

## Women, power, and cancer: a *Lancet* Commission



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### Executive summary

Women interact with cancer in complex ways, as healthy individuals participating in cancer prevention and screening activities, as individuals living with and beyond a cancer diagnosis, as caregivers for family members and friends, as patient advocates, as health workers and health-care professionals, and as cancer researchers and policy makers.

The topic of women and cancer spans broad terrain, beyond women's cancers and the biomedical aspects of any type of cancer that women in all their diversities might experience. It is inclusive of the ways in which sex and gender influence exposures to cancer risk factors, interactions with the cancer health system, and specific

challenges faced by health-care professionals, advocates, and caregivers. In all these domains, women experience gender bias, and are subject to overlapping forms of discrimination, such as due to age, race, ethnicity, socioeconomic status, sexual orientation, and gender identity, that render them structurally marginalised. These myriad factors can intersect and restrict a woman's rights and opportunities to avoid modifiable cancer risks and impede their ability to seek and obtain a prompt diagnosis and quality cancer care. At the same time, they serve to unfairly burden and perpetuate an unpaid cancer caregiver workforce that is predominantly female, and hinder women's professional advancement as leaders in cancer research, practice, and policy making. However,

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### Key findings and priority actions

#### Key findings

- 1 Cancer ranks in the top three causes of premature mortality among women in almost all countries of the world.
- 2 Of the 2·3 million women who die prematurely from cancer each year, 1·5 million deaths could be averted through primary prevention or early detection strategies, while a further 800 000 deaths could be averted if all women everywhere could access optimal cancer care.
- 3 Overall, cancer is less amenable to primary prevention in women than in men.
- 4 In countries ranked as low on the Human Development Index (HDI), as much as 72% of cancer deaths among women were premature (younger than age 70), compared with 36% in countries ranked as very high HDI.
- 5 In many countries, regardless of geographic region or economic resources, women are more likely than men to lack the knowledge and the power to make informed cancer-related health-care decisions.
- 6 Women are more likely than men to risk financial catastrophe due to cancer, with dire consequences for their families, even if quality cancer care is available.
- 7 Patriarchy dominates cancer care, research, and policy making. Those in positions of power decide what is prioritised, funded, and studied.
- 8 Within the cancer workforce, women are under-represented as leaders.
- 9 Women in the cancer workforce report frequent and severe experiences of gender-based discrimination, including bullying and sexual harassment.
- 10 Unpaid caregiving for people with cancer is largely undertaken by women. New methods are needed to estimate the true value of women's work in cancer care.

#### Priority actions

- To advance a more nuanced, inclusive, and gender transformative approach to the cancer field, we propose the following priority actions.
- 1 Ensure data on sex, gender, and other sociodemographic factors are routinely collected in cancer health statistics, publicly reported, and updated.
  - 2 Develop, strengthen, and enforce laws and policies that reduce exposures to known cancer risks for girls and women.
  - 3 Research, monitor, and act on emerging cancer risks that disproportionately affect girls and women, including occupational and environmental factors.
  - 4 Design and implement gender and intersectional transformative strategies to increase equitable access to early detection and diagnosis of cancer.
  - 5 Co-create accessible and responsive health systems that provide respectful, quality cancer care for girls and women.
  - 6 Ensure equitable access to cancer research resources, leadership, and funding opportunities for women.
  - 7 Develop, strengthen, and enforce policies that prevent gender-based harassment and discrimination in the cancer workforce.
  - 8 Integrate a gender competency framework into the education and training of the cancer workforce.
  - 9 Develop and validate a feminist economics approach to investment cases and other economic evaluations of cancer.
  - 10 Establish, implement, and enforce pay standards for all cancer caregivers that are fair, equitable, and inclusive.

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we believe that much can be achieved if actions are urgently taken.

This Commission was created to investigate the nexus of women, power, and cancer. By applying an intersectional feminist approach, we investigate, expose, and challenge the prevailing asymmetries of power in relation to cancer in three key domains: decision making, knowledge, and economics. In this Commission report, we present our key findings and recommend a set of ten actions, with the overarching recommendation that sex and gender are included in all cancer-related policies and guidelines, making all policies responsive to the needs and aspirations of women in all their diversities. The following ten key findings are based on our original research and evidence syntheses.

Cancer ranks in the top three causes of premature mortality among women in almost all countries of the world. Globally, women's health continues to be focused on reproductive and maternal health, a patriarchal construct that is aligned with narrow anti-feminist definitions of women's value and roles in society. Notably, women have approximately the same burden of cancer as men, representing 48% of new cases and 44% of deaths worldwide. Shedding light on these data will help drive action to benefit all.

Of the 2·3 million women who die prematurely from cancer each year, 1·5 million premature deaths could be averted through primary prevention or early detection strategies, while a further 800 000 deaths could be averted if all women everywhere could access optimal cancer care. In countries ranked as low on the Human Development Index (HDI), as much as 72% of cancer deaths among women were premature (younger than 70 years), compared with 36% in countries ranked as very high on the HDI.

There are important under-examined social implications and economic repercussions for families and societies when individuals experience cancer, in any country, at any age. This is particularly stark for women raising children, whose premature deaths from cancer resulted in an estimated 1 million maternally orphaned children in 2020 alone.

Overall, cancer in women is less amenable to primary prevention than is cancer in men. Even the causes of breast cancer, the most common cancer among women globally, are poorly understood, and of the risks identified, most (such as genetics and reproductive factors) are not amenable to change. More research is urgently needed to better understand the causes of cancer in women, including occupational and environmental factors, some of which have only been raised as potential hazards over the past 5–10 years.

