Breast Cancer Outcomes in Sub-Saharan Africa

The need to tackle advanced stage at diagnosis and improve access to high-quality treatment

International Agency for Research on Cancer

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Summary

The African Breast Cancer - Disparities in Outcomes Study (ABC-DO) aims to understand how to improve breast cancer outcomes, i.e. survival and quality of life, among women affected by breast cancer in sub-Saharan Africa. A focus is placed on challenges specific to the social, cultural, and health system contexts. ABC-DO is studying events along the entire journey with breast cancer of 2200 women in five sub-Saharan African countries. This journey started when the woman first noticed her breast symptoms, and it extends to diagnosis, through the treatment period, and to at least 5 years after diagnosis. The study will inform strategies to avert avoidable deaths from breast cancer in this region.

Introduction

Breast cancer is the most common cancer type in women in sub-Saharan Africa, affecting 129 000 women who were newly diagnosed in 2020. In high-income countries breast cancer has a good prognosis, but in sub-Saharan Africa survival is considerably lower. In this region, estimates for 5-year survival are near or below 50%, i.e. 1 in 2 women diagnosed with the disease have died within 5 years after diagnosis, compared with fractions in the USA of 1 in 5 for Black women and 1 in 10 for White women. The annual number of women diagnosed with breast cancer in sub-Saharan Africa is projected to nearly double by 2040, due to population ageing and expansion. This increase will be even larger if lifestyle and fertility changes are factored in. Women in Africa are having fewer children and are delaying first childbearing. Although these factors have multiple health and socioeconomic benefits for women, they also increase their risk of developing breast cancer in later life.

ABC-DO was set up to examine determinants of breast cancer survival across five African countries at different stages of economic and epidemiological transitions. In 2020, the five participating countries had age-standardized breast cancer incidence rates per 100 000 women ranging from 20.0 in Zambia and 22.2 in Uganda to 49.0 in Nigeria, 52.6 in South Africa, and 57.6 in Namibia.

"More than one third of the 64 000 deaths from breast cancer each year in sub-Saharan Africa could be averted."

– Dr Valerie McCormack

Study features

- Ongoing hospital-based multicountry breast cancer cohort study in sub-Saharan Africa: **Namibia, Nigeria, South Africa, Uganda, and Zambia**
- **2200 women** (aged ≥ 18 years) newly diagnosed with breast cancer are being actively followed up every 3 months
- Use of mobile health (**mHealth**) for management and standardization of data collection and follow-up in real time
- Recruitment was done in **7 public tertiary hospitals** and **1 small private clinic**
- In these settings, breast cancer is diagnosed mostly in symptomatic stages
- The selected sites manage a large breast cancer patient load per year (> 200 new patients per year)
- **Heterogeneous range** of countries and hospitals, with contrasting patient profiles (i.e. different stages of the breast cancer transition), catchment populations (geographically proximate and disparate), and health systems (i.e. with/without free provision of diagnosis and treatment, with/without routine immunohistochemical assessment of hormone receptor status, with/without support services such as transport and accommodation during treatment regimes)

Barriers to earlier stage at breast cancer diagnosis

Diagnosis of breast cancer at an advanced stage greatly reduces the possibilities of curative treatment. Breast cancer is, on average, a slow-growing tumour; thus, advanced disease typically occurs after an **extended time window of several months during which a palpable tumour was present in most women**. The palpable nature of breast cancer means that the disease can be diagnosed when the tumour is still small (~2 cm diameter) and has not spread to regional lymph nodes. In sub-Saharan Africa, the percentage of women diagnosed with late-stage (stage III or IV) breast cancer varies substantially between countries; 50% to 90% of women with breast cancer are diagnosed with regional or metastatic spread of the disease.

Which women were diagnosed with more advanced disease in ABC-DO?

Advanced disease is influenced by biological tumour factors, such as higher-grade and triple-negative tumours. In addition, women vulnerable to being diagnosed with advanced disease included **socially disadvantaged** women, such as those in unskilled employment, those with no formal education or only primary school attendance, and those with **poor breast cancer awareness**. Also, **younger women** and women who were **pregnant** within the past 3 years were diagnosed with more advanced disease (tumours tend to be more aggressive due to the pregnancy-related hormonal milieu, or symptoms of breast cancer may be mistaken for lactation problems).

