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

COMMUNICABLE DISEASES

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COMMUNIQUÉ

CONTENTS

Editor's Note

Prof Lucille Blumberg

This issue of the Communiqué highlights a number of communicable diseases where vaccines play a critical role in prevention. The recent case of wild-type polio in Malawi is a reminder of the need to strengthen the Expanded Programme for Immunization (EPI). During the COVID-19 pandemic, resources and attention have focussed on pandemic response and many pubic health programmes have been compromised. While a number of outbreaks of vaccine-derived poliovirus (VDPV) have been reported in Africa over the past few years, this is the first case of wild-type polio in Africa since the continent was declared free of wild-type polio in 2020.

The ongoing rabies outbreak, affecting mainly dogs, predominantly in KwaZulu-Natal and Eastern Cape provinces, has resulted in further human cases. Failure to seek post-exposure prophylaxis or incomplete regimens with failure to administer rabies immune globulin even after facial bites, are key factors resulting in rabies disease. A 'One Health' approach, especially vaccination of dogs (and cats), is strategically the most cost-effective intervention.

March and April are peak season for malaria in southern Africa and the time of lots of travel to malaria transmission areas both within and across our borders. Given overlapping signs and symptoms, between the two infections, misdiagnosis of malaria as COVID-19 has been identified as a major cause of delayed malaria treatment in a number of severe and fatal cases. Malaria must always be considered first in all persons with acute febrile illness with a history of travel to or residence in a malaria risk area, especially those with respiratory distress due to ARDS. Malaria should be considered in any person with unexplained fever, given the occasional infected mosquito that chooses to travel outside of its usual habitat, especially at this time of the year.

The influenza season is approaching and those at risk of severe illness should ensure they are vaccinated in time. There is clear overlap in those at risk for severe COVID-19 and influenza –related complications: age over 60 years, diabetes, pregnancy, those with immunodeficiency, obesity, and others. The COVID-19 vaccination programme has expanded over the past months to include more persons at risk for severe illness but there are still gaps in coverage. Vaccine hesitancy needs to be addressed and in most cases good communication, responding to queries, fears, and questions, and improving access to vaccines, will result in improved uptake.

It has been my privilege to guest edit this edition of the NICD Communiqué. I hope you will find it informative and interesting.

ZOONOTIC AND VECTOR-BORNE DISEASES

An update on rabies in South Africa

Since the last communication in February, three cases of human rabies have been laboratory confirmed in South Africa. These cases were reported from Eastern Cape (EC), KwaZulu-Natal (KZN) and Limpopo (LPP) provinces. As of 24 March 2022, a total of four human cases of rabies in South Africa has been laboratory confirmed. These cases originated in LPP (n=1), EC (n=2), and KZN (n=1). In 2021, 19 cases (n=9 ex-ECC, n=6 ex-KZN, and n=4 ex-LPP) were confirmed from the same three provinces.

The recent case from the EC involved a 63-year-old woman from Gqeberha, Nelson Mandela Municipality. The patient presented with fever, headache, malaise, nausea, vomiting, anorexia, muscle spasm and later with seizures, anxiety, confusion, delirium, hypersalivation, hydrophobia and agitation. The woman was reportedly bitten by a dog on her arm about a month before onset of illness. Reportedly, rabies post-exposure prophylaxis (PEP) was initiated, but she only received two doses of vaccine three weeks after the exposure. The cause of death was determined to be rabies after a laboratory examination of a brain sample.

A 24-year-old man from Folweni, eThekwini, KZN, was admitted to hospital with confusion, hallucinations, hysteria, and hypersalivation, and died on the day of his admission in early March 2022. In December of last year, when visiting a friend's home in nearby KwaMakhutha, he was scratched by a cat. The man did not seek rabies PEP, and the cat was apparently unvaccinated against rabies, behaving strangely, and died soon after the incident. Rabies was confirmed by laboratory examination of a postmortem-collected brain sample.

The case in LPP involved an eight-year-old child from Giyani, Mopani district. The child presented to hospital with fever, incapacity to walk, hallucinations and self-inflicted bite wounds. The patient died following seven days of hospitalization. Although the child had regular interaction with a number of dogs in his surroundings, there had been no specific dog bite history that could be linked to exposure. The diagnosis of rabies was confirmed by RT-PCR on antemortem-collected saliva and skin biopsy samples.

The outbreaks of rabies in domestic dogs in the eThekwini Municipality, KZN and Nelson Mandela and Buffalo City municipalities, EC since 2021, continue (see https://www.kzndard.gov.za/latest-news/item/327-rabies-update). The consequence is an increased risk for human exposures and hence an increased risk for developing rabies disease. The pivotal intervention for rabies is vaccination of dogs and cats and affected communities are encouraged to ensure that their pets are vaccinated against the disease. Once possible exposures occur, rabies PEP is a lifesaving intervention that should be provided urgently. Please visit the NICD website for further information on rabies and disease prevention: https://www.nicd.ac.za/diseases-a-z-index/rabies/

Crimean-Congo haemorrhagic fever in South Africa

A case of Crimean-Congo haemorrhagic fever (CCHF) was recorded in March 2022. This is the only case recorded in South Africa for the year to date.

