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

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COMMUNIQUÉ

CONTENTS

Editor's Note

Dr Michelle Groome

With the jacarandas in full bloom and COVID-19 case numbers lower than they have been since the start of the pandemic, October is bringing some colour and hope amidst the turmoil of the past 19 months.

The NICD has established a prospective surveillance network linking real-time SARS-CoV-2 genomic sequencing data to clinical data on hospitalised cases which allows rapid assessment of severity and clinical presentation of SARS-CoV-2 variants of concern.

Read all about DATCOV-Gen, as well as how wastewater surveillance for SARS-CoV-2 can be used as a monitoring tool. There has been a sustained increase in influenza cases in recent weeks, so remember to consider influenza as part of a differential diagnosis when managing respiratory illness. It is not too late to vaccinate against influenza, especially those at high risk of developing severe disease.

As the southern African malaria season starts, it is important to remember that malaria should be considered in all cases of unexplained progressive febrile illness with thrombocytopenia, regardless of travel history. Two cases of malaria were confirmed in Gauteng Province, without any history of travel. Although not intended for use in low seasonal malaria incidence countries like South Africa, the malaria vaccine RTS,S/AS01 has been recommended by the WHO for use among children in areas with moderate to high transmission of *P. falciparum* malaria – a major breakthrough in the fight against malaria!

The first case of Crimean-Congo haemorrhagic fever for this year has been reported, involving a woman who visited the Namaqualand Flower Route in the Northern Cape Province. Three cases of human rabies, all involving children, have been confirmed since last month. Rabies post-exposure prophylaxis is an effective preventative measure for rabies when provided shortly after exposure and according to current guidelines but cannot prevent or cure rabies in patients already presenting with symptoms. So please maintain a high index of suspicion in high risk areas.

On the international front, the Democratic Republic of the Congo continues its response to Ebola virus disease, Lassa fever continues in Nigeria, and a hepatitis A outbreak has been reported in the USA.

Enjoy this interesting edition.

ZOONOTIC AND VECTOR-BORNE DISEASES

An update on rabies in South Africa, 2021

Since the previous report, three cases of human rabies were confirmed in South Africa. These cases were reported from the Eastern Cape (EC) (n=2) and KwaZulu-Natal (KZN) (n=1) provinces. The total number of laboratory confirmed human rabies cases in South Africa for 2021 (as of 25 October 2021, and including the cases reported here) is eleven. These cases originate from the EC (n=5), KZN (n=3) and Limpopo (LPP) provinces (n=3). In addition, three probable cases were reported from KZN. Probable cases are defined by the World Health Organization as cases that present with clinical disease and outcome compatible with a diagnosis of rabies and an epidemiological link constituting exposure to a possibly rabid animal (for example a dog bite). Additionally, a suspected case from LPP is under investigation at the time of this report (not reported here).

The most recent cases have all involved children. The first case was a 2-year-old boy from Empangeni, King Cetshwayo District (KZN). The child sustained a deep and jagged laceration to the face and a deep puncture wound when attacked by a dog at the end of August 2021. The child was taken to a healthcare facility for medical attention the same day as the dog attack and received rabies vaccine. Rabies immunoglobulin therapy was only provided the following day. The child was admitted to the hospital in mid-September with a fever of 39.9°C, tremors, hallucination, poor appetite, muscle spasms, stiffness, and convulsions. The case reportedly had a "blank stare" and died a week following admission. A postmortem-collected brain sample tested positive for rabies at the NICD.

The second case involved an 11-year-old boy from Mdantsane, Buffalo City Metro District (EC).The child died in hospital after a week of rabies-like symptoms, including visual and auditory hallucinations, abdominal pains, psychotic event, hyper-salivation, weakness and reduced consciousness. No dog bite history was recorded for this case and it is likely that no rabies post-exposure prophylaxis (PEP) was sought. The diagnosis of rabies was confirmed by RT-PCR testing using an antemortem-collected cerebrospinal fluid sample.

The third case was a 5-year-old boy from Gqeberha, Nelson Mandela Metro Municipality (EC). The boy was bitten by a dog on the forehead and arm. The patient presented with anxiety, aggression, vomiting, confusion, aerophobia, and agitation. Rabies PEP was provided on admission to hospital. Rabies was confirmed by testing of post-mortem-collected brain samples.

Important observations about these cases:

- Wounds of the head and shoulders are problematic and often associated with shortened incubation periods for rabies. Several cases of human rabies have been recorded in cases that sustained such wounds and either did not receive PEP, or disease onset commenced before PEP completion.
- Exposure events may go unnoted for many reasons. Even small wounds, contamination of broken skin or contamination of mucosal membranes may provide an avenue of entry for the virus into the body. These may go unnoticed or unreported, especially in small children.
- Rabies PEP is an effective preventive measure for rabies when provided promptly following exposure and in accordance with guidelines. Rabies PEP has no preventive or curative effect when provided to patients on presentation with clinical rabies disease.

The NICD urges pet owners to ensure the vaccination of their pets and to report any animals with suspicious behaviour (i.e. could be rabid) to their local veterinary authorities. When possible exposures occur, visit a health care facility promptly for assessment for rabies PEP. More information can be found at www.nicd.ac.za.

Crimean-Congo haemorrhagic fever

A case of Crimean-Congo haemorrhagic fever (CCHF) was reported in September 2021, the first case confirmed in South Africa since February 2020. The case reported travel to the Northern Cape Province prior to falling ill.

The case involved a 70-year-old woman, who suffered a tick bite while on a guided trip in the Namaqualand Flower Route, Northern Cape Province. On 24 September, she presented to a general practitioner with malaise, fever, chills, headache, muscle and back pain, ecchymosis, and a maculopapular rash. During the medical examination, a tick was detected on the patient's neck. Following the development of profuse ecchymosis the patient was hospitalized in the Western Cape (as she resides in Ceres). Tick bite fever was considered as a differential diagnosis and doxycycline treatment was given. However, PCR testing for rickettsiae was negative. Further investigation included the differential diagnosis of CCHF. A blood sample submitted to the NICD did, however, test positive for CCHFV and CCHF IgG and IgM antibodies. The patient made a full recovery. Extensive contact tracing was conducted by the Western Cape Provincial Department of Health, and no secondary cases of CCHF have been found to date.