What were the delays to diagnosis in ABC-DO?

Most of the above-mentioned groups of women were vulnerable to being diagnosed with advanced breast cancer not because they did not notice changes in their breast; they did notice changes and did seek help, but they experienced long delays to diagnosis. Notably, one third of Black South African women, one half of Zambian and Namibian women, and three quarters of Ugandan women reported having had symptoms of a breast problem for more than 6 months. Most women proactively sought help for the changes in their breast, but they experienced considerable **delays between their first contact with the health system and the eventual diagnosis**.

Factors hypothesized to have an impact on breast cancer survival

Proximal factors:

- Extent of disease spread (i.e. tumour stage) at start of treatment
- Tumour biology: histology, grade, receptor status
- Treatment received: appropriateness for the breast cancer subtype, quality, and completion
- Comorbidities, including HIV infection

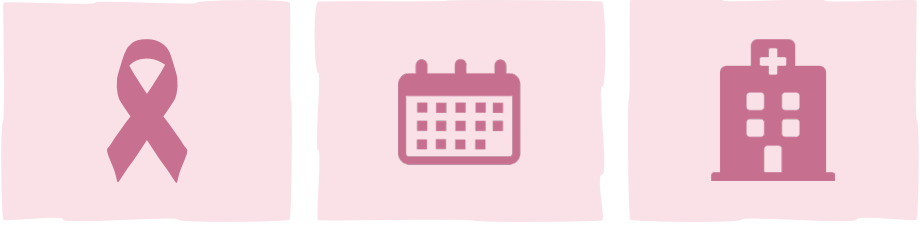
Distal factors:

- Delays in recognizing symptoms and in seeking help
- Prolonged times to reach the first caregiver and between pre-diagnostic contacts with caregivers in orthodox health, traditional health, and spiritual support systems
- Prolonged time between symptom recognition and diagnosis
- Delays between diagnosis and start of treatment
- Socioeconomic, cultural, and demographic factors
- Treatment refusal and early termination
- Quality of life status
- Attitudes and knowledge about breast cancer
- Treatment side-effects
- Impacts of disease on family and working life
- Barriers to health-care utilization and treatment
- Navigational barriers

Key evidence messages

- **At least one third of breast cancer deaths are avoidable, which will save lives and prevent the intergenerational consequences of maternal deaths, and maternal orphans, in the region.**
- To improve survival rates, as per the Breast Health Global Initiative's recommended phased implementation approach, sub-Saharan African countries need to develop and strengthen programmes to ensure the early diagnosis of symptomatic breast cancer, in parallel with improvements in timely access to appropriate high-quality treatment.
- Downstaging of symptomatic breast cancer is a realistic target in this setting.
- Reducing the time between symptom recognition and diagnosis to 2 to 3 months should be achievable for the majority of women in sub-Saharan Africa; delays longer than 1 year are common and should be considered extreme in any system. A clear supported and rapid referral system to diagnosis needs to be strengthened.
- Strategies to improve breast cancer education and awareness among women and health professionals should be intensified, including breast self-awareness and knowledge that the disease can be cured.
- Understanding of context-specific drivers of advanced stage at diagnosis is needed, because the drivers vary between African settings.
- Universal free access to cancer diagnosis and treatment in sub-Saharan Africa should be considered, to prevent growing social inequities in stage at breast cancer diagnosis, between-country divides in access to treatment and care, and survival disparities in the region.
- Education and support to increase treatment access and completion should be implemented.

Call to action



Improve breast cancer awareness among women, communities, and health professionals.

Support rapid (< 2 months) diagnostic investigations of suspected breast cancers.

Improve access to systemic therapy and surgery, and support completion of treatment courses.