The case involved a 69-year-old farmer from Vredendal in the Western Cape Province. He reported no tick bites or other possible exposures (for example exposure to sick livestock) before becoming ill. He was admitted to hospital with moderate leukopenia, raised aspartate transaminase and total bilirubin levels, and profound thrombocytopenia. Shortly following his admission, he tested positive for SARS-CoV2 infection. His condition continued to deteriorate and given his occupation, place of residence and profound thrombocytopenia, the differential diagnosis for the case included CCHF, Rift Valley fever and rickettsial infection. A blood sample submitted to the NICD, collected approximately one week following symptom onset, tested positive for CCHF virus RNA and CCHF IgM antibodies. Follow-up samples, collected at approximately day 10 of illness, remained CCHF PCR positive. The titre of the IgM antibodies did not increase and low titre of IgG was detectable on the repeat samples. The patient demised with a diagnosis of dual infection, namely COVID-19 and CCHF. Tracing of possible contacts for CCHF was conducted and no secondary cases of CCHF have been found.

From 1981 to March 2022, a total of 219 human cases of CCHF has been reported 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 been reported in the 1980s and there was a case of transmission in a laboratory worker 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, is available on www.nicd.ac.za.

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

ZOONOTIC AND VECTOR-BORNE DISEASES

Malaria in the time of COVID-19

COVID-19 has distracted attention from some other public health problems, such as seasonal malaria. Malaria cases generally peak in the first few months of the year after Christmas and Easter holidays, so at this time there should be a high index of suspicion for malaria in patients with fever or 'flu-like illness, particularly in the case of travel to, or residence in, a malaria-endemic area. All such patients with a fever or a recent history of fever must be tested for malaria, either by rapid diagnostic test or by microscopy. If this is initially negative and no other diagnosis is found, the malaria test should be repeated a few hours later. Any patient testing positive for malaria should be treated immediately; do not wait for COVID-19 or other laboratory results. Malaria typically rapidly progresses to severe illness, so early detection and treatment is essential to ensure optimal outcomes.

Artemether-lumefantrine (Coartem®) remains very effective in South Africa for the treatment of uncomplicated malaria. Patients must take each dose with some fatty food (milk, cheese, peanut butter) to ensure optimal absorption of the drugs. IV artesunate (Garsun®) is the recommended treatment for severe malaria. As artesunate produces significantly better treatment outcomes compared to IV quinine and is easier to use, it is the preferred treatment. Information on malaria risk areas in South Africa, and treatment and prevention of malaria, is available at www.https://www.nicd.ac.za/diseases-a-z-index/malaria/

Healthcare workers should be aware of odyssean malaria, also called 'taxi malaria' or 'minibus malaria'. This occurs when an infective mosquito is inadvertently transported from an endemic to a non-endemic area, where it subsequently infects people without recent travel history. Malaria should therefore be considered in the differential diagnosis, and be tested for, in patients with unexplained fever who get progressively sicker, especially if they have low platelet counts. The diagnosis of this form of malaria is often delayed or missed, with concerns about COVID-19 being a frequent distraction, and the mortality rate is high. Two recent incidents of odyssean malaria, one fatal, in Gauteng Province are reported below.

Odyssean malaria in Carletonville and Mamelodi, Gauteng Province

Case 1, Carletonville. The patient was a 30-year-old unemployed man who had recently arrived from the Eastern Cape Province. He became ill on 15 January with general body pains and was treated symptomatically as an outpatient. He was admitted on 22 January acutely ill, lethargic, dehydrated and hypotensive, with GCS of 6/15. A test for SARS-CoV-2 was negative. The haemoglobin level was 8.2 g/dL (low), leukocyte count 11.8 x 10^9/L (normal), platelet count 28 x 10^9/L (low); C-reactive protein was 153 mg/L (high), and renal function was compromised (urea 34.8 mmol/L, creatinine 265 µmol/L). Malaria parasites were detected in his blood sample but the patient demised before any antimalarial treatment was started. The patient had been residing in an informal settlement and a site inspection did not reveal any evidence of local vector breeding or recent arrival of neighbours' vehicles from malaria-endemic areas.

Cases 2 and 3, Mamelodi. A 5-year-old girl presented to a local clinic with fever and non-specific symptoms on February 22. A few days later she was admitted to hospital with fever, vomiting, abdominal cramps and diarrhoea. Laboratory investigations showed a haemoglobin concentration of 9 g/dL (low), platelet count of 46 x 10^9/L (low), C-reactive protein of 285 mg/L (high), and marginally-raised creatinine (44 µmol/L). Malaria was diagnosed by rapid diagnostic test and blood smear. She was treated with intravenous artesunate, followed by Coartem. The patient's brother, aged one year, also became ill at the same time, and was admitted on 2 March and similarly treated for malaria. Both children recovered fully. Epidemiological investigations revealed that the family had returned from Giyani, Limpopo Province on 2 January, too long previously to be related to these malaria infections. They had also visited Marikana in North West Province more recently, but unlike Giyani, this is not usually a malaria risk area. The mother's sister, who is her immediate neighbour in the settlement, had returned by motor vehicle from Giyani on 8 February, and we can speculate (but not prove) that this provided an opportunity to import a malaria-infected mosquito that fed on both children.

Source: Centre for Emerging Zoonotic and Parasitic Diseases, Gauteng Provincial Government Communicable Disease Control. johnf@nicd.ac.za

SEASONAL DISEASES

Influenza update, March 2022

The influenza season occurs mainly during the winter months of May to August. In the 10 years before 2020 the mean week of onset has been the second week of May, and the peak in the first week of July. However, since the start of COVID-19 pandemic in 2020, the restrictions and non-pharmaceutical measures put in place to prevent SARS-COV-2 transmission have interrupted influenza transmission, with very little transmission during 2020 and out-of-season transmission occurring during spring of 2021.

