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

The COVID-19 in Children Surveillance Report Week 48 of 2021

Epidemiology and clinical characteristics of laboratory-confirmed COVID-19 among individuals aged ≤19 years, South Africa, 1 March 2020 – 4 December 2021

HIGHLIGHTS

- As of 4 December 2021, individuals aged ≤19 years made up 14.8% of SARS-CoV-2 tests, 12.5% of laboratory-confirmed COVID-19 cases, 5.0% of all COVID-19-associated admissions and 0.7% of COVID-19 associated in-hospital deaths.
- There have been 2.86 million tests conducted among individuals aged ≤19 years, 378 083 laboratory-confirmed COVID-19 cases aged ≤19 years, 20 346 reported COVID-19-associated admissions and 658 COVID-19-related in-hospital deaths during the surveillance period.
- The weekly test rates, incidence of laboratory-confirmed COVID-19 cases and incidence of COVID-19-associated admissions among individuals aged ≤19 years in Gauteng has been increasing from week 45 of 2021, eight weeks since the end of the third wave in week 37 of 2021.
- To date, Gauteng province has contributed the highest proportion of tests 779 056 (27.2%), cases 102 524 (27.1%) and admissions 5 934 (29.2%) among individuals aged ≤19 years.
    - The number of cases among individuals aged ≤ 19 years increased first in the City of Tshwane Metro from week 45 to week 47 and then in the City of Johannesburg Metro from week 48
    - In the past three weeks, the City of Johannesburg Metro district contributed the most to the observed increase in cases (2993/7089; 42.2%) while the City of Tshwane Metro district contributed the most to the observed increase in admissions (326/557; 58.5%) in Gauteng province among individuals aged ≤19 years

BACKGROUND

The first case of COVID-19 in South Africa was reported on 5 March 2020. (2) On 4 December 2021, the country reported a cumulative total of 3 020 569 positive cases and 89 965 deaths. (2) COVID-19 disease in individuals aged ≤19 years has been more likely to be asymptomatic or mildly symptomatic and less likely to result in hospital admission compared to disease in adults. (3) However, there have been concerns of possible limited testing in children leading to cases among children being missed. (4) There have been also concerns regarding possible transmission within and outside schools and other congregate settings. Individuals aged ≤19 years, constitute just over a third of the population of South Africa (21 825 534; 36.6%) and includes the entire compulsory school-going age – considered 7- 15 years (5).

In November 2020, South Africa experienced an increase in cases of COVID-19 in all the provinces in what became the second wave. (2) Associated with this second wave was the emergence of the SARS-CoV-2 Beta variant (2, 6). In May 2021 South Africa officially entered the third wave of the COVID-19 pandemic with the Delta variant dominating. Since week 37 of 2021, South Africa exited its third wave and the country was moved to adjusted alert level 1 regulations on the 1st of October. Schools closed their third term in week 39 of 2021 and reopened for their fourth term in week 41 of 2021. Since week 45 case numbers have been increasing, associated with the emergence of the Omicron variant which was first reported in Botswana and South Africa in November 2021 (7).

In this report, the epidemiological characteristics of individuals aged ≤19 years with SARS-CoV-2 tests performed, laboratory-confirmed COVID-19 cases notified through the laboratory-based national notification system and COVID-19-associated admissions in South Africa are presented, with a focus on recent trends until week 48 (4 December 2021).

METHODS

Data collection procedures

Data extraction for this report was done on 6 December 2021. Data on laboratory tests for SARS-CoV-2 were obtained from the Notifiable Medical Conditions Surveillance System (NMCSS).

Laboratory testing was conducted in private and NHLS laboratories for people meeting the case definition for persons under investigation (PUI). This definition has been updated throughout the pandemic and is described further in the COVID-19 Testing Summary report. Data on laboratory results from public and private laboratories submitted to the NICD were extracted from the line list on the NMCSS. Limited demographic and epidemiological data collected at the time of specimen collection were available for analysis. Data on children and adults admitted to hospitals were collected on the DATCOV platform – an online hospital surveillance system. (9) Health care workers at hospitals admitting COVID-19 patients capture demographic and clinical information on admitted cases at admission, during admission and at discharge. The NMCSS and DATCOV databases are cleaned on an ongoing basis hence numbers of reported cases and deaths may increase or decrease as cases are verified and added or removed from the database. As of 4 December 2021, there were 665 hospitals submitting admissions data into DATCOV. This included 258 private hospitals and 407 public hospitals. (10)

Definition of outcomes

A SARS-CoV-2 test was defined as a real-time reverse-transcription polymerase chain reaction (rRT-PCR) test which detects SARS-CoV-2 viral genetic material or an antigen test that detects specific SARS-CoV-2 antigens/proteins. A laboratory-confirmed case of COVID-19 was defined as any person who tested positive for SARS-CoV-2 on either i) rRT-PCR or ii) an antigen test conducted on a respiratory sample obtained from a nasopharyngeal and/or oropharyngeal swab. A COVID-19-associated admission was defined as any person who tested SARS-CoV-2 positive and was admitted to hospitals registered to submit data to DATCOV, regardless of the reason for admission.

A COVID-19-associated death was defined as any person who died in a hospital as a result of COVID-19 and for whom outcome data was available.

Data analysis

Data from the national line list and DATCOV hospital surveillance database were exported into Stata14.2® for analysis. Descriptive statistics were used to describe the characteristics of tests, cases and admissions aged ≤19 years. The Statistics South Africa (Stats SA) mid-year population estimates for 2020 were used for calculating the testing rate, incidence and admission rates. The testing rate was determined as the number of tests in different age groups as a proportion of the population and presented as tests per 100 000 persons by age, gender, province and week of testing. Incidence was determined as the number of cases in different age groups as a proportion of the population and presented as cases per 100 000 persons by age, gender, province and week of diagnosis. The admission rate was determined as the number of admission in different age groups as a proportion of the population and presented as admissions per 1 000 000 persons by age, gender, province and week of admission. Descriptive statistics were used to describe demographic characteristics among tests, cases and admissions aged ≤19 years at hospitals stratified by age groups: <1 year, 1- 4 years, 5- 9 years, 10- 14 years and 15- 19 years.

