COVID-19 TESTING SUMMARY

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

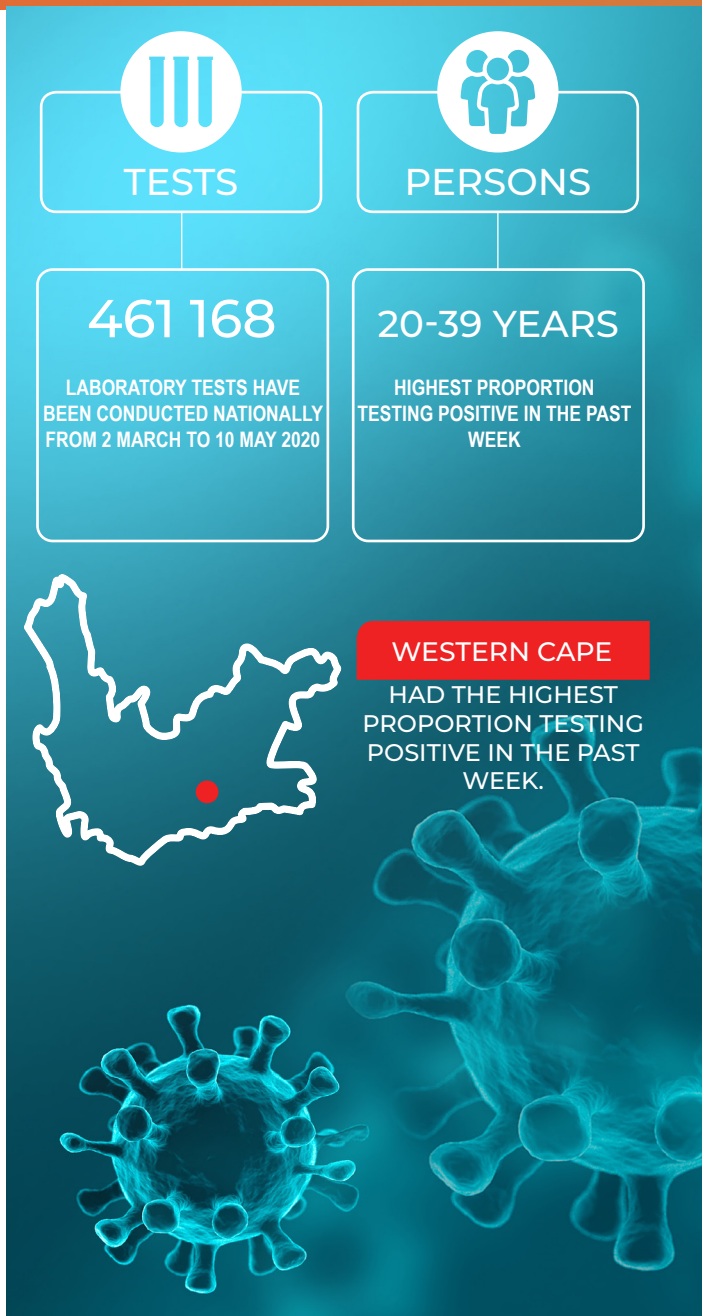
SOUTH AFRICA | WEEK 20 2020

OVERVIEW

This report summarises national laboratory testing for SARS-CoV-2, the virus causing COVID-19, in South Africa. This report is based on data collected up to 17 May 2020 (week 20 of 2020). Note: COVID-19 is the name of the disease and SARS-CoV-2 is the name of the virus.

Highlights

- In the period 02 March 2020 through 17 May 2020, 461 168 laboratory tests for SARS-CoV-2 have been conducted nationally
- Laboratory testing for SARS-CoV-2 increased week-on-week with a larger network of testing laboratories and the implementation of targeted community symptom screening and referral for testing in early April 2020. However, a decrease in testing volumes was observed in the past week, likely due to the limited supply of testing kits and laboratory testing backlogs.
- The mean turnaround time in the public sector increased from 2 days to >6 days from week 16 to week 20
- Overall proportion testing positive was 3.8%, however an increased proportion testing positive was observed in the week of 4-10 May (4.8%) and 11-17 May (5.0%)
- Western Cape (15.0%) and Eastern Cape (4.7%) provinces continued to have the highest proportion testing positive in the past week
- Proportion testing positive in the past week was highest in the 20-39 years age group, and was higher among females than males



METHODS

Testing for SARS-CoV-2 began on 28 January 2020 at the NICD and after the first case was confirmed on 5 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) hospitalized 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. CST has been implemented differently in different provinces, and ranges 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. Test results were automatically fed into a data warehouse. We excluded specimens collected outside South Africa and duplicate test results for an individual. 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.

For health district level results, estimates of overall prevalence were derived using regression techniques. These estimates were then refined using the margins command in Stata to adjust the district-specific positive test prevalences for the average age profile, the average sex composition, and the average balance between clinical and CST tests across the entire public testing data for the week for a more accurate comparison of the prevalences across districts.

The report includes tests conducted between 2 March 2020 (week 10), the week when the first case of COVID-19 was confirmed, and 17 May 2020 (week 20).

TESTING VOLUMES AND PROPORTION TESTING POSITIVE

From 2 March through 17 May 2020, 461 168 laboratory tests for SARS-CoV-2 were conducted. The number of tests conducted increased week on week to week 19, however decreased in week 20 (11-17 May). The decrease observed may be due to backlogs in laboratory testing and, as a result, all tests for samples collected in week 20 are not yet reflected. Reduced testing volumes were observed over weekends and public holidays (Figure 1).