In 2022 to date, sporadic detections of influenza have been made since week 1 of 2022. Although numbers remain low, there have been weekly detections in sentinel influenza-like illness (ILI) (Figure 1) and pneumonia surveillance (Figure 2) sites since week 9 (week ending 6 March) and 7 (week ending 20 February 2022), respectively.

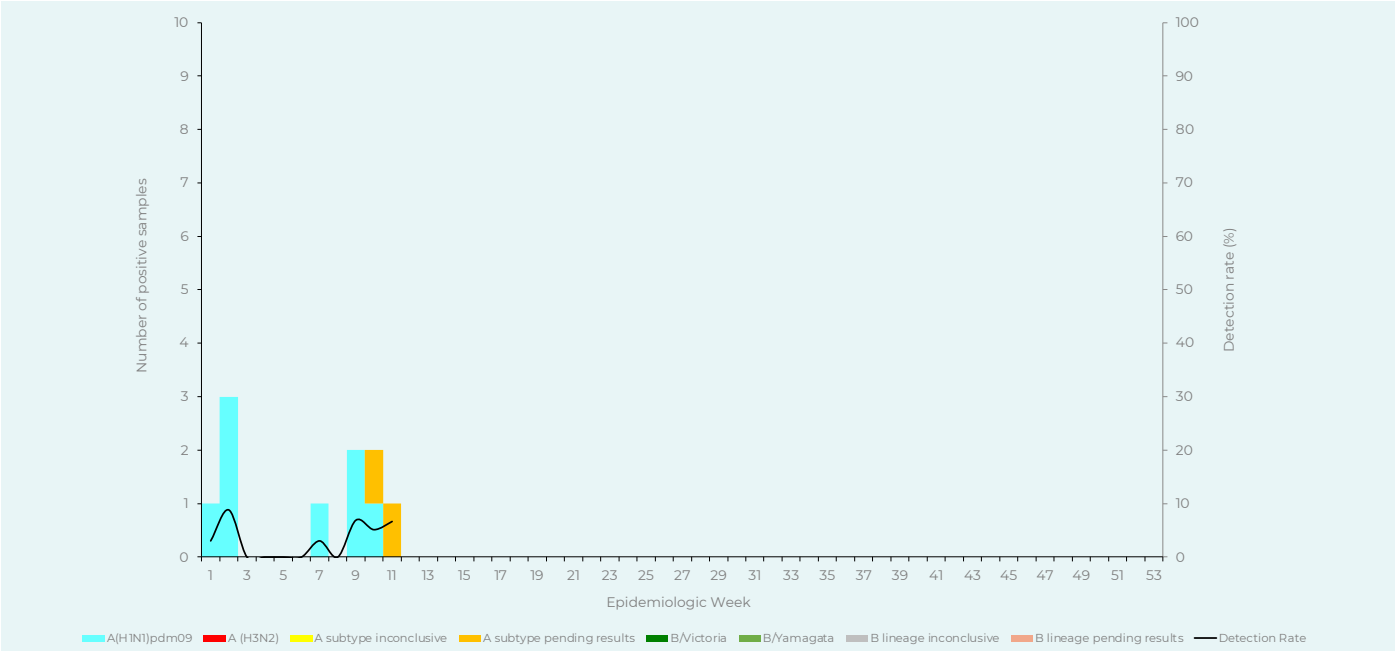

Figure 1. Number of influenza positive cases by influenza subtype and lineage and detection rate by week, Influenza-like illness (ILI) surveillance in primary health care clinics, 03/01/2022 – 20/03/2022

