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Respiratory Pathogen Surveillance

Programme Descriptions

Programme	Influenza-like illness (ILI)	Viral Watch	National syndromic surveillance for pneumonia	Private hospital consultations
Start year	2012	1984	2009	2002
Provinces*	KZ NW WC**	EC FS GP LP MP NC NW WC	GP KZ MP NW WC	EC FS GP LP MP NW WC
Type of site	Primary health care clinics	General practitioners	Public hospitals	Private hospitals
Case definition	An acute respiratory illness with a temperature ($\geq 38^{\circ}\text{C}$) and cough, & onset ≤ 10 days	An acute respiratory illness with a temperature ($\geq 38^{\circ}\text{C}$) and cough, & onset ≤ 10 days	Acute or chronic lower respiratory tract infection	ICD codes J10-J18
Specimens collected	Oropharyngeal & nasopharyngeal swabs	Throat and/or nasal swabs or Nasopharyngeal swabs	Oropharyngeal & nasopharyngeal swabs	Not applicable
Main pathogens tested***	INF RSV BP	INF RSV BP	INF RSV BP	Not applicable

Epidemic Threshold

Thresholds are calculated using the Moving Epidemic Method (MEM), a sequential analysis using the R Language, available from: <http://CRAN.R-project.org/web/package=mem>) designed to calculate the duration, start and end of the annual influenza epidemic. MEM uses the 40th, 90th and 97.5th percentiles established from available years of historical data to calculate thresholds of activity. Thresholds of activity for influenza and RSV are defined as follows: Below seasonal threshold, Low activity, Moderate activity, High activity, Very high activity. For influenza, thresholds from outpatient influenza like illness (Viral Watch Programme) are used as an indicator of disease transmission in the community and thresholds from pneumonia surveillance are used as an indicator of impact of disease.

* EC: Eastern Cape; FS: Free State; GP: Gauteng; KZ: KwaZulu-Natal; LP: Limpopo; MP: Mpumalanga; NC: Northern Cape; NW: North West; WC: Western Cape

**Started in 2019

***INF: influenza virus; RSV: respiratory syncytial virus; BP: *Bordetella pertussis*

Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

Results until end of epidemiologic week 22(2019)

Comments:

Influenza

The 2019 season started in week 16 (week ending 21 April) when influenza detection in the Viral Watch programme rose above the seasonal threshold, as determined by the Moving Epidemic Method. Influenza transmission is currently high and impact is moderate.

ILI programme: In 2019 to date, specimens from 786 patients were received from 3 ILI sites. Influenza was detected in 61 (7.8%) specimens, 12 were identified as influenza A(H1N1)pdm09 and 49 as influenza A(H3N2).

Viral Watch programme: During the same period, specimens were received from 443 patients from Viral Watch sites in 6 provinces. Influenza was detected in 271 (61.2%) patients, of which 18 were influenza A(H1N1)pdm09, 249 influenza A(H3N2) and 4 A subtype inconclusive. Of these, 7 gave a history of travel to the Northern Hemisphere.

Pneumonia surveillance: In this time period, specimens from 1942 patients with severe respiratory illness (SRI) were received from the 6 sentinel sites. Influenza was detected in 61 (3.1%) patients, influenza A(H1N1)pdm09 in 5, influenza A(H3N2) in 53, A subtype inconclusive in 2 and influenza B(Yamagata) in 1.

Respiratory syncytial virus

The 2019 RSV season started in week 8 (week starting 18 February) when RSV detections in pneumonia surveillance rose above the seasonal threshold, as determined by the Moving Epidemic Method.

In 2019 to date, RSV has been detected in the specimens of 106 (13.5%) patients in the ILI programme, 601 (30.1%) patients in the pneumonia surveillance programme and in 15 (3.4%) patients in the Viral Watch programme. The detection rate for RSV continues to go down in pneumonia surveillance programme following a peak in week 17 (week starting 29 April).

Bordetella pertussis

ILI programme: From 1 January 2019 to date, combined nasopharyngeal and oropharyngeal specimens were tested from 749 patients for *B. pertussis*, 8 (1.1%) tested positive.

Pneumonia surveillance: During the same period, combined nasopharyngeal and oropharyngeal specimens were tested from 1869 patients for *B. pertussis*, which was detected in 23 (1.2%) specimens.

In addition, *B. pertussis* was detected in 1 of 74 (1.4 %) specimens from patients who did not meet the pneumonia/ILI surveillance case definition, but who did meet the suspected pertussis case definition.

