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

COMMUNICABLE DISEASES

August 2021, Vol. 20 (8)

COMMUNIQUÉ

CONTENTS

Editor's Note

Dr Michelle Groome

COVID-19 is still at the forefront of everyone's minds as we continue to battle the third wave of infections. We take an in-depth look at the Northern Cape and Free State provinces that are showing a slightly different pattern compared to the other provinces. There's an update on rabies and an interesting East African trypanosomiasis case in a South Africa hunter who visited Zambia. Routine surveillance in wastewater revealed a Sabin poliovirus type 2 vaccine strain in the Eastern Cape Province.

NICD's Laboratory for Antimalarial Resistance Monitoring and Malaria Operational Research and its collaborators implemented a surveillance programme to facilitate the detection of any decrease in antimalarial drug efficacy. A parasite isolate with the *kelch* 13 Q613E mutation was recently detected - a first in South Africa. While this mutation alone is not suspected to confer antimalarial drug resistance, it serves as an early warning of the potential for emergence of artemisinin resistance in southern Africa.

Diarrhoeal surveillance restarted in May 2021 in several provinces with rotavirus detected in 25% of stool specimens. Remember that rotavirus is preventable with a vaccine given orally at 6 and 14 weeks of age. Seasonal respiratory diseases continue to keep a low profile in 2021. Influenza transmission has remained below the seasonal threshold and the detection rate of RSV has been below the mean detection rate reported for 2010-2019. However, it is still important to consider these viruses in your differential diagnosis. There has also been a marked decrease in cases of invasive meningococcal disease in 2020-2021, likely due to the measures put in place to stop the spread of SARS-CoV-2, but *Neisseria meningitidis* is still circulating and can cause severe illness.

The "Beyond Our Borders" section focuses on a hepatitis E outbreak in South Sudan, a human case of anthrax in Dagestan, Russia, and a new hantavirus case in Taiwan. A Marburg virus disease outbreak was declared in south-western Guinea - the first reported from West Africa. In addition, the Côte d'Ivoire declared its first Ebola virus disease outbreak in more than 25 years.

Enjoy reading this jam-packed August edition of the Communiqué!

ZOONOTIC AND VECTOR-BORNE DISEASES

An update on rabies in South Africa

As of 23 August 2021, a total of seven cases of human rabies was laboratory-confirmed in South Africa. The cases were reported from the Limpopo (n=3), KwaZulu-Natal (n=2) and the Eastern Cape (n=2) provinces. In addition, to date, three probable cases of human rabies have been identified from KwaZulu-Natal Province (including the case reported here).

The most recent case was a 5-year-old girl from East London, Buffalo City Metropolitan Municipality, Eastern Cape Province. The child was attacked by a dog on 9 July, sustaining facial wounds and was purportedly given post-exposure prophylaxis (PEP) but was then lost to follow-up. It is unclear whether the PEP included rabies immunoglobulin (RIG). She experienced fever, muscle spasms, anorexia, confusion, sleeplessness, and hyper-salivation two weeks later and died on 28 July in hospital. On 2 August, rabies was confirmed in a brain sample from the deceased child using a direct immunofluorescent assay test.

A case of probable rabies was reported in a 40-year-old man from Empangeni, King Cetshwayo district, KwaZulu-Natal Province. He sustained an unprovoked attack by a stray dog in mid-June, suffering multiple bites to his face, left forearm, and both palms of his hands. The next day, he received PEP at the local hospital, which included wound washing, RIG, and rabies and tetanus vaccinations. Five weeks later, he developed fever, nausea, vomiting, loss of appetite, agitation, restlessness, confusion, hallucinations, tachycardia, hypothermia, sweating, hyper-salivation, symptoms in keeping with rabies disease. He later died in hospital on 25 July, several days after his illness began.

A single antemortem saliva sample collected tested negative for rabies, which is insufficient to exclude the diagnosis of rabies. No further samples were available for laboratory investigation.

Further to our previous report (https://www.nicd.ac.za/wp-content/uploads/2021/07/An-update-on-rabies-in-South-Africa-2.pdf), an additional case of rabies was confirmed in a domestic dog from Tarlton, Krugersdorp. In total, since the last week of June 2021, a total of 5 jackal, one honey badger and the domestic dog reported here were confirmed with rabies from the Mogale City Municipality. Mass rabies vaccination campaigns in dogs have been underway in the West Rand since June 2021. Over 2 552 dogs have been vaccinated since the start of the outbreak. Public and healthcare worker awareness campaigns are also being carried out to increase awareness and knowledge of rabies in the affected community and for health care workers serving the affected community. In August 2021, two cases of rabies were confirmed in dogs from Khayelitsha, City of Cape Town, Western Cape Province. At the time of this publication, investigations into the source of the outbreak and possible human exposures were underway. Mass rabies vaccination campaigns in dogs have been employed in the affected area since 24 August 2021.

The website www.nicd.ac.za contains more information on rabies. World Rabies Day is celebrated on 28 September every year to bring attention to the prevention and control of rabies around the world. Visit the Global Alliance for Rabies Control website for more information (https://rabiesalliance.org/world-rabies-day).

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

East African Trypanosomiasis - South Africa, ex-Zambia

A 43-year-old South African professional hunter was active in the Eastern Province of Zambia during July and August 2021, where he recalled experiencing a number of tsetse fly bites. He developed an acute febrile illness, which did not respond to self-medication with an antimalarial. He was admitted to a hospital in Lusaka, Zambia, and a diagnosis of trypanosomiasis was suspected. The test for SARS-CoV-2 was negative. He was transferred for further management to a hospital in Pretoria, South Africa. On admission, jaundice, scattered petechiae and a typical trypanosomal chancre on one ankle, were noted. Marked thrombocytopenia, moderate leucopenia and mildly deranged liver functions were found.

A very scanty trypomastigote parasitaemia was noted on a Giemsa-stained blood smear, which was confirmed by PCR. The patient has responded well to suramin (course presently being completed), and examination of the CSF was negative on microscopy and PCR. In contrast to the 2017-2019 period, when several patients with East African trypanosomiasis were medivaced to South Africa for treatment, COVID-19-related travel and tourism restrictions and economic constraints have probably reduced the number of humans exposed to the disease in endemic areas of Central and East Africa during 2020-20221.

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

VACCINE-PREVENTABLE DISEASES

Detection of Sabin poliovirus type 2 vaccine strain in wastewater, Eastern Cape Province

The Centre for Vaccines and Immunology at the NICD conducts routine surveillance for poliovirus including polio vaccine strains from wastewater. Wastewater is tested from the inlet of wastewater plants before treatment and findings represent viruses present in faeces, not viruses present in drinking water. Environmental surveillance supplements the gold-standard acute flaccid paralysis surveillance system operating in the country.

On 2 August 2021, from a sample collected on 13 July 2021, the Centre reported the isolation of a Sabin vaccine serotype 2 from wastewater from Gqeberha, (Port Elizabeth), Nelson Mandela Bay district, in Eastern Cape Province of South Africa. This finding is surprising as there has been no use of oral poliovirus vaccine type 2 in South Africa since the switch of trivalent oral polio vaccine (OPV), containing Sabin vaccine serotypes 1, 2 and 3, to bivalent OPV, containing Sabin vaccine serotypes 1 and 3, in 2016.

