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

As winter starts to release its grip on South Africa, we can look forward to warmer days and more time spent outdoors. COVID-19 case and hospitalisation numbers remain low and the number of patients testing positive for influenza has declined over August. The warmer weather does, however, bring with it the start of the malaria season. World Mosquito Day was celebrated on the 20th of August to commemorate the discovery by Sir Ronald Ross that Anopheles mosquitoes transmit malaria and to raise public awareness of mosquito-borne infectious diseases. Malaria continues to be a concern, especially with the threat of antimalarial drug resistance. In 2021, Rwanda became the first African malaria-endemic country to confirm the presence of artemisinin-resistant parasites and locally *kelch 13* mutations are being detected with increasing frequency. Read more about the important work that the NICD's Laboratory for Antimalarial Resistance Monitoring and Malaria Operational Research is doing.

In this edition, we describe a recent case of tick bite fever in Welkom. Those who enjoy spending time walking or camping in the bush, as I do, should consider tick-borne diseases as a cause of fever. Late presentation and delayed initiation of treatment can lead to severe disease and even death. On the enteric diseases front, we describe a multi-facility outbreak of *Salmonella* Isangi in the Eastern Cape province. There's an article on *Candida* species responsible for bloodstream infections and updates on rabies and tetanus cases in South Africa.

The multi-country monkeypox outbreak continues, with the majority of cases detected in Europe and the United States. In South Africa, we have had five laboratory-confirmed cases which have all occurred in males aged from 28 to 42 years. These cases have been mild with those affected isolated at home in order to limit the spread of the virus. Testing for monkeypox is available through the NICD and some private laboratories. Based on data from Europe and the United States, males aged between 18 and 44 years, who self-identify as men who have sex with men and have reported recent sexual activities with one or multiple partners are disproportionately affected in the current outbreak. South Africans who consider themselves at high risk for contracting monkeypox should consult a health care practitioner if they develop symptoms suggestive of the disease who can then refer them for monkeypox testing if indicated.

It's vital that we keep an eye on infectious diseases affecting countries beyond our borders, particularly those that share borders with South Africa. The COVID-19 pandemic caused disruptions to routine infant immunisation services and this might lead to resurgences in vaccine-preventable diseases, particularly on our continent. A measles outbreak in Zimbabwe has necessitated a mass measles vaccine campaign and the risk of international spread of poliovirus remains a public health emergency of international concern. You can also read updates on dengue fever, West Nile virus, Lassa fever and Ebola virus disease in our "Beyond our Borders" section.

Enjoy the warmer weather and this issue of the Communiqué.

ZOONOTIC AND VECTOR-BORNE DISEASES

Case of severe tick-bite fever in Free State province

The case involved a 46-year-old woman in Welkom. She had visited a farm with her son who had noted the presence of ticks during the visit. Due to some domestic issues, the patient presented late and was in a state of ill health. The patient was admitted to the hospital's intensive care unit with a fever, signs of sepsis, hypotension, hypoxia, and anuria. Blood tests showed a slight increase in white cell count (12.1 x 10^9/L) with profound thrombocytopenia (28 x 10^9/L); together with raised transaminases and the presence of ecchymosis, this prompted the consideration of Crimean-Congo haemorrhagic fever (CCHF). A provisional diagnosis of tick bite fever (TBF) was then made when an astute and experienced physician noted the presence of eschar on the foot while palpating pedal pulses. Often small skin lesions such as eschars are missed in patientsadmitted to ICU. Treatment was started with ceftriaxone and doxycycline, with IV ciprofloxacin later added.

Blood samples were sent to NICD for CCHF investigations, while samples were also sent to the hospital's local private lab for rickettsial PCR testing. The patient remained in critical condition in ICU and passed away the next day. The rickettsial PCT test was positive, with the CCHF test negative.

Often, when a TBF patient presents with a delayed diagnosis or treatment is started at a late stage, clinical features can mimic viral haemorrhagic fever or other severe infections. While treatment with oral doxycycline is the usual recommendation, IV ciprofloxacin is used if oral administration of doxycycline is not an option. Unfortunately, despite the availability of treatment and testing for TBF, late presentation and therefore delayed initiation of treatment can lead to a fatal outcome.

Source: Outbreak Response Unit; zhixinh@nicd.ac.za

Monkeypox multi-country outbreak

From January 2022 to 22 August 2022, 41 664 laboratory-confirmed monkeypox cases including 12 deaths were reported from 96 countries/areas/territories across all six WHO Regions (European Region, Region of the Americas, Eastern Mediterranean Region, Western Pacific Region, South-East Asia Region and African Region). The majority of the cases have been reported from the WHO European Region with 20 652 cases and the Region of the Americas with 20 438 estimated cases (with the largest number of cases reported from USA). A total of 404 confirmed cases are reported from Africa. The 12 monkeypox-associated deaths reported in 2022 are reported from Spain (n=2); Brazil (n=1); Ecuador (n=1); India (n=1); Central African Republic (n=2) and Ghana (n=1). These cases are reported from Spain (n=2), Brazil (n=1), Ecuador (n=1), India (n=1), Nigeria (n=4), Central African Republic (n=2) and Ghana (n=1). In the ongoing 2022 multi-country monkeypox outbreak and from countries where monkeypox is not considered to be endemic, males aged between 18 and 44 years and males who self-identify as men who have sex with men (MSM) and have reported recent sexual activities with one or multiple partners continue to be disproportionately affected. On 23 July 2022, the WHO Director-General declared this outbreak a public health emergency of international concern (PHEIC) and issued temporary recommendations for countries in order to stop transmission and contain the outbreak. The latest updates on the global situation can be accessed at

https://worldhealthorg.shinyapps.io/mpx_global/;
https://www.ecdc.europa.eu/en/news-events/monkeypox-situation-update;
https://www.who.int/emergencies/situation-reports and
https://www.paho.org/en/monkeypox-situation-reports.

For the period 22 June 2022 to 25 August 2022 a total of 5 cases of monkeypox have been confirmed in South Africa. The cases were reported from Gauteng (n=2), Western Cape (n=2) and Limpopo (n=1) provinces and are males aged between 28 and 42 years. The cases are epidemiologically unlinked. For the 2 cases reported in the last month, travel histories to Europe were reported. For the first 3 cases, no secondary cases of monkeypox were reported. Case tracking and monitoring of responses have been instituted for the fourth and fifth cases. The first 3 cases reportedly made a full recovery. Available full genetic sequencing for the first two cases indicates that the viruses associated with these cases are most closely related to the viruses circulating in the current multi-country outbreak.