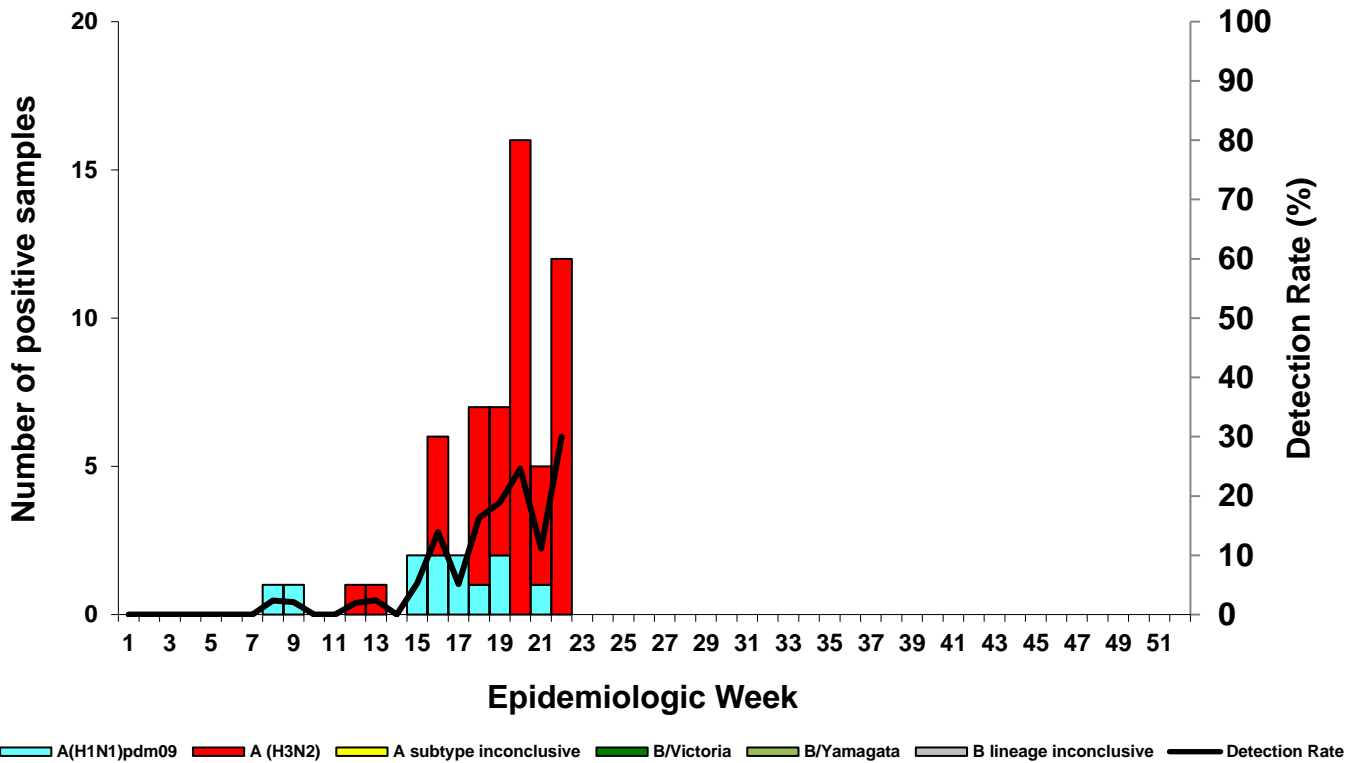
Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

Results until end of epidemiologic week 22(2019)

Influenza-like illness (ILI) surveillance primary health care clinics

Figure 1. Number of positive samples* by influenza subtype and lineage and detection rate by week**



*Specimens from patients with influenza-like illnesses at 3 sentinel sites in 3 provinces

**Only reported for weeks with >10 specimens submitted

Inconclusive: insufficient viral load in sample and unable to characterise further

Table 1. Cumulative number of influenza subtype and lineage and total number of samples tested by clinic and province

Clinic (Province)	A(H1N1)pdm09	A(H3N2)	A subtype inconclusive	B/Victoria	B/Yamagata	B lineage inconclusive	Total samples
Eastridge (WC)	11	47	0	0	0	0	497
Edendale Gateway (KZ)	0	0	0	0	0	0	40
Jouberton (NW)	1	2	0	0	0	0	249
Total:	12	49	0	0	0	0	786

KZ: KwaZulu-Natal; NW: North West; WCP: Western Cape

Inconclusive: insufficient viral load in sample and unable to characterise further