In many countries, regardless of geographic region or economic resources, women are more likely than men to lack the knowledge and the power to make informed health-care decisions. Language matters. Gender transformative actions can shift us from blaming women for “late presentation”, “neglected cancer”, or

“treatment abandonment”, to valuing women, in all their diversities, as equals of men, with agency and knowledge, empowered to make evidence-based informed decisions about their own care. An intersectional gender-transformative competency framework can be incorporated into the education and training of the global cancer workforce to ensure high quality and respectful care for all.

Women are more likely to experience financial catastrophe due to cancer, with dire consequences for their families, even if quality cancer care is available. In our gender analysis of a study in eight countries in Asia, almost three quarters of women who were newly diagnosed with cancer reported catastrophic expenditures in the year after diagnosis, having spent 30% or more of their annual household income on cancer-related expenses. The study did not even include indirect costs. A gendered investment case for cancer would better inform policy making for cancer prevention, care, and control.

Patriarchy dominates cancer care, research, and policy making. Those in positions of power decide which aspects of these areas are prioritised, funded, and studied. Globally, men are over-represented in the leadership positions of hospitals, treatment centres, and research institutes. The same is true for editors-in-chief of cancer research journals, and lead authors of cancer research papers. Gender bias, racism, and other forms of discrimination in cancer research and knowledge production can be addressed by creating awareness, ensuring equitable access to research opportunities and resources, and by implementing policies mandating that sex and gender dimensions are considered in research and research policy making.

Women in the cancer workforce report frequent and severe experiences of gender-based discrimination, including bullying and sexual harassment. Gender-based discrimination in the cancer workforce occurs in all settings and world regions, during undergraduate and residency training and at the workplace. Discriminatory actions range from unfair promotion and pay practices to outright sexual harassment. Perpetrators are usually male superiors and colleagues, and sometimes male patients and their relatives. Anti-discrimination policies that include pay equity, paid parental leave, and zero-tolerance for sexual harassment should be developed, implemented, and monitored.

Unpaid caregiving for people with cancer is largely undertaken by women. New methods are needed to estimate the true value of women's work in cancer care. Caregiving represents substantial value to the economy and highlights the need to establish fair and inclusive pay standards for cancer caregivers. Cancer caregiving should not only be recognised but also measured, using a feminist economics approach that considers not only its monetary value but the effects of caregiving on women's autonomy and economic potential.

In this report, we also feature unique stories that reflect the lived experiences of women from different communities and contexts, whose interactions with the cancer health system illustrate overlapping forms of discrimination that impact their personal and professional lives.

By exposing these realities and the asymmetries of power they reveal, we can envision a path forward that transforms the ways that women interact with the cancer health system, whether as patients, as care providers, or both.

## Introduction

In 2020, 9·23 million women worldwide were diagnosed with cancer, and 4·43 million women died of cancer.<sup>1</sup> By 2040, these numbers are projected to increase to 13·3 million new cases and 7·1 million deaths, representing a 44% increase in new cases and a 60% increase in deaths. Proportionally, this notable rise in new cases is much greater in lower-income countries than in higher-income countries, and only about a third of the difference can be explained by demographic changes.<sup>1</sup> Although the lifetime risk of cancer is greater in wealthier economies, the risk of dying from cancer is similar globally, regardless of where a woman lives. This finding is consistent with marked disparities in cancer survival across countries, with a clear gradient across the Human Development Index (HDI; a composite measure of Gross National Income, education, and life expectancy).

In the domain of global cancer policy, over the past decade, much has been achieved since the first UN High Level Meeting on Non-communicable Diseases in 2011, including the 2015 adoption of the Sustainable Development Goals (SDGs) and their target to reduce premature mortality (mortality between age 30–70 years) from non-communicable diseases by a third,<sup>2</sup> and the World Health Assembly Resolution, “Cancer prevention and control in the context of an integrated approach”, that was adopted by 194 member states in 2017.<sup>3</sup> The World Health Assembly Resolution drew attention to the increasing burden and economic impact of cancer, estimated to cost US\$1·16 trillion a year (a number expected to grow exponentially), and for which there are scant resources. Although the resolution marked an important milestone, neither of the terms sex nor gender appear anywhere in the Resolution text. This notable absence is in some ways not surprising, because it reflects the history of global health policy making, in which non-dominant groups are under-represented, and their needs continue to be unmet.

Cancer health disparities largely reflect social inequalities between countries and within countries.<sup>4</sup> But how, and to what degree these differences are driven by structural determinants such as sexism, racism, and ageism, have not been adequately investigated. *The Lancet's Series on health, equity, and women's cancers*<sup>5–7</sup> drew attention to the disproportionate ways in

which cancer affects women who are also marginalised due to geography, race, and ethnicity, and suggested that cancer in women has unmeasured far-reaching effects on society and economies. The Series focused solely on two cancers, namely breast and cervical, as examples of common cancers which predominantly occur in women, for which most deaths are preventable and premature, and for which the inequities between countries are stark (noting that about nine in ten women who die of cervical cancer were living in low-income or middle-income countries). The substantial burden of cancers that are not sex-specific, and the cancer-related needs of people of diverse sexual orientation, gender identity, and gender expression (SOGIE), were not covered in the *Lancet's Series*. Data indicate that people of diverse SOGIE can be at a greater risk of developing or dying from certain cancers.<sup>8</sup>

This Commission is intended to be more inclusive than previous research, reflecting on women in all their diversities.

