

COVID-19 TESTING SUMMARY



NATIONAL INSTITUTE FOR
COMMUNICABLE DISEASES

Division of the National Health Laboratory Service

SOUTH AFRICA WEEK 52 2020

OVERVIEW OF REPORT

This report summarises national laboratory testing for SARS-CoV-2, the virus causing COVID-19, in South Africa. This report is based on data for specimens reported up to 26 December 2020 (Week 52 of 2020).

HIGHLIGHTS

- In the period 1 March 2020 through 26 December 2020, 5,359,656 laboratory tests for SARS-CoV-2 have been conducted nationally.
- The number of tests performed in week 52 were higher than the weekly number of tests performed since week 30 (beginning 19 July)
- Western Cape (544 per 100,000 persons), KwaZulu-Natal (457 per 100,000 persons), Gauteng (429 per 100,000 persons) and Eastern Cape (256 per 100,000 persons) provinces had the highest testing rates in week 52.
- Percentage testing positive decreased from a peak of 30.4% in week 29 to 9.5% in week 43. In week 52 the percentage testing positive was 32.1%, highest observed since testing began.
- Percentage testing positive remained highest in the Western Cape (43.7%), Limpopo (41.0%), KwaZulu-Natal (38.8%) and Eastern Cape (31.9%). Percentages testing positive were between 15.9%-24.5% in Northern Cape, Free State, North West, Gauteng and Mpumalanga.
- In week 52, compared to the previous week, the percentage testing positive increased in all provinces.
- Mean laboratory turnaround time in week 52 was 1.7 days; 2.8 days in the public sector and <1 day in the private sector.

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Methods

Testing for SARS-CoV-2 began on 28 January 2020 at the NICD and after the first case was confirmed on 5th March 2020, testing was expanded to a larger network of private and NHLS laboratories. Laboratory testing was conducted for people meeting the case definition for persons under investigation (PUI). This definition was updated several times over the reporting period but at different times included (i) symptomatic individuals seeking testing, (ii) hospitalised individuals for whom testing was done, (iii) individuals in high-risk occupations, (iv) individuals in outbreak settings, and (v) individuals identified through community screening and testing (CST) programmes which were implemented in April 2020 and was discontinued from the week beginning 17th May. CST was implemented differently in different provinces, and ranged from mass screening approaches (including asymptomatic individuals) to screening of individuals in contact with a confirmed case to targeted testing of clusters of cases. Respiratory specimens were submitted to testing laboratories. Testing was performed using reverse transcriptase real-time PCR, which detects SARS-CoV-2 viral genetic material. Laboratories used any one of several in-house and commercial PCR assays to test for the presence of SARS-CoV-2 RNA. Testing for SARS-CoV-2 using rapid antigen-based tests was implemented during November 2020.

Test results were automatically fed into a data warehouse after result authorisation. We excluded specimens collected outside South Africa and duplicate test results for an individual. From week 48 onwards, test data was reported from the Notifiable Medical Conditions Surveillance System (NMCSS). Date of specimen receipt in the laboratory was used when date of specimen collection was missing. Proportion testing positive (PTP) was calculated as the number of positive tests/total number of tests and presented as percentage by multiplying with 100. We used 2020 mid-year population estimates from Statistics South Africa to calculate the testing rate, expressed as tests per 100 000 persons. Patient admission status was determined for public sector tests based on the reported patient facility.

Laboratory turnaround times were calculated as the mean number of days between specimen collection and reporting of the result. Categorical variables were compared using the chi-squared test, and continuous variables with the students t-test, with a P-value<0.05 considered statistically significant.

Health district and sub-district (in the metros) level results were mapped based on geo-locatable public and private sector testing facilities. Estimates of overall prevalence were derived using regression techniques. Estimates were adjusted to produce district-specific positive test prevalences based on the national average age and sex profile of testing for that week. This adjustment allows more accurate comparison of the proportion testing positive across districts.

The report includes tests conducted between 1 March 2020 (week 10), the week when the first case of COVID-19 was confirmed, and 26 December 2020 (week 52).

Testing volumes and proportion testing positive

From 1 March through 26 December 2020, 5,359,656 laboratory tests for SARS-CoV-2 were performed. The number of tests performed increased to week 20, however decreased in weeks 21 to 23 due to a limited supply of extraction and testing kits. Increased volumes of tests were observed week on week from week 24 to week 28, with the highest number of tests performed in week 28 (n=268,529), and have subsequently decreased. In week 52, 203,784 tests were performed, higher than the weekly number of tests performed between weeks 31 and 49. All tests for samples collected in the previous week may not yet be reflected. Reduced testing volumes were observed over weekends and public holidays (Figure 1).

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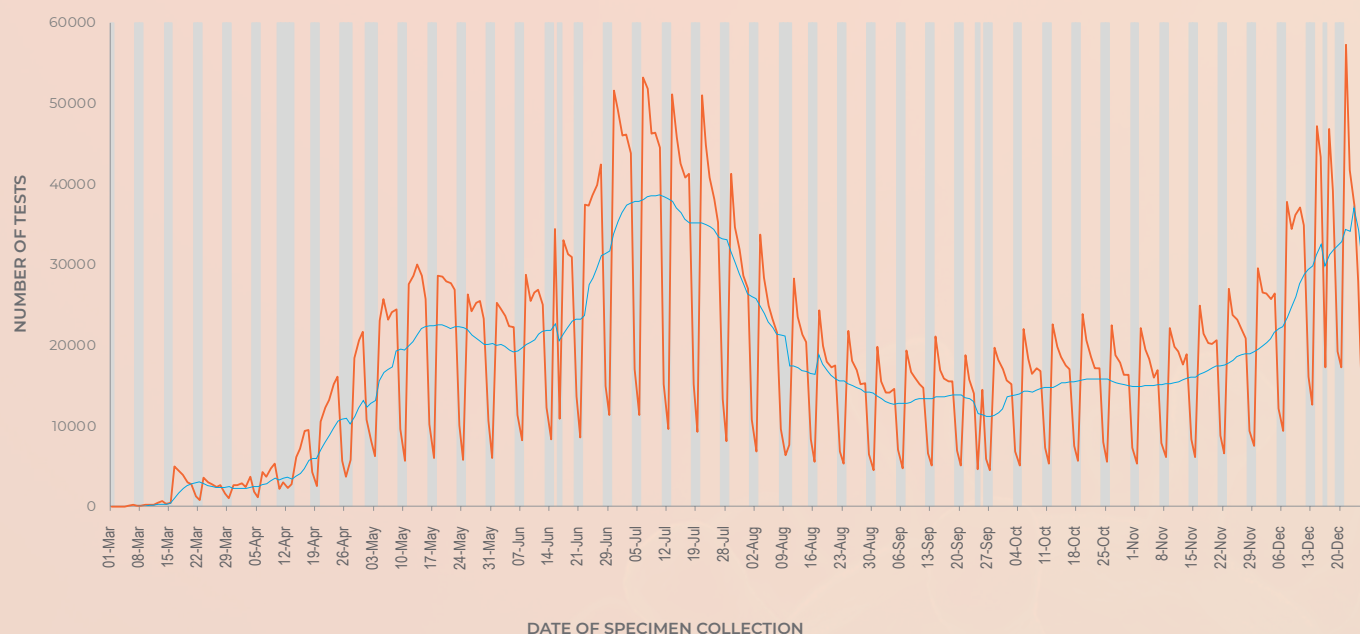


Figure 1. Number of laboratory tests conducted by date of specimen collection, South Africa, 1 March – 26 December 2020. Blue dotted line shows the 7-day moving average of the number of tests conducted. Grey bars highlight weekend days and public holidays.

The overall percentage testing positive from week 10 through 52 was 17.2% (Table 1). The percentage testing positive increased week on week from week 18 to a peak of 30.4% in week 29, and subsequently decreased to 9.5% in week 43. The percentage testing positive in week 52 was 32.1%, highest observed since testing began (Figure 2).

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Table 1. Weekly number of tests conducted and positive tests, South Africa, 1 March – 26 December 2020

Week number	Week beginning	No. of tests n (%)	No. of positive tests	Percentage testing positive (%)
10	01-Mar	408 (0.0)	8	2.0
11	08-Mar	2276 (0.0)	72	3.2
12	15-Mar	20893 (0.4)	651	3.1
13	22-Mar	16806 (0.3)	407	2.4
14	29-Mar	17187 (0.3)	375	2.2
15	05-Apr	24466 (0.5)	517	2.1
16	12-Apr	41592 (0.8)	977	2.3
17	19-Apr	75541 (1.4)	1847	2.4
18	26-Apr	89186 (1.7)	2770	3.1
19	03-May	136280 (2.5)	5275	3.9
20	10-May	156527 (2.9)	7101	4.5
21	17-May	155734 (2.9)	10011	6.4
22	24-May	141003 (2.6)	10990	7.8
23	31-May	135315 (2.5)	12683	9.4
24	07-Jun	153042 (2.9)	18710	12.2
25	14-Jun	162466 (3.0)	27855	17.1
26	21-Jun	219160 (4.1)	47903	21.9
27	28-Jun	265008 (4.9)	66142	25.0
28	05-Jul	268529 (5.0)	76228	28.4
29	12-Jul	246217 (4.6)	74801	30.4
30	19-Jul	232511 (4.3)	69342	29.8
31	26-Jul	182122 (3.4)	51163	28.1
32	02-Aug	148420 (2.8)	35224	23.7
33	09-Aug	115721 (2.2)	22302	19.3
34	16-Aug	109258 (2.0)	18201	16.7
35	23-Aug	99076 (1.8)	13991	14.1
36	30-Aug	89598 (1.7)	10833	12.1
37	06-Sep	93371 (1.7)	10325	11.1
38	13-Sep	96891 (1.8)	10474	10.8
39	20-Sep	78600 (1.5)	8767	11.2
40	27-Sep	97063 (1.8)	9556	9.8
41	04-Oct	103001 (1.9)	10261	10.0
42	11-Oct	108303 (2.0)	10431	9.6
43	18-Oct	110784 (2.1)	10472	9.5
44	25-Oct	104348 (1.9)	9931	9.5
45	01-Nov	106000 (2.0)	10491	9.9
46	08-Nov	112250 (2.1)	12923	11.5
47	15-Nov	122279 (2.3)	16519	13.5
48	22-Nov	132944 (2.5)	19165	14.4
49	29-Nov	154305 (2.9)	26613	17.2
50	06-Dec	205803 (3.8)	46282	22.5
51	13-Dec	225588 (4.2)	59311	26.3
52	20-Dec	203784 (3.8)	65374	32.1
Total		5359656 (100.0)	923274	17.2

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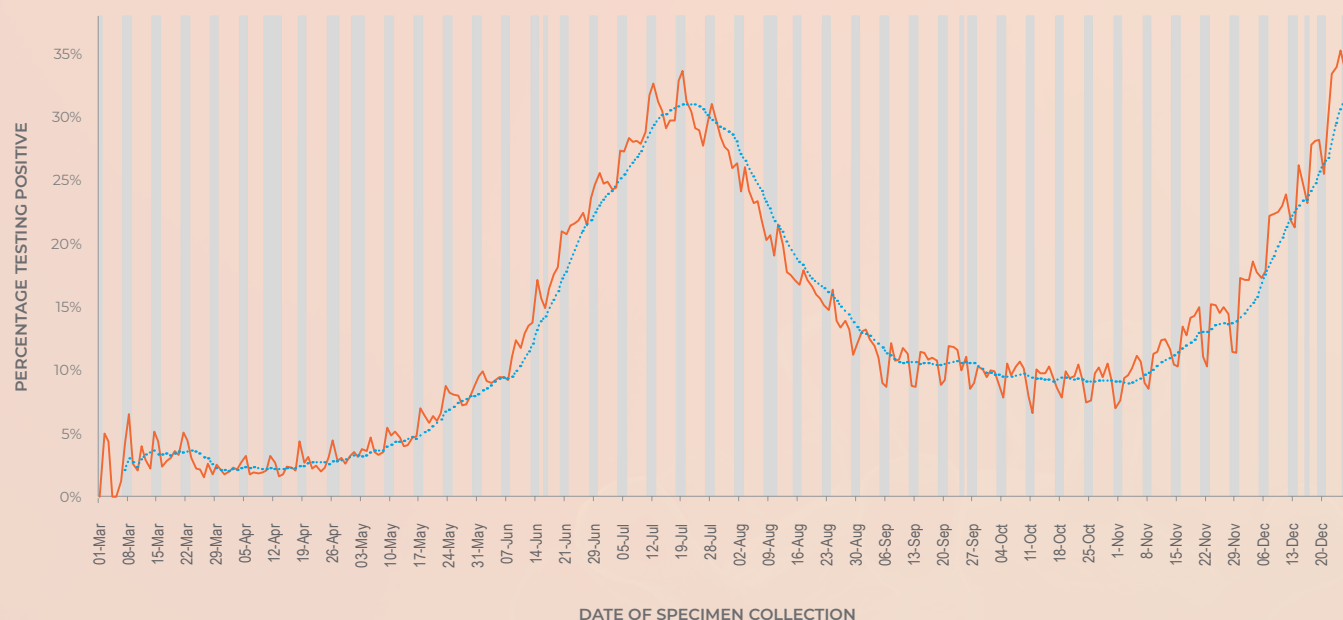


Figure 2. Percentage of laboratory tests positive for SARS-CoV-2 by date of specimen collection, South Africa, 1 March – 26 December 2020. Blue dotted line shows the 7-day moving average of the percentage testing positive. Grey bars highlight weekend days and public holidays.