From 1981 to October 2021, a total of 218 human cases of CCHF has been reported in South Africa (including the case reported here). Nearly two-thirds of CCHF cases confirmed in South Africa are linked to tick (mostly *Hyalomma spp.*) exposures. A small number of cases are linked to exposure to infected animal tissues and blood. CCHF cases are often reported among animal workers, such as farmers, veterinarians, wildlife or abattoir workers, or hunters. Nosocomial transmission was reported in the 1980s and transmission to a laboratory worker was observed in 1996. CCHF has been reported from all provinces in South Africa, but most often from the Northern Cape, North West and Free State provinces.

More information on CCHF and other viral haemorrhagic fevers, including guidance on the submission of samples for investigation are available on www.nicd.ac.za

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

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

Establishing a surveillance platform to assess the clinical impact of SARS-CoV-2 variants (DATCOV-Gen) in South Africa

Since the introduction of SARS-CoV-2 in the country in March 2020, South Africa has experienced three epidemic waves, with the Beta and Delta variants dominating the second and third waves, respectively. Genomic surveillance of SARS-CoV-2 in South Africa is currently being performed by the Network for Genomic Surveillance in South Africa **(NGS-SA)**, which includes the NICD. NICD has established a prospective surveillance network linking real-time SARS-CoV-2 genomic sequencing data to detailed epidemiologic and clinical data on hospitalised cases to allow rapid assessment of severity and clinical presentation of SARS-CoV-2 variants of concern and future emerging lineages (DATCOV-Gen). Clinical specimens from COVID-19 cases are sent to the NICD from private and public diagnostic laboratories around the country (predominantly from Gauteng, North West, Mpumalanga and Northern Cape provinces), and collected through the pneumonia surveillance programme in five provinces (Western Cape, KwaZulu-Natal, North West, Gauteng and Mpumalanga). SARS-CoV-2 whole genomes are sequenced in real-time from a random selection of specimens, and are linked to epidemiological data through the notifiable medical conditions surveillance system (NMCSS), and clinical and outcome data through the DATCOV national surveillance system. DATCOV is an active surveillance system for COVID-19 hospital admissions with comprehensive coverage of all hospitals in South Africa.[1,2]

From March 2020 through September 2021, 42 369 specimens were received at the NICD. Of these, 10 214 (24.1%) were sequenced and 6 673 (65.3%) yielded high quality sequence data for Global Initiative on Sharing All Influenza Data **(GISAID)** variant assignment (Figure 1). Among the sequenced cases, 1 272 (19.1%) were matched to hospitalised COVID-19 cases (hospital admission within 14 days of specimen collection) on the DATCOV database. The majority of specimens (1 158/1 272, 91%) were from adults aged ≥25 years in Gauteng (36%), Western Cape (17%) and North West (16%) provinces (Table 1). Among the COVID-19 cases admitted to a hospital, presence of co-morbidity, level of hospital care, clinical severity and hospital admission duration differed by variant type. Further analysis of these data will enable us to better understand the epidemiological and clinical characteristics of SARS-CoV-2 variants, and this platform will allow these characteristics to be rapidly assessed as new variants emerge. Public and private testing laboratories are requested to continue to submit COVID-19 respiratory samples weekly to the NICD or their closest NGS-SA sequencing laboratory. For further information on specimen submission please contact Prof Anne von Gottberg (annev@nicd.ac.za), Dr Nicole Wolter (nicolew@nicd.ac.za) or the closest NGS-SA laboratory. Regular **SARS-CoV-2 genomic surveillance** and **DATCOV** reports are available on the NICD website.

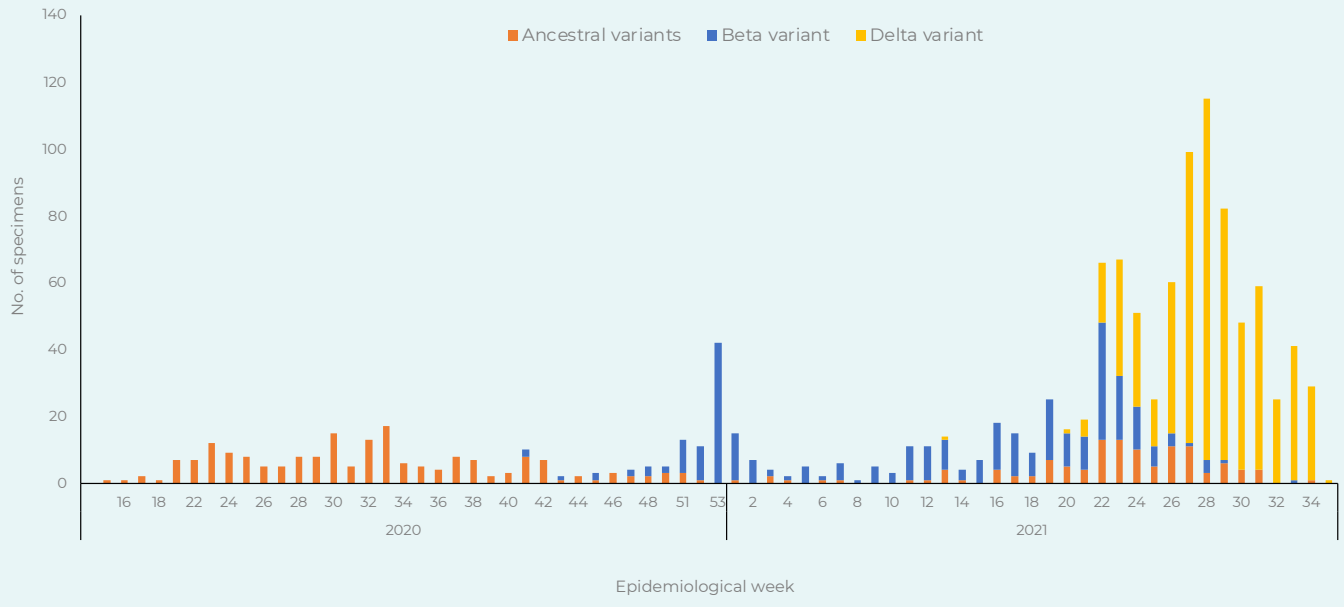

Figure 1. Number of SARS-CoV-2 specimens sequenced for hospitalised COVID-19 cases by epidemiological week and variant type, DATCOV-Gen, March 2020 – September 2021 (N=1 272)