Even though the risk of monkeypox to the general South African public is considered low, healthcare workers should be on high alert and maintain a high index of suspicion for high risk individuals presenting with an unexplained acute rash or skin lesions AND one or more of the following signs or symptoms: headache, acute onset of fever (>38.5°C), lymphadenopathy (swollen lymph nodes), myalgia (muscle pain/body aches) and backache AND for which the following differential diagnoses are excluded: chickenpox, measles, bacterial skin infections, syphilis, molluscum contagiosum, allergic reactions and other locally relevant common cause of a papular or vesicular rash. For more information on monkeypox preparedness and response activities, visit https://www.nicd.ac.za/diseases-a-z-index/monkeypox-2/.

Source: Centre for Emerging Zoonotics and Parasitic Diseases. NICD-NHLS; jacquelinew@nicd.ac.za

ZOONOTIC AND VECTOR-BORNE DISEASES

Malaria update: Increase in frequency of *Kelch 13* mutations found in malaria parasites from Mpumalanga Province, an early warning of the possible emergence of artemisinin-resistant malaria

Last year Rwanda became the first African malaria-endemic country to confirm the presence of artemisinin-resistant parasites, characterised by delayed parasite clearance. Since then, slow-clearing parasites have been reported in many other Central and East African countries, raising concerns over the sustained efficacy of artemisinin-based combination therapies (ACTs). Cognisant of the threat that antimalarial drug-resistant parasite poses to patient cure and South Africa's malaria elimination aspirations, the NICD's Laboratory for Antimalarial Resistance Monitoring and Malaria Operational Research (ARMMOR) further strengthened and expanded its antimalarial drug resistance surveillance programme. This programme uses malaria-positive rapid diagnostic tests routinely collected at healthcare facilities, as a source of malaria parasite DNA. In 2021, this initiative detected the *kelch 13* Q613E mutations, previously found in artemisinin-resistant parasites from South East Asia (NICD Communicable Diseases Communique, August 2021, Vol 20 (8)). At that time, this was an isolated finding. However, *kelch 13* mutations are now being detected with increasing frequency. To date, 2% (13/646) of the isolates collected in Mpumalanga Province have *kelch 13* mutations. Travel history data suggests these infections were all acquired outside South Africa. While none of the mutations appears to be able to confer artemisinin resistance on their own, their increased frequency is a clear indication that mutant parasites are becoming established in the region. Patients must, therefore, be compliant with their malaria treatment, taking every dose of artemether-lumefantrine with some fatty food or full cream milk, to ensure the efficacy of the companion drug, lumefantrine. In addition, every patient should be followed up, ideally with a blood smear on day 3 and day 28 to ensure a complete cure. These findings highlight the need for sustaining South Africa's Antimalarial Drug Resistance Surveillance Programme if the country is to eliminate malaria.

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

ZOONOTIC AND VECTOR-BORNE DISEASES

Rabies update

In the last month, two cases of rabies were reported in two children from the Eastern Cape province of which one was confirmed by post mortem brain biopsy and direct fluorescent antibody testing. The cases are from the Nelson Mandela Bay Municipality and the OR Tambo District. The former case was originally reported as a probable case in the last Communiqué 21 (7) of July 2022, because rabies-compatible illness had occurred in the deceased and there was a credible history of contact with a suspected rabid dog.

As of 25 August, 2022, South Africa reported ten laboratory-confirmed rabies cases, including five from the Eastern Cape province, Nelson Mandela Bay municipality (n=5); three from Limpopo province, Mopani (n=2) and Vhembe (n=1) districts; and two from KwaZulu-Natal province, eThekwini municipality (n=1) and iLembe district (n=1) (Figure 1). Furthermore, five deaths from probable rabies have been reported from the Eastern Cape Province's OR Tambo (n=4) and Amathole (n=1) districts, respectively (Figure 1).

Once clinical symptoms start to manifest, rabies is a fatal viral illness for both humans and animals. However, vaccination and increased awareness of people at risk can completely prevent rabies. Since the majority of cases are in dogs and result from dog bites, rabies can be effectively controlled through mass vaccination of dogs and cats using the One Health strategy. To prevent human cases, the World Health Organization recommends a coverage rate of 70% for dogs. It is still possible to stop rabies in humans with adequate and prompt post-exposure prophylaxis, which includes thorough wound cleaning with soap and water, the rabies vaccine, and rabies immunoglobulin, all of which must be given on the same day as the exposure to the saliva of an unknown suspicious dog, cat, or wild animal.

Although rabies can be prevented by vaccination, South Africa has been unable to stop continuous outbreaks in some areas of the Eastern Cape, Limpopo, and KwaZulu-Natal. The Eastern Cape, KwaZulu-Natal, Mpumalanga, and Limpopo provinces are the four known source areas of canine rabies. The national plan for eliminating dog-mediated rabies (2019-2030) has as its goal to focus on improving animal surveillance in these regions. It emphasizes the requirement for more funding for annual mass dog vaccination efforts, which have shown to be cost-effective with coverage rates of up to 70%. Animals are given access by owners for vaccination, according to research from rural Africa, but the effectiveness of free programs is far higher than owner-paid ones. Furthermore, there is a need for an improved animal bite and post-exposure prophylaxis surveillance in the South African public health sector to increase the availability and cost-effectiveness of administration to patients.

Please visit www.nicd.ac.za for more information on rabies.