In the past decade, efforts have been made to transform health research, policy, and practice, offering different conceptual models and analytical frameworks to expose, examine, and address gender disparities and related inequities in health, including *The Lancet's Commission on women and health*,<sup>9</sup> *The Guttmacher–Lancet Commission on sexual and reproductive health and rights*,<sup>10</sup> *The Lancet's Series on health, equity, and women's cancers*,<sup>5–7</sup> *The Lancet's Series on gender and health*,<sup>11–13</sup> and *The Lancet's Series on racism, xenophobia, discrimination, and health*.<sup>14–17</sup> Our starting point was *The Lancet's Commission on women and health*,<sup>9</sup> in which Ana Langer and colleagues proposed a novel way of exploring the interaction between women and health that was inclusive of women as people experiencing illness and as women in the health workforce. We acknowledge the importance of the insights and questions that these works challenge us to consider in relation to cancer. They have exposed long-neglected discriminatory practices that undermine women's interaction with the health system; yet, cancer remains wholly under-represented within the global women's health agenda.<sup>9,10,18</sup>

Although *The Lancet's Series on health, equity, and women's cancers* did not explicitly consider how gender and power relate to women as cancer care providers, researchers, or advocates, the concept around women, power, and cancer was presented in an accompanying Comment<sup>19</sup> by Michelle Bachelet, former President of Chile and UN High Commissioner for Human Rights. In this Commission, we attempt to emphasise a more holistic approach to cancer research, prevention, and care, by applying feminist values and principles of social and gender justice and equity in relation to the experience of cancer around the globe.

We aim to provoke thoughtful self-reflection, such as how and why we still label women as having “neglected”

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### Panel 1: Definitions in context

The terms sex and gender are distinguished throughout this Commission with sex referring to a set of biological attributes associated with physical and physiological features (such as chromosomes, gene expression, immunological profile, hormonal milieu, and sexual or reproductive anatomy).<sup>20</sup> Gender, as a social construct, refers to norms, roles, and behaviours that are considered appropriate for women and men in a given society.<sup>20,21</sup> Notably, gender identity refers to the feelings and identity of one's gender, which might deviate from the sex assigned at birth. These terms should not be conflated wherever possible. However, much of the research presented in this Commission relies on source material, in which sex and gender are often used interchangeably, and are most often only binary. We also recognise that race and ethnicity are social constructs. In our Commission, we use the term as used in the original research or data collection. We acknowledge the risks of this approach to unintentionally perpetuate biases.

breast cancer. If we routinely asked women, in an atmosphere free of judgment, to share their thoughts, feelings, beliefs, and life circumstances with their care providers, we might perhaps learn about the deficiencies in the health system that created delays in care, or their lack of personal agency because of an abusive partner at home, or their fears about cancer treatment, all of which could hinder their opportunities to receive timely, quality, cancer care. We also consider how challenging traditional notions of womanhood might influence a woman's decision to undergo a potentially life-saving mastectomy, hysterectomy, or oophorectomy. We also ask the reader to consider why so much of the caregiving for people with cancer, that is the work of mostly women, remains undervalued and, in the case of family caregiving, unpaid.

When relevant, we make comparisons between the available data for women and men (or females and males for cases in which the subject is that of biological sex *vs* gender; panel 1). For cases in which such data were available, we include populations of diverse SOGIE. In other cases, we highlight comparative data for women of different populations, countries, and contexts. This report includes in-depth analyses on several specific cancers, namely breast and cervical cancer, as examples of common cancers primarily occurring in women for which stark inequities persist, as well as lung and colorectal cancer, which respectively represent the second and third most common cause of cancer-related deaths among women globally.<sup>1,5–7,22</sup>

The nine stories in this Commission are meant to offer insight into the lived realities of individuals affected by cancer, including those of paid and unpaid cancer caregivers, in their own words. However, they are not meant to be representative of any one population,

### Panel 2: Guiding principles

An intersectional feminist approach recognises and seeks to disrupt power dynamics, and to this end, the Commission commits to:

- 1 Promote transformative action towards gender equality, equity, and social justice
- 2 Centre women's bodies, realities, and voices to capture their real-life experiences in relation to cancer (ie, experience of cancer, and cancer research, control, and care)
- 3 Reflect the plurality of women's experiences and the multiple intersecting dimensions of inequalities
- 4 Integrate an anti-racist and decolonial approach to all our work as a Commission
- 5 Challenge the way cancer research is funded, conducted, and reported, and by whom, and foster interdisciplinary inclusive research and policy that transcends biomedical worldviews
- 6 Shift the culture of cancer away from individual blame by recognising the role of structural, social, and commercial determinants of health affecting cancer risks and outcomes in women
- 7 Address asymmetries of power by encouraging reflexivity, humility, and inclusiveness in our approaches to cancer research, control, and care

community, or nation. Neither are the stories intended to reflect the health priorities or cancer burdens of countries. Rather, the stories are meant to highlight a specific problem as it presents itself in a specific context, from a local and personal perspective. These stories also offer inspiring examples of the courage and resilience of women in the face of unimaginable challenges and hardship.