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

Table 1: Epidemiological and clinical characteristics of hospitalised COVID-19 cases by SARS-CoV-2 variant type, DATCOV-Gen, March 2020 – September 2021

		Overall n (%)	Ancestral variants n (%)	Beta variant n (%)	Delta variant n (%)	P-value
Demographic characteristics						
Year		**N=1 272**	**N=310**	**N=313**	**N=610**	
	2020	266 (21)	192 (62)	74 (24)	0 (0)	<0.001
	2021	1 006 (79)	118 (38)	239 (76)	610 (100)	
Epidemic wave[a]		**N=1 270**	**N=309**	**N=312**	**N=610**	
	Pre-wave 1	31 (2)	31 (10)	0 (0)	0 (0)	<0.001
	Wave 1	99 (8)	99 (32)	0 (0)	0 (0)	
	Post-wave 1	56 (4)	51 (17)	5 (2)	0 (0)	
	Wave 2	114 (9)	15 (5)	98 (31)	0 (0)	
	Post-wave 2	132 (10)	23 (7)	105 (34)	1 (0)	
	Wave 3	838 (66)	90 (29)	104 (33)	609 (100)	
Age group (years)		**N=1 272**	**N=310**	**N=313**	**N=610**	
	<5	39 (3)	14 (5)	4 (1)	20 (3)	0.364
	5-12	13 (1)	2 (1)	5 (2)	6 (1)	
	13-18	24 (2)	5 (2)	8 (3)	11 (2)	
	19-24	38 (3)	11 (4)	7 (2)	19 (3)	
	25-39	180 (14)	45 (15)	45 (14)	83 (14)	
	40-59	424 (33)	104 (34)	93 (30)	216 (35)	
	≥60	554 (44)	129 (42)	151 (48)	255 (42)	
Sex		**N=1 272**	**N=310**	**N=313**	**N=610**	
	Male	538 (42)	137 (44)	134 (43)	256 (42)	0.727
	Female	734 (58)	173 (56)	179 (57)	357 (59)	
Province		**N=1 272**	**N=310**	**N=313**	**N=610**	
	Eastern Cape	93 (7)	44 (14)	12 (4)	37 (6)	<0.001
	Free State	1 (0)	0 (0)	0 (0)	1 (0)	
	Gauteng	453 (36)	100 (32)	173 (55)	158 (26)	
	KwaZulu-Natal	40 (3)	7 (3)	6 (2)	27 (4)	
	Limpopo	102 (8)	10 (3)	17 (5)	69 (11)	
	Mpumalanga	115 (9)	26 (8)	51 (16)	35 (6)	
	North West	209 (16)	77 (25)	20 (6)	109 (18)	
	Northern Cape	44 (3)	10 (3)	26 (8)	7 (1)	
	Western Cape	215 (17)	36 (12)	8 (3)	167 (27)	
Clinical characteristics						
HIV status		**N=564**	**N=170**	**N=111**	**N=266**	
	Uninfected	438 (78)	134 (79)	83 (75)	207 (78)	0.719
	Infected	126 (22)	36 (21)	28 (25)	59 (22)	
Co-morbidity		**N=1 272**	**N=310**	**N=313**	**N=610**	
	Absent	678 (53)	137 (44)	178 (57)	341 (56)	0.001
	Present	594 (47)	173 (56)	135 (43)	269 (44)	
Highest level of care		**N=1 272**	**N=310**	**N=313**	**N=610**	
	General ward	1 080 (85)	245 (79)	26 (83)	538 (88)	0.007
	High care	63 (5)	22 (7)	18 (6)	22 (4)	
	ICU	129 (10)	43 (14)	35 (11)	50 (8)	

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

		Overall n (%)	Ancestral variants n (%)	Beta variant n (%)	Delta variant n (%)	P-value
Severe disease[b]		**N=1 272**	**N=310**	**N=313**	**N=610**	
	No	457 (36)	104 (34)	87 (28)	253 (41)	<0.001
	Yes	815 (64)	206 (66)	226 (72)	357 (59)	
Hospital duration (days)		**N=1 266**	**N=310**	**N=312**	**N=606**	
	<3	261 (21)	58 (19)	54 (17)	136 (22)	0.030
	3-6	410 (32)	100 (32)	90 (29)	209 (34)	
	7-13	408 (32)	103 (33)	107 (34)	188 (31)	
	≥14	187 (15)	49 (16)	61 (20)	73 (12)	
Outcome		**N=1 266**	**N=310**	**N=312**	**N=606**	
	Survived	928 (73)	235 (76)	219 (70)	449 (74)	0.258
	Died	338 (27)	75 (24)	93 (30)	157 (26)	

[a] Epidemic wave periods (weekly incidence risk of ≥5 admissions per 100,000 individuals[1]) defined as: Pre-wave 1 (weeks 10-23 of 2020), Wave 1 (weeks 24-34 of 2020), Post-wave 1 (weeks 35-46 of 2020), Wave 2 (week 47 of 2020 – week 5 of 2021), Post-wave 2 (weeks 6-19 of 2021), Wave 3 (20-38 of 2021).
[b] Severe disease defined as a patient meeting at least one of the following criteria: admitted to ICU, received oxygen treatment, ventilated, received extracorporeal membrane oxygenation (ECMO), experienced acute respiratory distress syndrome (ARDS) and/or died.

