Access to oncology care in western KwaZulu-Natal Province before, during and after the COVID-19 pandemic

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Background. Timely access to oncological care is essential. International experience suggests that the COVID-19 pandemic negatively impacted this. Knowledge of the experience in South Africa is limited.
Objective. To assess the effect of COVID-19-associated lockdowns on access to cancer care for public sector patients in western KwaZulu-Natal Province (KZN).
Methods. A retrospective chart review was conducted in the Oncology Department of Grey's Hospital (GHOD), a tertiary hospital in KZN, to determine times between onset of symptoms, diagnosis, first consultation at GHOD and treatment. Patient demographics were included. Patients were stratified by both date of first GHOD appointment and of biopsy with respect to the various lockdown stages.
Results. A total of 360 patient files over four time periods (pre COVID-19, hard and soft lockdown and post-COVID-19) were reviewed. When stratified by first GHOD appointment, only waiting time from GHOD review to treatment decreased, with all other waiting times remaining stable. The average number of new patients seen per day decreased during soft lockdown, with the proportion of patients referred from primary care facilities most affected.
Conclusion. Despite the challenges of a global pandemic, access to GHOD care was not compromised in terms of patient waiting times. The absolute number of patients seen decreased, however, particularly those referred from primary care facilities. This study reviewed the entire COVID-19 period and shows that the impact of COVID-19 on patients who accessed care was not necessarily negative. The need for research regarding diagnosis and referral at primary and secondary care levels during the pandemic is highlighted.

Keywords: cancer care, access to care, treatment delays, waiting times, COVID-19 pandemic

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The pandemic caused by the SARS-CoV-2 virus (commonly known as the COVID-19 pandemic, and hereafter referred to as 'the pandemic') resulted in significant turmoil and uncertainty worldwide. There is evidence from both international and local literature that healthcare access was impaired during the worst stages of the pandemic.[1-3] In this regard, cancer care was no different,[4-9] with multiple strategies proposed to mitigate these challenges. Delays to cancer treatment may be associated with worse outcomes.[10]

Setting

Grey's Hospital in Pietermaritzburg, KwaZulu-Natal Province (KZN), is a tertiary hospital in the uMgungundlovu health district, and provides specialist oncology services to patients mostly from five health districts (Amajuba, Harry Gwala, uMgungundlovu, uMzinyathi and uThukela),[11] comprising region 2 of KZN. Grey's Hospital Oncology Department (GHOD) serves a total population of 4.5 million people.[12] It is the only public sector oncology service for these districts. State sector oncological care in the remainder of the province is provided by three public hospitals and, at the time of the study, a public/private partnership.[13] Grey's Hospital has 512 beds, 14 of which are dedicated to the inpatient oncology service.[11] The service is challenged by resource shortages and complex logistics of serving a largely rural and dispersed population from lower socioeconomic backgrounds.[14-16]

Context

The COVID-19 pandemic presented GHOD with multiple challenges: further resource shortages, patient and staff fear and anxiety[17] and difficult practical and ethical decisions regarding treatment of cancer during lockdowns, among other concerns.[18] There was concern that the pandemic and its associated lockdowns would compromise cancer care and increase already long waiting lists and waiting times for cancer treatment. Evidence from laboratory and clinic-based studies elsewhere in South Africa (SA) reflect a decrease in cancer diagnoses and treatment during the early part of lockdown.[6,19] Little information is available for later in the pandemic.[9]

On 15 March 2020, the COVID-19 pandemic was classified as a national disaster according to the Disaster Management Act 57 of 2002.[20] The country was then declared to be in lockdown. The Merriam-Webster online dictionary defines lockdown as 'an emergency measure or condition in which people are temporarily prevented from entering or leaving a restricted area or building'.[21] In this case, citizens were confined to their homes, apart from essential service workers and essential activities, e.g. emergency medical intervention and grocery shopping. Non-urgent medical appointments and procedures were, in general, suspended.

