BRIEF SEVEN

7. A deep dive into cancer

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Research briefs on non-communicable diseases in South Africa

Percept has developed a series of briefs aiming to explain, explore and quantify the burden of non-communicable diseases (NCDs) in South Africa. Throughout the briefs, both existing quantitative data as well as emerging qualitative data are drawn together. The primary qualitative data – presented in the form of vignettes – was collected by Dr. Beth Vale through in-depth ethnographic research, which was gathered in a community in the Karoo. Given the rising global burden of NCDs, particularly in low- and middle-income countries (LMICs) these briefs are incredibly relevant. They also present important insights as Covid-19 continues to attack those with pre-existing conditions more fatally.

Given South Africa's high prevalence of HIV, there's also recently been a focus on the link between HIV and NCDs, especially since the population living with HIV grows increasingly older with the successful uptake of ART. As we'll explain in the briefs, an ageing population is more at risk for NCDs. Moving towards universal health coverage (UHC), it's imperative to understand the current needs of our population – and how these may change going forward.

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- Actuarial Society of South Africa (ASSA): ASSA has an interest in being part of the development of high-quality evidence to support resource allocation and decision-making, and the interplay between the supply and demand sides of the health system.
- RGA Reinsurance Company of South Africa Ltd (RGA): RGA has an interest in the ways in which life insurance can be responsive to the changing burden of disease, and the ways in which we can use data to drive decision-making.
- Board of Healthcare Funders (BHF): BHF is a regional representative body of health funders, administrators, and managed-care organisations. It is committed to universal health coverage, value-based healthcare, and accountability for health. Addressing the NCD burden is an important element to achieve some of its objectives.

Take-home messages

- Cancer is a broad and complex disease group. Given that they're all characterised by uncontrollable, abnormal cell growth in the body, the many different types of cancer are often grouped together, but in reality, they're vastly different in terms of risk factors, symptoms and treatment.
- Cancer can develop as a result of exposure to certain cancer-causing agents, known as carcinogens. Carcinogens can be a range of physical substances, chemical substances, and biological organisms.
- Some NCD risk factors are carcinogenic, including tobacco use, alcohol use, an unhealthy diet, and low levels of physical activity. These risk factors are estimated to account for a third of cancer deaths.
- Cancer is the second-leading cause of mortality worldwide, and more than 70% of cancer deaths occur in developing countries.
- It is estimated that 30-50% of cancers could be avoided by reducing exposure to risk factors, which highlights prevention as a key focus area for effective cancer interventions.
- Cancer treatment has successfully improved the health outcomes and prolonged life expectancy in cancer patients. However, it's often associated with unpleasant side effects, which can have negative impacts on a patient's quality of life.
- While the incidence of cancer is on the rise in both lower- and upper-income countries, the burden of cancer differs greatly across geographies. Cancers caused by infections are more prevalent in LMICs, while cancers such as breast and prostate cancer are more common in upper-income countries.
- Differences in cancer incidence and mortality can largely be explained by differences in access to screening (which increases incidence, and allows for early diagnosis – and improved outcomes) and treatment, both of which are often not available in low-income settings.
- The incidence of cancer in South Africa is high and increasing. The high prevalence of HIV in the country also contributes to the high burden of cervical cancer and lymphomas, which are more prevalent in people living with HIV.
- As the South African population ages, we can expect the incidence of cancer to increase, given the association between cancer and age.

Introduction

Cancer is a fast-growing health priority all over the world. It's estimated that 1 in 9 individuals will develop cancer in their lifetime, and it's currently the second-leading cause of global mortality.1 While the burden of cancer differs across countries, it's one of the top five mortality causes in most.1

In South Africa, both public- and private-sector data confirm that the incidence of cancer is on the rise. This is exacerbated by the high prevalence of HIV in the country, given the close association between various cancers and HIV. In the context of South Africa's high, quadruple burden of disease, the shortage of health-system resources directed at cancer is evident in the poor access to cancer screening, diagnosis and treatment availability in the public sector.

This brief aims to dive deep into the mechanisms behind the increasing burden of cancer across the globe, and in South Africa in particular.

Data and methods

Two broad quantitative data sets were used for this brief: the National Cancer Registry (NCR) and Discovery Health Medical Scheme (DHMS) data. When we analysed the quantitative datasets for comparison against one another, we standardised them based on age, given the relationship between age and NCDs (see brief 2).

We also used qualitative data in this brief, based on primary data collection in one pocket of South Africa, to marry the quantitative findings to the lived experience on the ground.

