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

COMMUNICABLE DISEASES

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COMMUNIQUÉ

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Editor's Note

Dr Michelle Groome

This month South Africa entered a new phase of the COVID-19 pandemic, with our President announcing the end of the national state of disaster, which has been in place for over two years. Yet, April also brought devastation to the KwaZulu-Natal Province due to the recent flooding. Many health risks are associated with natural disasters such as flooding, including outbreaks of infectious diseases such as diarrhoea. Read about what to look out for and ways to prevent food- and water-borne infections.

The cooler weather means increased gathering indoors and circulation of seasonal respiratory viruses like respiratory syncytial virus and influenza. We have seen sporadic cases of influenza in the past weeks, with a predominance of influenza A (H1N1)pdm09. Remember to get your influenza vaccine especially if you are at risk of severe disease like those ≥65 years, pregnant women and those with underlying conditions. The 2022 RSV season started in the week ending 20 February and reached a peak at the beginning of April. Clinicians are reminded to consider RSV as a cause of severe respiratory illness, especially in young children.

With regards to COVID-19, the NICD continues to monitor new cases, the number of tests, hospitalisations and deaths. The past week has shown an increase in daily case numbers and the proportion testing positive, most likely due to the newly detected Omicron sub-lineages BA.4 and BA.5 which are increasing in proportion. We are keeping a close eye on hospitalisation and deaths, as well as monitoring for any new variant of concern. Now is the time to go for your COVID-19 vaccine booster, especially if you are at high risk of severe disease.

The 25th of April was World Malaria Day. Despite a decreasing burden globally and big strides made in diagnosis and treatment, malaria remains a priority public health problem in sub-Saharan Africa. There are still many challenges, including some which are exacerbated by the COVID-19 pandemic, such as reduced control activities and limited access to health care.

There is an update on rabies cases in South Africa, stressing the importance of correct and timely delivery of rabies post-exposure prophylaxis to prevent human rabies deaths. The Center for Enteric Diseases also provides a comprehensive update on enteric fever clusters in Western Cape, North West and Gauteng Provinces.

Beyond our borders, there have been outbreaks of meningitis in Ethiopia, measles in South Sudan and cholera in Malawi. Ebola has once again raised its head in the Democratic Republic of Congo, with a confirmed case in a 31-year old male. This highlights the continued risk of infectious disease outbreaks on the African continent. Further afield, several cases of severe hepatitis have been reported in the United States and Europe. Investigations are ongoing as to an infectious cause.

So enjoy reading this issue of the Communiqué!

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

COVID-19- an update, South Africa

From 3 March 2020 through to 16 April 2022 (week 15 of 2022), there were 23 952 846 tests conducted for SARS-CoV-2, 3 741 230 cases of COVID-19, 467 531 hospitalisations and 101 831 deaths due to COVID-19 recorded in South Africa.

The majority of tests were conducted in Gauteng Province (8 234 891/23 952 846, 34.4%), followed by KwaZulu-Natal Province (4 621 877/23 952 846, 19.3%) and lowest number of tests were conducted in Northern Cape Province (620 429/23 952 846, 2.6%). In week 15 of 2022 Gauteng Province reported the highest testing rates (311 tests per 100 000 persons), followed by the Western Cape Province (217 tests per 100 000 persons) and Limpopo reported the lowest testing rates (30 tests per 100 000 persons) (Table 1 and Figure 1).

The province with the highest cumulative incidence risk was the Western Cape Province (9 212 cases per 100 000 persons), followed by the Northern Cape Province (8 372 cases per 100 000 persons) and the lowest cumulative incidence risk was reported in Limpopo Province (2 633 cases per 100 000 persons). In week 15 of 2022 Gauteng Province reported the highest weekly incidence risk (27 cases per 100 000 persons), followed by the Western Cape Province (23 cases per 100 000 persons) and lowest weekly incidence risk reported in Limpopo Province (1 case per 100 000 persons) (Table 1). Since the peak of the fourth wave in week 49 of 2022 all provinces continued to report a decreasing weekly COVID-19 incidence trend; however, in the past week Gauteng (4 cases per 100 000 persons, 14.9% increase) and the Free State (0.3 cases per 100 000 persons, 4.3% increase) provinces reported an increase in weekly incidence risk (Figure 1). The 50-54-year age group reported the highest cumulative incidence risk (11 642 cases per 100 000 persons).

Table 1. Number and incidence risk of laboratory-confirmed cases of COVID-19, SARS-CoV-2 tests per 100 000 population, and COVID-19 admissions per 100 000 persons, 3 March 2020-16 April 2022 in South Africa.

Province	Population in mid-2021	Cumulative tests N (%)	Cumulative cases N (%)	Cumulative admissions N (%)	Cumulative incidence risk cases*	Cumulative incidence risk admissions*	Incidence risk of new cases in week 15 of 2022*	Tests incidence in week 15 of 2022*	Incidence of new admissions in week 15*
Eastern Cape	6 676 590	2 060 845 (8.6)	346 266 (9.3)	44 540 (9.5)	5 186	667	6	99	0.3
Free State	2 932 441	1 443 512 (6.0)	202 917 (5.4)	28 668 (6.1)	6 920	978	7.	206	1
Gauteng	15 810 388	8 234 891 (34.4)	1 219 318 (32.6)	142 855 (30.6)	7 712	904	27	311	1
KwaZulu-Natal	11 513 575	4 621 877 (19.3)	664 926 (17.8)	79 528 (17.0)	5 775	691	13	169	1
Limpopo	5 926 724	709 711 (3.0)	156 075 (4.2)	19 226 (4.1)	2 633	324	1	30	0.1
Mpumalanga	4 743 584	1 292 754 (5.4)	193 839 (5.2)	20 558 (4.4)	4 086	433	4	100	0.2
North West	4 122 854	1 150 604 (4.8)	193 452 (5.2)	30 377 (6.5)	4 692	737	3	109	1
Northern Cape	1 303 047	620v 429 (2.6)	109 091 (2.9)	10 519 (2.3)	8 372.	807	5	147	0.3
Western Cape	7 113 776	3 793 706 (15.8)	655 346 (17.5)	91 260 (19.5)	9 212	1 283	23	217	1
Unknown		24 517 (0.1)							
Total	**60 142 978**	**23 952 846**	**3 741 230**	**467 531**	**6 221**	**777**	**14**	**184**	**1**

* Cumulative/ weekly (tests, cases and admissions) incidence per 100 000 persons

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

To date there has been a total of 467 531/3 741 230 (12.5%) COVID-19 admissions, the majority were from Gauteng Province 142 855/467 531 (30.6%), and the lowest number of admissions were reported from the Northern Cape Province 10 519/467 531 (2.3%) (Table 1). The highest cumulative admission incidence was reported in the Western Cape Province (1 283 admissions per 100 000 persons), followed by the Free State Province (978 admissions per 100 000 persons), and the lowest from Limpopo Province (324 admissions per 100 000 persons). Among the hospitalized cases 21.8% (101 831/467 437) died, the ≥70-year age group reported a third 33.7% (34 331/101 831) of the deaths https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/surveillance-reports/weekly-hospital-surveillance-datcov-update/). The peak in both admissions and deaths in the third wave (23 admissions and 6 deaths per 100 000 persons), the fourth wave (15 admissions and 2 deaths per 100 000 persons) were lower than the peak in the second wave (29 admissions and 9 deaths per 100 000 persons). In week 15 of 2022 the Gauteng Province reported the highest admission incidence 1 admission per 100 000 persons, and the Limpopo Province reported the lowest weekly admissions incidence 0.1 cases per 100 000 persons. (Figure 2).

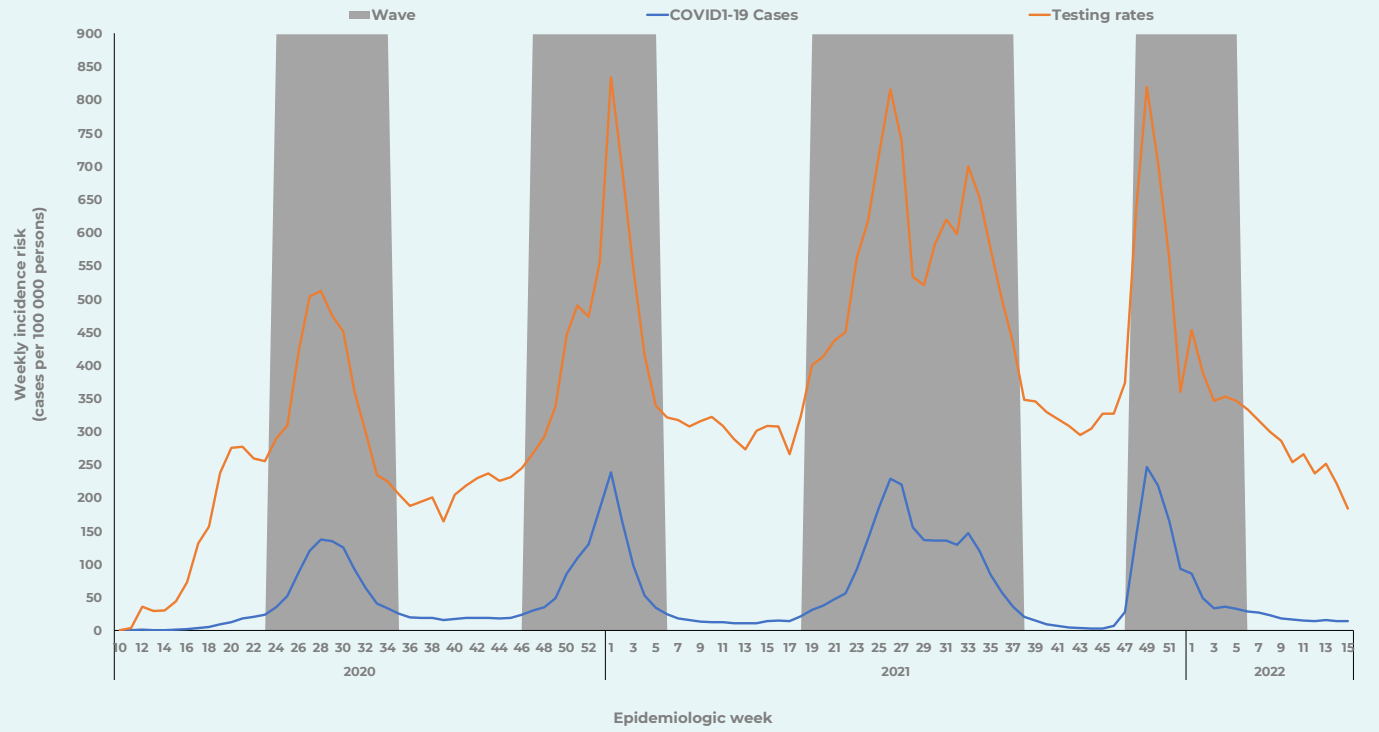

Figure 1. Weekly COVID-19 testing rates per 100 000 persons and incidence risk of laboratory-confirmed cases of COVID-19 by epidemiologic week, South Africa, 3 March 2020-16 April 2022 (n=23 952 846 tests, and n= 3 741 230 cases)

