

Pertussis

From January to October 2022, 59 of the 6 110 (1%) patients tested for *Bordetella pertussis* through the pneumonia surveillance at sentinel hospitals, tested positive. The increase that was first reported in July, continues, with the percentage of cases testing positive at 11,4 % (5/59) in July, 62% (23/59) in August, 44% (26/59) in September and 5% (3/59) in October (testing for October is ongoing) (Figure 3). The increase in laboratory-confirmed pertussis cases was predominantly from sentinel surveillance sites in Western Cape (Figure 4) followed by Gauteng and Mpumalanga Provinces, with detection rates of 2,7% (56/1 903), 2,3% (4/1 568) and 0,4% (3/838), respectively. Of all pertussis cases, 78% (46/59) were children under 5 years of age and of those, 61% (28/46) were children <3 months old. The latter group are too young to have completed the primary vaccination schedule and therefore would not have had full immunity against the disease.

Pertussis, commonly known as 'whooping cough' is a vaccine-preventable disease caused by *Bordetella pertussis* and is a category 1 notifiable medical condition. Clinicians are advised to have a high index of suspicion for pertussis, especially in very young children who may not present with typical symptoms. They are also advised to conduct diagnostic testing where appropriate, to notify cases and to prescribe post-exposure prophylaxis to close contacts of suspected or confirmed cases.

NICD recommendations for pertussis diagnosis, management and public health response may be found on the NICD web page (<http://www.nicd.ac.za/index.php/pertussis/>). Notification forms can be accessed at <http://www.nicd.ac.za/index.php/nmc/>. An alert for increased pertussis cases was released on 21 September 2022 (<https://www.nicd.ac.za/increase-in-pertussis-cases-in-south-africa-21-sept-2022/>)

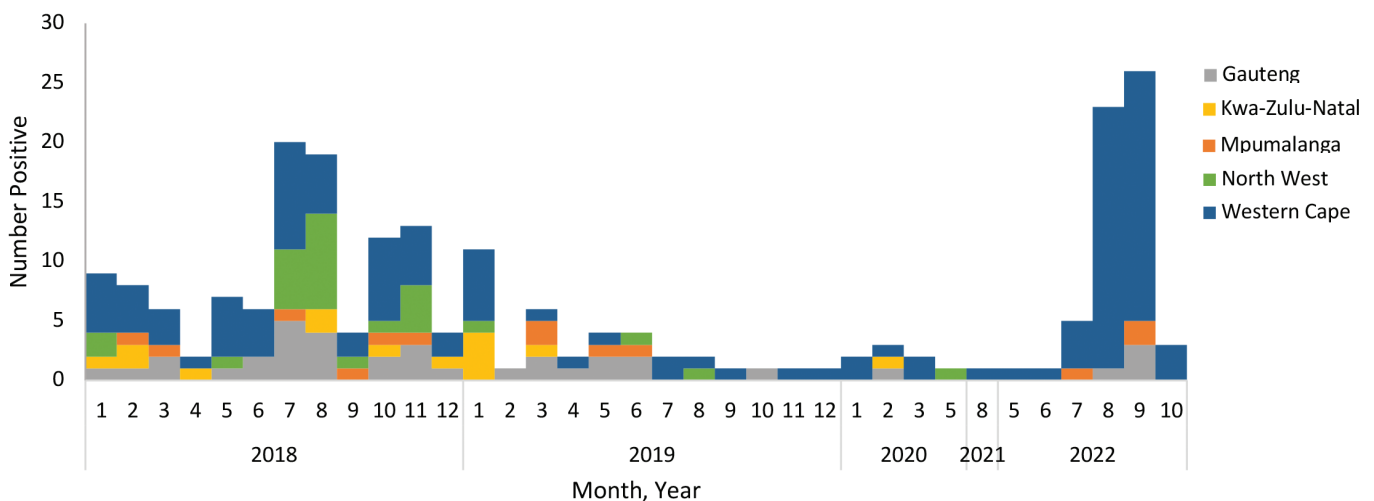


Figure 3. Number of laboratory-confirmed pertussis cases from pneumonia surveillance programme by year, month and province, 2018-2022