RESULTS

National SARS-CoV-2 testing rate and percentage test positive among individuals aged ≤19 years

At data extraction on 6 December 2021, 19 414 426 tests were conducted until 4 December 2021 and of these, 4 720 (0.02%) were missing age information. Among the remainder of tests with available age information (N= 19 409 706), 2 866 084 (14.8%) were among individuals aged ≤19 years. The testing rate per 100 000 population has increased from week 45 of 2021 in all age groups with the >19 years age group having the highest rate in week 48 at 752 tests, followed by the <1 year at 558 tests and the 15-19 years at 425 tests. (Figure 1a). The overall percentage testing positive (PTP) from week 35 of 2021 among individuals aged ≤19 years was 9.8% (53098/543200) compared to 8.3% (212946/2578555) among individuals >19 years (Figure 1b). The majority of the tests among individuals aged ≤19 years were in five provinces; Gauteng (27.2%), KwaZulu-Natal (25.0%), Western Cape (11.9%), Eastern Cape (12.3%) and Free State (7.1%) provinces together accounting for 83.4% of all tests in this age group. From week 45 of the 2021 surveillance period, weekly testing rates have been increasing in Gauteng province among individuals aged ≤19 years (Figure 2a).

National SARS-CoV-2 case rates among individuals aged ≤19 years

There were 3 031 404 cases with a date of specimen collection on or before 4 December 2021 captured on the national line list. Of these 28 112 (0.9%) were missing age information. Of the 3 003 292 with known age 378 083 (12.5%) were aged ≤19 years. The incidence of cases per 100 000 population has increased from week 45 of 2021 in all age groups with the adults >19 years having the highest incidence in week 48 at 151.1 followed by the 15-19 years at 84.1, the 10-14 years at 53.9 and the <1 year at 32.3 (Figure 1c).

Among individuals aged ≤19 years, from week 45 of the 2021 surveillance period, weekly case incidence rates have been increasing in all provinces, with the highest rates in Gauteng province (Figure 2b).

National SARS-CoV-2 hospital admission rates and deaths among individuals aged ≤19 years

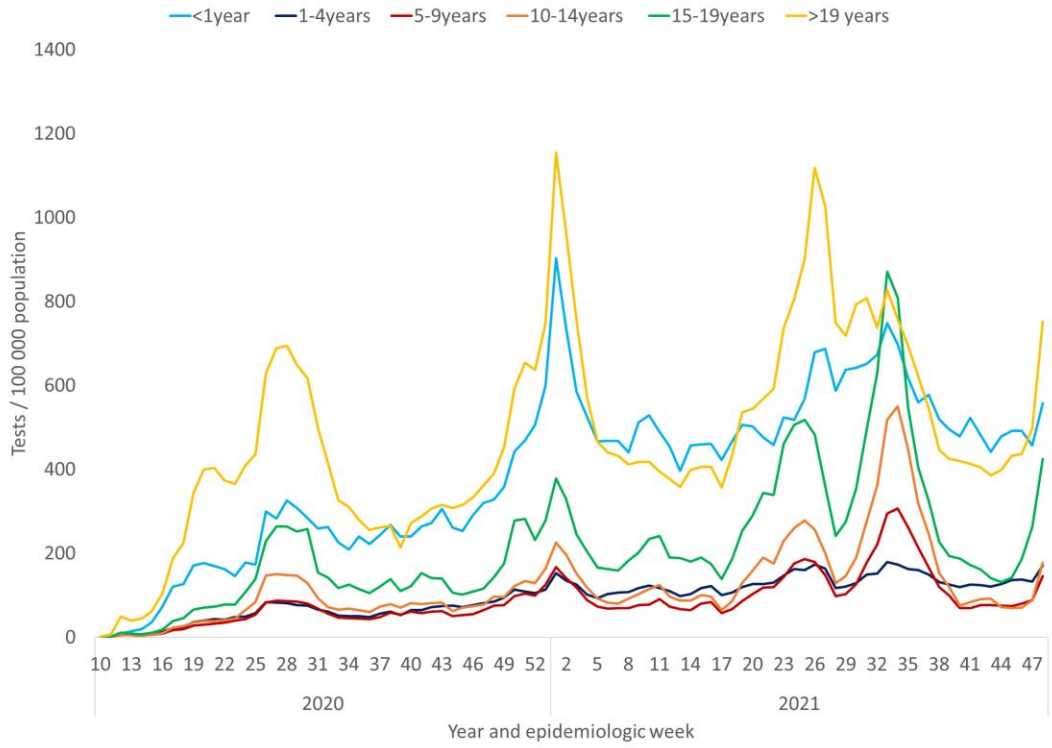
400 785 COVID-19-associated admissions were captured on DATCOV on or before 4 December 2021. Of these admissions 2 275 (0.6%) were missing age information. Among the admissions with available age information (N= 398 510), 20 346 (5.1%) were among individuals aged ≤19 years a 0.9% increase from the end of the 3rd wave. Weekly national numbers of admissions, as well as the admission rates per 1 000 000 population, have been increasing since week 45 of 2021 in all age groups with the <1 year having the highest increase in week 48 at 97.7 followed by the adults >19 years at 60.4, the 15-19 years at 26.6 and the 1-4 year at 19.9 (Figure 1d). The reason for this is unclear but could reflect increased testing among young infants and neonates if admitted for other reasons, precautionary admissions in young children who may not otherwise meet the criteria for severity, high transmission among women of childbearing age with transmission to infants or a high force of infection from adults with asymptomatic or minimally symptomatic infection as a result of previous infection or vaccination. The proportion of all COVID-19-associated admissions among individuals aged ≤19 years varied across provinces from 5.2% in Eastern Cape to 11.2% in North West Province possibly reflecting variation in clinical practice or the effect of clusters of cases. The majority of the admissions among individuals aged ≤19 years were in five provinces; Gauteng (29.2%), KwaZulu-Natal (18.0%), Western Cape (18.0%), North West (11.2%) and Eastern Cape (7.9%) provinces together accounting for 84.4% of all admissions (N=20 346). In week 48, Gauteng province had the highest admission rate for individuals aged ≤19 years at 62.2 per 1 million populations (Figure 2c).