The finding of Sabin OPV serotype 2 has been investigated to exclude the possibility that the vaccine strain has been circulating amongst community members in the Nelson Mandela Bay Metro. Investigations have not found any expired vaccine stocks that may have contained Sabin poliovirus type 2 present in medical facilities, hospitals or vaccine distribution depots in the area. As of 27 August 2021, there has not been a subsequent detection of type 2 poliovirus from that wastewater treatment plant, or three other treatment plants in the Eastern Cape Province. This finding therefore likely reflects a traveller who was vaccinated with monovalent oral polio vaccine type 2 as part of a polio vaccination campaign in another country before coming to South Africa.

Polio is caused by a virus that used to be endemic worldwide. Poliovirus can cause sudden weakness, permanent paralysis, or death in susceptible individuals. Polioviruses have been targeted for eradication since the Global Polio Eradication Initiative was launched in 1988 with the initial target for eradication in the year 2000. In 2021, there have been only two cases of acute flaccid paralysis caused by wild-type poliovirus worldwide from the last endemic countries, Pakistan and Afghanistan. There have however been an additional 62 detections of wild poliovirus from environmental sources in Pakistan and Afghanistan.

Two vaccines provide excellent protection from polio disease, namely OPV or inactivated polio vaccine (IPV). In South Africa, children are protected with both vaccines. The live attenuated vaccine has the added advantage of inducing gastrointestinal immunity, which can interrupt shedding in faeces of any wild polio strains. Prolonged circulation for years in the environment in areas with low population vaccination coverage can allow reversion to neurovirulence, termed cVDPV. A new polio vaccine, novel OPV2 (nOPV2) received an emergency use listing in 2020 and is currently replacing monovalent OPV2 for outbreak response to cVDPV2. nOPV2 has been used in seven African countries in 2021.

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

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

COVID-19 update in South Africa – focus on Northern Cape and Free State provinces

From 2 March 2020 through 21 August 2021 (week 33 of 2021), there were 2 690 973 cases of COVID-19 reported from South Africa. To date, there have been three periods of increased transmission (waves). A wave was defined as the period from weekly incidence of 30 cases per 100 000 persons to weekly incidence below 30 cases per 100 000 persons. This report describes the upward trend of the three waves in the Northern Cape and Free State provinces, from the weekly incidence of 30 cases per 100 000 persons to the peak of the wave. In the Northern Cape Province, the upward-trend of the first wave was from week 27 of 2020 and peaked at week 38 of 2020, the second wave from week 51 of 2020 and peaked at week 1 of 2021, and third wave from week 10 of 2021 and peaked at week 32 of 2021. In the Free State Province, the upward-trend of the first wave was from week 27 of 2021 and peaked at week 30 of 2020, the second wave from week 52 of 2020 and peaked at week 1 of 2021, and the third wave from week 14 of 2021 and has not yet reached peak as of week 33 of 2021(as at 21 August 2021).

The Northern Cape and Free State provinces were the first provinces to enter the latest surge (third wave) of cases in South Africa, followed by North West Province nine weeks later. The third wave curves of the two provinces appeared different compared to other provinces, Northern Cape showing two peaks and Free State showing a steady increase for 20 weeks (Figure 1).

In week 33 of 2021, compared to other provinces, the Northern Cape and Free State provinces reported the second and fourth highest cumulative incidence risk of 5 935 and 4 852 cases per 100 000 persons, respectively, which was above the national incidence (4 513.4 cases per 100 000 persons). In the Northern Cape, since the start of the SARS-CoV-2 epidemic the highest weekly incidence risk was reported in week 32 of 2021 (250.7 cases per 100 000 persons), higher than the peak rate reported in the first and second waves. Although the Northern Cape and Free State provinces were the first and second provinces to enter the third wave, in week 33 they continued to report high incidences, second and third highest weekly incidence risk 187.8 and 151.0 cases per 100 000 persons, respectively (Figure 1).

In week 32 of 2021, in the Northern Cape Province all the districts reported the highest weekly incidence risk since the start of the pandemic. In the current surge of cases, the Northern Cape Province had two peaks, first in week 20 of 2021 (236.4 cases per 100 000 persons) and the second in week 32 of 2021 (250.7 cases per 100 000 persons). In the first peak of the current wave, two districts reported the highest weekly incidence risk, Frances Baard (275.0 cases per 100 000 persons) and Pixley ka Seme (343.3 cases per 100 000 persons), whereas in the second peak, the ZF Mgcawu (293.0 cases per 100 000 persons) and the Namakwa districts (412.6 cases per 100 000 persons) reported the highest weekly incidence. For more information see link below: https://www.nicd.ac.za/wp-content/uploads/2021/08/COVID-19-Weekly-Epidemiology-Brief-week-33-2021.pdf

In the Free State Province, three districts have reported weekly incidence risk higher than that reported in the first or second wave peaks, Lejweleputswa (135.7 vs 125.9 cases per 100 000 persons), Mangaung Metro (184.5 vs 103.3 cases per 100 000 persons) and Xhariep (197.8 vs 147.6 cases per 100 000 persons) districts. For more information see link below: https://www.nicd.ac.za/wp-content/uploads/2021/08/COVID-19-Weekly-Epidemiology-Brief-week-33-2021.pdf

In the Northern Cape Province, the majority of cases during the first wave (5 435/14 811, 36.7%), second wave (1 574/4 421, 35.6%), and third wave (12 201/39 892, 30.6%) were in the age group 20-39-years. In the Free State Province, the majority of cases during the first wave (6 487/17 202, 37.7%) and third wave (18 780/58 304, 32.2%) were in the age group 40-59 years, and in the second wave in the 20-39-year age group (2 756/7 739, 35.6%). The majority of cases were female in all the provinces and the three waves (Table 1).

In both provinces, on multivariable analysis when comparing characteristics of cases during the first and second waves to the third wave of infections, individuals in the younger age groups (<20 years) compared to individuals aged 20-39 years had increased odds of being diagnosed with COVID-19 in the third wave (Table 1), possibly in part due to an immunity gap in these age groups as adults were more affected in the first two waves. In the Northern Cape Province, compared to the first wave, cases were more likely to be from ZF Mgcawu and Namakwa districts during the third wave. In the Free State Province, cases were more likely to be from Xhariep district during the third wave compared to the first wave (Table 1).

Despite low numbers of samples sequenced in some weeks, data from genomic surveillance suggest that in both Northern Cape and Free State provinces during the first part of the third wave the Beta variant was predominant. This variant was subsequently replaced by the Delta variant during the wave, which could in part have contributed to the long wave duration observed (https://www.nicd.ac.za/wp-content/uploads/2021/08/Update-of-SA-sequencing-data-from-GISAID-19-August-2021.pdf). Additional factors such as mixing patterns and immunity gaps could have contributed to the observed pattern.