Testing in private and public sectors

From 1 March through 26 December, 2,459,722 laboratory tests were conducted in public sector laboratories, with 17.0% testing positive. Over this same period, private sector laboratories conducted 2,899,934 tests, with 17.4% testing positive (Table 2). Overall the public sector has conducted 45.9% of tests and accounted for 45.4% of positive tests. The peak percentage testing positive was observed in week 30 in the public sector (29.5%), and in week 29 in the private sector (31.4%) in the first wave of infections. From week 51 to week 52, the percentage testing positive increased by 6.0% in the public sector (27.3% to 33.1%, $P < 0.001$), and increased by 6.0% (25.5% to 31.4%, $P < 0.001$) in the private sector. In week 52 the percentage testing positive continued to be higher

in the public sector (33.1%) compared to the private sector (31.4%) ($P < 0.001$).

The mean turnaround time for tests conducted in week 52 was 1.7 days. Turnaround time slightly increased in the public sector (2.8 days) and stayed the same in the private sector (0.9 days) (Figure 3). Turnaround times for public sector tests were >2 days in Mpumalanga (4.9 days), KwaZulu-Natal (3.3 days), Limpopo (3.2 days), Northern Cape (3.0 days), Western Cape (2.6 days), Free State (2.6 days) and Eastern Cape (2.5 days) (Figure 4). Turnaround times in the past week increased in Western Cape, Northern Cape, Free State, KwaZulu-Natal, Gauteng, and Limpopo. Eleven of the 28 (39.3%) NHLS laboratories performing testing for SARS-CoV-2 had turnaround times ≤ 2 days (Figure 5).

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Table 2. Weekly number of tests conducted and positive tests, by healthcare sector, South Africa, 1 March – 26 December 2020

Week number	Week beginning	Public sector		Private sector		Public sector percentage of		Ratio of PTP ^a
		Tests	Cases n (%)	Tests	Positive tests n (%)	Tests (%)	Positive tests (%)	
10	01-Mar	251	5 (2.0)	157	3 (1.9)	61.5	62.5	1.042
11	08-Mar	353	13 (3.7)	1923	59 (3.1)	15.5	18.1	1.200
12	15-Mar	1344	51 (3.8)	19549	600 (3.1)	6.4	7.8	1.236
13	22-Mar	3357	127 (3.8)	13449	280 (2.1)	20.0	31.2	1.817
14	29-Mar	5623	174 (3.1)	11564	201 (1.7)	32.7	46.4	1.780
15	05-Apr	11336	329 (2.9)	13130	188 (1.4)	46.3	63.6	2.027
16	12-Apr	23739	610 (2.6)	17853	367 (2.1)	57.1	62.4	1.250
17	19-Apr	54096	1473 (2.7)	21445	374 (1.7)	71.6	79.8	1.561
18	26-Apr	66199	2283 (3.4)	22987	487 (2.1)	74.2	82.4	1.628
19	03-May	92226	4210 (4.6)	44054	1065 (2.4)	67.7	79.8	1.888
20	10-May	104869	5051 (4.8)	51658	2050 (4.0)	67.0	71.1	1.214
21	17-May	95340	6567 (6.9)	60394	3444 (5.7)	61.2	65.6	1.208
22	24-May	74156	5904 (8.0)	66847	5086 (7.6)	52.6	53.7	1.046
23	31-May	60129	6035 (10.0)	75186	6648 (8.8)	44.4	47.6	1.135
24	07-Jun	59865	7274 (12.2)	93177	11436 (12.3)	39.1	38.9	0.990
25	14-Jun	55826	10946 (19.6)	106640	16909 (15.9)	34.4	39.3	1.237
26	21-Jun	82320	18649 (22.7)	136840	29254 (21.4)	37.6	38.9	1.060
27	28-Jun	97142	24985 (25.7)	167866	41157 (24.5)	36.7	37.8	1.049
28	05-Jul	107808	30103 (27.9)	160721	46125 (28.7)	40.1	39.5	0.973
29	12-Jul	101155	29268 (28.9)	145062	45533 (31.4)	41.1	39.1	0.922
30	19-Jul	96069	28343 (29.5)	136442	40999 (30.0)	41.3	40.9	0.982
31	26-Jul	73827	21342 (28.9)	108295	29821 (27.5)	40.5	41.7	1.050
32	02-Aug	64059	15747 (24.6)	84361	19477 (23.1)	43.2	44.7	1.065
33	09-Aug	53631	10401 (19.4)	62090	11901 (19.2)	46.3	46.6	1.012
34	16-Aug	50862	8924 (17.5)	58396	9277 (15.9)	46.6	49.0	1.104
35	23-Aug	45459	7232 (15.9)	53617	6759 (12.6)	45.9	51.7	1.262
36	30-Aug	41028	5614 (13.7)	48570	5219 (10.7)	45.8	51.8	1.273
37	06-Sep	46354	5982 (12.9)	47017	4343 (9.2)	49.6	57.9	1.397
38	13-Sep	49068	6114 (12.5)	47823	4360 (9.1)	50.6	58.4	1.367
39	20-Sep	40892	5123 (12.5)	37708	3644 (9.7)	52.0	58.4	1.296
40	27-Sep	44189	5195 (11.8)	52874	4361 (8.2)	45.5	54.4	1.425
41	04-Oct	45569	5272 (11.6)	57432	4989 (8.7)	44.2	51.4	1.332
42	11-Oct	48217	5298 (11.0)	60086	5133 (8.5)	44.5	50.8	1.286
43	18-Oct	50212	5608 (11.2)	60572	4864 (8.0)	45.3	53.6	1.391
44	25-Oct	45567	5304 (11.6)	58781	4627 (7.9)	43.7	53.4	1.479
45	01-Nov	47111	5576 (11.8)	58889	4915 (8.3)	44.4	53.2	1.418
46	08-Nov	52647	7466 (14.2)	59603	5457 (9.2)	46.9	57.8	1.549
47	15-Nov	59925	9765 (16.3)	62354	6754 (10.8)	49.0	59.1	1.504
48	22-Nov	65709	11142 (17.0)	67235	8023 (11.9)	49.4	58.1	1.421
49	29-Nov	71548	14276 (20.0)	82757	12337 (14.9)	46.4	53.6	1.338
50	06-Dec	93825	22484 (24.0)	111978	23798 (21.3)	45.6	48.6	1.128
51	13-Dec	99259	27135 (27.3)	126329	32176 (25.5)	44.0	45.8	1.073
52	20-Dec	77561	25689 (33.1)	126223	39685 (31.4)	38.1	39.3	1.053
Total		2459722	419089 (17.0)	2899934	504185 (17.4)	45.9	45.4	0.980

^aRatio of percentage testing positive (PTP) in the public sector to the private sector calculated as (no. of cases/total tests in public sector)/ (no. of cases/total tests in private sector)

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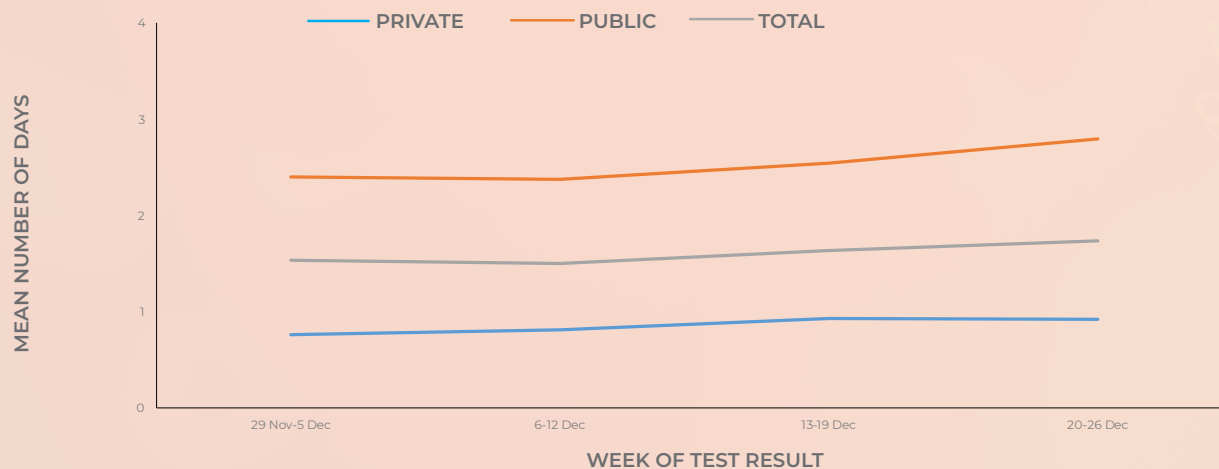


Figure 3. Mean number of days between date of specimen collection and date of test result, by week of test result, South Africa, 29 November – 26 December 2020

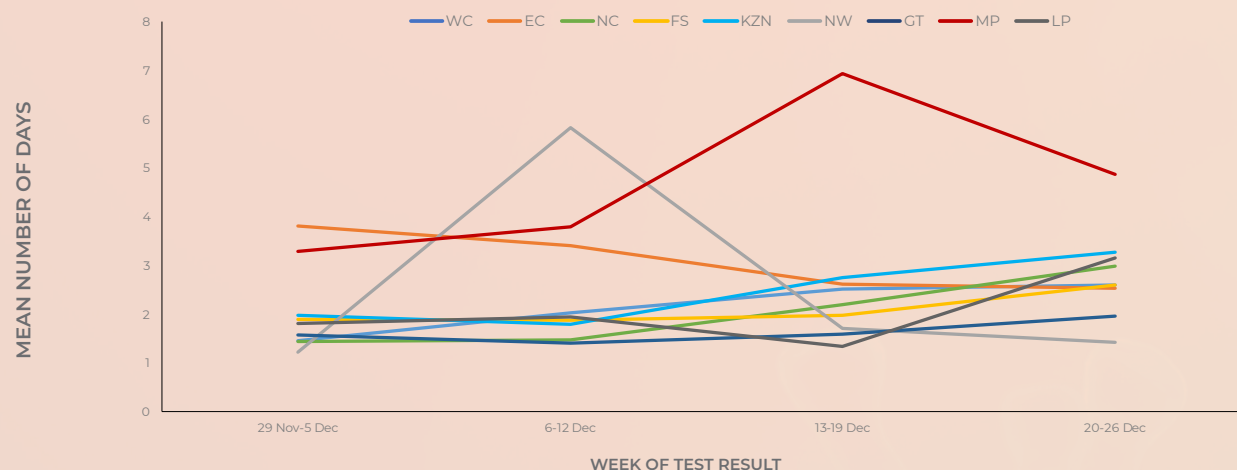


Figure 4. Mean number of days between date of specimen collection and date of test result, by week of test result and province, public sector, South Africa, 29 November – 26 December 2020. WC, Western Cape; EC, Eastern Cape; FS, Free State; KZN, KwaZulu-Natal; GT, Gauteng; NC, Northern Cape; NW, North West; MP, Mpumalanga; LP, Limpopo

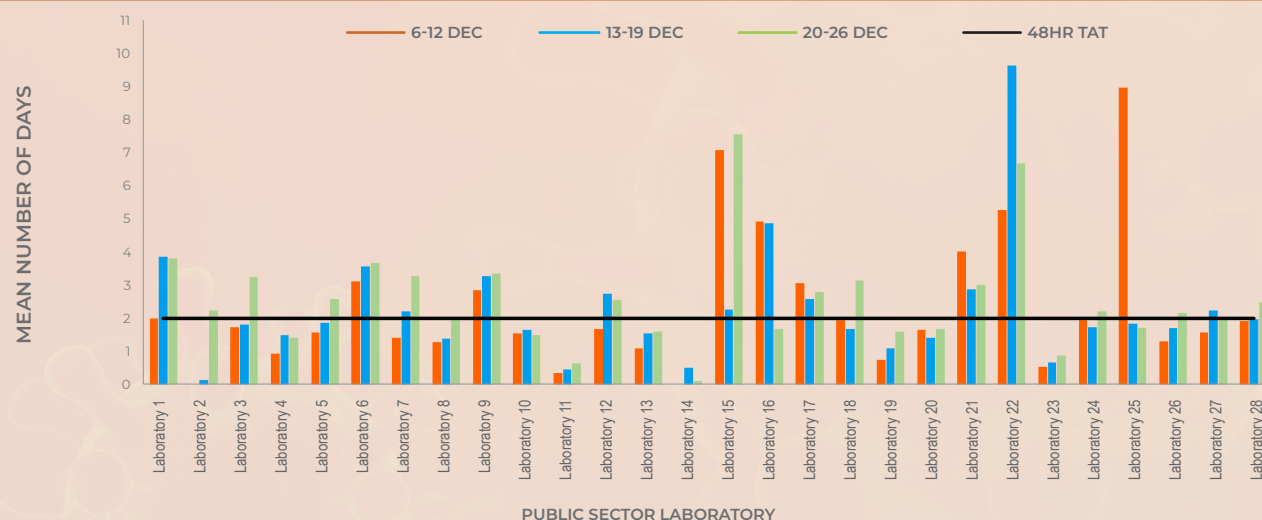


Figure 5. Mean number of days between date of specimen collection and date of test result, by public sector laboratory, 6 – 26 December 2020. The horizontal black line indicates 48-hour turnaround time (TAT).