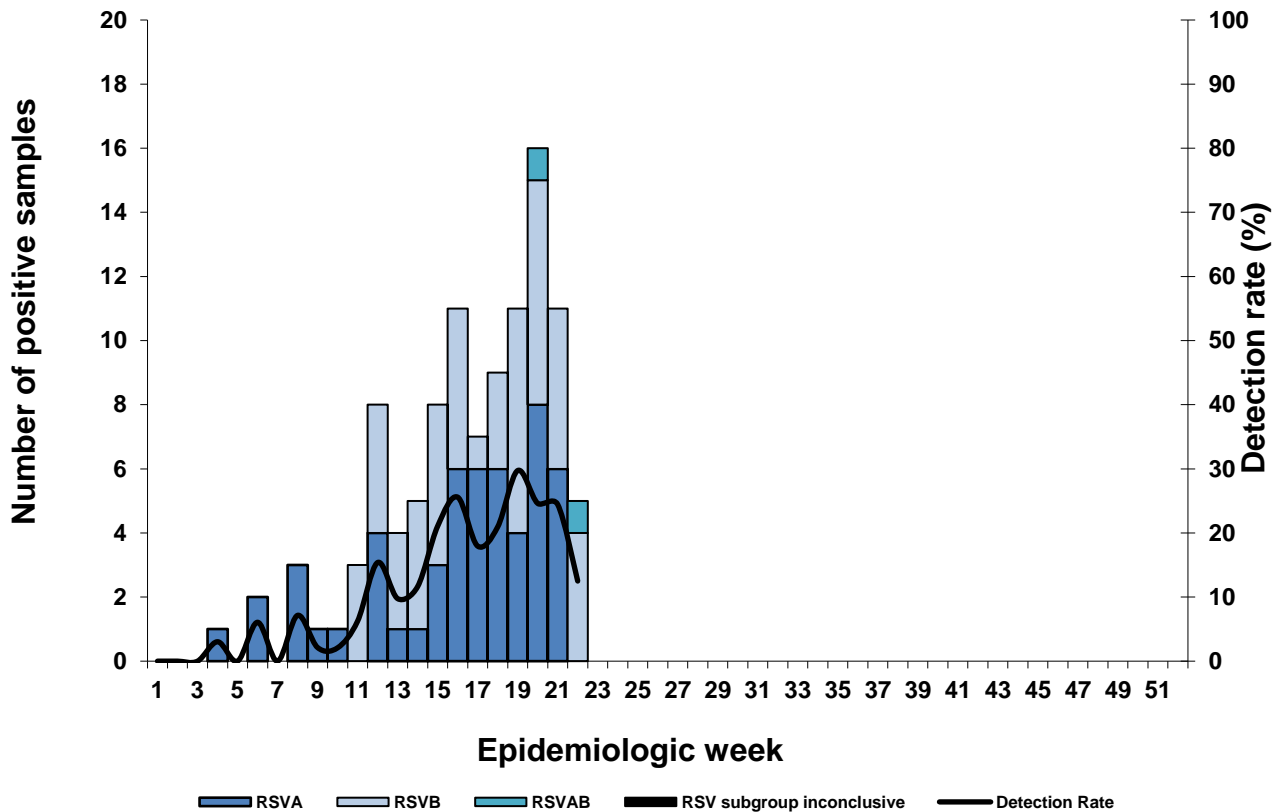
Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

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Influenza-like illness (ILI) surveillance primary health care clinics

Figure 2. Number of samples testing positive for respiratory syncytial virus by subgroup and detection rate by week



Inconclusive: insufficient viral load in sample and unable to characterise further
 RSV AB: Both RSV A and B subgroup identified

Table 2. Cumulative number of respiratory syncytial virus subgroups identified and total number of samples tested by clinic and province

Clinic (Province)	RSVA	RSVB	RSVAB	RSV subgroup inconclusive	Total samples
Eastridge (WC)	20	50	1	0	497
Edendale Gateway (KZ)	5	0	0	0	40
Jouberton (NW)	28	1	1	0	249
Total	53	51	2	0	786

KZ: KwaZulu-Natal; NW: North West; WC: Western Cape
 Inconclusive: insufficient viral load in sample and unable to characterise further
 RSV AB: Both RSV A and B subgroup identified

Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

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Influenza-like illness (ILI) surveillance primary health care clinics

Figure 3. Number of samples testing positive for *B. pertussis* and detection rate by month