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

This summary highlights the shift in the age group of cases with laboratory confirmed COVID-19 to younger age groups during the third wave of infections compared to earlier waves of infection in the two provinces in South Africa. In the Northern Cape Province, different districts were responsible for the unique curve (two peaks) in the third wave. The weekly incidence risk reported in the Northern Cape Province exceeds that reported in the first and second wave peaks, while the Free State Province reported weekly incidence higher than that reported in the second wave. Cases diagnosed in the third wave were more likely to be in the younger age groups. This may be due to school clusters or outbreaks at schools, or increased immunity in the older age group. Recommendations are adherence to non-pharmaceutical interventions at work, school, and public space such as shopping centers, and if possible avoid public spaces.

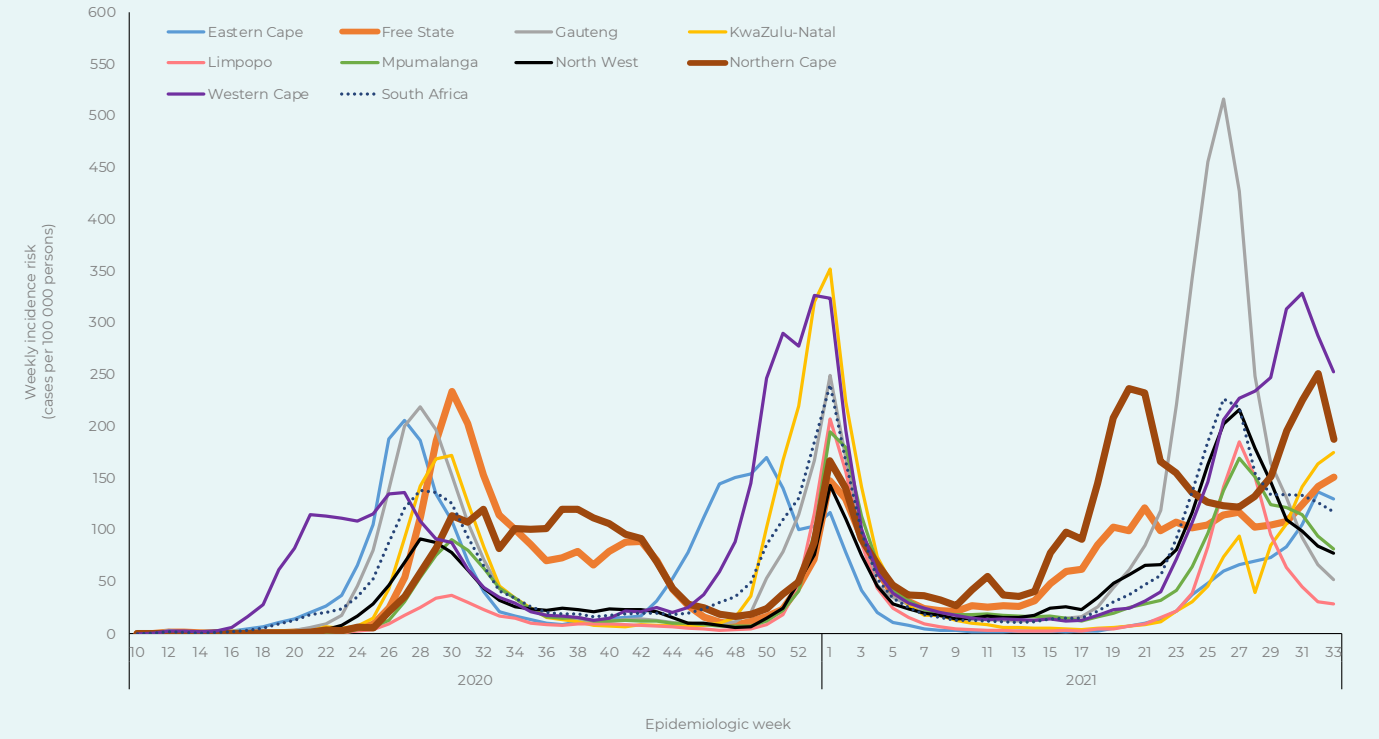

Figure 1. Weekly incidence risk of laboratory-confirmed cases of COVID-19 by province and epidemiologic week, South Africa, 2 March 2020 –21 August 2021 (n=2 690 973).

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

Table 1: Comparison of characteristics of new COVID-19 cases between first wave and third wave, and second and third wave in Northern Cape and Free State provinces, N=142 369

