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Respiratory Pathogen Surveillance

Programme Descriptions

Programme	ILI	Viral Watch	National syndromic surveillance for pneumonia	Private hospital consultations
Start year	2012	1984	2009	2002
Provinces*	KZ NW MP	EC FS KZ 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	≥ 5 years of age: oropharyngeal/nasopharyngeal swabs <5 years of age: nasopharyngeal aspirates	Throat and/or nasal swabs or Nasopharyngeal swabs	≥ 5 years of age: oropharyngeal/nasopharyngeal swabs <5 years of age: nasopharyngeal aspirates Induced/expectorated sputum	Not applicable
Main pathogens tested**	INF RSV BP	INF RSV BP	INF RSV SP*** 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

**INF: Influenza; RSV: respiratory syncytial virus; BP: Bordetella pertussis; SP: Streptococcus pneumoniae

*** SP: *Streptococcus pneumoniae* children <1 year tested at KZ and all age groups tested at MP and NW

Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

Comments:

Influenza

The 2018 season started in week 18 (first week of May), when influenza detections in the Viral Watch programme rose above the seasonal threshold, as determined by the Moving Epidemic Method. The season ended in week 41 (second week of October). Influenza transmission and impact have been below threshold since week 42.

ILI programme: From 1st January 2018 to 31st December 2018, specimens from 840 patients were received from 3 ILI sites. Influenza was detected in 104 specimens, the majority (70) identified as influenza A(H1N1)pdm09, and 34 as influenza B.

Viral Watch programme: During the same period, specimens were received from 1472 patients from Viral Watch sites. Since April, when the number of specimens received started to increase, influenza has been detected in 691 specimens, 388 of which were identified as influenza A(H1N1)pdm09, 20 as influenza A(H3N2), 279 as influenza B, and four influenza A untyped due to low viral load.

In addition, influenza A(H3N2) was detected in three patients, A(H1N1)pdm09 in four, and influenza B in 14, before the start of the influenza season, most of whom had a history of travel or contact with tourists.

Pneumonia surveillance: In this time period, specimens from 4627 patients with severe respiratory illness (SRI) were received from the 6 sentinel sites. Influenza was detected in 304 specimens, 167 of which were identified as A(H1N1)pdm09, one as A(H3N2), 133 as influenza B, and three influenza A untyped due to low viral load.

Respiratory syncytial virus

The 2018 RSV season which started in week 9 (week starting 26 February) when RSV detections in pneumonia surveillance rose above the seasonal threshold, as determined by the Moving Epidemic Method, ended in week 23 (week ending 10 June) although sporadic detections of RSV are still being made.

From 1st January 2018 to 31st December 2018, RSV has been detected in the specimens of 86 patients in the ILI programme, and 822 from patients in the pneumonia surveillance programme.

During the same period, 40 specimens from Viral Watch surveillance programme sites tested positive for RSV.

Streptococcus pneumoniae

Pneumonia surveillance: From the 1st January 2018 to 31st December 2018, blood specimens from 1155 patients from 3 sentinel sites were tested for *S. pneumoniae* which was detected in 71 (6.1 %) specimens.

Bordetella pertussis

ILI programme: From 1st January 2018 to 31st December 2018, nasopharyngeal/oropharyngeal specimens were tested from 838 patients for *B. pertussis*, 16 (1,9%) tested positive.

Pneumonia surveillance: During the same period, sputa and/or nasopharyngeal specimens were tested from 4627 patients for *B. pertussis* which was detected in 94 (2,0%) specimens.

An increase in pertussis cases was noted in 2018 from all pneumonia surveillance sites. A summary is available at: <http://www.nicd.ac.za/wp-content/uploads/2018/11/Update-on-increase-in-pertussis-cases-in-South-Africa.pdf>