### Section 1: re-imagining cancer equity—an intersectional feminist framework for cancer

We have centred our work based on a foundation of intersectional feminism—a phrase first used by the American civil rights activist, feminist, and legal scholar, Professor Kimberlé Crenshaw in 1989,<sup>23</sup> and more recently used to articulate “a prism for seeing the way in which various forms of inequality often operate together and exacerbate each other”.<sup>24</sup> An intersectional feminist approach recognises that patriarchy and colonialism is embedded in society and institutions, forming visible and invisible gender hierarchies overlaying other power dynamics, resulting in discriminations, alienation, and marginalisation that can vary in form and shape, yet persist over time (panel 2). Drawing from existing feminist theories and intersectional frameworks,<sup>23,25–28</sup> we centred our approach building on the seminal works of Crenshaw,<sup>23</sup> bell hooks,<sup>29</sup> and Audre Lorde.<sup>30</sup> Our intersectional feminist approach to cancer attempts to address biological factors as well as the gendered socioeconomic, environmental, cultural, and political

dimensions, and gendered social structures and systems that shape the overall experience of women in relation to cancer.

We conducted a review of feminism, intersectionality, and cancer and found that the incorporation of intersectional feminist principles in cancer literature is scant (appendix p 1). Most studies focused on breast cancer, and were conducted and authored in high-income countries, mainly in Australia, Canada, the UK, and the USA. Within these settings, the intersectional analysis primarily considered gender, sexual orientation, and race. Very few studies focused on the intersectional disadvantages faced by indigenous women, migrants and refugees, people living with disabilities, or other marginalised groups.

Efforts to address gender bias in health research or health-care systems have predominantly focused on institutional gender inequalities or the social determinants of health; however, the political dimensions of gender have received little attention. Research and health care are ultimately political endeavours. Decisions regarding which research topics are funded, prioritised, and commissioned are made by political institutions, and at times, can be based on economic rationale, as opposed to being based on the population's needs. How research is conducted and by whom, which populations are included, what is published or accepted to constitute the mainstream body of knowledge, and what evidence counts when policy decisions are made (and by whom) are all subject to patriarchal and colonial forces.<sup>31</sup> A feminist approach to

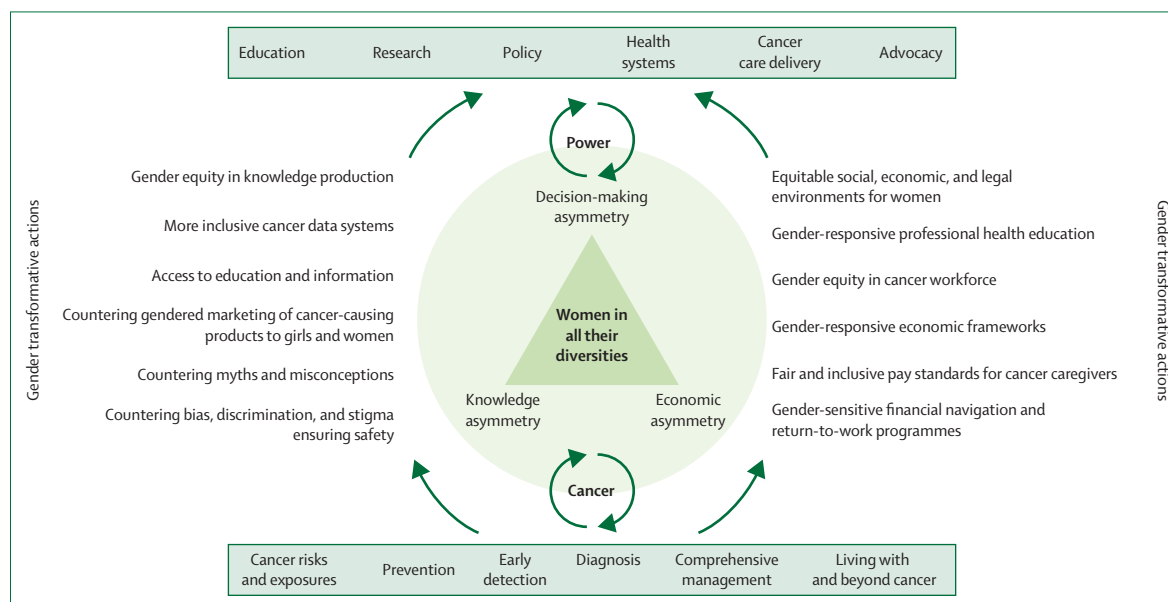
cancer research, prevention, and care, is ultimately a way of collective activism to challenge and disrupt persistent patriarchal and colonial structures within which gender and other power hierarchies and orders are maintained, and within which science is shaped, supported, and performed; health policies are developed and implemented; and health care and other services are prioritised, funded, subsidised, and delivered.

See Online for appendix

Our proposed framework draws from advances made in gender and health, while anchoring these in intersectional feminist scholarship, to ensure a comprehensive and holistic approach that encompasses the experience of cancer in its entirety, beyond sex and gender differences or gender binaries and heteronormative notions, acknowledging the persistent effect of colonialism (figure 1). This framework further intends to extend its application outside health systems, encompassing research, education, political and financial systems. Moreover, our framework recognises the wide range of concerns that persist beyond cancer survival, including but not limited to emotional, mental, and financial health; sexuality and sexual pleasure; fertility and childbearing; and all other aspects of life required for overall wellbeing.