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Testing by province

Gauteng (32.6%) performed the largest number of tests in week 52, followed by KwaZulu-Natal (25.9%), Western Cape (18.7%) and Eastern Cape (8.5%) provinces (Table 3). Western Cape (544 per 100,000 persons), KwaZulu-Natal (457 per 100,000 persons), Gauteng (429 per 100,000 persons) and Eastern Cape (256 per 100,000 persons) provinces had the highest testing rates in week 52 (Figure 6). Over recent weeks, testing rates have increased in the Western Cape, Gauteng, KwaZulu-Natal, and decreased in the Eastern Cape.

The percentage testing positive in week 52 was highest in the Western Cape (43.7%), Limpopo (41.0%), KwaZulu-Natal (38.8%) and Eastern Cape (31.9%). Percentages testing positive were between 15.9%-24.5%

in Northern Cape, Free State, North West, Gauteng and Mpumalanga in week 52 (Figure 7). Compared to the previous week, the percentage testing positive in week 52 increased in all of the nine provinces: 5.5% in the Western Cape (38.1% to 43.7%, $P<0.001$), 1.1% in Eastern Cape (30.7% to 31.9%, $P=0.012$), 9.9% in Northern Cape (11.3% to 21.3%, $P<0.001$), 5.7% in Free State (10.3% to 15.9%, $P<0.001$), 6.7% in KwaZulu-Natal (32.1% to 38.8%, $P<0.001$), 5.0% in North West (16.8% to 21.8%, $P<0.001$), 7.6% in Gauteng (16.9% to 24.5%, $P<0.001$), 8.0% in Mpumalanga (11.1% to 19.0%, $P<0.001$) and 21.8% in Limpopo (19.2% to 41.0%, $P<0.001$). The percentage testing positive was higher than the national average, not weighted for population size, in the Western Cape, KwaZulu-Natal and Limpopo provinces (Figure 7).

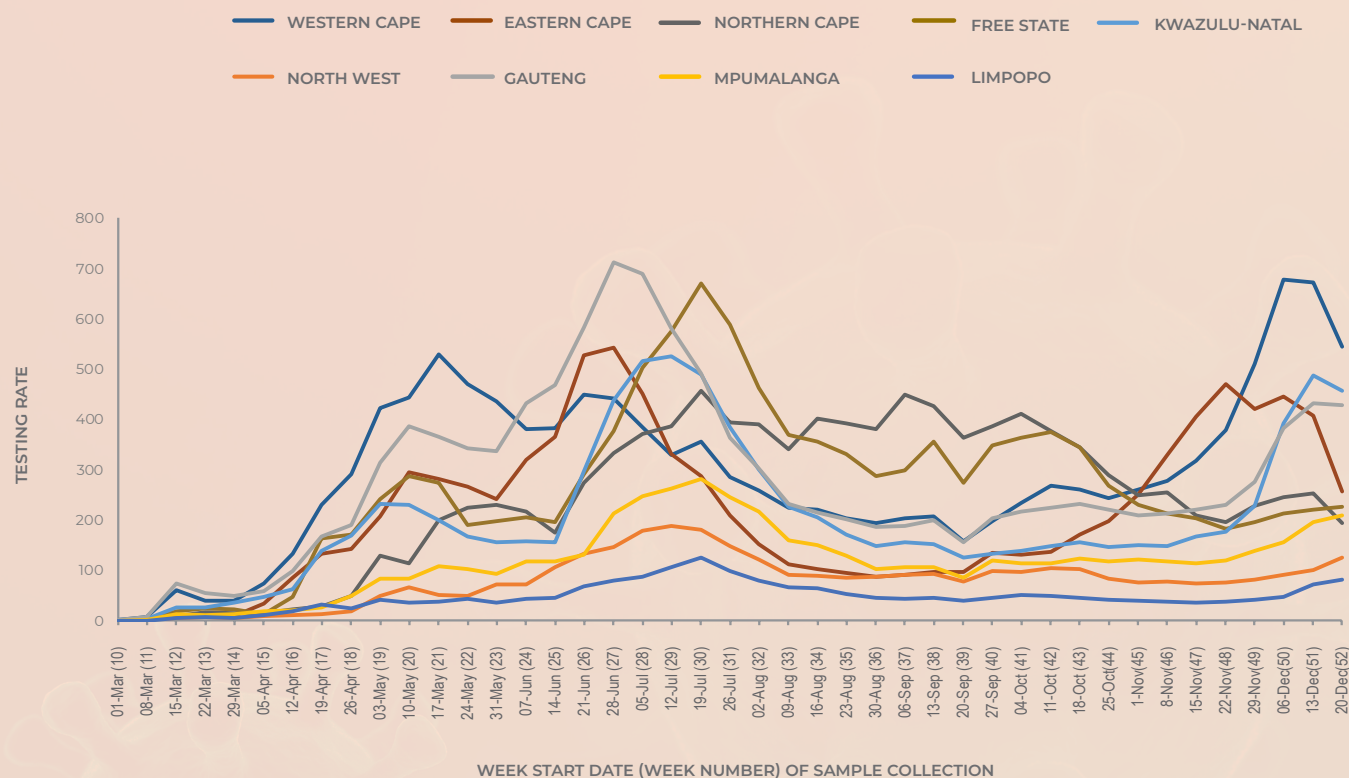


Figure 6. Testing rate per 100,000 persons by province and week of specimen collection, South Africa, 1 March – 26 December 2020

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Table 3. Weekly number of tests performed and positive tests, by province, South Africa, 6 – 26 December 2020

Province	Population ^a	6-12 Dec		13-19 Dec		20-26 Dec		Tests per 100,000 persons	Change in percentage positive ^b
		No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)		
Western Cape	7005741	47532	15392 (32.4)	47094	17956 (38.1)	38140	16650 (43.7)	544	5.5%
Eastern Cape	6734001	30045	10249 (34.1)	27434	8433 (30.7)	17235	5492 (31.9)	256	1.1%
Northern Cape	1292786	3176	252 (7.9)	3264	370 (11.3)	2496	531 (21.3)	193	9.9%
Free State	2928903	6235	472 (7.6)	6481	666 (10.3)	6654	1061 (15.9)	227	5.7%
KwaZulu-Natal	11531628	45258	10977 (24.3)	56178	18009 (32.1)	52728	20434 (38.8)	457	6.7%
North West	4108816	3748	435 (11.6)	4157	700 (16.8)	5114	1116 (21.8)	124	5.0%
Gauteng	15488137	59151	7493 (12.7)	67011	11329 (16.9)	66448	16259 (24.5)	429	7.6%
Mpumalanga	4679786	7298	570 (7.8)	9120	1008 (11.1)	9782	1859 (19.0)	209	8.0%
Limpopo	5852553	2754	405 (14.7)	4197	806 (19.2)	4737	1943 (41.0)	81	21.8%
Unknown		606	37 (6.1)	652	34 (5.2)	450	29 (6.4)		1.2%
Total	59622350	205803	46282 (22.5)	225588	59311 (26.3)	203784	65374 (32.1)	342	5.8%

^a 2020 Mid-year population Statistics SA

^b Current week compared to previous week

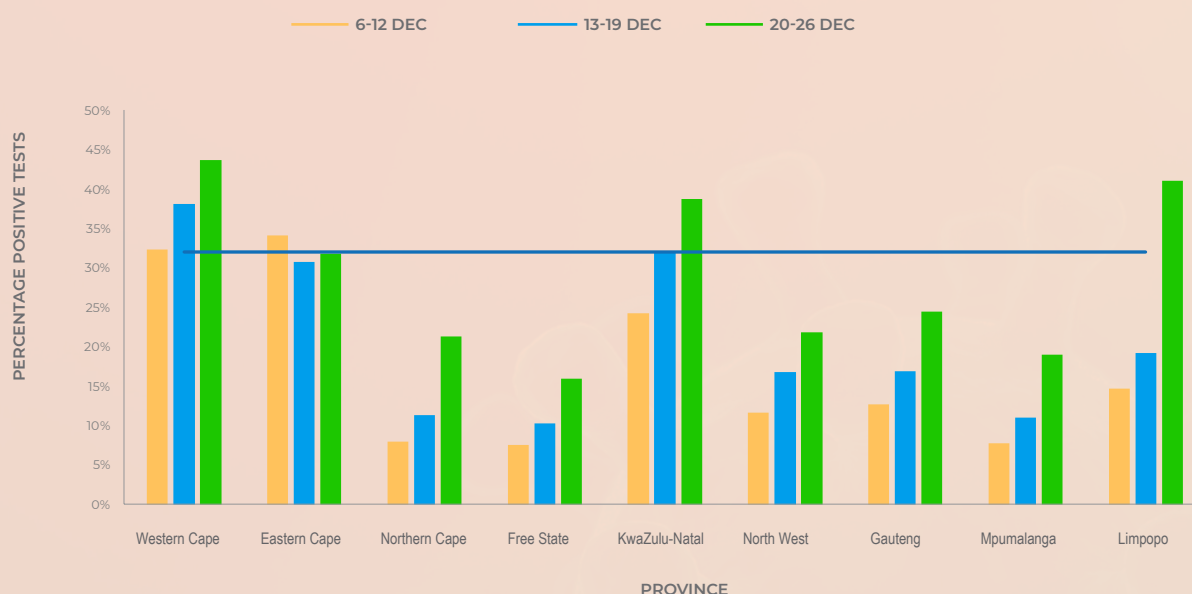


Figure 7. Weekly percentage testing positive, by province, South Africa, 6 – 26 December 2020. The horizontal blue line shows the national mean for week 52, beginning 20 December 2020.

Testing in the public sector

In the public sector, the percentage testing positive increased in the past week (27.3% in week 51 to 33.1% in week 52, $P < 0.001$) (Table 4). The percentage testing positive in week 52 was highest in the Western Cape

(49.0%), Limpopo (39.1%) and KwaZulu-Natal (36.4%). The percentage testing positive in the public sector remains higher than the national average, not weighted for population size, in the Western Cape, KwaZulu-Natal and Limpopo provinces (Figure 8).

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Table 4. Weekly number of tests conducted and positive tests in the public sector, by province, South Africa, 6 – 26 December 2020

Province	6-12 Dec		13-19 Dec		20-26 Dec	
	No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)
Western Cape	20730	7774 (37.5)	18661	8318 (44.6)	14011	6871 (49.0)
Eastern Cape	21760	6941 (31.9)	20729	5836 (28.2)	12501	3563 (28.5)
Northern Cape	1976	164 (8.3)	1899	177 (9.3)	1599	309 (19.3)
Free State	3299	271 (8.2)	3491	357 (10.2)	2811	419 (14.9)
KwaZulu-Natal	22951	4824 (21.0)	28270	8230 (29.1)	23165	8437 (36.4)
North West	1521	267 (17.6)	1673	355 (21.2)	1642	441 (26.9)
Gauteng	16611	1825 (11.0)	18629	3181 (17.1)	16846	4320 (25.6)
Mpumalanga	3575	240 (6.7)	3746	393 (10.5)	3077	729 (23.7)
Limpopo	805	142 (17.6)	1517	254 (16.7)	1467	573 (39.1)
Unknown	597	36 (0.0)	644	34 (5.3)	442	27 (6.1)
Total	93825	22484 (24.0)	99259	27135 (27.3)	77561	25689 (33.1)

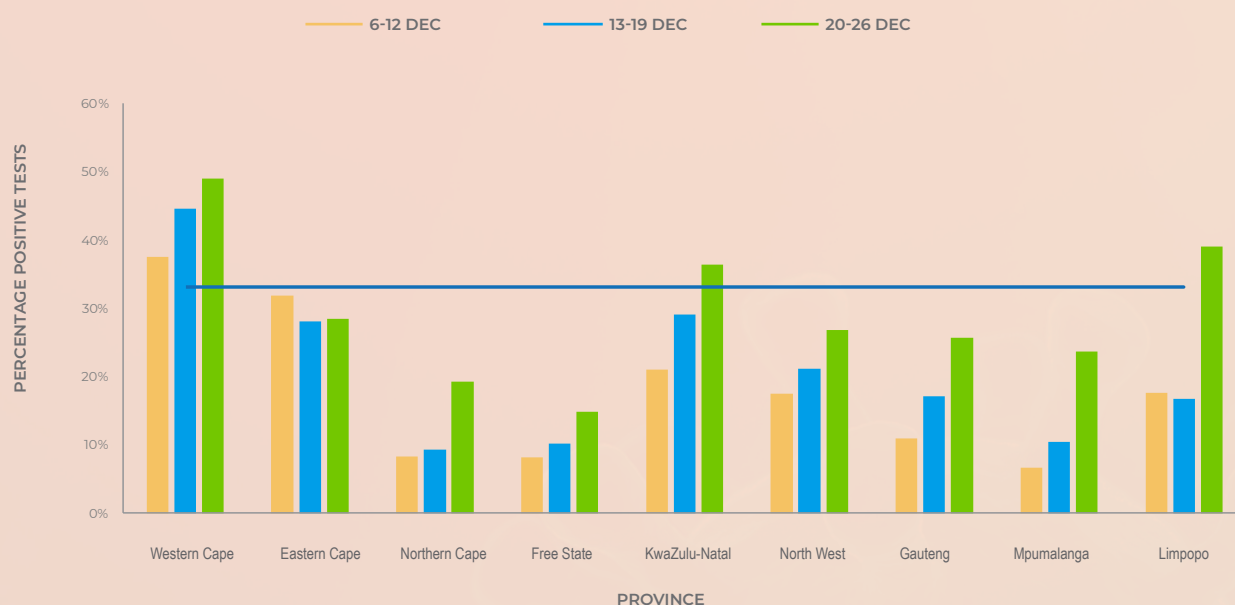


Figure 8. Weekly percentage testing positive in the public sector, by province, South Africa, 6 – 26 December 2020. The horizontal blue line shows the national mean for week 52, beginning 20 December 2020.