Of the 20 346 COVID-19-associated admissions among individuals aged ≤19 years 1 226 (6.0%) were admitted into ICU and 468 (2.3%) were ventilated at some point during admission. At analysis 18 819 (93.4%) had been discharged, 395 (1.9%) were still admitted, 492 (2.4%) had been transferred to other facilities and 671 (3.2%) had died during admission including 13 deaths confirmed as unrelated to COVID-19. Among individuals with outcome data available the in-hospital case fatality risk (CFR) was 3.4% (658/19 490)

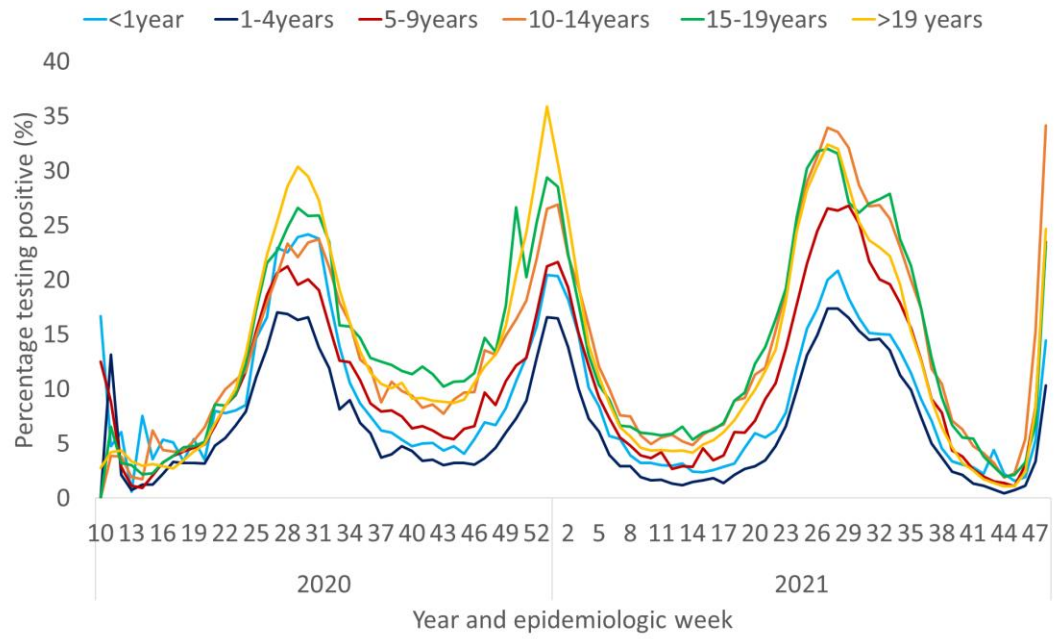
in individuals ≤19 years, 7.5 times lower when compared with 25.4% (93 576/368 881) among individuals aged >19 years. The overall median length of hospital stay was 4 days (IQR 2- 8 days) and was 4 days (IQR 1- 10 days) for those who died. Of the 658 COVID-19 associated in-hospital deaths in individuals aged ≤19 years, 373 (56.7%) had data on underlying conditions available. Of these 190 (50.9%) reported ≥1 underlying condition.

Fig 1: Rate of SARS-CoV-2 (a) testing, (b) percentage testing positive (PTP), rate of (c) cases and (d) admissions by epidemiologic week and age group, South Africa, 1 March 2020 – 27 November 2021

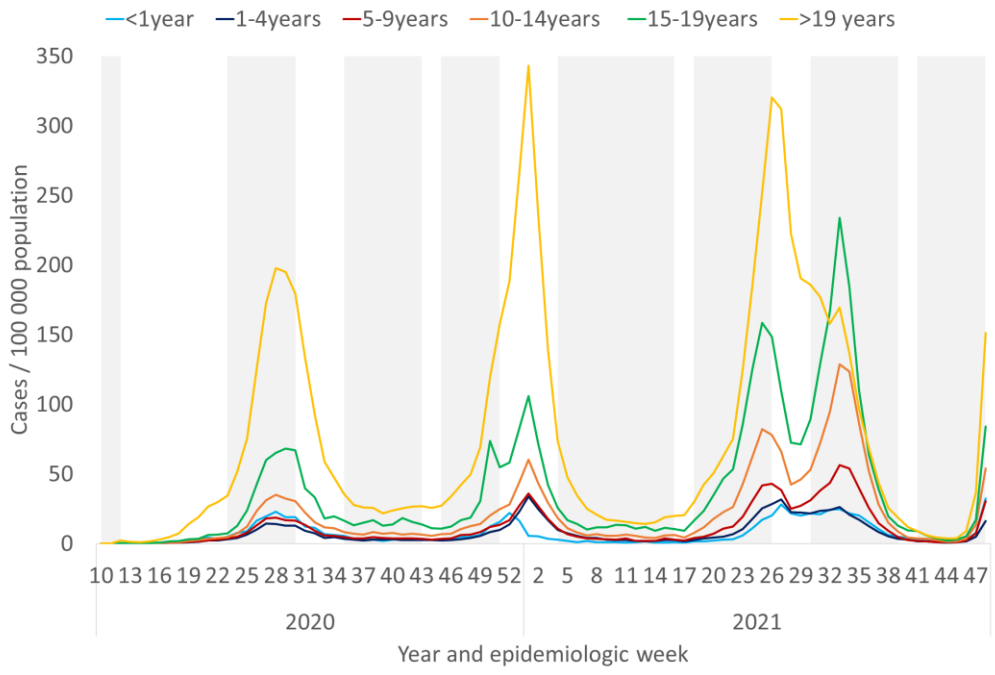
a)



b)



c)



*Schools open – School term as per Department of Basic Education

d)

