt PEP is critical in the prevention of rabies disease. Information on rabies PEP and rabies disease is available from the NICD website (see https://www.nicd.ac.za/diseases-a-z-index/rabies/). World Rabies Day is commemorated on 28 September to raise awareness about rabies prevention and control around the world. For further information, go to the Global Alliance for Rabies Control website (see https://rabiesalliance.org/world-rabies-day).

Figure 1a

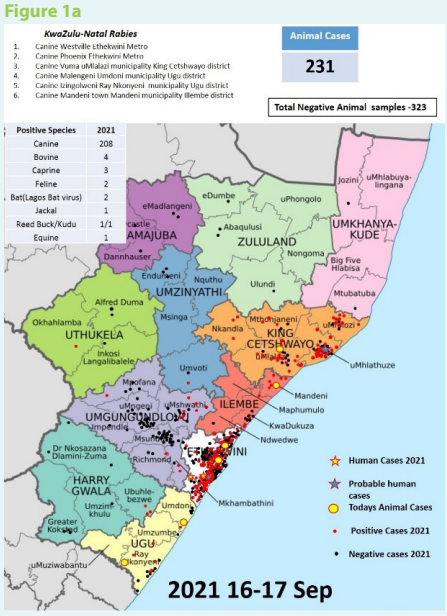


Figure 1b

Figure 1a and 1b. Detect the presence of Canine and Human Rabies in KwaZulu-Natal and Eastern Cape. (Source: KZNDARD, https://www.kzndard.gov.za/veterinary-services)

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

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

Data from sequencing and variant typing of laboratory-confirmed cases of COVID-19 patients enrolled in syndromic surveillance for respiratory illness in South Africa, March 2020 - September 2021

South Africa has been conducting syndromic surveillance for pneumonia since 2012. Ten sentinel hospitals in five provinces (Gauteng, Mpumalanga, Western Cape, KwaZulu-Natal and North West) and five clinics in four provinces (Mpumalanga, Western Cape, North West and KwaZulu-Natal) contribute to the surveillance programme. In March 2020, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was included as one of the pathogens tested for among patients enrolled at sentinel surveillance sites. Testing for SARS-CoV-2 variants was done by whole -genome sequencing and /or tested using Seegene variant polymerase chain reaction kits (Seoul, South Korea). To date, there have been three periods of increased transmission (waves) in South Africa. A wave was defined using national data as the period from weekly incidence of 30 cases per 100 000 persons to weekly incidence below 30 cases per 100 000 persons. Wave 1 was from week 24 to week 34 of 2020, wave 2 was from week 47 of 2020 to week 5 of 2021, and wave 3 was from week 19 of 2021 and ongoing at the time of writing this article.

From 10 March 2020 to 4 September 2021, a total of 8 375 pneumonia surveillance cases and 3 192 influenza-like illness (ILI) cases were tested for SARS-CoV-2, of which 23.3% (1 953/8 375) and 21.3% (680/3 192) of pneumonia and ILI cases were positive. The median age of laboratory-confirmed COVID-19 cases was 54.2 (IQR 40.0 – 64.8) and 35.6 (IQR 26.7-47.3) years for hospitalised and outpatient cases, respectively.

Among ILI cases, the detection rate peaked at 48.0% (21/43) in week 30 of 2020, at 64.3% (9/14) in week 53 of 2020 and at 59.6% (28/47) in week 28 of 2021 in the first, second and third waves, respectively (Figure 2). Among pneumonia surveillance cases, the detection rate peaked at 48.0% (62/128) in week 30 of 2020, at 55.9% (33/59) in week 53 of 2020 and at 59.9% (136/227) in week 29 of 2021 in the first, second and third waves, respectively (Figure 3).

From 10 March 2020 to 4 September 2021, 2 197 (83.4%) of the 2 633 SARS-CoV-2 positive samples had data on variant, of which 28.8% (633/2 197) were the Beta variant. The first wave of increased transmission was dominated by the wild type virus 91.2% (413/453). The second wave was dominated by the Beta variant 82.8% (367/443), which was first detected in week 45 and by week 48 of 2020, ≥50% cases per week were classified as the Beta variant. The third wave was dominated by Delta variant 61.9% (596/962), which was first detected in week 20 of 2021 and by week 25 of 2021 ≥50% of cases per week were classified as the Delta variant.

In both surveillance programmes, the number of cases testing positive has been decreasing in the past few weeks. The surveillance was able to describe the three waves of increase in SARS-COV-2 infections in South Africa, each driven by a different variant. Ongoing surveillance including data on circulating SARS-CoV-2 variants is important for understanding the epidemiology of the COVID-19. Going forward, results of sequencing and variant typing will be included in NICD weekly surveillance reports.