Facilities with high proportions testing positive

Table 5.1 shows the 25 public sector clinics, hospitals and testing laboratories (where specimens were not tied to a particular facility), that had 25 or more

specimens tested and at least five positive results in the week of 20 – 26 December, with the highest proportion testing positive nationally. This week's list is again dominated by facilities in the Western Cape (15), while 8 are in KwaZulu-Natal, and two in the Eastern Cape.

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Table 5.1 Public sector healthcare facilities with a high proportion testing positive, 20 – 26 December 2020

Facility Name	Province	Tests	PTP (95% CI)
Facility 1	Western Cape	43	0.791 (0.669;0.912)
Facility 2	Western Cape	48	0.771 (0.652;0.890)
Facility 3	KwaZulu-Natal	25	0.760 (0.593;0.927)
Facility 4	Western Cape	32	0.750 (0.600;0.900)
Facility 5	KwaZulu-Natal	78	0.744 (0.647;0.840)
Facility 6	Western Cape	35	0.743 (0.598;0.888)
Facility 7	Western Cape	66	0.742 (0.637;0.848)
Facility 8	Western Cape	166	0.741 (0.674;0.808)
Facility 9	Western Cape	72	0.736 (0.634;0.838)
Facility 10	KwaZulu-Natal	30	0.733 (0.575;0.892)
Facility 11	Western Cape	45	0.733 (0.604;0.863)
Facility 12	Western Cape	25	0.720 (0.544;0.896)
Facility 13	Eastern Cape	38	0.711 (0.566;0.855)
Facility 14	Western Cape	76	0.711 (0.609;0.812)
Facility 15	Western Cape	107	0.692 (0.604;0.779)
Facility 16	Eastern Cape	61	0.689 (0.572;0.805)
Facility 17	KwaZulu-Natal	92	0.685 (0.590;0.780)
Facility 18	Western Cape	41	0.683 (0.540;0.825)
Facility 19	KwaZulu-Natal	34	0.676 (0.519;0.834)
Facility 20	Western Cape	163	0.669 (0.596;0.741)
Facility 21	Western Cape	63	0.667 (0.550;0.783)
Facility 22	KwaZulu-Natal	116	0.664 (0.578;0.750)
Facility 23	KwaZulu-Natal	92	0.663 (0.566;0.760)
Facility 24	KwaZulu-Natal	32	0.656 (0.492;0.821)
Facility 25	Western Cape	107	0.654 (0.564;0.744)

95% CI: 95% confidence interval; PTP: positive test proportion

Table 5.2 shows the 25 private sector clinics, hospitals and testing laboratories (where specimens were not tied to a particular facility), that had 25 or more specimens tested and at least five positive results in the week of 20 – 26 December, with the highest proportion testing positive nationally. Private sector facilities with high proportions testing positive are concentrated in the Western Cape (11), KwaZulu-Natal (8) and Gauteng (4).

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Table 5.2 Private sector healthcare facilities with a high proportion testing positive, 20 – 26 December 2020

Facility Name	Province	Tests	PTP (95% CI)
Facility 1	Western Cape	109	0.780 (0.702;0.858)
Facility 2	Gauteng	35	0.771 (0.632;0.911)
Facility 3	KwaZulu-Natal	38	0.737 (0.597;0.877)
Facility 4	Western Cape	69	0.725 (0.619;0.830)
Facility 5	Western Cape	49	0.714 (0.588;0.841)
Facility 6	Eastern Cape	73	0.685 (0.578;0.791)
Facility 7	KwaZulu-Natal	95	0.684 (0.591;0.778)
Facility 8	KwaZulu-Natal	113	0.673 (0.586;0.759)
Facility 9	Eastern Cape	26	0.654 (0.471;0.837)
Facility 10	Western Cape	43	0.651 (0.509;0.794)
Facility 11	Gauteng	71	0.648 (0.537;0.759)
Facility 12	Western Cape	48	0.646 (0.511;0.781)
Facility 13	KwaZulu-Natal	59	0.644 (0.522;0.766)
Facility 14	KwaZulu-Natal	243	0.642 (0.582;0.702)
Facility 15	Western Cape	158	0.633 (0.558;0.708)
Facility 16	Western Cape	144	0.625 (0.546;0.704)
Facility 17	Gauteng	50	0.620 (0.485;0.755)
Facility 18	KwaZulu-Natal	76	0.618 (0.509;0.728)
Facility 19	KwaZulu-Natal	69	0.609 (0.494;0.724)
Facility 20	Western Cape	596	0.602 (0.563;0.642)
Facility 21	Western Cape	105	0.600 (0.506;0.694)
Facility 22	KwaZulu-Natal	42	0.595 (0.447;0.744)
Facility 23	Western Cape	92	0.587 (0.486;0.688)
Facility 24	Western Cape	72	0.583 (0.469;0.697)
Facility 25	Gauteng	26	0.577 (0.387;0.767)

95% CI: 95% confidence interval; PTP: positive test proportion

Health district-level results

The data from geolocatable public testing (almost every public sector facility in the country) and private testing (approximately 77% of private testing facilities) in the week from 20-26 December have been located within the spatial framework of the health districts and health sub-districts (in the metros). Estimates of overall prevalence were derived using regression techniques. These estimates were then adjusted to produce district-specific positive test prevalence based on the national average age and sex profile of testing for that week. This adjustment allows more accurate comparison of the proportion testing positive across districts.

The results for the 25 municipalities and metropolitan health sub-districts showing the greatest proportions testing positive in the week of 20 – 26 December 2020 are shown in Table 6. Districts showing the greatest proportions testing positive are concentrated in the Western Cape (15 districts). The remaining ten districts are in KwaZulu-Natal (4), Limpopo (3), with one each in the North-West, Eastern Cape and the Northern Cape.

All 25 districts with the highest proportion testing positive in the week from 20-26 December showed a proportion testing positive greater than 40%. In six districts, the proportion testing positive was greater than 60%, and in 6 others it was greater than 50%. A significant increase over the previous week was observed in 8 of the 25 districts.

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Table 6. Health sub-districts with the highest proportion testing positive based on public and private sector data for the week of 20 – 26 December 2020

Health district or sub-district	Province	PTP (95% CI)	Previous week
Witzenberg	Western Cape	0.697 (0.653-0.740)	0.632 (0.591-0.673)
Swellendam	Western Cape	0.634 (0.568-0.700)	0.543 (0.475-0.611)
Umzumbe	KwaZulu-Natal	0.615 (0.546-0.683)	0.560 (0.509-0.612)
Langeberg	Western Cape	0.614 (0.562-0.666)	0.573 (0.532-0.614)
Cape Agulhas	Western Cape	0.606 (0.510-0.701)	0.534 (0.452-0.615)
Swartland	Western Cape	0.605 (0.537-0.672)	0.473 (0.413-0.534)
Greater Kokstad	KwaZulu-Natal	0.584 (0.533-0.636)	0.558 (0.511-0.605)
Breede Valley	Western Cape	0.571 (0.542-0.599)	0.488 (0.461-0.516)
CT Klipfontein	Western Cape	0.551 (0.503-0.599)	0.469 (0.429-0.509)
Theewaterskloof	Western Cape	0.550 (0.496-0.604)	0.477 (0.434-0.520)
Umzimkhulu	KwaZulu-Natal	0.518 (0.468-0.569)	0.477 (0.431-0.522)
CT Mitchells Plain	Western Cape	0.514 (0.485-0.542)	0.461 (0.438-0.485)
Drakenstein	Western Cape	0.497 (0.470-0.524)	0.389 (0.365-0.413)
Moses Kotane	NorthWest	0.490 (0.356-0.623)	0.457 (0.333-0.580)
Beaufort West	Western Cape	0.488 (0.407-0.570)	0.367 (0.296-0.437)
Lepele-Nkumpi	Limpopo	0.486 (0.413-0.559)	0.353 (0.247-0.458)
CT Eastern	Western Cape	0.483 (0.462-0.505)	0.433 (0.416-0.449)
CT Northern	Western Cape	0.481 (0.463-0.500)	0.371 (0.356-0.386)
Overstrand	Western Cape	0.481 (0.450-0.512)	0.383 (0.353-0.413)
Ba-Phalaborwa	Limpopo	0.477 (0.386-0.567)	0.172 (0.103-0.242)
Ntabankulu	Eastern Cape	0.475 (0.375-0.575)	0.450 (0.369-0.531)
Ubuntu	Northern Cape	0.473 (0.333-0.613)	0.481 (0.338-0.624)
Oudtshoorn	Western Cape	0.470 (0.422-0.519)	0.467 (0.426-0.509)
Ubuhlebezwe	KwaZulu-Natal	0.462 (0.411-0.514)	0.375 (0.321-0.428)
Polokwane	Limpopo	0.461 (0.439-0.483)	0.240 (0.219-0.261)

95% CI: 95% confidence interval; PTP: adjusted positive test proportion; Elements marked in **red** have current week proportions testing positive that are **higher** than, and CIs that do not overlap with, the previous week proportions and CIs. Elements marked in **blue** have current week proportions testing positive that are **lower** than, and CIs that do not overlap with, the previous week proportions and CIs.

The data for every district with a non-zero proportion testing positive or where the range of confidence interval is not more than 30% (15% either side of the point estimate) for the current week is presented graphically below.

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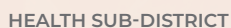


Figure 9.1 Proportions testing positive by health sub-district in the Western Cape, Eastern Cape, Gauteng and KwaZulu-Natal provinces based on public and private sector data for the week of 20 – 26 December 2020.

