



IJSRIS
journal
ISSN: 2820-7157

INTERNATIONAL JOURNAL OF

SCIENTIFIC RESEARCH AND INNOVATIVE STUDIES

Advancing Knowledge, Inspiring Innovation

www.ijsrisjournal.com



INDEXED JOURNAL

PEER REVIEWED
Rigorous & Transparent

DOI: CROSSREF
Member

OPEN ACCESS
For Global Visibility

BI-MONTHLY
Timely Publication

WIDE READERSHIP
High Impact & Visibility

AUTHOR FRIENDLY
Fast | Supportive | Reliable



RECEIVED
17 August 2026



ACCEPTED
09 September 2026



PUBLISHED
1 October 2026

October 2026

Volume 5

Number 5

623 to 632

Factors affecting the survival of patients with breast cancer: A study conducted at the university clinics in Kinshasa

MASENGU KABENGELE Virginie¹, MWANYIM BOPE PELENG Pierre Céleste¹, BALOW'A KALONJI KAMUNA Ignace¹

¹Higher Institute of Medical Technology, P.O. Box 774 Kinshasa XI, DRC

LICENSE



This article is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

<https://creativecommons.org/licenses/by/4.0/>



PREFIX :

10.63883

IJSRIS JOURNAL

OPEN ACCESS



This is an open access article distributed under the terms of open access.

ABSTRACT

The aim of this study was to identify the factors affecting the survival of patients with breast cancer.

This was a retrospective, analytical study involving 451 medical records examined during the study period; 138 of these records concerned female breast cancer patients treated

as inpatients in the gynaecological oncology department between 2021 and 2023, spanning a three-year period.

The results showed that:

- The prevalence of breast cancer was 30.6 per cent.
- More than half (55 per cent) of the patients were aged 45 or over, with a median age of 46 (40.25–54.75) years.

- The predominant clinical symptoms were breast pain, a breast lump and dimpling of the skin.
- The difference in median survival time according to whether chemotherapy was administered was statistically significant ($P = 0.025$). This means that women who received chemotherapy had better survival outcomes.
- The difference in median survival duration according to surgical treatment was statistically significant ($P = 0.002$). This means that women who had not undergone surgery died earlier.
- The difference in median survival time according to palliative care was statistically significant ($P = 0.047$). This means that women who were not receiving palliative care had a shorter life expectancy.

Thus, improvements in early diagnosis, access to appropriate treatments and medical follow-up appear essential for reducing breast cancer mortality.

Keywords: cancer, breast, survival, affecting, factor, patients.

1. Introduction

Breast cancer is now a major global public health issue. According to the World Health Organisation (WHO), in 2020 it became the most commonly diagnosed cancer worldwide, with approximately 2.3 million new cases and nearly 685,000 deaths (WHO, 2021). It is the leading cause of cancer-related mortality among women in many countries, particularly in resource-limited regions.

According to the International Agency for Research on Cancer (IARC), countries in sub-Saharan Africa have proportionally higher mortality rates than developed countries, due in particular to late diagnosis, limited access to early screening and difficulties in accessing specialised treatments (Sung et al., 2021). Whilst the five-year survival rate exceeds 80 per cent in several Western countries, it remains below 50 per cent in many African countries (Allemani et al., 2018). The survival of patients with breast cancer is influenced by several factors. Clinical determinants such as tumour stage at diagnosis, tumour size, lymph node involvement and the presence of metastases are major prognostic factors (Elston & Ellis, 1991). Biological characteristics, notably hormone receptor status and HER2 expression, also play a decisive role in the course of the disease and response to treatment (Perou et al., 2000).

In sub-Saharan Africa, mortality remains high. The majority of patients are diagnosed at an advanced stage of the disease, which significantly reduces their chances of survival.

In the Democratic Republic of the Congo, socio-economic constraints, delayed consultation, inadequate organised screening and limited access to specialised treatments worsen the prognosis for patients; the absence of structured national screening programmes and difficulties in accessing specialised care further exacerbate the situation.