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

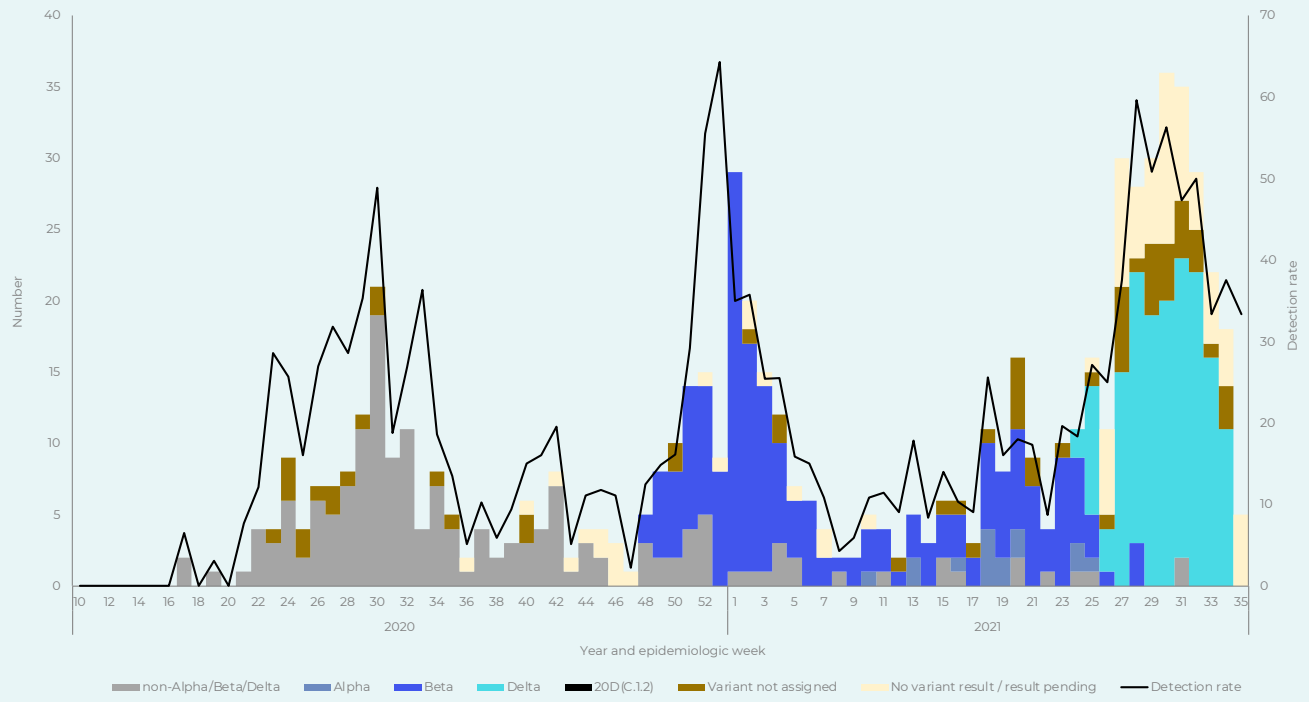


Figure 2. Number and detection rate of laboratory-confirmed cases of COVID-19 by variant type and epidemiologic week, influenza-like-illness surveillance, 10 March 2020 - 4 September 2021 (n=680)

No variant result/pending= samples awaiting sequencing or sample with CT values >=35 not submitted for sequencing. Variant not assigned= variant not assigned due to poor sample quality or internal quality check failed

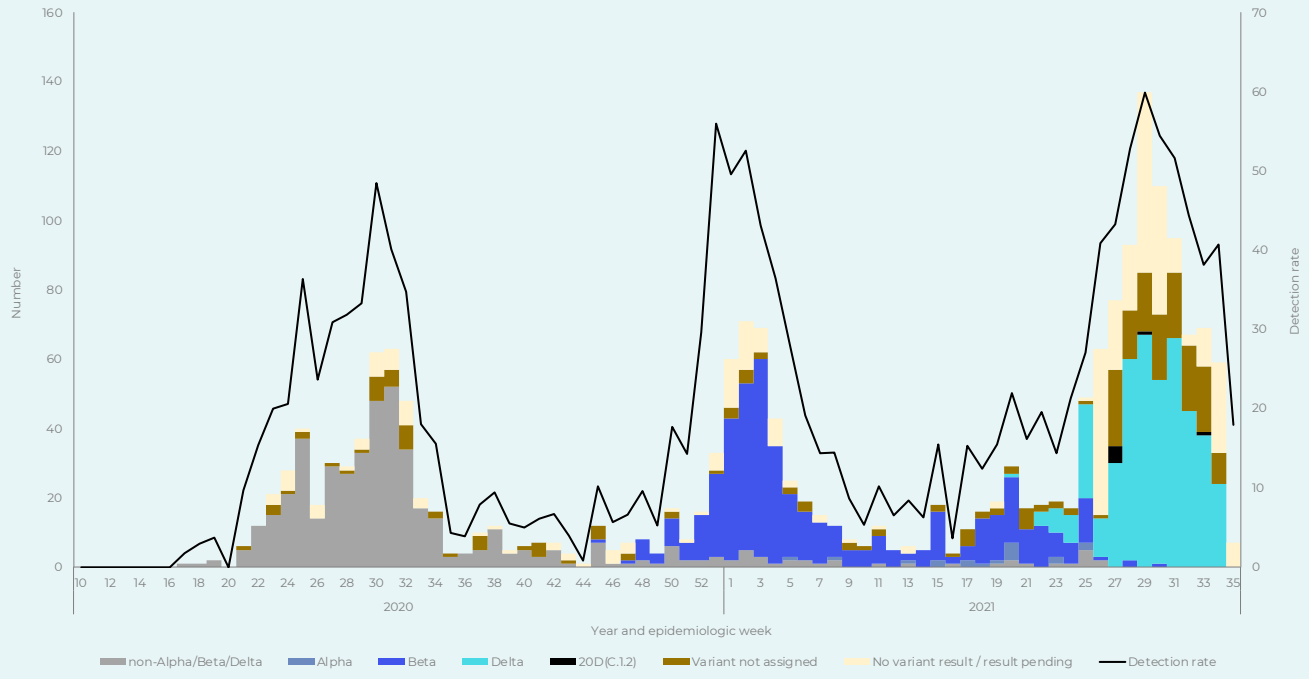


Figure 3. Number and detection rate of laboratory-confirmed cases of COVID-19 by variant type and epidemiologic week, pneumonia surveillance, 10 March 2020 - 4 September 2021 (n= 1 953)

