The World Health Organization (WHO) defines the occurrence of infectious diseases, such as tuberculosis (TB) and HIV/AIDS; noncommunicable diseases, like heart disease and cancer; and violence and injuries as a “triple threat” to global health (WHO, 2018b). HIV/AIDS is among the leading causes of death globally, with low- and middle-income countries disproportionately affected (WHO, 2017). Cancer is reported as the second leading cause of death worldwide, accounting for nearly 14 million new cases in 2012 and 8.8 million deaths in 2015 (WHO, 2018a). About 70% of deaths occur in low- and middle-income countries (WHO, 2018a). In addition, infectious diseases, including human papillomavirus (HPV), are associated with 25% of cancer cases in such countries (WHO, 2018a). Africa, Asia, and Central and South America account for 60% of the world’s cancer cases and 70% of cancer-related deaths (McGuire, 2016). Cancer in sub-Saharan Africa (SSA), which occurs concurrently with infectious disease, accounts for some of the lowest survival outcomes in the world (Olaleye & Ekrikpo, 2017; Sankaranarayanan et al., 2010). Although public health initiatives focus on TB, HIV/AIDS, malaria, and maternal mortality, the burden of cancer is increasing in SSA (De Vuyst et al., 2013). Oncology nurses face challenges of adequate staffing, training, workforce stability, and the prioritization of care in the context of potentially numerous life-threatening disease states (Munjanja, Kibuka, & Dovlo, 2005).

The most common cancers occurring in Zambia are listed in Table 1. HPV-associated diseases, particularly cervical cancer, are major causes of morbidity and mortality in SSA. Cervical cancer incidence rates in SSA are the highest in the world, and the disease is the most common cause of cancer death among women in the region (De Vuyst et al., 2013). Rates of cervical cancer vary considerably in different subregions; however, cervical cancer ranks first or second in all individual SSA countries and subregions. Guinea, Zambia, Tanzania, Malawi, and Mozambique have some of the highest invasive cervical cancer incidence rates in the world, at more than 50 per 100,000 women (De Vuyst et al., 2013).

The Challenge of HIV and Cervical Cancer
Because of aging, population growth, lack of access to appropriate prevention services, and the concomitant HIV/AIDS epidemic, cervical cancer incidence and mortality rates in SSA are anticipated to rise during the next 20 years (De Vuyst et al., 2013). The prevalence of cervical precancer and cancer is reported to be high among women who are HIV positive in SSA, who typically present with cancer at an earlier age (Bateman et al., 2015). In SSA countries with high burdens of HIV, AIDS-associated malignancies, such as cervical cancer, increase as more...
women live longer with better access to antiretroviral therapy (ART) (Kapambwe et al., 2015). In the WHO clinical staging for HIV infections, cervical cancer occurrence in a patient who is HIV positive is classified as stage IV, along with other AIDS-defining malignancies like Kaposi sarcoma and lymphoma (Ntekim, Campbell, & Rothenbacher, 2015).

A Cancer Center’s Experience

The Cancer Diseases Hospital (CDH), located in the capital city of Lusaka, is the only cancer center in Zambia. Cervical cancer has the highest morbidity and mortality and accounts for more than 30% of all cancer cases treated at CDH (see Table 2). Lusaka province has an HIV rate of 21%, Southern province 15%, and Western province 15% (Kalima et al., 2015). Compared to the general population in the provinces, a significantly higher HIV seroprevalence is seen among patients with cervical cancer (Kalima et al., 2015).

Patients can access HIV treatment at their local health facilities, but cancer treatment (which is free) is only available at CDH. Zambia has a total area of 752,614 km² (290,585 square miles) with an estimated population of more than 16.5 million people in 2016 (Worldometer, 2018). Therefore, patients from outside Lusaka have transportation and food expenses for themselves and any accompanying caregivers. Studies in limited-resource settings have shown that expenses for cancer care, beyond the cost of medications, surgery, and related treatment, are significant barriers to treatment (Kalima et al., 2015). Whereas chemotherapy, radiotherapy, and highly active ART (HAART) are free of charge, the indirect expenses associated with treatment, such as laboratory fees for diagnostic and monitoring purposes (Kalima et al., 2015), are unaffordable for most patients and could be a barrier to receiving or completing treatment. The following patient case highlights clinical and logistic challenges to care in this community.