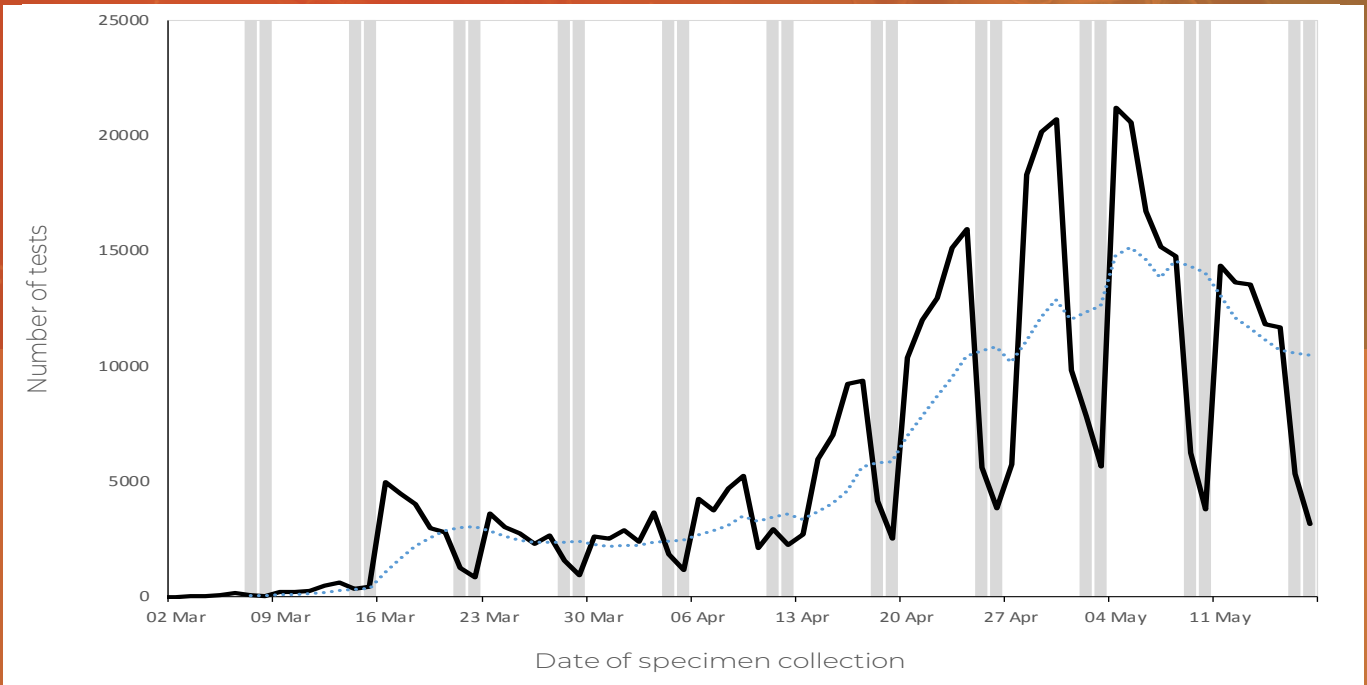


Figure 1. Number of laboratory tests conducted by date of specimen collection, South Africa, 2 March – 17 May 2020. Blue dotted line shows the 7-day moving average of the number of tests conducted. Grey bars highlight weekend days

The overall proportion testing positive from week 10 through 20 was 3.8%. While the proportion testing positive remained relatively consistent in week 13 through week 17 (2.7%-2.8%), an increase in the proportion testing positive weekly was observed since week 18 to 5.0% of samples testing positive in week 20 (11-17 May) (Table 1).

Table 1. Weekly number of tests conducted and positive tests, South Africa, 2 March – 17 May 2020

Week number	Week beginning	No. of tests n (%)	No. of positive tests	Proportion testing positive (%)
10	2 Mar 20	447 (0.1)	13	2.91
11	9 Mar 20	2668 (0.6)	115	4.31
12	16 Mar 20	21374 (4.6)	872	4.08
13	23 Mar 20	16914 (3.7)	463	2.74
14	30 Mar 20	17146 (3.7)	458	2.67
15	6 Apr 20	25287 (5.5)	715	2.83
16	13 Apr 20	41033 (8.9)	1166	2.84
17	20 Apr 20	75893 (16.5)	2136	2.81
18	27 Apr 20	88274 (19.1)	3076	3.48
19	4 May 20	98559 (21.4)	4698	4.77
20	11 May 20	73573 (16.0)	3670	4,.9
Total		461 168 (100)	17 382	3.77

TESTING IN PRIVATE AND PUBLIC SECTORS

From 2 March through 17 May, 248 099 laboratory tests were conducted in public sector laboratories, with 4.2% testing positive. Over this same period, private sector laboratories conducted 213 069 tests, with 3.3% testing positive (Table 2). Overall, the public sector has conducted 53.8% of tests. The proportion of tests conducted in public sector laboratories increased from week 12 through 18, however decreased in week 19 (57.0%) and week 20 (31.8%). This is likely due to limited supplies of testing kits and resulting backlogs in testing. The public sector accounted for 59.6% of positive tests overall, however the proportion decreased from 72.3% in week 19 to 39.9% in week 20. The proportion testing positive in the public sector has increased from 2.7% in week 16 to 6.3% in week 20. In the private sector the proportion testing positive also increased from 3.0% to 4.4% over this period.