In Kinshasa, the Kinshasa University Clinics are one of the main referral centres for cancer care. However, few analytical studies have thoroughly assessed the factors influencing the survival of patients with breast cancer in this hospital setting.

Research question:

Through this study, we aim to answer the following fundamental question: What factors affect the survival of breast cancer patients in the gynaecological oncology department at the Cliniques Universitaires de Kinshasa?

Hypothesis:

In response to the research question raised, we hypothesise that the survival of breast cancer patients at the Kinshasa University Clinics is influenced by age, socio-economic status, tumour size, lymph node involvement, anaemia, hormone receptor status, surgery, chemotherapy and palliative care.

General objective:

The general objective of this study was to identify the factors affecting the survival of breast cancer patients in the gynaecological oncology department at the University Clinics of Kinshasa.

2. Methodology

This was a retrospective analytical study conducted using a comprehensive review of the medical records of patients admitted to the gynaecological oncology department at the Kinshasa University Clinics over a three-year period from 2021 to 2023. The sample size comprised 138 case records of cancer patients treated at the study site.

3. Results

Table 1: Prevalence of breast cancer.

Total number of records reviewed	Total number of breast cancer case records	Prevalence of breast cancer
451 records	138 cancer records	30.6%

Table 1 shows that the prevalence of breast cancer was 30.6 per cent of the cases observed among patients admitted to the gynaecological oncology department at the Kinshasa University Clinics.

Table 2: Breakdown of patients by socio-demographic characteristics.

Parameters (n=138)	n(%)	Median (25th–75th percentile)
Age (years)		46 (40.25 – 54.75)
<45	62 (45)	
≥45	76 (55)	
Level of education		
High	138(100)	
Low	0(0)	
Occupation		
Not in employment	30(22)	
In employment	108(78)	
Marital status		
Married	90(65)	

Unmarried	48(35)	
Parity (number of births)		3(2–3)
<3	39(28)	
≥3	99(72)	
Length of hospital stay		14(11.25 – 16.00)
<14	65(47)	
≥14	73(53)	

Table 2 shows that 55 per cent of participants were aged 45 or over and that the median age was 46, with an interquartile range of 40.25–54.75 years.

With regard to educational attainment, all participants (100 per cent) had a high level of education. In terms of employment, 78 per cent of respondents were in employment, compared with 22 per cent who were not in employment.

An analysis of marital status shows that 65 per cent of the participants were married, whilst 35 per cent were unmarried. The median parity was 3 births, with an interquartile range of 2 to 4. The majority of participants (72 per cent) had a parity of 3 or more, compared with 28 per cent who had a parity of less than 3. Finally, the median length of hospital stay was 14 days, with an interquartile range of 11.25 to 16.00 days. More than half of the respondents (53 per cent) had a length of stay of 14 days or more, whilst 47 per cent had a stay of less than 14 days.

Table 3: Breakdown of patients by personal history.

Parameters	n(%)
Smoking (n=138)	
Yes	0(0)
No	138(100)
Having a drug allergy (n=138)	
Yes	14(10)
No	124(90)
Type of medication involved (n=14)	
Antimalarials	6 (42.8)
Antibiotics	4 (28.6)
Painkillers	4 (28.6)
Having a food allergy (n=138)	
Yes	36 (26)
No	102 (74)

Table 3 shows that all participants (100 per cent) were non-smokers.

With regard to drug allergies, only 10 per cent of respondents had a history of allergy to a drug. The group of drugs most commonly implicated consisted mainly of antimalarials (42.8 per cent). As for food allergies, it is noted that 26 per cent of respondents reported having a food allergy.

Table 4: Breakdown of patients by diagnosis on admission.

Parameters	n(%)
Diagnosis on admission (n=138)	
Yes	130 (94)
No	8 (6)
Types of diagnosis observed (n=130)	
Breast lump	
Yes	101 (77.7)
No	29 (22.3)
Orange peel skin	
Yes	91 (70.2)
No	39 (29.8)
Breast pain	
Yes	115 (88.3)
No	15 (11.7)
Patient's general condition on admission (n=138)	
Poor	15 (11)
Good	123 (89)

Table 4 shows that 94 per cent of participants had a confirmed diagnosis on admission. With regard to the confirmed diagnosis, it is noted that a breast lump (77.7 per cent), dimpled skin (70.2 per cent) and breast pain (88.3 per cent) were cited.