No variant result/pending= samples awaiting sequencing or sample with CT values >=35 not submitted for sequencing. Variant not assigned= variant not assigned due to poor sample quality or internal quality check failed

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

INTERNATIONAL OUTBREAKS OF IMPORTANCE

Marburg virus disease, Guinea

On 16 September 2021, Guinea declared an end to the Marburg virus disease (MVD) outbreak after it recorded no new cases over 42 days. The index case-patient, a 42-year-old farmer who was diagnosed posthumously on 3 August, was Guinea's only recorded case. More than 170 contacts were traced and monitored for 21 days and one high-risk contact was lost to follow-up. No further suspected cases were notified. This was the first-ever MVD outbreak reported in Guinea.

There are currently no vaccines or antiviral treatments approved to treat MVD but supportive care, via rehydration and treatment of symptoms, has been shown to improve survival. A range of potential treatments are still being evaluated.

Ebola virus disease, Cote d'Ivoire 'NOT CONFIRMED'

Secondary testing of the samples of a case that was reported in Cote d'Ivoire in August 2021 has found no evidence of Ebola virus. Samples taken from the 18-year-old female patient were sent to the Institut Pasteur in Lyon, France, for further testing after the Institut Pasteur of Cote d'Ivoire had initially found samples positive for EVD. The suspected patient had travelled from Labe in Guinea to Abidjan, Cote d'Ivoire, by public transport and Cote d'Ivoire had confirmed more than 140 close contacts in two countries. None of the close contacts developed any symptoms of the disease or tested positive for the virus.

Cote d'Ivoire reacted to the EVD outbreak with the necessary public health measures such as isolation, detection, and containment for the, then believed to be, first EVD case in the country in more than 25 years. WHO has now downgraded its actions in Cote d'Ivoire from response to readiness mode.

Source: World Health Organization (www.who.int)

SEASONAL DISEASES

Influenza, 2021

A total of 94 influenza positive cases has been detected by the syndromic sentinel surveillance programmes conducted by the NICD as of week 36 of 2021 (week ending 12 September 2021). Following the first case detected in March 2021, sporadic cases of influenza have been reported, with highest number of influenza positive cases reported in 2021 to date (12/94, 13%) in week 23 (week ending 13 June 2021). Influenza B Victoria has been the most detected subtype (79/94, 84.04%), followed by Influenza A (H3N2) (6/94, 6.38%), Influenza A(H1N1)pdm09 (2/94, 2.13%) and 7.45% (7/94) were influenza B subtype inconclusive. The influenza transmission rate for 2021 has remained below the 2010 – 2019 and 2013 - 2019 mean detection rate and is below seasonal threshold [using the Moving Epidemic Method (MEM), a sequential analysis using the R Language, to calculate the duration, start and end of the annual epidemic] (Figure 4 and 5). In comparison to 2020, when influenza circulation was mostly observed in the beginning of the year in Western Cape Province, influenza detections in 2021 have mostly been observed in the second half of the year. This could be due to a reduced adherence to non-pharmaceutical interventions implemented as part of the COVID-19 pandemic response strategy. With changes in influenza transmission noted since the start of the pandemic, influenza should be considered as one of the differential diagnoses based on clinical suspicion irrespective of the time of the year. The NICD influenza guidelines, 2021, contain recommendations on influenza diagnosis, target groups, dosages, and contraindications for the 2021 influenza vaccine, as well as influenza antiviral treatment.