Contrary to other NCDs, the vast majority of epidemiological work done on cancer reports only on the incidence of cancer, and not the prevalence. This is largely because it is complex to accurately estimate the prevalence of cancer, especially when facing data constraints. Furthermore, by definition, cancer prevalence[a] also includes those who have had cancer in the past but are currently in remission. This blurs the lines of the burden that prevalence numbers place on the health system, making incidence a more useful measure in many instances. The results presented in this brief are therefore predominantly based on incidence data.

[a] Prevalence is the total number of cases of a particular disease at a given point in time, or over a specified time period

What is cancer?

Definition

Cancer is a broad and complex disease group characterised by uncontrollable, abnormal cell growth in the body.[2,3] The uncontrollable growth of abnormal cells arises as a result of genetic mutations (changes) in the DNA of an individual's cells, often as a result of some interaction with a physical, chemical or biological external agent, which causes the cells to start dividing and growing rapidly.[2,3] This growth of abnormal cells can take place anywhere in the body and cancers are usually defined by the area of the body where the first cancerous growth started.[3] The cancer cells often continue to grow beyond the primary site, spreading to other organs and parts of the body in a process called metastasising.[2,3]

Different types of cancers

There are many kinds of cancer, with a vast range of risk factors, causes and symptoms. While there are still major differences between cancers within these categorisations, they are broadly grouped into four types, namely: carcinomas (cancer that originates in the skin or tissue that covers the surface of internal organs/glands), sarcomas (cancer that originates in the tissues of the body), leukaemias (cancers of the blood) and lymphomas (cancer that originates in the lymphatic system).[3]

The uncontrollable cell growth that causes cancer often leads to the formation of a solid mass called a tumour. Tumours can be benign (when they don't spread to other areas in the body) or malignant (those that spread to other areas in the body), but cancerous tumours are always malignant. However, not all cancers form tumours. For example, leukaemia is not associated with tumour growth.[2,3]

While cancers are non-communicable, some cancers are caused by biological agents which can be passed from one person to another. For example, cervical cancer is caused by the human papillomavirus (HPV), which is sexually transmitted.[4] However, the cancer itself is not passed from one person to another, only the cancer-causing agent (virus) is. Cancers are therefore all framed as, and considered to be NCDs.

Given that there are over 120 hundred different types of cancer,[5] this brief will focus on some of the most prevalent cancers, including prostate, breast, cervical and lung cancer.

Cancer stages

Cancers are further differentiated by stage. Cancer staging is done to refine the definition of the cancer, and assists in describing the cancer in more detail.[6] While there are various staging methods, staging typically includes information about the size of the cancerous tumour, whether the cancer has spread to any lymph nodes and whether the cancer has metastasised (spread to other body parts).[6] This information serves to allow for better understanding of the extent of the cancer, and helps to inform treatment protocols and prognosis.[6]

What causes cancer?

There are several causes, including carcinogens, biological organisms, genetics and age and sex profiles.

Carcinogens don't always cause cancer. Many individuals are exposed to carcinogens and don't develop cancer at all. For example, tobacco smoke is a carcinogen and increases the risk of lung cancer, but not all smokers develop lung cancer. Whether or not a carcinogen leads to the development of cancer depends on an individual's genetic structure, as well as the type, length and intensity of exposure to the carcinogen.[7]

Carcinogens can be physical substances (e.g., ultraviolet exposure), chemical substances (e.g., asbestos exposure) or biological organisms (e.g., HPV), and different carcinogens are associated with different cancers.[8] There are many known carcinogens, and many more carcinogenic substances that are discovered over time, with some being more likely to cause cancer than others.[8]

Biological organisms that can cause certain types of cancer include viruses, bacteria and parasites. The increased risk of cancer as a result of infection by such an organism can be because of cellular changes associated with long-term inflammation caused by the infection, or because of immune suppression caused by the infection.[7] Furthermore, some viruses cause uncontrollable cell growth by inserting virus genes into body cells.[7] Such infections account for 15-20% of total cancers worldwide.[7] This proportion is higher in LMICs, where such infections are often more common. Some common infections that raise the risk of cancer include HIV, HPV (cervical cancer), Human Herpesvirus 8 (HHV-8; also known as Kaposi sarcoma), Hepatitis B and C (liver cancer) and Helicobacter pylori (stomach cancer).[7]

Cancers can also be **hereditary**, but only about 5-10% of cancers are truly caused by a genetic mutation that's been passed on from previous generations.[7] When more than one family member develops cancer, it's often because family members have had similar exposure to other risk factors, or even purely a result of chance, given that cancer is a relatively common disease.[7]

While cancer can develop at any age, the **risk of cancer increases dramatically with age**. This can be attributed to both the biological consequences of ageing, as well as the increased time of exposure to carcinogens (such as tobacco or UV light) that naturally comes with age.[9] The biological consequences of ageing on cancer risk can be explained as follows: human cells continuously divide and replicate, and with each replication, there's a chance of a mutation that leads to the development of cancer.[9] The older a person is, the more cell replication has occurred in their bodies and so, the higher the chance of a mutation that leads to the development of cancer.