CORONAVIRUS DISEASE (COVID-19) PANDEMIC

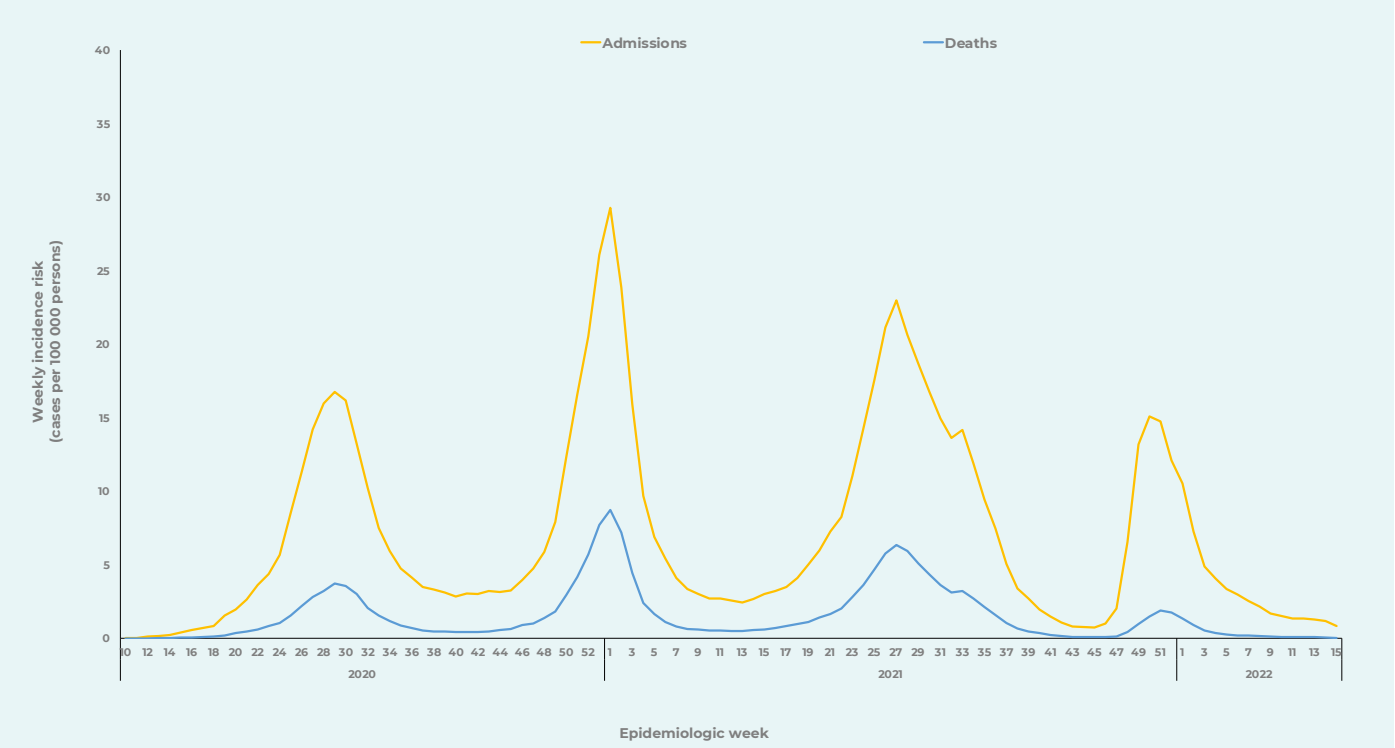

Figure 2. Weekly admissions and deaths per 100 000 persons of laboratory-confirmed cases of COVID-19 by epidemiologic week, South Africa, 3 March 2020-16 April 2022 (n=467 531 admissions, n= 101 829 deaths, and n=2 missing collection date).

This summary highlights the burden of COVID-19 in South Africa. Although there has been a continued decreasing trend of COVID-19 weekly incidence since the peak of the fourth wave nationally in week 3 of 2022, an increase in number of cases in two provinces has been reported in week 15 of 2022, which may indicate community transmission or an early signal/warning for a resurgence in cases.

With continued transmission of SARS-CoV-2, individuals eligible for COVID-19 vaccines are encouraged to vaccinate and to get booster shots as indicated in order to reduce hospitalizations, deaths and the spread of COVID-19. The COVID-19 vaccine schedule for immunocompromised adults has been updated, as of 11 April 2022, additional and booster doses administered to immunocompromised adults are available (https://sacoronavirus.co.za/2021/11/29/circular-vaccination-of-immunocompromised-adults/).

Centre for Respiratory Diseases and Meningitis (CRDM), National Institute for Communicable Diseases, Johannesburg, South Africa.

ZOONOTIC AND VECTOR-BORNE DISEASES

An update on rabies in South Africa

Cumulatively (and as of 21 April), four human rabies cases for 2022 have been confirmed in South Africa. These cases are reported from the EC (n=2, Nelson Mandela Bay Municipality), KwaZulu-Natal (n=1) and Limpopo (n=1) provinces (Figure 3). In addition, two probable rabies deaths from the OR Tambo (Mthatha) and Amathole Districts (Fameni) in EC, were also reported for the first quarter of 2022 (Figure 3). The latter involved children who were bitten by suspected rabid dogs and rabies post-exposure prophylaxis (PEP) was not sought or was incomplete. The clinical course and outcome of both cases were also in keeping with a diagnosis of rabies. The outbreaks of rabies in domestic dogs in districts of the Eastern Cape and KwaZulu-Natal provinces are ongoing (Figure 4).

Recent cases have highlighted challenges in the effective delivery of rabies post-exposure prophylaxis (PEP) to prevent human rabies deaths. For example, the case from Fameni, the course of vaccine was not completed and no rabies immunoglobulin (RIG) was administered. Infiltration of RIG into wound sites is critical for category III rabies virus exposures. The latter includes all cases where there is any break in the skin, with any amount of blood drawn. The wounds may also be large and distributed over different parts of the body, or small and seemingly benign. The challenge with cases that sustained multiple wounds is to identify all wound sites, failure to infiltrate even one small wound could provide the entry point for the virus, which may lead to the development of rabies virus infection. Facial wounds may be problematic as administration of RIG is painful, yet essential for RIG to have an effect. A number of recent rabies cases have been associated with facial wounds and failure to administer RIG. Facial bites have a high risk of rabies and the incubation period in such cases may be short. All facial bites should be referred for management to a facility that can manage the RIG administration. It may be required to sedate the patient, often a child, in order to infiltrate wounds with RIG appropriately. It is critical to provide RIG immediately in all category III cases where there is a rabies risk, and if it is not accessible, it must be sourced as soon as possible from stock available at major South African hospitals. Vaccine takes seven days to elicit an immune response. The purpose of RIG is to neutralize the virus at the wound site. The RIG can be given seven days after the first vaccination, according to guidelines, but any delay increases the risk of rabies. It is equally important to follow the complete vaccination regimen for category II and III wounds in order to prevent rabies. For further information on rabies and disease prevention, please visit the NICD website: https://www.nicd.ac.za/diseases-a-z-index/rabies/.

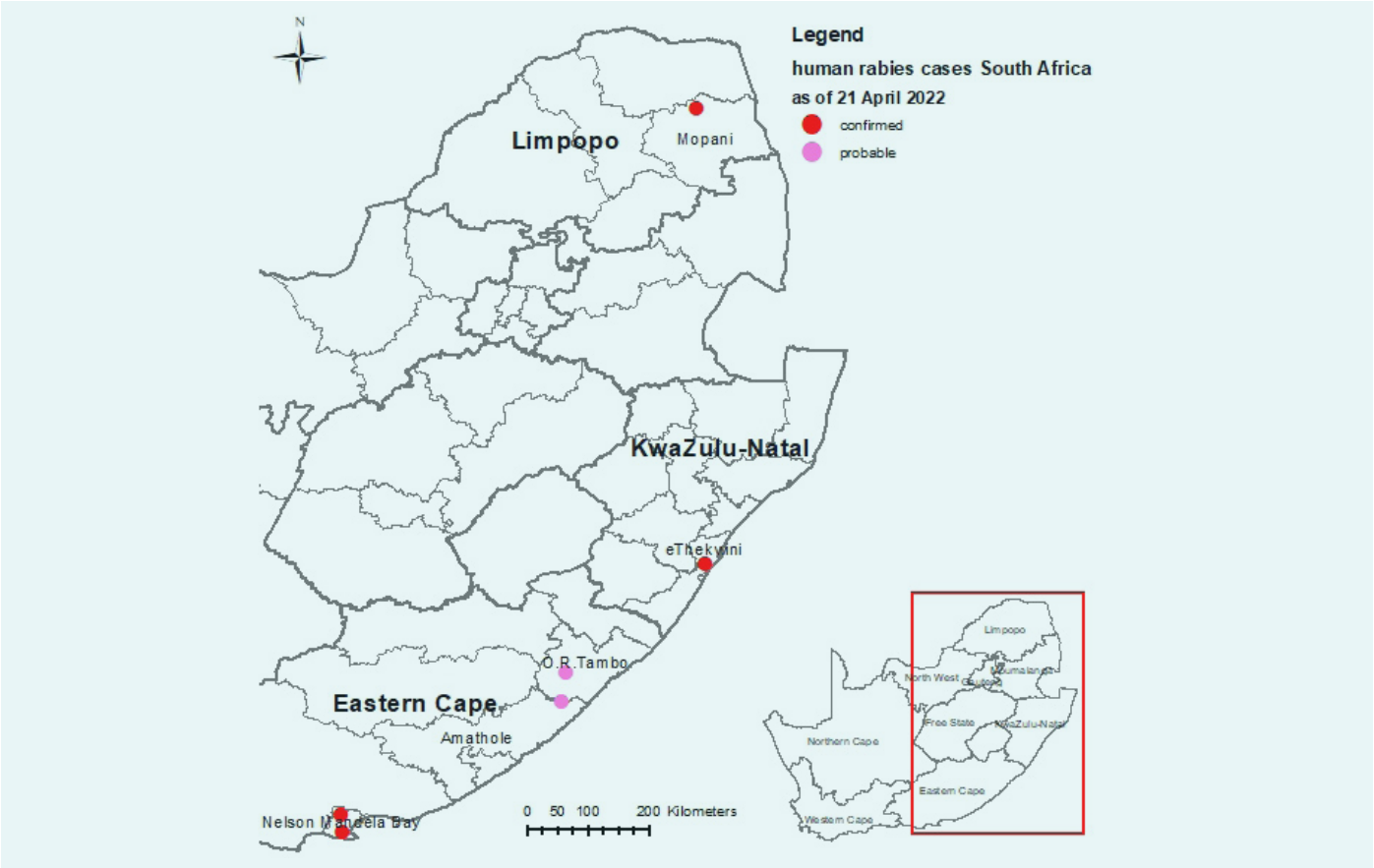

Figure 3. Geographic distribution of human rabies in South Africa for 2022 (as of 21 April 2022). Data source NHLS-NICD.