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2. Jassat W, Cohen C, Tempia S, Masha M, Goldstein S, Kufa T, Murangandi P, Savulescu D, Walaza S, Bam JL, Davies MA, Prozesky HW, Naude J, Mnguni AT, Lawrence CA, Mathema HT, Zamparini J, Black J, Mehta R, Parker A, Chikobvu P, Dawood H, Muvhango N, Strydom R, Adelekan T, Mdlovu B, Moodley N, Namavhandu EL, Rheeder P, Venturas J, Magula N, Blumberg L; DATCOV author group. Risk factors for COVID-19-related in-hospital mortality in a high HIV and tuberculosis prevalence setting in South Africa: a cohort study. Lancet HIV. 2021 Sep;8(9):e554-e567. doi: 10.1016/S2352-3018(21)00151-X.

Acknowledgements

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

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

Wastewater surveillance for SARS-CoV-2

Since November 2020, the South African Collaborative COVID-19 Environmental Surveillance System (SACCESS) network, in partnership with the Water Research Commission, tests for SARS-CoV-2 in wastewater from over 90 wastewater facilities across the nine provinces in South Africa. Water-based epidemiology of SARS-CoV-2 is a valuable tool in areas with limited clinical surveillance and is independent of changes in health-seeking behaviour or testing patterns. SARS-CoV-2 nucleic acid is detectable in water but wastewater is not a source of SARS-CoV-2 transmission.

Grab samples of wastewater from plant influent are concentrated, undergo RNA extraction, and are then tested by polymerase chain reaction (PCR) for SARS-CoV-2. Results are quantified and expressed as genome copies/ml of wastewater sample. To understand the trend of SARS-CoV-2 virus levels in relation to the clinical cases across the epidemiological weeks, the genome copies are plotted on a graph alongside the clinical cases (Figure 2) for all wastewater plants within a metropolitan city.

An example of results for Ekurhuleni Metropolitan Municipality are shown in Figure 2. Testing for SARS-CoV-2 commenced in epidemiological week 8 (week ending February 26, 2021) for one treatment plant (Vlakplaats), and week 9 for three treatments plants (Daveyton, Hartebeesfontein and Olifantsfontein). In all treatment plants, the peak of SARS-CoV-2 in wastewater levels corresponded with the peak in clinical cases at week 26 (week ending July 2, 2021) However, from week 39 (week ending October 1, 2021) till week 41 (week ending October 15, 2021), the SARS-CoV-2 levels have been steadily declining in Hartesbeenfontein and Vlakplaats plants, corresponding to the decrease in clinical cases.

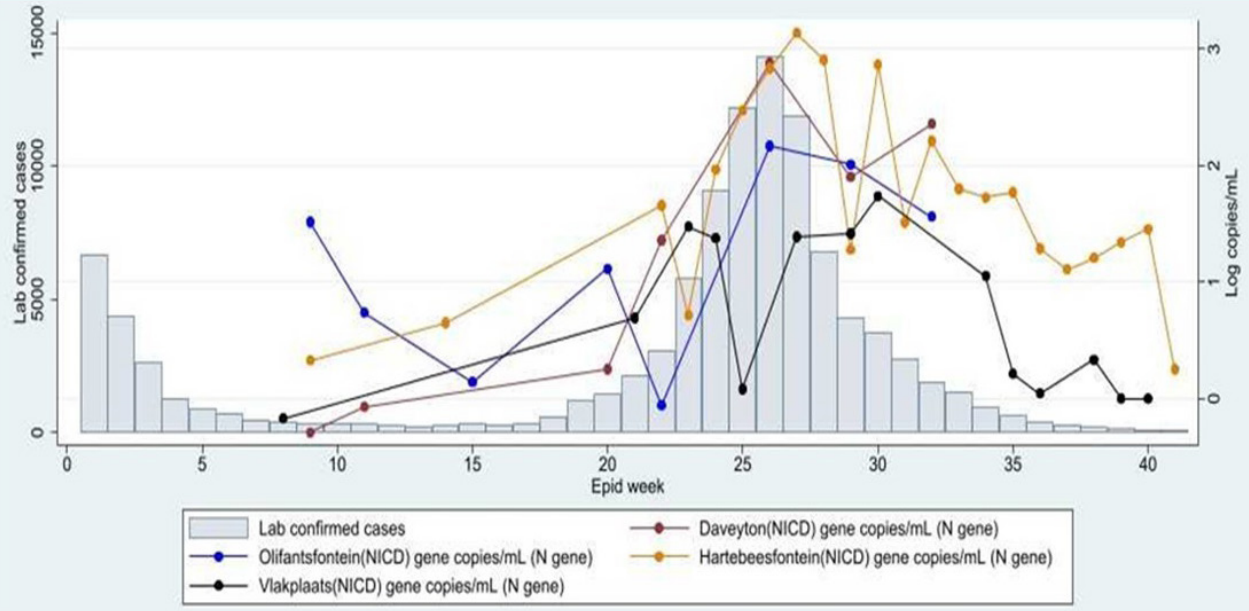

Figure 2. Laboratory confirmed cases of SARS-CoV-2 (bars) and levels of SARS-CoV-2 in log copies/ml of wastewater (coloured lines) for selected wastewater treatment plants (WWTP) in Ekurhuleni Metropolitan Municipality during epidemiological weeks 1-41, 2021. The testing laboratory and quantified SARS-CoV-2 gene are named in brackets after the name of the WWTP

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

INTERNATIONAL OUTBREAKS OF IMPORTANCE

Ebola virus disease, DRC

The World Health Organization (WHO) is supporting health authorities of Butsili, North Kivu Province, in the Democratic Republic of the Congo (DRC) following the death of a 2-year-old boy with Ebola-like symptoms in a health facility on 6 October 2021. The investigation confirmed that the child was from the same community where three family members died displaying Ebola-like symptoms. The child was later confirmed with Ebola on 8 October 2021. North Kivu has been burdened with multiple previous Ebola outbreaks, leading to a strengthened response to the disease, early disease recognition, intervention, and control.

Ebola vaccination commenced in the North Kivu Province, using the "ring vaccination" approach by prioritizing those at highest risk, including the contacts of the confirmed case and the first responders. Approximately 1 000 doses of the rVSV-ZEBOV Ebola vaccines with additional medical supplies were delivered from the capital Kinshasa to Gomo city in the province, of which 200 doses were sent to Beni city, near the Butsili health zone. The country has more than 12 000 vaccine doses in Kinshasa available for utilization when necessary.