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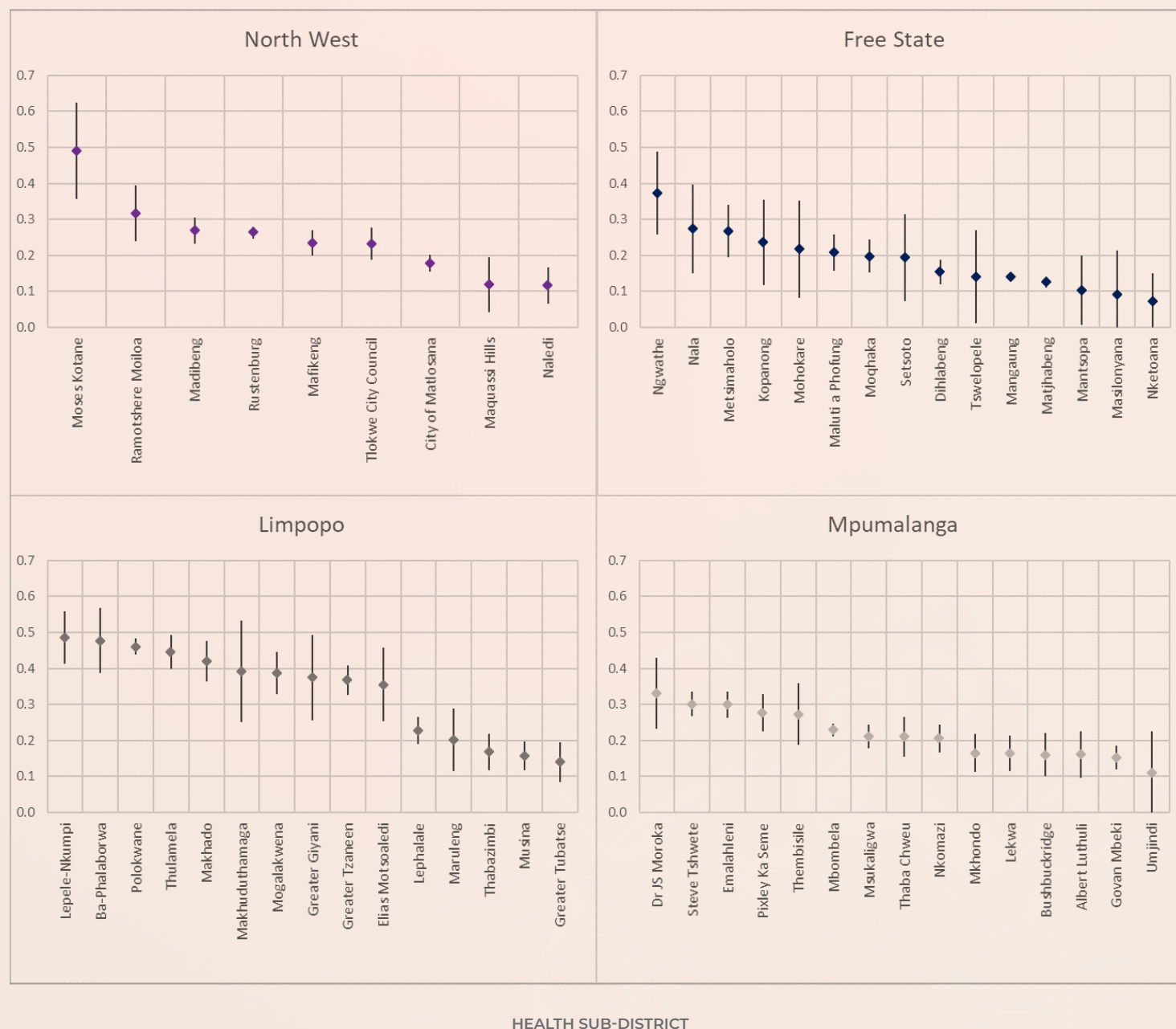


Figure 9.2 Proportions testing positive by health sub-district in the North West, Free State, Limpopo and Mpumalanga provinces based on public and private sector data for the week of 20 – 26 December 2020.

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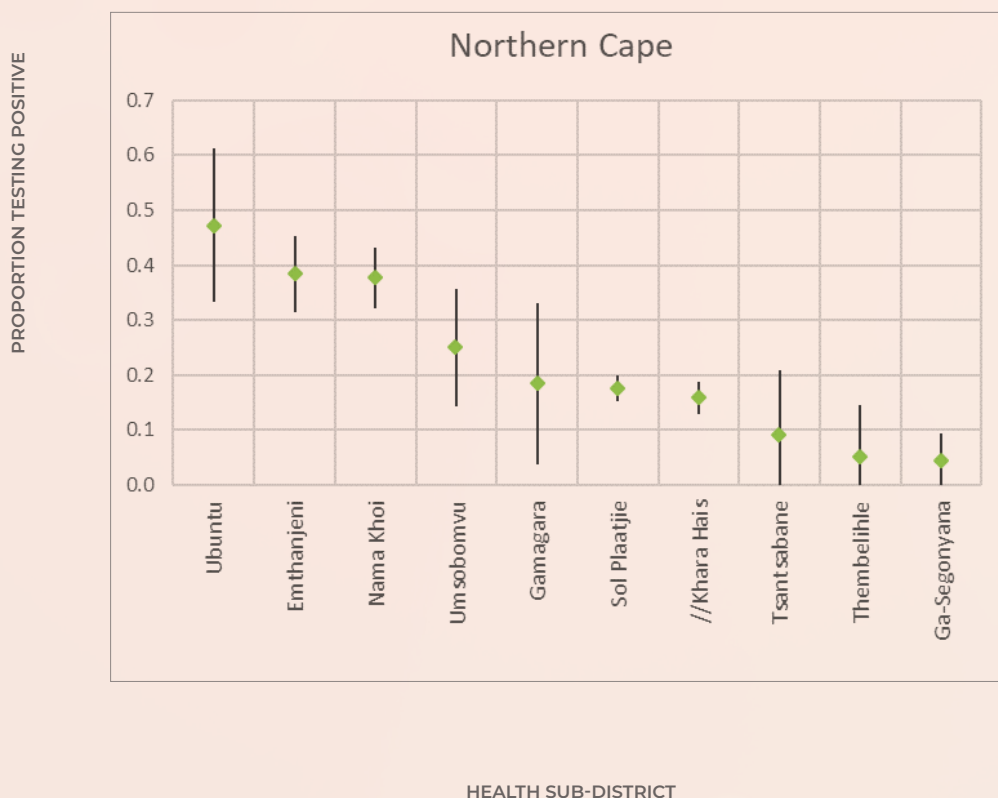


Figure 9.3 Proportions testing positive by health sub-districts in the Northern Cape Province based on public and private sector data for the week of 20 – 26 December 2020.

The spatial pattern of adjusted proportions testing positive, including both public and private sector data, by health district and sub-district are shown for South Africa (Figure 10), Western Cape (Figure 11), Eastern Cape (Figure 12), Northern Cape (Figure 13), Free State (Figure 14), KwaZulu-Natal (Figure 15), North West (Figure 16), Gauteng (Figure 17), Mpumalanga (Figure 18) and Limpopo (Figure 19).

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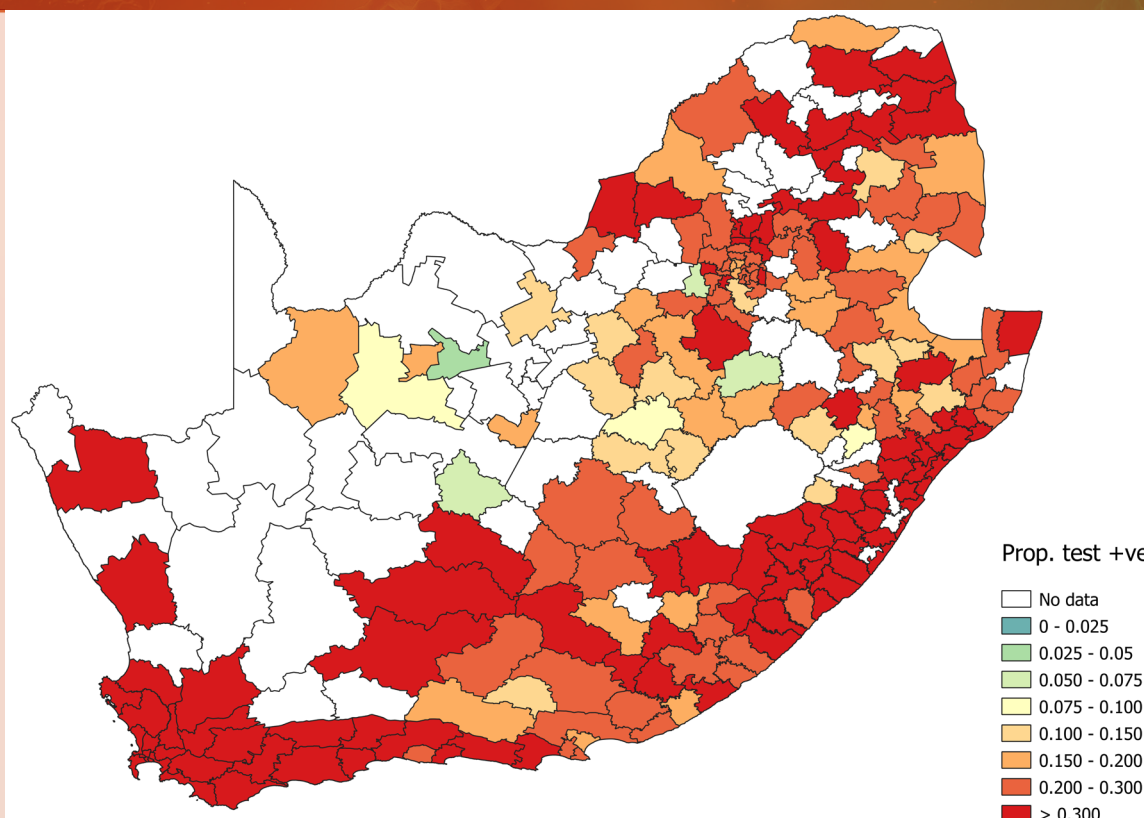


Figure 10. Proportion testing positive by health sub-district in South Africa for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

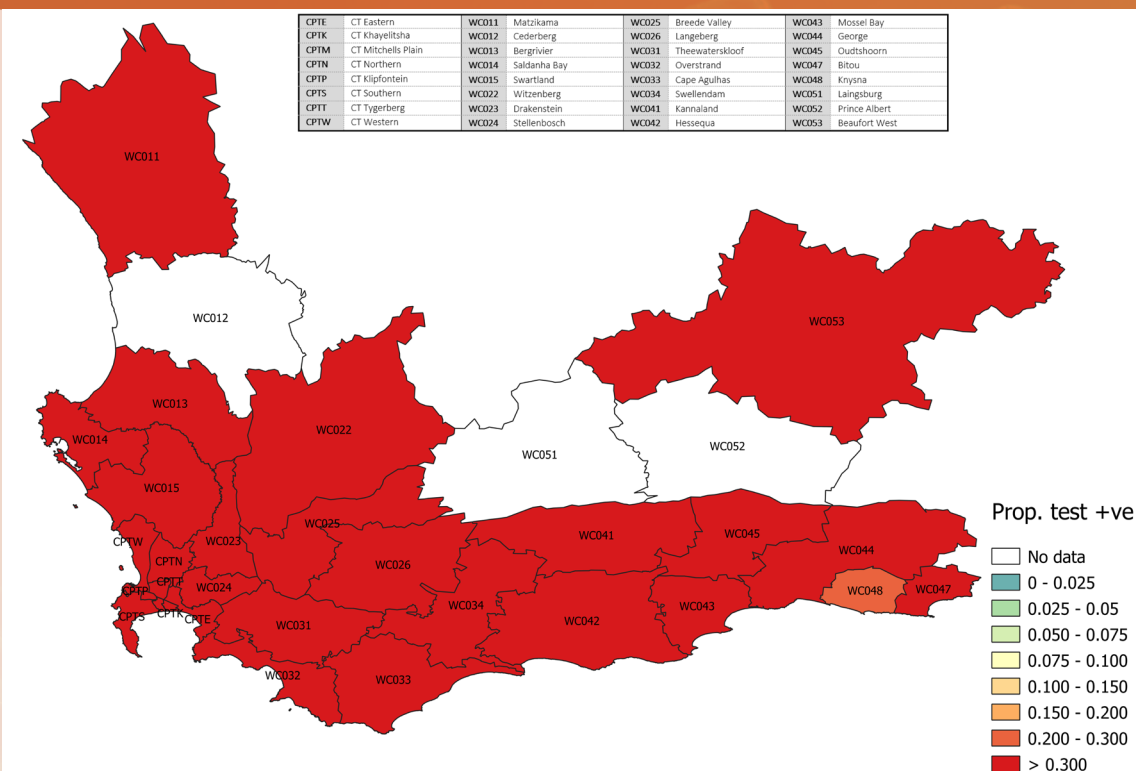


Figure 11. Proportion testing positive by health sub-district in the Western Cape province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

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BUF	Buffalo City	EC122	Mnquma	EC135	Intsika Yethu	EC155	Nyandeni
EC101	Camdeboo	EC123	Great Kei	EC136	Emalahleni	EC156	Mthontlo
EC102	Blue Crane Route	EC124	Amahlathi	EC137	Engcobo	EC157	King Sabata Dalindyebo
EC103	Ikwezi	EC126	Ngqushwa	EC138	Sakhisizwe	EC441	Matatiele
EC104	Makana	EC127	Nkonkobe	EC141	Elundini	EC442	Umtzimvubu
EC105	Ndlambe	EC128	Nxuba	EC142	Senqu	EC443	Mbizana
EC106	Sundays River Valley	EC131	Inxuba Yethemba	EC143	Maletswai	EC444	Ntabankulu
EC107	Baviaans	EC132	Tsolwana	EC144	Gariep	NMAA	Nelson Mandela Bay A
EC108	Kouga	EC133	Inkwanca	EC153	Ngqiza Hill	NMAB	Nelson Mandela Bay B
EC109	Kou-Kamma	EC134	Lukani	EC154	Port St Johns	NMAC	Nelson Mandela Bay C
EC121	Mbashe						