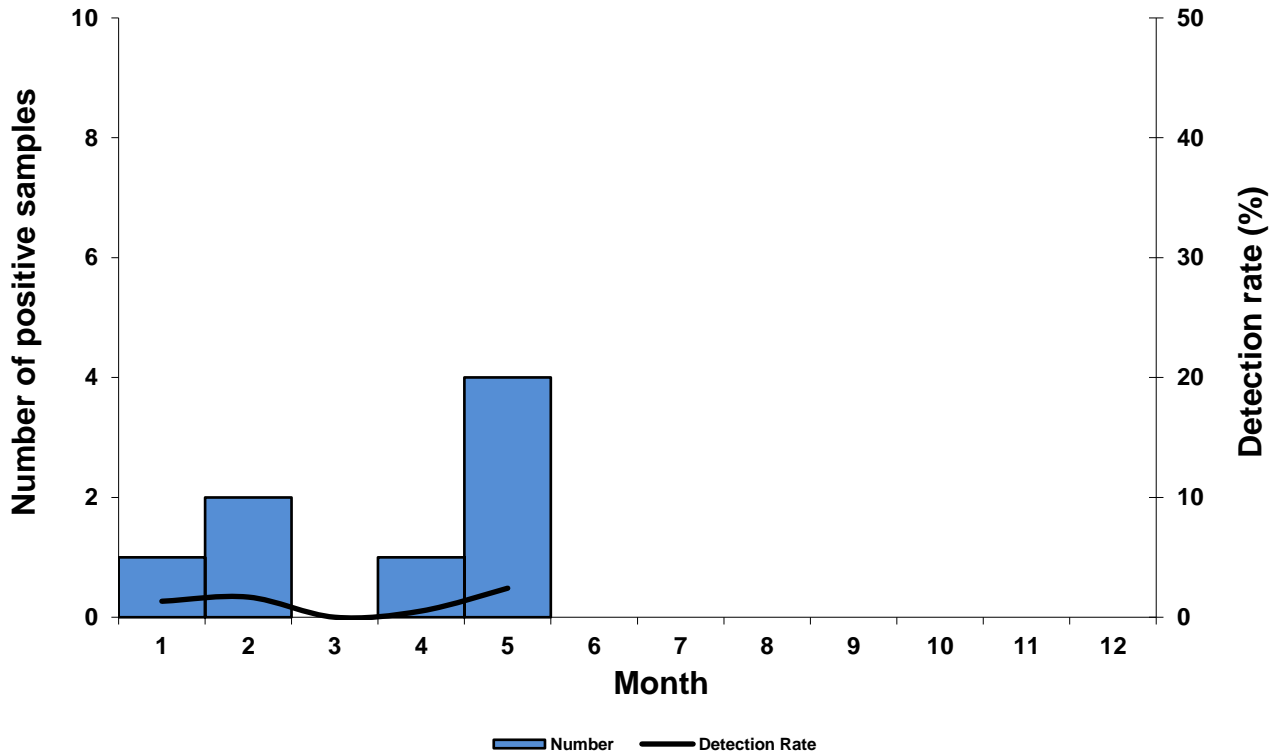


Table 3. Cumulative number of *B. pertussis* identified and total number of samples tested by province**

Clinic (Province)	<i>B. pertussis</i> Positive**	Total samples
Eastridge (WC)	3	470
Edendale Gateway (KZ)	2	36
Jouberton (NW)	3	243
Total:	8	749

KZ: KwaZulu-Natal; NW: North West; WC: Western Cape

**12 cases met the suspected pertussis case definition but did not meet Influenza-like illness (ILI) case definition. These are not included in the table or the epidemiological curve

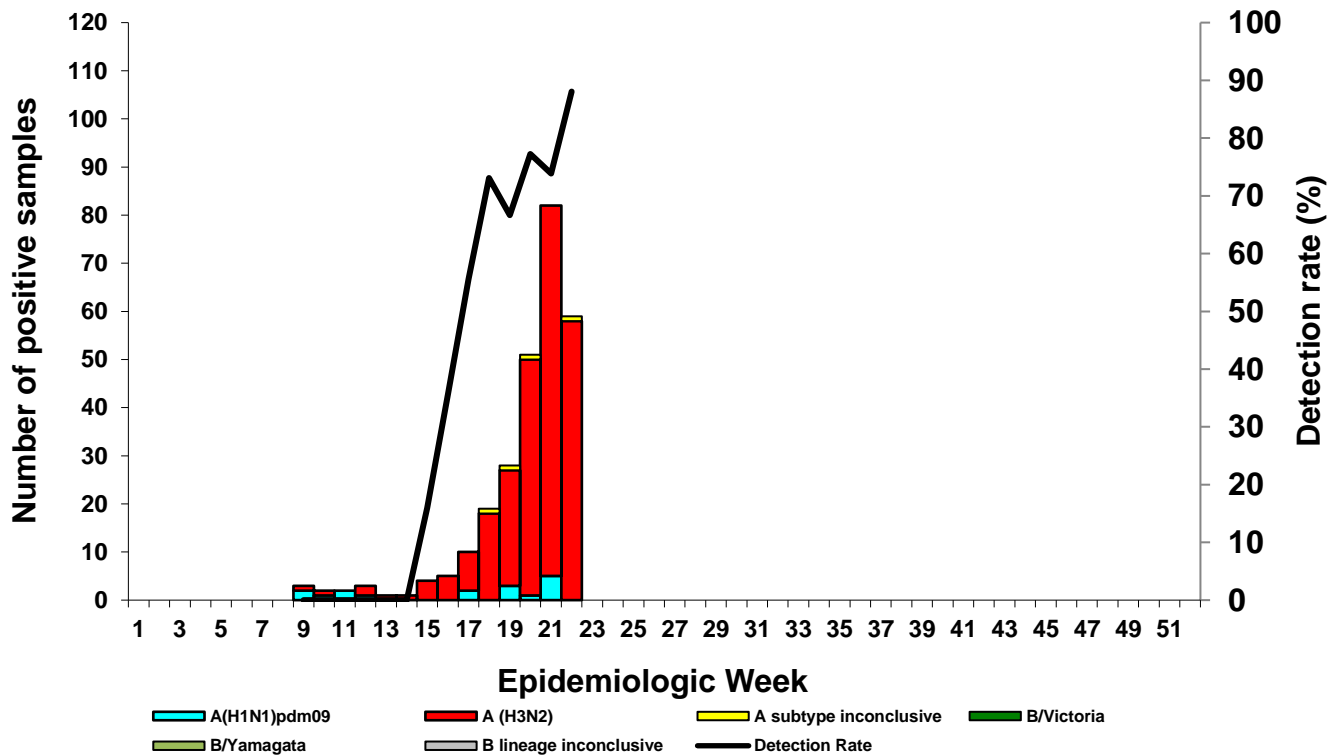
Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

Results until end of epidemiologic week 22(2019)