Case Study

The patient, S.M., is a 51-year-old female who lives more than 600 km from the cancer center. She was diagnosed with stage IVB cervical cancer with rectal involvement in November 2016. She also is HIV positive and has been on HAART since 2016. She was accompanied to the hospital by one of her relatives, who was a caregiver at her bedside.

Cancer and HIV Management

The clinical management of cervical cancer is challenging in patients who are HIV-positive because of immune status. HIV infection, cancer, radiotherapy, and chemotherapy lower immunity through reduction in CD4 cell counts. To date, no cancer treatment guidelines exist for patients who are HIV positive in this setting, and these patients are managed like their HIV-seronegative counterparts (Ntekim et al., 2015).

The patient in the case study received palliative external beam radiation therapy 40 Gy to the pelvis rather than high-dose rate brachytherapy because her tumor was too bulky. Despite potential financial constraints, radiotherapy has been shown to be cost-effective to definitively treat and palliate many cancers (Balogun, Rodin, Ngwa, Grover, & Longo, 2017). Concurrent chemoradiotherapy is considered a standard of care for cervical cancer, and the addition of HAART depends on the CD4 cell count of a patient (Ntekim et al., 2015). S.M. and her caregiver received pre- and postradiation therapy counseling, education, and monitoring for rectal vaginal fistula and other acute or late side effects of radiation therapy. To provide palliative symptom management, specialists from the Adult Infectious Diseases Centre, a separate organization located close to CHD, managed her HIV symptoms while she continued HAART.

Palliative Care and Symptom Control

Consistent with palliative care guidelines (Ferrell et al., 2017), the CDH palliative care team addressed pain and symptom management and promoted quality of life. The team used a holistic assessment tool to assess and evaluate S.M.’s physical, social, psychological, and spiritual needs. The assessment revealed that the emotional, social, and economic impact of her illness was substantial, including fear, stigma, and these patients are managed like their HIV-seronegative counterparts (Ntekim et al., 2015).

TABLE 1.
INCIDENCE AND MORTALITY OF THE FIVE MOST COMMON CANCERS IN ZAMBIA

<table>
<thead>
<tr>
<th>CANCER TYPE</th>
<th>INCIDENCE (%)</th>
<th>MORTALITY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>15.1</td>
<td>10.6</td>
</tr>
<tr>
<td>Cervix</td>
<td>14.9</td>
<td>12.8</td>
</tr>
<tr>
<td>Prostate</td>
<td>8.3</td>
<td>8.4</td>
</tr>
<tr>
<td>Liver</td>
<td>6.2</td>
<td>8.3</td>
</tr>
<tr>
<td>Kaposi sarcoma</td>
<td>5.9</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Note. Based on information from World Health Organization, 2014.

TABLE 2.
TOP 10 CANCERS MANAGED AT THE CANCER DISEASES HOSPITAL IN ZAMBIA IN 2016 (N = 2,258+)

<table>
<thead>
<tr>
<th>CANCER TYPE</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervix</td>
<td>747</td>
<td>33</td>
</tr>
<tr>
<td>Breast</td>
<td>186</td>
<td>8</td>
</tr>
<tr>
<td>Kaposi sarcoma</td>
<td>173</td>
<td>8</td>
</tr>
<tr>
<td>Prostate</td>
<td>173</td>
<td>8</td>
</tr>
<tr>
<td>All lymphomas</td>
<td>114</td>
<td>5</td>
</tr>
<tr>
<td>Esophagus</td>
<td>74</td>
<td>3</td>
</tr>
<tr>
<td>Eye</td>
<td>53</td>
<td>2</td>
</tr>
<tr>
<td>Liver</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>Vulva</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>Brain</td>
<td>29</td>
<td>1</td>
</tr>
</tbody>
</table>

+ Total number of new cancer cases seen at the hospital from January to December 2016.