Table 2. Weekly number of tests conducted and positive tests, by healthcare sector, South Africa, 2 March – 17 May 2020

		Public sector		Private sector		Public sector proportion of		Ratio of PTP[a]
Week number	Week begining	Tests	Cases n (%)	Tests	Cases n (%)	Tests (%)	Cases (%)	
10	2 Mar	309	8 (2.6)	138	5 (3.6)	69.1	61.5	0.715
11	9 Mar	394	24 (6.1)	2 274	91 (4.0)	14.8	20.9	1.522
12	16 Mar	1496	78 (5.2)	19 878	794 (4.0)	7.0	8.9	1.305
13	23 Mar	3665	123 (3.4)	13 249	340 (2.6)	21.7	26.6	1,308
14	30 Mar	5811	182 (3.1)	11 335	276 (2.4)	33.9	39.7	1.286
15	6 Apr	12146	397 (3.3)	13 141	318 (2.4)	48.0	55.5	1.351
16	13 Apr	24137	651 (2.7)	16 896	515 (3.0)	58.8	55.8	0.885
17	20 Apr	55576	1638 (2.9)	20 317	498 (2.5)	73.2	76.7	1.202
18	27 Apr	64919	2392 (3.7)	23 355	684 (2.9)	73.5	77.8	1.258
19	4 May	56227	3397 (6.0)	42 332	1 301 (3.1)	57.0	72.3	1.966
20	11 May	23419	1464 (6.3)	50 154	2 206 (4.4)	31.8	39.9	1.421
Total		248 099	10 354 (4.2)	213 069	7 028 (3.3)	53.8	59.6	1.265

[a] Ratio of proportion 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)

Laboratory delays are indicated by an increase in the mean number of days between specimen collection and reporting of the results over the past 5 weeks, predominantly in the public sector. The mean turnaround time in the public sector increased from 2 days to >6 days from week 16 to week 20 (Figure 2). The turnaround time in the private sector has remained <2 days over this same period. Among tests conducted in the public sector, the increased turnaround time has been observed in all five provinces where the largest number of tests have been conducted, however the largest delay in testing has been observed in Gauteng Province from 2.3 days in week 16 to >8 days in week 20 (Figure 3).

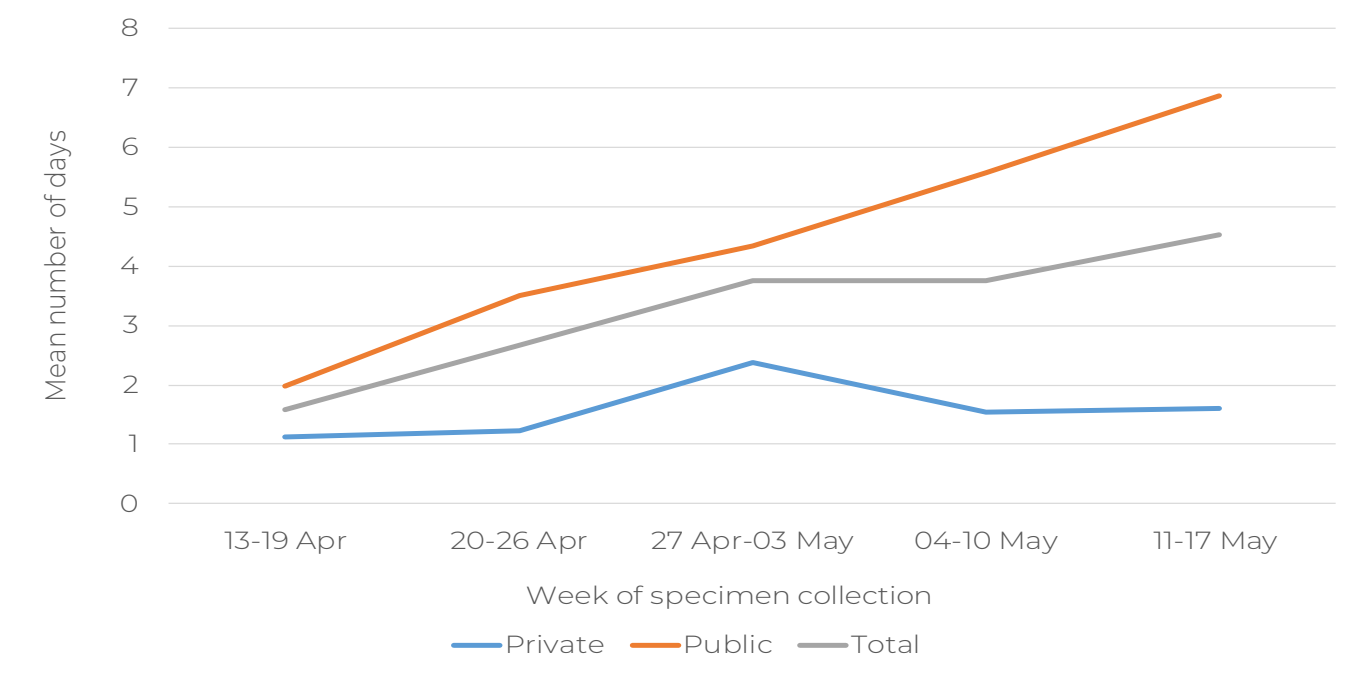


Figure 2. Mean number of days between date of specimen collection and date of test result, by week, South Africa, 13 April – 17 May 2020