	Northern Cape Province (NCP)					Free State Province (FSP)				
Characteristics	**Wave 1**	**Wave 2**	**Wave 3**	**Multivariate 1st wave vs 3rd wave**	**Multivariate 2nd wave vs 3rd wave**	**Wave 1**	**Wave 2**	**Wave 3**	**Multivariate 1st wave vs 3rd wave**	**Multivariate 2nd wave vs 3rd wave**
(n/%)	14 811	4 421	39 892	adjusted OR (95% CI)	adjusted OR (95% CI)	17 202	7 739	58 304	adjusted OR (95% CI)	adjusted OR (95% CI)
Age group										
0-4	194 (1.3)	55 (1.2)	512 (1.3)	1.1 (0.9-1.3)	1.1 (0.8-1.5)	203 (1.2)	71 (0.9)	683 (1.2)	1.2 (1.0-1.4)	1.3 (1.0-1.7)
5-9	358 (2.4)	83 (1.9)	1 516 (3.8)	1.5 (1.3-1.8)	2.6 (2.0-3.3)	273 (1.6)	105 (1.4)	1 431 (2.5)	1.9 (1.6-2.1)	1.9 (1.6-2.3)
10-14	538 (3.6)	167 (3.8)	2 854 (7.2)	2.1 (1.9-2.4)	2.5 (2.1-3.0)	578 (3.4)	199 (2.6)	2 853 (4.9)	1.8 (1.6-2.0)	2.0 (1.7-2.3)
15-19	865 (5.8)	223 (5.0)	3 327 (8.3)	1.5 (1.4-1.7)	1.9 (1.6-2.2)	954 (5.6)	261 (3.4)	4 452 (7.6)	1.6 (1.5-1.8)	2.4 (2.1-2.7
20-39	5 435 (36.7)	1 574 (35.6)	12 201 (30.6)	1	1	6 324 (36.8)	2 756 (35.6)	17 757 (30.5)	1	1
40-59	4 989 (33.7)	1 467 (33.2)	12 119 (30.4)	1.1 (1.1-1.2)	1.0 (1.0-1.1)	6 487 (37.7)	2 680 (34.6)	18 780 (32.2)	1.0 (1.0-1.1)	1.1 (1.0-1.1)
60-69	1 016 (6.9)	396 (9.0)	3 127 (7.8)	1.4 (1.3-1.5)	1.0 (0.9-1.2)	1 043 (6.1)	664 (8.6)	5 282 (9.1)	1.8 (1.7-2.0)	1.1 (1.0-1.3)
>=70	657 (4.4)	249 (5.6)	2 551 (6.4)	1.7 (1.6-1.9)	1.2 (1.1-1.4)	578 (3.4)	556 (7.2)	4 599 (7.9)	2.8 (2.5-3.0)	1.1 (1.0-1.3)
Unknown	759 (5.1)	207 (4.7)	1 685 (4.2)	1.1 (0.1-1.2)	1.0 (0.8-1.1)	762 (4.4)	447 (5.8)	2 467 (4.2)	1.1 (1.0-1.2)	1.0 (0.9-1.2)
Sex, (n, %)										
Female	8 547 (57.7)	2 541 (57.5)	22 119 (55.5)	1		10 285 (59.8)	4 400 (56.9)	33 086 (56.8)	1	
Male	6 041 (40.8)	1 847 (41.8)	17 099 (42.9)	1.1 (1.1-1.1)		6 790 (39.5)	3 257 (42.1)	24 857 (42.6)	1.2 (1.1-1.2)	
Unknown	223 (1.5)	33 (0.8)	674 (1.7)	1.1 (0.9-1.3)		127 (0.7)	82 (1.1)	361 (0.6)	0.8 (0.7-1.0)	
Laboratory type (n, %)										
Public	8 668 (58.5)	2 939 (66.5)	26 940 (67.5)	1.2 (1.2-1.3)		8 113 (47.2)	4 392 (56.8)	28 851 (49.5)	1.0 (0.9-1.0)	0.8 (0.8-0.9)
Private	6 143 (41.5)	1 482 (33.5)	12 952 (32.5)	1		9 089 (52.8)	3 347 (43.3)	29 453 (50.5)	1	1
District (n, %) NCP | FSP										
Frances Baard | Fezile Dabi	5 292 (41.2)	741 (19.8)	11 261 (33.7)	1.2 (1.1-1.2)	0.9 (0.8-1.1)	2 513 (15.6)	1 370 (21.5)	9 843 (18.0)	1.6 (1.5-1.7)	0.8 (0.8-0.9)
John Taolo Gaetsewe | Lejweleputswa	2 295 (17.9)	251 (6.7)	4 113 (12.3)	1	1	4 878 (30.3)	1 370 (21.5)	11 846 (21.6)	1	1
Namakwa | Mangaung	434 (3.4)	944 (25.2)	3 783 (11.3)	4.3 (3.9-4.9)	0.2 (0.2-0.3)	5 581 (34.7)	1 714 (26.9)	19 933 (36.4)	1.5 (1.4-1.6)	1.4 (1.3-1.5)
Pixley ka Seme | Thabo Mofutsanyane	3 064 (23.8)	1 088 (29.0)	6 945 (20.8)	1.1 (1.0-1.2)	0.4 (0.3-0.4)	2 695 (16.7)	1 589 (25.0)	10 731 (19.6)	1.6 (1.5-1.7)	0.8 (0.7-0.9)
ZF Mgcawu | Xhariep	1 773 (13.8)	727 (19.4)	7 326 (21.9)	2.2 (2.0-2.4)	0.6 (0.5-0.7)	440 (2.7)	323 (5.1)	2 403 (4.0)	2.2 (2.0-2.4)	0.9 (0.8-1.0)

INTERNATIONAL OUTBREAKS OF IMPORTANCE

Marburg virus disease, Guinea

A case of Marburg virus disease (MVD) was reported in the Gueckedou Prefecture in the Nzerekore Region of south-western Guinea. A 46-year-old male farmer and resident of Temessadou M'Boke, 9 km from the Sierra Leone border, demised on 3 August 2021 and was diagnosed on post-mortem sampling. The patient first developed symptoms on 25 July, and presented to the local clinic on 1 August with fever, headache, fatigue, abdominal pain, and gingival haemorrhage. The source of infection has not yet been identified.

MVD, formerly known as Marburg haemorrhagic fever, is a severe disease with a high case fatality rate. Though caused by different viruses, Ebola virus disease (EVD) and MVD are clinically similar. Transmission occurs via direct contact with blood and body fluids from infected persons, contact with *Rousettus* bat colonies, or via infected semen from infected persons up to seven weeks post recovery. Suspected cases may present with a sudden onset of fever (>38.5°C) and should have at least three of the following signs and symptoms:

- Headaches, lethargy, myalgia, or
- abdominal pain, vomiting, anorexia, loss of appetite, diarrhoea, difficulty in swallowing, hiccups, bloody diarrhoea, or
- bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine.

The current outbreak in Guinea involves one confirmed case and remains localized. Further detailed investigation to identify the source of infection, as well as contact tracing, is ongoing. A high risk for trans-border transmission exists as there is frequent international movement between Gueckedou in Guinea and districts of Foya in Liberia and Kailahun in Sierra Leone. The Ministry of Health together with WHO, USCDC, Alima, Red Cross, UNICEF, FAO, and other partners have initiated measures to control the outbreak and prevent further spread.

Ebola virus disease, Cote d'Ivoire

On 14 August 2021, a case of Ebola virus disease (EVD) was confirmed in Cote d'Ivoire at Abidjan Hospital. The case-patient is an 18-year-old female, who had travelled from Labe in Guinea to Abidjan, Cote d'Ivoire, by public transport. The patient presented to a local clinic on 12 August 2021 with fever, headache, and bleeding from her gums and genitals. Samples were sent to Institut Pasteur de Cote d'Ivoire for testing and the regions first case of EVD in 25 years was confirmed. The current outbreak in Cote d'Ivoire involves one confirmed case and a one suspected case. Preliminary information suggests the suspected case is a family member and direct contact of the first case. A total of 9 direct contacts has been traced.

On 22 August 2021, Burkina Faso announced the detection of a suspected case of EVD at the Bogodogo University Hospital Center in Ouagadougou. The patient is thought to have travelled from Cote d'Ivoire. As of 24 August 2021, no EVD related deaths have been reported. Cote d'Ivoire's public health response to the EVD outbreak has been appropriate with implementation of the necessary public health measures. Cote d'Ivoire has received 5 000 doses of the Ebola vaccine from WHO and has vaccinated 828 people to date.

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

SEASONAL DISEASES

Influenza, 2021

As of week 32 (week ending 15 August 2021) to date, a total of 70 influenza positive cases has been reported from the syndromic sentinel surveillance programmes conducted by NICD. Following the first case detected in March 2021, sporadic cases of influenza have been reported. The highest number of influenza positive cases in 2021 to date was reported in week 23 (n=12, 17%), (week ending 13 June 2021).

The majority of cases (68/70, 97%) were influenza B, of which 59 (87%) were influenza B/Victoria, six (9%) influenza B lineage inconclusive and three (4%) influenza B lineage result pending. Two of the influenza cases detected in 2021 were influenza A (H3N2). Influenza has been detected from all the provinces (Eastern Cape, KwaZulu-Natal, North West, Gauteng, Mpumalanga and the Western Cape) which have participated in surveillance in 2021. Influenza transmission has remained 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 2). During the period of COVID-19 and influenza transmission, it is still important to consider influenza as one of the differential diagnosis depending on clinical presentation. Recommendations on influenza diagnosis, target groups, dosages and contraindications for the 2021 influenza vaccine, and influenza antiviral treatment are available in the Influenza NICD recommendations, 2021.