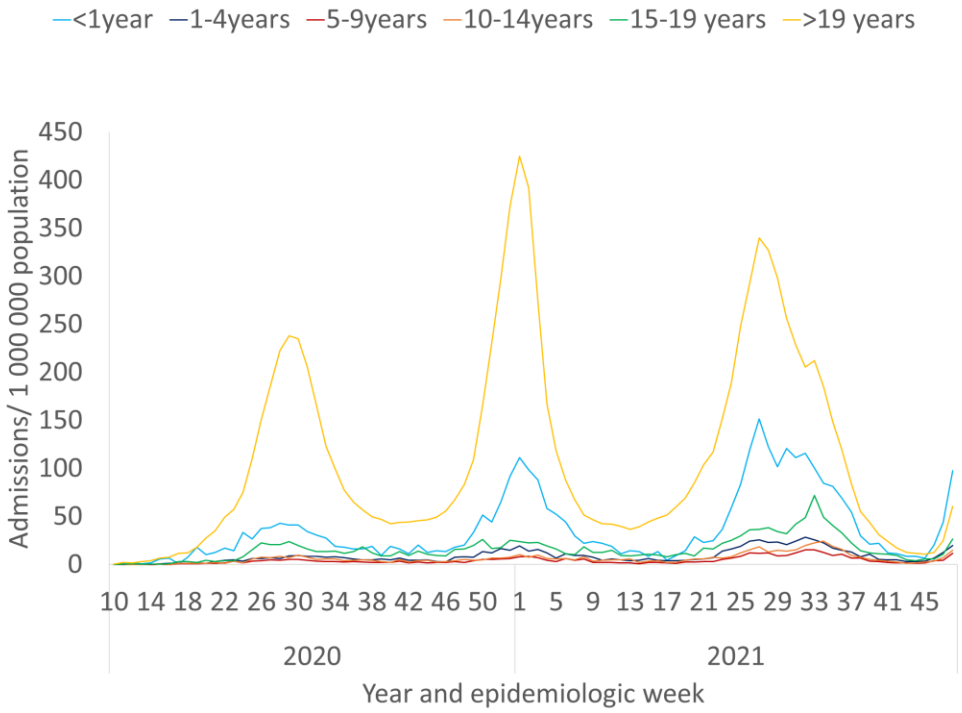
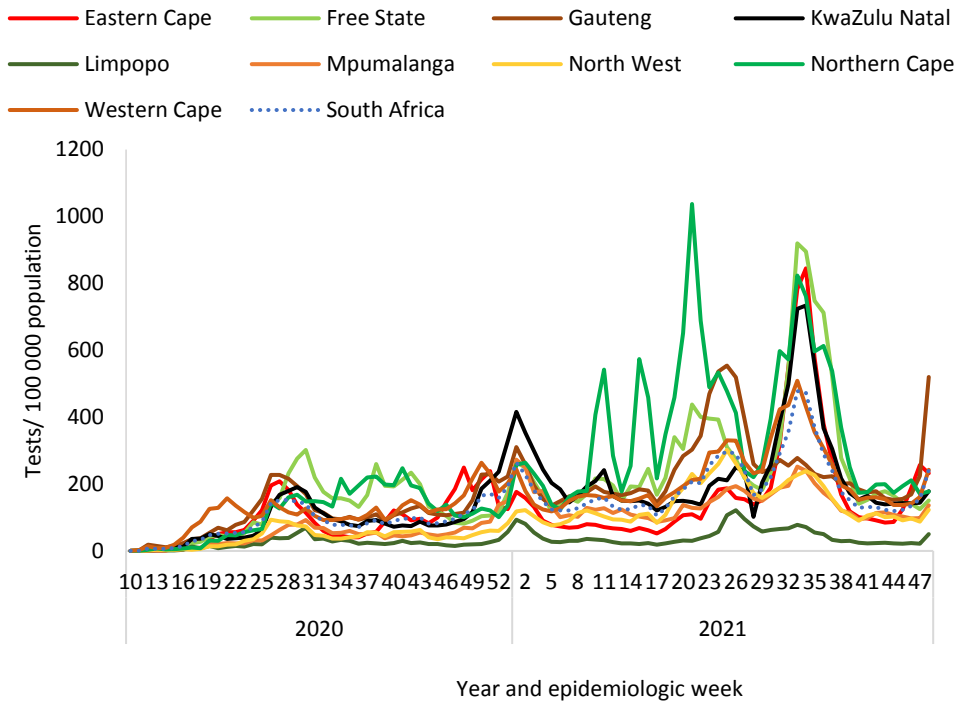
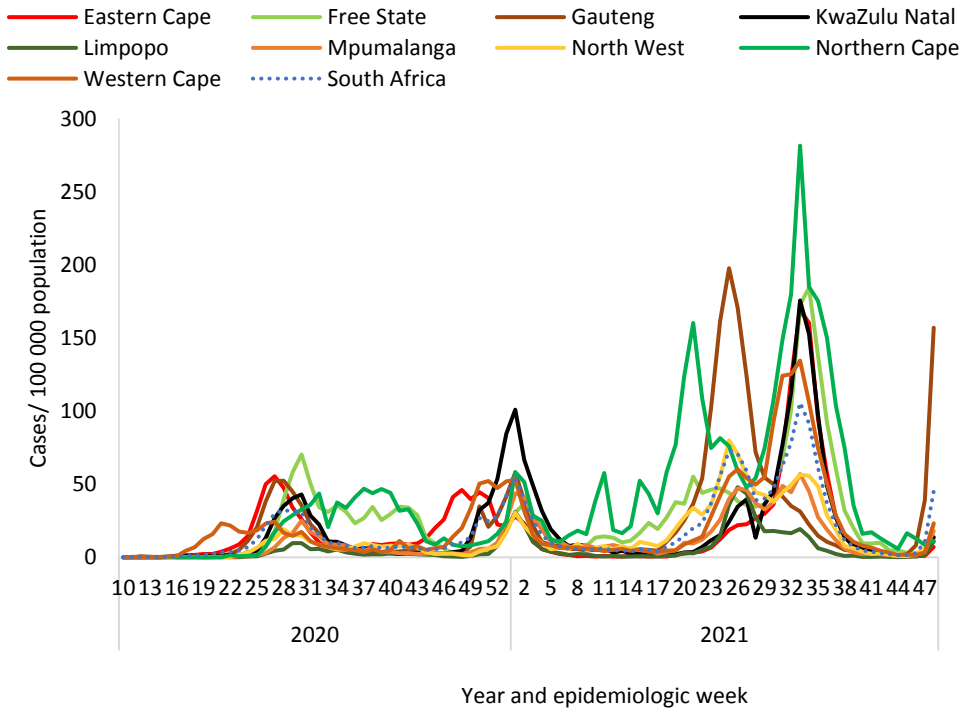

<1year
1-4years
5-9years
10-14years
15-19 years
>19 years
Admissions/ 1 000 000 population
450
400
350
300
250
200
150
100
50
0
10 14 18 22 26 30 34 38 42 46 50 1 5 9 13 17 21 25 29 33 37 41 45
2020
2021
Year and epidemiologic week

Fig 2: Rate of SARS-CoV-2 (a) testing, (b) cases and (c) admissions among individuals aged ≤19 years by epidemiologic week and province, South Africa, 1 March 2020 – 4 December 2021