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

ZOONOTIC AND VECTOR-BORNE DISEASES

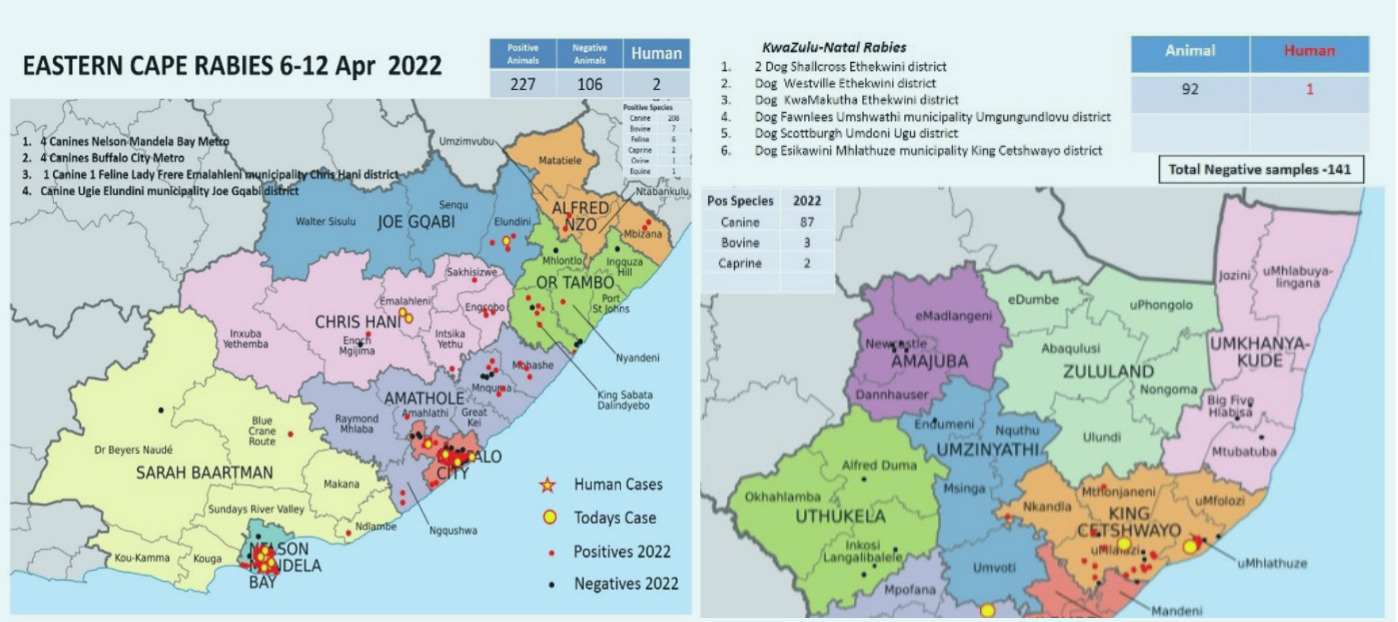

Figure 4. Animal rabies cases (numbers and geographic distribution) from the Eastern Cape (left) and KwaZulu Natal (right) provinces (as of 12 April 2022). Source: https://www.kzndard.gov.za/latest-news/item/327-rabies-update

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

Malaria in the time of COVID-19

The 25th of April is World Malaria Day, and its theme in 2022 is 'Harness innovation to reduce the malaria disease burden and save lives'. Over the past two decades, the global burden of malaria has been decreasing, mostly in response to improved funding and advances in diagnosing and treating malaria. However, malaria remains a priority public health problem, with about 240 million cases in 2020, 95% of which are in sub-Saharan Africa. The World Health Organization's latest World Malaria Report showed a 12% rise in malaria deaths in 2020, after a number of years of trending downwards; most deaths occur in children under-5-years of age in sub-Saharan Africa. Some of this increase in cases is ascribable to the COVID-19 pandemic, with reduced control activities and limited access to health care. In South Africa, the restrictions on cross-border travel contributed to a reduced number of malaria cases over the last two seasons, but this is likely to reverse as the country returns to more normal conditions. Simultaneously, South Africa faces a number of challenges to its malaria elimination agenda, including restrictions imposed on control programme activities due to COVID-19, and, as has happened elsewhere in Africa, the potential for emergence of drug-resistance and reduced efficiency of rapid diagnostic tests, both due to adaptive mutations in the parasite. A resurgence in COVID-19 cases is likely to occur in the near future, and although the end of the malaria season for South Africa is approaching, we again emphasise that the early clinical presentation of the two infections overlaps significantly. While the focus of attention in acute febrile illness continues to be COVID-19 or other resurging respiratory infections, malaria, particularly in residents or travellers exposed in malaria-endemic areas, should be remembered and actively tested for. This is irrespective of COVID-19 test results pending or already received.

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

ZOONOTIC AND VECTOR-BORNE DISEASES

Ebola in DRC

On 23 April 2022, a confirmed case of Ebola was declared in the Democratic Republic of Congo in Mbandaka. The 31-year-old male patient presented to an Ebola treatment centre one week after developing symptoms and demised shortly after admission. All contacts of the case are currently being followed up with active monitoring and the deceased received a safe and dignified burial. The health facility where the patient was admitted has since been decontaminated. This is the third outbreak in this north-western Equateur Province since 2018 and the 14th outbreak in the Democratic Republic of Congo since 1976.

Community vaccination plans are underway with the rVSV—ZEBOV Ebola vaccine already available in Goma and Kinshasa. Vaccines will be sent to the communities in Mbandaka and administration will occur through a ring vaccination strategy.

Many of the community members were vaccinated during the 2020 outbreak, which health authorities hope will limit the impact of the disease in the area. Those vaccinated previously, will be revaccinated.

The average case fatality rate of EVD is approximately 50% and has increased in past outbreaks to 90%. Surveillance, early identification and an effective outbreak response is vital in controlling the spread of EVD and preventing fatalities.

Source: Outbreak Response Unit, NICD-NHLS; ayeshar@nicd.ac.za
Sources used: World Health Organisation News – Democratic Republic of Congo declares new Ebola outbreak in Mbandaka (https://www.afro.who.int/countries/democratic-republic-of-congo/news/democratic-republic-congo-declares-new-ebola-outbreak-mbandaka)

SEASONAL DISEASES

Influenza , April 2022

In recent weeks, influenza-like illness (ILI) surveillance in outpatients in primary health clinics and pneumonia surveillance sentinel sites (hospitals) have seen sporadic cases of influenza. As of week 15 of 2022 (week ending 17 April 2022), the total number of influenza cases detected by the NICD's syndromic sentinel surveillance was 38. Of these cases, 22 influenza cases were detected at pneumonia surveillance sentinel sites. The predominant subtype and lineage is influenza A (H1N1)pdm09 (20/22, 90.9%) followed by A (H3N2) (2/22, 9.1%) (Figure 5A).

At ILI sentinel sites in primary health clinics 16 influenza cases have been reported, with the predominant subtype being influenza A (H1N1)pdm09 (15/16, 93.8%) followed by B Victoria (1/16, 6.2%) (Figure 5B). Although the numbers of positive influenza cases remain low, there have been weekly influenza detections since week 7 (week starting 14 February) in pneumonia surveillance.

The influenza vaccine is available at health facilities and private pharmacies. Individuals who are at risk of severe influenza illness including the elderly ≥65 years, pregnant women, individuals with underlying conditions (diabetes, chronic pulmonary and cardiac conditions) and those who are immunocompromised are encouraged to get the influenza vaccine. Updated guidelines on influenza diagnosis and management are available at:

https://www.nicd.ac.za/wp-content/uploads/2022/04/Influenza-guidelines_-22-April-2022-final.pdf

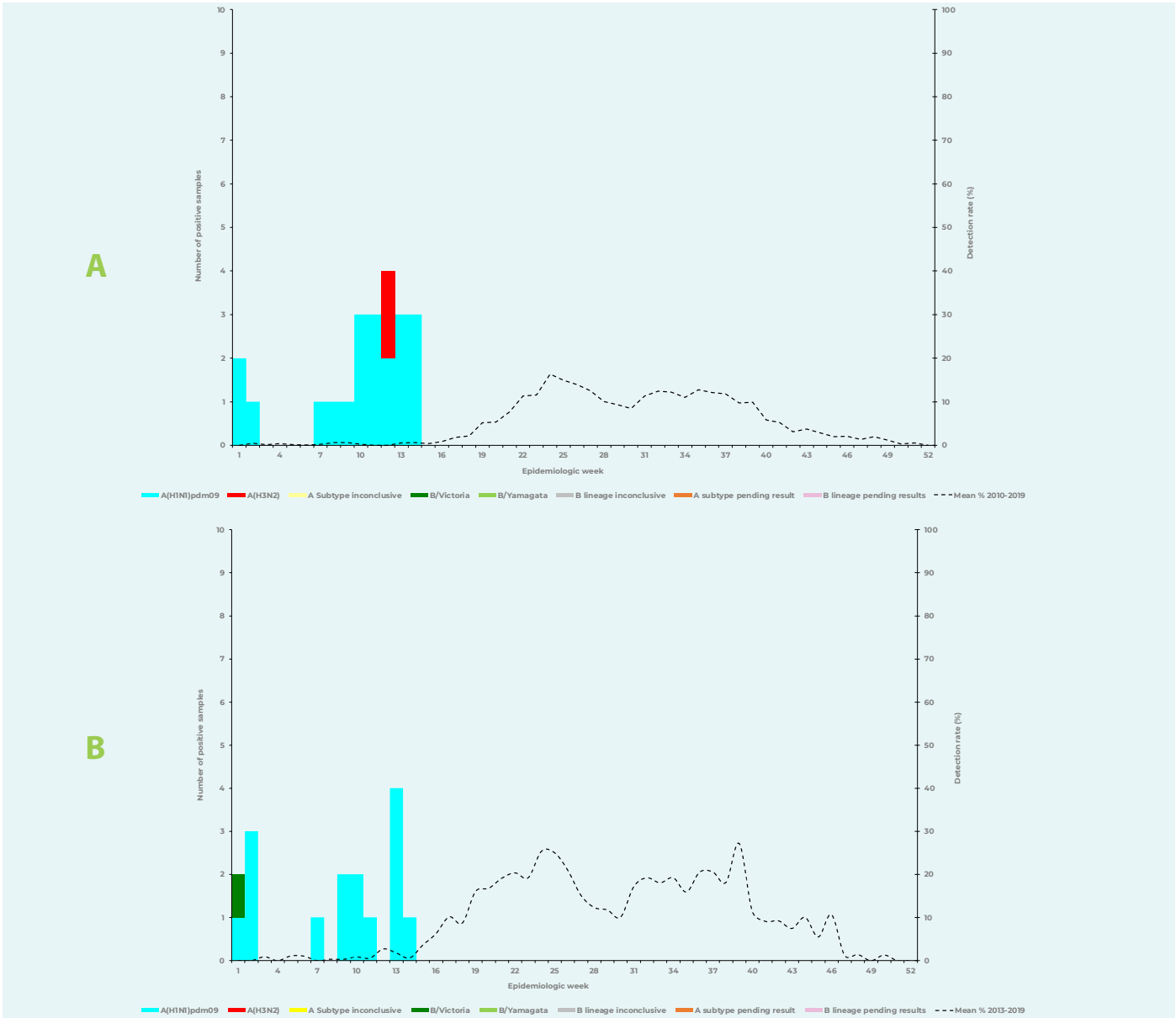

Figure 5. Number of positive cases by influenza subtype and lineage and detection rate, pneumonia surveillance (A) and ILI surveillance (B), week 1 of 2022 – week 15 of 2022

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

SEASONAL DISEASES

Respiratory syncytial virus (RSV) 2022

In South Africa the RSV season usually precedes the influenza season, starting between the beginning of February and mid-March, with the mean peak of the season in mid to late April. Increased RSV activity has been detected for 2022 with the season starting in week 7 (week ending 20 February), when the RSV detection rate among children aged <5 years hospitalized with lower respiratory tract illness at sentinel sites breached the low threshold level (using the Moving Epidemic Method (MEM)).