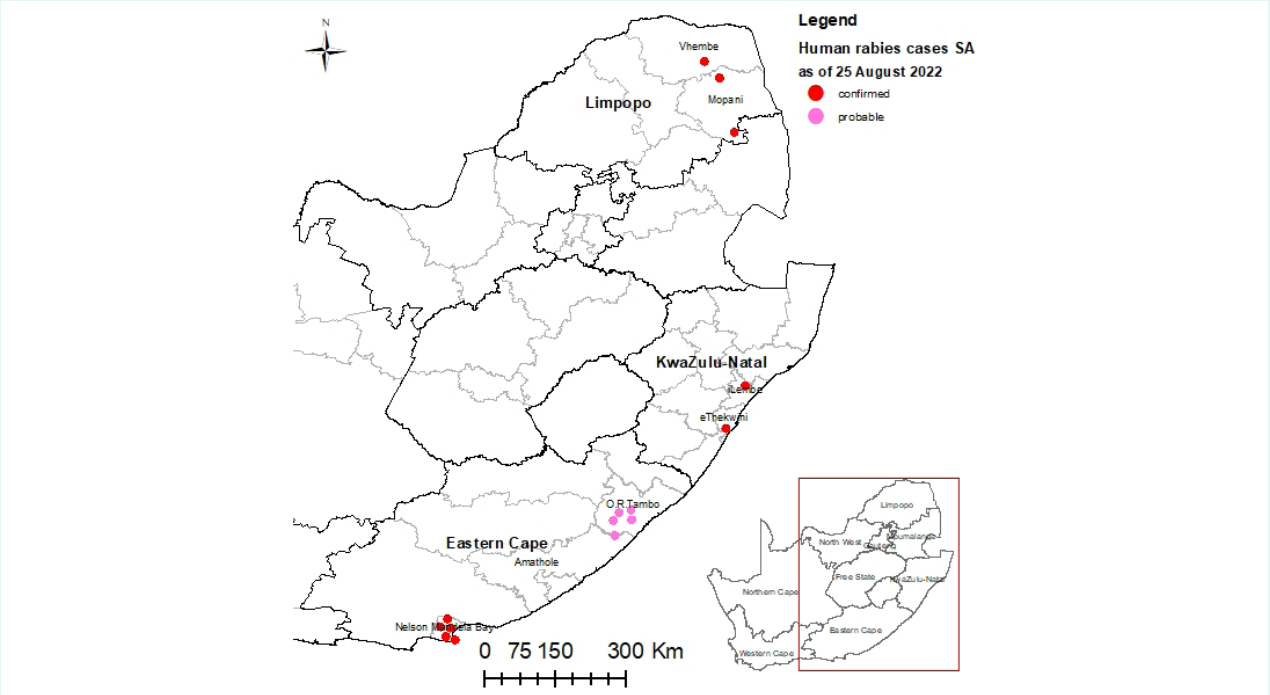

Figure 1. Human rabies cases in South Africa in 2022, as of August 25. (Source: NICD data)

Source: Centre for Emerging Zoonotic and Parasitic Diseases, veerlem@nicd.ac.za

ENTERIC DISEASES

Multi-facility healthcare-associated outbreak of *Salmonella enterica* serovar Isangi, Eastern Cape province

Healthcare-associated infections and outbreaks of non-typhoidal *Salmonella* (NTS) are uncommon but well described. Owing to the mode of spread and specific healthcare-population characteristics, the majority of NTS healthcare-associated outbreaks have been reported in paediatric- and neonatal-care settings.

An outbreak caused by a unique 'strain' of *Salmonella enterica* serovar Isangi *(Salmonella Isangi)* has been identified in the Nelson Mandela Bay Metropolitan Municipality (NMBMM), Eastern Cape province. From April through July 2022 the NHLS laboratory noted an increase in the number of cases of extended β-lactamase producing (ESBL) NTS diagnosed on culture; the case numbers peaked in May and decreased steadily thereafter. To date, the total number of cases is 43, of which 36 case patients had symptoms or evidence of an illness from infection, and 7 case patients were asymptomatic (i.e. they had no symptoms or evidence of illness; 6 were detected when all patients in the affected hospital wards were tested, and one case of carriage was detected incidentally). The cases included children and adults, and most were patients at the three largest public hospitals in NMBMM (Dora Nginza, Livingstone and Uitenhage provincial hospitals).

Available isolates which were submitted to the Centre for Enteric Diseases at the National Institute for Communicable Diseases, from patients diagnosed with nontyphoidal salmonellosis in Eastern Cape province from 2020 through 2022, underwent further investigation including whole-genome sequencing (WGS). Phenotypic serotyping identified the isolates as *Salmonella* Isangi and antimicrobial resistance testing confirmed their antimicrobial susceptibility profile as reported by the NHLS laboratory (multi-drug resistant, resistant to ciprofloxacin, ESBL-producing). Core genome multi-locus sequence typing analysis of WGS results identified a cluster of highly related *Salmonella* Isangi isolates, and revealed that the first two cases due to this unique 'strain' occurred in late 2021.

Following an outbreak investigation, including a review of patients' laboratory and medical records, it was determined that this prolonged outbreak was a multi-facility healthcare-associated outbreak. Records showed that the majority of patients were tested for and diagnosed with NTS infections at least 48 hours after admission. The few patients who tested positive for *Salmonella* Isangi on admission had recent exposure to one of the three hospitals. Transfer of patients between these facilities is common practice and likely facilitated transmission of the strain from patients in one hospital to the next.

Following the implementation of targeted and enhanced infection prevention and control measures in these hospitals, the number of cases decreased and only one probable case has been identified since the end of July 2022.

The predominant mode of transmission in NTS healthcare-associated outbreaks has been reported as person-to-person transmission, usually as a result of NTS contamination of healthcare workers' hands. In such cases, the initial source of infection is usually a symptomatic patient who is shedding NTS bacilli. Other important sources for ongoing transmission of NTS in an established outbreak include environmental and fomite contamination. NTS has been isolated from a range of environmental sources during outbreaks, including cots, mattresses, washbasins, bedpans, bedpan washers, rectal thermometers, thermometer holders, gastroscopes, suction apparatus, and soiled linen. Contaminated food served to patients (being inherently contaminated or contaminated during handling/processing by infected food-handlers) has also been documented as a source of infection during outbreaks amongst adolescent/adult patients, as has contaminated milk formula feeds amongst young children (again, either inherently contaminated or contaminated during handling/processing by infected milk kitchen staff). Transmission of NTS via pooled breast milk resulted in an outbreak in a neonatal ward, ward. This outbreak was shown to be as a result of an infected mother excreting NTS in breast milk.

Within outbreak settings, persons with underlying medical conditions or immunosuppression (including HIV) are most at risk of developing symptomatic disease and complications. Young children in particular are at considerable risk of morbidity if infected, with other underlying medical conditions or predisposing factors (e.g. prematurity) compounding this risk. As a consequence, NTS outbreaks in paediatric- or neonatal-care settings often have high attack rates (as high as 43% in some reported outbreaks) and high case fatality rates (12-41% in published studies). In an outbreak of *Salmonella* Isangi in the paediatric wards at Chris Hani Baragwanath Hospital in 2001, a case fatality rate of 22% (9/41) was recorded, with 78% (7/9) of fatal cases being HIV co-infected.

The duration of NTS outbreaks in paediatric/neonatal wards may also be prolonged, and outbreaks lasting >1 year have been described. Asymptomatic patients, asymptomatic healthcare workers, and asymptomatic mothers of hospitalised children may shed NTS bacilli for many weeks (even months) and serve as an invaluable source of ongoing transmission to susceptible patients. Symptomatic NTS-infected patients may shed NTS for prolonged periods (many months), particularly

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very young children, children with HIV co-infection, and children on antibiotic therapy. Children with symptomatic NTS infection who are treated with antibiotics and show clinical response to treatment and resolution of symptoms can still have NTS for many weeks or months thereafter.

The incubation period of NTS in healthcare-associated outbreaks is variable, and depends on the patient characteristics as well as the serotype of NTS. *Salmonella Typhimurium* has been documented as having incubation periods from ±24 hours to 14 days in hospital outbreaks. As a result, patients may develop symptomatic disease after being discharged from the hospital. If such patients are readmitted (which frequently happens, particularly if they have other underlying medical conditions etc), they may serve as additional propagators of NTS transmission. A feature of many published NTS outbreaks in paediatric/neonatal wards is that many weeks may pass with no new cases detected, but due to asymptomatic shedders and readmission of previously infected patients who have since become symptomatic, ongoing cases occur.