Influenza-like illness (ILI) surveillance Viral Watch

Figure 4. Number of positive samples* by influenza subtype and lineage and detection rate by week**



*Specimens from patients with Influenza-like illnesses at 90 sentinel sites in 6 provinces

** Only reported for weeks with >10 specimens submitted.

Inconclusive: insufficient viral load in sample and unable to characterise further

Table 4. Cumulative number of influenza subtype and lineage and total number of samples tested by province

Province	A(H1N1)pdm09	A(H3N2)	A subtype inconclusive	B/Victoria	B/Yamagata	B lineage inconclusive	Total samples
Eastern Cape	1	26	2	0	0	0	36
Free State	0	33	0	0	0	0	36
Gauteng	4	65	0	0	0	0	163
Limpopo	0	2	0	0	0	0	3
Mpumalanga	1	7	0	0	0	0	18
North West	0	0	0	0	0	0	0
Northern Cape	0	0	0	0	0	0	0
Western Cape	12	116	2	0	0	0	187
Total:	18	249	4	0	0	0	443

Inconclusive: insufficient viral load in sample and unable to characterise further

From 01 January 2019 to date, 25 patients were tested for influenza at the time of entry into South Africa following travel abroad and influenza was detected in 3 patients, of which one were influenza A(H1N1)pdm09 and 2 influenza A(H3N2).

Patients known to have acquired influenza abroad are not included in the table or epidemiological curve.

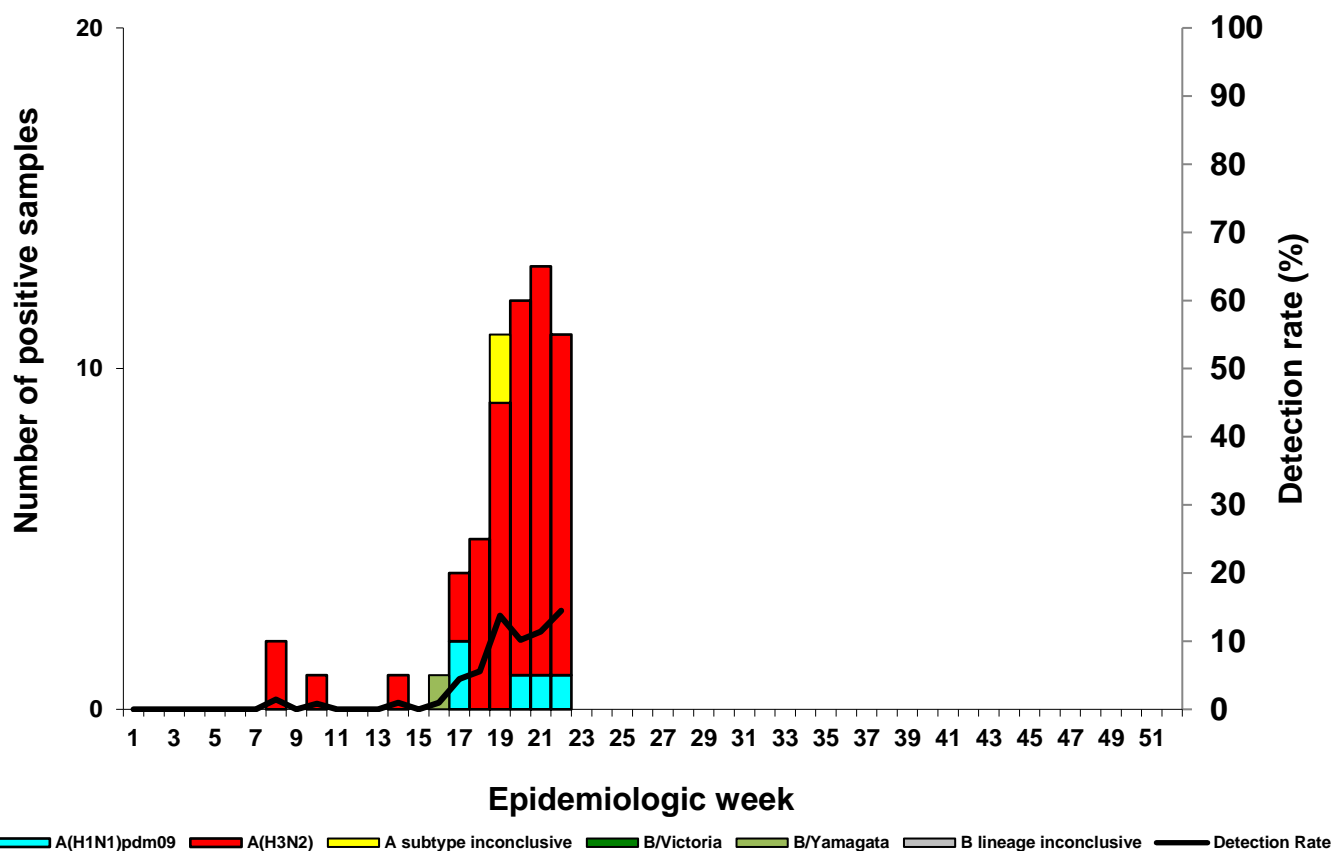
Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