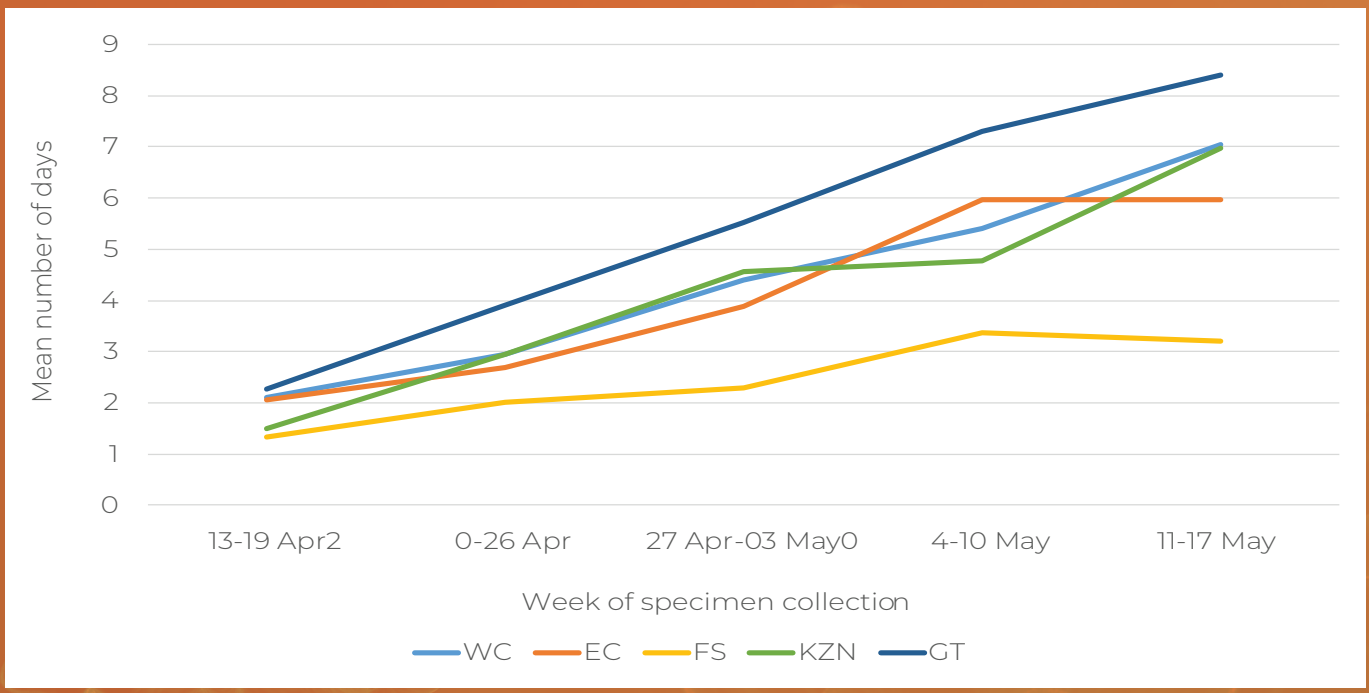


Figure 3. Mean number of days between date of specimen collection and date of test result, by week and province, South Africa, 13 April – 17 May 2020. WC, Western Cape; EC, Eastern Cape; FS, Free State; KZN, KwaZulu-Natal, GT, Gauteng

TESTING BY PROVINCE

In the past week, Gauteng, Western Cape and KwaZulu-Natal provinces conducted the largest numbers of tests, although the number of tests decreased in all these provinces compared to the previous week (Table 3). Western Cape and Eastern Cape provinces continued to have the highest proportion testing positive in week 20. The proportion testing positive continued to increase week on week in the Western Cape (Figure 4).

Table 3. Weekly number of tests conducted and positive tests, by province, South Africa, 27 April – 17 May 2020

	27 April – 3 May		4-10 May		11-17 May	
Province	No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)
Western Cape	19530	2025 (10.4)	25639	3482 (13.6)	18728	2808 (15.0)
Eastern Cape	11735	458 (3.9)	11016	688 (6.2)	6986	329 (4.7)
Northern Cape	694	9 (1.3)	1391	6 (0.4)	965	6 (0.6)
Free State	5544	13 (0.2)	4326	6 (0.1)	4216	28 (0.7)
KwaZulu Natal	19260	218 (1.1)	15351	204 (1.3)	11053	161 (1.5)
North West	1152	6 (0.5)	1840	16 (0.9)	2505	15 (0.6)
Gauteng	26243	310 (1.2)	32603	272 (0.8)	23221	288 (1.2)
Mpumalanga	2501	26 (1.0)	3259	11 (0.3)	3301	18 (0.5)
Limpopo	1436	8 (0.6)	2458	11 (0.4)	1840	8 (0.4)
Unknown	179	3 (1.7)	676	2 (0.3)	758	9 (1.2)
Total	88274	3076 (3.5)	98559	4698 (4.8)	73573	3670 (5.0)