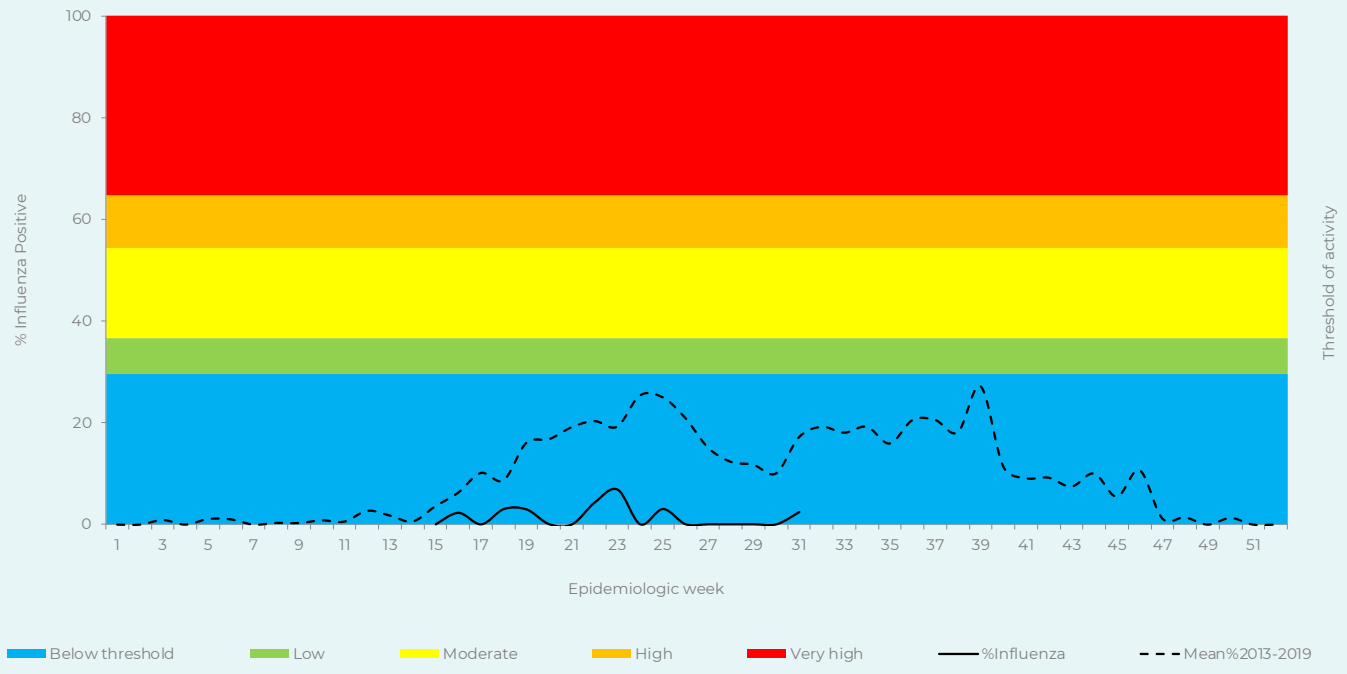

Figure 2. ILI surveillance (primary health) percentage influenza detections and epidemic thresholds*

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

SEASONAL DISEASES

Respiratory syncytial virus (RSV) 2021

In 2021 to date, RSV has been circulating since the first week of the year. Of the 4 003 cases hospitalised for severe respiratory illness who were tested for RSV at sentinel sites, 397 (10%) tested positive. The majority of RSV positive cases were subgroup A (203/397, 51%), followed by subgroup B (176/397, 44%) and RSVAB subgroup (4/397, 1%). The RSV subgroup was inconclusive for seven (2%) and pending for seven (2%). The highest detection rate in 2021 to date was reported in week 11 (26/116, 22%), and the detection rate has been decreasing in the past few weeks, weekly detection rates below 10% since week 26 (Figure 3). Since week 7 of 2021, the detection rate of RSV in 2021 has been below the mean detection rate reported for 2010-2019. The non-pharmaceutical measures put in place to prevent COVID-19 have also resulted in reducing the number of influenza and RSV cases. It is not clear what the effects of reduced transmission of these two pathogens since 2020 will be if controls to slow the spread of SARS-CoV-2 are relaxed in future.

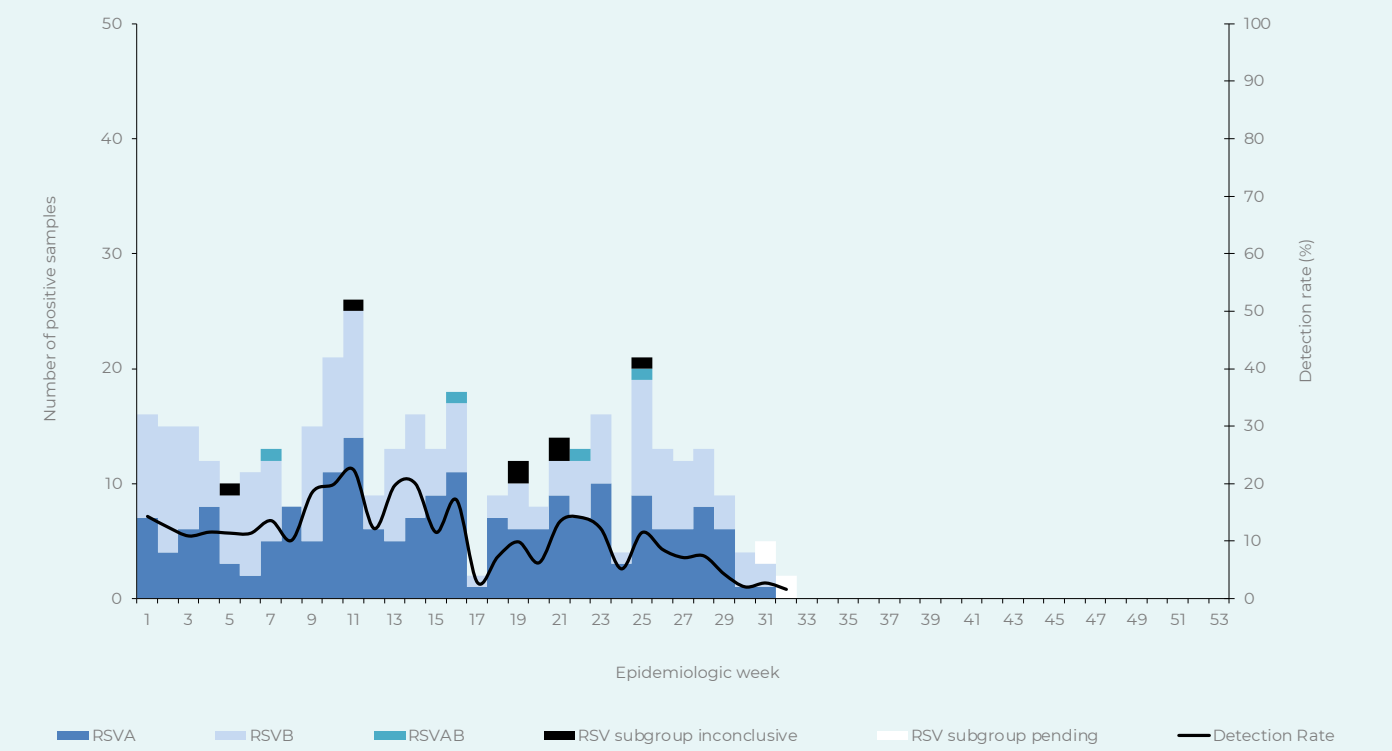

Figure 3. Number of samples testing positive for respiratory syncytial virus* by subgroup and detection rate by week