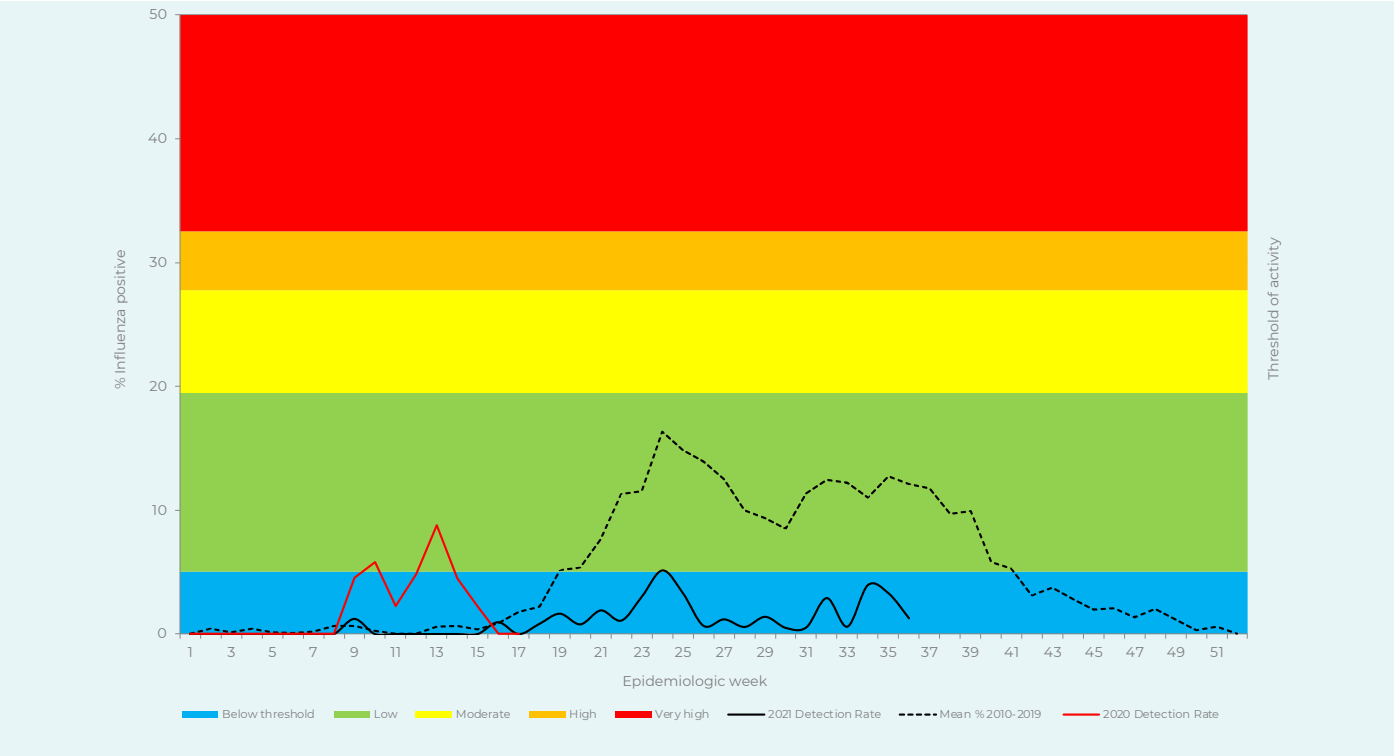


Figure 4. SRI surveillance percentage influenza 2020 & 2021 detections and epidemic thresholds*

SEASONAL DISEASES

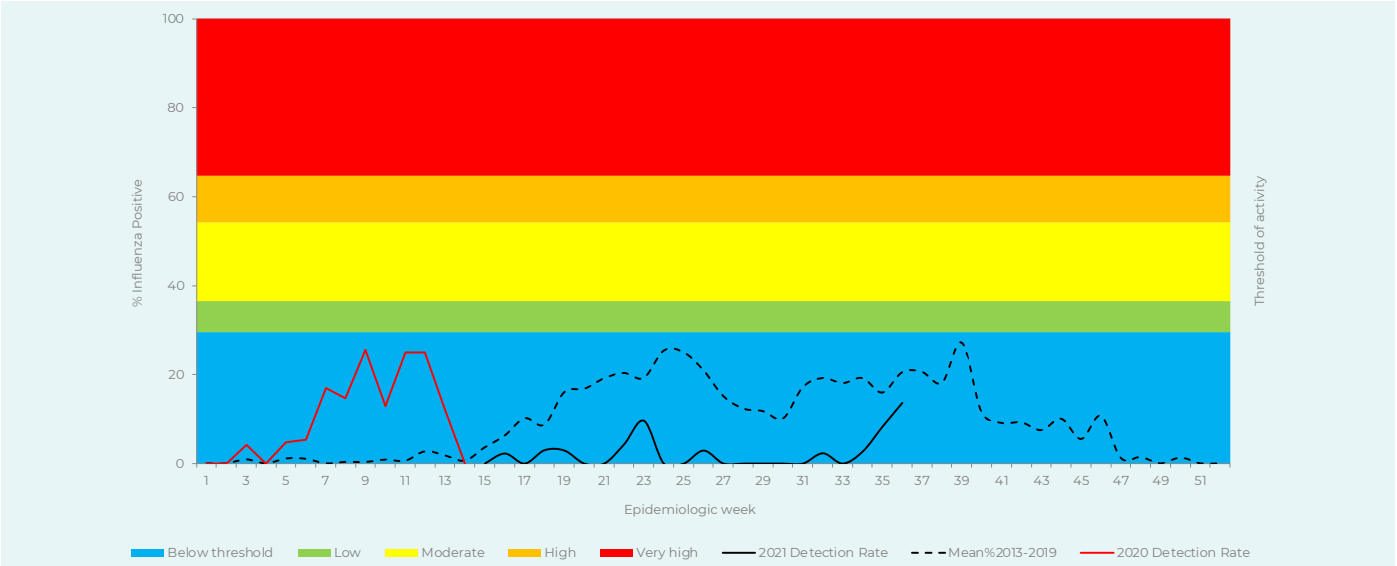


Figure 5. ILI surveillance (primary health) percentage influenza detections and epidemic thresholds. *Threshold based on 2013-2019 data

*Threshold based on 2010-2019 data

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

Respiratory syncytial virus (RSV) 2021

In 2021 to date, RSV has been circulating since the first week of the year. Of the 5 792 cases who were tested for RSV at the sentinel sites, 470 (8%) tested positive, 5% (73/1 314) in ILI and 8% (397/4 478) in SRI. The majority of RSV positive cases were subgroup A (243/470, 52%), followed by subgroup B (212/470, 45%), nine (2%) were inconclusive. The highest detection rate in 2021 to date was reported in week 11, 22% (26/116) for SRI and 28% (7/25) for ILI (Figure 6 and 7). The detection rate has been decreasing in the past few weeks to rates below 10% since week 26 (Figure 6 and 7). Since week 7 of 2021, the detection rate for hospitalised cases in 2021 has been below the mean detection rate reported for 2010 – 2019 mean percentage (Figure 6). However, the detection rate for outpatients briefly surpassed the 2013 – 2019 mean percentage between weeks 23 and 25 (Figure 7).