Note. Based on information from Cancer Diseases Hospital, 2017.
Communities

rejection, repeated bereavement, and conflicting messages (Downing, Atieno, Debere, Mwangi-Powell, & Kiyange, 2010). This makes palliative care important for all women receiving treatment for cervical cancer, particularly those with limited or no treatment options (Odendal, 2011). Specifically, the team focused on the patient’s pain, anemia, vomiting, and distress.

**Pain:** The patient reported severe pain (4 out of 5 on a numeric rating scale) consistent with physical and psychological pain associated with advanced cervical cancer (Odendal, 2011). The team managed her pain with an appropriate analgesia based on the WHO pain step ladder.

**Anemia:** The patient’s anemia (hemoglobin level of 7 g/dl) required immediate intervention so she could proceed to radiotherapy per institutional parameters. Her anemia may have been from vaginal bleeding secondary to cervical cancer, which may present as prolonged menstruation or spontaneous bleeding (White et al., 2012). She was prescribed iron supplements (ferrous sulphate 200 mg orally every eight hours) and whole blood transfusion to relieve the anemia. Hematopoietic toxicities, including anemia, thrombocytopenia, and neutropenia (grades 1 and 2), are reportedly higher in patients who are HIV positive than in those who are HIV negative, which further compounds the often preexisting disease or treatment-related anemia (Ntekim et al., 2015).

**Vomiting:** The patient reported vomiting, attributed to radiotherapy treatment. For relief and to treat dehydration, she received 5-HT3, antiemetic therapy and IV fluid infusions. In 5% of patients who are HIV positive (versus 2% of those who are HIV negative), grades 3 and 4 gastrointestinal reactions were reported (Ntekim et al., 2015).

**Distress:** Psychosocial assessment revealed that the patient and her family had inadequate knowledge about her disease trajectory and stage, leading to worry and depression. In Zambia, cervical cancer is highly stigmatized because of its anatomic location, dire natural course, connections to socially condemned behaviors, and association with HIV/AIDS (White et al., 2012). Most women in this region equate cervical cancer with death. Family conferences, including psychosocial counseling, addressed knowledge deficits about cervical cancer and her plan of care to return home. Spiritual counseling and support addressed the patient’s anger with her situation. Despite the circumstances, she conveyed that she was at peace with God and with those around her.

**Community Challenges**

Diverse logistical, financial, operational, and clinical challenges exist to providing cancer care in this region. Logistically, many patients live far from the cancer center, including this patient, who lived in a town more than 370 miles away.

"Indirect expenses associated with treatment are unaffordable for most patients and could be a barrier to receiving or completing treatment."

Financial constraints of travel prevent many individuals from accessing cancer care or returning for follow-up. Operationally, CDH does not have on-site HIV staff to manage patients who are HIV positive, which makes coordinated care for patients with cancer and others with multiple diseases difficult. A need exists to integrate HIV services into cancer care within the hospital to improve management of patients with multiple disease ailments, such as HIV and cancer, a common feature for most patients with cervical cancer in this community. The proximity of the Adult Infectious Diseases Centre helps to alleviate some of these challenges by providing oversight for HIV care. Clinical challenges include fundamental needs, such as access to blood products for transfusion, which can delay care. Educationally at CDH, only 12 of 150 nurses are oncology-trained and only one is specialized in palliative care, which poses an additional challenge to meeting the needs of patients with cancer.

**Conclusion**

As cancer incidence and related deaths continue to rise disproportionately in SSA and other countries, cancer care delivery is increasingly challenged by multiple potentially life-threatening disease states, compounded by unique logistic and operational barriers. Nurses are tremendously important to supporting the holistic needs of patients with cancer and other disease states. Ultimately, cancer care in Zambia, SSA, and other parts of the world are dependent on nurses to expand access to care, ensure patient and caregiver education, and engage with interprofessional teams to provide care to patients in their respective communities.

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**References**