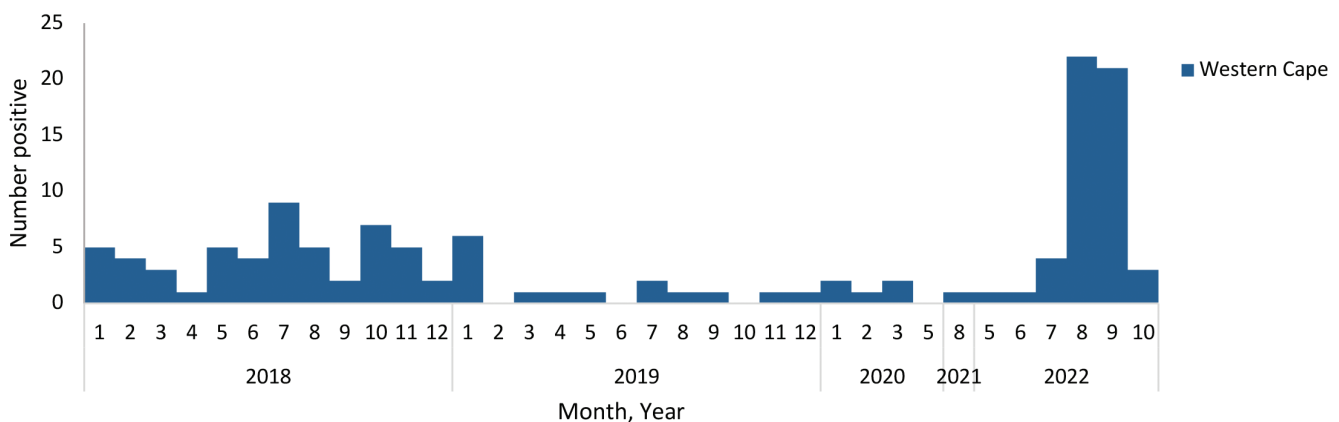


Figure 4. Number of laboratory-confirmed pertussis cases from pneumonia surveillance programme by year, month in Western Cape, 2018-2022.

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

COVID-19

From 3 March 2020 through to 15 October 2022 (epidemiological week 41), a total of 21 232 779 PCR tests for SARS-CoV-2, 4 023 655 laboratory-confirmed COVID-19 cases, 543 678 admissions and 104 435 deaths were reported in South Africa. In epidemiological week 41, the PCR testing rate was highest in Western Cape Province (55 per 100 000 persons) and lowest in Limpopo Province (6 per 100 000 persons). The percentage testing positive (PTP) in week 41 was highest in Gauteng Province (4,0%) and lowest in Mpumalanga (4,2%) and was significantly higher in week 41 (9,4%) compared to week 40 (7,2%), $p < 0.05$.

The PTP has been on an increasing trend since week 36, where it was 4.6%. The highest weekly incidence risk was reported in Gauteng Province (7,8% cases per 100 000 persons), and the lowest in Limpopo Province (0,7% cases per

100 000 persons), with an overall 27,2% increase in new cases in epidemiological week 41 (2 271) as compared to week 40 (1 786).

The highest weekly proportion of admissions was reported in Gauteng Province (40,1%), and the lowest was in Northern Cape Province (0,8%), with an overall 21,0% decrease in new admissions in week 41 (232) compared to epidemiological week 40 (293). In summary, the testing rate has continued to decline, whilst the PTP has been on an increasing trend over the past six weeks, and the weekly incidence has been increasing since week 38. The number of admissions and deaths has remained low and stable over the past few weeks. Individuals eligible for COVID-19 vaccines are encouraged to vaccinate and to get booster shots as indicated in order to reduce their risk of severe disease.

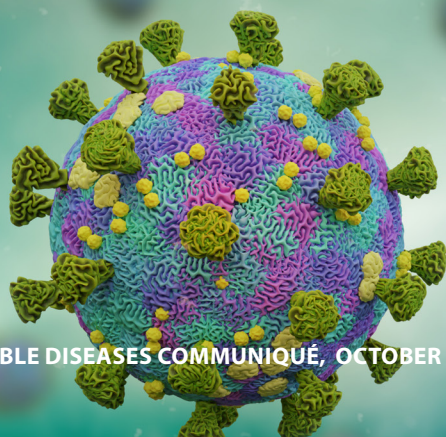
Table 1. Number and cumulative incidence risk of SARS-CoV-2 PCR testing, laboratory-confirmed cases of COVID-19, admissions and deaths per 100 000 persons by province, South Africa, 3 March 2020 – 15 October 2022

Province	Cumulative cases (n) (percentage, n/ total cases in South Africa)	Population in mid-2021 ¹ , n	Cumulative testing rate per 100,000	Cumulative incidence risk of cases / 100,000	Cumulative incidence risk of admissions / 100,000	Cumulative incidence risk of deaths / 100,000
Eastern Cape	365 184 (9.1)	6 676 590	24599.4	5 469.6	731.5	199.3
Free State	216 812 (5.4)	2 932 441	42533.7	7 393.6	1114.7	209.9
Gauteng	1 334 633 (33.2)	15 810 388	50213.5	8 441.5	1016.5	194.1
KwaZulu-Natal	719 808 (17.9)	11 513 575	32050.1	6 251.8	777.7	152.9
Limpopo	160 277 (4.0)	5 926 724	10323.5	2 704.3	357.8	90.0
Mpumalanga	203 049 (5.0)	4 743 584	22523.9	4 280.5	486.1	104.0
North West	202 949 (5.0)	4 122 854	22565.6	4 922.5	831.3	121.7
Northern Cape	115 504 (2.9)	1 303 047	43125.6	8 864.2	915.0	188.8
Western Cape	705 436 (17.5)	7 113 776	49446.4	9 916.5	1707.1	266.1
Unknown	3					
Total	4 023 655	60 142 978	35303.8	6 690.1	904.0	173.6