Sex also plays a role. Cervical cancer, for example, is only possible if the person has a cervix. Furthermore, some cancers that can develop in both sexes are more common in one: for example, breast cancer is far more common in women than in men.

Cancer treatment

There are various treatment regimens for most cancers. The treatment regimen depends on the type of cancer, the stage of the cancer, and the individual.[10] Three of the most common treatment categories for cancer are surgery, radiotherapy and chemotherapy. These treatments can be received alone or in combination.

Surgery involves the surgical removal of cancerous growths/tissues from the body, while radiation therapy involves the use of high doses of radiation to kill cancer cells and thereby reducing the size of the tumor or the number of cancer cells.[10] Chemotherapy involves the use of medication to kill cancer cells and reduce the size of the cancer.[10] There are also many other treatment categories, including hormone therapy, immunotherapy, and stem-cell transplants.[10]

While the vast range of cancer treatments available has led to improved health outcomes in cancer patients, a major downside to cancer treatment is that it is often associated with unpleasant side effects.[11] These side effects are a result of the cancer treatment affecting and damaging normal body tissues and organs in the process of trying to kill cancer cells.[11] Side effects can include anaemia, pain, hair loss, fatigue, nausea, diarrhoea, oedema, sleep problems, constipation and appetite loss – among others.[11] These side effects naturally have substantial impacts on the quality of life of patients receiving cancer treatment.

Furthermore, cancer treatment is not only associated with physical side effects, but also has emotional, social and financial implications for patients as well as their families.[12] The diagnosis of a disease as severe as cancer can be highly stressful for the patient and their loved ones, and this alone can impact negatively on their emotional wellbeing. On top of this, the negative effects of treatment side effects on quality of life can lead to further emotional distress.[12] Additionally, some of the physical effects of cancer treatment (such as hair loss and swelling), as well as side effects of cancer itself (such as weight loss), affect body image, and therefore emotional wellbeing.[12]

The financial implications of cancer can also add to emotional distress. Not only is cancer treatment very expensive, but to receive cancer treatment, patients may need to take time off from work. In addition, cancer, or cancer treatment, may make the individual too ill to work, which can translate to job or income loss.[12]

The wide range of symptoms associated with cancer (including impacts on physical and psychological health) highlights the importance of palliative care in cancer treatment.[13] Palliative care entails a holistic, biopsychosocial approach to patient care and focuses on relief from suffering for both patients and their loved ones, by means of early identification, assessment and treatment of pain and other physical, psychosocial and spiritual needs and achieving total symptom management.[13] Palliative care can include, but is not limited to, the use of medication for symptom management, dietary changes and emotional and spiritual support.[12]

While palliative care is often associated with end-of-life care, any individual with cancer – regardless of the prognosis – can receive and benefit from palliative care. The WHO recommends that palliative care is received alongside curative care, serving as an extra layer of support, as opposed to being received in terminal cases of cancer only.[12] Evidence has shown that palliative care is highly successful in improving cancer patient outcomes and that patients who receive palliative care alongside their curative care are more likely to experience a better quality of life, have less disease or treatment-related symptoms and are more satisfied with their treatment in general.[12]

Vignette 1 explores some of the impacts of cancer and cancer treatment on individuals, and highlights the value of palliative care in providing relief from the many stressors associated with cancer.

Vignette 1: Home-based care

In the early months of 2020, I met Tina [pseudonym], a full-time caregiver working for a small-town branch of the Cancer Association in the Eastern Cape Karoo. Hers is a town of about 5,000 people, located in arid sheep-farming country. Tina is one of three home-based caregivers deployed by the Cancer Association to provide palliative and psychosocial care to registered beneficiaries. At the time I met her, she had forty active cancer cases assigned to her care, and a further eleven cancer survivors.

"How do you care for so many patients?" I asked her. Having worked with community health workers before, I know that just one quality home visit could be incredibly time-consuming, especially when there was travel involved.