As of week 15 of 2022 (week ending 17 April) across all ages, 311 hospitalised RSV cases have been detected at pneumonia surveillance sentinel sites. The highest detection rate was at the Gauteng province site (128/311, 41.2%), followed by sites in Western Cape (83/311, 26.7%), KwaZulu-Natal (76/311, 24.4%), Mpumalanga (14/311, 4.5%) and North West (10/311, 3.2%) provinces. Subtype B accounted for the majority of RSV positive cases (168/311, 54.0%). The vast majority of the 311 RSV cases (295/311, 94.9%) were in children below 5 years and more than half were subgroup B (160/295, 54.2%), followed by subgroup A (102/295, 34.6%) and 28/295 (9.5%) are yet to be grouped. Since week 4 of 2022 the RSV detection rate has been on an upward trend among all ages and children under 5 years, with RSV-detection rates higher than the mean annual detection rate for all ages (2010-2019) during this period) (Figure 6).

Clinicians are reminded to consider RSV in differential diagnoses for severe respiratory illness, especially in young children, where RSV is detected in approximately 60% of LRTIs admitted to hospitals during the season.

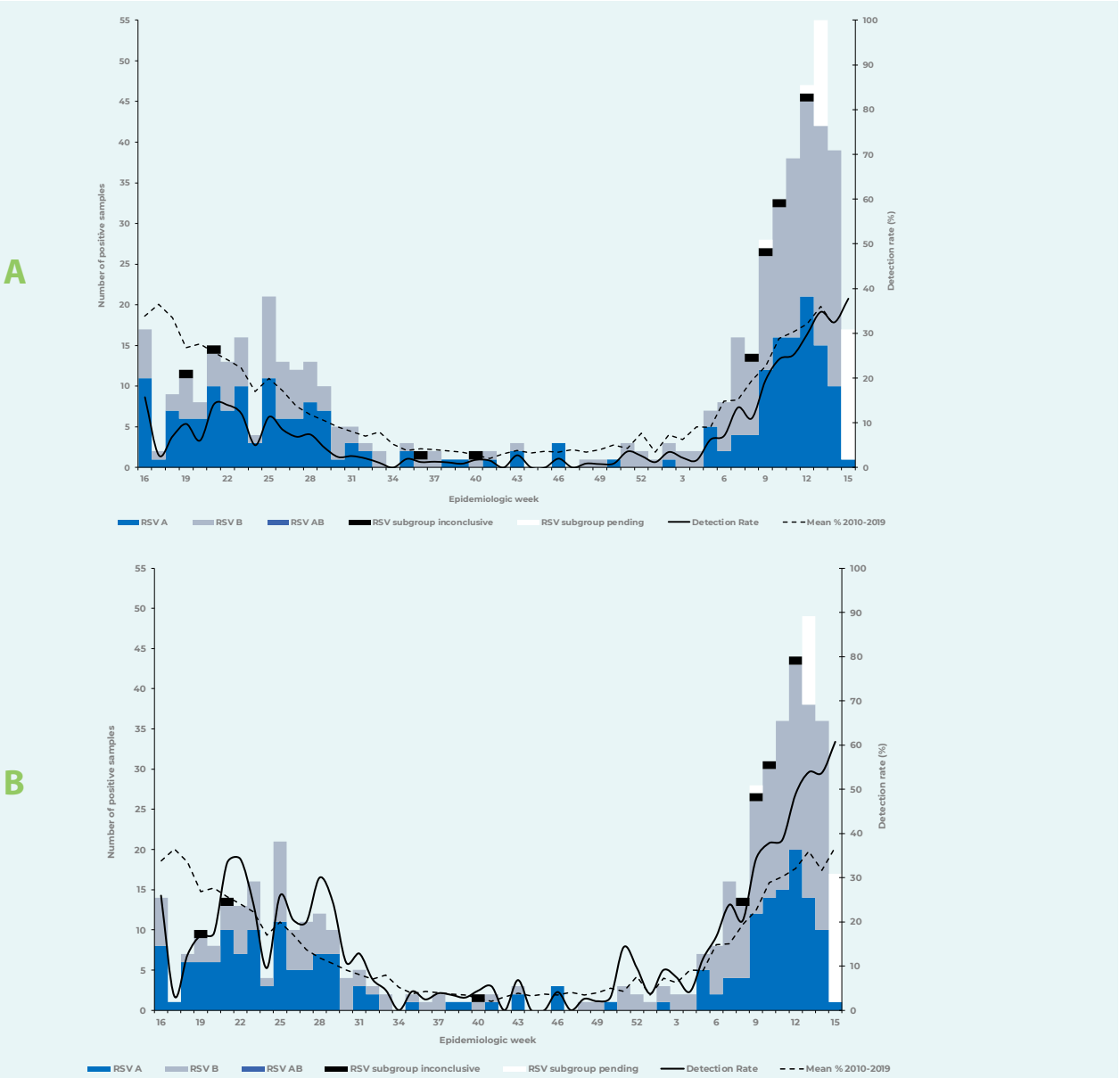

Figure 6. Number of samples from hospitalised patients testing positive for respiratory syncytial virus by subgroup and detection rate (percentage) by week for all ages (A) and children under 5 years (B), week 16 of 2021 – week 15 of 2022

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

ENTERIC DISEASES

Update on enteric fever, South Africa

Background

South Africa is endemic for enteric fever caused by *Salmonella* Typhi, although the prevalence of disease is much lower than most other countries in sub-Saharan Africa. It is a Notifiable Medical Condition, meaning that all laboratory-confirmed cases must be officially reported to the Department of Health. However, reported cases significantly underrepresent the true number of cases. The likelihood that enteric fever cases are identified and diagnosed depends on many factors, including how ill the patient is, how aware of the disease healthcare workers are, whether blood culture tests are done, and how accessible laboratory testing for blood cultures is. Blood culture tests are not performed at all levels of health care and are not a routine investigation in many South African healthcare settings; blood culture tests are usually performed only for selected patients who are admitted to hospital. This means that many cases of enteric fever are likely missed across the country, especially those cases with milder disease as well as cases in areas of the country where the necessary laboratory testing is not readily accessible.

The number of reported enteric fever cases in South Africa has declined over the last few decades, and larger outbreaks have become less common. The most recent large outbreak occurred in Delmas in 2005, with over 2900 cases.

After the outbreak in Delmas in 2005, the number of enteric fever cases in South Africa has remained stable with less than 150 cases per year (an average of 97 cases per year) – Figure 7.

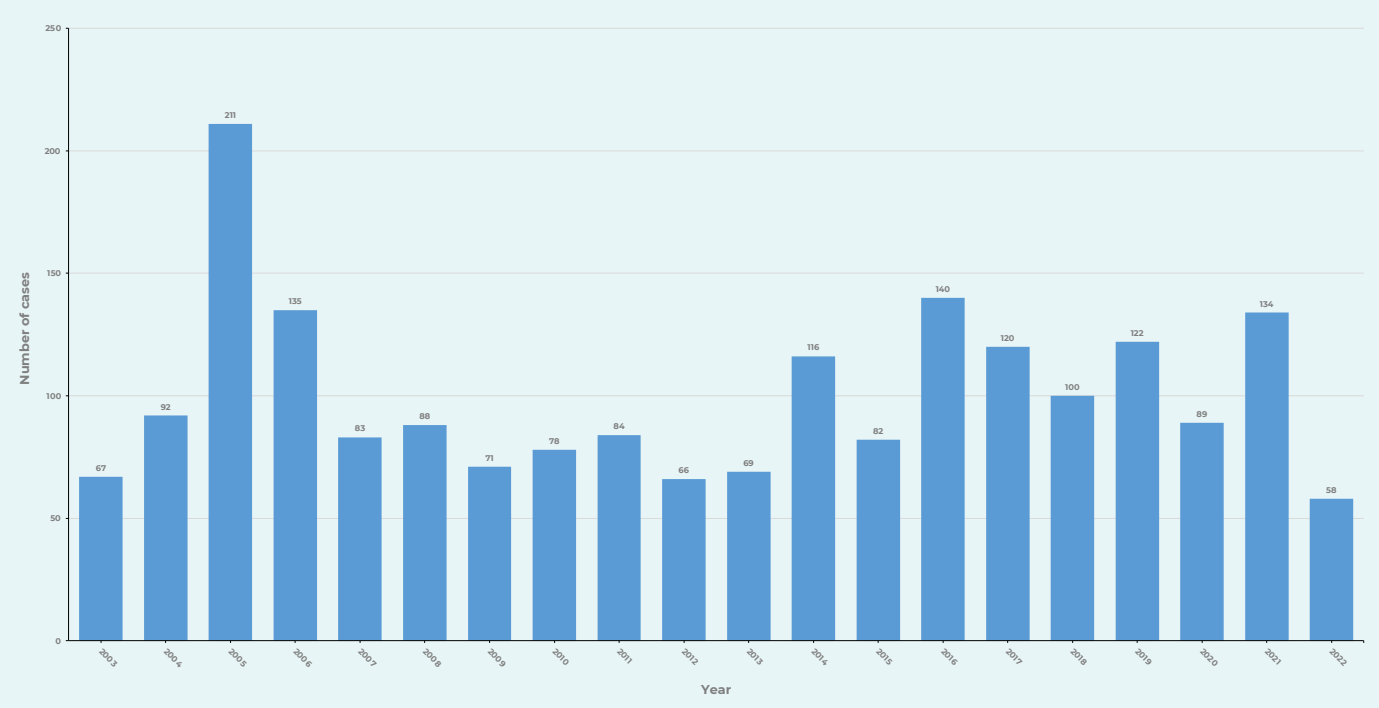

Figure 7. Laboratory-confirmed enteric fever cases, South Africa, 1 January 2003 – 21 April 2022

ENTERIC DISEASES

Over the past decade (since 2012), Gauteng Province usually reported the most cases per year followed by Western Cape, Mpumalanga and KwaZulu-Natal provinces (Figure 8).