Factors shown to contribute to the persistence of the organism and ongoing transmission during outbreaks include suboptimal infection prevention and control practice (particularly hand hygiene and contact precautions), inadequate cleaning and disinfection of the environment and medical equipment, understaffing, and overcrowding. Review, inspection and audit of these practices and institutional factors facilitate corrective actions and intervention measures to reduce transmission and stop the outbreak. Screening of all patients in affected wards to identify those who may have asymptomatic carriage is also recommended; isolation or cohorting of patients with NTS infection (whether symptomatic or asymptomatic) may reduce the risk of onward patient-to-patient transmission.

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

RESPIRATORY DISEASES

COVID-19 update

From 3 March 2020 through to 20 August 2022 (week 33 of 2022), a total of 21 036 460 PCR tests for SARS-CoV-2, 4 009 943 laboratory-confirmed COVID-19 cases, 541 827 admissions and 104 262 deaths were reported in South Africa. The majority of cases are from Gauteng province (33.1%), followed by the KwaZulu-Natal province (17.9%) and the least number of tests were conducted in the Northern Cape province (2.9%) (Table1). In week 33 the PCR testing rate was 50 per 100 000 persons, highest in Gauteng (81 per 100 000 persons) and lowest in Limpopo (9 per 100 000 persons). The percentage testing positive in week 33 was 4.1%, highest in Limpopo (10.3%) and lowest in Northern Cape (1.6%). The highest weekly incidence risk was reported in Gauteng (3.8 cases per 100 000 persons), and the lowest in the Northern Cape (0.6 cases per 100 000 persons). The highest weekly proportion of admissions was reported in Gauteng (42.3%), and the lowest was in the Northern Cape (0%). In summary, the decline in testing rate, positivity rate, case incidence, admissions and deaths reported since May 2022 has stabilised in the past few weeks.

Table 1. Number and cumulative incidence risk of SARS-CoV-2 PCR testing, laboratory-confirmed cases of COVID-19, admissions and deaths per 100 000 persons by province, South Africa, 3 March 2020 – 20 August 2022

Province	Cumulative cases (n) (percentage, n/ total cases in South Africa)	Population in mid-2021[1], n	Cumulative testing rate per 100,000	Cumulative incidence risk of cases / 100,000	Cumulative incidence risk of admissions / 100,000	Cumulative incidence risk of deaths / 100,000
Eastern Cape	364 498 (9.1)	6 676 590	24466.9	5 459.3	730.5	199.2
Free State	216 295 (5.4)	2 932 441	42234.3	7 375.9	1112.8	209.8
Gauteng	1 327 888 (33.1)	15 810 388	49730.1	8 398.8	1011.8	193.7
KwaZulu-Natal	717 960 (17.9)	11 513 575	31628.7	6 235.8	773.2	152.5
Limpopo	159 890 (4.0)	5 926 724	10265.8	2 697.8	357.1	90.2
Mpumalanga	202 532 (5.1)	4 743 584	22235.1	4 269.6	484.8	103.8
North West	202 245 (5.0)	4 122 854	42955.0	4 905.5	834.1	121.6
Northern Cape	115 405 (2.9)	1 303 047	22407.5	8 856.6	915.9	188.8
Western Cape	703 229 (17.5)	7 113 776	49055.0	9 885.5	1700.2	265.5
Unknown	1					
Total	**4 009 943**	**60 142 978**	**34977.4**	**6 667.4**	**900.9**	**173.4**

[1]2021 Mid-year population Statistics South Africa

RESPIRATORY DISEASES

Influenza season update

The 2022 influenza season started in week 17 (week starting 25 April 2022) when the detection rate among patients in pneumonia surveillance breached the epidemic threshold as determined by the Moving Epidemic Method (MEM).

In 2022, to date, a total of 684 influenza cases have been detected from the three surveillance programmes conducted by NICD. Of these, 389 (56,9%) were influenza A (H1N1)pdm09, 184 (26.9%) were influenza A(H3N2) and 49 (7,2%) were influenza B Victoria. In addition, influenza subtype/lineage results were inconclusive for 24 (3.5%) and pending for 38 (5.6%). To date the season has been predominated by influenza A(H1N1)pdm09, however since week 24, there has been a relative increase in detection of influenza A(H3N2) and influenza B (Victoria) (Figure 2 and figure 3).

The majority of cases were reported from Western Cape n=200 (29,2%) followed by Gauteng n=183 (26,6%), KwaZulu-Natal n=95 (13,8%), Mpumalanga n=81 (11,8%), North West n=58 (8,4%), Eastern Cape n=50 (7,3%), Free State n=7 (1%), and Limpopo n=6 (1%) province sentinel surveillance sites.

Although the number of patients testing positive for influenza has declined over the month of August, clinicians are reminded that influenza should still be considered as one of the potential causes of illness in patients presenting with influenza-like illness or respiratory illness during this period and should continue to promote influenza vaccination for individuals at risk for severe respiratory illness.