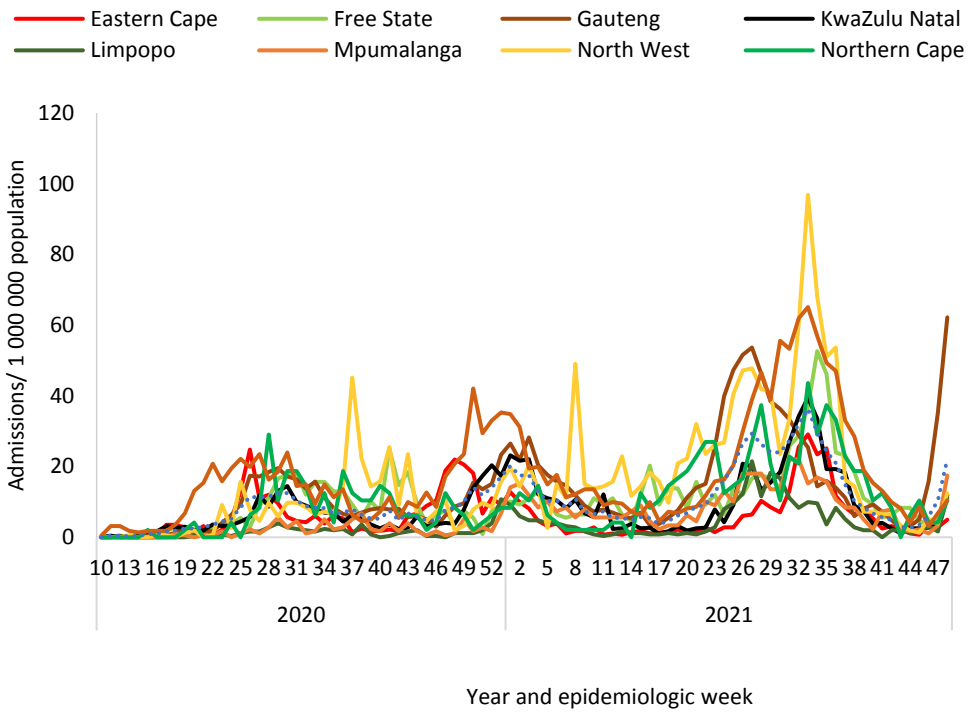
a



b



c


Eastern Cape
Free State
Gauteng
KwaZulu Natal
Limpopo
Mpumalanga
North West
Northern Cape
Admissions/ 1 000 000 population
120
100
80
60
40
20
0
10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 2 5 8 11 14 17 20 23 26 29 32 35 38 41 44 47
2020
2021
Year and epidemiologic week

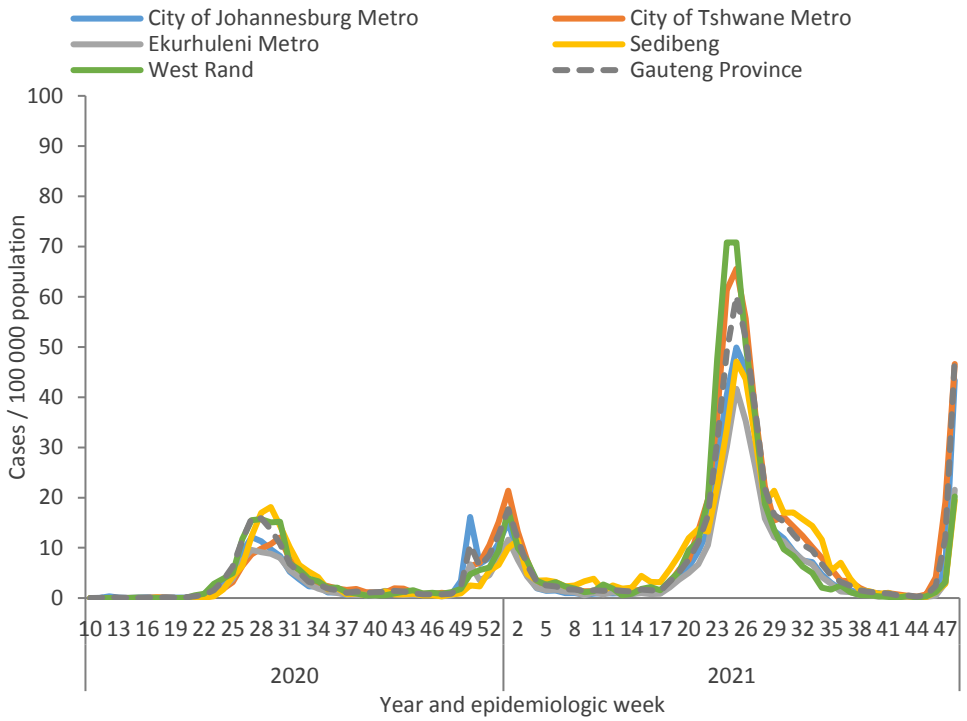
Gauteng SARS-CoV-2 case rate and admission rate among individuals aged ≤19 years

From the provincial analysis, Gauteng province has been experiencing a significant increase in case numbers and hospital admissions among individuals aged ≤19 years since week 45 in all districts. For week 48, the weekly incidence of cases per 100 000 populations among individuals aged ≤19 years in the City of Tshwane Metro was 47 followed by the City of Johannesburg Metro at 43, Ekurhuleni Metro at 22, West Rand at 20 and lastly Sedibeng at 19 (Figure 3a). The rate of admissions per 1 million population also showed a similar trend with the City of Tshwane Metro at 48 followed by the City of Johannesburg Metro at 13, West Rand at 13, Ekurhuleni Metro at 11, and lastly Sedibeng at 2 (Figure 3b). The rate of tests, cases and admissions by age group in Gauteng province reflects a similar trend to that of the national estimates described above (Figure 4a, b, c). The proportion of tests in children aged <1 year compared to total tests in the week, has decreased from 2.5% (week 46) to 1.9% (week 47) to 1.3% (week 48) and also decreased for 1-4 years from 2.9% (week 46) to 2.2% (week 47) to 2.0% (week 48) (Figure 5a). The proportion of cases in children <1 year compared to total cases in the week, has remained largely the same through the last three weeks at 0.5% (week 46), 0.6% (week 47) and 0.5% (week 48) but decreased for 1-4 years from 1.4% (week 46) to 1.3% (week 47) to 1.1% (week 48) (Figure 5b). The proportion of admissions in children <1 year compared to total admissions in the week, has decreased from 6% (week 46) to 5% (week 47 & 48) and also decreased for 1-4 years from 8% (week 46) to 5% (week 47) to 3% (week 48) (Figure 5c).