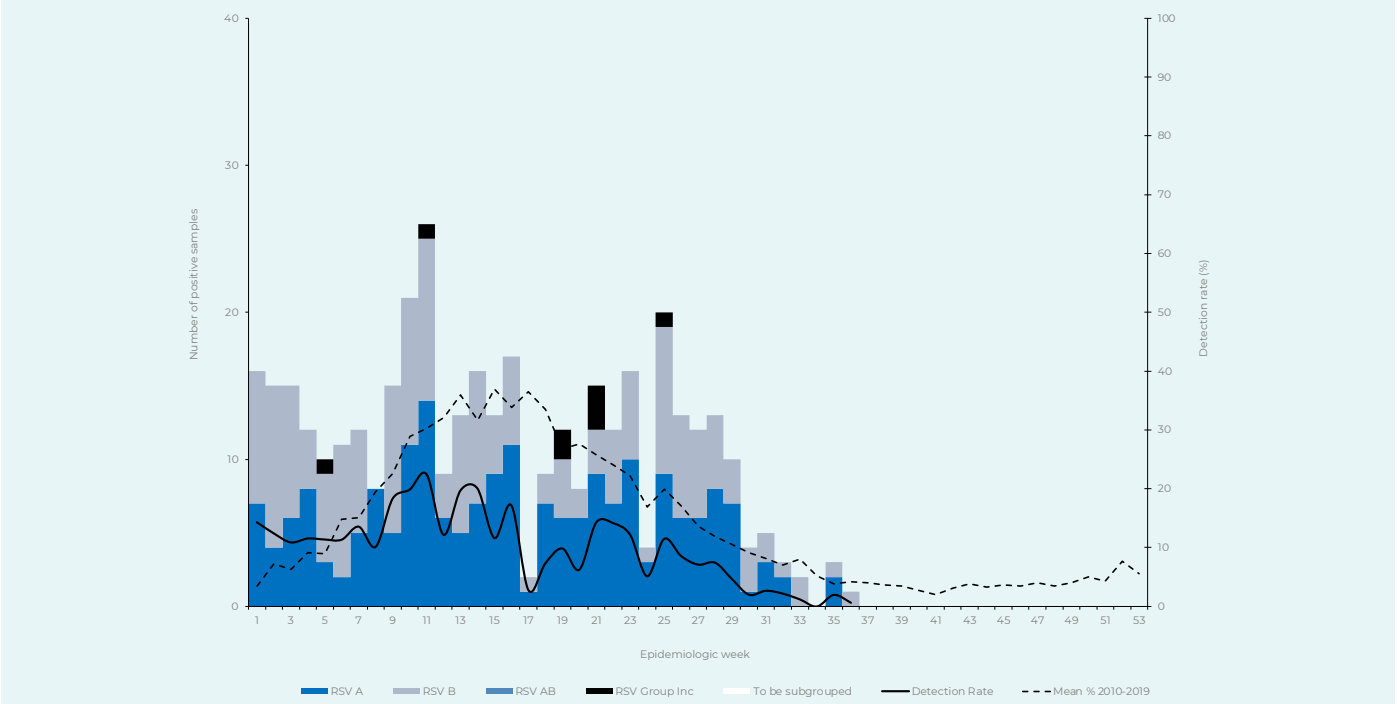


Figure 6. Number of samples testing positive for respiratory syncytial virus* by subgroup and detection rate by week for SRI surveillance

SEASONAL DISEASES

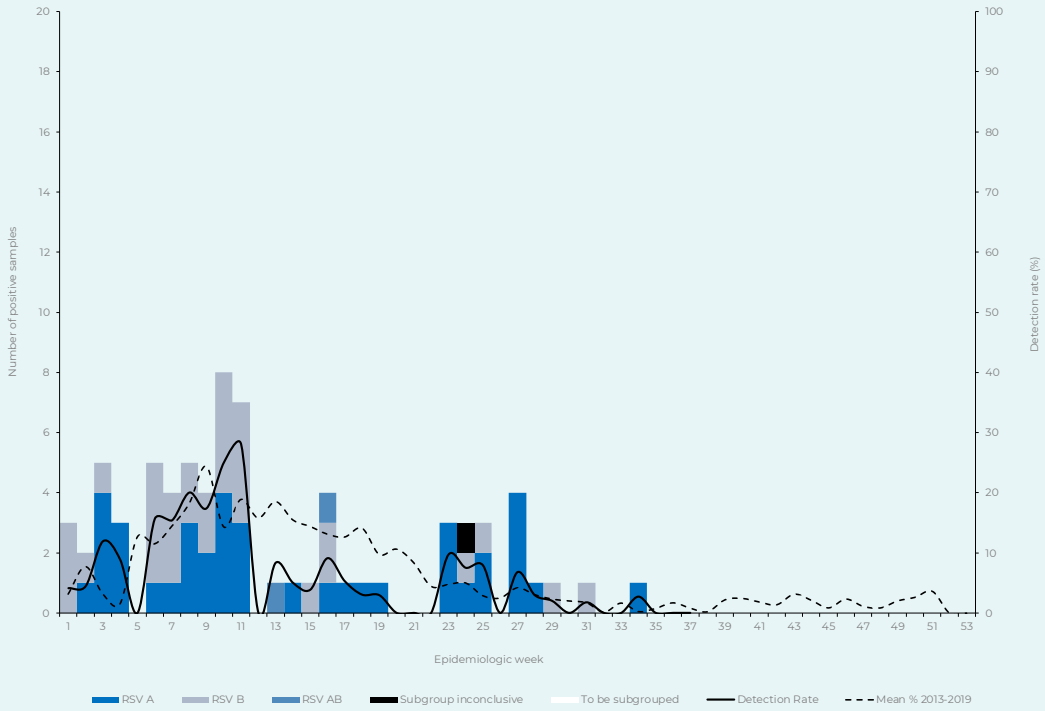


Figure 7. Number of samples testing positive for respiratory syncytial virus by subgroup and detection rate by week for ILI surveillance