GHOD experienced challenges with staff shortages[22-24] related to their reallocation to COVID services, as well as absenteeism due to COVID infection or contact. A decision was made not to

change protocols and appointments[25] for new patients, although patients on surveillance post-oncological therapy had the interval between visits extended, and patients themselves often postponed visits. GHOD made every attempt to continue radiotherapy during this period, although there were interruptions due to outbreaks among patients. Patients who tested COVID-positive were not treated with radiotherapy until de-isolation. Greater use was made of hypofractionated radiotherapy schedules[7] during the pandemic, and palliative chemotherapy was minimised, although curative chemotherapy continued. Uncertainty during the lockdown periods made the provision of oncological care challenging and dynamic depending on the situation. The exact impact of the COVID pandemic on district and regional level cancer care is unknown, and this study attempted, in part, to highlight possible impacts through the lens of GHOD.

SA experienced five levels of lockdown (with lockdown level 5 being the initial and strictest level) with varying degrees of severity, maximum size and type of gatherings and curfews.[20] In the latter half of the pandemic, there were also 'adjusted' lockdown levels that were similar to the previous level of the same number but had slightly different regulations, e.g. regarding gatherings and curfews.

Objective

The study aimed to review the effect of the COVID-19 pandemic on access to oncological care for newly diagnosed patients with cancer to be treated at GHOD. This could be at the stage of patients seeking care for concerning symptoms, biopsy and diagnosis, or oncological review and receipt of treatment, the latter two at GHOD. The objectives were to (*i*) determine waiting times from first presentation with a symptom suspicious for malignancy to diagnosis, review at GHOD and first oncological treatment; and (*ii*) to analyse these waiting times in cohorts of patients regarding their pandemic-related timing (before, during and after).

Access to care

The University of Missouri Centre for Health Ethics defines access to care as 'the ability to obtain healthcare services such as prevention, diagnosis, treatment and management of disease'.[26] It is within the scope of this definition that this article is written. Similarly, the SA Human Rights Commission (SAHRC) states that access to healthcare is a basic human right that cannot be denied completely, although it may be limited by resources.[27] The SAHRC concludes that access is determined not just by the existence of the healthcare system, but also by financial and geographical factors that may limit a person's ability to seek healthcare. Without adequate access to oncological care, patients with cancer experience preventable morbidities and, potentially, mortalities. If a unit is striving to decrease preventable morbidities, timeous access to specialist assessment and treatment is essential – however, this cannot be ensured if the extent and impact of external delaying factors are unknown.

Methods

Study design

This study was an observational, descriptive retrospective chart review of patient records from January 2019 to December 2022.

To determine any delays in access to care before, during and after the COVID-19 pandemic period and associated lockdowns, various time points (Fig. 1) were identified across the study period. Waiting time intervals (waiting periods or delays) were calculated between the time points for the various stages of the cancer care continuum.

For the purposes of this study, oncological treatment included surgery, chemotherapy, radiotherapy and endocrine therapy. Only the first oncological treatment was reviewed (regardless of treatment intent), and further lines of treatment (including any waiting period for these treatments) were not considered to be within the scope of this study.

Target population

The target population included all patients who were newly diagnosed with cancer in western KZN. The study population, from which a sample was drawn, consisted of all patients from region 2 of KZN who were newly diagnosed with cancer and who attended GHOD for the first time between January 2019 and December 2022 (inclusive).

Sampling and participants

A census sample was not logistically feasible, therefore disproportionate stratified random sampling was used. The required sample size was calculated to be 352 using G*Power statistical software (Heinrich-Heine-Universität Düsseldorf, Germany)[28] with an effect size of 0.3, power of 0.8 and a 5% precision level. GHOD was purposively selected owing to convenience for the researcher. The sample was divided into four time-based cohorts depending on when they were first seen at GHOD and the pandemic lockdown level at that time (Table 1). Within these cohorts, the individual study participants were selected from a list of patient names kept at GHOD using simple random sampling with an online random number generator.