The DRC has reacted to the outbreak with great urgency and prioritized public health measures, with the support of the WHO, by strengthening their human resources, contact tracers, disease surveillance, isolation, and testing capabilities. Over and above the vaccination drive, Ebola awareness is improving in communities throughout and the emergency response teams have identified more than 170 contacts who are being monitored, and infected spaces are being decontaminated.

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

SEASONAL DISEASES

Influenza, 2021

There has been a sustained increase in influenza cases from the influenza-like illness (ILI) (outpatient in public health clinics) and pneumonia (hospital) surveillance sentinel sites in recent weeks. The total number of influenza cases detected by the syndromic sentinel surveillance programmes conducted by the NICD as of week 41 of 2021 (week ending 17 October 2021) has increased to 154.

The increase in influenza detections at pneumonia sentinel sites has been observed mostly in Gauteng Province, with the predominant subtype and lineage being B Victoria (49/92, 53.3%) followed by A (H1N1)pdm09 (21/92, 22.8%), A (H3N2) (14/92, 15.2%), B subtype pending or inconclusive (5/92, 5.4%) and A subtype pending or inconclusive (3/92, 3.3%) (Figure 3). For the ILI sentinel sites, the increase has been observed mostly in North West Province, with the predominant subtype and lineage being B Victoria (39/62, 62.9%) followed by A (H3N2) (5/62, 8.1%), A (H1N1)pdm09 (5/62, 8.1%), A subtype pending or inconclusive (9/62, 14.5%), and B subtype inconclusive (4/62, 6.5%) (Figure 4).

Clinicians are encouraged to consider influenza as part of a differential diagnosis when managing patients presenting with respiratory illness. It is also important to encourage patients, especially those at high risk for developing severe influenza illness and complication to take influenza vaccine. Because of the recent changes in respiratory virus epidemiology as a result of non-pharmaceutical interventions to control COVID-19, it is possible that we may see increasing influenza detections even as we enter the summer months. For this reason, it is still not too late to vaccinate against influenza.

Updated guidelines on influenza diagnosis and management are available at: https://www.nicd.ac.za/wp-content/uploads/2021/07/Influenza-guidelines_-April-2021-final.pdf

The WHO recommended composition of influenza virus vaccines for use in the 2022 southern hemisphere influenza season is available at: http://apps.who.int/iris/bitstream/handle/10665/346863/WER9642-eng-fre.pdf

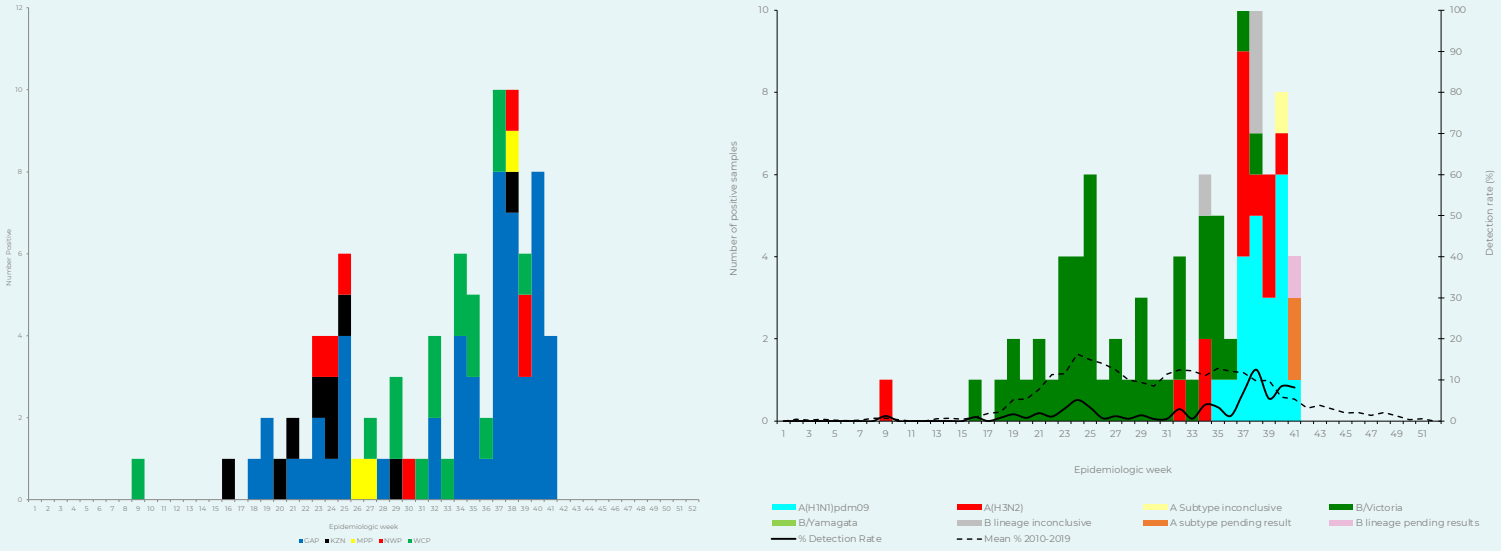

Figure 3. Number of positive cases by province and epidemiologic week (left) and number of positive cases by influenza subtype and lineage and detection rate (right), pneumonia surveillance, 01 January 2021 – 17 October 2021