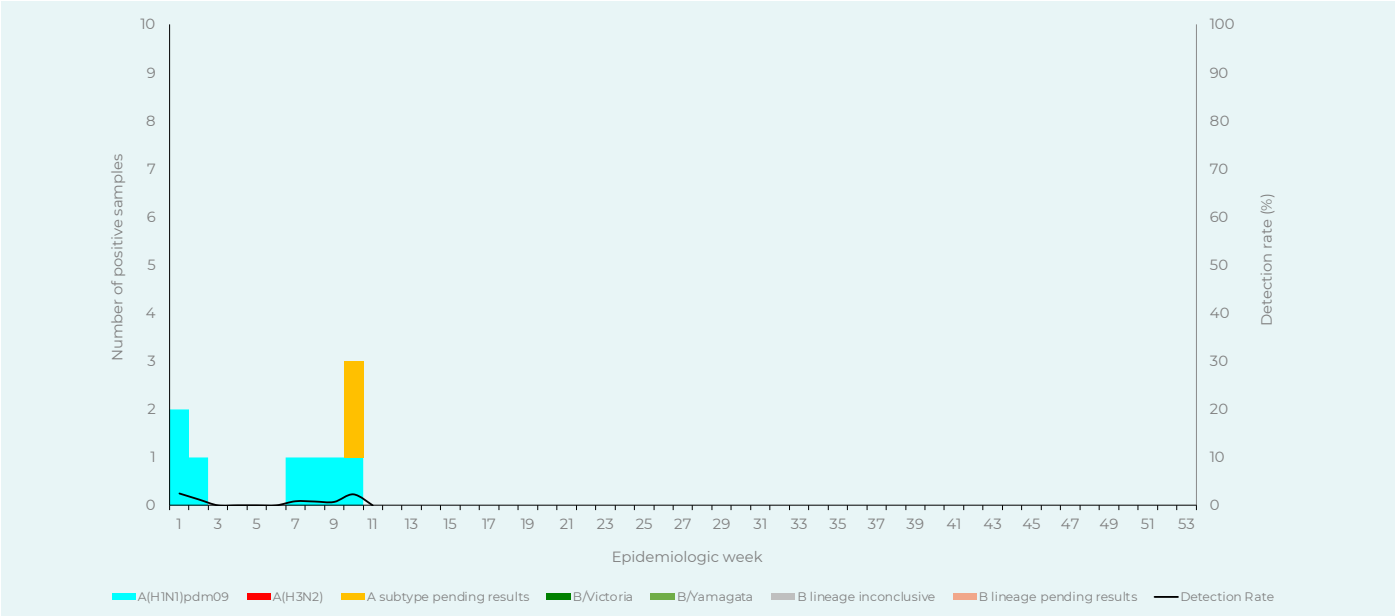

Figure 2. Number of positive influenza positive cases by influenza subtype and lineage and detection rate by week, pneumonia surveillance public hospitals, 03/01/2022 – 20/03/2022

SEASONAL DISEASES

Recommended influenza vaccine formulation for 2022

Influenza vaccine composition is updated frequently because circulating influenza viruses continuously evolve. The following strains have been recommended by the World Health Organization (WHO) for the trivalent and quadrivalent inactivated influenza vaccine for the 2022 southern hemisphere influenza season:

- an A/Victoria/2570/2019 (H1N1)pdm09-like virus;
- an A/Darwin/9/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage) like- virus; and
- a B/Phuket/3073/2013-like (B/Yamagata lineage) virus*.

*Quadrivalent vaccine is available in private sector and limited number of doses in public sector.

Timing of influenza vaccination

Vaccination should be administered each year before the influenza season, i.e. from March (or as soon as the vaccine becomes available). Protective antibodies develop by two weeks' post-immunization. The 2022 influenza vaccine is currently available at private pharmacies and will be available in primary health facilities shortly. Healthcare workers are encouraged to discuss influenza vaccination with their patients, especially amongst those who are at increased risk for severe influenza-associated complications. Individuals at risk of severe influenza disease include, among others, pregnant women, and those vulnerable due to pre-existing illnesses or risk factors (diabetes, chronic lung conditions, immunosuppression). The National Department of Health guidelines for influenza vaccination have been updated and coadministration of influenza and COVID-19 vaccines is now allowed. Clinicians are to give both vaccines during the same visit when an eligible patient presents to the health facility. A contralateral limb should be used for injection of COVID-19 vaccine, when delivered during the same visit.

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

SEASONAL DISEASES

2022 respiratory syncytial virus (RSV) season has started and may be associated with higher than usual RSV circulation

Before the COVID-19 pandemic, the RSV season in South Africa usually preceded the influenza season with the usual average onset at the end of February (range early February – mid-March). However, since the start of COVID-19 pandemic, with non-pharmaceutical interventions to prevent SARS-CoV-2 transmission in place, RSV circulation has been disrupted, with fewer cases and out of season outbreaks reported.

In 2022 to date, among patients of all ages hospitalised with lower respiratory tract illness (LRTI) at sentinel pneumonia surveillance sites, RSV transmission started to increase from week 5 (week ending 13 February). Of the 31 patients testing positive for RSV among influenza-like-illness (ILI) surveillance cases at primary health facilities, the majority were RSV subgroup A (97%, 30/31) and one was pending RSV subgroup results. Whereas among cases hospitalised with LRTI at sentinel pneumonia surveillance sites, the majority were RSV subgroup B (54%, 79/147), followed by RSV subgroup A (28%, 41/147), RSV subgroup results were inconclusive for three (2%) and pending results for 24 (16%).

The 2022 RSV season started in week 7 (week ending 20 February 2022) when the RSV detection rate breached the low threshold level and levels are currently moderate (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 3).