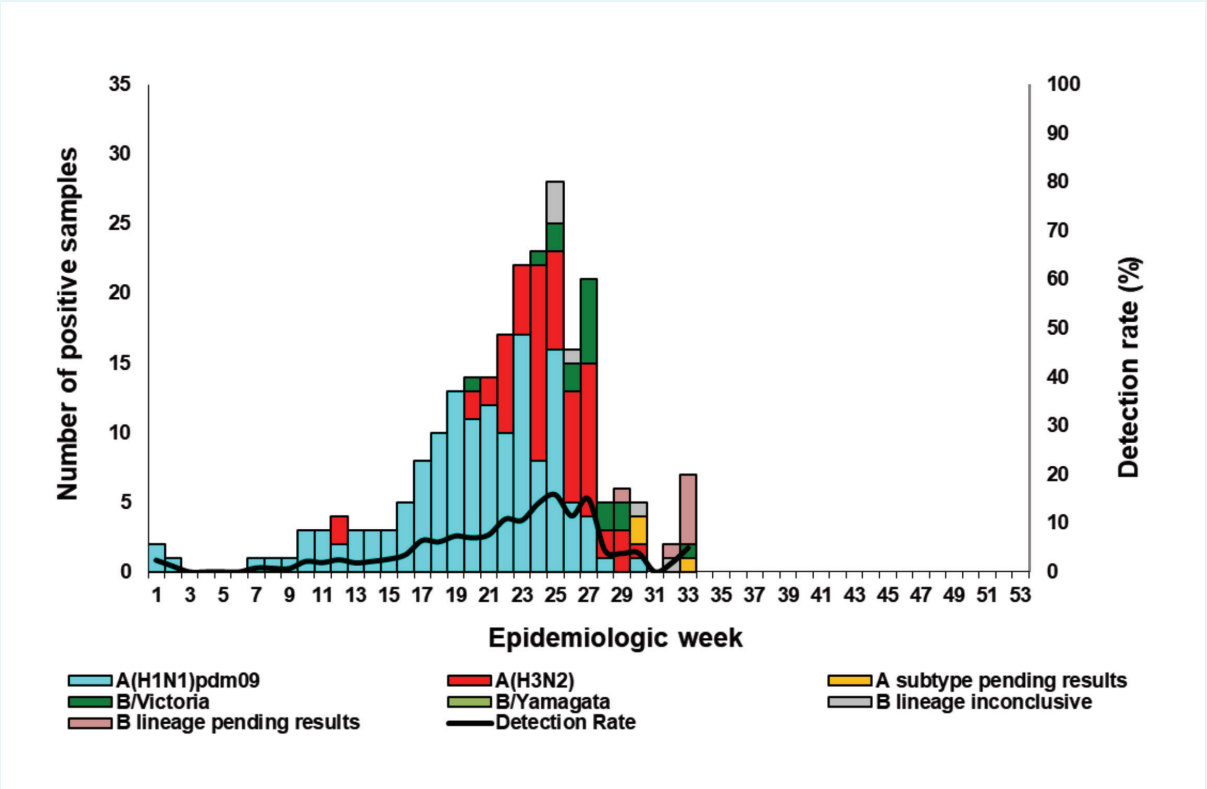

Figure 2. Number of positive influenza positive cases* by influenza subtype and lineage and detection rate** by week, pneumonia surveillance public hospitals, 03/01/2022 – 21/08/2022

Inconclusive: insufficient viral load in the sample and unable to characterise further
*Specimens from patients hospitalised with pneumonia at 10 sentinel sites in 6 provinces
**Only reported for weeks with >10 specimens submitted

RESPIRATORY DISEASES

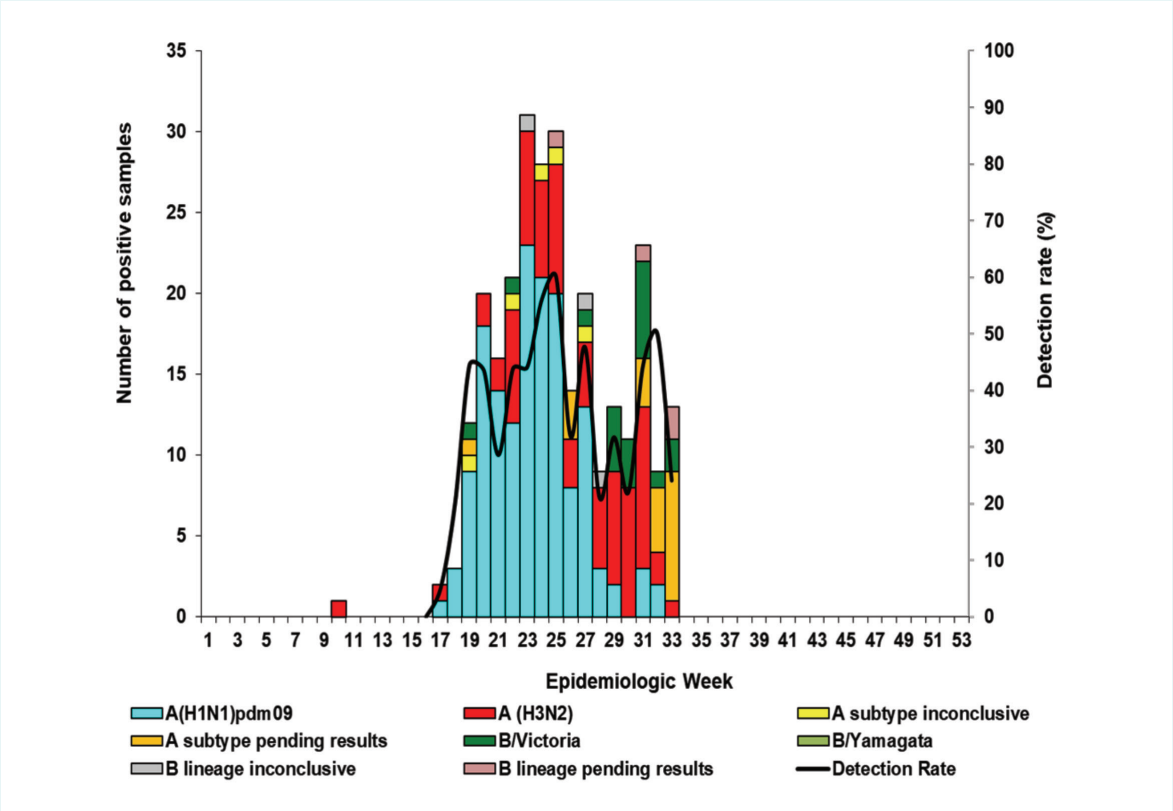

Figure 3. The number of positive patients* by influenza subtype and lineage and detection rate** by week, ILI surveillance - Viral Watch, 03/01/2022 – 21/08/2022

*Specimens from patients with Influenza-like illnesses at 90 sentinel sites in 8 provinces
**Only reported for weeks with >10 specimens submitted.
Inconclusive: insufficient viral load in the sample and unable to characterise further

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

HEALTHCARE-ASSOCIATED INFECTIONS, ANTIMICROBIAL RESISTANCE AND MYCOSES

Changing distribution of *Candida* species causing bloodstream infections in South Africa, 2019-2021

To describe the species causing *Candida* bloodstream infections (BSI) in South Africa, we summarized electronic blood culture data obtained from the NICD surveillance data warehouse and the South African Society of Clinical Microbiology from 1 January 2019 through 31 December 2021. A case of *Candida* BSI was defined as a person who had a blood culture from which one of the six common *Candida* species *(C. albicans, C. auris, C. glabrata, C. krusei, C. parapsilosis or C. tropicalis)* was isolated either at an NHLS or private pathology laboratory (Ampath, Lancet Laboratories, PathCare/ Vermaak and Partners).

Over the three-year period, 12 959 culture-confirmed cases of *Candida* BSI were reported, 71% (9 142/12 959) from the private sector. *Candida parapsilosis* BSI accounted for 40% of cases (5 244/12 959), followed by *C. auris* (25% (3 235/12 959)). There was a notable increase in the proportion of cases of *C. auris* BSI from 17% in 2019 to 31% in 2021 (p<0.01), and a corresponding decrease in the proportion of *C. parapsilosis* BSI from 46% in 2019 to 37% in 2021 (p<0.01) (Figure 4). Gauteng province accounted for 50% (6 496/12 959) of all *Candida* BSI cases, followed by KwaZulu-Natal province (14% (1 833/12 959)).