SEASONAL DISEASES

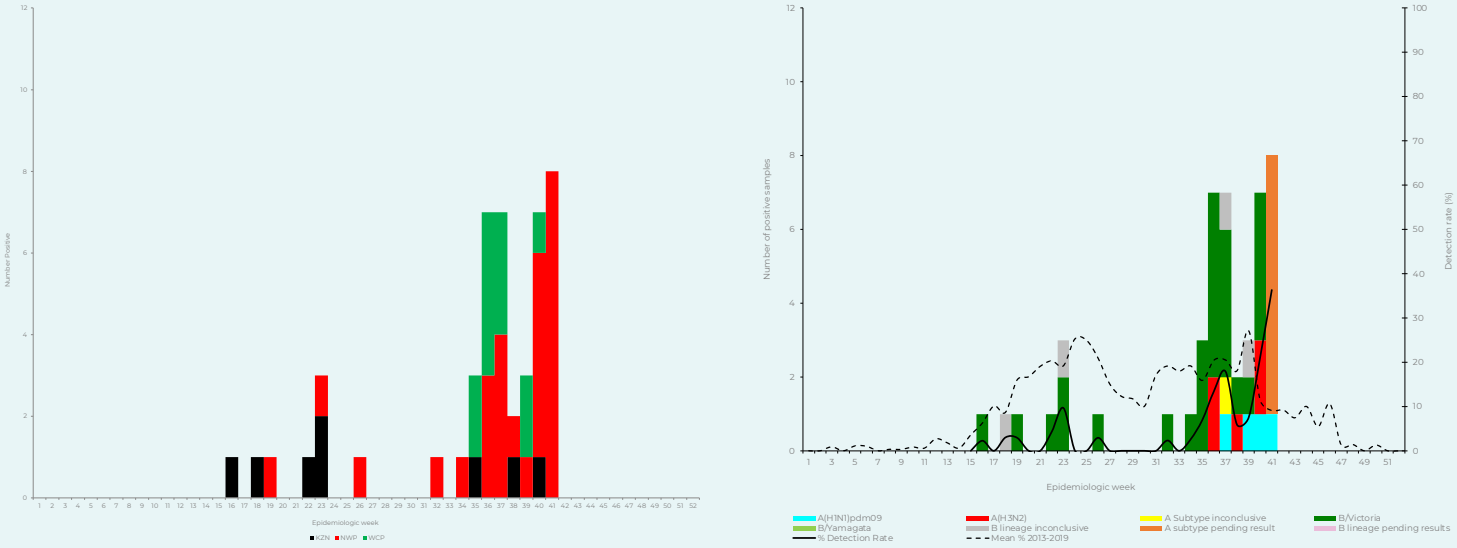

Figure 4. Number of positive cases by province and epidemiologic week (left) and number of positive cases by influenza subtype and lineage and detection rate (right), ILI surveillance, 01 Jan 2021 – 17 October 2021

Respiratory syncytial virus (RSV) 2021

The total number of RSV cases detected by the syndromic sentinel surveillance programmes conducted by the NICD as of week 41 of 2021 (week ending 17 October 2021) has increased to 479; 74 (15.4%) from ILI surveillance and 405 (84.6%) from pneumonia surveillance. The majority of RSV positive cases were subgroup A (253/479, 52.8%), followed by subgroup B (218/479, 45.5%), eight (1.7%) were inconclusive. The detection rate continues to decrease these past few weeks to rates below 10% since week 26 (Figure 5).

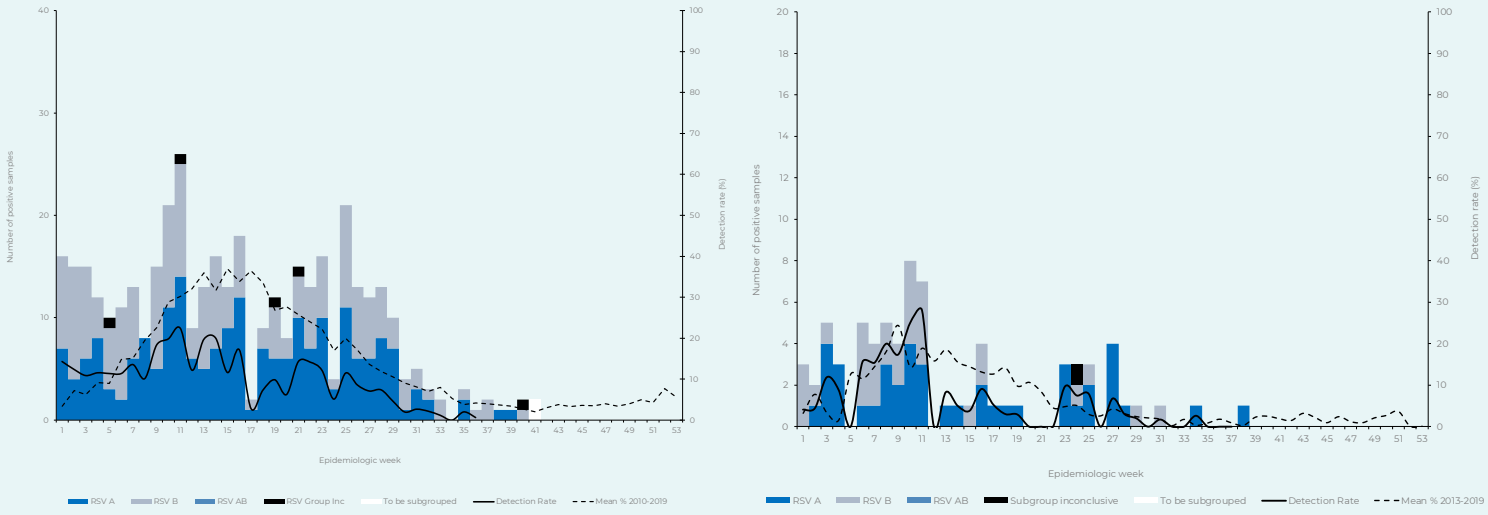

Figure 5. Number of samples testing positive for respiratory syncytial virus by subgroup and detection rate by week for pneumonia surveillance (left) and ILI surveillance (right), 01 Jan 2021 – 17 October 2021

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

SEASONAL DISEASES

Malaria
Odyssean malaria outbreak, Kempton Park

At an early stage of the southern African malaria season, two confirmed cases of malaria in residents without history of travel were reported in Kempton Park, Ekurhuleni Municipality, Gauteng Province, a non-endemic area for malaria.