Inclusion criteria limited participants to patients with a histologically confirmed cancer without oncological treatment in a different healthcare region who were presenting to GHOD for the first time. Patients <18 years of age and those whose medical notes from the first visit were missing were excluded from the study.

Data collection, analysis and quality control

Data were extracted from paper-based medical records held at GHOD onto a custom-designed Excel v16.48 (Microsoft, USA) spreadsheet template. The data fields included patient demographic information, the relevant dates and descriptive factors about the patients (including site of cancer), HIV status, comorbidities and employment status.

Analysis was done with the assistance of a statistician using Stata v17 (StataCorp, USA). Dependent variables comprised the waiting time intervals W1, W2, W3 and W4 (Fig. 1), while independent variables included demographic data and details on cancer type and treatment received. Categorical data were described using frequencies and percentages, and numerical data were reviewed using means, medians and interquartile ranges (IQRs). The Kruskal-Wallis equality of populations test and Dunn's test were used to compare numerical data, and χ^2 tests were used for categorical data (time periods). Significance was set at $p<0.05$. The average number of new patients per time period per day was calculated directly from the size of the target population in the relevant time period (Box 1). The average number of new patients for the various subgroups (e.g. system of cancer or level of referring centre) is an approximation based on extrapolating the proportion of patients seen in the study to the target population. As this was aggregate data, these values were not amenable to statistical analysis, and only descriptive methods could be used.

Ethical considerations

Ethics approval was obtained from the University of KwaZulu-Natal Biomedical Research Ethics Committee (ref. no. BREC/00004530/2022), and gatekeeper permission was obtained from the KwaZulu-Natal Provincial Health Research Ethics Research Committee (ref. no. 202208 040). The study was also registered with the National Health

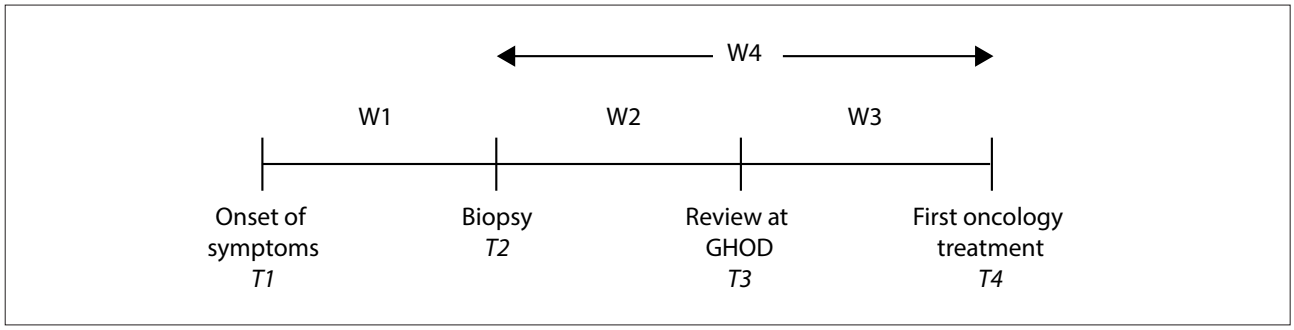

Fig. 1. Timeline of recorded time points. (W1 = onset of symptoms to biopsy; GHOD = Grey's Hospital Oncology Department; W2 = biopsy to first review at GHOD; W3 = first review at GHOD to first oncology treatment; W4 = biopsy to first oncology treatment.)

Box 1. Calculations for average patients per day

Average new patients per day =

$$\frac{\text{New patients seen, } n}{\text{Days, } n}$$

For patients with a specific characteristic, e.g. breast cancer:
Percentage of strata with that characteristic: a
Total number of patients in that time period: b
Number of working days in that time period: c

$$\frac{a \div 100 \times b}{c}$$

Research Database. All study data were stored digitally in password-protected files.

Results

A total of 360 files were included, 90 in each stratum.