Tina explained that she always prioritised her sickest patients – those who needed her the most. Patients who were back at work and regularly attending their medical appointments could be visited less regularly. "For those, I'll just pop in, send an SMS, or give them a quick call to see how they're doing."

During the five years that Tina had served as a full-time caregiver, she'd seen the number of cancer diagnoses steadily rise. "There isn't a month that goes by without new cases," she told me.

While she doesn't offer any medical care or dispense treatment to her patients; Tina – and the Cancer Association – offer essential psychosocial and palliative support.

"We look at the situation in which the patient lives. Are they alone? What is the situation in their home? In some homes, there's no one working. Sometimes no income at all! In those cases, we assist patients in applying for social grants. While that is being processed, we take the patient food parcels every month."

Food is a central part of the care the Cancer Association provides. A group of volunteers gather regularly to make soups and lasagnes, which were delivered to patients in need. Tina also took Ensure shakes and other supplements to her most sickly patients, who she felt needed a boost. Aside from food deliveries and mediating social assistance, Tina talked and prayed with her patients, changed their linen, and helped to facilitate transport to hospital appointments. Since all patients in Tina's town live at least two hours from the nearest oncology unit, the time and money spent on travel overwhelms the experience of cancer treatment, and often places an immense burden on families.

Cancer can debilitate on many levels: physically, socially, and economically. Treatment is long, taxing, and often accompanied by severe side effects, making patients feel very unwell. In a recent qualitative study with breast cancer survivors in Soweto, some participants felt that the treatment make them sicker than cancer. One Karoo resident I met even told me:

"My mother died of chemotherapy, not cancer, I promise you."

For some, cancer is disabling or disfiguring, demanding ongoing support as patients come to grips with their changed bodies. Breast cancer patients may undergo mastectomies; throat cancer patients may struggle to speak; and some with osteosarcoma may need amputations. Cancer patients may also face co-morbid illnesses. Among Tina's patients were those with hypertension, diabetes, epilepsy, and HIV.

In her role as a caregiver, Tina was facilitating and providing many types of support, including linking her throat cancer patients to speech therapists; encouraging treatment adherence for a range of chronic conditions; giving dietary advice; and offering emotional upliftment to patients who had undergone mastectomy.

To add to this, patients who once worked risked losing their jobs and income because of the time spent in treatment. Meanwhile, the loss of independence and self-sufficiency often made it difficult to care for others or help around the home. This meant that the families of cancer patients were often under significant emotional, financial and social stress.

For the vast majority of South Africa's cancer patients and their families, caregivers like Tina are invaluable. Yet, they often operate on a volunteer basis, with very limited support. Unlike many caregivers, Tina has her own car, so she doesn't have to walk to patients. But she pays for all the petrol herself. Over the course of my fieldwork, home-based caregivers in Tina's town, as well as neighbouring ones, were being retrenched, with local NGOs no longer having the resources to support them.

While a vast range of cancer treatment regimens exists, including some which are highly effective, many cancers can't be cured. Instead, treatment is most often aimed at prolonging a patient's life and improving their quality of life.[14] When cancer treatments are effective and all signs of cancer in the body have disappeared, the individual is considered to be in remission.[15] Despite this, individuals in remission are usually still at higher risk of developing cancer again in the future, compared to similar individuals who have never had cancer.[15]

The link between cancer and other NCDs

Cancer is a major global health concern with a high and increasing prevalence, as well as high mortality rates. It's estimated that 1 in 8 men and 1 in 10 women will develop cancer in their lifetime.[1] 16% of global deaths can be attributed to cancer, making cancer the second-biggest contributor to mortality globally.[1]

The role of geography

While cancer spans across all populations, its burden differs greatly across geographies (see brief 4). Not only does the incidence of cancer differ between countries, but the relative burden of different types of cancers does too: cancers that are associated with infections (such as cervical cancer) typically have a higher incidence in LMICs, while cancers such as breast and prostate cancer are more common in upper-income countries.