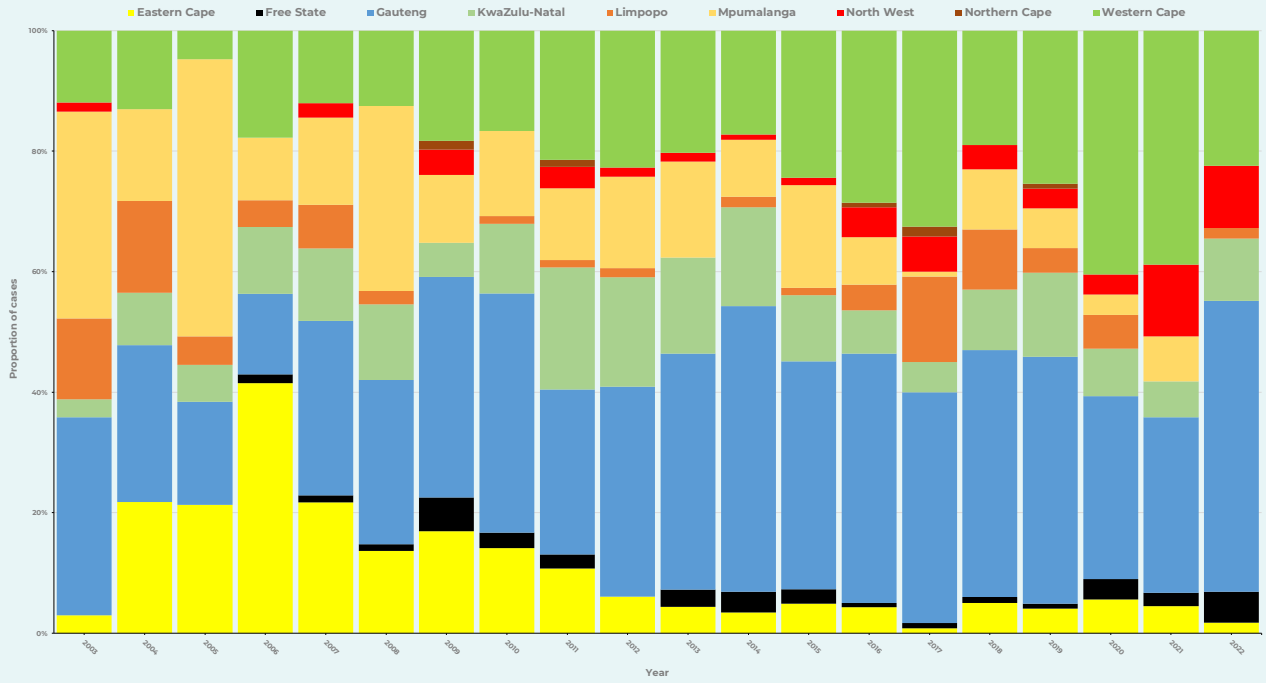

Figure 8. Proportion of laboratory-confirmed enteric fever cases by province, South Africa, 1 January 2003 – 21 April 2022

During 2020 and 2021, the total number of enteric fever cases across the country (89 cases in 2020 and 134 cases in 2021) was similar to previous years. However, at a provincial level there was an increase in the number of cases reported from Western Cape and North West provinces in 2021 (Figure 9, arrows showing case numbers for WC (green line) and NW (red line)) with a concurrent decrease in the number of cases reported from Gauteng (blue line).

For Western Cape Province, the increase in cases for 2021 was clearly attributable to increased numbers of cases in only 3 districts (City of Cape Town Metro, Cape Winelands and Garden Route), and in North West Province the increase was solely due to cases in a single district (Dr Kenneth Kaunda District). Cases continue to be reported from both provinces in 2022.

Genomic surveillance

Public and private laboratories throughout the country submit *Salmonella* Typhi isolates to the Centre for Enteric Diseases (CED), NICD, for further investigation. All isolates are investigated using whole-genome sequencing (WGS) and core-genome multilocus sequence typing (cgMLST) analysis. cgMLST analyses 3002 genes to assess genetic relatedness. A cluster is defined as a group of *Salmonella* Typhi isolates that on cgMLST analysis differ from each other by ≤5 alleles – this means that they are highly genetically related. Unfortunately, not all isolates are received, so cases with missing isolates cannot definitively be linked to or excluded from clusters.

Enteric fever in South Africa: the year 2022 to date

Fifty-eight cases of enteric fever have been reported nationally in 2022 to date (21 April 2022). Gauteng Province reported most cases (48%; 28/58), followed by Western Cape Province (22%; 13/58). North West and KwaZulu-Natal provinces each reported 10% (6/58) of the total cases, Free State Province reported three cases, and Eastern Cape and Limpopo provinces each reported a single case (Figure 9).

ENTERIC DISEASES

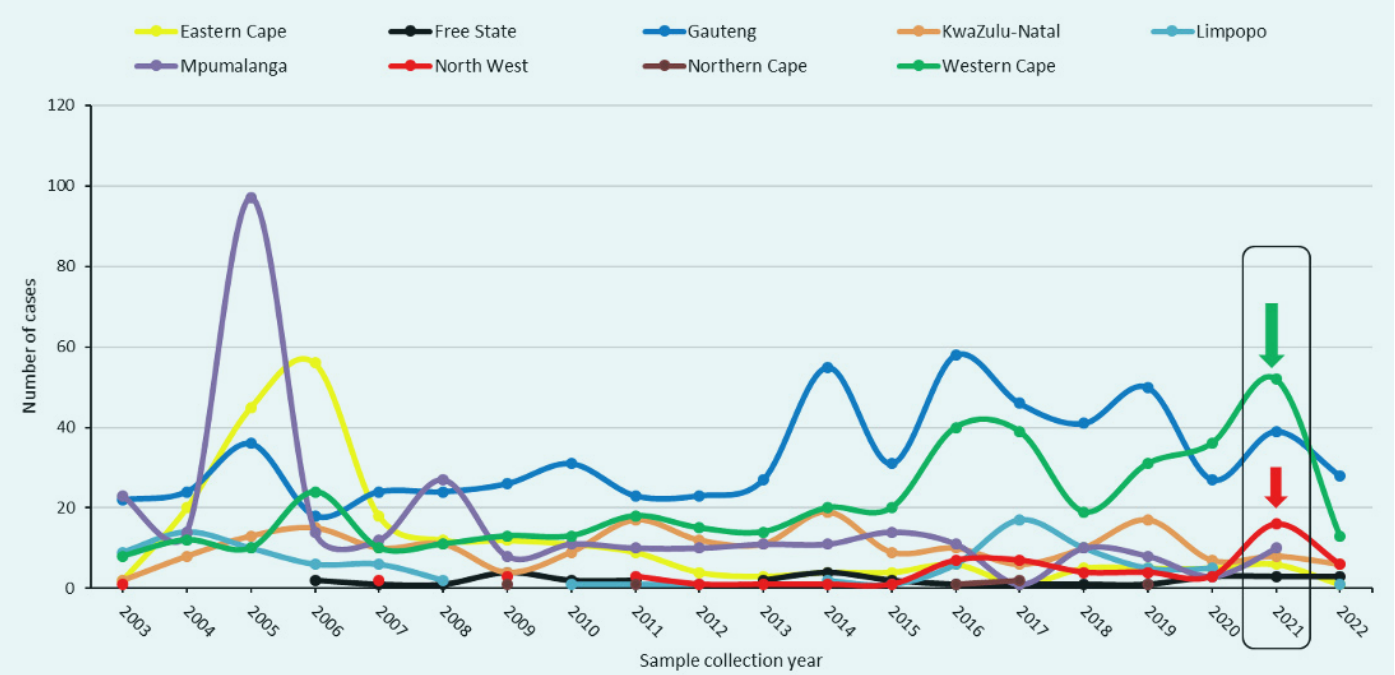

Figure 9. Enteric fever cases by province, South Africa, 1 January 2003 – 21 April 2022

Update on enteric fever clusters

i. Western Cape Province

The current status of the three clusters in Western Cape Province is summarised in Table 2 and Figure 10. The City of Cape Town cluster now comprises 18 cases, with five cases identified in 2022. The Garden Route cluster has 15 cases, with two cases identified in the current year. The last case in the Winelands cluster was identified in May 2021. Although six laboratory-confirmed cases of enteric fever were reported from the Winelands District between July 2021 and January 2022, none could be linked to the Winelands cluster on cgMLST.

Table 2. Western Cape *Salmonella* Typhi clusters, January 2020 – 21 April 2022*

District	Number of cases	Date of first case	Date of most recent case
City of Cape Town	18	November 2020	February 2022
Cape Winelands	11	July 2020	May 2021
Garden Route	15	August 2020	February 2022
Grand Total	**44**	**July 2020**	**February 2022**

*The results of WGS and cgMLST analysis are still pending for isolates from recent cases detected in City of Cape Town Metro, so case numbers may change as these results become available.

ENTERIC DISEASES

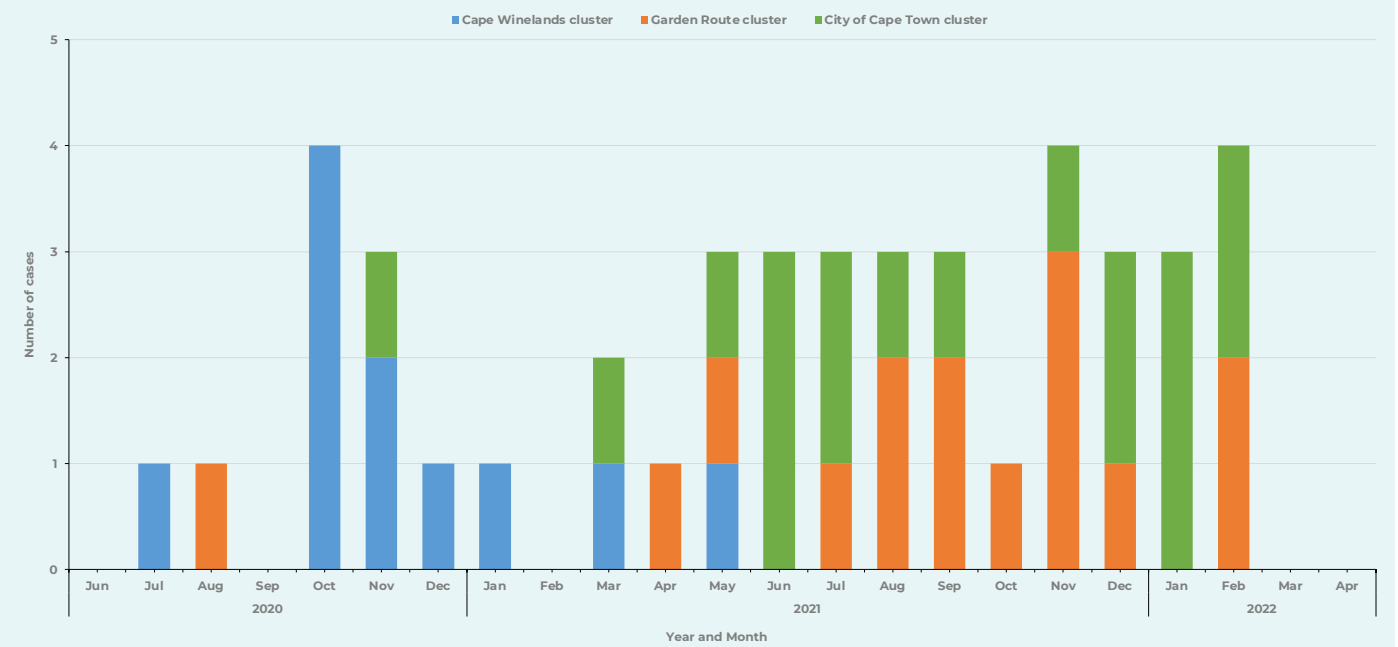

Figure 10. Cases of enteric fever by cluster (as determined by cgMLST), Western Cape Province, 1 January 2020- 21 April 2022

ii. North West Province

As at 21 April 2022 there are 36 cases in the Klerksdorp cluster. While most cases hail from North West Province (64%, 23/36), cases belonging to this cluster have also been identified in four other provinces (Table 3 and Figure 11).