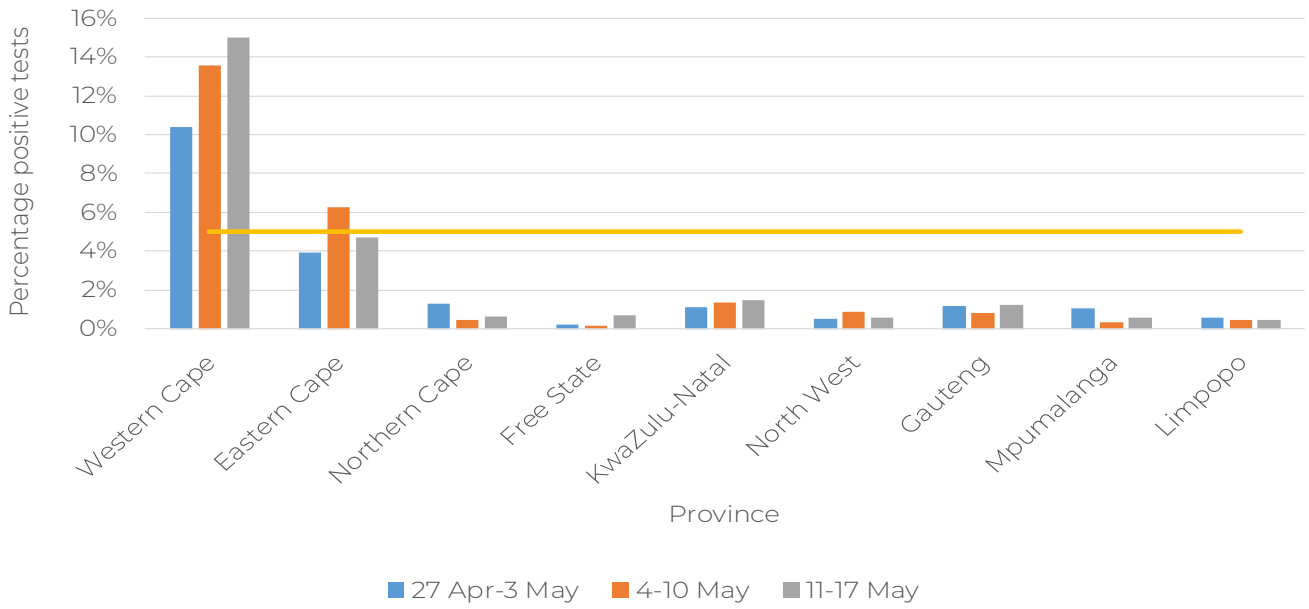


Figure 4. Weekly proportion testing positive, by province, South Africa, 27 April – 17 May 2020. The horizontal yellow line shows the national average for the week beginning 11 May 2020

TESTING IN THE PUBLIC SECTOR

In the public sector, the proportion testing positive remains highest in the Western Cape, and has increased to 23.0% in the past week (Table 4). The proportion testing positive is second highest in the Eastern Cape, but has decreased from 6.6% in week 19 to 4.1% in week 20. The proportion testing positive from the public sector remains higher than the national average, not weighted for population size, in Western Cape Province (Figure 5).

Table 4. Weekly number of tests conducted and positive tests in the public sector, by province, South Africa, 27 April – 17 May 2020

	27 April – 3 May		4-10 May		11-17 May	
Province	No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)	No. of tests	No. positive tests (%)
Western Cape	14008	1559 (11.1)	14908	2562 (17.2)	5326	1223 (23.0)
Eastern Cape	10859	419 (3.9)	9263	614 (6.6)	3778	154 (4.1)
Northern Cape	313	0 (0.0)	581	0 (0.0)	114	0 (0.0)

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Free State	4754	3 (0.1)	2840	0 (0.0)	2500	3 (0.1)
KwaZulu Natal	14426	150 (1.0)	8395	104 (1.2)	4318	43 (1.0)
North West	337	5 (1.5)	526	5 (1.0)	874	3 (0.3)
Gauteng	17740	233 (1.3)	17088	110 (0.6)	4872	34 (0.7)
Mpumalanga	1423	20 (1.4)	1174	1 (0.1)	903	2 (0.2)
Limpopo	1058	3 (0.3)	1452	1 (0.1)	734	2 (0.3)
Unknown	1	0 (0.0)	0	0 (0.0)	0	0 (0.0)
Total	64919	2392 (3.7)	56227	3397 (6.0)	23419	1464 (6.3)

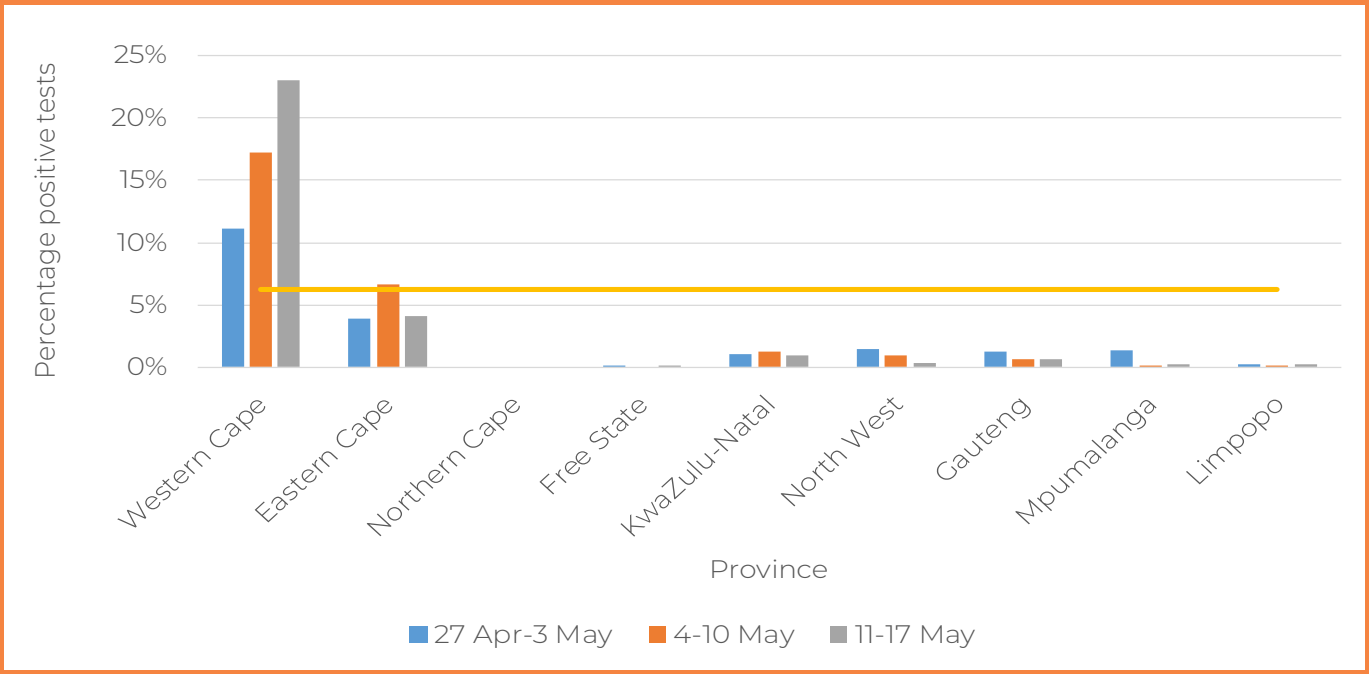

Figure 5. Weekly proportion testing positive in the public sector, by province, South Africa, 27 April – 17 May 2020. The horizontal yellow line shows the national average for week 20, beginning 11 May 2020