The higher incidence of infection-related cancers in LMICs (where 25% of cancers are caused by infections)[19] can be attributed to increased exposure to cancer-causing infections, in combination with poorer access to prevention activities. Infection-related cancers are largely preventable, and where prevention activities exist, they are highly effective in reducing the incidence of such cancers. For example, both the bivalent and the quadrivalent HPV vaccines (the difference between the two is that the quadrivalent vaccine offers protection against more strains of HPV) are more than 90% effective in preventing HPV infections that can lead to cervical cancer.[20] In countries where HPV vaccination and cervical cancer screening coverage is high, cervical cancer incidence and mortality are low, given that most cases are prevented or caught early (predominantly in the pre-cancerous stage).[20]

Conversely, in countries where access to screening and vaccination coverage is low, a high burden of cervical cancer persists.[20] Given resource limitations and characteristically weak health systems, access to screening and prevention activities are often poor in LMICs. This explains the higher incidence and mortality of cervical cancer (and other infection-related cancers), particularly in sub-Saharan Africa.[20]

Cancer screening allows for early diagnosis, which is associated with improved treatment outcomes.[19] Screening activities are therefore very important to address the cancer burden. However, it should be appreciated that high levels of screening require a functional supply side. That is, while increased cancer screening will allow for earlier detection of cancer, there can be no improved health outcomes if a health system isn't equipped to provide treatment to all those diagnosed with cancer following a positive screening. This also translates to ethical considerations around screening, where adequate care can't be provided upon a positive screening result.

Another caveat of screening is that it can lead to overdiagnosis, and therefore artificially high incidence rates through detecting clinically irrelevant cancers,[19] particularly for breast, prostate and thyroid cancer. This can, in part, explain the high rates of cancer incidence in populations where screening is widely available, such as high-income countries (HICs). Consequently, this may lead to artificially low cancer mortality rates.

In terms of mortality, LMICs bear a disproportionate burden of cancer, accounting for 70% of global cancer deaths.[1] This can largely be explained by differences in resource allocation: in LMICs, where resources are strapped and infectious diseases persist as major public health concerns, cancer is often considered a lower priority and is therefore under-resourced and under-addressed.[1] This translates to poor access to cancer screening, diagnosis and treatment, and ultimately, worse health outcomes for cancer patients.

Another geographical difference associated with cancer is that of treatment. While there are multitudes of cancer treatment types for individual cancers, as well as across the various types of cancer, access to treatment differs largely across and within countries. For example, 90% of HICs have cancer treatment services available, compared to less than a third of LMICs.[1]

The differences in access to screening, diagnosis and treatment not only differ across countries, but also within countries. As explored in brief 4, which deals with geography and NCDs, access to health services is generally poorer in rural areas. Vignette 3 provides some insight into the challenges around access to cancer care in the rural Eastern Cape.

Vignette 3: Hospital care

All cancer cases in the Eastern Cape Karoo are referred to a central hospital in Port Elizabeth (PE), which can be anywhere from a 2-4 hour trip from patients' homes. Often, those due for appointments or check-ups at the PE oncology unit will leave their Karoo towns as early as 5am, returning as late as 10pm. They'll spend much of their day on a bus or a waiting room bench, and a very short time with a doctor. If they have jobs, they will have to negotiate time off. If they are caring for children or relatives, they will have to make alternative arrangements. And they will incur costs along the way. Even if the transport from their local hospital to the PE hospital is state-sponsored; transport from their homes to the hospital is not. For those on farms, this is a particular challenge.

"This is why," one of PE's oncology doctors told me, "I try to do outreach regularly". For the oncologist, Dr. Breda [pseudonym], this means making regular trips to the Karoo to visit cancer patients. On these trips, she visits between twelve and twenty homes. Some are follow-up patients, who the hospital will check in on for up to five years. "It's not really long enough," Dr. Breda tells me, "because we know cancer can recur". Outreach visits not only save patients time and money, they also decrease the numbers in hospital queues, which is why Dr. Breda invests time in them.

Dr. Breda tells me she sees about 100 new cancer patients each year, but she's not sure whether this increase is a reflection of rising incidence, or improved screening.

The oncology ward at Dr. Breda's hospital is located right next to the mortuary, which Dr. Breda considers horribly telling. She guesses that more than 60% of her state patients die within two years of being diagnosed. This is, in part because, although screening has improved, it's still not happening enough, which means that patients present at a very late stage. "There is a lot we can do to prevent things like cervical and prostate cancer, but early screening is not happening enough." Patients wait until they have severe symptoms before they present at a health facility. Mortality rates are also high because treatment options in the public sector are very limited, and it's expensive to treat cancer.