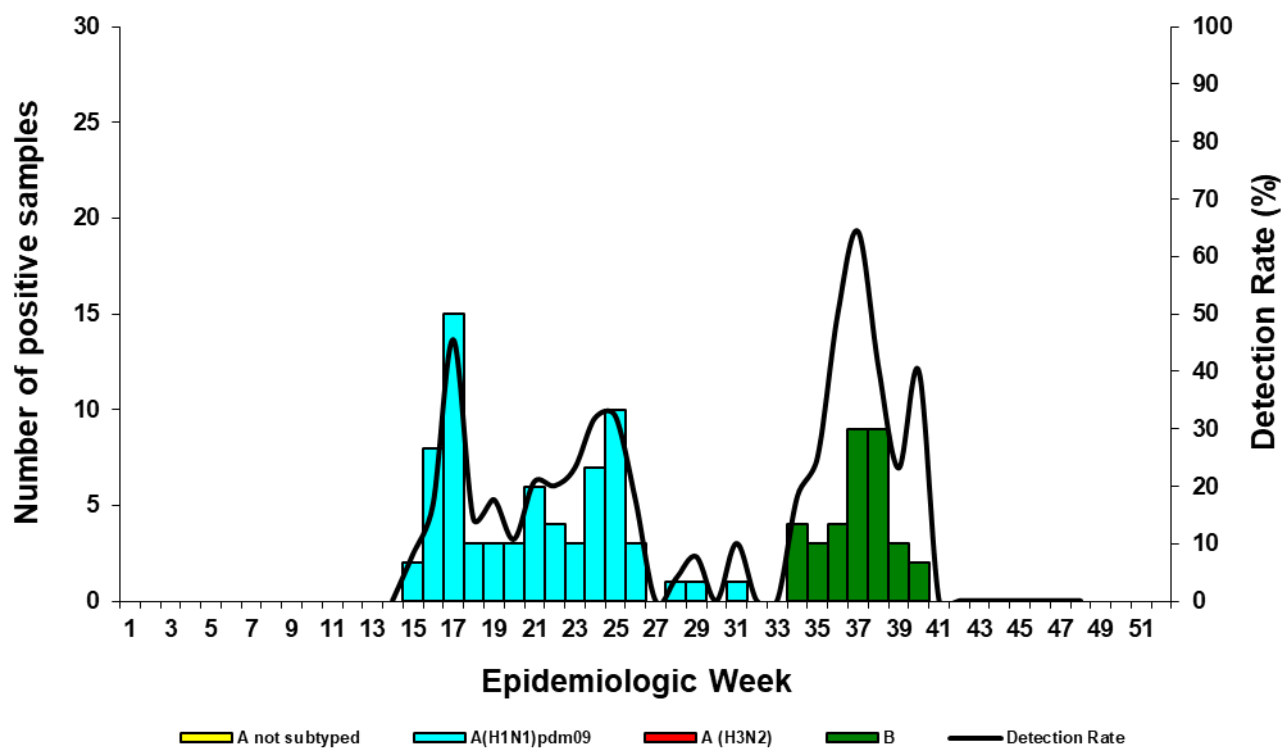
Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

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

Figure 1. Number of positive samples* by influenza types and subtypes and detection rate** by week



*Specimens from patients with influenza-like illnesses at 3 sentinel sites in 3 provinces from week 1 – week 21 and from 2 sites in 2 provinces from week 22 (surveillance in Mpumalanga suspended since week 22).

**Only reported for weeks with >10 specimens submitted

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

Clinic (Province)	A not typed as yet	A(H1N1)pdm09	A(H3N2)	B	Total samples
Agincourt Clinic (MP)*		3			141
Edendale Gateway Clinic (KZ)		40		14	334
Jouberton Clinic (NW)		27		20	346
Total:		70		34	821

KZ: KwaZulu-Natal; NW: North West, MP: Mpumalanga *Surveillance suspended at Mpumalanga site since week 22

Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

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

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

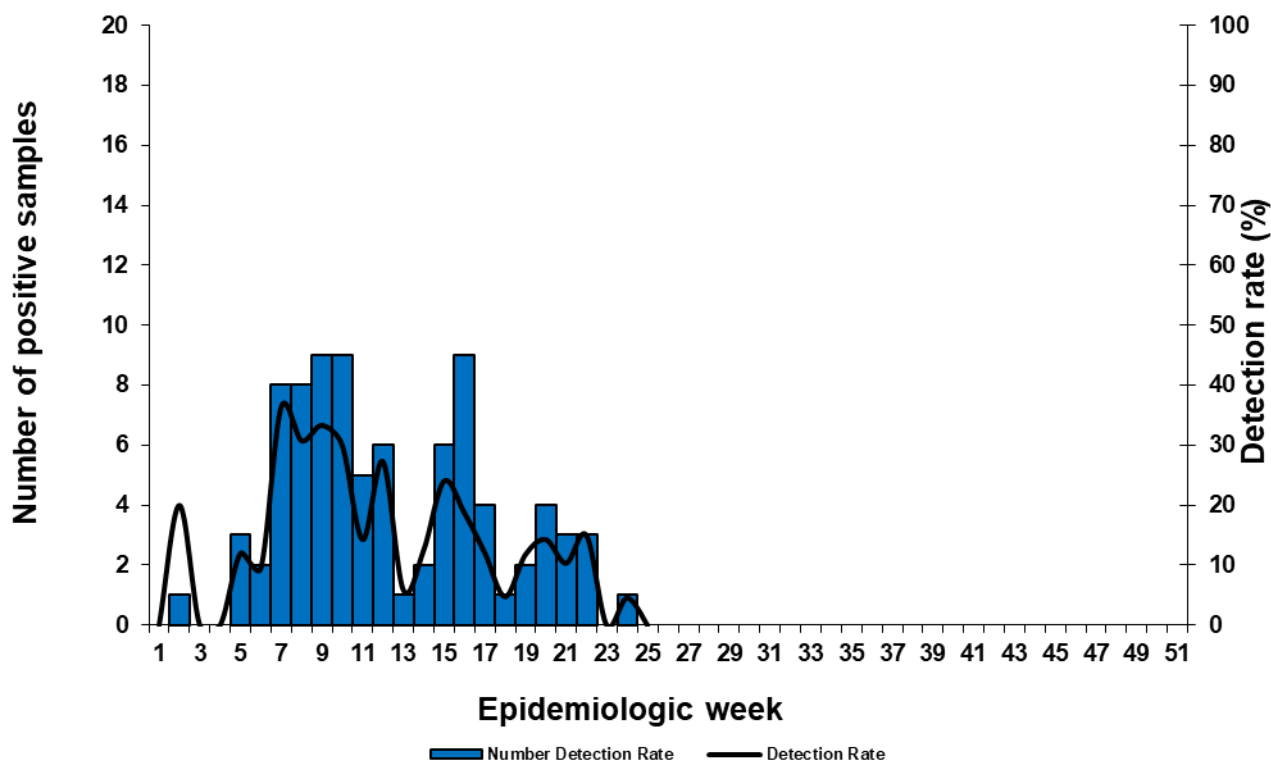


Table 2. Cumulative number of respiratory syncytial virus identified and total number of samples tested by clinic and province

Clinic (Province)	RSV Positive	Total samples
Agincourt Clinic (MP)*	38	141
Edendale Gateway Clinic (KZ)	26	334
Jouberton Clinic (NW)	22	346
Total:	86	821

KZ: KwaZulu-Natal; NW: North West, MP: Mpumalanga *Surveillance suspended at Mpumalanga site since week 22

Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

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

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

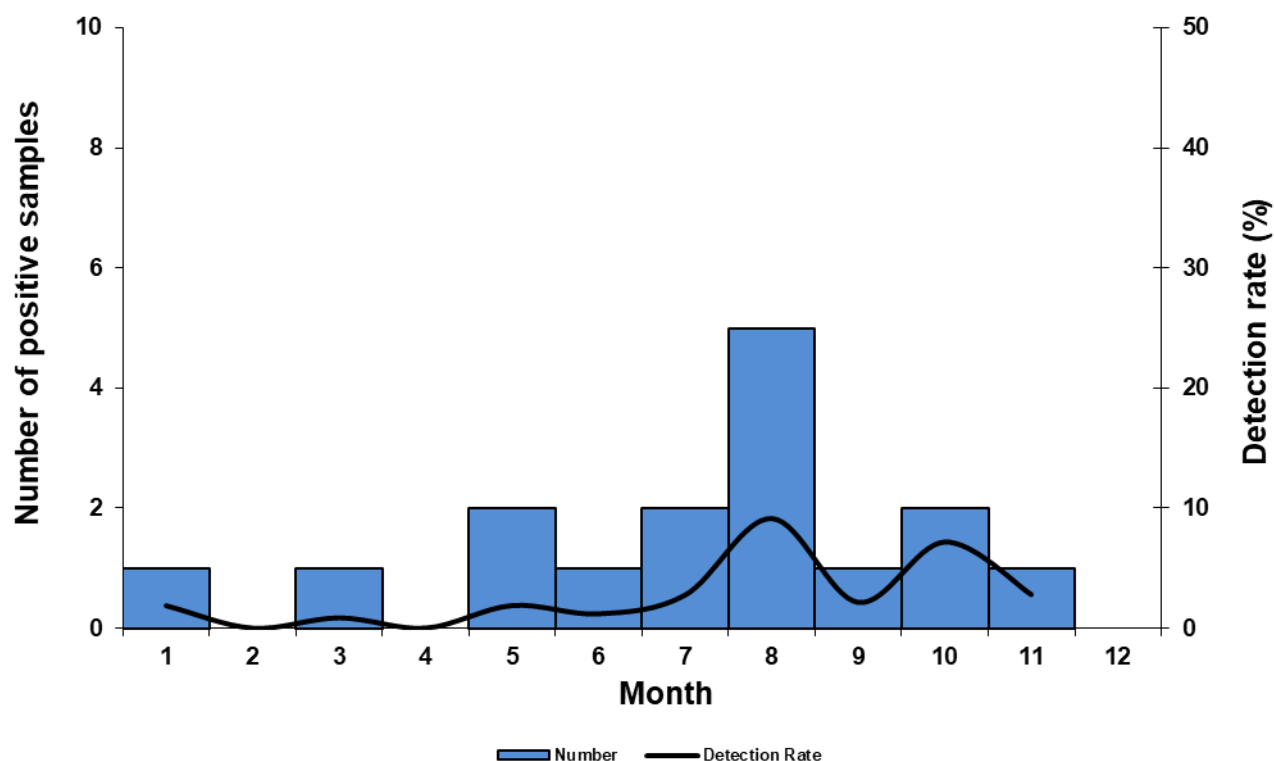


Table 3 Cumulative number of *B. pertussis* identified and total number of samples** tested by province

Clinic (Province)	<i>B. pertussis</i> Positive**	Total samples
Agincourt Clinic (MP)*	1	141
Edendale Gateway Clinic (KZ)	2	333
Jouberton Clinic (NW)	13	345
Total:	16	819