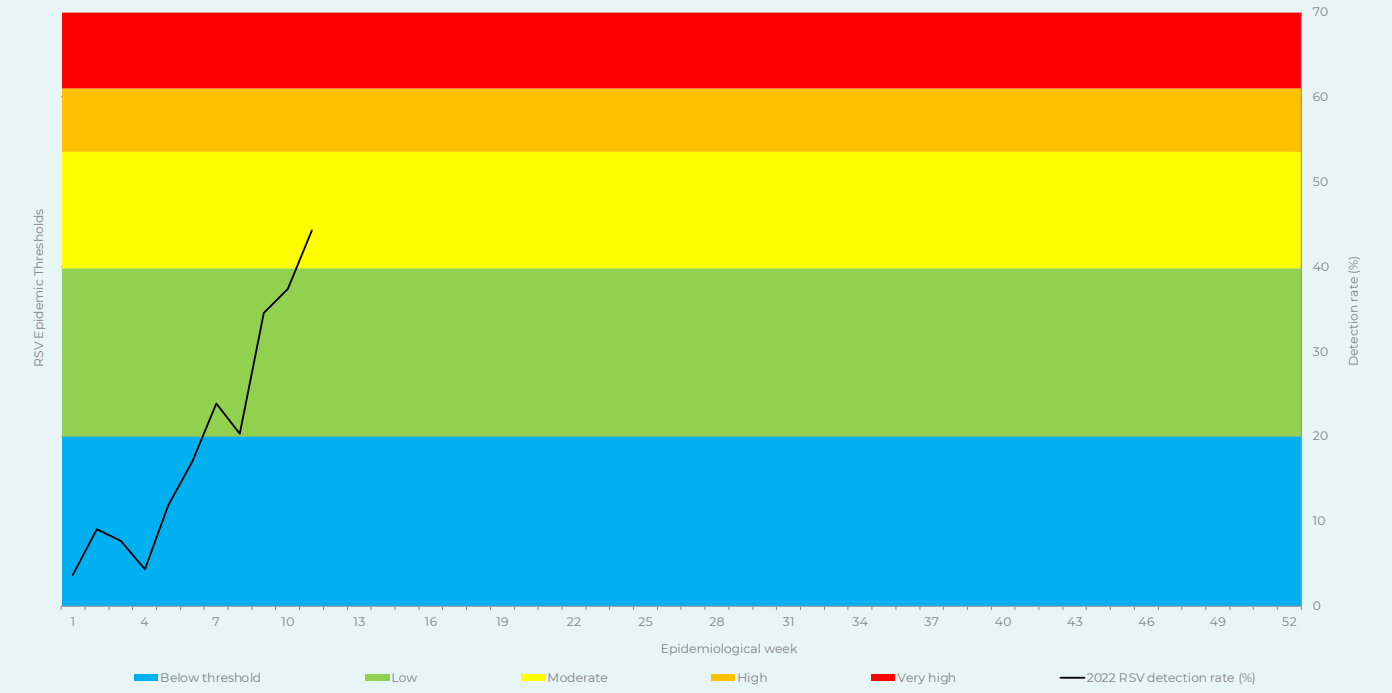

Figure 3. RSV detection rate in 2022 and epidemic thresholds among cases aged <5 years hospitalised with severe respiratory illness, pneumonia surveillance programme, 03/01/2022 – 20/03/2022

thresholds based on 2010-2019 data

During this period, clinicians should consider RSV in their differential diagnosis and anticipate an increase in paediatric admissions. This is particularly important in light of the results from a modelling study using surveillance data from South Africa, which has predicted a 32% increase in peak number of monthly hospitalisations compared to the average for 2015-2019, with an earlier than usual peak number of RSV-related hospitalisations in early April and largest percent increase in hospitalisations among older children [1]. Healthcare providers may have to reallocate resources to paediatric patients to ensure adequate response to the anticipated surge in RSV cases.

1. Bents S, Viboud C, Grenfell B, Hogan A, Tempia S, Gottberg Av, et al. The impact of COVID-19 non-pharmaceutical interventions on future respiratory syncytial virus transmission in South Africa. medRxiv 2022:2022.2003.2012.22271872.

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

SEASONAL DISEASES

Wild-type polio on the African continent

The global polio eradication community was notified on 17 February 2022 of the isolation of a wild-type polio strain from a case of acute flaccid paralysis in a 4-year-old child from Lilongwe, Malawi. Stool samples from the case were submitted to the NICD, which serves as a regional reference laboratory for the WHO-AFRO region, and a poliovirus type 1 was isolated. The identity and genetic lineage was confirmed by the USA CDC and the WHO, which reported that the strain's closest genetically-related strain had been reported from Pakistan in 2019 in environmental and clinical cases. The strain had acquired over 15 single-nucleotide polymorphisms suggesting that it had been circulating undetected in the Middle East or East Africa for up to two years. Outbreak investigations in Lilongwe are ongoing, supported by laboratory diagnostic testing at the NICD.

The case serves to highlight the current status of polio eradication efforts globally. Whilst tremendous gains have been made in eradication of wild-type polio in Afghanistan and Pakistan, a number of countries are reporting circulating vaccine-derived poliovirus (cVDPV) cases. The global polio elimination initiative (GPEI) reports weekly on the current status of polio elimination (https://polioeradication.org/polio-today/), illustrating graphically the location of wild-type and VDPV strains in the last 6 months (Figure 4). The newly released Polio Eradication Strategy 2022-2026 identifies two goals, namely to permanently interrupt all poliovirus transmission in endemic countries, and secondly to stop cVDPV transmission and prevent outbreaks in non-endemic countries. Key strategic principles include creating urgency and accountability in political will, generating vaccine acceptance, integrating polio eradication efforts within a broad range of partners in health care delivery and prevention activities, and strengthening detection and response activities. Given the extent of cVDPV on the continent, and the challenging social and economic environments in many countries, polio eradication will continue to require enormous commitment and resources. In South Africa, maintenance of high levels of vaccine coverage, and good quality surveillance, are essential to detect imported cases of VDPV, and to contain transmission. High levels of awareness for cases of AFP, and ongoing commitment are required to maintain and increase AFP surveillance at required levels. AFP indicators up to week 7 of 2022 are shown in Table 1.