## Section 2: uncovering the burden of cancer in women

In this section, we present and evaluate a global exposition of key cancer statistics in women. We aimed to emphasise, from a population perspective, the marked



**Figure 1: An intersectional feminist framework for cancer**

The Commission's intersectional feminist approach highlights and challenges existing asymmetries of power in relation to cancer: in decision making, knowledge, and economics. As consumers and providers of cancer prevention, control, and care, women in all their diversities will only reach their full potential of health and wellbeing if we listen, learn, and understand their unmet needs, and centre their voices and lived experiences to disrupt the status quo. We propose gender-transformative policies and actions including in education and training of health professionals, in research and knowledge production, in health systems, and in the creation of enabling environments that value and support all who care for those with cancer.



direct and indirect effect of cancer on women across age spans, places of residence, and HDI levels of development. We focus on premature mortality (age 30–70 years), and specific indicators, selected cancer types, and cancer risks that serve to reveal the inequalities endured by women and that are often hidden. Additional indicators, such as cancer prevalence, disability-adjusted life years, and productivity loss, can also inform the burden of cancer among women, but are not presented in detail in this Commission. However, we did conduct additional analyses of years of life lost due to premature deaths from cancer (for men and women) to provide additional insights, which appear in an accompanying original research article.<sup>32</sup>

### The rise of non-communicable diseases

Deaths from non-communicable diseases, including cancer, have increased from 57% in 1990 to 74% in 2019 in both men and women (and in women specifically from 58% to 76%) over the past 30 years, and by the year 2019, non-communicable diseases were responsible for three out of four deaths worldwide.<sup>33</sup> The increase was a driver of the UN political declaration on non-communicable diseases,<sup>34</sup> which led to the adoption of the SDGs target 3.4 to reduce premature mortality from the four major non-communicable diseases by a third by 2030.<sup>2</sup>

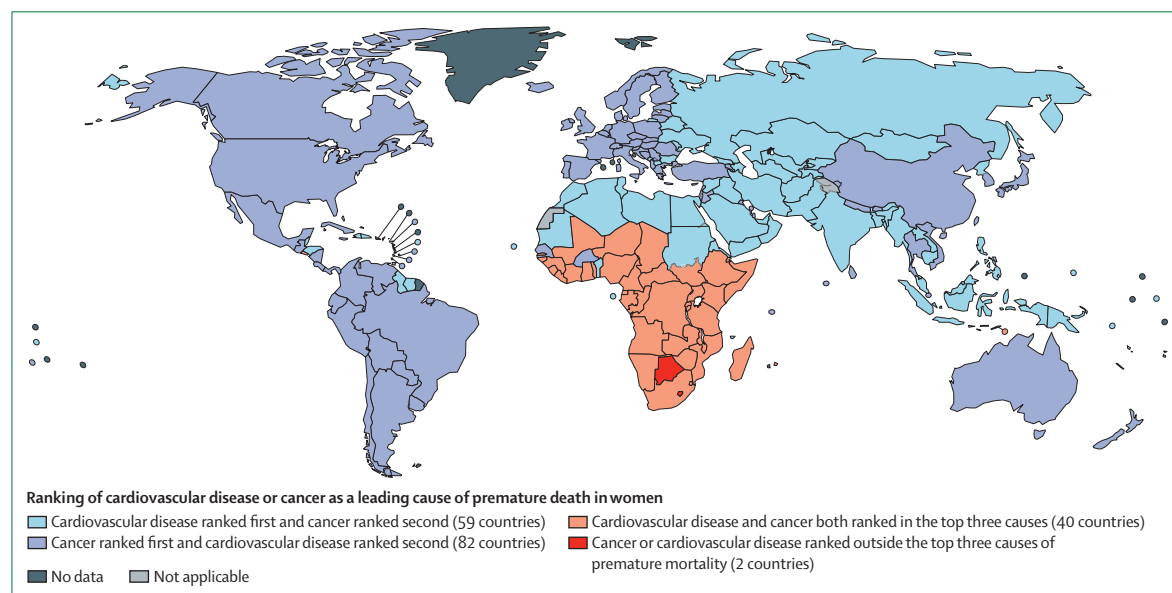
Cardiovascular disease and cancer are today the leading causes of premature death among women in more than 130 countries,<sup>33</sup> with cancer ranking first in 82 of these (including Brazil and China; figure 2). Development plays a crucial role in understanding the shifting disease profiles, with most of these countries within the top tiers

of the HDI, a composite index of average achievement in three basic dimensions: a long and healthy life, education, and a good or acceptable standard of living. In another 40 countries, mostly classified as low HDI and mainly located in Africa, cancer and cardiovascular disease remain among the top three causes of premature death. Cancer or cardiovascular disease ranked outside the top three causes of premature mortality in only two countries (Botswana and The Gambia).

Reflecting on trends in premature mortality due to cancer from 2000 to 2019 in countries with robust data, uniform declines have been noted in many high-income countries, whereas progress has been mixed across those classified as middle-income countries.<sup>35</sup> Furthermore, declines in cancer-related premature mortality have been greater among men than among women in some middle-income countries. This difference might be related to the decreasing burden of tobacco use among men.<sup>35</sup>

### The scale and profile of cancer in women

There were an estimated 9·2 million new cancer cases and 4·4 million cancer deaths among women of all ages in 2020.<sup>36</sup> In terms of incidence, the five leading cancer types in women were breast, colorectal, lung, cervical, and thyroid cancer, contributing to more than half (53·7%) of the total number of female cancer cases.<sup>36</sup> In terms of cancer deaths among women, the same top four cancers—breast, lung, colorectal, and cervical cancer—were the leading causes in 2020, and with stomach cancer in fifth place; these comprised 54% of the total mortality burden. The pattern of cancer type among men is quite different, with lung, prostate, and colorectal cancers the



**Figure 2: Relative national ranking of cardiovascular disease and cancer as leading causes of premature death among women, 2019**

Data retrieved from Global Health Estimates 2019: disease burden by cause, age, sex, by country and by region, 2000–19, World Health Organization,<sup>33</sup> for the Commission analysis. The boundaries and names shown and the designation used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

most common cancers diagnosed, and lung, liver, and colorectal classified as the most common causes of cancer deaths among men. Although men are at higher risk than women for most cancer types that develop in both sexes,<sup>1</sup> women have approximately the same burden as do men from all cancers combined, sharing 48% of the combined incidence and 44% of the mortality burden worldwide.