Overview of demographic data

Various demographic data were examined for patients included in the study: these included age, sex, level of referring hospital, facility where biopsy was done and presence or absence of comorbidities, including HIV status (Table 2). There was no statistically significant relationship between the demographic variables across the five strata.

Waiting times stratified by date of first GHOD appointment

Waiting times in months (Table 3) were analysed by strata defined by date of first GHOD appointment. The self-reported mean period between a patient noticing their symptoms and cancer diagnosis (W1) did not vary significantly between COVID-19 periods (Table 4) (p=0.28). Viewing the four periods together, the median W1 was 6.20 months, and the IQR was 3 - 12 months, implying that approximately half of the patients waited just over half a year, a quarter waited <3 months, and a quarter waited >1 year before presenting to the healthcare system. Once the cancer was diagnosed, less than half of the patients waited 2.62 months until being seen at GHOD (W2), while one quarter waited >4.37 months. This wait did not vary significantly before, during or after the COVID-19 pandemic.

Analysis of the time period from first appointment at GHOD to first treatment (W3) showed that patients received treatment significantly sooner after the COVID-19 pandemic when compared with all other time periods (p=0.001). Median (IQR) W1s were 2.23 (0.80 - 5.93) months and 0.53 (0.30 - 1.13) months pre and post pandemic, respectively (Table 3).

The time period between diagnosis (biopsy) and receipt of first oncological therapy (W4) was, however, not significantly different between the time periods (p=0.93) (Table 3). Considering all four time periods together, approximately half the patients waited >2.62 months and one-quarter waited >4.37 months. Any instances where cancer treatment was initiated prior to biopsy (n=4) were excluded from this calculation, as this was considered unusual practice.

Waiting times stratified by date of biopsy

The data were grouped into strata defined by when the biopsy was done in relation to the COVID-19 pandemic (n=337). As seen in Table 3, W1 did not vary significantly between the different time periods, with an overall median (IQR) of 6.09 (3 - 12) months (p=0.51). Median (IQR) W2 overall was 6.00 (3.00 - 10.47) months, and was stable between the various COVID-19 periods (p=0.197).

The time period of W3 was significantly shorter during soft and post lockdown (p=0.02). Prior to the pandemic, patients waited a median (IQR) of 1.47 (0.70 - 5.47) months from first oncological appointment to treatment, while during soft lockdown this delay was 0.77 (0.43 - 3.03, p=0.003) months and post lockdown was 0.67 (0.47 - 0.90, p=0.02) months.

Similarly, comparing the time period from biopsy to first treatment (W4) among these strata demonstrated that W4 pre-COVID-19 was significantly longer than in all other periods (p=0.046). Pre COVID-19, half the patients waited ≥4.64 months, with one-quarter of patients waiting ≥9.30 months. This was significantly longer than all three other periods, with median waiting times of 3.23 (1.02 - 5.32; p=0.02) months, 3.34 (1.58 - 3.70; p=0.02) months and 2.60 (1.68 - 3.85; p=0.04) months for hard, soft and post-lockdown periods, respectively.

Average number of new patients seen per day

The study findings were extrapolated to the target population to estimate the mean number of new patients per day for each time period (Table 4).

Table 4 shows that fewer biopsies were done per day for patients in the study cohort during the COVID-19 pandemic than before the pandemic. While a similar average number of new patients per day (5.1) were seen in hard lockdown compared with pre (5.0) and post lockdown (5.3), soft lockdown saw an average of only 3.5 new patients per day. This is 69% of baseline levels.

Furthermore, it is evident that the proportion of new patients referred from primary levels of care was lower during both lockdown periods (42% and 33% of baseline, respectively). While the proportion of referrals from secondary and tertiary/quaternary levels of care increased during hard lockdown (111% and 121%, respectively), this also decreased relative to baseline during soft lockdown (84% and 74%, respectively) which correlates with the lower total number of new patients seen. Post-lockdown referrals from secondary level facilities remained relatively high at 132% compared with baseline, whereas tertiary and quaternary referrals returned to approximately baseline (95%).