In the last three weeks from week 45 of 2021 to week 48 of 2021, the City of Johannesburg Metro district contributed the most to the observed increase in cases (2993/7089; 42.2%) while the City of Tshwane Metro district contributed the most to the observed increase in admissions (326/557; 58.5%) in Gauteng province compared to the other districts (Table 1).

Fig 3: Rate of SARS-CoV-2 (a) cases and (b) admissions among individuals aged ≤19 years by epidemiologic week and district, Gauteng, 1 March 2020 – 4 December 2021

a



b

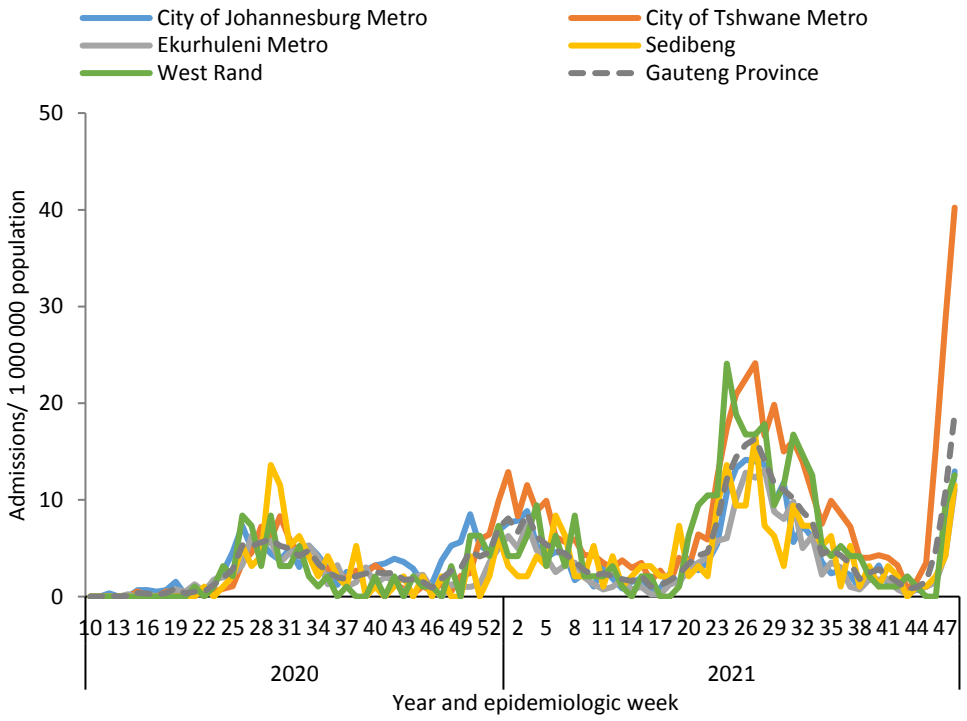
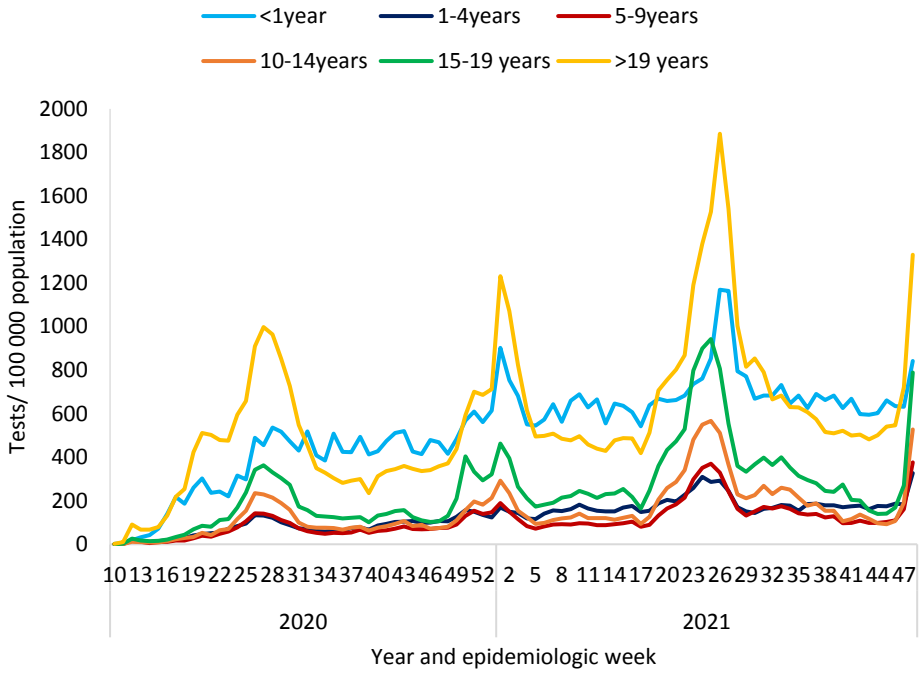
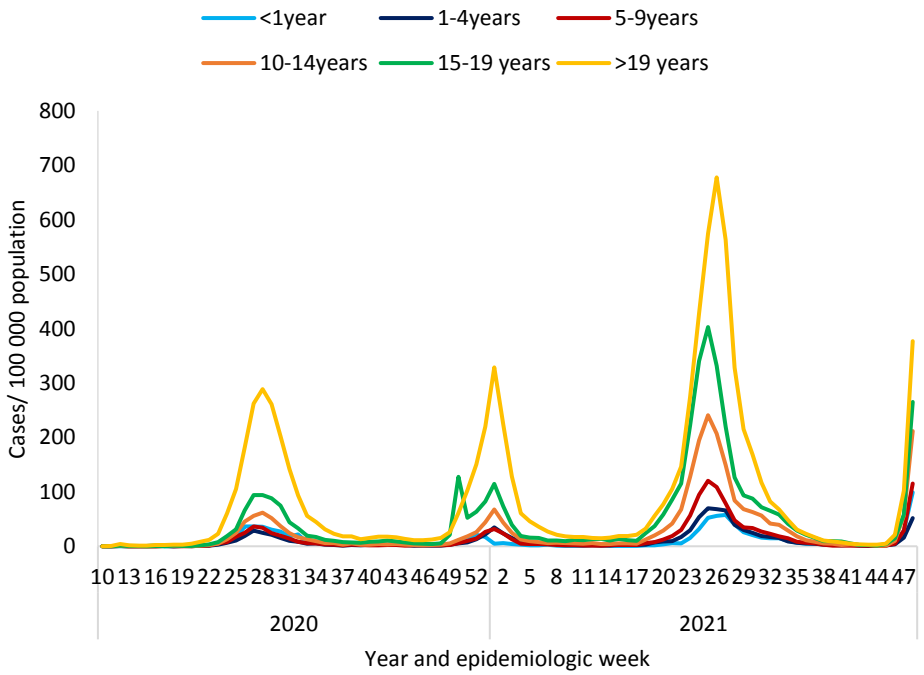