Table 3. Klerksdorp *Salmonella* Typhi cluster cases by province, January 2020 – 21 April 2022

Provinces	Number of cases
North West	23
Gauteng	6
Mpumalanga	4
KwaZulu-Natal	2
Free State	2
Grand Total	**36**

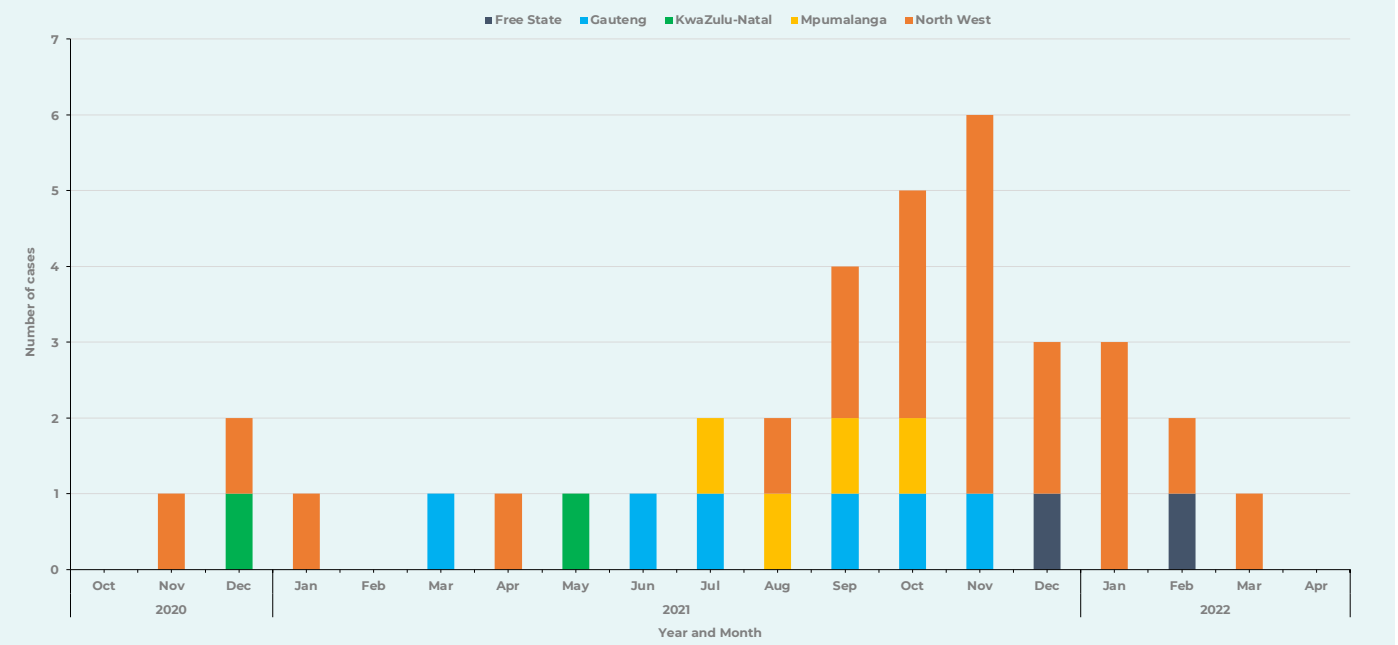

Figure 11. Klerksdorp cluster enteric fever cases by province, November 2020 – 21 April 2022 (N = 36)

ENTERIC DISEASES

iii. Gauteng Province

Gauteng Province reported 28 cases in the current year to date. The number of cases reported in January, February and March 2022 is higher than those reported for the same months in previous years (Figure 12)

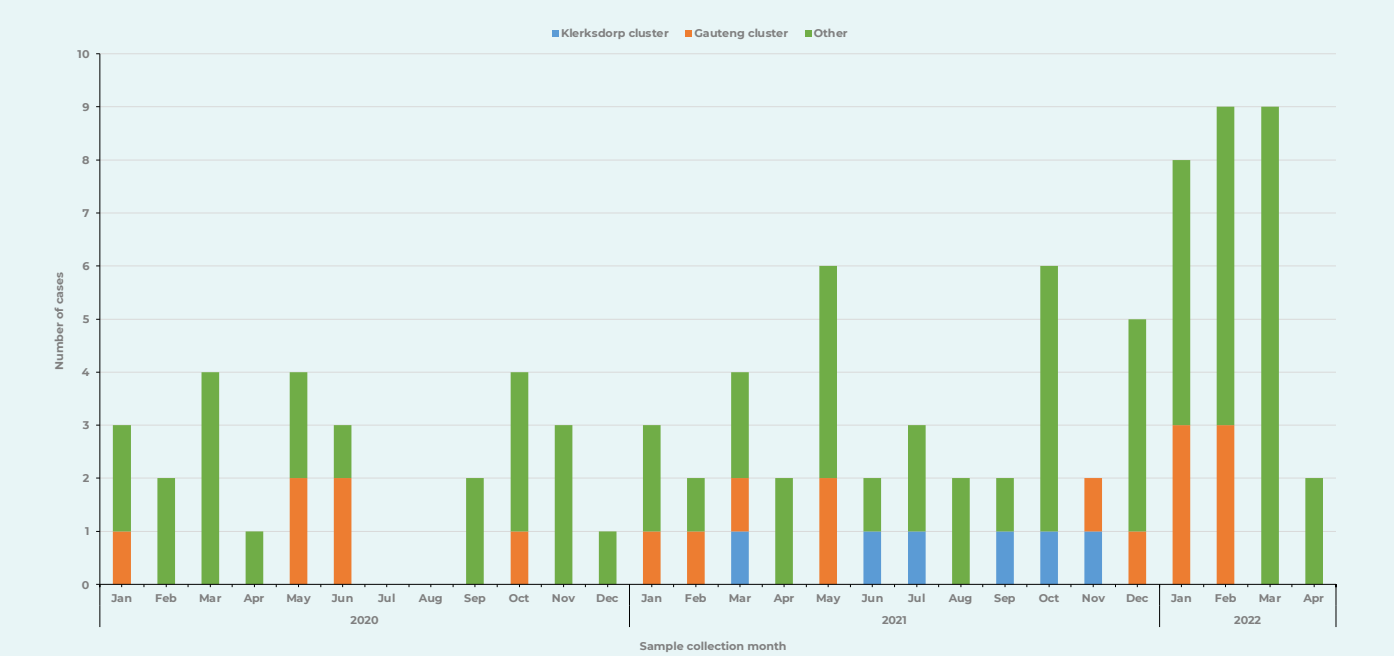

Figure 12. Cases of enteric fever by cluster, Gauteng Province, 1 January 2020 - 21 April 2022

Six cases have been found to belong to the Klerksdorp cluster. A slow growing cluster has been identified in the province, comprising 20 cases to date; this has been labelled the 'Gauteng cluster'. The first Gauteng cluster case was identified in January 2020 and the most recent case in February 2022, as shown in Figure 12.

The distribution of the Gauteng cluster cases by district is shown in Figure 13. Unlike the clusters in Western Cape and North West provinces, the cases in this cluster are not localised to a single district. However, of the 6 cases for 2022 to date, 4 are from Ekurhuleni Metro. A case diagnosed in Rustenburg, North West Province, has also been linked to this cluster. The cases span a range of age groups as shown in Figure 14.

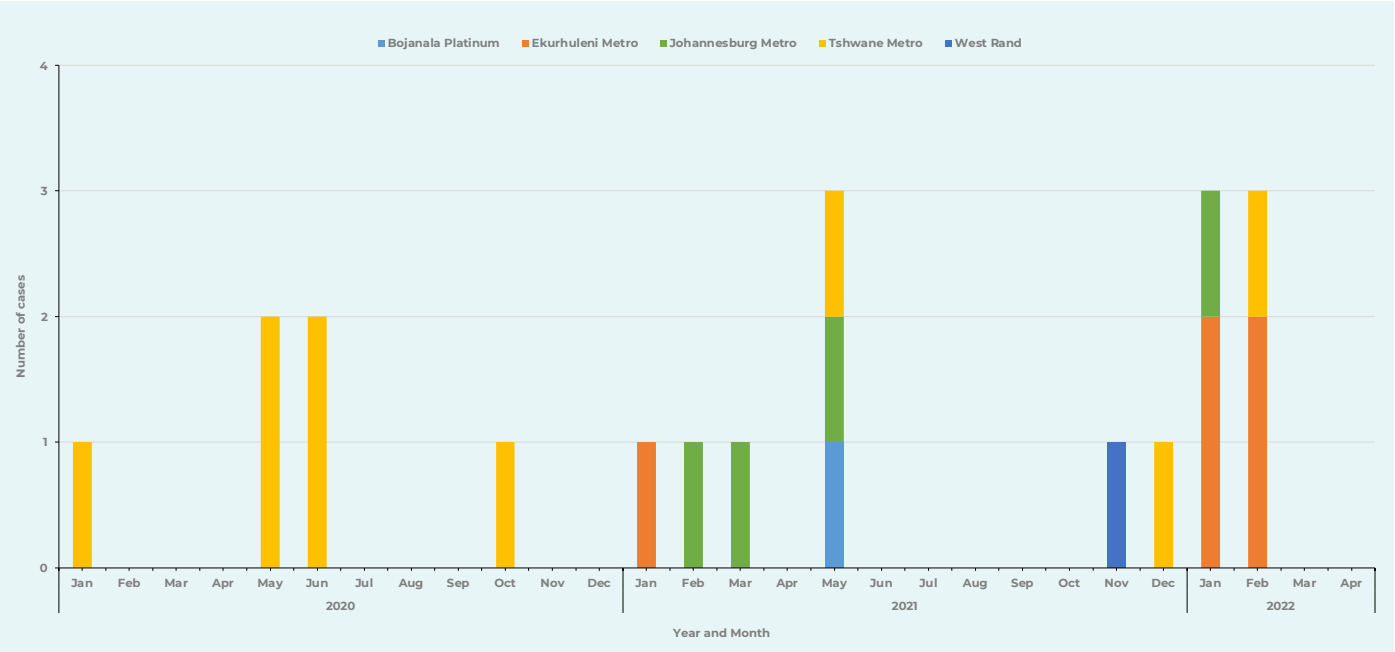

Figure 13. Gauteng cluster enteric fever cases by district, January 2020 - 21 April 2022 (N = 20)