The first case-patient was a 24-year-old woman who became ill on 24 September 2021 with symptoms of myalgia, headaches, fatigue, and chills. The initial clinical diagnosis was COVID-19 following an assessment by a general practitioner on 27 September, and a COVID-19 PCR was done. Malaria was finally diagnosed on 29 September, when she was admitted to ICU following progressive clinical deterioration. Malaria parasites (0.4% parasitaemia) were seen on routine examination of her peripheral blood smear and PCR confirmed the presence of *P. falciparum*. Laboratory results were compatible with malaria, showing thrombocytopenia (platelets 22 x 10^9 /L), raised inflammatory markers (CRP 263 mg/L), and deranged liver function tests (total bilirubin 79 µmol/L, GGT 67 U/L, AST 396 U/L, ALT 174 U/L). The patient was treated uneventfully with intravenous artesunate followed by oral artemether-lumefantrine (Coartem).

The second case was the 25-year-old husband of the first patient, who became symptomatic on 27 September 2021 with diarrhoea, vomiting, myalgia, and headaches. He was treated symptomatically and a COVID-19 PCR test was done following initial assessment by a general practitioner on 28 September. Malaria was diagnosed upon hospitalisation in the same unit as his wife when his symptoms worsened severely on 30 September. Shortly after admission he developed acute respiratory distress syndrome and was intubated, requiring mechanical ventilation, as well as renal dialysis. His laboratory results supported the diagnosis of malaria with multi-organ involvement. The blood film microscopy finding of *P. falciparum* (8.7%) was confirmed by PCR. He had thrombocytopenia (platelets 28 x 10^9 /L), raised inflammatory markers (CRP 262 mg/L), acute kidney injury (urea 14.6 mmol/L, creatinine 328 µmol/L and e-GFR 21 ml/min) and deranged liver function tests (total bilirubin 65 µmol/L, GGT 124 U/L, AST 184 U/L, ALT 134 U/L). The patient was successfully treated with intravenous artesunate, followed by oral Coartem once he became more clinically stable. He was discharged home but still requires renal care, blood transfusion, and nutritional support as well as rehabilitation following prolonged intubation and mechanical ventilation.

Neither patients nor their family members had significant travel histories, and none had had recent blood transfusions or injections. Inspection of the patient's house did not reveal any potential vectors or local vector breeding sites. Both patients were infected with the same *P. falciparum* genotype, implicating a single infected vector mosquito. The most likely explanation for this type of malaria transmission is the accidental importation by road transport of an infected mosquito from a malaria-endemic area. Healthcare workers are reminded again that malaria should be considered in all patients with an unexplained progressive febrile illness with thrombocytopenia, regardless of travel history, and that malaria tests should be repeated until either malaria or an alternative diagnosis is confirmed.

Malaria vaccine

The first malaria vaccine (RTS,S/AS01) to undergo large clinical trials has been recommended by the WHO for broad use among children in areas with moderate to high transmission of *P. falciparum* malaria. The recommendation followed compelling evidence from the ongoing WHO-coordinated pilot program in three African countries, where more than 800 000 children were reached since 2019. The vaccine requires a 4-dose regimen (dose 1 at 6 months of age, dose 2 at 7 months of age, dose 3 at 9 months of age, and the last dose at 24 months of age) and is administered to children from the age of 5 months. Currently, more than 2.3 million doses have been administered and the vaccine has shown evidence of favourable safety profile, feasibility, cost-effectiveness, and improved equity in access to malaria management. It reduces severe childhood malaria by more than 30% and does not negatively impact health-seeking behaviour and the use of insecticide-treated nets when used as an adjunct to traditional malaria public health measures. The way forward includes the need for funding from international stakeholders that will determine how widely available the vaccine will be as well as key country decision-making on whether to adopt it. This vaccine is not intended for use in low seasonal malaria incidence southern African countries like South Africa, Botswana, Namibia and Eswatini.

Source: District Communicable Disease Control, Ekurhuleni Metro; Division of Public Health Surveillance and Response; Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; johnf@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 6 on page 12.

Lassa fever virus - Nigeria

A total of 379 cases of Lassa fever virus has been reported in Nigeria this year, with a case fatality ratio of 20.3% (226/379). The majority of cases are from Edo, Ondo, and Taraba states; however, a total of 14 states has been affected. The predominant age group affected by the virus is 21 to 30 years, and the age range is from <1 to 70 years.

Lassa fever is a zoonotic acute viral disease caused by the Lassa fever virus, a member of the arenavirus family of viruses. Lassa fever is endemic in many parts of West Africa, including Sierra Leone, Liberia, Guinea, and Nigeria. The animal reservoir is the multimammate rat *(Mastomys natalensis)*, which is found throughout the region. Once infected, the rodent can excrete the virus for long periods of time, sometimes for the rest of its life.

Transmission of Lassa virus to humans occurs through ingestion or inhalation of the virus found in rodent urine or droppings. Person-to-person transmission may occur when there is exposure to an infected person's blood, tissue and excretions. Health workers are commonly at risk of this type of exposure in settings where there is limited protective personal equipment (PPE).

The incubation period for Lassa fever is 1 to 3 weeks and the majority of patients (80%) will experience mild symptoms. However, 20% of patients experience severe symptoms including haemorrhaging, respiratory distress, severe vomiting, dehydration, and shock. A serious and common complication of Lassa fever is deafness. All persons infected with the virus are at risk of varying degrees of hearing loss, irrespective of the severity of the disease.

Treatment for Lassa fever is supportive care, ensuring fluid and electrolyte balance, oxygenation and maintaining blood pressure. The antiviral drug, ribavirin, has been used successfully in Lassa fever patients.

Hepatitis A – Virginia, USA

A foodborne outbreak of hepatitis A virus has been reported in the United States of America (USA), in Virginia. A total of 44 cases has been confirmed. One patient required liver transplantation and one patient, aged 75, has died. Patients range in age from 31 to 79 years, and more than half (n=26) have required hospitalisation.

Hepatitis A is a vaccine-preventable disease affecting the liver, caused by the hepatitis A single-stranded, RNA virus. The virus can be transmitted from person to person via the faecal oral-route, through direct contact with an infectious person, or from contaminated needles in drug-users. The incubation period is usually 14 to 28 days, and the disease can range from an asymptomatic infection to acute viral hepatitis, and in severe cases, to acute liver failure.