Advanced stage at breast cancer diagnosis

- Stage at breast cancer diagnosis reflects the size of the breast tumour and the extent of its spread beyond the breast at the time of diagnosis. Stage depends on both the rate of tumour growth and spread and the duration of growth before diagnosis and start of treatment.
- Tumour growth rate is affected by biological factors (e.g. tumour subtype, grade, and morphology; woman's age, menopausal status, hormone receptor status, and hormone exposure during pregnancy).
- Delays to diagnosis result from long delays between referral points in the health-care system.
- Delays in obtaining a diagnosis and starting treatment are associated with poorer prognosis.
- **A CRITICAL WINDOW OF OPPORTUNITY:** The time from symptom recognition to diagnosis and, ultimately, start of treatment was often too long in ABC-DO. This period offers a critical window of opportunity, a period that can be shortened through the actions and reactions of women and care providers, to accelerate diagnosis and start of treatment.

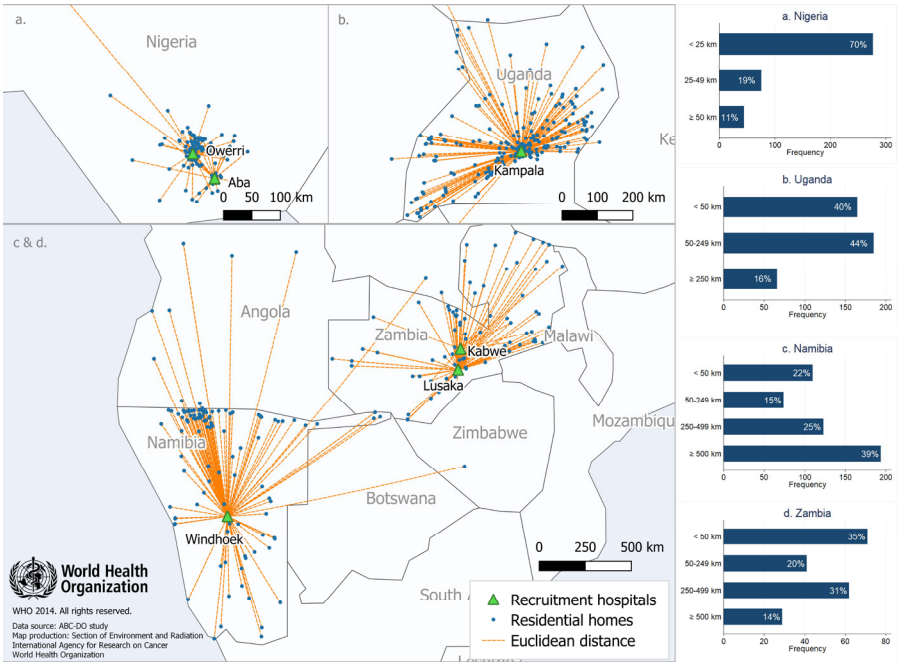


Fig. 1 Residential locations of participants and hospitals where they were recruited and received cancer care.

"Ensuring access to timely diagnosis and appropriate treatment is critical to preventing deaths from breast cancer in sub-Saharan Africa."

– Professor Isabel dos Santos Silva

The median number of visits to health-care providers ranged from 1 to 4 per woman, but **time intervals between visits were long**. Women who attributed their initial symptoms to cancer had a shorter median time to diagnosis than those who did not (an absolute difference of 4.1 months), and the time to diagnosis of less-educated women (those with no or only primary education) was on average 3.6 months longer than that of more-educated women.

Barriers to early presentation are the **low breast cancer awareness levels**. In Uganda, 2 out of every 3 women did not know that the disease is curable. Myths about the causes of breast cancer were prevalent, such as beliefs that it is due to curses, or carrying money or phones in the bra.

Geospatial barriers to an earlier diagnosis have also been quantified, highlighting more advanced stage at diagnosis in women who live farther from treatment centres. Often journeys of several hundred kilometres need to be made to reach treatment centres (as shown in Figure 1).