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

SEASONAL DISEASES

Invasive meningococcal disease

For 2021, only 23 cases of laboratory-confirmed invasive meningococcal disease (IMD) have been reported up until end of July. This is the second consecutive year that few cases of IMD have been reported (Figure 4). The marked decrease in meningococcal disease may be an additional benefit from enforced mask wearing and social distancing measures put in place to contain the spread of SARS-CoV-2. Through these measures, person-to-person transmission of *Neisseria meningitidis* from respiratory droplets is reduced, leading to less transmission of virulent organisms and their subsequent progression to invasive disease.

The 23 cases reported to date are from the Western Cape (n=10, 43%), Gauteng (n=5, 22%), Eastern Cape (n=4, 17%), KwaZulu-Natal (n=3, 13%) and North West (n=1, 4%) provinces. Children <5 years of age were most affected (n=10), followed by 5-14 year olds (n=6). Of 11 organisms serogrouped, serogroup B was most predominant (n=7, 63%) followed by serogroup W (n=2, 18%), and serogroup C and Y (9%, one case each).

Although cases are few, *Neisseria meningitidis* is still circulating widely in South Africa. Meningococcal disease onset is swift and even with appropriate treatment, patients can deteriorate rapidly. Clinicians are urged to consider IMD in patients presenting with acute onset of severe illness, look especially for the characteristic non-blanching petechial rash associated with meningococcaemia, and begin appropriate antibiotic treatment (intravenous penicillin or ceftriaxone) whilst awaiting laboratory confirmation of disease.

Meningococcal disease is a category 1 notifiable medical condition (NMC) and any clinically suspected or laboratory-confirmed case should be reported immediately to the provincial Communicable Disease Control Coordinators to ensure appropriate contact tracing, responsible prescribing of chemoprophylaxis (single oral dose of ciprofloxacin) and case counting.

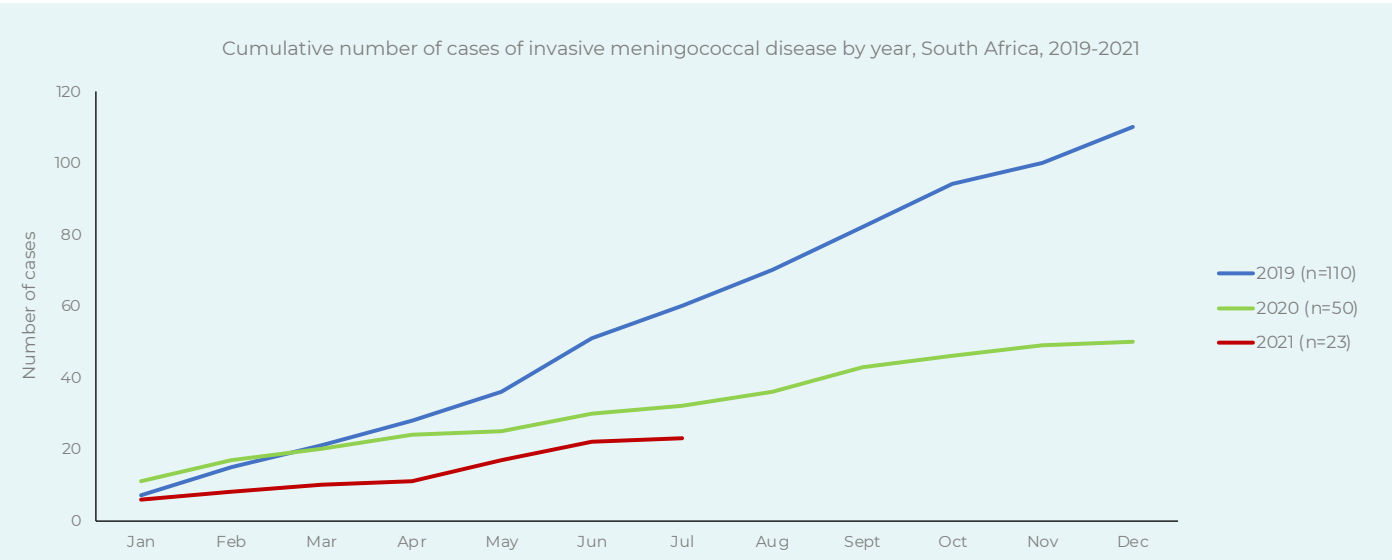

Figure 4. Cumulative number of cases of invasive meningococcal disease by year, South Africa, 2019-2021

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

SEASONAL DISEASES

Rotavirus season 2021

Rotavirus is a common childhood infection with a seasonal pattern, peaking during the cooler, drier months of the year. Since the rotavirus vaccine was introduced into the South African national immunization programme in 2009, the annual rotavirus season occurs from late June to mid-August.

Diarrhoeal surveillance restarted in May 2021 and is conducted in three provinces [Free State (Pelonomi Hospital); North West (Klerksdorp/Tshepong hospitals); and Western Cape (Red Cross Children's Hospital, Eastridge Clinic and Michell's Plain Hospital and Clinic)], targeting all patients who present for the treatment of diarrhoea. In addition, diarrhoeal surveillance is conducted as part of the ANDEMIA program in two provinces [Gauteng (Kalafong Hospital), and Mpumalanga (Mapulaneng and Matikwana hospitals)] and has been running since 2018.

A total of 361 stool specimens have been screened with 24% (86/361) positive for rotavirus, mostly concentrated in the Western Cape and the 2021 season dominated by G2P[4] strains. As expected the 2021 rotavirus season was earlier (week 16; 19 April) and the prevalence higher than seen in 2019 (11%; 57/508). Most of the rotavirus cases were in children < 5 years. Vaccination remains the most important intervention to combat rotavirus diarrhoea and all children should receive two doses of the oral formulation at 6 and 14 weeks.