Table 1. COVID-19 time periods, lockdown levels and dates

COVID-19 period	Dates	Lockdown level	Cohort size, *n*	Target population size, *n*
Pre COVID-19	1 January 2019 - 31 December 2019	N/a	90	1 258
Hard lockdown	26 March 2020 - 31 May 2020, and 28 June 2021 - 25 July 2021	5, 4; adjusted 4	90	322
Soft lockdown	1 June 2020 - 27 June 2021, and 26 July 2021 - 4 April 2022	3, 2, 1; adjusted 3, 2, 1	90	2 438
Post COVID-19	5 April 2022 - 31 December 2022	N/a	90	987
Total			360	5 005

N/a = not applicable.

Table 2. Summary of demographic data by strata (determined by first GHOD appointment)

Lockdown period	Characteristic, *n* (%)					*p*-value
	Age					
	18 - 44	44 - 55	56 - 64	65 - 90	Unknown	
Pre	25 (27.8)	19 (21.1)	26 (28.9)	20 (22.2)	0 (0)	
Hard	20 (22.2)	24 (26.7)	23 (25.6)	23 (25.6)	0 (0)	
Soft	21 (23.3)	19 (21.1)	24 (26.7)	26 (28.9)	0 (0)	
Post	20 (22.2)	30 (33.3)	16 (17.8)	24 (26.7)	0 (0)	
Overall	86 (23.9)	92 (25.6)	89 (24.7)	93 (25.8)	0 (0)	
	Level of referring hospital					
	Primary	Secondary	Tertiary/quaternary	Other	Unknown	0.16
Pre	21 (23.3)	34 (37.8)	34 (37.8)	1 (1.1)	0 (0)	
Hard	8 (8.9)	37 (41.1)	40 (44.4)	5 (5.6)	0 (0)	
Soft	11 (12.2)	40 (44.4)	37 (41.4)	2 (2.2)	0 (0)	
Post	15 (16.7)	43 (47.8)	31 (34.4)	1 (1.1)	0 (0)	
Overall	55 (15.3)	154 (42.8)	142 (39.4)	9 (2.5)	0 (0)	
	Sex					
	Female		Male			0.59
Pre	62 (68.9)		28 (31.1)		0 (0)	
Hard	52 (57.8)		38 (42.2)		0 (0)	
Soft	54 (60.0)		35 (38.9)		1 (1.1)	
Post	57 (63.3)		33 (36.7)		0 (0)	
Overall	225 (62.5)		134 (37.2)		1 (0.4)	
	Comorbidities					
	Present		Absent		Unknown	0.57
Pre	67 (74.4)		22 (24.4)		1 (1.1)	
Hard	63 (70.0)		26 (28.9)		1 (1.1)	
Soft	59 (65.6)		30 (33.3)		1 (1.1)	
Post	64 (71.1)		23 (25.6)		3 (3.3)	
Overall	253 (70.3)		101 (28.1)		6 (1.7)	
	HIV status					
	Negative		Positive		Unknown	0.31
Pre	51 (56.7)		36 (40.0)		3 (3.3)	
Hard	51 (56.7)		37 (41.1)		2 (2.2)	
Soft	50 (55.6)		32 (35.6)		8 (8.9)	
Post	41 (45.6)		45 (50.0)		4 (4.4)	
Overall	193 (53.6)		150 (41.7)		17 (4.7)	

GHOD = Grey's Hospital Oncology Department.

To review the cancer diagnoses being referred, the study cohort was further subdivided by organ system to facilitate useful comparisons when absolute numbers of a single cancer diagnosis were low. This showed that a lower proportion of patients with cancers of the gastrointestinal (GIT) tract were referred during soft lockdown (50% of baseline), and this value did not return to pre-pandemic levels during the study period (63% of baseline in the post-lockdown period). Referrals of patients with gynaecological cancers decreased to 74% of baseline in hard lockdown, and 47% during soft lockdown, increasing to 79% of baseline post lockdown. There are corresponding proportionate increases in rates of patients seen with other cancer diagnoses during these periods.