¹2021 Mid-year population Statistics South Africa

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

SARS-COV-2 virus



Influenza in South Africa

As of 3 January 2022 to 16 October 2022 (week 39), 373 cases of influenza have been detected from pneumonia surveillance (public hospitals) sentinel sites. Of which 146 (49%) were influenza A(H1N1)pdm09, 104 (35%) influenza A(H3N2), 11 (4%) influenza A(subtype inconclusive), 8 (3%) influenza A(pending results), 89 (30%) influenza B(Victoria), 11 (4%) influenza B(lineage inconclusive) and 5 (2%) influenza B(pending results) (Figure 5).

The 2022 influenza season started in week 17 (week starting 25 April 2022) when the detection rate among patients in pneumonia surveillance breached the epidemic threshold as determined by the Moving Epidemic Method (MEM) and in week 41, the impact was low (Figure 6). The 2022 seasonal

wave so far was of low impact, with a seasonal peak in week 25 (week starting 20 June 2022) and a second peak in week 39 (week starting 26 September 2022). In recent weeks, a decline in detection rate of the second wave (week 32 - week 41) is noted. The majority of cases were children under 5 years old (155/373, 42%). Most cases were enrolled from Gauteng Province (88/373, 24%) followed by Western Cape Province sentinel sites (78/373, 21%).

It is better to vaccinate before the start of influenza season. However, flu continues to circulate and as a result the Department of Health extended the vaccination campaign. Clinicians are encouraged to continue to recommend flu vaccination to their patients.

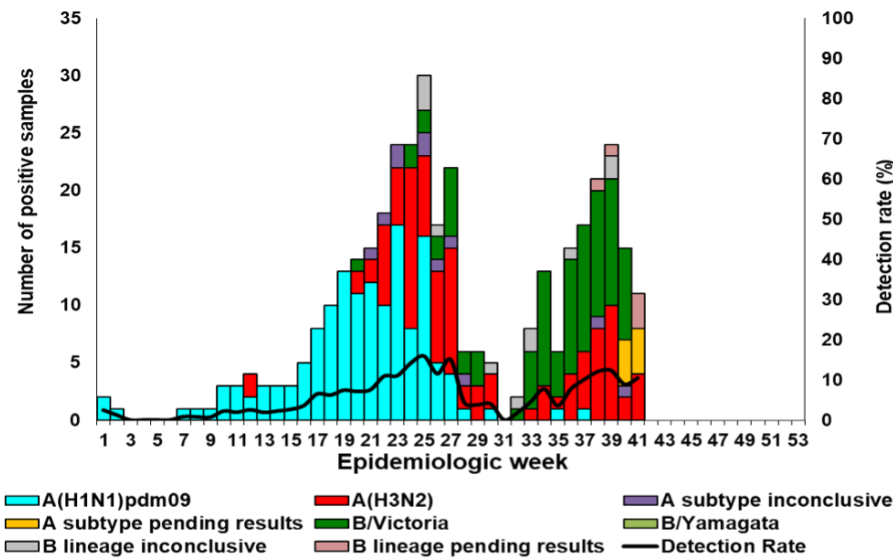


Figure 5. Number of influenza positive cases by influenza subtype and lineage and detection rate by week, pneumonia surveillance public hospitals, 03/01/2022 – 16/10/2022

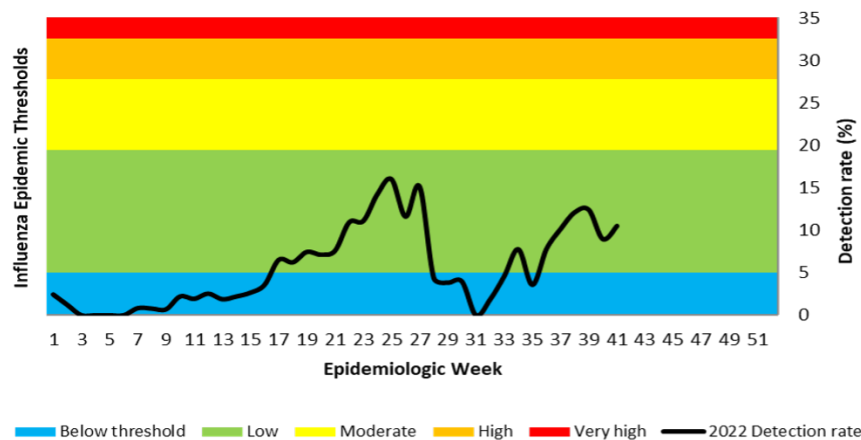


Figure 6. Influenza percentage detections and epidemic thresholds among cases of all ages, pneumonia surveillance public hospitals, 03/01/2022 – 16/10/2022