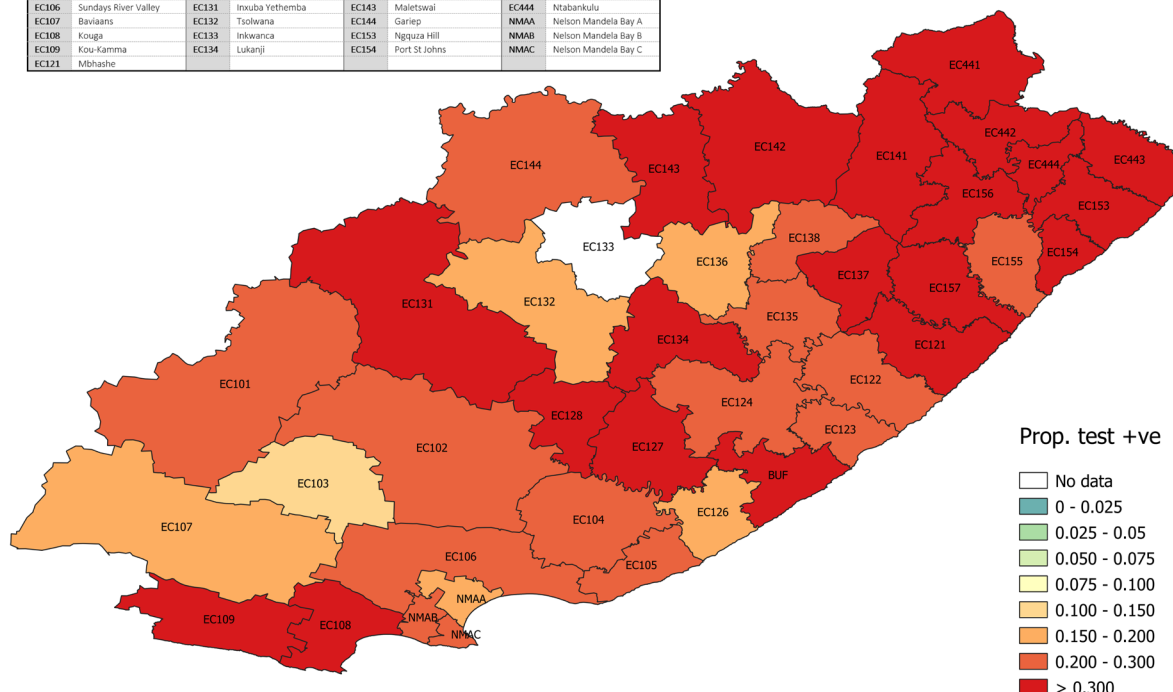


Figure 12. Proportion testing positive by health sub-district in the Eastern Cape province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

NC061	Richtersveld	NC074	Kareeberg	NC085	Tsantabane
NC062	Nama Khoi	NC075	Rensosterberg	NC086	Kgatelopele
NC064	Kameelsburg	NC076	Thembelille	NC091	'Sol Plaatje
NC065	Hamdam	NC077	Siyathemba	NC092	Dikgatlong
NC066	Karoo Hoogland	NC078	Siyancuma	NC093	Magareng
NC067	Edik-Roo	NC081	Karoo	NC094	Phokwane
NC071	Uburutu	NC082	Kal Ikarib	NC451	Joe Morolong
NC072	Umsobomvu	NC083	/Kharu Hais	NC452	Ga-Segonyana
NC073	Terburgse	NC084	Viesies	NC453	Gomagaga

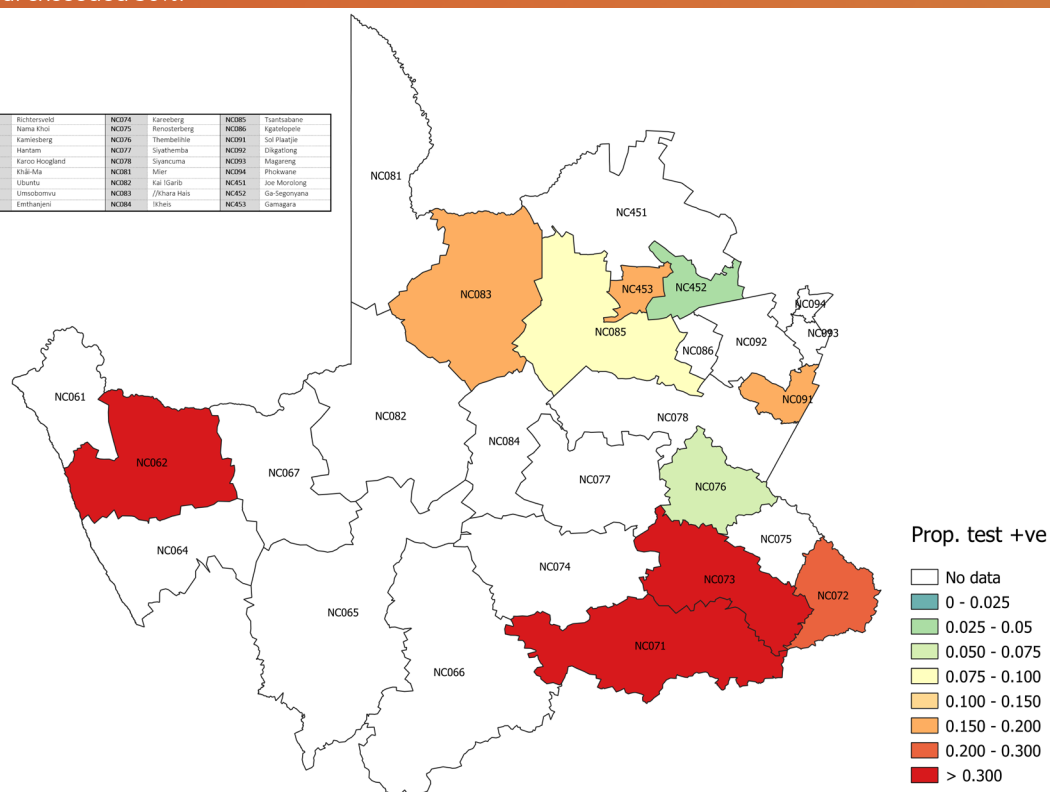


Figure 13. Proportion testing positive by health sub-district in Northern Cape Province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

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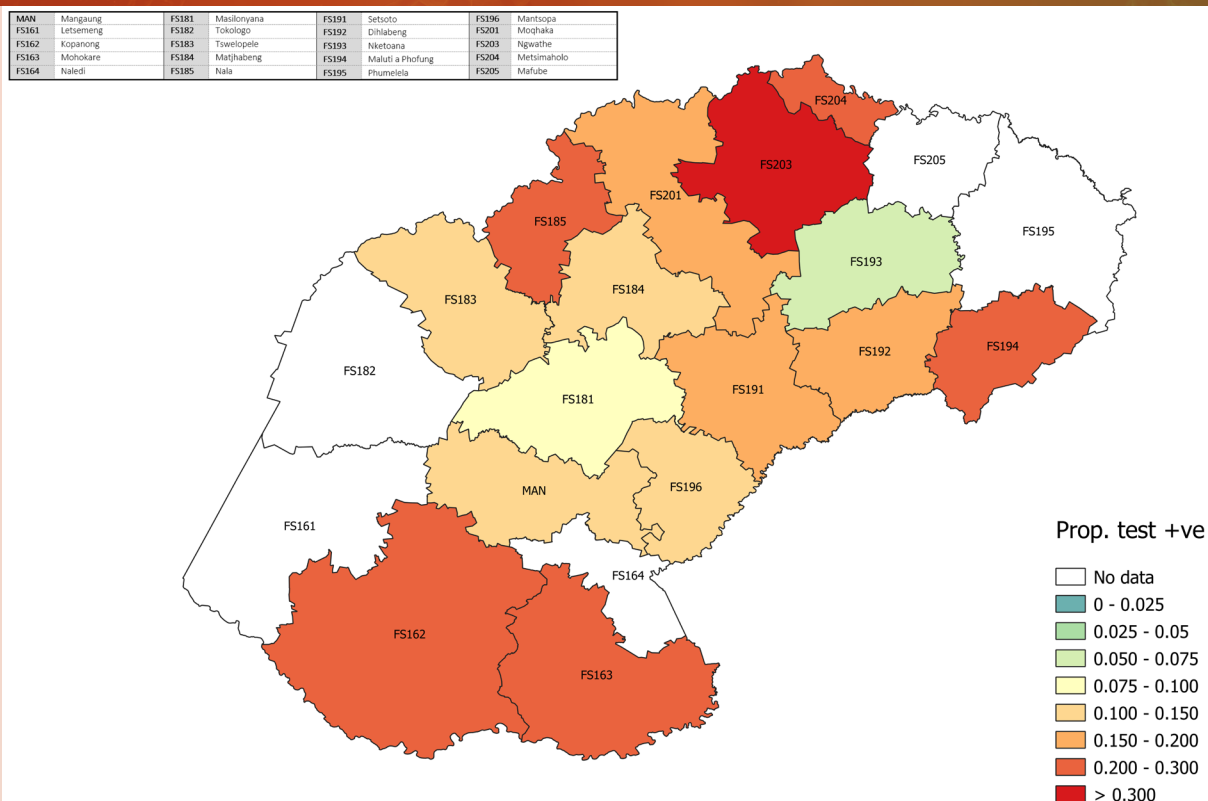


Figure 14. Proportion testing positive by health sub-district in Free State Province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

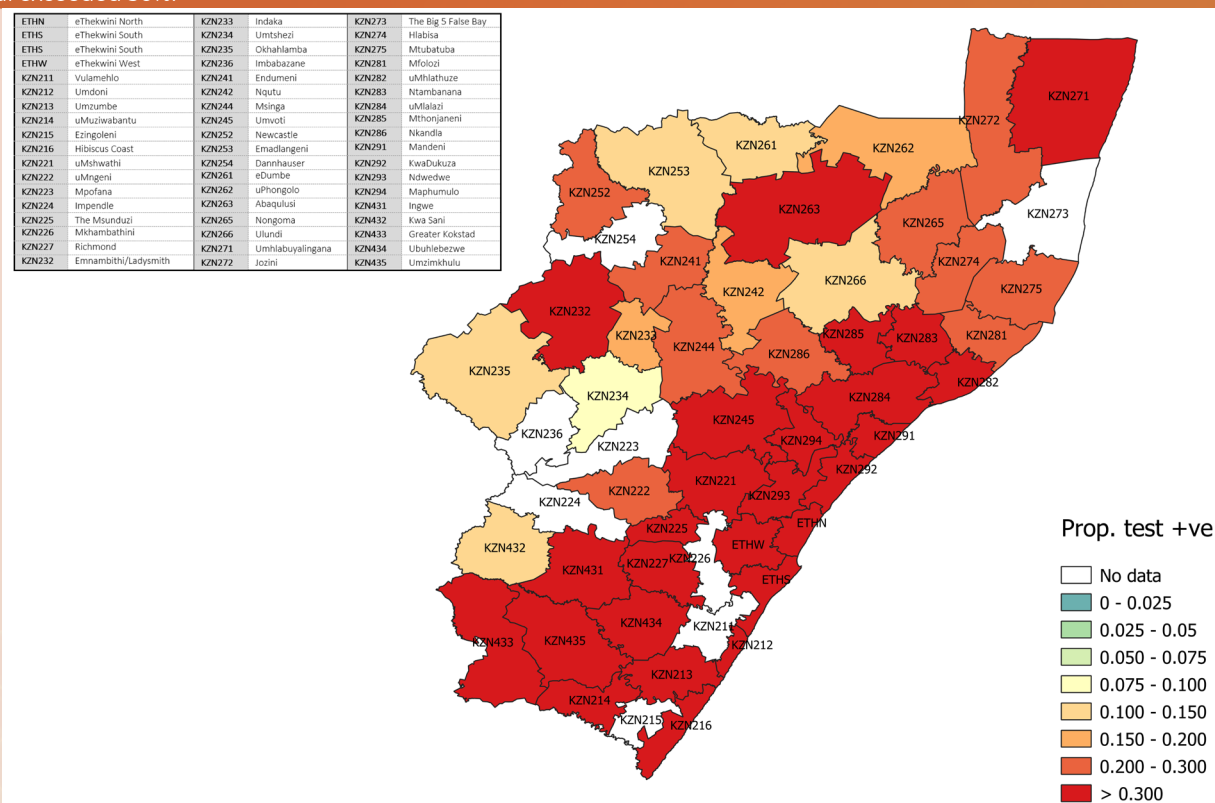


Figure 15. Proportion testing positive by health sub-district in KwaZulu-Natal Province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