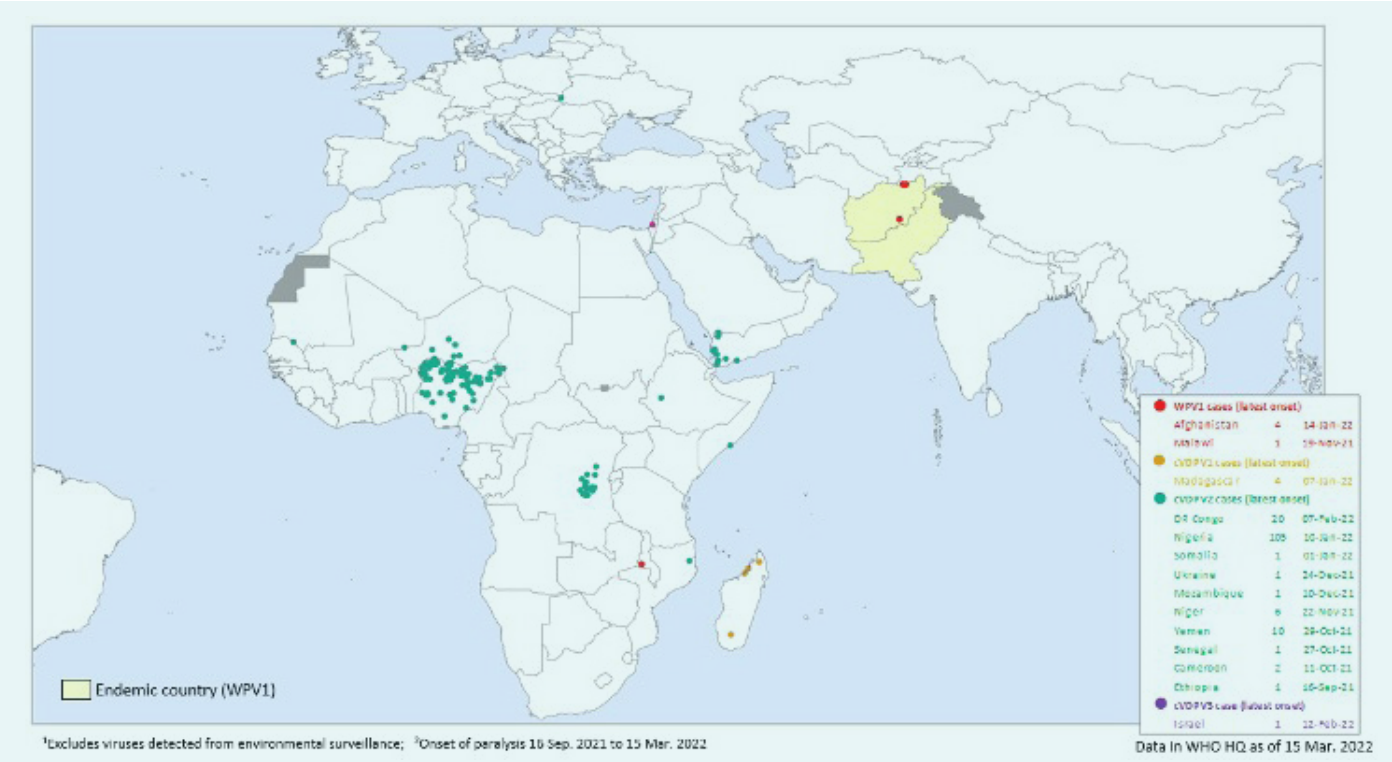

Figure 4. Global location of wild-type polio and vaccine derived polio cases across the world in the last 6 months (as provided by the Global Polio Elimination Initiative (GPEI). (https://polioeradication.org/polio-today/)

SEASONAL DISEASES

Table 1. Acute flaccid paralysis indicators up to week 7 of 2022 by province of South Africa.

Province	Target cases for 2022 (based on population size)	#notified AFP cases by week 7, 2022	#adequately investigated cases	Detection rate (cases/100,000 <15 year olds)	Stool adequacy rate (%)
Eastern Cape	100	2	2	1	100
Free State	33	6	3	5	50
Gauteng	146	8	6	2	75
KwaZulu-Natal	160	13	6	2	46
Limpopo	79	9	6	3	67
Mpumalanga	53	3	2	2	67
North West	48	2	1	1	50
Northern Cape	13	1	1	2	100
Western Cape	65	6	5	3	83
South Africa	**698**	**50**	**32**	**2**	**64**

Source: Centre for Vaccines and Immunology, NICD, kerriganm@nicd.ac.za

Notifiable Medical Conditions surveillance system - improved electronic application users

The Notifiable Medical Conditions (NMC) is a passive surveillance system with two reporting platforms: paper-based, or electronic application (App). To use the electronic platform, the users have to register and be approved after a short vetting process. A user can either be facility-based, private practice or role-based. Facility–based users can be linked to no more than five facilities. Role-based users can either be national (including NICD centres), provincial, district or sub-district based and are linked to health programmes. The users are given access to the NMC App data according to their specific linking type.

Since the soft introduction of the improved NMC App in December 2020, there is a total of 5 098 newly registered and authorised App users to date. Of those, 23% (n=1 555) are from KwaZulu-Natal, followed by Western Cape (20%, n=1 034) and Gauteng (20%, n=1 020) provinces. North West (4%, n=198) and Limpopo (4%, n=214) provinces have the smallest number of newly registered users (Figure 5). Whitelisting of the new improved NMC App on the provincial intranets could be the main reason for the high proportion of approved registered users in KwaZulu-Natal and Western Cape, as it simplifies access for the App users. The majority are facility-based (84%, n=4 301), followed by role-based users (9%, n=437) and private practice users (7%, n=359). Female users (75.6%) are in majority compared to males. The median age of users at registration was 40 (IQR: 31- 49) years. Of the facility-based users, 41% are in the age group 35 to 49 years. Provinces are to be encouraged to whitelist the NMC App and healthcare providers to register and use the electronic platform.