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

Malaria

At the same time as the third wave of COVID-19 infections is subsiding locally, the southern African malaria season has started. Although the numbers of reported malaria cases were substantially lower in the last season than in previous years, many of the variables that influence malaria incidence are unstable or unpredictable (e.g. climatic, economic, population migration, and political factors, and the state of the SARS-CoV-2 pandemic and effects of control measures like border closures and limitations on accessing healthcare) and it cannot be assumed that the malaria cases will again decline from previous levels. People intending to visit malaria risk areas should be appropriately advised about malaria prevention measures (https://www.nicd.ac.za/wp-content/uploads/2019/03/National-Guidelines-for-prevention-of-Malaria_updated-08012019-1.pdf). While COVID-19 is often the main concern when a person becomes ill with non-specific symptoms, it is now as important as ever to remind healthcare workers of the need to consider malaria in a febrile patients living in or travelling from a malaria-endemic region, regardless of their SARS-CoV-2 test status. We have previously reported deaths from late-diagnosed malaria in patients with positive COVID-19 tests (for example, see NICD Communiqué (2020); 19(12): 7, https://www.nicd.ac.za/wp-content/uploads/2020/12/NICD-Monthly-Communiqu%C3%A9-December.pdf). The ability of vector mosquitoes to hitchhike into non-malaria malaria areas and infect local residents, frequently with serious medical consequences, should not be forgotten. This type of malaria should be considered in a patient with a progressively worsening febrile illness of unknown cause, particularly if thrombocytopenia is evident.

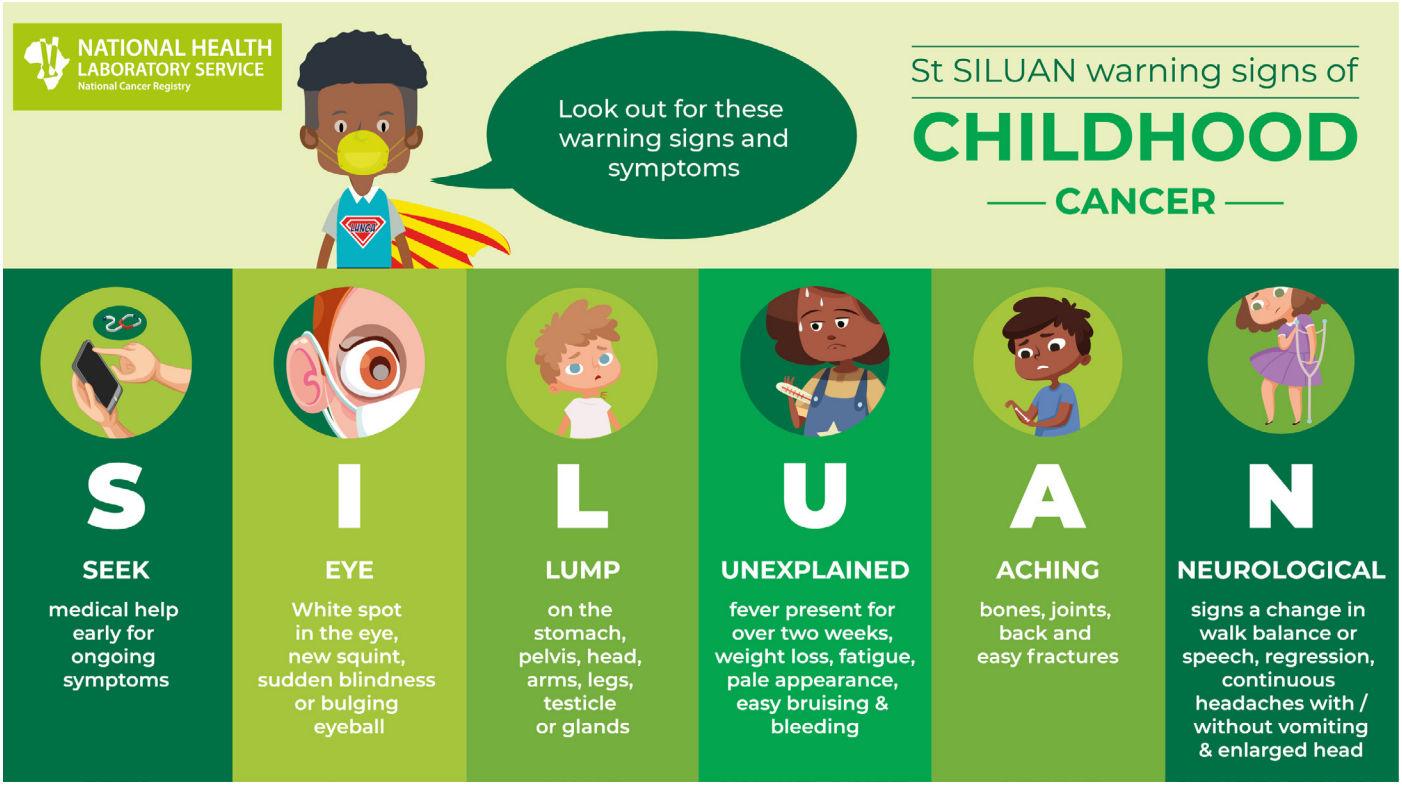
Source: Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; johnf@nicd.ac.za