With regard to general health on admission, the majority of patients (89 per cent) were assessed as being in good general health.

Table 5: Breakdown of patients by type of treatment administered.

Type of treatment administered (n=138)	n(%)
Antibiotics	
Yes	103(74.7)
No	35 (25.3)
Chemotherapy	
Yes	55 (40)
No	83 (60)
Surgery	
Yes	45 (32.6)
No	93 (67.4)
Pain relief	
Yes	128 (92.6)
No	10 (7.4)
Blood transfusion	
Yes	71(51.6)
No	67(48.4)
Palliative care	

Yes	35(25.3)
No	103(74.7)

Table 5 shows that analgesics (92.6%), antibiotics (74.7%) and blood transfusions (51.6%) were the most commonly administered treatments among hospitalised patients.

Table 6: Breakdown of patients according to complications or adverse effects reported during treatment.

Complications/adverse effects reported during treatment (n=138)	n (%)
Experienced a complication/adverse effect	
Yes	127(92)
No	11(8)
Type of complications or adverse effects (n=127)	
Gastritis	87(68.5)
Vomiting	109 (85.9)
Anaemia	100(79.3)
Asthenia	115 (90.2)

Table 6 shows that 92 per cent of participants had experienced a treatment-related complication or adverse effect. Among the complications reported, asthenia (90.2 per cent), vomiting (85.9 per cent) and anaemia (79.3 per cent) were the most commonly observed manifestations.

Figure 1 below shows that the difference in median survival time according to chemotherapy treatment was statistically significant ($p = 0.025$). This means that women who were treated with chemotherapy had better survival outcomes.

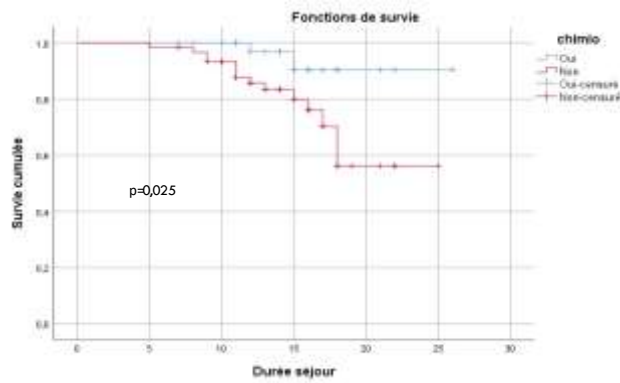


Figure 1: Comparison of median survival by chemotherapy.

Figure 2 below shows that the difference in median survival according to surgical treatment was statistically significant ($p = 0.002$). This means that surgical treatment was associated with better survival.

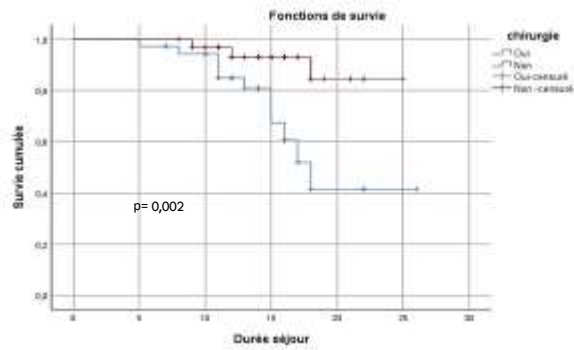


Figure 2: Comparison of median survival by surgical treatment.

Figure 3 below shows that the median survival time according to palliative care treatment was statistically significant ($p = 0.047$). This means that women who were not receiving palliative care had a shorter life expectancy.