There are some differences in the proportion testing positive at a provincial level between individuals attending or admitted to healthcare facilities (passive case finding), and those tested as part of the community screening and testing (CST) programme (active case finding) in the four provinces where the greatest volume of public testing has been conducted in the last week (11-17 May). The proportion of positive tests in the Western Cape was higher among individuals being tested in healthcare facilities compared to those being tested as part of the CST programme (Table 5). In the Eastern Cape, the proportion of positive tests was higher among individuals tested as part of the CST programme compared to individuals in healthcare facilities, possibly due to targeted testing of community clusters in this province. The difference was less marked in Gauteng and KwaZulu-Natal provinces.

Table 5. Number of tests conducted and proportion of positive tests in the public sector by case-finding method, South Africa, 11 - 17 May 2020

	Healthcare facilities[a]		Community[b]	
Province	No. of tests	Proportion testing positive (%)	No. of tests	Proportion testing positive (%)
Western Cape	4145	23.3%	1181	21.8%
Eastern Cape	2631	3.7%	1147	5.0%
KwaZulu-Natal	2298	1.0%	2020	1.0%
Gauteng	3136	0.7%	1736	0.6%

[a] Individuals presenting or admitted to a healthcare facility
[b] Individuals tested through community screening

PUBLIC SECTOR TESTING: HEALTH DISTRICT-LEVEL RESULTS

Table 6 shows health sub-districts with high adjusted proportion testing positive for the week of 11-17 May, from both public healthcare facilities and community screening. The adjusted positive test proportion exceeded 20% in nine health sub-districts in the Western Cape (Figure 6 and 7). The proportion testing positive increased significantly in four health sub-districts in the Western Cape (Saldanha; CT Tygerberg; CT Western; and CT Southern). Two of Nelson Mandela Bay's health sub-districts are also represented in the list, although the proportion testing positive has remained constant or decreased.

Health district or sub-district	Province	PTP (95% CI)	Previous week
Saldanha Bay	Western Cape	**0.428 (0.276-0.579)**	0.108 (0.000-0.225)
CT Khayelitsha	Western Cape	0.338 (0.267-0.409)	0.255 (0.233-0.277)
CT Tygerberg	Western Cape	0.283 (0.248-0.318)	0.183 (0.170-0.196)
CT Mitchells Plain	Western Cape	0.279 (0.246-0.313)	0.235 (0.215-0.255)
CT Klipfontein	Western Cape	0.242 (0.192-0.293)	0.182 (0.157-0.207)
CT Northern	Western Cape	0.236 (0.108-0.364)	0.149 (0.121-0.178)
CT Western	Western Cape	**0.226 (0.205-0.248)**	0.165 (0.148-0.181)

CT Southern	Western Cape	**0.205 (0.180-0.229)**	0.099 (0.085-0.112)
CT Eastern	Western Cape	0.204 (0.144-0.264)	0.150 (0.125-0.176)
Drakenstein	Western Cape	0.167 (0.067-0.268)	0.150 (0.114-0.187)
Breede Valley	Western Cape	0.124 (0.010-0.239)	0.011 (0.000-0.027)
Swartland	Western Cape	0.087 (0.000-0.249)	0.068 (0.015-0.120)
Knysna	Western Cape	0.085 (0.024-0.146)	...
Witzenberg	Western Cape	0.077 (0.000-0.160)	0.109 (0.068-0.150)
Nelson Mandela Bay C	Eastern Cape	0.055 (0.042-0.068)	0.068 (0.054-0.082)
Nelson Mandela Bay B	Eastern Cape	0.053 (0.002-0.105)	0.053 (0.027-0.079)
Buffalo City	Eastern Cape	0.046 (0.033-0.058)	0.115 (0.102-0.128)
Nkonkobe	Eastern Cape	0.044 (0.000-0.094)	...
Baviaans	Eastern Cape	0.041 (0.000-0.086)	0.006 (0.000-0.013)

95% CI: 95% confidence interval; PTP: adjusted positive test proportion; CT: Cape Town; **bold** font indicates current week proportions that are significantly higher than the previous week;