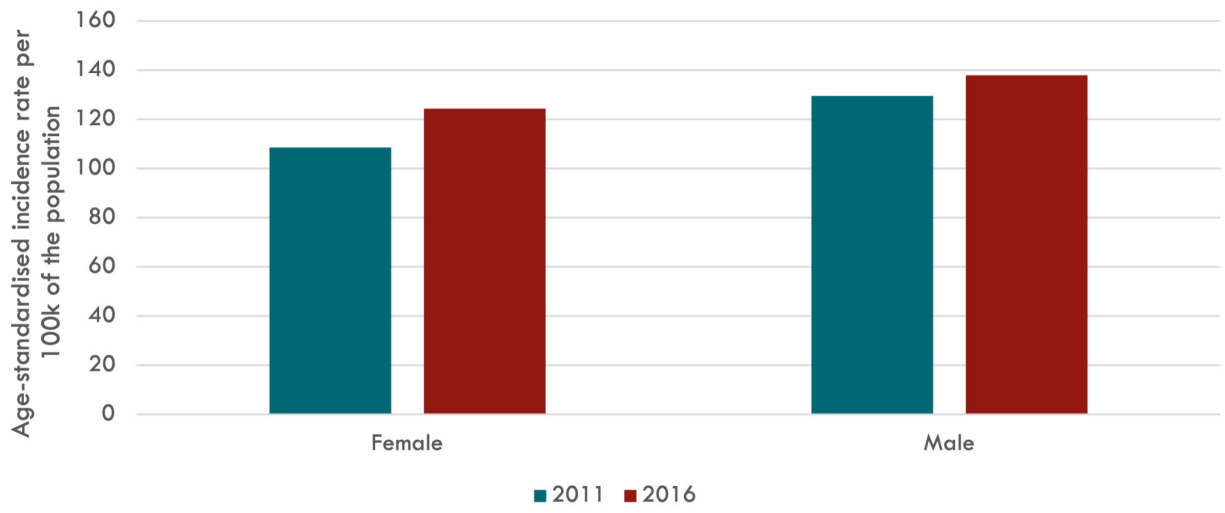
"Some of the new machines we need cost R60 million," Dr. Breda told me, "but the hospital budget is only R20 million. Most of my work ends up being palliative."

Challenges in oncology care are not confined to the Eastern Cape. In 2017, the South African Human Rights Commission drew attention to the crisis in oncology services in KwaZulu-Natal, including a dire shortage of both staff and working machinery.

The burden of cancer in South Africa

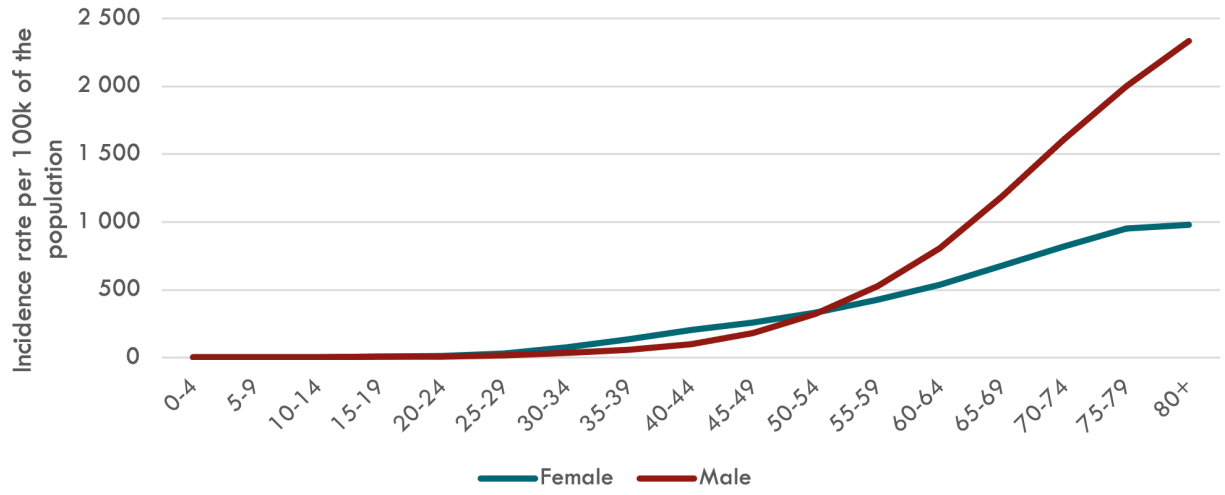
The incidence of cancer is on the rise in South Africa. While part of the increase in cancer cases can be attributed to a growing and ageing population, data from the National Cancer Registry (NCR) shows that the cancer incidence rate (per 100,000 of the population) is increasing at almost every age. Figure 1 demonstrates the increase in the age-standardised incidence rate of cancer over time.

Figure 1: Age-standardised incidence rate (per 100,000 of the population) of cancer in South Africa, by sex (NCR 2011 and 2016)[21,22]



When looking at the cancer incidence in South Africa by age, the increased risk of cancer at older ages is evident (see Figure 2). The incidence of paediatric cases is very low and relatively stable over time, whereas cancers are becoming increasingly common at older ages. Furthermore, differences between the incidence of cancer in males and females can be observed.