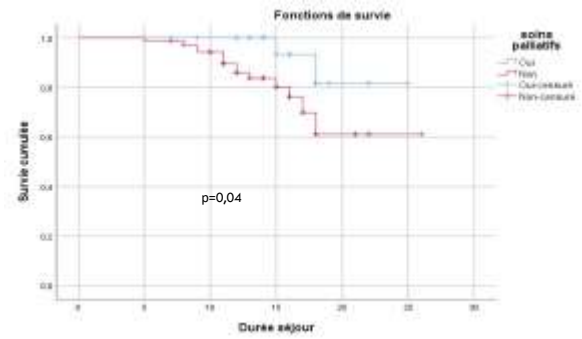


Figure 3: Comparison of median survival by palliative care treatment.

Table 7: Cox regression in univariate analysis.

Variables	Hazard Ratio	95% CI	p-value
Antimalarials			
Yes	1		
No	4.29	[0.95 – 19.43]	0.058
Orange peel			
No	1		
Yes	2.657	[0.99 – 7.12]	0.523
Chemotherapy			
No	1		
Yes	0.21	[0.04 – 0.95]	0.043
Surgery			
Yes	1		
No	4.44	[1.54 – 12.81]	0.006

Palliative care			
No	1		
Yes	0.25	[0.05 – 1.11]	0.068
Vomiting			
No	1		
Yes	5.45	[2.0 – 14.8]	<0.001

Univariate Cox regression analysis was used to identify factors associated with the risk of death, expressed as a hazard ratio (HR) with their 95% confidence intervals (95% CI) and p-values.

The results indicate that antimalarial drugs (HR = 4.29; 95% CI [0.95 – 19.43]; p = 0.058), orange peel skin (HR = 2.657; 95% CI [0.99 – 7.12]; p = 0.523, and chemotherapy are associated with an HR of 0.21 (95% CI [0.04 – 0.95]; p = 0.043).

The absence of surgery; (HR = 4.44; 95% CI [1.54 – 12.81]; p = 0.006), the use of palliative care (HR = 0.25; 95% CI [0.05–1.11]; p = 0.068), vomiting (HR = 5.45; 95% CI [2.0–14.8]; p = 0.001), gastritis (HR = 11.91; 95% CI [4.12 – 34.45]; p < 0.001) and anaemia (HR = 6.90; 95% CI [2.50–19.02]; p < 0.001) were significantly associated with the risk of death in patients.

Table 8: Cox regression in multivariable analysis.

Variables	HRa	95% CI	p-value
Age (years)			
<45	1		
≥45	6.54	[1.28 – 33.27]	0.024
Surgery			
Yes	1		

No	6.54	[1.28 – 33.27]	0.024
Anaemia			
Yes	16.47	[2.89 – 109.23]	0.002
No	1		

After adjusting for all variables, the results indicate that being aged 45 or over is a significant risk factor for death among women with breast cancer (HRa = 6.54; 95% CI [1.28 – 33.27]; p = 0.024). This means that women aged 45 and over had a 6.5 times higher risk of death than those under 45.

The absence of surgery was strongly associated with a significant risk of death (HRa = 4.97; 95% CI [1.54–16.01]; p = 0.007). This means that patients who had not undergone surgical treatment were almost five times more likely to die than those who had undergone surgery.

The presence of anaemia was strongly associated with an increased risk of mortality (HRa = 16.47; 95% CI [2.89–109.23]; p = 0.002). This means that anaemic patients had more than 16 times the risk of death compared with those with normal haematological status.

4. Discussion

This study, conducted at the University Clinics of Kinshasa, examined 451 hospital records, of which 138 concerned patients with breast cancer, representing 30.6 per cent. This proportion represents the frequency of breast cancer records amongst the records reviewed and should not be equated with the prevalence of breast cancer in the general population of Kinshasa. Indeed, hospital data are influenced by patient recruitment, the facility's referral status and the arrangements for accessing care. Nevertheless, this frequency highlights the significance of breast cancer within the gynaecological oncology practice of this institution. According to the World Health Organisation (WHO, 2024), breast cancer is the most common cancer among women worldwide, with an estimated 2.3 million new cases and 670,000 deaths in 2022. Mortality remains a particular cause for concern in low- and middle-income countries, where delays in diagnosis and difficulties in accessing specialised treatment contribute to poor treatment outcomes.