The moderately higher lifetime risk of developing cancer overall in men (23% in men vs 19% in women) thus reflects differences in case-mix between the sexes. More women will die from a cancer that is specific to women than men will die of a cancer that is specific to men, if breast cancer is considered a female-specific cancer.<sup>37</sup> Moreover, although the common sex-specific cancers for women and men are generally not amenable to primary prevention, the proportion of non-sex-specific cancers that are amenable—for example, by avoiding tobacco and alcohol—is greater for men than for women, because men consume more alcohol and tobacco overall than do women. Therefore, overall, the proportion of all cancers that are amenable to primary prevention is less for women than for men.

Compared with the large variations in lifetime risk of developing cancer seen across world regions, relative to incidence, the corresponding risk of death from cancer is more homogeneous in both men and women. As previously noted,<sup>1</sup> and by contrast to what is often assumed, lifetime risks of dying from cancer in women are broadly comparable across world regions, irrespective of human development, with lifetime risks of dying only

slightly higher in eastern Africa and eastern Asia than in northern America and northern Europe (figure 3).<sup>36</sup>

### Premature cancer mortality

We undertook an original analysis of premature cancer mortality in 2020 among women for 36 cancers in 185 countries. Detailed methods are presented in our accompanying research article by Frick and colleagues.<sup>32</sup> Globally, about 2·3 million women died prematurely from cancer, with the most common cancer types being highly preventable or treatable.<sup>1,32</sup> The top four cancers—breast, colorectal, lung, and cervical cancer—contributed to almost half (49·4%) of all premature cancer deaths (that is, deaths in women aged 30–70 years; figure 4A). There are stark contrasts in the proportion of women who die prematurely from cancer according to the average levels of national human development in their countries of residence. Countries ranked as low HDI had a disproportionately high burden of premature cancer deaths (ie, 72% in low HDI countries versus 36% in very high HDI countries, with breast and cervical cancer contributing to almost half of these deaths; figure 4B).

We also estimated that approximately 1·5 million women could have avoided premature suffering and death from cancer through primary or secondary prevention (ie, early detection, whether by early diagnosis or screening; called preventable in figure 4C), while a further 800 000 premature deaths could have been prevented if all women everywhere had equitable access to optimal cancer care (also termed treatable; figure 4D).