Discussion

Impact of COVID-19 on waiting times

Assessing the impact of the COVID-19 pandemic on access to GHOD care is complex. Regarding waiting times to biopsy, GHOD appointment, or treatment stratified by date of presentation to GHOD,

Table 3. Waiting times (months) stratified by GHOD appointment and by date of biopsy

		Lockdown period							
		Stratified by first GHOD appointment				Stratified by date of biopsy			
Waiting time interval		Pre	Hard	Soft	Post	Pre	Hard	Soft	Post
W1	Median	6.00	5.97	7.45	7.23	6.00	6.00	7.00	5.35
	IQR	2.57 - 9.87	3.00 - 10.67	3.73 - 12.40	3.73 - 13.97	3.00 - 10.47	2.00 - 10.83	3.37 - 12.00	2.00 - 13.75
	p-value	0.28				0.51			
W2	Median	2.73	2.78	2.52	2.47	3.28	1.40	2.43	2.08
	IQR	1.60 - 4.40	1.02 - 5.32	1.58 - 3.70	1.68 - 3.85	1.83 - 5.22	1.74 - 2.93	1.43 - 3.68	1.35 - 2.99
	p-value	0.93				0.20			
W3	Median	2.23	0.93	1.05	0.53	1.37	1.17	0.77	0.67
	IQR	0.80 - 5.93	0.50 - 2.47	0.47 - 3.78	0.30 - 3.50	0.70 - 5.47	0.47 - 3.40	0.43 - 3.30	0.4 - 0.90
	p-value	0.001				0.02			
W4	Median	2.73	2.78	2.52	2.47	4.64	3.23	3.34	2.60
	IQR	1.6 - 4.40	1.02 - 5.32	1.58 - 3.70	1.68 - 3.85	2.10 - 9.30	1.20 - 4.97	1.93 - 5.40	1.67 - 3.43
	p-value	0.93				0.046			

GHOD = Grey's Hospital Oncology Department; W1 = onset of symptoms to biopsy; IQR = interquartile range; W2 = biopsy to first review at GHOD; W3 = first review at GHOD to first oncology treatment; W4 = biopsy to first oncology treatment.

Table 4. Average number of new patients per working day per COVID-19 period when extrapolated to the whole population

	Lockdown period			
Characteristic, *n*	**Pre**	**Hard**	**Soft**	**Post**
Average biopsies done per working day in study cohort	0.6	0.4	0.2	0.2
Average new patients seen per working day	5.0	5.1	3.5	5.3
Level of referring hospital				
Primary	1.2	0.5	0.4	0.9
Secondary	1.9	2.1	1.6	2.5
Tertiary or quaternary	1.9	2.3	1.4	1.8
Cancer site/system				
Breast	0.8	1.1	0.9	1.1
Gastrointestinal	0.8	0.8	0.4	0.5
Gynaecological	1.9	1.4	0.9	1.5
Head and neck	0.2	0.6	0.3	0.4
Urology	0.5	0.7	0.7	0.8
Miscellaneous*	0.7	0.6	0.3	1.1

*Miscellaneous: predominantly lung cancer, lymphoma, Kaposi sarcoma, melanoma and sarcomas.

the findings suggest that, if care was accessed, oncological care was largely unaffected by the pandemic. Conversely, patients received treatment significantly sooner after first GHOD review post pandemic than before. However, in terms of the average number of new patients seen per day, fewer patients were seen during soft lockdown than during any other period. GHOD did not limit referrals of new patients during any period of lockdown;[25] therefore other explanations for this decreased number need to be sought. Potential explanations include an absolute decrease in the number of patients presenting to primary and secondary healthcare facilities with symptoms of cancer, or fewer biopsies being done and a decrease in screening programmes.[9] Fear of attending hospitals (including GHOD) during the pandemic could well have contributed.[29] This decrease could also contribute to the shorter waiting time experienced by patients from the first GHOD appointment to treatment in the post-lockdown period, as fewer patients filtered through the system.