The median age of patients in our study was 46 years, with an interquartile range of 40.25 to 54.75 years. This distribution

shows that the hospitalised patients were relatively young, as nearly half were under 45 years of age. This observation is significant in the African context, where breast cancer is frequently diagnosed at a younger age than in many high-income countries. The work of Joko-Fru et al. (2020), which examined cancer cases recorded in several sub-Saharan African countries, highlights the growing importance of breast cancer in the burden of cancer among African women. However, the relatively young age observed in our study could also reflect the hospital recruitment profile and does not, on its own, allow us to conclude that there is a difference in risk by age in the general population.

From a socio-demographic perspective, 78 per cent of the patients were in employment and 65 per cent were married. All participants were classified as having a high level of education, which limits the ability to assess the influence of educational attainment on survival or clinical characteristics. This homogeneity may also reflect the patient selection criteria or the definition used for educational attainment. Furthermore, the median parity was three births. Although age at first pregnancy, breastfeeding and family history may contribute to the assessment of breast cancer risk, the available variables do not allow us to determine their role in this population. The observed incidence should therefore not be directly attributed to parity or marital status.

On admission, the main symptoms reported were breast pain (88.3 per cent), the presence of a breast lump (77.7 per cent) and dimpling of the skin (70.2 per cent). These results show that patients frequently presented with local clinical signs suggestive of advanced breast disease. However, in the absence of data on TNM staging, tumour dimensions, lymph node involvement and the presence of metastases, it is not possible to state with certainty that the majority of patients were at an advanced stage. 'Orange peel' skin, in particular, may indicate cutaneous lymphatic involvement, but its interpretation must be cross-checked against histopathological findings and the extent of the disease.

These observations echo the concerns described by Joko-Fru et al. (2020), whose multicentre study conducted across 12 sub-Saharan African countries showed that a significant proportion of patients were diagnosed at an advanced stage and that survival varied considerably depending on stage and national context. The authors reported a three-year relative survival rate of 78 per cent among patients diagnosed at an early stage, compared with 40.3 per cent at stages III and IV. These results highlight the importance of early diagnosis, rapid access to imaging and pathological examination, and the referral of patients to facilities with appropriate treatment capabilities.

With regard to management, analgesics were the most frequently administered treatment (92.6 per cent), followed by antibiotics (74.7 per cent), blood transfusions (51.6 per cent), chemotherapy (40 per cent) and surgery (32.6 per cent). The high frequency of analgesic use is consistent with the significant proportion of patients presenting with breast pain. However, in the absence of data on indications, the frequency of antibiotic prescriptions does not allow us to conclude that there is a high incidence of infections. Similarly, the fact that more than half of the patients received blood transfusions suggests a significant burden of haematological needs; however, the medical records should be reviewed to clarify the indications for transfusion, haemoglobin levels and any blood loss.

The proportion of patients who received chemotherapy (40 per cent) or underwent surgery (32.6 per cent) must be interpreted taking into account tumour stage, clinical status, contraindications and the availability of treatments. The WHO (2023), as part of its Global Breast Cancer Initiative, recommends integrated care comprising rapid diagnosis and appropriate multimodal treatment. Surgery, chemotherapy, hormone therapy and targeted therapies are indicated according to the tumour's biological characteristics and the stage of the disease. Consequently, the proportion of patients who underwent surgery in our series cannot be interpreted in isolation as an indicator of quality of care without knowing their eligibility for surgery and the therapeutic strategies adopted.

Furthermore, 92 per cent of patients had experienced at least one reported complication or adverse effect. The most common manifestations were asthenia (90.2 per cent), vomiting (85.9 per cent), anaemia (79.3 per cent) and gastritis (68.5 per cent). These complications may be linked to several mechanisms: disease progression, inflammation, malnutrition, blood loss or the effects of anticancer treatments. It is nevertheless important to distinguish between complications of the disease and adverse effects directly attributable to chemotherapy, as the available data do not allow this attribution to be established for each patient. The high incidence of anaemia warrants regular haematological monitoring and investigation into its causes, particularly iron deficiency, bleeding and bone marrow toxicity from treatments.