Survival and how to improve it

By 2020, the ABC-DO breast cancer cohort had been followed up for several years, and the data were used to analyse overall survival at 3 years after diagnosis. Breast cancer survival is better in certain study settings than in others (as illustrated in Figure 2). This demonstrates that realistic improvements can be achieved to avoid deaths from this disease. None of the settings has population-based breast cancer mammography screening; thus, these improvements can be made in the absence of such programmes.

Breast cancer survival was alarmingly low in Black African women. At 3 years after diagnosis, survival in ABC-DO was 90% in White Namibian women, 58% in Black Namibian and South African women, 46% in Ugandan and Zambian women, and 36% in Nigerian women.

Advanced **stage at diagnosis** and lack of access to **surgery and systemic therapy**, which particularly affected women from lower socioeconomic groups, were the largest contributors to low survival. In contrast, the relatively high proportions of young-onset breast cancer (age < 30 years at diagnosis), HIV-positive women, and more aggressive tumour subtypes made smaller contributions to low overall survival.

Barriers to oncology care and inequities in breast cancer treatment

At the health-care system level, in most sub-Saharan African countries **oncology care facilities are few** and are overstretched. **Treatment can be lacking** and/or **waiting times** for chemotherapy and radiotherapy (if available) are long. Once a woman reaches a cancer care hospital, the challenges to cancer care begin during the diagnostic workup. In the ABC-DO study settings, Namibia and South Africa have routine triple-receptor assessment at diagnosis, which enables clinicians to inform breast cancer management and prescribe effective and

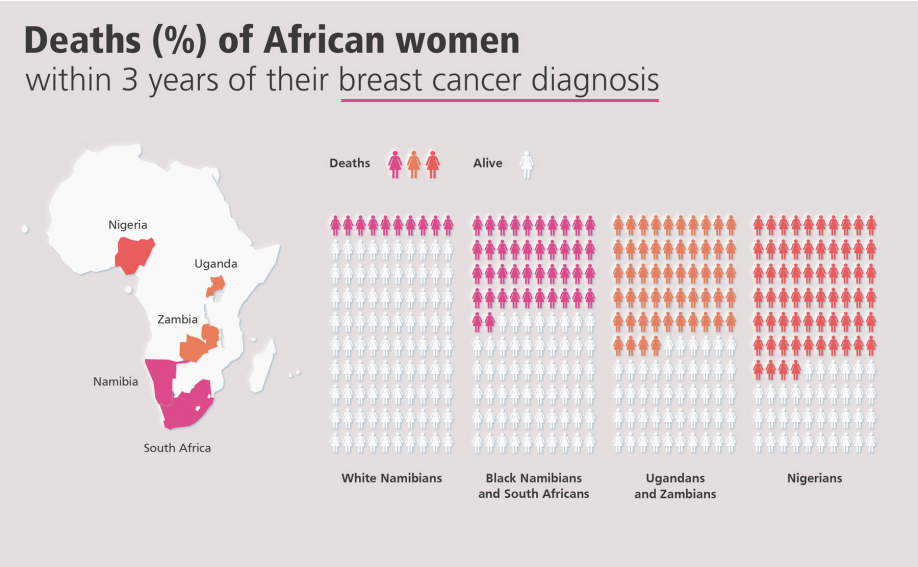


Fig. 2 Deaths (%) of African women within 3 years of breast cancer diagnosis.

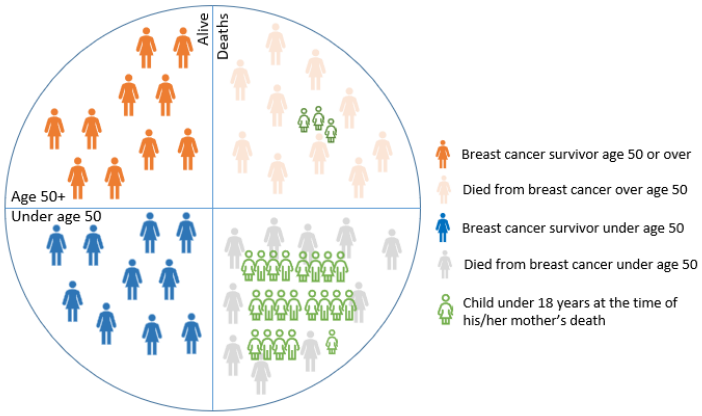


Fig. 3 Vital status and maternal orphans at 3 years among 40 women with breast cancer.

affordable treatment of patients with hormone receptor-positive breast cancer. In Uganda, Zambia, and Nigeria, for most women this **immunohistochemical assessment of hormone receptor status** was lacking.