SEASONAL DISEASES

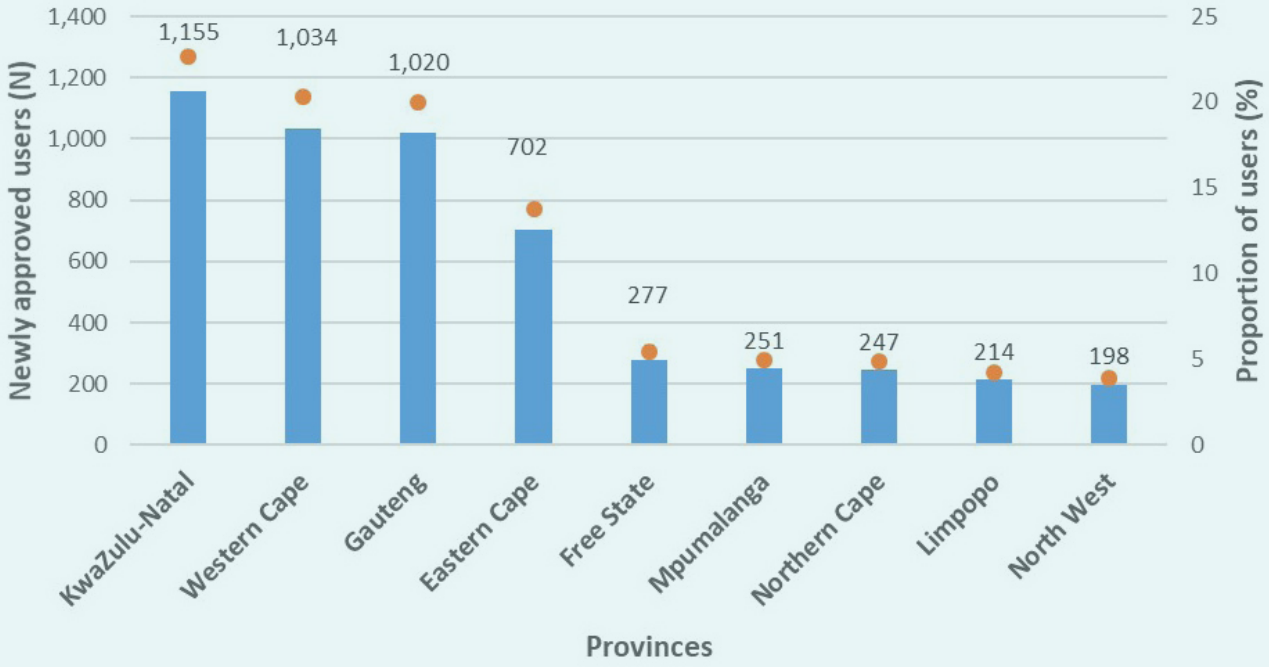

Figure 5. Newly approved NMC App users by province, December 2020 to date

Source: Notifiable Medical Conditions Surveillance, NICD, lehlohonoloc@nicd.ac.za