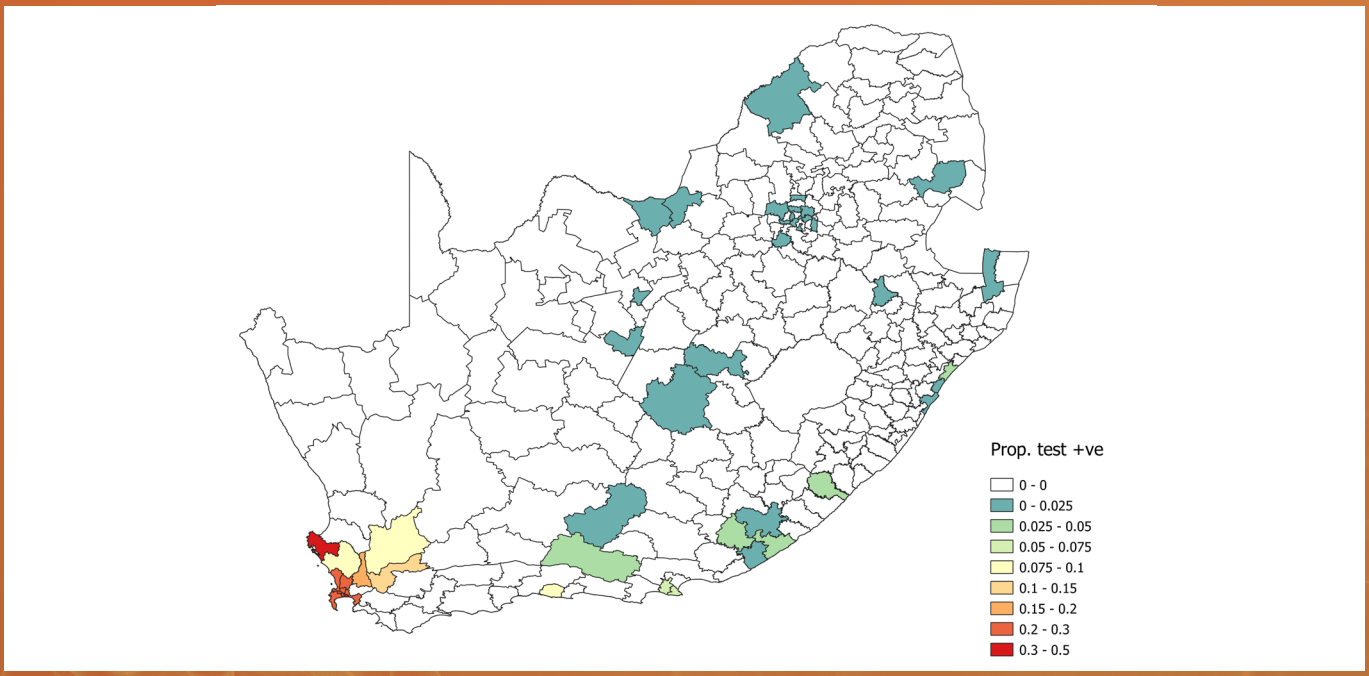

Figure 6. Proportion testing positive in the public sector by health sub-district for the week of 11-17 May, South Africa

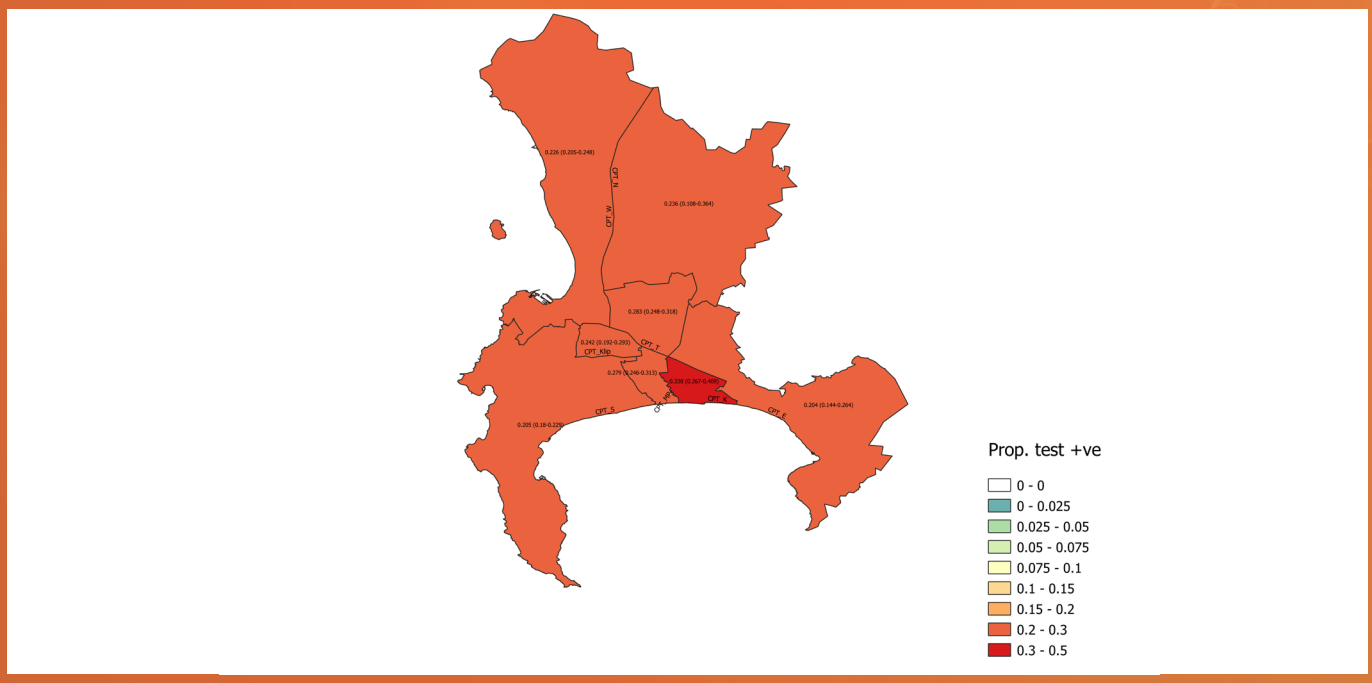

Figure 7. Health sub-districts in the Western Cape Province with a high proportion testing positive in the public sector for the week of 11-17 May

DEMOGRAPHIC PROFILE OF INDIVIDUALS TESTED

The mean age of individuals tested has remained stable over the last four weeks. However, the mean age of individuals testing positive has increased. The sex ratio (the number of males per 100 females) of individuals tested has decreased: in week 20 for every 100 females tested, 80 males were tested. However, the sex ratio of cases has increased: in week 20 for every 100 cases identified among females, 71 cases were identified among males (Table 7). For both males and females, the proportion testing positive increased in the older age groups in week 20 compared to week 19 (Figure 8). This was most marked for females in the ≥80 year age group, which increased from 2.1% in week 19 to 5.9% in week 20.