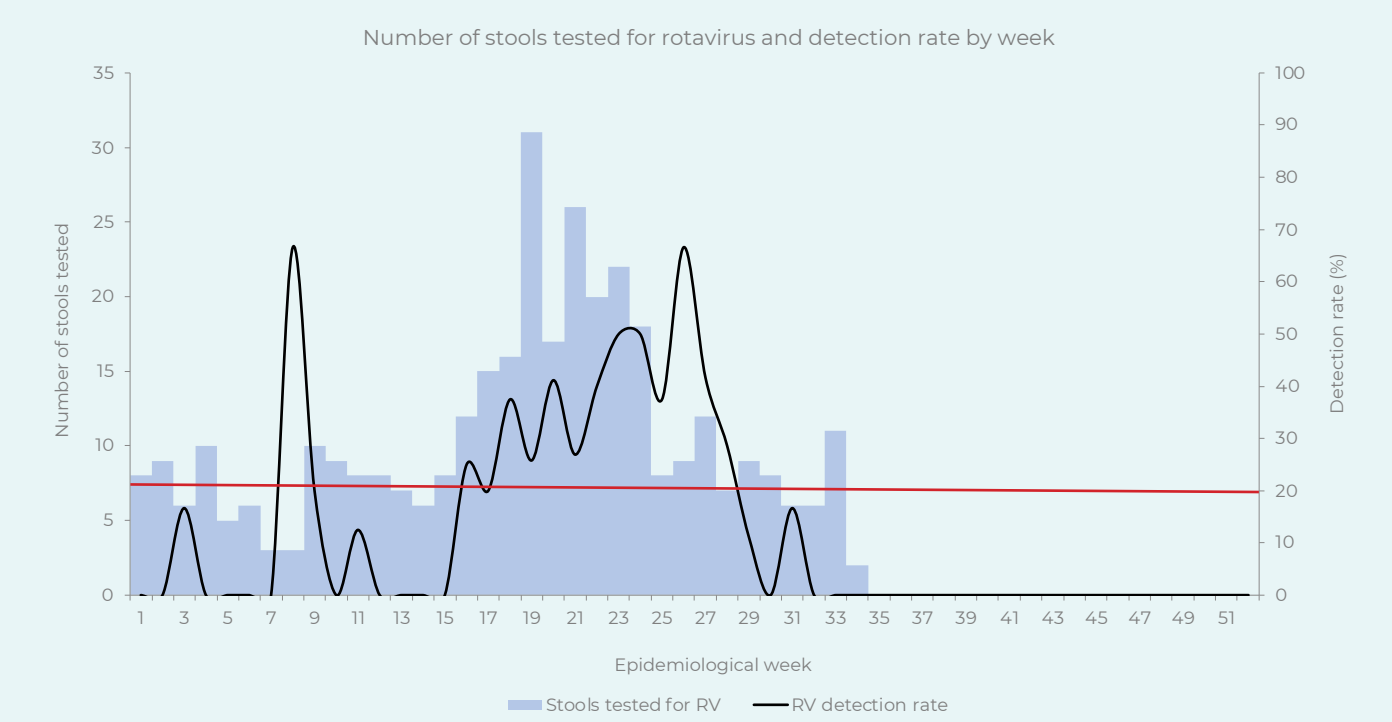

Figure 5. The total number of stool specimens collected and screened for rotavirus by epidemiological week in 2021 from all diarrhoeal sentinel surveillance sites, South Africa

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

SEASONAL DISEASES

Malaria treatment: first detection of the *Plasmodium falciparum kelch* 13 Q613E mutation in South Africa

Artemisinin-based combination therapies (ACTs), the currently used antimalarial drugs in South Africa, are highly effective for treating malaria. Unfortunately, parasites resistant to artemisinins have emerged and spread across South East Asia, the historic epicentre for antimalarial drug resistance. Given the threat that artemisinin-resistant parasites would pose to curing patients and South Africa's malaria elimination aspirations, the NICD's Laboratory for Antimalarial Resistance Monitoring and Malaria Operational Research (ARMMOR,) in collaboration with the University of Cape Town and the National and Provincial Malaria Control programmes, implemented a surveillance programme to facilitate the prompt detection of, and rapid response to, any decrease in antimalarial drug efficacy. Used malaria rapid diagnostic test kits, routinely collected from healthcare facilities in malaria-endemic districts, serve as the source of parasite DNA. Any validated mutations in the parasite's *kelch* 13 gene associated with artemisinin resistance are used as a proxy measure of parasite susceptibility to artemisinins. It was through this surveillance that a parasite isolate with the *kelch* 13 Q613E mutation was recently detected by ARMMOR, a first in South Africa. A unique patient/sample barcode facilitated the identification of the patient as an individual from KwaZulu-Natal Province, who most likely contracted malaria while visiting Mozambique. Similar mutations have been found in parasites in several west and central African countries. While this mutation alone is not suspected to confer parasite resistance, it serves as an early warning of the potential for emergence of artemisinin resistance in southern Africa. Therefore, patients must be compliant with malaria treatment; every dose of artemether-lumefantrine must be taken with some fat (e.g. a glass of full-cream milk), and patients followed up (ideally with a blood smear check) at days 3 and 28, to ensure they are cured. This finding highlights the importance of sustaining the surveillance programme in South Africa and the need to expand it across southern Africa. (Guidelines for malaria treatment and prevention are available at www.nicd.ac.za/diseases-a-z-index/malaria/ and www.health.gov.za/communicable-diseases).

Source: ARMMOR, Centre for Emerging Zoonotic and Parasitic Diseases, NICD-NHLS; jaishreer@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 14.

Hepatitis E - South Sudan

On 15 August 2021, the South Sudanese health ministry reported eight deaths related to hepatitis E virus infection in the country's Bentiu camp for internally displaced persons. A total of 219 hepatitis cases has been reported in the country this year.

Hepatitis E disease is a viral hepatitis caused by hepatitis E virus, a single-stranded, single-serotype, RNA virus belonging to the Hepeviridae family. The disease is commonly found in poorly developed regions with poor sanitation and limited access to clean water. The virus has four different genotypes. Genotypes 1 and 2 have only been found in humans. Genotypes 3 and 4 are found in animals with possible transmission to humans. Hepatitis E genotypes 1 and 2 are transmitted by the faecal-oral route. Hepatitis E outbreaks are largely waterborne, whilst most sporadic cases are zoonotic or foodborne. Vertical transmission may also occur.

The incubation period of hepatitis E ranges from 2 to 9 weeks. Symptoms include jaundice, fever, loss of appetite, abdominal pain, and lethargy. Hepatitis E symptoms are indistinguishable from symptoms of other causes of viral hepatitis. For most cases, the virus causes an acute infection that is self-limiting and, in some instances, asymptomatic. Pregnant woman are particularly vulnerable to infection, particularly those in the second or third trimester and are at increased risk of acute liver failure, foetal loss, and mortality.

Treatment of hepatitis E is largely non-specific and supportive, with few cases presenting with fulminant liver failure, requiring hospitalisation. Prevention through improved water and sanitation as well as hygiene practices is the most effective tool to combat hepatitis E outbreaks.

Anthrax - Russia

A human case of anthrax has been reported in Dagestan, Russia. A 52-year-old male was confirmed with cutaneous disease reportedly following his involvement in butchering a cow. He is reported to be in a moderate clinical condition. Cutaneous anthrax is a milder and better tolerated form of disease than the pulmonary or gastrointestinal forms.