WHO AFRO UPDATE

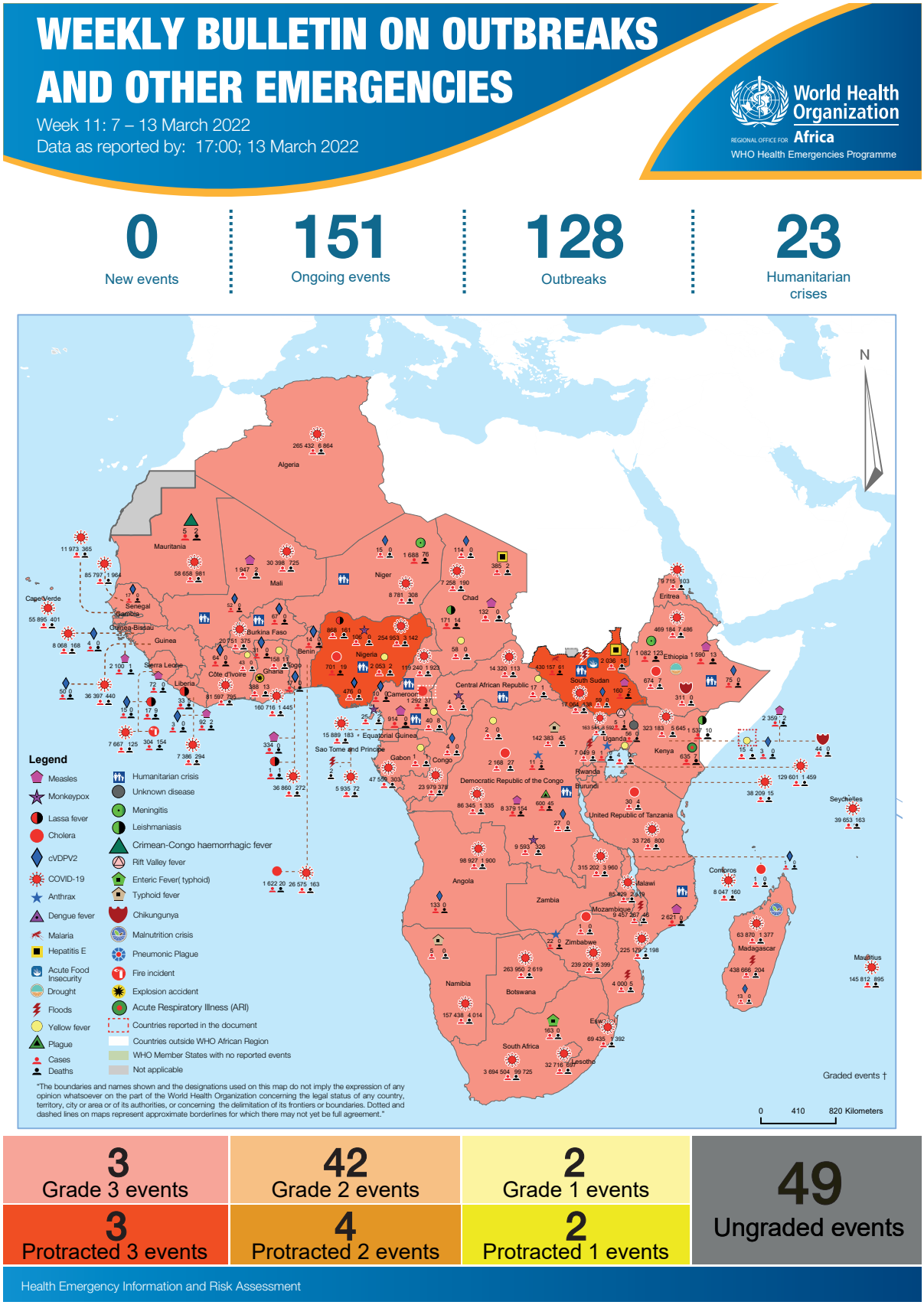

Figure 6. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 140 events. For more information, see link below:
https://apps.who.int/iris/bitstream/handle/10665/352474/OEW11-0713032022.pdf

BEYOND OUR BORDERS

The 'Beyond our Borders' column focuses on selected and current international diseases that may affect South Africans travelling abroad. Numbers correspond to Figure 7 on page 9.

Cholera: Cameroon

Cameroon declared a cholera outbreak in October 2021, which is ongoing, with the epicentre in the south-west region. A total of 151 cases and six deaths have been reported. Outbreak response effects have been limited by ongoing violence and armed conflict in the region, limiting the population's access to basic social services, health, and sanitation.

Cholera is caused by the bacterium *Vibrio cholerae,* and while it has the potential to cause severe morbidity and mortality, it is easily preventable and treatable. Globally, 2.9 million annual clinical cases are reported, with an average of 95 000 deaths.

Yellow fever: Kenya

On the 4th of March 2022, Kenya declared a yellow fever outbreak with 8 villages in 3 sub-counties affected. A total of 15 people has been infected, all of whom have no vaccination status report yet available. Kenya has negligible population immunity well below the threshold of herd immunity. The national government and partners have mobilized resources, which includes a vaccination campaign together with a rapid response team.

Yellow fever is a viral infection caused by the yellow fever virus, transmitted by mosquitoes in the subtropical areas in South America and Africa. The majority of those infected recover after a period of mild disease, while a smaller subset may go on to develop severe disease that may include jaundice, GIT bleeds, high fever, and organ failure.

Serological diagnosis is made either through the identification of antibodies or the virus itself.

Treatment remains nonspecific. Caution should be taken in using medications that increase the risk of bleeding.

Prevention is key, through the prevention and avoidance of mosquito bites, and vaccination prior to entering endemic areas.

Lassa fever: Nigeria

Between 1 January and 13 March 2022, a total of 630 laboratory confirmed cases of Lassa fever has been reported in Nigeria, with 112 deaths across 23 states. This resulted in the activation of the multi-sectoral coordination centre (EOC), which aims to coordinate the response.

Lassa fever is an animal-borne acute viral illness and is endemic in certain parts of West Africa (Sierra Leone, Liberia, Guinea and Nigeria). The main Lassa virus reservoir animal is the multimammate mouse, *Mastomys natalensis.* First discussed in 1969, Lassa fever was named after the town in Nigeria in which it was discovered. Global cases are roughly estimated to number between 100 000 and 300 000 annually, due to non-standardized surveillance.

Transmission is through the ingestion or inhalation of rodent-shed virus in urine and droppings, direct contact with these though touching soiled objects, eating contaminated food or exposure to open wounds. Person-to-person transmission has occurred. The majority of cases exhibit mild disease, with severe disease presenting with mucosal haemorrhage, respiratory distress, chest pain and multi-organ failure. Deafness is a common complication, not correlated to severity of disease.

Source: World Health Organization (who.int); World Organisation for Animal Health (oie.int); ProMED (promedmail.org); National Institute for Communicable Diseases (nicd.ac.za); Centers for Disease Control and Prevention. (cdc.gov); Outbreak News Today (outbreaknewstoday.com).

BEYOND OUR BORDERS

Figure 7. 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: World Health Organization (who.int); World Organisation for Animal Health (oie.int); ProMED (promedmail.org); National Institute for Communicable Diseases (nicd.ac.za); Centers for Disease Control and Prevention. (cdc.gov); Outbreak News Today (outbreaknewstoday.com).

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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Division of the National Health Laboratory Service

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