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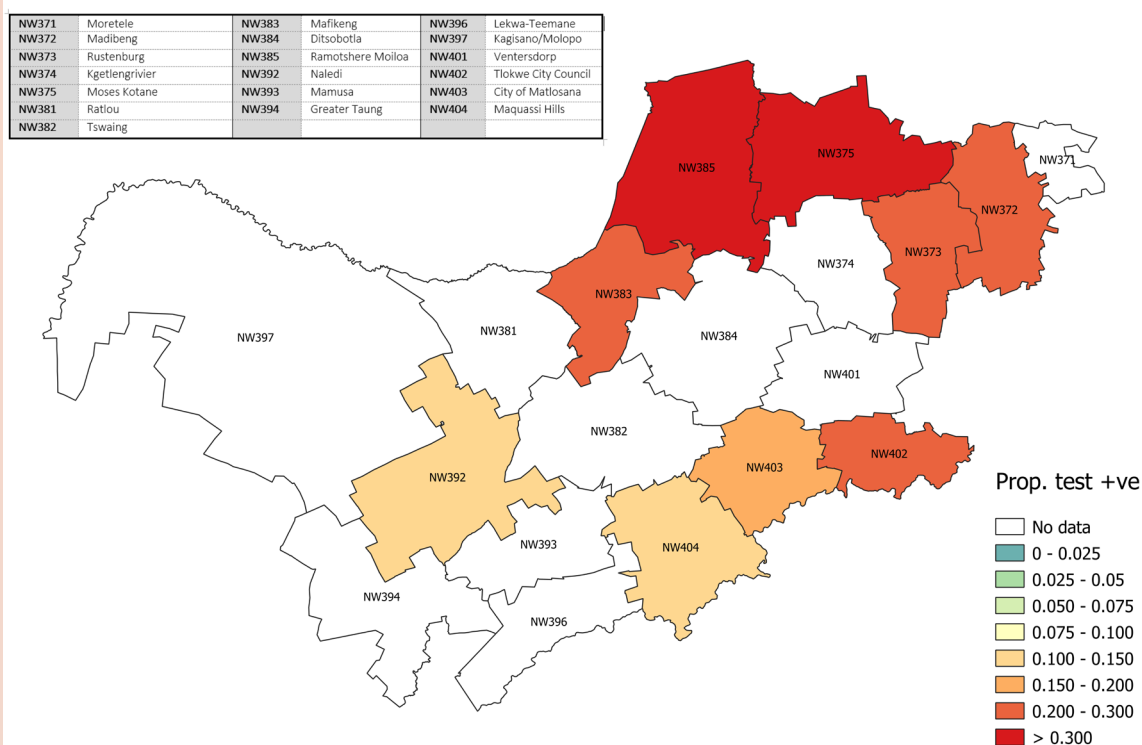


Figure 16. Proportion testing positive by health sub-district in North West Province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

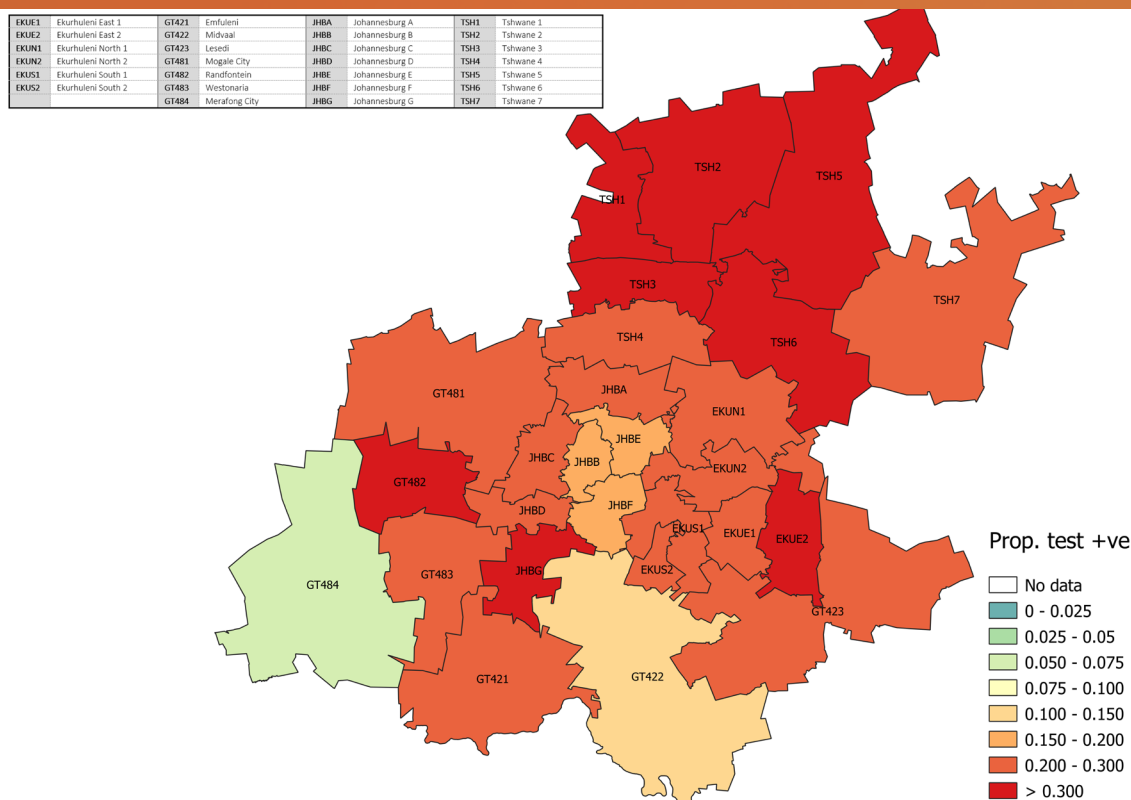


Figure 17. Proportion testing positive by health sub-district in Gauteng Province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

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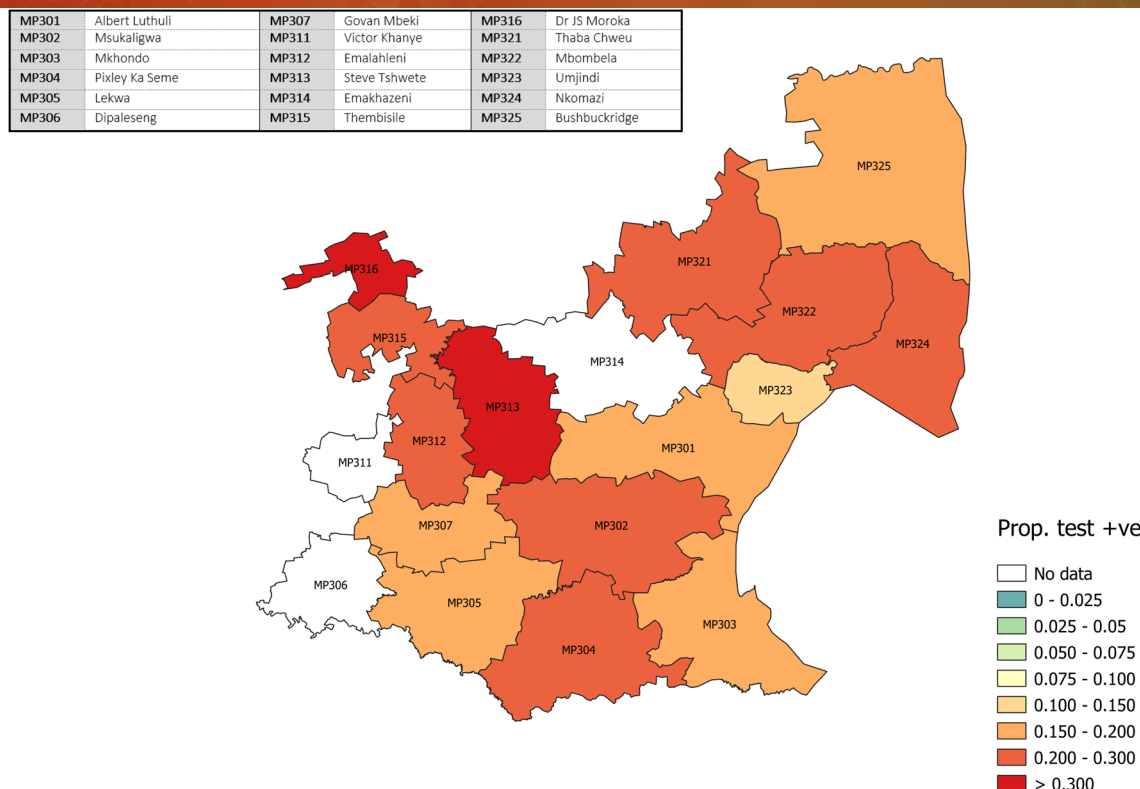


Figure 18. Proportion testing positive by health sub-district in Mpumalanga Province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

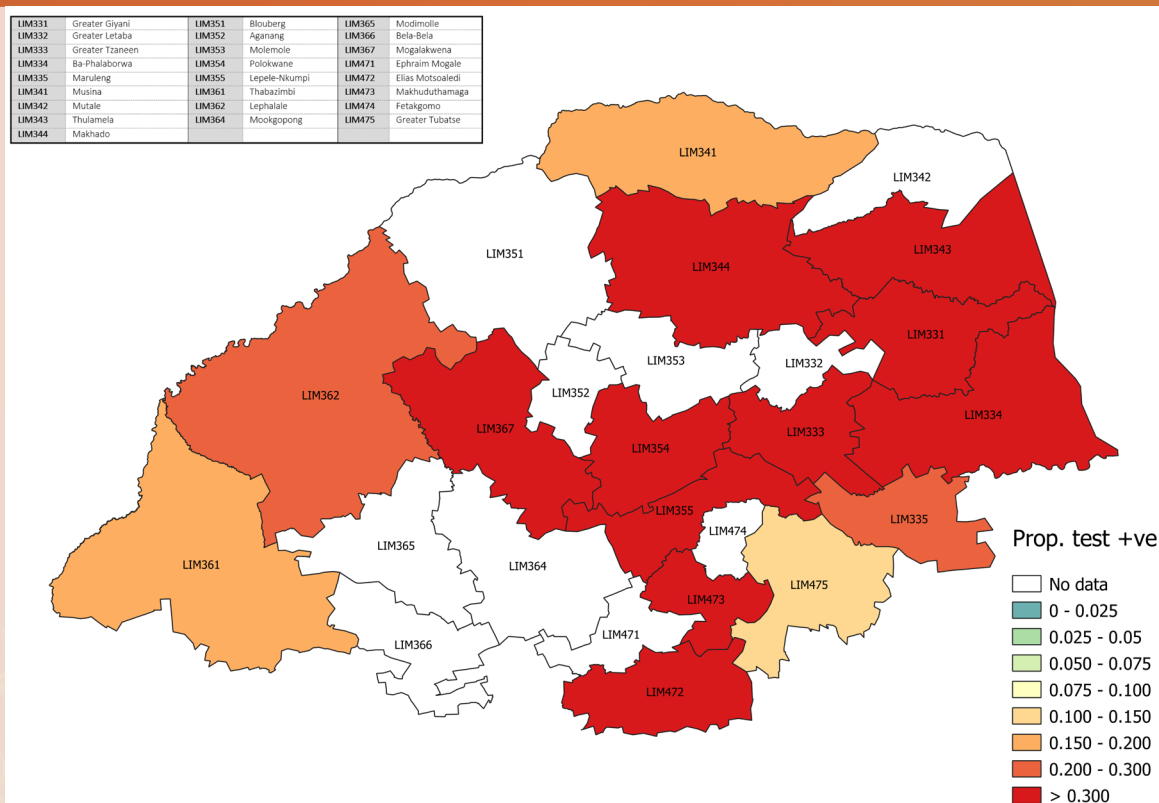


Figure 19. Proportion testing positive by health sub-district in Limpopo Province for the week of 20 – 26 December 2020. Areas shaded white represent districts in which either (i) no tests were conducted, (ii) all tests were negative, or (iii) the confidence interval exceeded 30%.

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Testing by patient admission status

In week 52, 45.8% of tests in the public sector were performed for hospitalised patients (Figure 20). The proportion of inpatient tests was highest in North West (70.3%), Free State (58.2%) and Northern Cape (58.0%) provinces. Comparing week 52 to the previous week, the proportion of inpatient tests increased in eight provinces: Eastern Cape, Northern Cape,

Free State, KwaZulu-Natal, North West, Gauteng, Mpumalanga and Limpopo. The percentage testing positive in week 52 remained lower among inpatients (33.3%) compared to outpatients (36.0%), and increased among both inpatients (28.1 to 33.3%) and outpatients (28.7 to 36.0%) (Figure 21). In the public sector in week 52 the mean laboratory turnaround time continued to be lower for inpatients (2.5 days) compared to outpatients (3.5 days) (Figure 22).