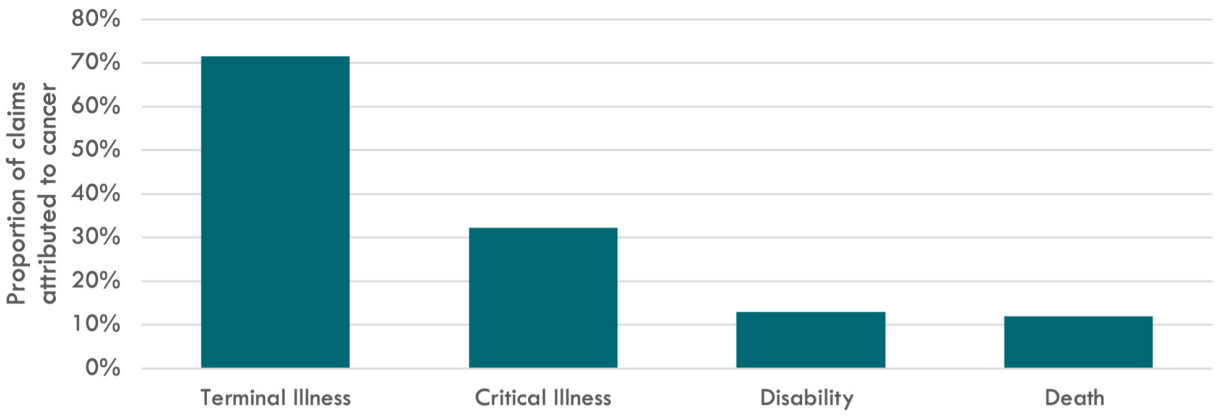
Figure 2: Incidence of cancer in South Africa, by age and sex (NCR 2016)[21]



The most common cancers in South African females are breast, cervical, colorectal, uterus and lung cancer, while the most common cancers in men are prostate, colorectal, lung, non-Hodgkin lymphoma and bladder cancer.[23] The extremely high incidence rate of cancer in men at older ages, as seen in Figure 2, can largely be attributed to the high incidence of prostate cancer at these ages.

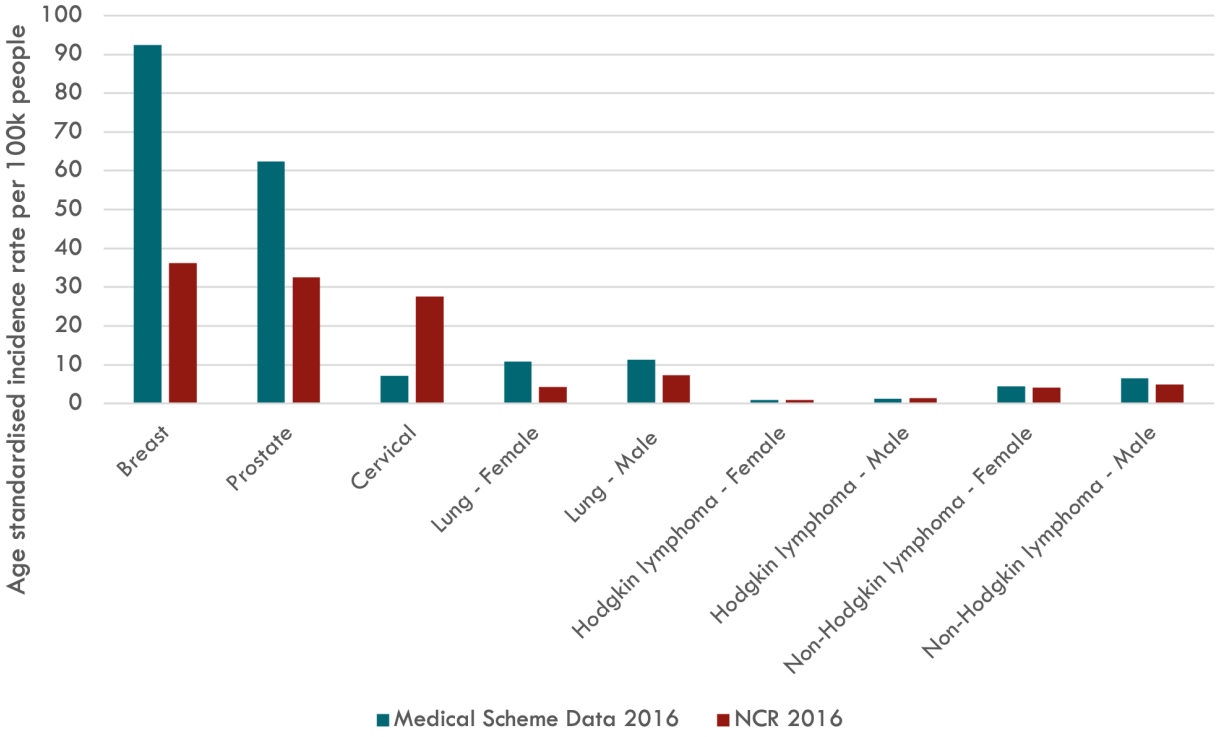
The high incidence of cancer and associated morbidity is further evident in the large proportion of insurance claims attributed to cancer. Approximately 70%, 30% and 10% of terminal illness, critical illness and disability claims can be attributed to cancer (Figure 3). Additionally, one in ten deaths in the insured population is cancer-related.