Survival analysis revealed a statistically significant difference in survival according to chemotherapy ($p = 0.025$) and surgery ($p = 0.002$). Patients who received these treatments showed better survival in the comparative analyses. In univariate Cox regression analysis, chemotherapy was associated with a reduction in the instantaneous risk of death ($HR = 0.21$; 95%

CI: 0.04–0.95; $p = 0.043$), whilst the absence of surgery was associated with an increase in this risk (HR = 4.44; 95% CI: 1.54–12.81; $p = 0.006$). These results are consistent with the importance of anticancer treatments in improving prognosis, but they must be interpreted with caution, as observational analyses alone cannot establish a causal link.

The findings of Joko-Fru et al. (2020) confirm the importance of access to appropriate care for the survival of breast cancer patients in sub-Saharan Africa. Their study showed that survival varied significantly according to the stage at diagnosis and the country's human development index. These differences highlight that prognosis depends not only on the treatment received, but also on the early detection of the disease, the availability of treatments and the continuity of care. In our study, the lack of detailed data on tumour stage, hormone receptors, HER2 status and metastases limits comparison with these findings.

After multivariate adjustment, being aged 45 or over was associated with a higher risk of death (adjusted HR = 6.54; 95% CI: 1.28–33.27; $p = 0.024$). However, this association should be regarded as a finding specific to our sample and not as evidence that being aged 45 or over is systematically an independent predictor of poor prognosis. Indeed, Joko-Fru et al. (2020) demonstrated that age at diagnosis was not independently associated with increased mortality after adjusting for tumour stage and human development level. The discrepancy between the two studies could be explained, in particular, by differences in sample size, tumour stage distribution, biological characteristics and confounding factors. It highlights the need for a sufficiently robust multivariate model and for the main clinical determinants of survival to be taken into account.

Anaemia also emerged as a factor associated with mortality in our study. In univariate analysis, it was associated with a higher risk of death (HR = 6.90; 95% CI: 2.50–19.02; $p < 0.001$). In the multivariate analysis, the comparison between anaemia categories showed an adjusted HR of 16.47 (95% CI: 2.89–109.23; $p = 0.002$). This significant association may reflect the severity of the clinical condition, tumour burden, impaired nutritional status, blood loss or the myelosuppressive effects of certain treatments. However, the very wide confidence interval indicates considerable uncertainty in the estimate, possibly due to the limited number of events or the distribution of patients across the categories. It would therefore be an overstatement to claim that anaemia exactly increases the risk of death by a factor of 16 in other populations. Nevertheless, this finding warrants particular attention to the assessment and management of haematological disorders.

Finally, vomiting was associated with an increased risk of death in univariate analysis (HR = 5.45; 95% CI: 2.00–14.80; $p < 0.001$). This association could reflect adverse drug reactions, dehydration, impaired nutritional status or more severe disease. However, vomiting cannot be considered a direct cause of mortality on the basis of this analysis alone. Similarly, palliative care was associated with a difference in survival in the graphical comparison ($p = 0.047$), whilst the univariate Cox analysis reported an HR of 0.25 with a confidence interval including 1 (0.05–1.11; $p = 0.068$). This discrepancy requires further verification of the analyses. The primary aim of palliative care is to relieve symptoms and improve quality of life; its association with survival must be interpreted whilst taking into account the stage of the disease and the clinical indication.

Limitations and implications of the study

The results of this study must be interpreted in light of several methodological limitations. Firstly, as the study was conducted in a hospital setting, the proportion of 30.6 per cent cannot be extrapolated to the entire female population of Kinshasa. Secondly, the lack of detailed information on tumour stage, histopathological characteristics and adjuvant treatments limits the interpretation of prognostic factors. Thirdly, the sample size and the wide confidence intervals of certain estimates call for caution. Finally, the differences in survival observed across treatment groups may be influenced by confounding factors, notably the severity of the disease at diagnosis, the patients' general health, and the time taken to initiate treatment.

In practice, these results support the need to strengthen early diagnosis, ensure access to multidisciplinary oncological care, monitor complications and improve patient follow-up. They also highlight the value of conducting prospective studies with comprehensive data on tumour stage, treatments received and causes of death, in order to better identify the factors independently associated with survival within the context of the University Hospitals of Kinshasa.