Fewer than 30% of cases of *Candida* BSI were reported from the public sector, suggesting differential specimen-taking practices or a relatively smaller population at risk.[1] *Candida* auris, a multi-drug resistant pathogen, was the second most common cause of candidaemia. This represents a further shift in epidemiology since a national survey in 2016-2017 found that *C. parapsilosis* was the most common species (44% (2 600/5 876)), followed by *C. albicans* (23% (1 353/5 876)) and *C. auris* (14% (794/5 876)).[2]

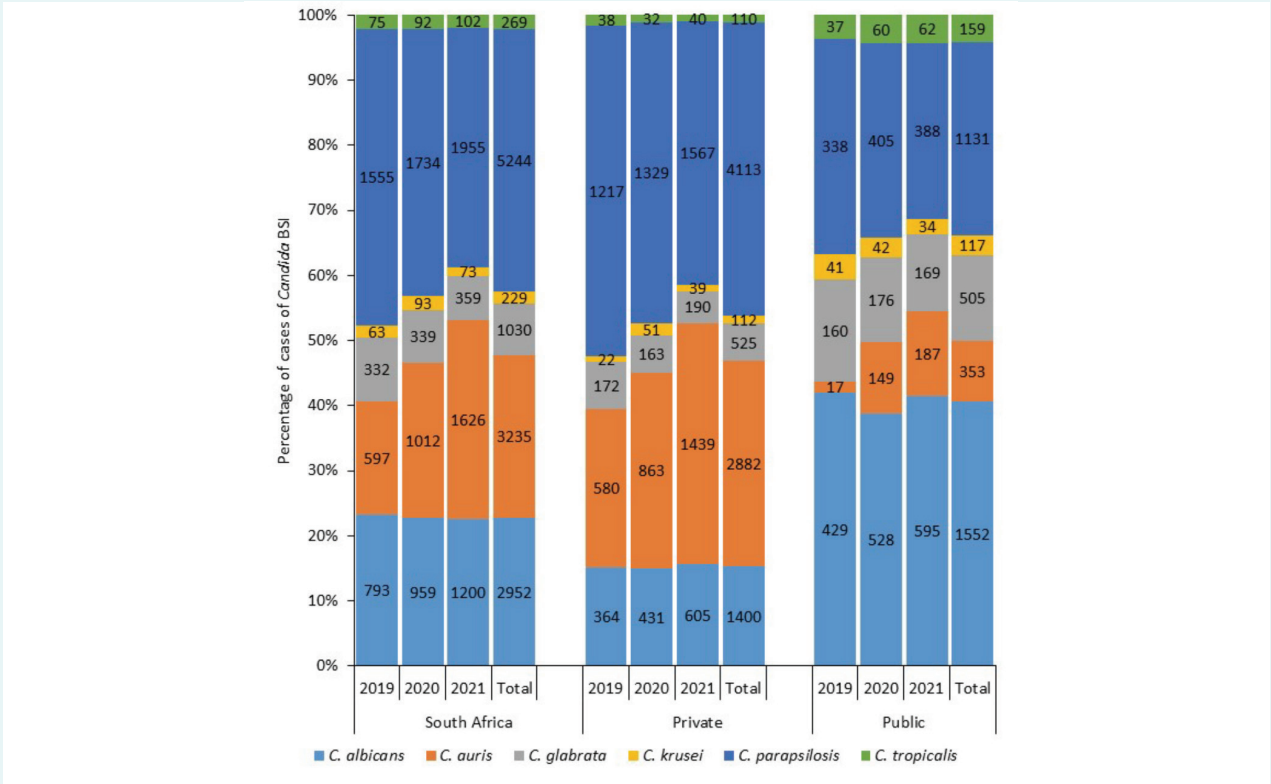

Figure 4. Distribution of six *Candida* species by the health sector in South Africa, 2019 to 2021 (n=12 959)

References:

1. Moema I, Shuping L, Kuonza L, Perovic O. Blood culture specimen collection practices among patients with suspected bloodstream infections at an emergency department of a tertiary hospital in Johannesburg, 14-20 June 2018. NICD Bull. 2018;18(1):14-20.
2. van Schalkwyk E, Mpembe RS, Thomas J, et al. Epidemiologic Shift in Candidemia Driven by Candida auris , South Africa, 2016–2017[1] . Emerg Infect Dis. 2019;25(9):1698-1707. doi:10.3201/eid2509190040.

Source: Centre for Health-Associated Infections, Antimicrobial Resistance and Mycoses, NICD-NHLS; husnai@nicd.ac.za

TETANUS UPDATE

Tetanus cases from 01 January to 15 August 2022

Tetanus is a category 2 notifiable disease caused by the bacterium *Clostridium tetani*. Typical presentation is painful muscle spasm and locked jaw and infection can result in serious complications and death. The incubation period of tetanus varies between a few days and several weeks and neonatal tetanus has shorter incubation with the majority of neonates developing symptoms within 6 to 8 days. It is not transmitted from person to person but occurs when wounds or animal bites are infected with tetanus spores.

Tetanus can be prevented by the administration of tetanus toxoid, which induces specific antitoxins. To prevent neonatal tetanus, tetanus toxoid needs to be administered to the mother before or during pregnancy, the delivery has to take place under hygienic conditions and umbilical cord care needs to be appropriate. Neonatal tetanus, with a fatality rate of 80-100%, is particularly common in rural areas where home deliveries are frequent.

There is no laboratory test for tetanus and cases are classified after reviewing medical records.

There have been 6 tetanus cases notified on the Notifiable Medical Notification system since 01 January 2022 ranging in age from 9 to 66 years of age. Three cases have been confirmed as tetanus and 3 are still pending classification. There have not been any neonatal tetanus cases this year.

Source: Centre for Vaccines and Immunology, NICD-NHLS; Susanm@nicd.ac.za

BEYOND OUR BORDERS

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

Measles – Zimbabwe

A measles outbreak which began in April 2022 has so far resulted in 157 deaths in Zimbabwe. The Zimbabwean Ministry of Health has reported that the cumulative number of cases as of 15 August is 2 056, with the majority coming from the Mutasa district in Manicaland province where the outbreak was first reported (1 270 cases and 122 deaths). Other provinces which have been affected are Harare (121 cases), Midlands (83 cases and 16 deaths), Masvingo (116 cases and 3 deaths), Mashonaland East (115 cases and 16 deaths), Mashonaland Central (87 cases), Mashonaland West (130 cases), Matabeleland North (85 cases), Matabeleland South (23 cases) and Bulawayo (12 cases).

The majority of cases amongst children are from religious sects that are unvaccinated against measles due to religious beliefs.

Earlier this year, WHO issued a warning to African countries regarding the surge in vaccine-preventable diseases. Between January and March 2022, Africa recorded approximately 17 500 cases of measles, a 400% increase in comparison to the same period last year. WHO attributed this increase to inequalities in vaccine access as well as the disruptions caused by the COVID-19 pandemic to routine immunization services in many African countries. In order to eliminate measles, countries are expected to attain and maintain measles vaccination coverage of 95% with 2 doses of the vaccine.