KZ: KwaZulu-Natal; NW: North West, MP: Mpumalanga *Surveillance suspended at Mpumalanga site since week 22

**All 14 positive pertussis cases met the suspected pertussis case definition

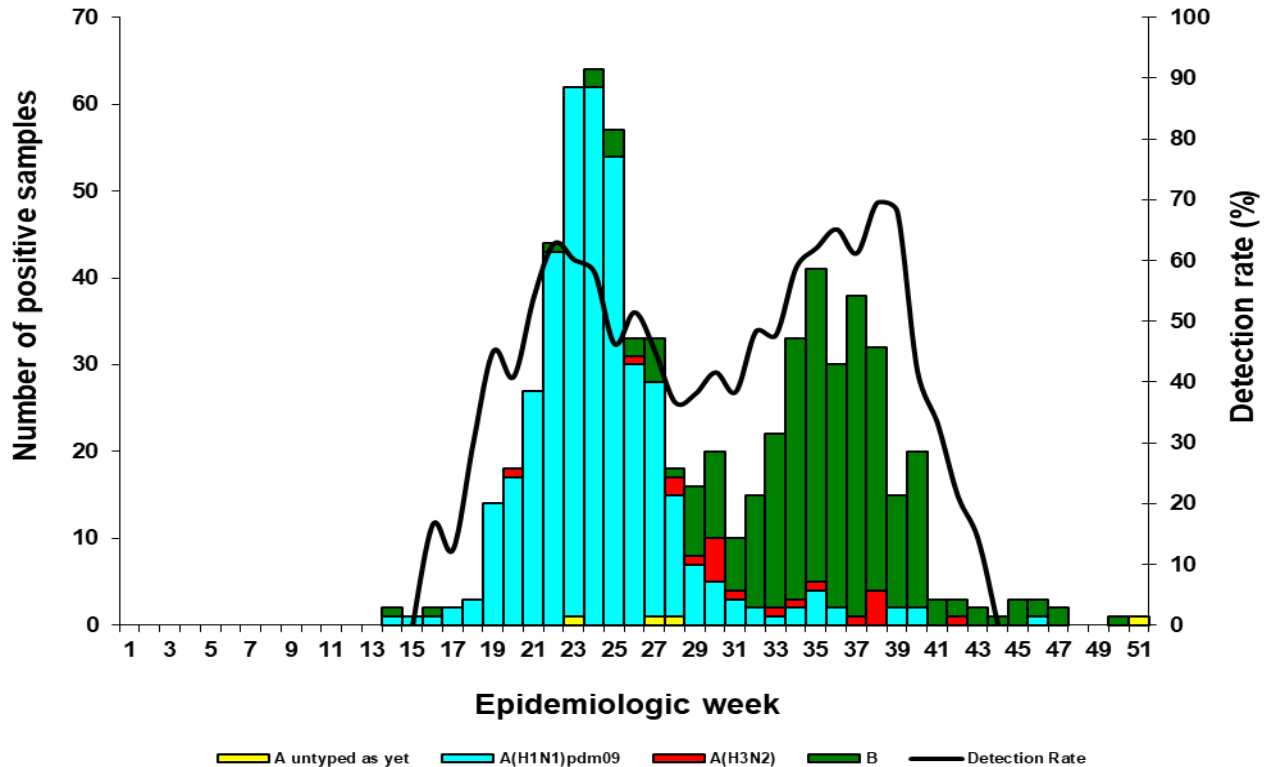
Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

Influenza-like illness (ILI) surveillance Viral Watch

Figure 4. Number of positive samples* by influenza types and subtypes and detection rate by week**



*Specimens from patients with Influenza-like illnesses at 90 sentinel sites in 8 provinces

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

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

Province	A not subtyped	A(H1N1)pdm09	A(H3N2)	B	Total samples
Eastern Cape	1	52		31	131
Free State				1	15
Gauteng	2	199	17	89	702
Limpopo		15		8	38
Mpumalanga	1	20		12	84
North West		1		2	6
Northern Cape		3		1	17
Western Cape		98	3	135	479
Total:	4	388	20	279	1472

From 01 January 2018 to date, 132 patients were tested for influenza at the time of entry into South Africa following travel abroad and 37 tested influenza positive - 18 of which were identified as influenza A(H1N1)pdm09, 08 as influenza A(H3N2) and 11 as influenza B.