CHILDHOOD CANCER AWARENESS MONTH

Childhood cancers

Childhood cancers are defined as cancers diagnosed in children younger than 15 years of age. Although childhood cancers are very rare, the incidence rate is increasing and each year between 800 and 1 000 children are diagnosed with cancer in South Africa, and approximately 400 000 children globally. In South Africa, the five most common childhood cancers are leukaemias, lymphomas, brain and spinal cord tumours, nephroblastoma (or Wilms tumours) and soft tissue sarcomas.

Survival rates among childhood cancer patients are as high as 80% in high-income countries, compared to survival rates of 15-20% in low- and middle-income countries (LMICs). The poor survival rates in LMICs are a result of several factors; diagnostic challenges due to inadequate health infrastructure and lack of specialist doctors, limitations in access to treatment including chemotherapy shortages, and delayed diagnosis. It is estimated that less than half of children with cancer in South Africa are diagnosed, with the majority of cases only diagnosed during the advanced stages of the illness. This is partly due to a lack of awareness regarding the early warning signs of childhood cancer. It is important that healthcare workers and parents familiarise themselves with the early warning signs as childhood cancers symptoms may be non-specific or similar to those seen in other illnesses. Early warning signs, also referred to as the "St SILUAN warning signs", is an effective method to aid early detection, as 85% of paediatric cancers are associated with the following signs:



Source: National Cancer Registry, NICD-NHLS; elviras@nicd.ac.za

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 8 on page 11.

Japanese Encephalitis – Patna, India

The state capital Patna, in India, has reported seven cases of Japanese encephalitis (JE) and one death. The state has reported 419 cases in the last five years and 78 deaths. JE is a mosquito-borne disease, and is the most important cause of viral encephalitis in Asia. There are an estimated 68 000 JE cases that occur in Asia annually.

JE virus is a flavivirus that belongs to the same genus as dengue, yellow fever, and West Nile viruses. The virus is transmitted to humans through bites from infected mosquitoes belonging to the *Culex* genus. Unlike in yellow fever, humans, once infected, do not develop sufficient viraemia to infect feeding mosquitoes. JE causes symptomatic disease more commonly in children; most adults in endemic countries have lifelong immunity after childhood infection. The incubation period is 4 to 14 days. Most childhood cases are asymptomatic; however, symptomatic disease presents with symptoms that include high fever, headache, and neck stiffness. In severe cases symptoms may progress to confusion, coma, seizures, spastic paralysis, and death. The case fatality rate in symptomatic disease has been noted to be as high as 30%. Of those who do survive, 30% to 50% may develop neurologic and psychiatric sequelae.

Diagnosis of JE is confirmed through CSF sampling for JE virus-specific IgM antibodies, which remains the gold standard. This test may also be done on serum. There is no cure for JE, and management is completely supportive. JE is, however, a vaccine-preventable disease, and vaccination in endemic areas is recommended by the WHO. Mosquito control is another public health intervention in the prevention and control of JE.

Meningococcal meningitis – DRC

On Wednesday 8 September, the Democratic Republic of the Congo declared an outbreak of meningitis in Banalia, a town in the north-eastern Tshopo Province. The region reported 261 suspected cases and a total of 129 deaths. Banalia lies in the African meningitis belt, which runs across the continent from Senegal to Ethiopia and is made up of 26 countries. The African meningitis belt is composed of countries that are most vulnerable to recurrent meningitis outbreaks, most commonly during the dry season that runs from December to June. Meningococcal meningitis is associated with a high fatality ratio (50% when untreated) and high frequency (10-20%) of severe long-term sequelae.

Meningococcal meningitis is caused by the bacterium *Neisseria meningitidis*. There are twelve serogroups of *N. meningitidis* that have been identified, six of which (A, B, C, W, X and Y) are responsible for disease and epidemics worldwide. Meningococci can also cause septicaemia, pneumonia, and focal infections such as myocarditis and arthritis. Meningococcal meningitis can affect persons of any age, but most commonly affects neonates, infants, and children. The incubation period ranges from 2 to 10 days. There is no animal reservoir. Transmission occurs via person to person through respiratory droplets from infected individuals or carriers. It is estimated that up to 10% of the population carries *N. meningitidis* in their throats. The symptoms are commonly neck stiffness, high fever, headaches, photophobia, nausea, and vomiting. In severe disease symptoms may include seizures and coma.

Diagnosis is made by clinical examination and CSF analysis and culture, or by using polymerase chain reaction. Antibiotics remain the mainstay of treatment. Under epidemic conditions in resource-poor settings, ceftriaxone is the drug of choice. The disease is vaccine preventable; however, only serogroup-specific vaccines exist, conferring varying degrees of duration of protection. To date, no universal vaccine against meningococcal disease exists.

BEYOND OUR BORDERS

Chikungunya – Vadodara, India

The Vadodara Municipal Corporation (VMC) in India, has reported a total of 251 chikungunya cases for this year. Until 5 August this year, the VMC recorded 60 chikungunya cases, and by August 25, 251 cases had been reported.