Results until end of epidemiologic week 22(2019)

National syndromic surveillance for pneumonia

Figure 6. Number of positive samples* by influenza subtype and lineage and detection rate by week**



*Specimens from patients hospitalised with pneumonia at 6 sentinel sites in 5 provinces

**Only reported for weeks with >10 specimens submitted

Inconclusive: insufficient viral load in sample and unable to characterise further

Table 5. Cumulative number of identified influenza subtype and lineage and total number of samples tested by hospital

Hospital (Province)	A(H1N1)pdm09	A(H3N2)	A subtype inconclusive	B/Victoria	B/Yamagata	B lineage inconclusive	Total samples
Edendale (KZ)	0	0	0	0	0	0	368
Helen Joseph-Rahima Moosa (GP)	0	10	1	0	0	0	506
Klerksdorp-Tshepong (NW)	0	2	0	0	0	0	267
Mapulaneng-Matikwana (MP)	0	3	1	0	1	0	210
Red Cross (WC)	3	25	0	0	0	0	440
Mitchell's Plain (WC)	2	13	0	0	0	0	151
Total:	5	53	2	0	1	0	1942

GP: Gauteng; KZ: KwaZulu-Natal; NW: North West; MP: Mpumalanga; WC: Western Cape

Inconclusive: insufficient viral load in sample and unable to characterise further

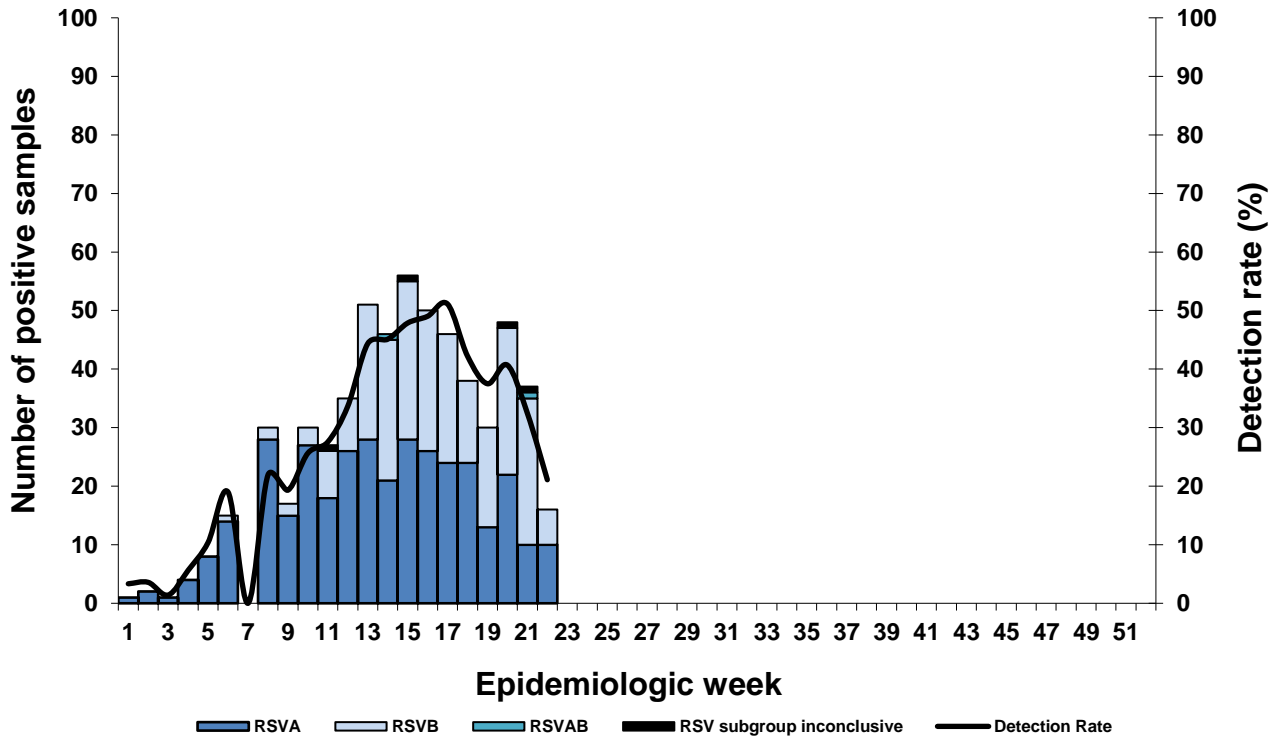
Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

Results until end of epidemiologic week 22(2019)

National syndromic surveillance for pneumonia

Figure 8. Number of samples testing positive for respiratory syncytial virus by subgroup and detection rate by week



Inconclusive: insufficient viral load in sample and unable to characterise further
 RSV AB: Both RSV A and B subgroup identified

Table 6. Cumulative number of respiratory syncytial virus subgroups identified and total number of samples tested by hospital