Conclusion

At the conclusion of this study conducted at the Kinshasa University Clinics, out of 451 medical records reviewed—138 of which concerned patients with breast cancer—the proportion of breast cancer cases was 30.6 per cent. The patients had a median age of 46 years, and the most frequently reported clinical symptoms were breast pain, a breast lump and dimpling of the skin.

Management mainly involved the use of analgesics, antibiotics and blood transfusions. The most common complications were asthenia, vomiting and anaemia. Survival analysis showed an association between chemotherapy, surgery and improved survival. After multivariate adjustment, age of 45 years or over and anaemia were associated with an increased risk of death, whilst the absence of surgery was also an unfavourable prognostic factor.

Ultimately, these results highlight the importance of early diagnosis, access to appropriate cancer treatments, monitoring and the management of complications, particularly anaemia. Strengthening multidisciplinary care and patient follow-up could help to improve their prognosis. However, these associations must be interpreted with caution given the hospital-based nature of the study and certain statistical uncertainties that need to be verified in the original analyses.

References

- World Health Organisation. (26 March 2021). *Breast cancer*. World Health Organisation. Link: <https://www.who.int/news-room/fact-sheets/detail/breast-cancer>
- Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 71(3), 209–249. <https://doi.org/10.3322/caac.21660>
- Allemani, C., Matsuda, T., Di Carlo, V., Harewood, R., Matz, M., Nikšić, M., Bonaventure, A., Valkov, M., Johnson, C. J., Estève, J., Ogunbiyi, O. J., Silva, G. A. E., Chen, W.-Q., Eser, S., Engholm, G., Stiller, C. A., Monnereau, A., Woods, R. R., Visser, O., ... Coleman, M. P. (2018). Global surveillance of trends in cancer survival 2000–14 (CONCORD-3): Analysis of individual records for 37,513,025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. *The Lancet*, 391(10125), 1023–1075. [https://doi.org/10.1016/S0140-6736\(17\)33326-3](https://doi.org/10.1016/S0140-6736(17)33326-3)
- Elston, C. W., & Ellis, I. O. (1991). Pathological prognostic factors in breast cancer. I. The value of histological grade in breast cancer: Experience from a large study with long-term follow-up. *Histopathology*, 19(5), 403–410. <https://doi.org/10.1111/j.1365-2559.1991.tb00229.x>
- Perou, C. M., Sørlie, T., Eisen, M. B., van de Rijn, M., Jeffrey, S. S., Rees, C. A., Pollack, J. R., Ross, D. T., Johnsen, H., Akslen, L. A., Fluge, Ø., Pergamenschikov, A., Williams, C., Zhu, S. X., Lønning, P. E., Børresen-Dale, A.-L., Brown, P. O., & Botstein, D. (2000). Molecular portraits of human breast tumours. *Nature*, 406, 747–752. <https://doi.org/10.1038/35021093>
- Joko-Fru, W. Y., Miranda-Filho, A., Soerjomataram, I., Egue, M., Akele-Akpo, M.-T., N'da, G., et al. (2020). Breast cancer survival in sub-Saharan Africa by age, stage at diagnosis and human development index: A population-based registry study. *International Journal of Cancer*, 146(5), 1208–1218. <https://doi.org/10.1002/ijc.32406>
- World Health Organisation. (2023). *Global breast cancer initiative implementation framework: Assessing, strengthening and scaling up services for the early detection and management of breast cancer*. World Health Organisation. <https://www.who.int/publications-detail-redirect/9789240065987>
- World Health Organisation. (1 February 2024). *Global cancer burden growing, amidst mounting need for services*. World Health Organisation. <https://www.who.int/news/item/01-02-2024-global-cancer-burden-growing--amidst-mounting-need-for-services>
- American Society of Clinical Oncology. (2017). Antiemetics: American Society of Clinical Oncology clinical practice guideline update. *Journal of Clinical Oncology*. <https://doi.org/10.1200/JCO.2017.74.4789>