Table 7. Mean age and sex ratio of individuals tested, South Africa, 20 April – 17 May 2020

		Mean age of tested (years)		Mean age of cases (years)		Sex ratios (males / 100 females)	
Week number	Week beginning	Males	Females	Males	Females	Tested	Cases
17	20 April	41.4	42.0	37.1	36.5	81.7	65.6
18	27 April	41.6	42.3	38.3	37.9	91.3	66.6
19	4 May	41.8	41.5	38.2	38.2	81.2	72.8
20	11 May	42.2	41.8	40.4	41.5	79.5	70.8

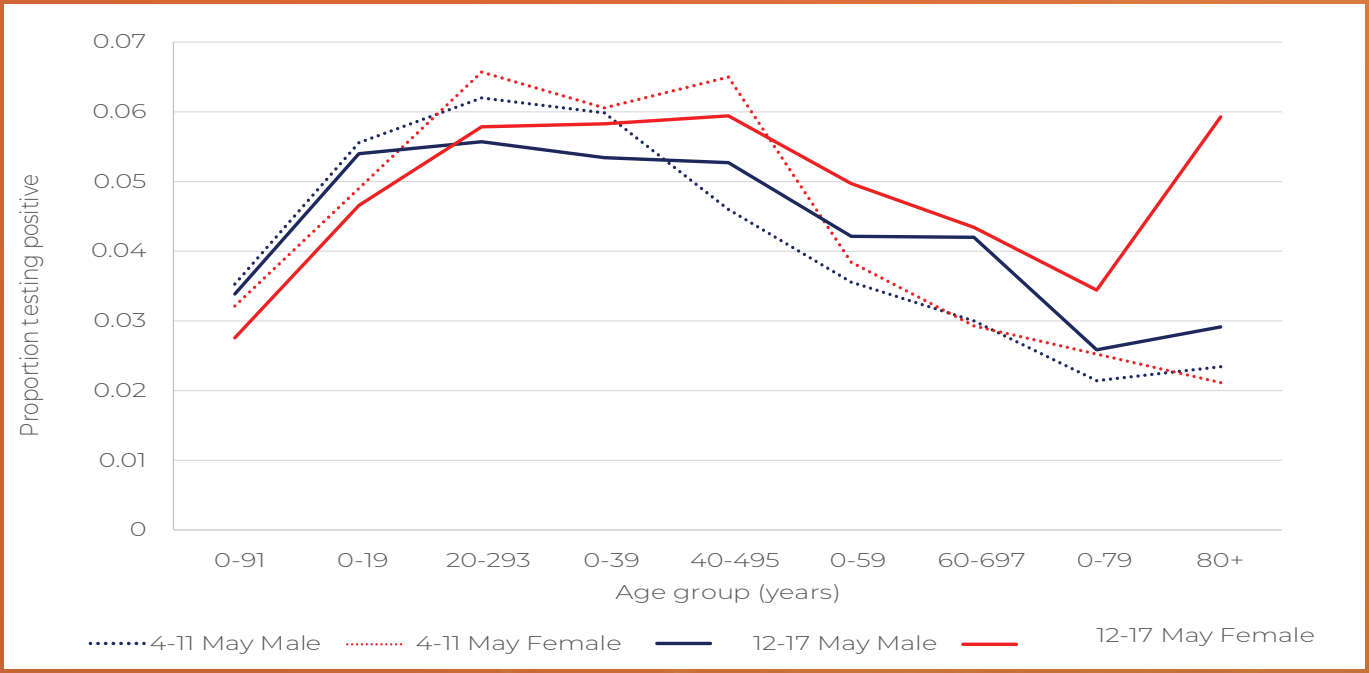

Figure 8. Weekly proportion testing positive by age group and sex, South Africa, 4-17 May 2020

In the past week, the proportion testing positive in each age group 20 years and older was higher among females than males (Table 8). The proportion testing positive was highest in the 20-39 years age group (5.4% for males and 5.8% for females).

Table 8. Proportion testing positive by sex and week, South Africa, 20 April – 17 May 2020

Age (years)	20-26 April		27 April – 3 May		4-10 May		11-17 May	
	Male	Female	Male	Female	Male	Female	Male	Female
0-19	3.7%	4.0%	3.7%	4.3%	4.4%	4.2%	4.3%	3.7%
20-39	3.0%	4.5%	3.5%	5.8%	6.1%	6.3%	5.4%	5.8%
40-59	2.2%	2.4%	2.9%	3.6%	4.1%	5.2%	4.8%	5.5%
60-69	1.5%	1.6%	1.7%	2.0%	3.0%	2.9%	4.2%	4.3%
70+	1.7%	1.1%	1.7%	1.7%	2.2%	2.4%	2.7%	4.3%
Total	2.5%	3.2%	3.0%	4.2%	4.7%	5.2%	4.7%	5.3%

LIMITATIONS

- The backlog in testing of samples by public laboratories will affect the reported numbers of tests conducted, and if severe cases are prioritised for testing, this would likely result in an inflated proportion testing positive.
- The delay in testing affects the analysis of the testing data and identification of outbreak hotspots.
- Different testing strategies (targeted vs. mass testing) used by different provinces makes percentage testing positive difficult to interpret and compare.

CONCLUSIONS

Limited availability of testing kits and influx of specimens from the CST programme has resulted in an increase in laboratory turnaround time, predominantly in the public sector. This impacts the analysis of testing data as results for a portion of samples collected in the past week are not yet reflected in this report. The overall proportion testing positive has increased to 5.0% in week 20. Western Cape (15.0%) and Eastern Cape (4.1%) provinces continue to have the highest proportion testing positive.