Hospital (Province)	RSVA	RSVB	RSVAB	RSV subgroup inconclusive	RSV positive (pending subgroup)	Total samples
Edendale (KZ)	121	5	0	1	0	368
Helen Joseph-Rahima Moosa (GP)	99	52	1	0	0	506
Klerksdorp-Tshepong (NW)	29	6	0	1	1	267
Mapulaneng-Matikwana (MP)	48	1	0	0	0	210
Red Cross (WC)	36	132	1	2	9	440
Mitchell's Plain (WC)	17	36	0	0	3	151
Total:	350	232	2	4	13	1942

GP: Gauteng; KZ: KwaZulu-Natal; NW: North West; MP: Mpumalanga; WC: Western Cape

Inconclusive: insufficient viral load in sample and unable to characterise further

RSV AB: Both RSV A and B subgroup identified

RSV positive (pending subgroup): these cases are RSV positive but pending subgroups at the time of data extraction and they are not reflected in the above RSV graph

Respiratory Pathogen Surveillance

Reporting period 01/01/2019 to 02/06/2019

Results until end of epidemiologic week 22(2019)

National syndromic surveillance for pneumonia

Figure 10. Number of samples testing positive for *B. pertussis* and detection rate by month

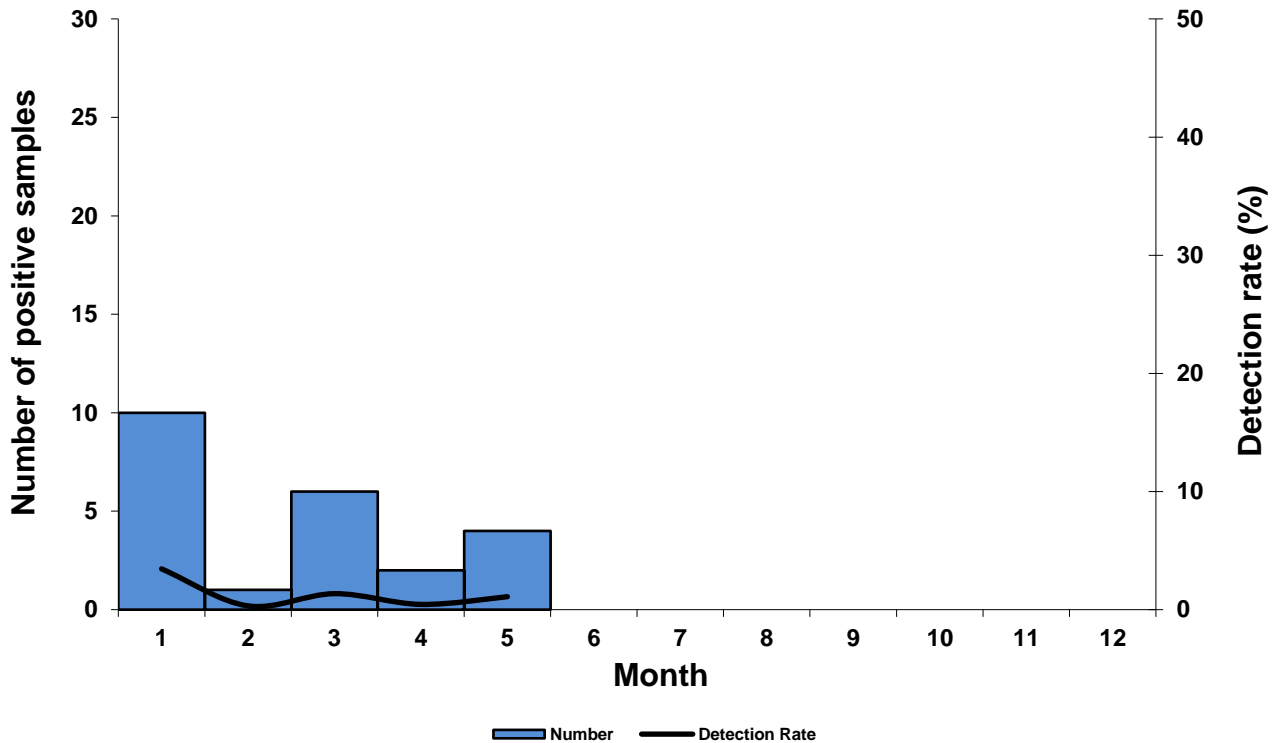


Table 9. Cumulative number of *B. pertussis* identified and total number of samples tested by hospital and province