The Zimbabwean government has recently invoked the Civil Protection Unit Act to deal with the measles outbreak. It has initiated a mass vaccination campaign targeting individuals between the ages of 6 months and 15 years old.

Sources: https://promedmail.org/promed-post?place=8705164,171
https://www.afro.who.int/news/vaccine-preventable-disease-outbreaks-rise-africa

Dengue fever update

As of 27 July 2022, there have been 2 357 301 cases of dengue fever and 1 731 deaths globally. Brazil has recorded the highest number of cases (n=1 827 617), followed by Vietnam (n=103 433), the Philippines (n=64 797), Peru (n=56 021) and Indonesia (n=52 313).

The Pan American Health Organization (PAHO) reported increased dengue transmission earlier in the year compared to previous years, possibly due to the easing of lockdown measures for COVID-19. The European CDC also noted that there is currently a high risk of transmission of dengue in continental Europe due to favourable environmental conditions.

Transmission of dengue fever usually peaks during and after rainy seasons. This is mainly due to high mosquito population levels at this time, susceptibility to circulating serotypes, more favourable air temperatures and precipitation and humidity. All these factors have an impact on mosquito population levels and feeding patterns, as well as on the dengue virus incubation period.

The current dengue outbreaks are in countries frequented by South African travellers, so clinicians should have a high index of suspicion in people returning from these areas with signs and symptoms consistent with the disease.

Sources: https://www.ecdc.europa.eu/en/dengue-monthly
https://ais.paho.org/ha_viz/arbo/pdf/PAHO%20Arbo%20Bulletin%202022.pdf
https://www.who.int/health-topics/dengue-and-severe-dengue#tab=tab_1

BEYOND OUR BORDERS

West Nile Virus – Europe

As of 17 August 2022, 292 human cases of West Nile Virus (WNV) have been reported in the European Union (EU) and European Economic Area (EEA) in the 2022 transmission season. The majority of these cases have been reported in Italy (n=228), with other cases being reported in Greece (n=59), Austria (n=2), Romania (n=2) and Slovakia (n=1). The EU/EEA has also recorded 15 deaths in this transmission season. EU-neighbouring countries have reported 53 human cases and 3 deaths, all of these being in Serbia. The Pistoia region in Italy and Moravicki region in Serbia have reported their first ever human cases of WNV infection.

There have also been 12 equid and 52 bird outbreaks reported since the start of the 2022 transmission season. The equid outbreaks have been in Italy (n=10), France (n=1) and Hungary (n=1), whilst the bird outbreaks have been in Italy (n=51) and Germany (n=1).

WNV belongs to the *Flaviviridae* family under the *flavivirus* genus. It is endemo-epidemic in Europe and is a mosquito-borne zoonotic disease. It typically affects countries in southern, eastern and western Europe but is also commonly found in Africa, the Middle East, North America and West Asia. The virus is transmitted via the bite of infected mosquitoes and usually affects birds, but can infect humans, horses and other mammals. It may also be transmitted to humans through contact with infected animals, their blood and other tissues. Very rarely, human-to-human transmission can occur through organ transplants, blood transfusions and breast milk, but to date, no human-to-human transmission has occurred through casual contact and when infection control measures have been implemented. The incubation period of the virus is typically 3 to 14 days.

In the majority of cases (80%), WNV is asymptomatic. However, approximately 20% of people infected with WNV will develop West Nile Fever (WNF) and 1 in 150 people will develop severe West Nile disease. Symptoms of WNF include fever, headache, fatigue, myalgia, nausea and vomiting, skin rash and lymphadenopathy. Severe disease can result in meningitis, encephalitis, poliomyelitis and death. Immunocompromised people and people over the age of 50 are at the highest risk of developing severe disease.

Currently, no definitive treatment other than supportive management exists for the neuroinvasive disease. There is also no vaccine available for use in humans.

Sources: https://www.ecdc.europa.eu/en/west-nile-fever/surveillance-and-disease-data/disease-data-ecdc
https://www.who.int/news-room/fact-sheets/detail/west-nile-virus

Ebola virus disease update

Health authorities in the Democratic Republic of the Congo (DRC) have declared a resurgence of Ebola following confirmation of one case of Ebola virus disease (EVD) in the province of North Kivu on 22 August 2022. The last outbreak in the area resulted in 11 cases and 6 deaths over a period of 2 months and ended on 16 December 2021.

A 46-year-old woman presented to a health facility in Beni, North Kivu, for unrelated ailments but subsequently developed signs and symptoms consistent with EVD. She died on 15 August 2022 and the presence of the virus was confirmed by both the Beni and Goma branches of the National Institute of Biomedical Research. Genetic analysis of the patient's sample revealed that the case was genetically linked to the 2018-2020 Ebola outbreak in the North Kivu and Ituri provinces of the DRC.

There are currently 160 contacts being closely monitored and followed up by WHO and the health authorities in the DRC. Ring vaccination is also expected to be initiated, with 200 of the country's 1000 doses of the rVSV-ZEBOV Ebola vaccine being sent to Beni this week.

On 19 August 2022, WHO published its 1st guideline for EBV therapeutics where it strongly recommended the use of 2 monoclonal antibody treatments, namely mAb114 (Ansuvimab; Ebanga) and REGN-EB3 (Inmazeb). This was the outcome of a systematic review and meta-analysis of randomised clinical trials of EVD therapeutics, with the largest of these trials. Having been conducted in the DRC during an Ebola outbreak. Access to both these lifesaving medicines remains a problem in resource-limited countries and WHO is working on improving global access, especially in areas where there is an active outbreak or where the threat of an outbreak is very high.

Sources: https://www.afro.who.int/countries/democratic-republic-of-congo/news/democratic-republic-congo-declares-ebola-resurgence-north-kivu
https://apps.who.int/iris/bitstream/handle/10665/361697/9789240055742-eng.pdf

Polio update

As of 9 August 2022, there have been 19 cases of wild poliovirus type 1 (WPV1) and 223 cases of circulating vaccine-derived poliovirus (cVDPV) globally in 2022. In 15 countries worldwide, 93% of the cases of cVDPV have been attributed to cVDPV type 2 (cVDPV2).

UK health authorities have advised a targeted booster dose of inactivated polio vaccine (IPV) to all children between the ages of 1 and 9, following the detection of poliovirus type 2 (PV2) in sewage samples. Testing has revealed that some of the vaccine-derived poliovirus type 2 (VDPV2) isolates in the UK are genetically linked to VDPV2 isolated from a case in New York in July 2022, as well as to environmental samples collected in New York and Greater Jerusalem, Israel.