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

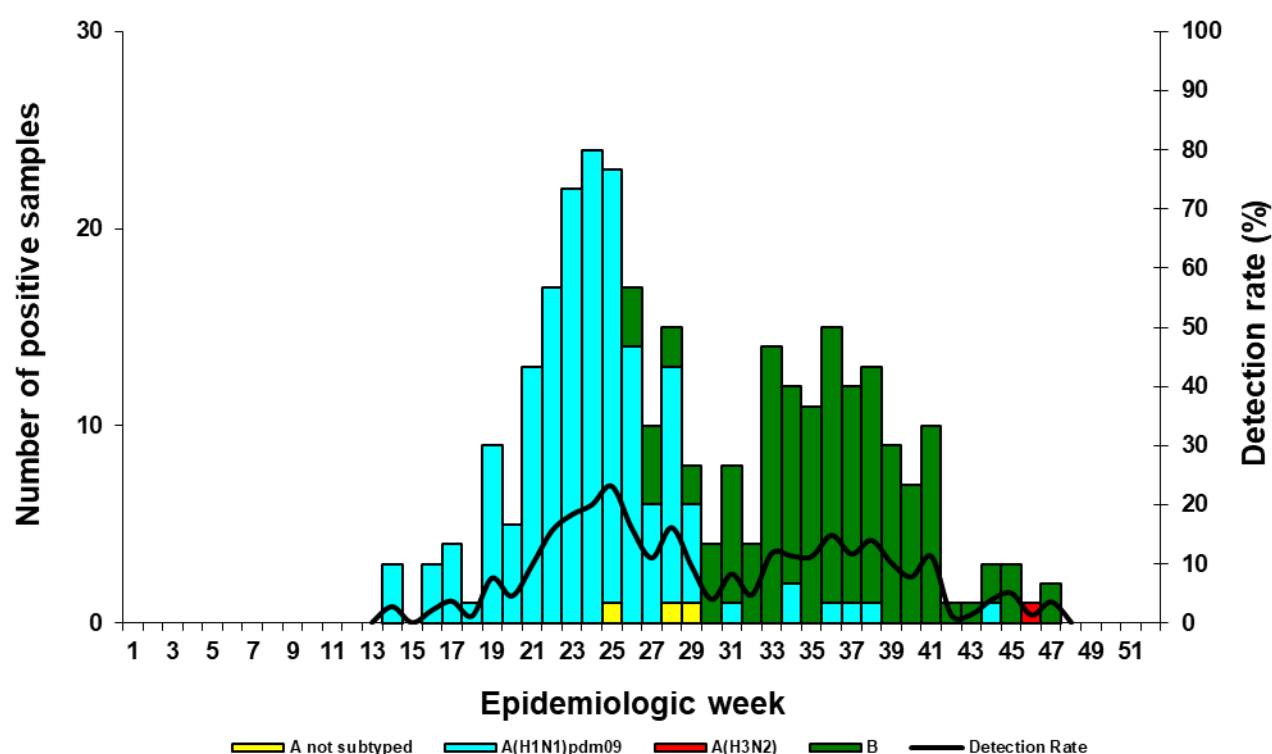
Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

National syndromic surveillance for pneumonia

Figure 6. Number of positive samples* by influenza types and A not typed as yet 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

Table 5. Cumulative number of identified influenza types and subtypes and total number of samples tested by hospital

Hospital (Province)	A not typed as yet	A(H1N1)pdm09	A(H3N2)	B	Total samples
Edendale (KZ)	1	28		11	705
Helen Joseph-Rahima Moosa (GP)		40	1	27	1016
Klerksdorp-Tshepong (NW)		13		19	668
Mapulaneng-Matikwana (MP)		25		17	309
Red Cross (WC)	2	37		36	1291
Mitchell's Plain (WC)		24		23	642
Total:	3	167		133	4631

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

In addition 98 specimens have been tested from pregnant women in Groote Schuur Hospital and Mowbray Maternity Hospital, two of whom were positive for influenza A(H1N1)pdm09.

Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

National syndromic surveillance for pneumonia

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

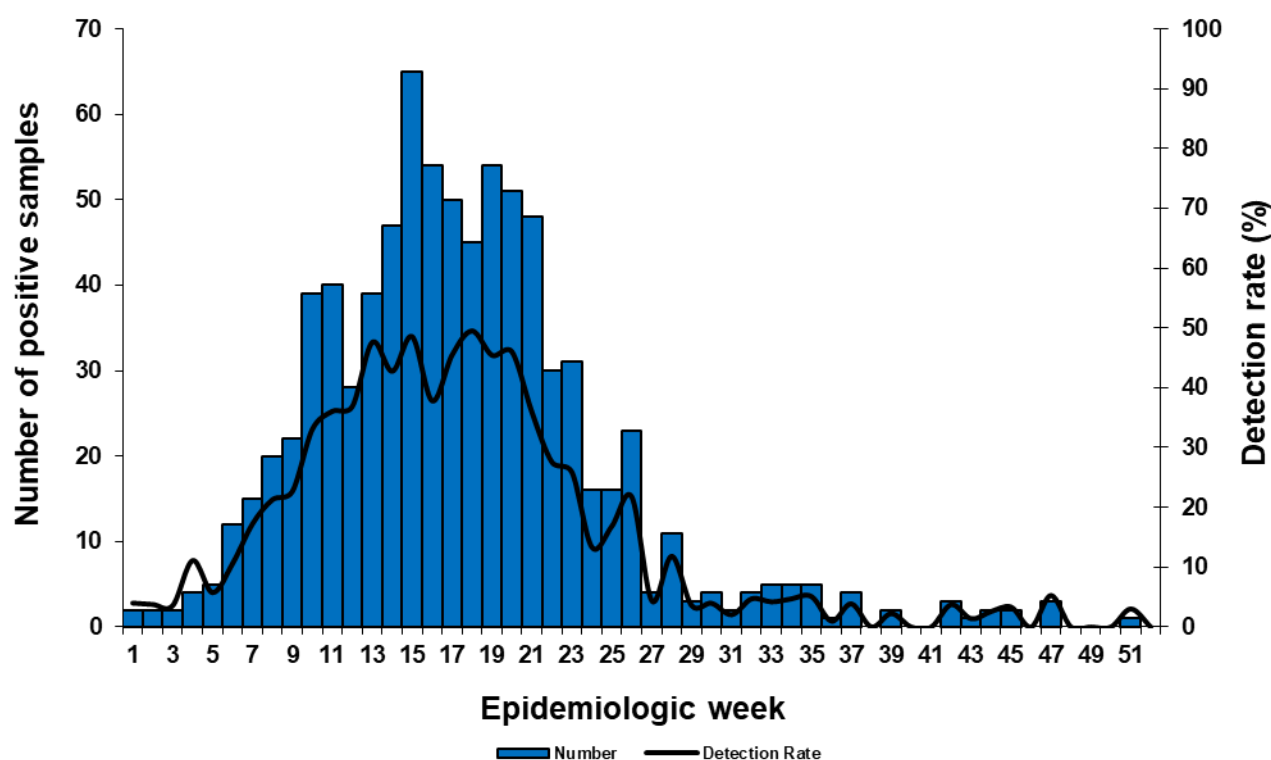


Table 6: Cumulative number of respiratory syncytial virus identified and total number of samples tested by hospital

Hospital (Province)	RSV Positive	Total samples
Edendale (KZ)	82	705
Helen Joseph-Rahima Moosa (GP)	164	1016
Klerksdorp-Tshepong (NW)	41	668
Mapulaneng-Matikwana (MP)	46	309
Red Cross (WC)	344	1291
Mitchell's Plain (WC)	145	642
Total:	822	4631

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

Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

National syndromic surveillance for pneumonia

Figure 9. Number of samples testing positive for *S. pneumoniae** and detection rate by week

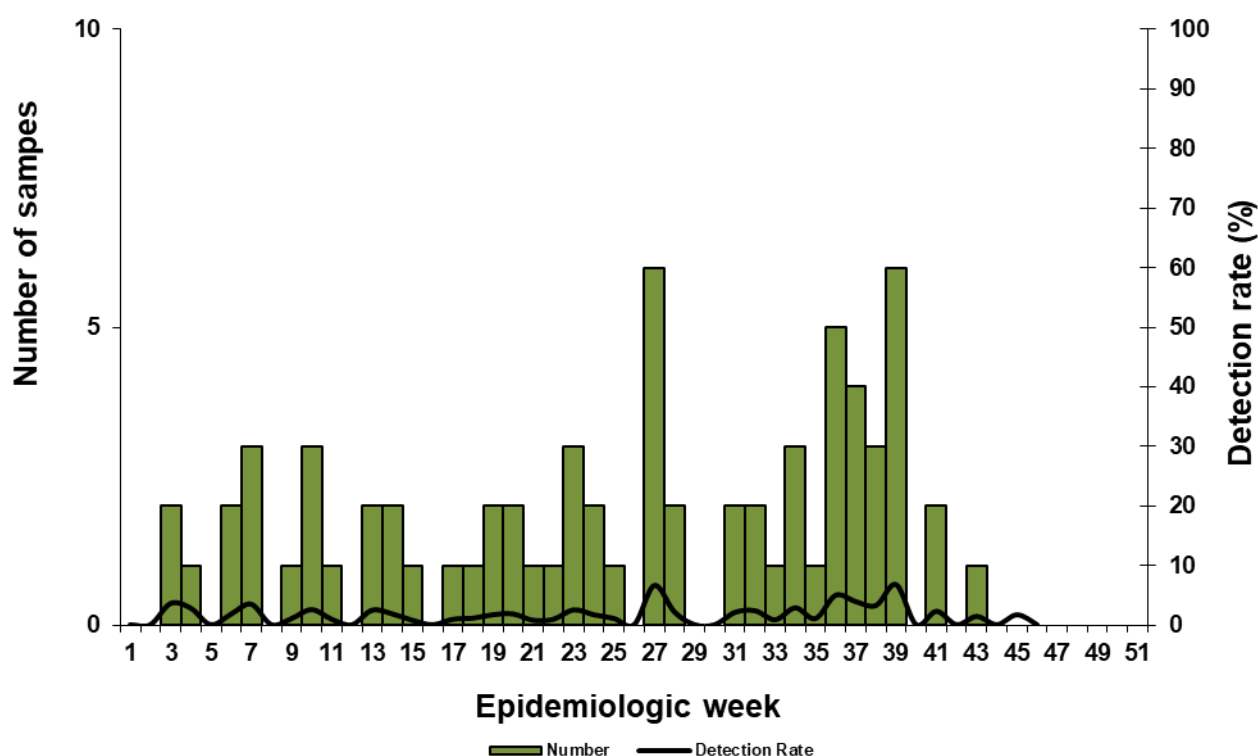


Table 7. Cumulative number of *S. pneumoniae* identified and total number of samples tested by hospital and province