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

Influenza vaccine effectiveness in South Africa

The effectiveness of the trivalent/quadrivalent seasonal influenza vaccine (TIV/QIV) to prevent influenza-associated medically attended acute respiratory illness was assessed using a test-negative case control study design. Patients meeting the case definition for influenza-like illness presenting to an outpatient influenza sentinel surveillance programme (Viral Watch) in South Africa were enrolled during the 2022 influenza season.

Of the 521 surveillance cases enrolled in the VW programme during the season and included in vaccine effectiveness (VE) analysis (aged >6 months with known vaccination status), 207 (40%) were classified as cases (influenza test positive) and 314 (60%) as controls (influenza test negative).

Vaccine coverage was 12% (61/521) overall in the VW programme (Table 2): 6% (12/207) and 16% (49/314) among cases and controls respectively. Coverage was highest in the ≥65 years age group (53%) and lowest among cases aged <18 years (8.8%).

The overall (any influenza) VE estimate, adjusted for age and seasonality was 65% (95% confidence interval (CI): 30%, 82%) (Table 3). Influenza A(H1N1)pdm09 VE estimate, adjusted for age and seasonality was 46% (95% CI: -20%, 76%). The influenza A(H3N2) estimate, adjusted for age and seasonality was 91% (95% CI: 31%, 99%). VE was not able to be determined for B/Victoria due to small numbers.

Table 2. Vaccine coverage and vaccine effectiveness (VE) by age group and timing within season, 2022

	Vaccine coverage			Unadjusted VE % (95% confidence interval)
	Cases n/N (%)	Controls n/N (%)	Total n/N (%)	
All	12/207 (6)	49/314 (16)	61/521 (12)	66.7 (35.7, 82.8)
<18 years	4/72 (6)	10/86 (12)	14/158 (9)	55.3 (-49.1, 86.6)
18-64 years	7/128 (6)	28/201 (14)	47/329 (10)	62.3 (15.5, 84.8)
≥65 years	1/7 (1)	11/27 (41)	18/34 (53)	75.8 (-130.4, 97.5)
Early-season (week 16-21)	3/47 (6)	9/96 (9)	12/143 (8)	34.1 (-155.8, 83.2)
Mid-season (week 22-27)	7/113 (6)	20/117 (17)	27/230 (12)	68.0 (20.9, 87.0)
Late-season (week 28-31)	2/47 (4)	20/101 (20)	22/148 (15)	82.0 (19.4, 96.0)

Table 3. Vaccine coverage and vaccine effectiveness (VE) by influenza subtype, adjusted by age and seasonality, 2022

	Vaccine coverage			Unadjusted VE % (95% confidence interval)
	Cases n/N (%)	Controls n/N (%)	Total n/N (%)	
Any influenza	12/207 (5.8)	49/314 (15.6)	61/521 (11.7)	64.5 (29.9-82.0)
Influenza A(H1N1)pdm09	9/122 (7.4)	49/314 (15.6)	58/436 (13.3)	45.8 (-20,75.5)
Influenza A (H3N2)	1/58 (1.7)	49/331 (14.8)	50/389 (12.8)	90.8 (31.4,98.8)

Recommended Southern Hemisphere influenza vaccine formulation for 2023

South Africa is a Southern Hemisphere country with a temperate climate and with influenza epidemics usually occurring between April and October, with a peak during the winter months. The following strains are recommended for 2023 trivalent and quadrivalent inactivated influenza vaccine (IIV) Southern Hemisphere influenza season:

Egg-based tri/quadri-valent vaccines including

- an A/Sydney/5/2021 (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 only)

The 2023 recommendations include a change to the A(H1N1)pdm09 component of egg-based vaccines strains compared with the 2022 Southern Hemisphere trivalent and quadrivalent IIV. For A(H1N1)pdm09 vaccine virus component, A/Victoria/2570/2019 (H1N1)pdm09-like virus was replaced with A/Sydney/5/2021 (H1N1)pdm09-like virus. In South Africa, the trivalent IIV was only available in the public sector (at designated clinics and hospitals), the quadrivalent IIV was available mostly in the private sector with limited doses in public sector, generally from March or April. Either trivalent or quadrivalent IIV may be used during 2023 flu season depending on availability.

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