The costs of cancer treatment to the patient vary between settings, ranging from low or minimal costs to costs that are fully paid by the patient and/or their family. Regardless of direct care costs, out-of-pocket costs associated with the journey to a hospital and with accommodation are also substantial. These **financial barriers, coupled with fears of treatment and lack of belief in its effectiveness**, mean that a considerable proportion (17%) of women in ABC-DO did not receive either surgery or systemic therapy (chemotherapy or endocrine therapy) within the first year after diagnosis. This treatment gap varied greatly between settings; the percentage of untreated women was highest in the two regional hospitals in Nigeria (1 in 3 untreated: 38% in the public setting and 34% in the private setting), was 1 in 6 (17%) at the national referral hospital in Uganda, and was almost zero in women who reached the Namibian Oncology Centre in Windhoek. These findings were unaltered after excluding women diagnosed with metastatic disease.

Across settings, women vulnerable to not receiving any treatment within the first 12 months after diagnosis were **younger women**, possibly due to stigma and fear of disfigurement and abandonment, but this treatment gap applied equally to **the most elderly** women. **Socioeconomic position** was the most influential determinant of treatment access in Uganda and Nigeria, countries without universal health-care coverage. In addition, **preference for traditional medicine** also appeared to divert women from starting cancer treatment in Uganda.

Intergenerational impacts of breast cancer deaths: maternal orphans

ABC-DO has unveiled wider intergenerational impacts of breast cancer deaths in Africa. Half of the breast cancer deaths occurred in women younger than 50 years, and, on average, each of these deaths created 2 maternal orphans (children aged < 18 years; Figure 3). Families reported that their concerns for children's future care and education were exacerbated by the catastrophic financial expenses associated with cancer treatment.

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– Dr Moses Galukande

Implications

The findings of ABC-DO have identified groups of women vulnerable to being diagnosed with advanced-stage disease because of delays in diagnosis. For these women, **downstaging** (i.e. shifting the stage distribution of tumours at diagnosis towards a lower stage) may be achievable through a combination of strategies that (i) improve **breast cancer awareness** and promote timely **help-seeking behaviours in women** and (ii) equip the health system to receive, examine, and refer women presenting with breast symptoms in an appropriate fashion. Because help-seeking behaviour depends greatly on how a woman views herself, her status, and her roles within her community, **empowerment** may play a key role in sub-Saharan African breast cancer disparities. The findings also suggest that although downstaging may be achieved in the long term through improvements in the general education level of women, the stage distribution may also be improved in the short term through specifically tailored interventions to improve breast cancer awareness, such as community education on breast cancer symptoms, breast self-examination, and where to seek help, and about the potential to cure breast cancer.

When a woman does present to the health system with breast symptoms, she needs to be met by a linked network of first-line health-care providers trained in clinical breast examination and equipped with knowledge of how to support and where to refer women through an **efficient navigational pathway to diagnosis and treatment**. In the design of such setting-specific programmes, disadvantaged women with low levels of literacy and education, or those in unskilled employment, must be catered for, because these women are more likely to be diagnosed with advanced disease.

ABC-DO has also identified marked inequities in access to breast cancer treatment, which contribute as much to low survival as does advanced stage at diagnosis. Gaps in access to high-quality treatment need to be addressed to fully benefit from the survival gains that are to be achieved through downstaging. These findings underline the importance of providing population-wide affordable cancer care through **universal health-care coverage**. In addition to overcoming financial barriers to treatment, providing support and educating women on the importance of the full therapeutic plan to achieve curative treatment is needed, because some women terminate treatment early in preference for traditional medicine or spiritual options alone.

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