Hospital (Province)	<i>S. pneumoniae</i> Positive	Total samples
Edendale (KZ)	6	179
Klerksdorp-Tshepong (NW)	39	667
Mapulaneng-Matikwana (MP)	26	309
Total:	71	1155

KZ: KwaZulu-Natal; NW: North West; MP: Mpumalanga;

* Children <1 year tested at KZ and all age groups tested at MP and NW

Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 31/12/2018

Results until end of epidemiologic week 52 (2018)

National syndromic surveillance for pneumonia

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

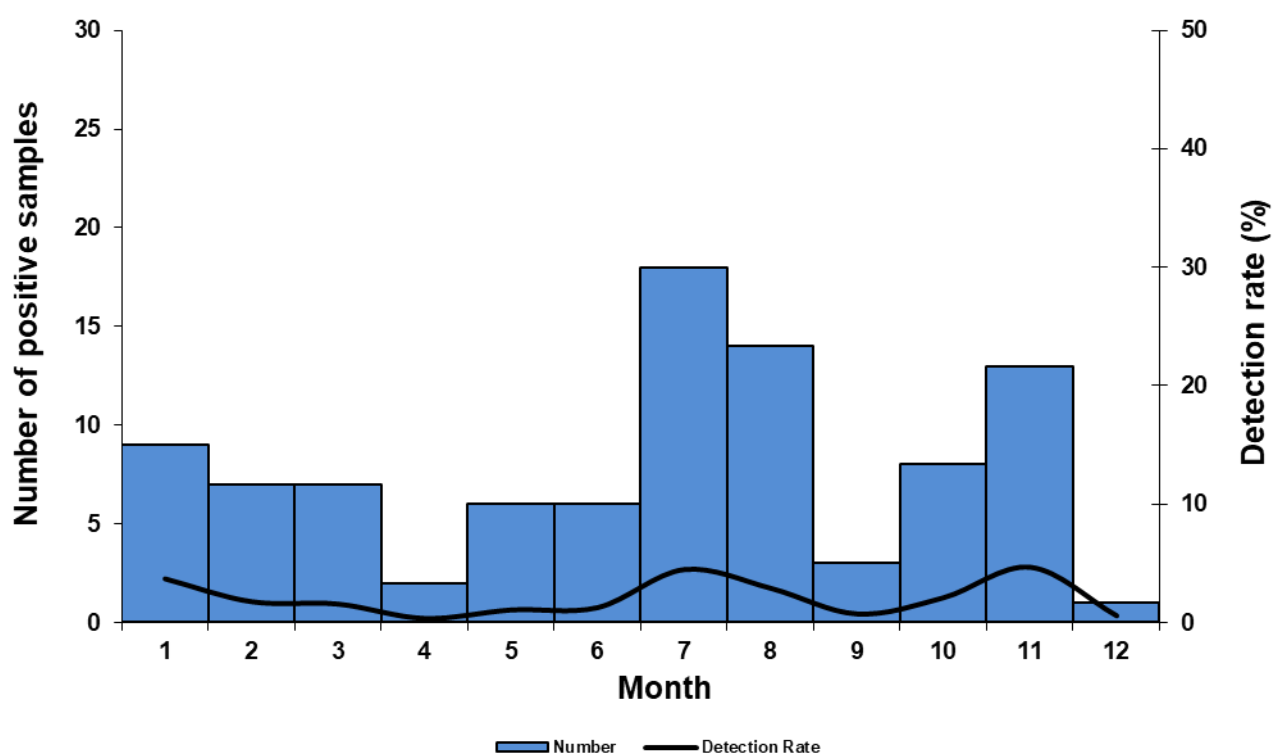


Table 9. Cumulative number of *B. pertussis* identified and total number of samples tested by hospital and province

Hospital (Province)	<i>B. pertussis</i> Positive**	Total samples
Edendale (KZ)	7	705
Helen Joseph-Rahima Moosa (GP)	18	1015
Klerksdorp-Tshepong (NW)	18	668
Mapulaneng-Matikwana (MP)	5	309
Red Cross (WC)	35	1290
Mitchell's Plain (WC)	11	640
Total:	94	4627