In most developing countries where the virus is endemic, infection occurs in early childhood, which results in asymptomatic disease and lifelong immunity. In high-income countries, where there is intermediate to low endemicity of hepatitis A virus, infection can occur later in life, commonly during sporadic outbreaks, where the risk of severe disease is much higher. For this reason, many high-income countries routinely vaccinate children and high-risk groups against hepatitis A. During outbreaks, however, vaccination is recommended for persons of all ages.

BEYOND OUR BORDERS

Novel Yezo virus - Japan

A novel virus, named Yezo (YEZV), that can be transmitted by tick bites has been discovered in Japan. Yezo virus is an orthonairovirus, belonging to the Nairoviridae viruses, which are tickborne viruses that can cause fatal febrile illness in humans and other animals. There are 15 species within the genus orthonairovirus; four species are known to infect humans. These include Crimean-Congo haemorrhagic fever virus, Nairobi sheep disease virus, Dugbe virus, and Kasokero virus.

The first case of Yezo virus was recorded in 2014 in a 41-year-old male, admitted with a history of a tick bite to the abdomen and subsequent fever and leg pain. A second case was reported in 2020 with a patient who was bitten by a tick whilst hiking and developed similar symptoms as the first case. Clinical manifestations for both patients included thrombocytopenia, leukopenia, and elevation of liver enzymes. The common viruses carried by ticks in Japan were excluded in both cases. An investigation was conducted that found that a total of seven patients has been infected with Yezo since 2014, with animals and ticks the most likely reservoirs. No deaths have been linked to this novel virus at this stage.

Based on the history of a suspected tick bite, the patient was treated empirically with eight days of ceftriaxone for suspected Lyme disease or *Borrelia miyamotoi* infection, 14 days of doxycycline for suspected rickettsioses, and six days of gentamicin for suspected tularemia. The patient was discharged without any complications.

Figure 6. 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), Centres 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); Kodama F, Yamaguchi H, Park E, Tatemoto K, Sashika M, Nakao R, et al. A novel nairovirus associated with acute febrile illness in Hokkaido, Japan. Nat Commun. 2021 Dec;12(1):5539

WHO AFRO UPDATE

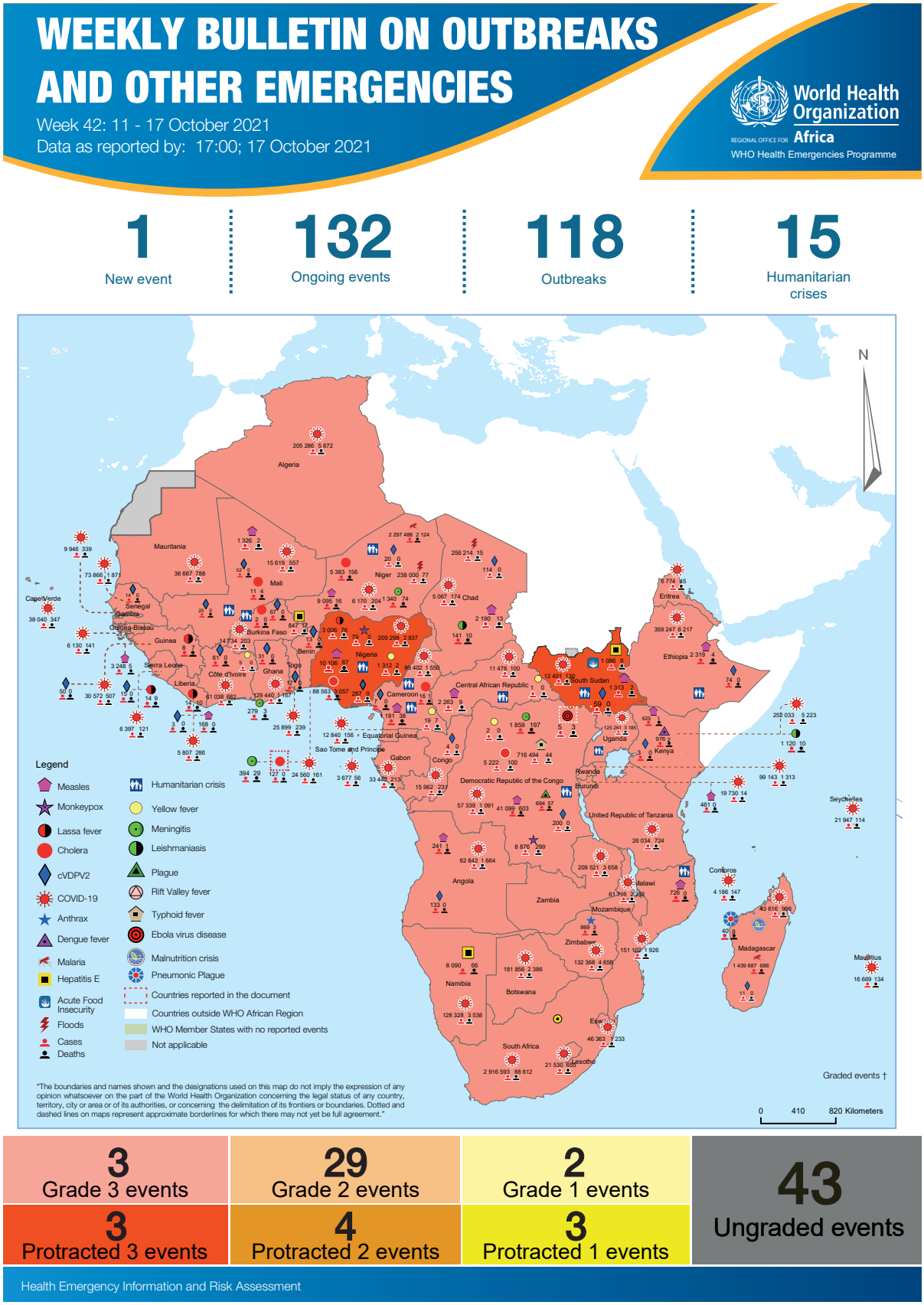

Figure 7. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 133 events. For more information see link below:
https://apps.who.int/iris/bitstream/handle/10665/346680/OEW42-1117102021.pdf

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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