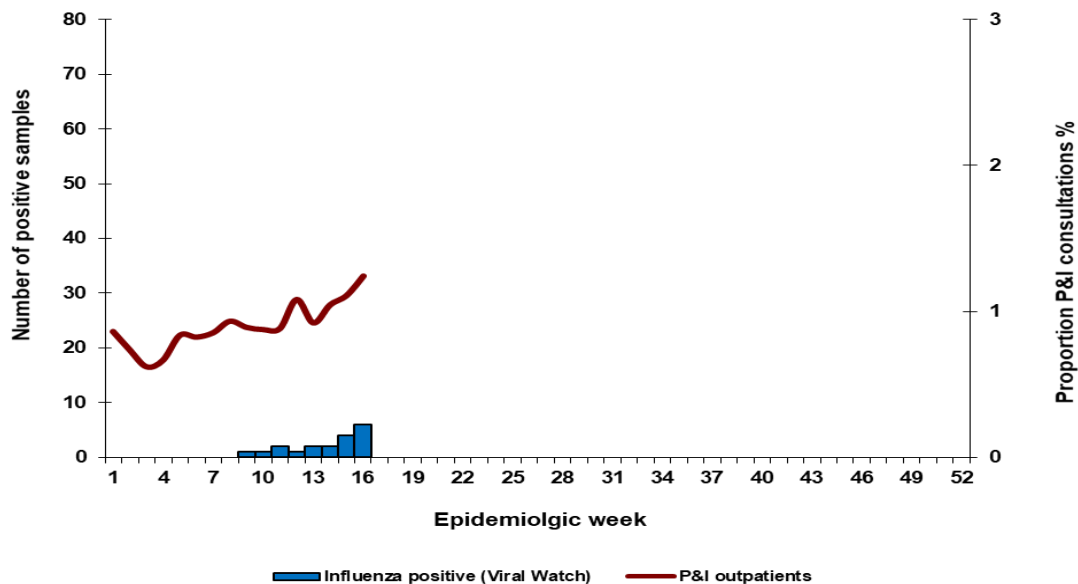
Hospital (Province)	<i>B. pertussis</i> Positive**	Total samples
Edendale (KZ)	5	362
Helen Joseph-Rahima Moosa (GP)	6	483
Klerksdorp-Tshepong (NW)	1	249
Mapulaneng-Matikwana (MP)	3	206
Red Cross (WC)	8	424
Mitchell's Plain (WC)	0	145
Total:	23	1869

GP: Gauteng; KZ: KwaZulu-Natal; NW: North West; MP: Mpumalanga; WC: Western Cape

**62 pertussis-positive cases met the suspected pertussis case definition but did not meet Pneumonia Surveillance case definition. These are not included in the table and epidemiologic curve

Private hospital consultations

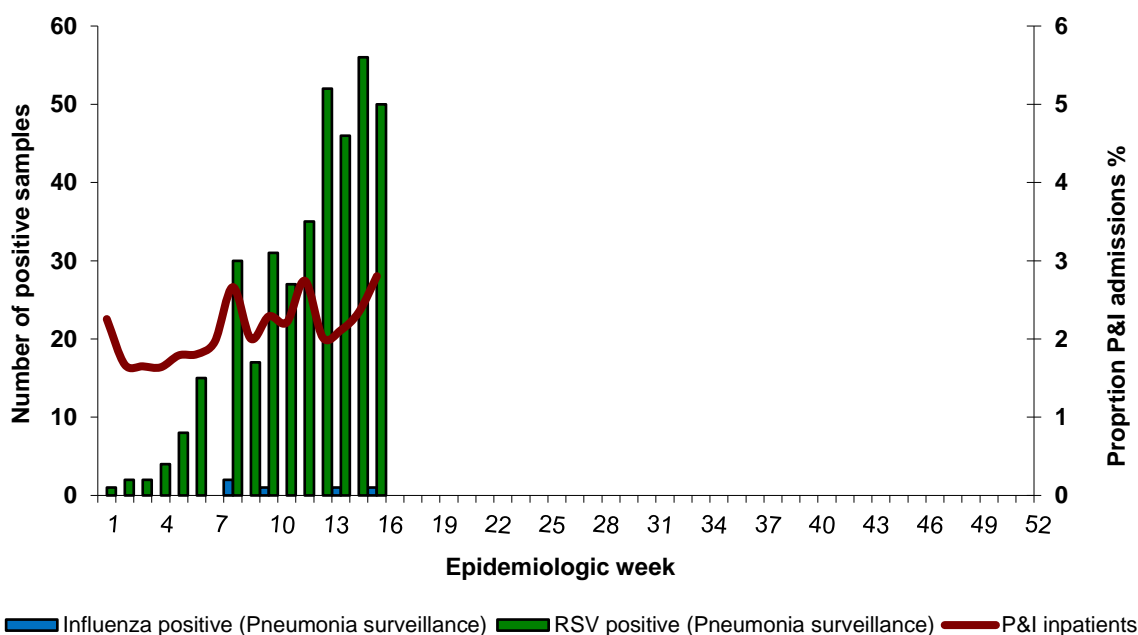
Figure 9. Number of private hospital outpatient consultations* with a diagnosis of pneumonia and influenza (P&I) and viral isolates**



* Hospital outpatient data from weekly reports of consultations to the Netcare hospital group. Discharge diagnosis is according to International Statistical Classification of Diseases and Related Health Problems coding by clinicians and does not represent laboratory confirmation of aetiology

** Influenza positive specimens from the Viral Watch surveillance programme

Figure 10. Number of private hospital admissions* with a discharge diagnosis of pneumonia and influenza (P&I) and viral isolates**



*Hospitalisation admission data from weekly reports of consultations to the Netcare hospital group. Discharge diagnosis is according to International Statistical Classification of diseases and Related Health Problems/ ICD by clinicians and does not represent laboratory confirmation of aetiology ** Influenza positive specimens from the national syndromic surveillance for pneumonia.