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

**All 75 positive pertussis cases met the suspected pertussis case definition

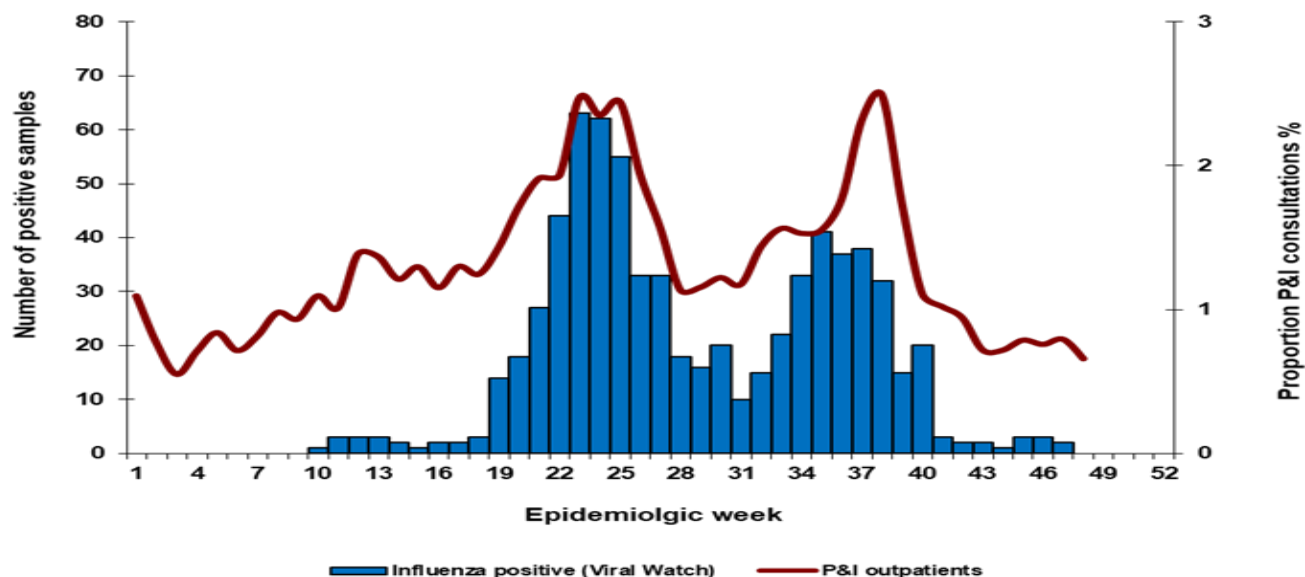
Respiratory Pathogen Surveillance

Reporting period 01/01/2018 to 02/12/2018

Results until end of epidemiologic week 48 (2018)

Private hospital consultations

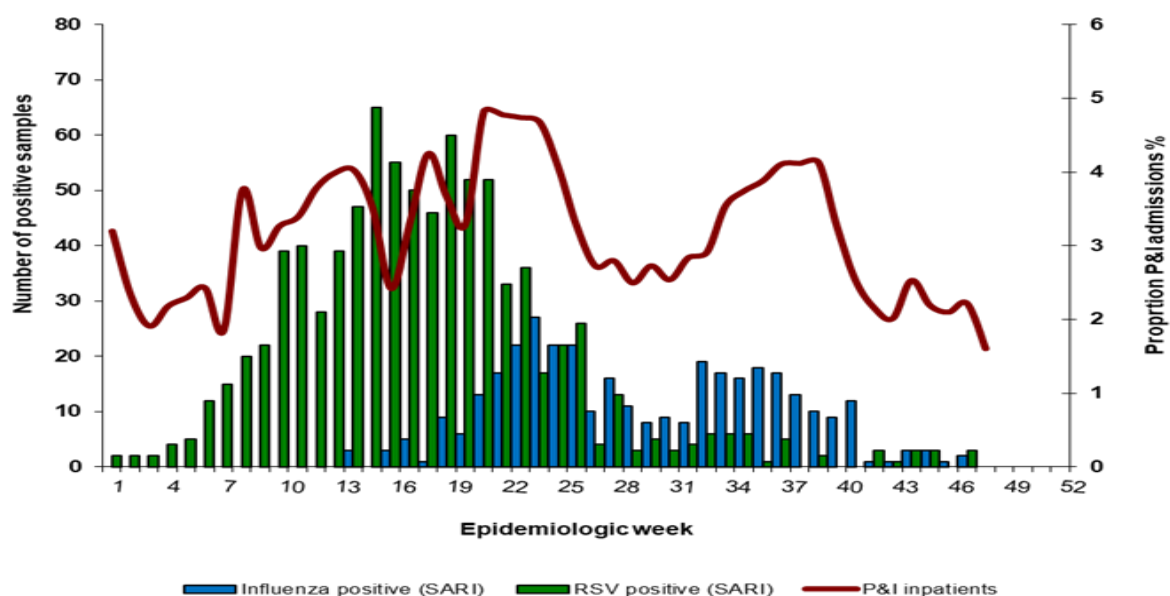
Figure 11. Number of private hospital outpatient consultations* with a diagnosis of pneumonia and influenza (P&I) and viral isolates**



* 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 12. 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.