Anthrax is a zoonotic disease caused by a spore-forming gram-positive, rod-shaped bacteria known as *Bacillus anthracis,* capable of causing severe illness in both humans and animals. Anthrax spores extremely resilient and survive for years in soil, or on the wool or hair of infected animals. Spores are ingested or inhaled by an animal, or enter through cuts in their skin. Humans generally acquire the disease directly or indirectly from infected animals, or through occupational exposure to infected or contaminated animal products. The cutaneous form occurs when the spores enter the body through cuts or scratches in the skin and cause a local infection that, if not controlled may spread throughout the body. The gastrointestinal form occurs when the spores are ingested, and the pulmonary form occurs when the spores are inhaled. There is no evidence that anthrax can be transmitted from human to human.

The symptoms of anthrax depend on the type of infection and can take anywhere from 1 day to more than 2 months to appear. All types of anthrax have the potential, if untreated, to spread throughout the body and cause severe illness and death. Symptoms of cutaneous anthrax are characterised by a raised, itchy bump resembling an insect bite at the site of infection that quickly develops into a painless sore with a black centre. There may be associated flu-like symptoms. Gastrointestinal anthrax infection causes non-specific symptoms such as nausea and vomiting, abdominal pain, and fever. The disease can result in bloody diarrhoea in the later stages of the disease. Inhalation anthrax, is the most severe form and is characterised by flu-like symptoms, shortness of breath and chest discomfort. This form of the disease may also result in drenching sweats.

Anthrax infection is treated with antibiotics, antitoxin and if necessary, ventilatory support.

BEYOND OUR BORDERS

Hantavirus – Taiwan, Asia

The Taiwan Centre for Disease Control has reported a new hantavirus case in a male in his 40s, bringing the total number of confirmed cases in Taiwan to eight, as of 12 August 2021. The male patient reported a positive history of a rat bite, had no travel history and was admitted to hospital with mild disease where hantavirus infection was confirmed. He has since been discharged home.

Hantavirus pulmonary syndrome is a zoonotic disease spread to humans largely by rodents. Hantavirus, of the family Bunyaviridae, may cause hantavirus pulmonary syndrome (HPS), or haemorrhagic fever with renal syndrome (HFRS). Hantaviruses that cause pulmonary disease are mostly found in the Americas and are termed 'new world' hantaviruses. 'Old world' hantaviruses are mostly found in Europe and Asia and mainly cause the haemorrhagic and renal manifestations.

The rest of this section will focus on HPS.

Humans are at risk of infection by inhalation or direct contact with dust or objects contaminated with rodent faeces or urine, or bites from rodents carrying the virus. The incubation period for HPS ranges from 1 to 8 weeks. Early symptoms include sudden and persistent fever, conjunctival congestion, weakness, back pain, headache, and abdominal pain. Late symptoms occur 4 to 10 days after the initial phase of the illness, and include coughing, shortness of breath and tight chest. Depending on the disease severity, patients may develop some degree of hypotension and progressive evidence of pulmonary oedema and hypoxia, usually requiring mechanical ventilation.

There is no specific treatment, cure, or vaccine for HPS. Treatment is mainly supportive, and prognosis is improved by early patient presentation. Severe cases usually require intensive care management. HPS has a case fatality rate of up to 38%.

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)

WHO AFRO UPDATE

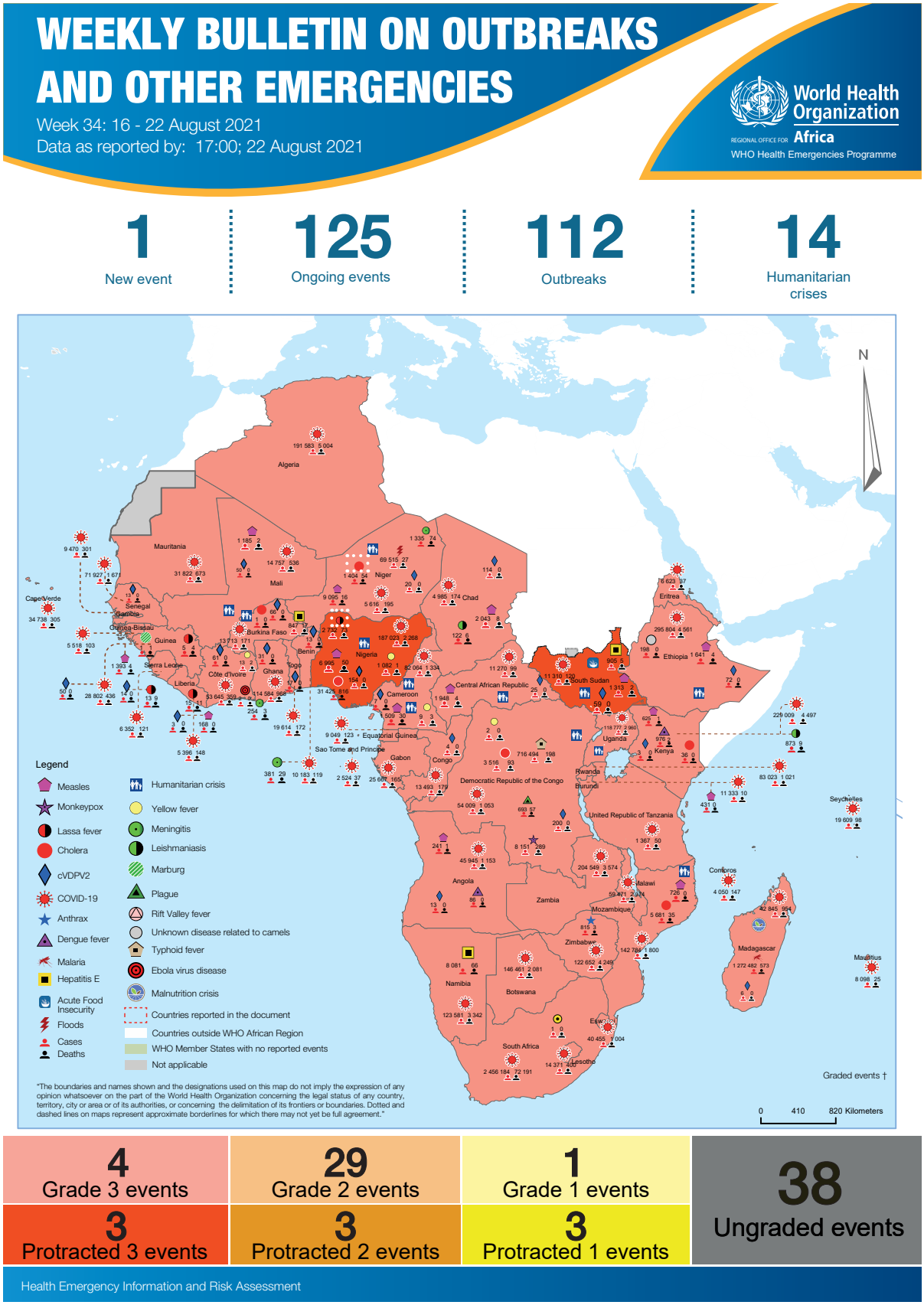

Figure 7. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 126 events. For more information see link below:
https://apps.who.int/iris/bitstream/handle/10665/344445/OEW34-1622082021.pdf

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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