Waiting time data are complicated by the delay between biopsy and first review at GHOD, which is of variable length and attributed to multiple factors at all levels of care.[30] The strata in this study were originally defined by date of first GHOD appointment. Data were then re-analysed based on timing of biopsy in relation to the lockdown periods. The disparity is highlighted by the significant difference in W3 and W4 when the data are stratified by biopsy date, compared with the finding of no difference in W2 or W4, but a difference in W3 when data are stratified based on GHOD appointment. Shorter waiting times in the late and post-lockdown periods could well be explained by a decrease in the absolute number of patients seeking cancer care during and immediately post pandemic – the lower average number of new patients seen per day in soft lockdown correlates with this interpretation. There may have also been departmental factors that contributed to W3 that were not explored in this study, but require acknowledgement. A second linear accelerator was commissioned at GHOD in late 2020.[31] However, the original linear accelerator experienced significant maintenance challenges, so two machines were not consistently in operation. Furthermore, COVID-19 infection of patients, staff and those patients accommodated in the lodger facility presented delays to completion of radiotherapy treatments. The use of chemotherapy was rationalised but, when indicated, there was no marked change from baseline practice regarding chemotherapy access. The effect of the lockdowns on surgical care varied with level of lockdown, type of surgery and treating hospital. The impact is not well documented in the literature. Endocrine therapy was used extensively during the lockdown periods owing to its relative safety, with no impact on timing.

Of those patients who presented to GHOD, there was no patient demographic group whose access to care was particularly affected by the lockdowns. Neither age, HIV status nor presence of comorbidities was seen to affect access to care, indicating that patients deemed to be at higher risk of adverse COVID-19 outcomes[29,32,33] persisted in accessing cancer care despite this. Similarly, pre-existing engagement with the healthcare system through treatment for comorbid disease did not affect access to cancer diagnosis and care. Importantly, this study was conducted from the perspective of patients who persisted in seeking care for their cancer despite the pandemic, so results must be interpreted with caution. Despite this, no specific patient characteristic varied significantly from baseline, which suggests no specific patient group or groups experienced poorer access to cancer care owing to the COVID-19 pandemic. Prior to biopsy (T2), seeking care is largely within the control of the patient, while after initial contact with the healthcare system, access to care is a combination of patient compliance with healthcare appointments and the healthcare system itself.

COVID-19 and referrals from various levels of care

It can be postulated from the average patient numbers per day that cancer detection services were decreased at primary care institutions during both hard and soft lockdowns. While institutions at higher levels of care initially compensated somewhat for this decrease during hard lockdown, soft lockdown showed fewer referrals from facilities of these levels as well. The study was not, however, designed to evaluate cancer diagnosis rates from a non-GHOD perspective, and further investigation to analyse the decrease in referrals is warranted.

Differences in patient numbers during soft lockdown

Possible explanations for lower average new patient numbers in GHOD during soft lockdown need to be sought. GHOD did not change the booking policy for new patients during COVID-19 lockdowns, so the decreased number of new patients was likely a result of factors external to the department. Fewer biopsies performed and referrals from district level facilities are supported by the data, with secondary and tertiary level facilities also referring fewer patients, but not by the same proportion. Therefore, while the absolute wait experienced by patients who accessed oncological care remained stable, it seems that the number of patients referred decreased during the COVID-19 pandemic. Some possible reasons include patient reluctance to access care, limitations imposed by healthcare facilities, socioeconomic factors, such as lack of public transport or financial constraints, and or a combination of factors.[4,7,34,35]