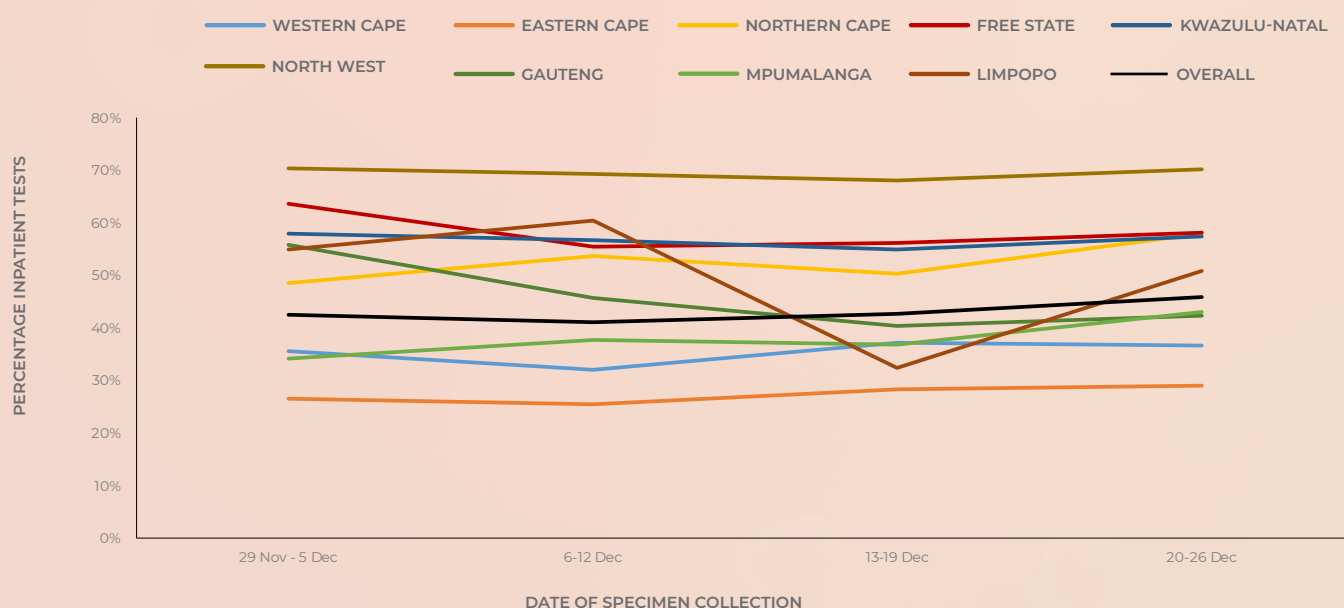


Figure 20. Percentage of inpatient tests performed in the public sector by province, 20 -26 December 2020

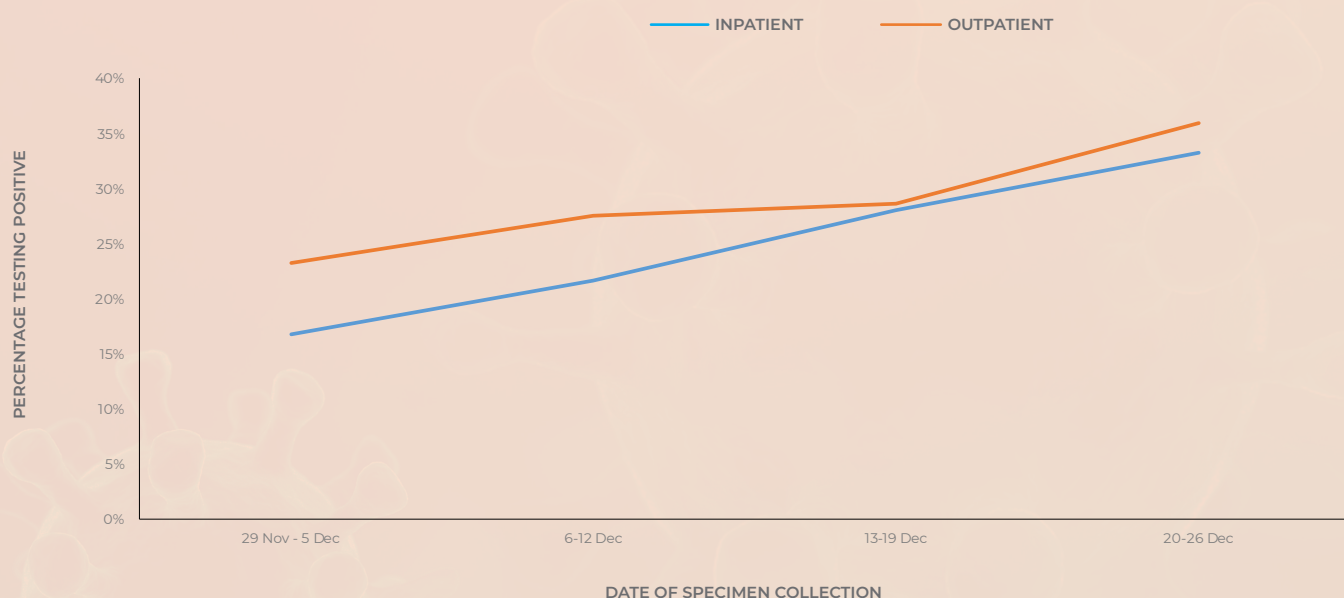


Figure 21. Percentage testing positive by patient admission status in the public sector, 20 - 26 December 2020

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Figure 22. Mean number of days between date of specimen collection and date of test result, by patient admission status and date of test result in the public sector, South Africa, 20 – 26 December 2020

Testing by age and sex

The mean age of individuals tested in week 52 was 39.3 years, slightly higher than the previous week's (38.4 years). The mean age of individuals with a positive test in week 52 was 42.6 years, slightly higher than the previous week (41.8 years). The mean age of individuals with a positive test in week 52 was slightly higher in

females (42.8 years) compared to males (42.5 years, $P=0.0128$) (Table 7). The sex ratio (the number of males per 100 females) of individuals with a positive test in week 52 was 81.4. In both sexes the proportion testing positive in week 52 was higher than or similar to the previous week in all age groups (Figure 23).

Table 7. Mean age and sex ratio of individuals tested, South Africa, 20 – 26 December 2020

Week number	Week beginning	Mean age of tested (years)		Mean age of positive tests (years)		Sex ratios (males / 100 females)	
		Males	Females	Males	Females	Tested	Positive tests
49	29 November	38.3	39.1	40.8	41.5	87.4	73.1
50	6 December	37.6	38.5	39.7	40.5	86.5	75.7
51	13 December	38.0	38.9	41.4	42.2	90.5	76.4
52	20 December	39.3	39.3	42.5	42.8	98.4	81.4

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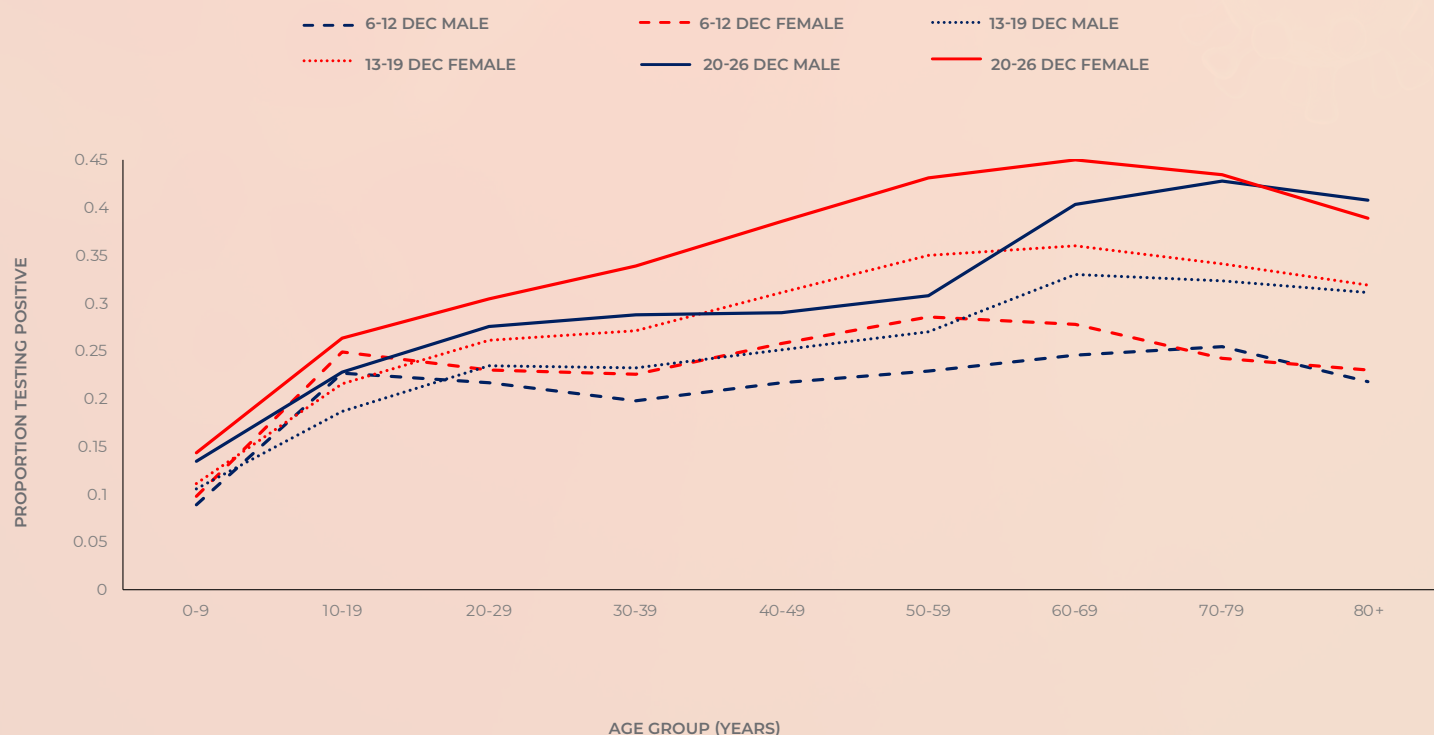


Figure 23. Weekly proportion testing positive by age group and sex, South Africa, 20 – 26 December 2020

From week 49 to week 52, the percentage testing positive increased by 13.4% in males (from 15.7% to 29.1%) and increased by 16.4% in females (from 18.8% to 35.2%) (Table 8). In week 52, the percentage testing positive was higher in females compared to males

in the 0-19 years ($P<0.001$), 20-39 years ($P<0.001$), 40-59 years ($P<0.001$) and 60-69 years ($P<0.001$) age groups, and did not differ in individuals aged ≥ 70 years ($P=0.806$).

Table 8. Percentage testing positive by sex and week, South Africa, 29 November – 26 December 2020

Age (years)	29 Nov-5 Dec		6-12 Dec		13-19 Dec		20-26 Dec	
	Male	Female	Male	Female	Male	Female	Male	Female
0-19	12.1%	14.0%	16.9%	19.2%	15.4%	17.4%	18.8%	21.6%
20-39	15.1%	17.3%	20.7%	22.8%	23.4%	26.7%	28.3%	32.3%
40-59	17.2%	22.4%	22.1%	27.0%	25.9%	32.8%	29.8%	40.6%
60-69	18.4%	21.5%	24.6%	27.8%	33.0%	35.9%	40.3%	44.9%
70+	17.8%	18.2%	24.5%	23.8%	32.0%	33.4%	42.3%	42.0%
Total	15.7%	18.8%	21.0%	24.0%	24.1%	28.5%	29.1%	35.2%

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Limitations

- A backlog in testing of samples by laboratories affects the reported numbers of tests performed. As a result, numbers tested during this period may change in subsequent reports.
- If higher-priority specimens were tested preferentially, this would likely result in an inflated proportion testing positive.
- Different and changing testing strategies (targeted vs. mass testing) used by different provinces makes percentage testing positive difficult to interpret and compare.
- Health district and sub-district level were mapped based on the testing facility and not place of residence.
- Patient admission status was categorised based on the reported patient facility and may not reflect whether the patient was actually admitted to hospital.

CONCLUSIONS

Weekly testing volumes peaked in week 28 (beginning 5 July), decreased weekly to week 39 (beginning 20 September) and have subsequently increased. The number of tests performed in week 52 was higher than the number of weekly tests performed in weeks 31 to 49. Gauteng (32.6%), KwaZulu-Natal (25.9%), Western Cape (18.7%), and Eastern Cape (8.5%) provinces performed the majority of tests in the past week. Western Cape (544 per 100,000 persons), KwaZulu-Natal (457 per 100,000 persons), Gauteng (429 per 100,000 persons) and Eastern Cape (256 per 100,000 persons) provinces had the highest testing rates in week 52. The overall laboratory turnaround time in week 52 was 1.7 days; 2.8 days in the public sector and 0.9 days in the private sector.

The percentage testing positive decreased from a peak of 30.4% in week 29 to 9.5% in week 43. In week 52 the percentage testing positive was 32.1%, highest observed since testing began. The percentage testing positive was highest in the Western Cape (43.7%), Limpopo (41.0%), KwaZulu-Natal (38.8%) and Eastern Cape (31.9%). Percentages testing positive were between 15.9% -24.5% in Northern Cape, Free State, North West, Gauteng and Mpumalanga. In week 52, compared to the previous week, the percentage testing positive increased in all provinces. Of the 25 districts with the highest proportions testing positive in week 52, 15 were in Western Cape, 4 in KwaZulu-Natal, 3 in Limpopo, and one each in the North West, Eastern Cape and the Northern Cape.