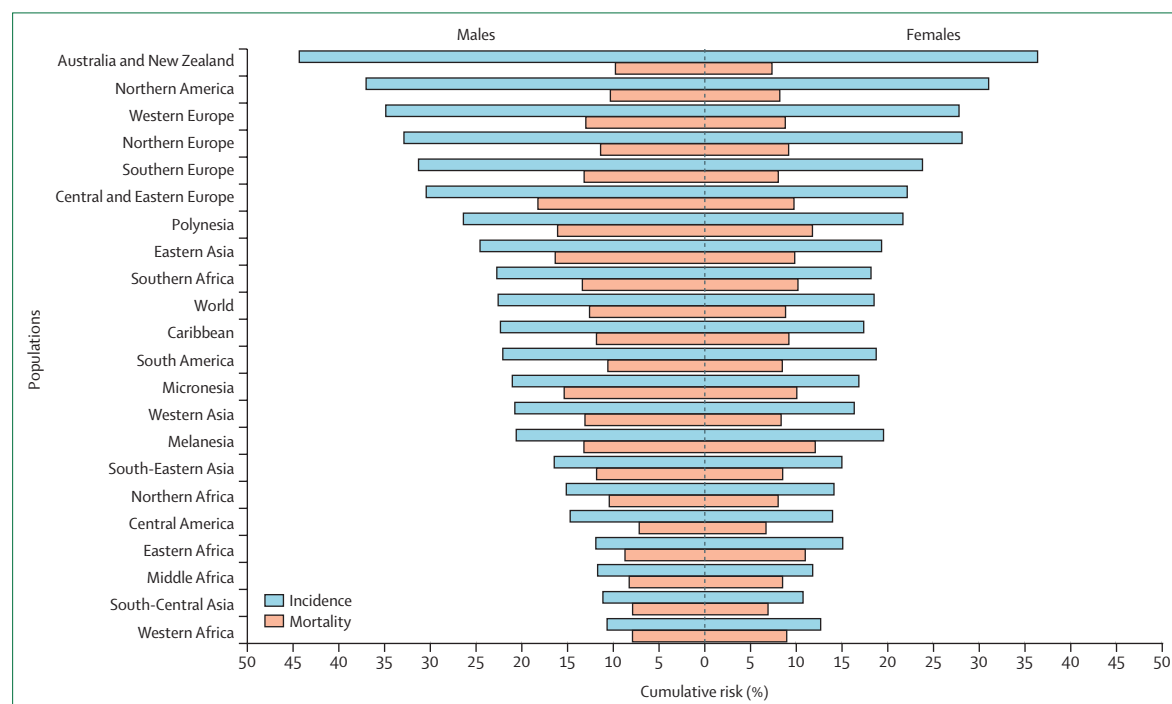
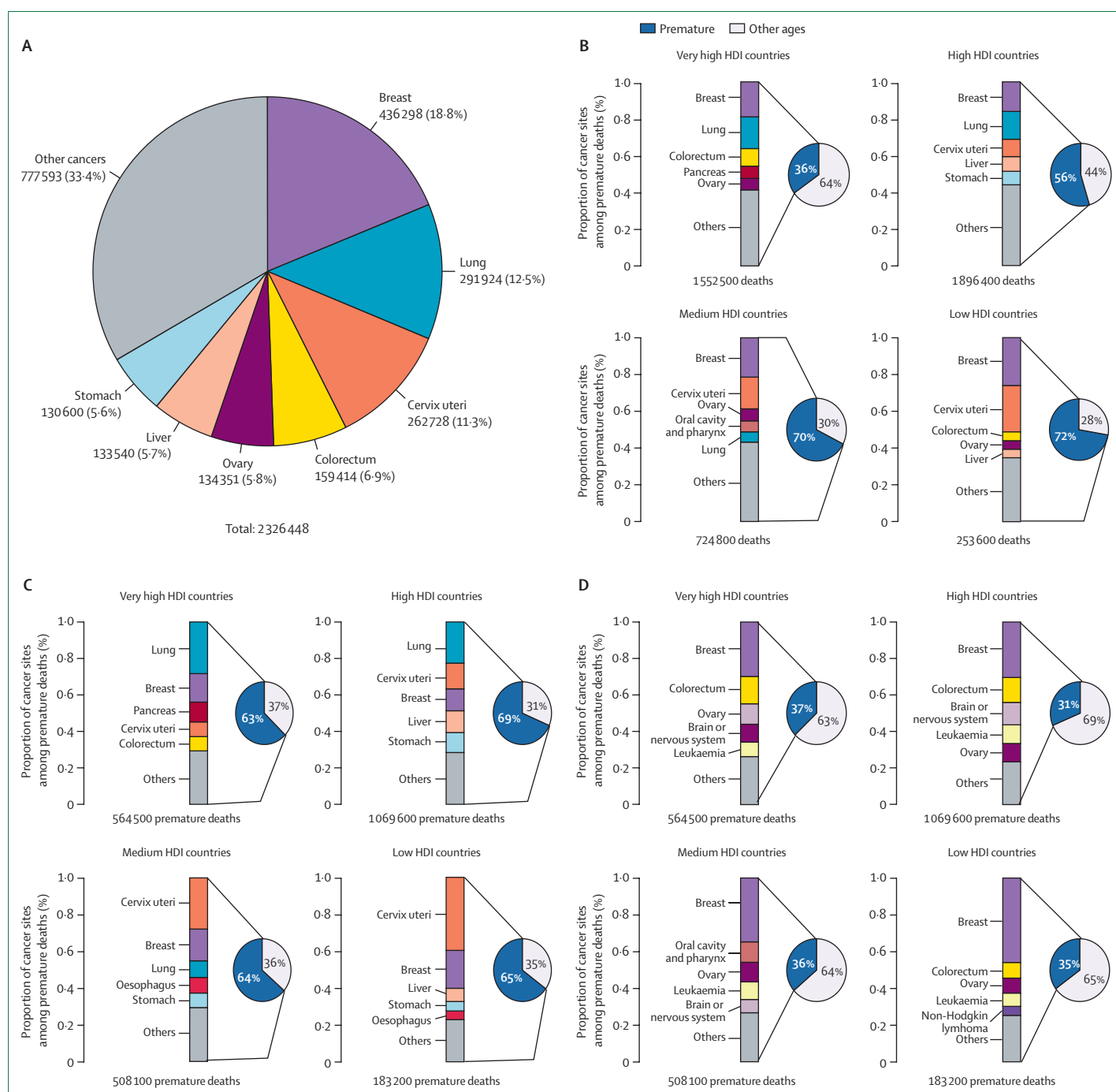


Figure 3: Cumulative incidence and mortality from all cancers combined in 2020, by sex and world region

Data retrieved from Global Cancer Observatory 2020,<sup>36</sup> for the Commission analysis.



**Figure 4: Premature cancer deaths among women aged 30–69 years**

Data retrieved from Global Cancer Observatory 2020,<sup>36</sup> and Frick et al.<sup>37</sup> for the Commission analysis. (A) Distribution of premature cancer deaths in women aged 30–69 years for the top ten most common cancers among women worldwide in 2020. (B) Proportion of all premature cancer deaths among women aged 30–69 years in 2020, and distribution of the top five cancers according to the HDI. (C) Number of premature cancer deaths among women that were avoidable if all women had access to primary or secondary prevention (early detection). (D) Number of premature cancer deaths among women that were avoidable if all women had access to optimal treatment. HDI=Human Development Index.

Of note, the proportion of preventable (about two of three) versus treatable (about one of three) premature deaths is about the same, regardless of HDI level. However, the top five cancers differ by HDI, with lung

cancer ranking first in terms of preventable premature cancer deaths among women in high and very high HDI countries, while cervical cancer ranks first for low HDI and medium HDI countries.