ENTERIC DISEASES

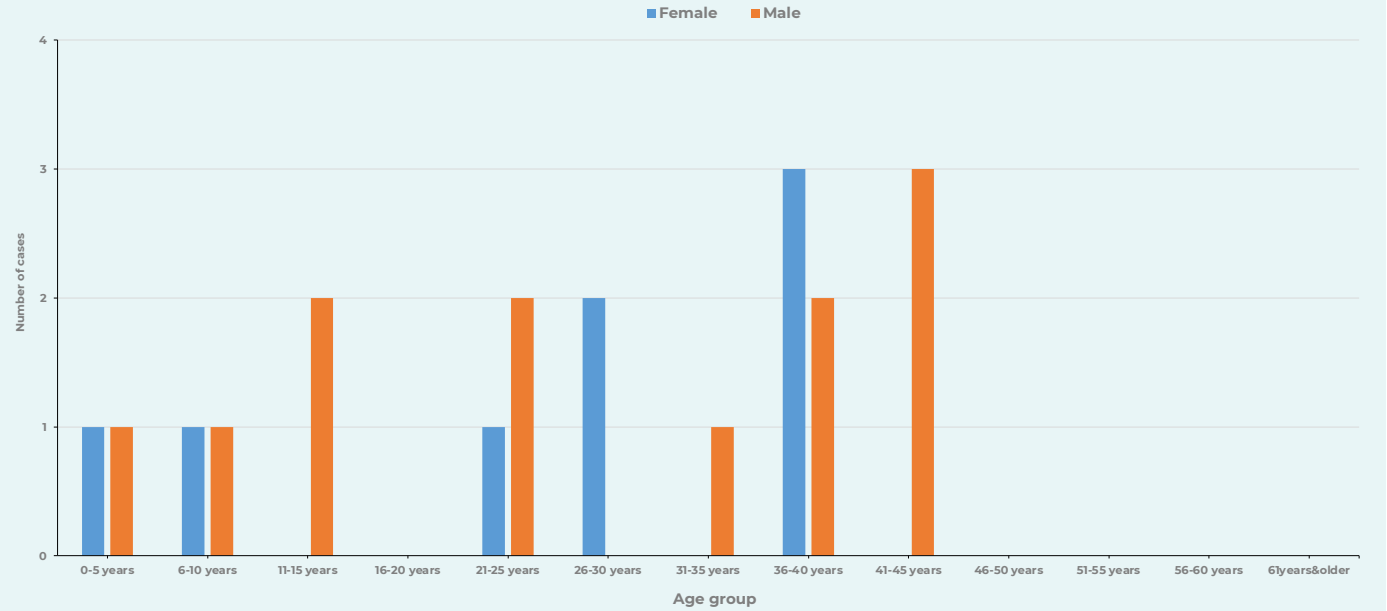

Figure 14. Gauteng cluster enteric fever cases by age and gender, 1 January 2020 – 21 April 2022

The relevant provincial and district departments of health are aware of all the above-mentioned clusters, and outbreak investigations are ongoing. Contamination of municipal water is extremely unlikely to be the source of infection in any of these clusters, due to the demographics of the cases (including their age profiles, places of residence, source(s) of drinking water and access to improved sanitation) and the slow growing nature of the clusters. It is likely that there are complex chains of transmission within the respective communities, mostly due to the presence of unrecognised cases and carriers who serve as reservoirs of infection and lead to ongoing transmission. This makes it challenging to investigate and identify source(s) within the communities.

No likely or definite source(s) of infection have been identified for the Western Cape clusters as yet. For the Klerksdorp cluster, contaminated water in an illicit underground gold mine in the City of Matlosana has been identified as a common source of infection for a subset of the cases. However, multiple concurrent patterns of transmission are likely occurring in this cluster, including ongoing exposure of miners working underground, where miners with acute illness or asymptomatic *Salmonella* Typhi carriage cause persistent contamination of underground source(s) of drinking water and/or food. Infected miners (who are acutely ill, asymptomatic carriers, or are shedding during convalescence following acute illness), may then unknowingly transmit infection to household contacts through contamination of food or water in the home. Cases for which the source of infection or exposure is unknown have also been reported, suggesting community transmission. Infected persons who travel may become sources for new chains of transmission in other provinces.

In addition to the 36 confirmed cases in the Klerksdorp cluster, an additional 11 people were identified who had clinically compatible illness and were epidemiologically linked to a confirmed Klerksdorp cluster case; these were classified as probable cases. These probable cases were identified through interviews with confirmed case-patients (or their proxies), and were close contacts of case-patients who developed illness contemporaneously, in keeping with household-type transmission.

ENTERIC DISEASES

Prevention and control of enteric fever

Healthcare workers countrywide should be more aware of enteric fever, so that cases can be detected and treated appropriately. It is essential to follow up on all cases to ensure clearance of the organism and to screen household/close contacts for *Salmonella* Typhi. Chronic carriers need to be identified and managed appropriately.

Preventive measures for the public include:

- Hand hygiene. Wash hands with soap and safe water before eating or preparing food, and after using the toilet or changing a baby's nappy.
- Food safety practice. Follow the World Health Organization's five keys to safer food: keep clean; separate raw and cooked; cook thoroughly; keep food at safe temperatures; and use safe water and raw materials.
- Using safe water. Contamination of municipal water is extremely unlikely to be the source of infection in any of these clusters. However, if people are concerned about the quality of water they use for drinking and cooking, then it is recommended to treat the water first by boiling it (place water in a clean container and bring to a boil for 1 minute) or treating it with household bleach (add 1 teaspoon of household bleach (containing 5% chlorine) to 20-25 litres of water, mix well and leave it to stand for at least 30 minutes before use).

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

HEALTH RISKS

Health risks associated with flood disasters

South Africa is currently experiencing heavy rains and floods in some parts of the country.

Flood disasters result in five categories of health risks:

- Acute events: drowning and trauma
- Noncommunicable diseases: floods impact significantly on chronic health conditions due to medication non-compliance and lack of access to health services
- Healthcare infrastructure: damage or disruption to healthcare infrastructure and systems
- Mental health: anxiety, depression and post-traumatic stress disorder (PTSD) are potential mental health consequences for flood victims
- Infection

Infectious diseases following flood disasters

Flood disasters result in an increased risk of a range of infections. Damage to or disruption of environmental health infrastructure and services (water supply and sewage systems) increases the risk of water- and food-borne disease. The displacement of people and overcrowding that often results from flooding provides optimal conditions for outbreaks of respiratory and gastrointestinal illness; contributing factors in such settings include poor standards of hygiene, close contact among flood victims, poor sanitation, poor nutrition, and poor food safety.

Cutaneous infections

Skin and soft tissue infections can follow trauma. These are often caused by typical bacterial causes of skin and soft tissue infections (*Staphylococcus aureus* and *Streptococcus pyogenes*) as well as less common water-dwelling organisms *(Aeromonas* spp., *Vibrio* spp.). Fungal infections also occur, and may be polymicrobial; these may present as rapidly progressing necrotising fasciitis. Nontuberculous mycobacteria (*M. chelonae, M. fortuitum* and *M. abscessus*) can also cause infections after exposure to flood water.

Respiratory infections

Acute respiratory infections are common following flood disasters. Disruption of housing and overcrowding increase the risk of transmission of respiratory viral pathogens.

HEALTH RISKS

Gastrointestinal disease:

Cholera

Cholera is an acute diarrhoeal illness caused by infection with *Vibrio cholerae* bacteria following the ingestion of food or water that is contaminated with faeces of an infected person. Although most people infected with *V. cholerae* don't develop symptoms, about 10% will develop severe disease with acute profuse watery diarrhoea that can rapidly lead to severe dehydration. If left untreated, cholera can result in death. Mild cases are treated with oral fluids, whilst more severe cases may require intravenous fluids and appropriate antibiotics.

Shigellosis

Shigella spp. are a group of bacteria that cause shigellosis. Transmission to humans occurs via the faecal-oral route, from person to person and through the ingestion of contaminated water or food. Symptoms include watery or bloody diarrhoea (dysentery), fever, nausea and sometimes vomiting and abdominal cramps. Severe infection with high fever may be associated with seizures in young children, and other possible complications include bloodstream infections, post-infectious arthritis and haemolytic-uraemic syndrome.

Enteric fever

Enteric fever is a bacterial infection caused by *Salmonella* Typhi or *S.* Paratyphi A, B or C. It is transmitted by the ingestion of water or food that has been contaminated by faeces of an infected person. Symptoms of the disease are nonspecific, and include fever, headache, and gastrointestinal symptoms (such as abdominal pain, nausea, constipation and/or diarrhoea).

Other diarrhoeal disease

Transmission of other pathogens (bacteria, viruses and parasites) that cause diarrhoeal disease can result from contaminated water sources. These include *E. coli* (particularly enterotoxigenic *E. coli*), rotavirus and norovirus. Children are typically at increased risk of these infections. Symptoms include diarrhoea, vomiting and fever.

Hepatitis A

Hepatitis A is caused by hepatitis A virus. This virus is transmitted through the faecal-oral route, through ingestion of contaminated food and water or through close person to person contact with an infectious individual. Symptoms include fever, malaise, nausea, vomiting, diarrhoea, abdominal discomfort, dark urine and jaundice.

HEALTH RISKS

Zoonoses and vector-borne diseases

Flood disasters can result in changes in the physical environment that favour an increase in the breeding of some animals and vectors, which can lead to an increase in zoonoses and vector-borne diseases. Flood waters that remain stagnant after the flood provide breeding sites for mosquitoes.

Leptospirosis

Leptospirosis is a bacterial disease caused by *Leptospira* spp. and is transmitted to humans through direct contact with animal hosts (rodents, domestic pets and livestock) or through an environment contaminated by animal urine. It is increasingly recognised as an important infection associated with flood disasters. People who come into direct contact with flood water (for example, by swimming or wading) that is contaminated with the urine of infected animals are at high risk of being infected. Symptoms are nonspecific and include fever, headaches, muscle aches, chills, conjunctival suffusion (redness), abdominal pain, jaundice, vomiting, diarrhoea and sometimes a rash.