Figure 3: RGA insurance claims attributable to cancer (own analysis 2020)[24]



While NCR data theoretically includes all cancer diagnoses across the country (given that cancer is a notifiable disease), there are various quality concerns associated with the data. The NCR data is based on histologically (laboratory) diagnosed cancer, which leads to the under-reporting of cancers that are typically diagnosed by other methods. Furthermore, many South Africans with cancer never actually present at health facilities and are therefore never diagnosed, nor recorded in the data. This is a result of many complex factors, including poor access to cancer screening, barriers to access to general health services and low levels of health-seeking behaviour. The under-representation of the true cancer burden in the NCR is evident when comparing private-sector data to NCR statistics, as seen in Figure 3.

Figure 4: Comparison of age-standardised incidence rate (per 100,000 people) of individual cancers across NCR and DHMS data (own analysis)[21,25]



While medical scheme data is likely more representative of the true burden of cancer, there are some nuances to this statement. Firstly, high levels of screening in the private sector may, as mentioned, over-estimate the cancer burden for certain cancers (such as breast and prostate) through the diagnosis of clinically insignificant cancers. Additionally, medical scheme incidence of cancers that are associated with risk factors that are less prevalent in the medical scheme population than in the national population are likely not truly representative of the South African population. For example, NCR data demonstrates a higher incidence rate for cervical cancer than that observed in medical scheme data. This can be explained by both the biological association between cervical cancer and HIV (which has a much higher prevalence in the public sector), as well as the socio-economically driven risk factors of HPV infection (which is an STI), which are more prevalent in the public-sector population.

The link between infections and cancer incidence

The high prevalence of HIV in South Africa contributes considerably to the burden of cancer in the country (see brief 6). HIV is biologically associated with an increased risk of various cancers including lymphoma, cervical cancer and Kaposi sarcoma.[26] HIV-positive patients are around 1127 times more likely to develop Hodgkin lymphoma and 1626 times more likely to develop non-Hodgkin lymphoma.[28] Furthermore, HIV-positive patients tend to have worse treatment outcomes.[29] Successful antiretroviral treatment in people living with HIV has reduced excess risk of cancer in recent years,[28] as well as improved treatment outcomes in these patients.[30] Given that HPV is a sexually transmitted disease, contracting HPV is associated with many of the same risk factors as HIV.

It's therefore difficult to establish the extent of a causal link between HIV and increased risk of cervical cancer.

Since 2014, the National Department of Health has rolled out a nationwide HPV vaccination campaign, whereby Grade 4 girls enrolled at public schools across the country are vaccinated against HPV in an attempt to prevent cervical cancer by reducing the risk of HPV infection.[31] The campaign has been successful in large-scale vaccinations to date.[31] Given that the incidence of cervical cancer only begins to rise around the age of 35, the benefits of the vaccination campaign will only be evident by about 2040, when the first cohort of vaccinated girls will be 35.

Conclusion

The burden of cancer goes beyond the physical morbidity experienced by cancer patients: it infiltrates all aspects of their lives, as well as the lives of those around them. Coupled with the fact that so many cancers could be avoided by reducing exposure to known risk factors, it highlights the need for a holistic approach to reducing its burden, as is the case with the majority of NCDs.

Given that cancer is a largely preventable disease, and that the cost of treatment is so high, prevention strategies are key in reducing the global burden of cancer morbidity and mortality. Additionally, the strong overlap in risk factors for other major NCDs and cancer, which are estimated to cause one-third of cancer deaths, emphasises the value of targeting cancer-prevention strategies alongside that of other major NCDs.

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