Fig 4: Rate of SARS-CoV-2 (a) testing, (b) cases and (c) admissions by epidemiologic week and age group, Gauteng, 1 March 2020 – 4 December 2021

a



b



c

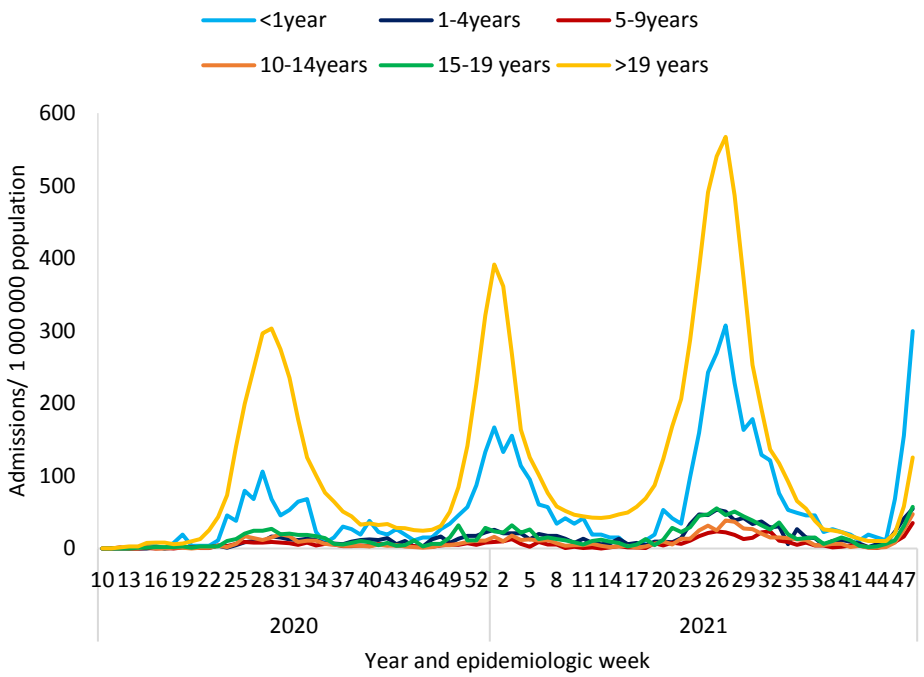
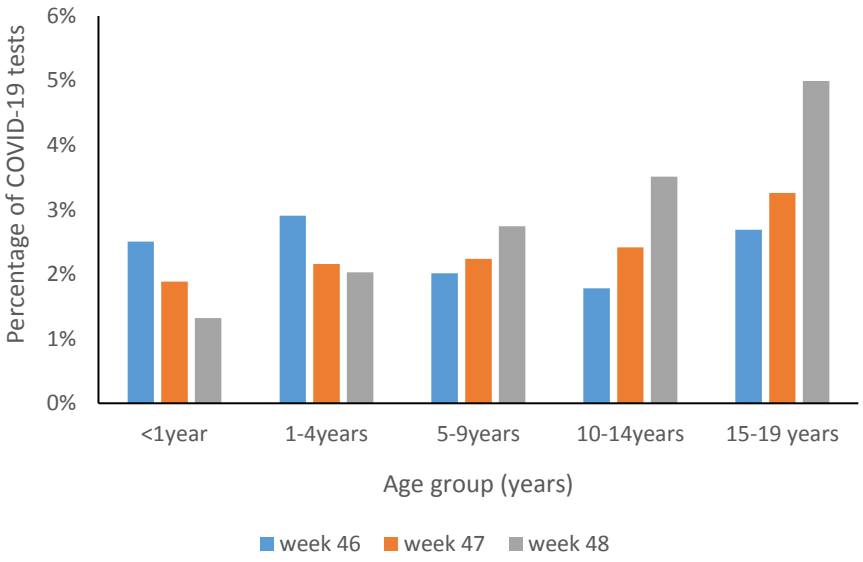
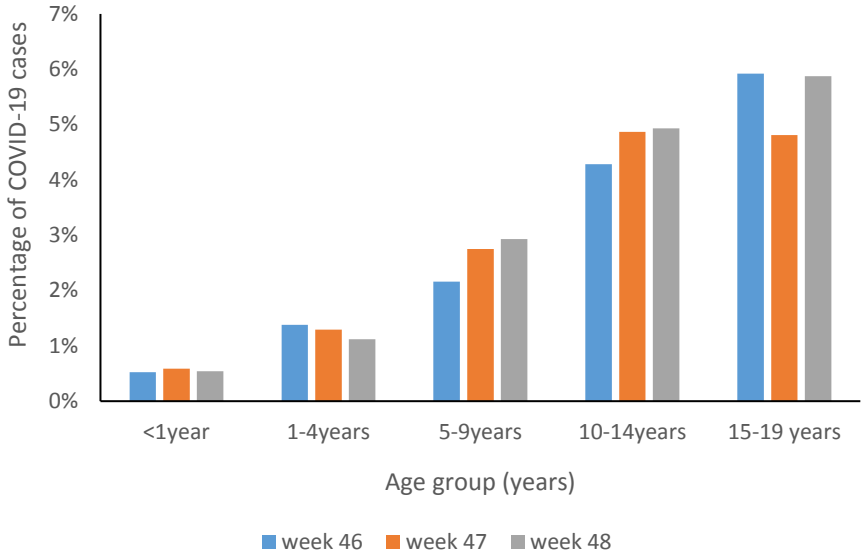