Malaria

Malaria is caused by *Plasmodium* spp. parasites transmitted to humans through the bites of infected female *Anopheles* mosquitoes. Symptoms are nonspecific and mimic many other febrile illnesses; common symptoms include fever, sweats, cold shivers, headache, muscle/joint aches, malaise, loss of appetite, nausea and vomiting. Urgent diagnosis and treatment according to national guidelines is important to prevent complications and death. Malaria transmission areas in South Africa include north-eastern KwaZulu-Natal and low altitude areas of Mpumalanga and Limpopo, particularly those bordering Zimbabwe, Mozambique and Swaziland.

Rift Valley fever

Rift Valley fever (RVF) is an infection that primarily affects domestic animals, but infection can be transmitted to humans through the bites of the *Aedes* mosquito. It can also be transmitted through the consumption of unpasteurised milk or the meat of infected dead animals, or contact with the blood or tissues of these animals. Heavy rains and floods can trigger outbreaks of RVF among animals, leading to infections in humans. The majority of human RVF infections are mild or do not present with any symptoms. Most affected people present with a flu-like illness; common symptoms include fever, headache, muscle or joint aches, neck stiffness, sensitivity to light, loss of appetite and/or vomiting.

West Nile virus disease

West Nile virus disease is caused by West Nile virus (WNV) which is transmitted to humans through the bites of *Culex* mosquitoes. Infection with West Nile virus is asymptomatic in the majority (70-80%) of patients. Persons who develop symptoms usually present with a nonspecific flu-like illness; common symptoms include fever, headache, fatigue, nausea, vomiting, muscle or joint aches, diarrhoea and a rash. Severe illness can occur, manifesting as encephalitis or meningitis.

HEALTH RISKS

Prevention of food- and water-borne infections following a flood disaster

The provision of safe drinking water to affected communities is critical. Uninterrupted safe water supply, safe wastewater disposal and solid waste handling are key to preventing large outbreaks of waterborne disease.

Health education for victims of flood disasters is an important preventive measure. Health messaging should focus on the use of safe water, hand hygiene, and food safety practice.

Advice for those affected by the floods includes:

- Always use safe water. If you are concerned about the quality of water you are using for drinking and cooking, then treat the water first by boiling it (place water in a clean container and bring to a boil for 1 minute) or treat it using household bleach (add 1 teaspoon of household bleach (containing 5% chlorine) to 20-25 litres of water, mix well and leave it to stand for at least 30 minutes before use).
- Practice good hand hygiene. Wash hands with soap and safe water:
  - ◊ Before, during, and after preparing food
  - ◊ Before and after eating food
  - ◊ Before and after caring for someone at home who is sick (especially if they have diarrhoea)
  - ◊ After using the toilet
  - ◊ After changing diapers/nappies or cleaning up a child who has used the toilet
- Make sure your food is safe! Follow the World Health Organization's five keys to safer food: keep clean; separate raw and cooked; cook thoroughly; keep food at safe temperatures; and use safe water and raw materials. Washing hands with soap and water before, during and after preparing food and before eating is especially important.

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

WHO AFRO UPDATE

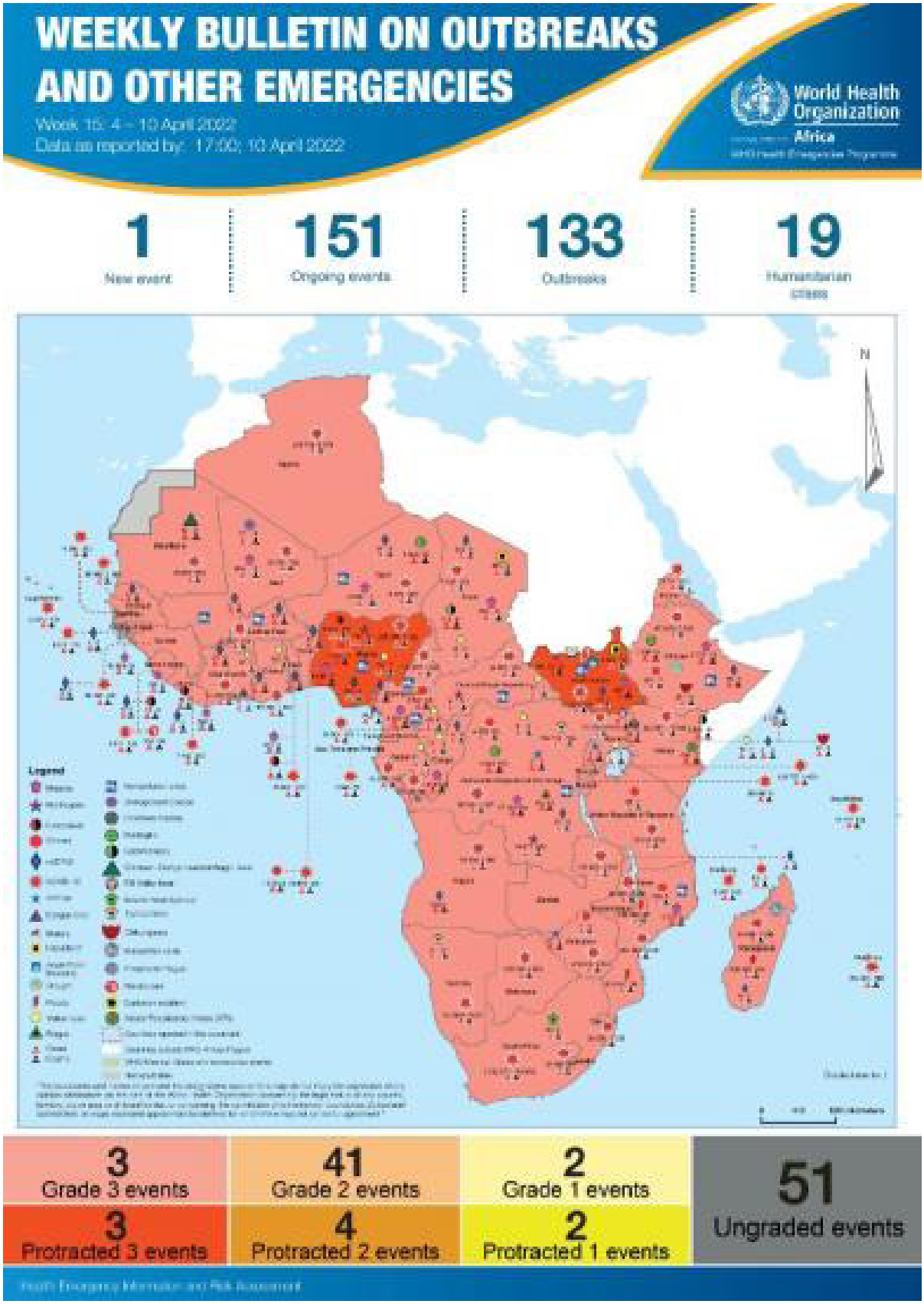

Figure 15. The Weekly WHO Outbreak and Emergencies Bulletin focuses on selected public health emergencies occurring in the WHO African Region. The African Region WHO Health Emergencies Programme is currently monitoring 140 events. For more information, see link below:
https://apps.who.int/iris/bitstream/handle/10665/352474/OEW11-0713032022.pdf

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 16 on page 20.

Meningitis in Ethiopia

Eleven out of the 12 regions in Ethiopia have reported meningitis, with four regions having surpassed the epidemic threshold. The key challenge is low in-country laboratory and technical capacity for the cerebrospinal fluid (CSF) collection to confirm the diagnosis, therefore laboratory samples are shipped out of the country for the confirmation of meningitis. At times more samples are required to further investigate the dominant meningococcal strain, to confirm the appropriate vaccine response. The meningitis outbreak has been noted since the week ending the 12 December 2021, and as of 3 March 2022 there have been a total of 1 398 suspected meningitis with 13 deaths recorded. Of the 14 CSF samples sent to the National Institute of Communicable Diseases (NICD) in South Africa, two came back positive for Human herpesvirus with one positive for *Neisseria meningitidis*.

Public health measures that have been put in place include: setup of a rapid response team; capacity building for laboratory management with continuous CSF samples being sent to the regional reference laboratory; and ceftriaxone antibiotic for case management.

Neisseria meningitidis is a Gram-negative diplococcus that is transmitted via respiratory secretions from both asymptomatic and symptomatic individuals. While it is found worldwide, it is hyperendemic in certain African countries referred to as the "meningitis belt" which extends from Senegal to Ethiopia. Meningococcal meningitis progresses rapidly, and it is a medical emergency.

Measles in South Sudan

Measles outbreak was declared on the 23 February 2022 in three states known to South Sudan - Eastern Equatoria, Upper Nile and Western Equatoria. A total of 209 cases was recorded in the week ending 6 March 2022 of which the predominant population was under 5-years of age, and more males than females.

With the current outbreak, there are no deaths reported, and majority of these cases are from refugee camps. The public health response to measles includes creating community awareness and routine immunization - including targeted vaccination for children aged 6-59 months of age.

Measles is caused by a single-stranded enveloped RNA morbillivirus with humans being the only natural host. It is highly contagious and is transmitted by infectious airborne droplets between humans, and can remain in the air for approximately two hours after an infected person leaves the area. Even in previously healthy children, measles can cause severe illness requiring hospitalization and there is a high risk for complications such as otitis media, bronchopneumonia, diarrhoea, laryngotracheobronchitis and acute encephalitis.

Cholera in Malawi

In January and February 2021, the southern region of Malawi was affected by tropical storm Ana and cyclone Gombe that caused torrential rains and flooding, resulting in displaced populations with no access to safe drinking water and sanitation facilities. A cholera outbreak was declared on 3 March 2022 with a confirmed case identified at the Machinga District Hospital - the collected stool sample tested positive (by culture) for *Vibrio cholerae* Inaba. A separate locus of cholera cases was reported in Nsanje district on the 3 April 2022 - there were 54 recorded cases including 9 confirmed by culture and 2 deaths reported, with children between the ages of 5-14 years being affected the most. Of these, 55% were imported from Mozambique.

The public health interventions include the setting up of a multisectoral approach response team, and the Ministry of Health and WHO field supportive supervision visits.

Cholera is caused by *Vibrio cholerae* and presents as an acute intestinal infection which is often mild or without symptoms, but can be severe with a profuse watery diarrhoea, nausea and vomiting, circulatory collapse and shock. It has an incubation period between 2 hours and 5 days. The diagnosis of cholera is by culture of the organism from a rectal swab or a stool sample; however, do not wait for a positive culture before starting treatment. Treatment includes the rapid administration of fluids together with antibiotics. If not treated, this disease can be fatal.

BEYOND OUR BORDERS

Hepatitis in US and Europe

Multiple cases of severe hepatitis in young children have been reported by public health officials from the United States of America and Europe - 74 cases reported in the United Kingdom (UK), 3 cases reported in Spain, and a similar number of cases reported in Denmark and the Netherlands.

The most common population affected in the UK is children between 2-5 years of age. As reported by the World Health Organization (WHO) on 15 April 2022, six children require liver transplants, as a consequence of the disease.

Hepatitis is inflammation of the liver, and it is often caused by a virus. The most common types of viral hepatitis are A, B and C. They are acquired differently and are endemic in different countries.

Figure 16. 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); 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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