The proportions of patients seen by cancer site also varied during lockdown. Some sites, such as breast and genito-urinary cancers, remained relatively stable, while others, notably GIT and gynaecological cancers, decreased, especially in soft lockdown. Published experience from a pathology laboratory in the Western Cape Province during the first 3 months of lockdown[6] showed a decrease in the rates of diagnosis of common cancers, but with different cancers affected to different degrees. A study reviewing only breast cancer shows similar decreased rates of access to care.[19] Rates of breast and genito-urinary (primarily prostate) cancers were stable in this study period, but seen to decrease in other studies,[6,8] while gynaecological cancers, represented in the pathology study by cervical cancers, remained stable in the Western Cape Province but decreased in KZN. GIT cancers decreased in both studies. The decrease in GIT and breast cancers particularly may have been partly due to limitations on non-urgent surgical procedures imposed during the entire lockdown period.[22] In the case of gynaecological cancers, this is probably related to the decreased rate of referrals from primary healthcare level – a common setting for both screening and diagnostic investigations. A corresponding increase in the proportion of head and neck cancers was also seen in KZN – probably due to the specialist nature of the diagnostic processes for these cancers, which are predominantly done in a tertiary centre. The dissimilar experience between the present KZN study and the Western Cape studies may be due to the longer surveillance period of our study, differences between provincial healthcare systems or the fact that the lag between biopsy and review at GHOD means that the time when a patient was diagnosed was not necessarily during the same COVID-19 time period as when seen at GHOD.

Limitations and recommendations

All findings of this study need to be interpreted in the context of a patient population that did in fact seek oncological care, despite the COVID-19 pandemic and its aftermath. A study evaluating rates and patterns of care from the perspective of the clinics to which patients initially present with symptoms suspicious of cancer is needed to confirm these findings. Furthermore, analysis of radiotherapy practices, including machine downtime at GHOD during this period, is needed to establish the significance of these factors.

The relatively short duration of the post-lockdown period studied is a limitation in that it is possible that not enough time had elapsed since the pandemic to allow services to stabilise. Furthermore, the delay between biopsy and referral to GHOD exacerbates this. It is thought that the low number of biopsies in the study post lockdown reflects a lag in referrals of patients to GHOD (and therefore study entry), rather than a decrease in number of biopsies done. As such, no conclusions can be drawn from this study regarding post-lockdown service delivery. It does, however, reflect the experience of many patients who sought care and were diagnosed during the pandemic, especially soft lockdown, but were only referred to GHOD post lockdown.

A key finding was the lower average number of patients seen per day during soft lockdown. As the 'average number of patients per day' variable was an aggregate, with no measurement of variance about the mean, it could not be analysed for statistical significance, and thus no formal comparisons between periods could be made.

As this was a retrospective chart review, it was reliant on medical records. The study and data collection tool were purposely designed with this is mind to keep data as objective and uniform as possible, other than in W1 (onset of suspicious symptoms to diagnosis). This was a patient-reported variable, therefore prone to recollection and social desirability bias.[36]

Each stratum in the original study design was predetermined to consist of 90 patients, regardless of the duration of the time period. This was to ensure that each period had adequate data points to enable analysis, but it may misrepresent relative periods. The analysis based on average number of new patients per day attempts to provide more perspective.

Conclusion

For patients who did access oncological care in western KZN during the COVID-19 pandemic, waiting times to GHOD appointment and treatment were not affected. There were, however, on average, fewer new patients seen at GHOD during soft lockdown, and this may have resulted in the decreased waiting time from GHOD appointment to treatment experienced in the immediate post-lockdown period. There were also lower numbers of patients referred from primary healthcare facilities during lockdown. Research over a similar period into rates of cancer diagnoses and referrals at all levels of care is warranted to correlate these findings.

Data availability. Anonymised raw data may be requested by correspondence with the authors and within appropriate ethical constraints.

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Conflicts of interest. LW is a doctor (registrar) in the GHOD; LS is head clinical unit of GHOD; LN was senior manager: Medical Services at Grey's Hospital during the study period. There are no financial relationships that may have influenced the writing of this article. The views expressed in this article are those of the authors and not the official position of GHOD, Grey's Hospital or the KZN Department of Health.

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