Chikungunya is a mosquito-borne viral disease caused by an RNA virus which belongs to the *alphavirus* genus of the family *Togaviridae*. Chikungunya virus is transmitted between humans via mosquitoes (*Aedes aegypti* and *Aedes albopictus*). The incubation period is 4 to 8 days. The characteristic symptoms of chikungunya include an abrupt onset of fever and associated painful joint swelling which is often severe and may last from a few days to several months after infection. Other symptoms include headaches, nausea, and fatigue. In some cases, the disease may be mild and can even go unrecognised. Serious complications are uncommon.

Chikungunya is diagnosed using serological tests such as enzyme-linked immunosorbent assays, and reverse transcriptase-polymerase chain reaction, to confirm the presence of IgM antibodies. Management of chikungunya is mostly supportive and non-specific, directed at symptomatic relief. At present, the main method of transmission control and prevention is mosquito vector control by reducing the number of water habitats which support breeding of these vectors, and education of vulnerable populations.

Figure 8. 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), World Health Organization (www.who.int), Centers for Disease Control and Prevention (www.cdc.gov), World Organisation for Animal Health (www.oie.int), National Institute for Communicable Diseases (www.nicd.ac.za); Outbreak News Today (www.outbreaknewstoday.com)

WHO AFRO UPDATE

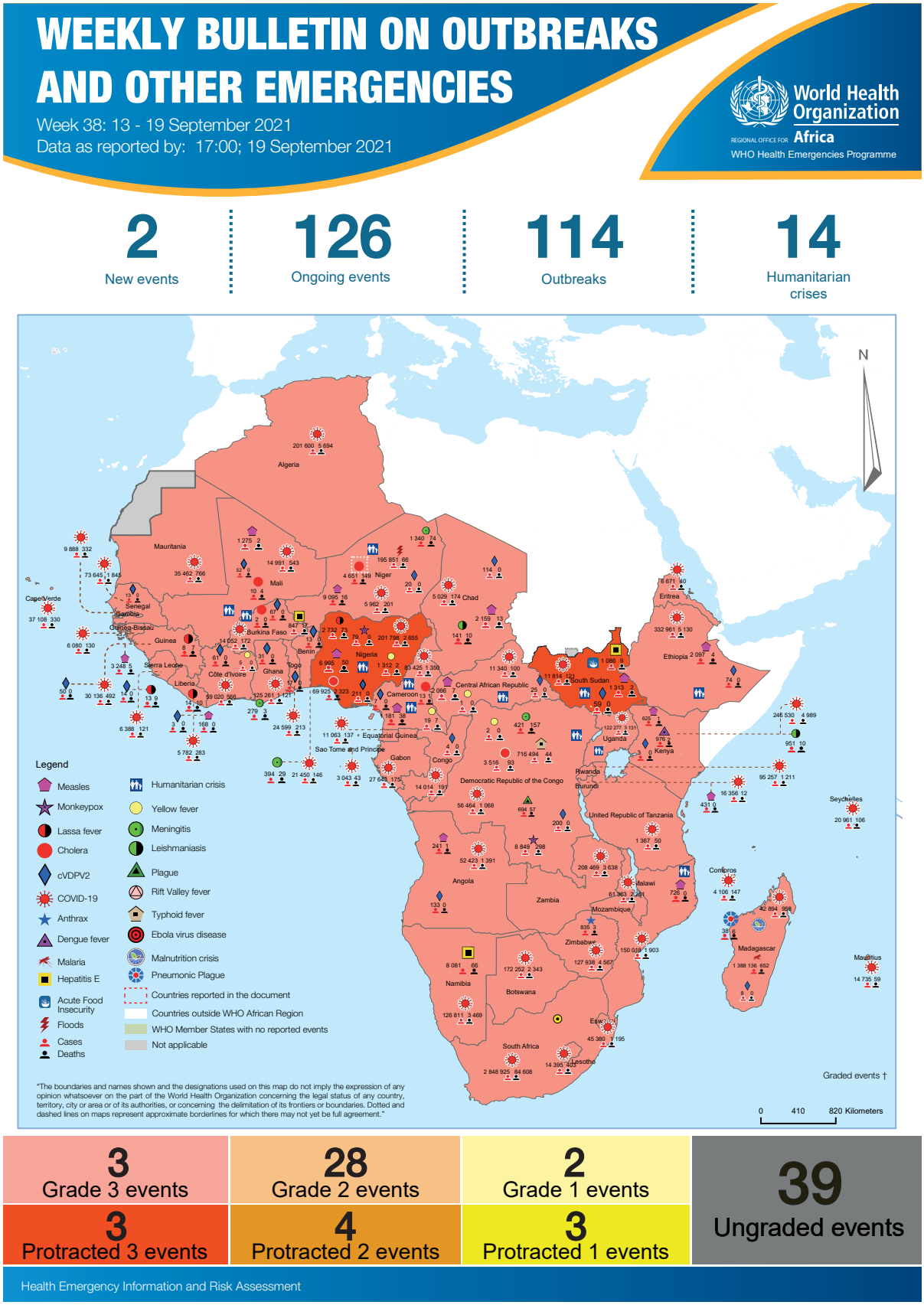


Figure 9. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 128 events. For more information see link below:
https://apps.who.int/iris/bitstream/handle/10665/345306/OEW38-1319092021.pdf

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/

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