Inactivated polio vaccines are used in all EU/EEA countries and the WHO European Region has remained polio-free since 2002. The risk of the virus being reintroduced still remains a threat though, as there are still unvaccinated population groups in Europe. Countries with low population immunity include Poland, Romania and Ukraine and these countries are at high risk of a sustained polio outbreak from either wild poliovirus importation or the emergence of cVDPV. This was determined by the European Regional Certification Commission for Poliomyelitis Eradication report from September 2021, where they also classified 11 other EU/EEA countries as being at intermediate risk of sustained polio outbreaks.

WPV1 also remains a threat due to continuous circulation in Pakistan and Afghanistan and after the detection of 4 cases in Mozambique and 1 case in Malawi in 2022. The fact that these cases are genetically linked to a strain from Pakistan further emphasises the risk of importation of WPV. There is also growing concern regarding the occurrences of outbreaks of cVDPV in Africa, as there is the risk of international spread in populations with low polio immunity. The 32nd Polio IHR Emergency Committee which convened on 15 June 2022 unanimously agreed that the risk of international spread of poliovirus remains a Public Health Emergency of International Concern (PHEIC).

Sources: https://www.ecdc.europa.eu/en/news-events/update-polio-situation-eueea-and-world
https://www.who.int/news/item/24-06-2022-statement-of-the-thirty-second-polio-ihr-emergency-committee
https://polioeradication.org/polio-today/polio-now/

Lassa fever - Guinea

As of 12 August 2022, the Laboratory of Viral Haemorrhagic Fevers of Guinea (LFHVG) reported 6 confirmed and 1 probable case of Lassa fever in the Conakry and Kindia regions of the country. 4 of the cases in Conakry were reported to the same clinic, the Gbessia clinic. They presented with symptoms of fever, myalgia, headache, nausea, vomiting, chest pain and loss of appetite. A total of 63 contacts in Conakry and 21 contacts in Kouroussa have been identified so far.

Lassa fever is caused by the Lassa virus and is an acute viral haemorrhagic illness. It is endemic in several countries in West Africa, namely Benin, Ghana, Guinea, Liberia, Mali, Sierra Leone, Togo and Nigeria. Approximately 80% of people who become infected with the Lassa virus will be asymptomatic, however, 20% of people will develop severe disease with an overall case-fatality rate of 1%. In patients who are hospitalised with severe disease, the case-fatality rate is around 15%. Supportive treatment and management of symptoms improve survival.

Sources: https://www.who.int/health-topics/lassa-fever#tab=tab_1
https://africacdc.org/disease/lassa-fever/
https://apps.who.int/iris/bitstream/handle/10665/361771/OEW33-0814082022.pdf

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Figure 5. In reference to the above map. A red dot indicates the approximate location of the outbreak or event.

WHO AFRO UPDATE

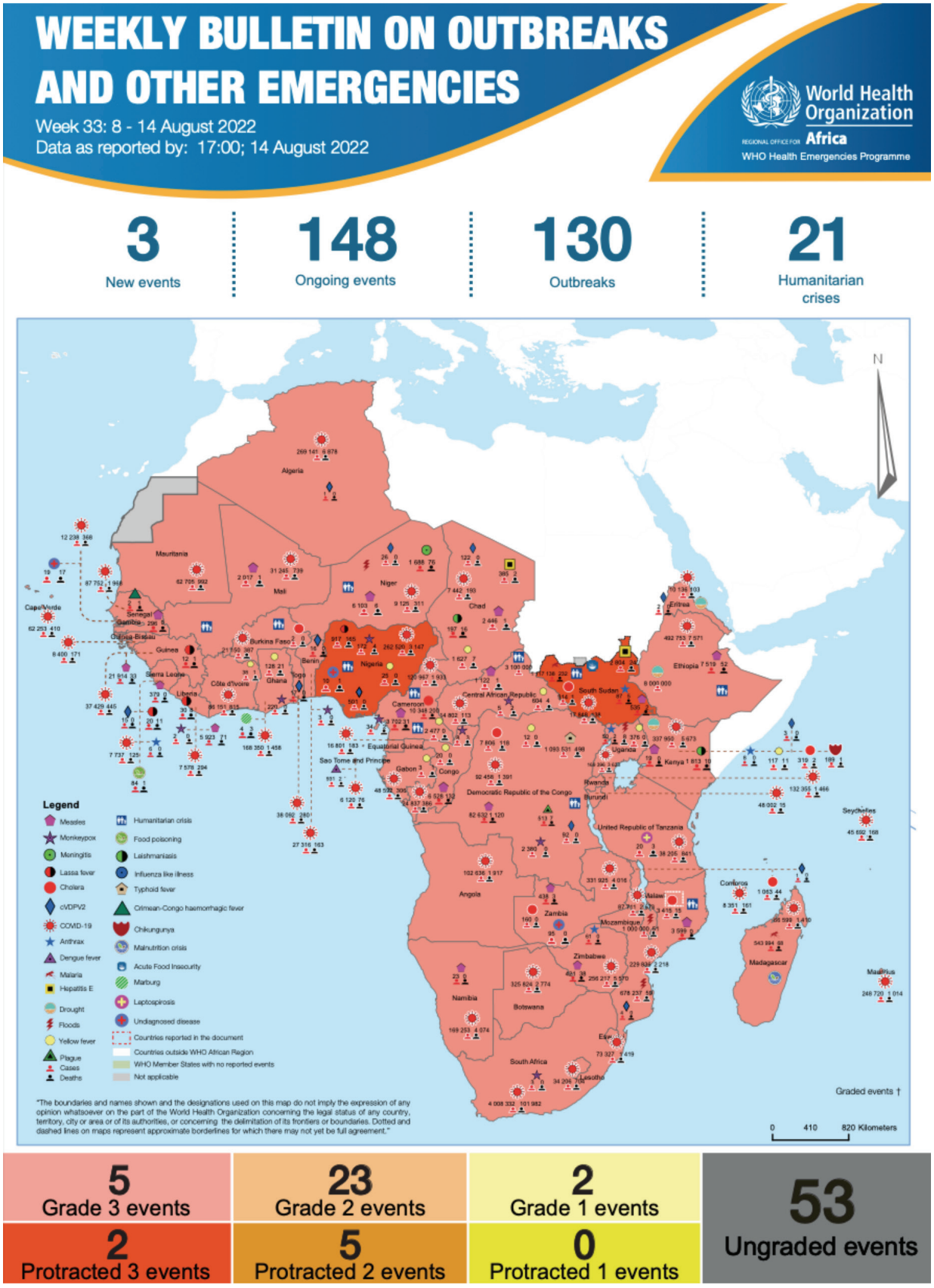

Figure 6. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 140 events. For more information, see the link below:
https://apps.who.int/iris/bitstream/handle/10665/361771/OEW33-0814082022.pdf