Fig 5: Percentage of SARS-CoV-2 (a) tests, (b) cases and (c) admissions by age group, Gauteng province, 14 November 2021 (week 46) – 4 December 2021 (week 48)

a



b


Percentage of COVID-19 cases
7%
6%
5%
4%
3%
2%
1%
0%
<1year
1-4years
5-9years
10-14years
15-19 years
Age group (years)
week 46
week 47
week 48

c

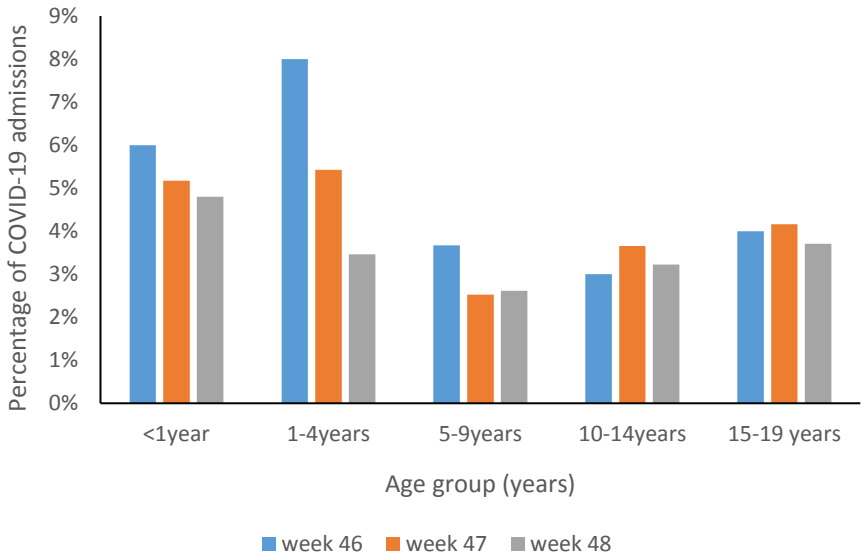

Percentage of COVID-19 admissions
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
<1year
1-4years
5-9years
10-14years
15-19 years
Age group (years)
week 46
week 47
week 48

Table 1: Number of SARS-CoV-2 cases, hospitalizations and in-hospital deaths among individuals aged ≤19, Gauteng province, between 7 November 2021 (week 45) and 4 December 2021 (week 48)

District	Cases since week 45	Admissions since week 45	Deaths since week 45
City of Johannesburg	2993 (42.2%)	121 (21.7%)	1 (11.1%)
City of Tshwane	2629 (37.1%)	326 (58.5%)	3 (33.3%)
Ekurhuleni	1004 (14.2%)	71 (12.8%)	3 (33.3%)
Sedibeng	226 (3.2%)	18 (3.2%)	0 (0.0%)
West Rand	237 (3.3%)	21 (3.8%)	2 (22.2%)
TOTAL	**7089**	**557**	**9**

DISCUSSION

This report presents data on the epidemiology and clinical features of individuals aged ≤19 years with laboratory-confirmed COVID-19 using data from two surveillance systems established for monitoring the COVID-19 pandemic in South Africa. Since the last report, South Africa exited its third wave and has entered a new resurgence since week 45 first emerging in Gauteng Province. This resurgence is driven by the emergence of the Omicron variant. The data presented showed that as of 4 December 2021 individuals aged ≤19 years made up 14.8% of SARS-CoV-2 tests, 12.5% of all laboratory-confirmed COVID-19 cases, 5.0% of COVID-19 associated admissions and 0.7% of COVID-19 associated deaths reported in South Africa despite comprising almost 37% of the population.

Our data showed increasing trends in testing, cases and hospitalisations among individuals ≤19 years from week 45 of 2021 however the increase in admissions is disproportionate to the increase in tests or cases hence these are unlikely to fully explain the increase in admissions (7). Prior to the emergence of Omicron in South Africa, there had already been a sustained increasing trend in respiratory admissions in children and adolescents for several weeks, likely related to increased circulation of other respiratory viruses following the relaxation of COVID-19 restrictions (21). It is possible therefore that many of the COVID-19 detections in this age group are incidental rather than the reason for admission. Other reasons for the increase in tests and cases could reflect a shift of cases to younger ages due to the gap in immunity between children and adults, less compliance with non-pharmaceutical interventions in this age group or relative increased infection of children with the new circulating variant Omicron for other reasons. A clinician report of the early clinical features of paediatric Omicron cases from the City of Tshwane district, suggests relatively low severity and that many admissions may be incidental (22). The DATCOV system captures all admissions with laboratory-confirmed COVID-19 including those admitted for other reasons. Additional details of the epidemiology of cases hospitalised in the City of Tshwane metro are included in the weekly DATCOV report (23).

The overall in-hospital case fatality risk was 7.5 times lower among individuals aged ≤19 years with complete outcome data compared to individuals aged >19 years. Even though absolute numbers of deaths remain substantially lower than those in adults, efforts should be made to promote and increase vaccinations among eligible adolescents and adults who come in contact with young children especially with underlying conditions placing them at increased risk of severe SARS-CoV-2. Adolescents 12- 17 years have been eligible for vaccination since the 20th of October 2021 in South Africa. While proportionately more hospitalisations have been seen in the <1-year age group in the City of Tshwane Metro, this trend seems to be stabilising with proportionately fewer in this age group with successive weeks since the emergence of Omicron. There remains a need to maintain heightened vigilance and consistent implementation of non-pharmaceutical interventions and discourage community and mass gatherings involving young people.

This analysis was subject to several limitations. First, both surveillance systems included only SARS-CoV-2-confirmed or tested COVID-19 cases or admissions and therefore asymptomatic cases would have been missed as well as individuals who were not tested. Testing approaches in South Africa have changed as the epidemic progressed potentially biasing characteristics of detected cases. In particular, increased use of antigen detection testing may bias numbers as individuals diagnosed with antigen tests are less likely to be reported and captured by surveillance systems as they may require manual reporting. Second information on underlying medical conditions is incomplete in the two surveillance systems and the section on underlying conditions has a generic list of specified underlying conditions which are not specific for children. Additional information on underlying conditions among admitted individuals aged ≤19 years is always being sought from reporting hospitals. Lastly, the indications or reasons for admission are mostly not provided. These would allow determination of whether the admission was due to COVID-19 disease for isolation purposes or other diseases.

In conclusion, the number of children and adolescents tested, diagnosed and admitted has been increasing in Gauteng since week 45 of 2021. Some admissions may have been for other reasons with SARS-CoV-2 as an incidental diagnosis. There is a need to ensure high compliance with respect to non-pharmaceutical interventions within households and communities of individuals aged ≤19 years, especially during the school holidays. There is also a need for more detailed ongoing data on the clinical presentation and severity of paediatric admissions to better understand the epidemiology of the disease in children with the Omicron variant.

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