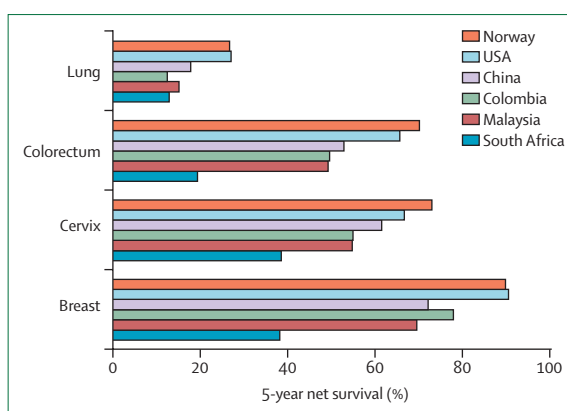


### Survival and stage at diagnosis

Sex-specific cancer survival is typically slightly higher in women than in men, an observation linked to biological factors that directly modify survival (or serve as predictive factors of treatment), as well as to sex or gender differences in comorbidity and health-seeking behaviors.<sup>38</sup> Several global studies of women and men with different cancer types have associated decreased survival with a variety of factors, including late stage of diagnosis, insurance status, delays in seeking care, health system delays, rural residence, non-specific symptoms, and history of comorbidities (including HIV).<sup>39–42</sup>

Marked differences in survival between countries are evident, yet differences in male to female ratio across countries worldwide are less often reported. Our original analyses of individual-level data on 5-year net survival (that assume the cancer in question is the only possible underlying cause of death) for four major cancer types in Asia (China, Malaysia), Africa (South Africa), the Americas (Colombia, the USA), and Europe (Norway) among women diagnosed between 2008 and 2015 are presented in figure 5. Breast cancer is an example of a common cancer largely affecting women, for which (notwithstanding some differences depending on molecular subtypes) most patients have a good prognosis or a high likelihood of long-term survival (in the range of 80–90%) if the cancer is detected at an early stage (ie, stage I or II),<sup>46</sup> and all have access to prompt, affordable, evidence-based, quality treatment.<sup>46,47</sup> Stage at diagnosis is a crucial indicator of the effectiveness of early diagnosis and screening intervention in countries. The importance of stage to inform progress in cancer control has led the Global Breast Cancer Initiative to create a new pillar with the aim of increasing the proportion of newly diagnosed invasive cancers at stage 1 or 2 at diagnosis to 60% or more.<sup>48</sup> Yet, comparative assessment of stage information on the basis of population-level data remains challenging for various reasons, including the complexity of deriving such data (in particular, in countries with fewer resources to support data capture and reporting), paucity of consistent information in medical records to register or record, and changing of staging rules over time.

However, it is striking that 5-year breast cancer survival varies markedly between countries, with proportions ranging from 91% in the USA to 38% in South Africa.<sup>44,45,49–51</sup> Similarly, large survival differences are seen for women with cervical cancer, and to some extent, colorectal cancer, while survival from cancers with generally poor outcomes, such as lung or pancreatic cancer, vary considerably less. A recent study reviewing breast cancer stage at diagnosis in five sub-Saharan African countries showed that the proportion of women diagnosed with late-stage disease was lower in non-Black women from southern Africa than in Black women in any region of the continent, ranging from 30% to 44% among non-Black Africans, compared with 74–91% in Black Africans.<sup>52</sup> This study highlights the



**Figure 5: 5-year net survival in women by country and cancer type**  
Data retrieved from SURVCAN-3,<sup>43</sup> SEER (for the USA),<sup>44</sup> and NORDCAN<sup>45</sup> (for Norway), for the Commission analysis.

importance and impact of structural racism on a woman's access to health care for an early diagnosis of breast cancer (and thus, treatment), and illustrates how intersectional factors can render women structurally marginalised within systems of cancer care.

### The female cancer burden across the lifespan

#### Childhood cancer

In 2020, an estimated 206 362 new cancer cases were diagnosed globally in children aged 15 years and younger, of which 43% was predicted to be among girls.<sup>36</sup> The patterns of cancers in children are distinct from cancers diagnosed at older ages, with the most diagnosed cancers being leukaemia (25% of all cancer in this age group), cancer of the brain and the nervous system, and non-Hodgkin lymphoma, and this pattern does not vary by sex. Global estimates of the cancer burden among children have shown substantial differences by country and region; however, similar to adult cancer, reliable data from most lower-resource countries are scarce, especially in the African continent.<sup>53</sup> Moreover, a modelling study estimated that 43% of childhood cancers are undiagnosed, and this varies greatly depending on where a child lives.<sup>54</sup> To our knowledge, there are few reliable data to estimate any differences in the undiagnosed childhood cancer burden by sex.

In keeping with cancer survival in other age groups, survival from childhood cancer varied substantially between countries, with much higher survival in Europe, North America, and Australia and New Zealand than observed in other world regions. Gender disparities have been reported for childhood cancer in some parts of the world; some reports suggest evidence of one girl receiving cancer treatment for every 2.4 boys.<sup>55,56</sup> This disparity has been explained as a consequence of social discrimination of girls, whereby families living in poverty prioritise the health-care needs of boys rather than girls, because they are considered to be more valuable in certain settings.<sup>55,56</sup>

### *Cancer in young adults*

There were an estimated 1·2 million new cancer cases and 360 000 cancer deaths among young adults aged 20–39 years in 2020.<sup>36</sup> The number of new cancer cases was markedly higher among women (about two thirds of all cases occurred among women, 773 000 of 1·2 million), while mortality from cancer for this age group was more evenly distributed between sexes. The types of cancer that affect younger women aged 20–39 years are distinct compared with the childhood or older age group, with breast, thyroid, and cervical cancer being the three most common diagnoses, and breast, cervical, and thyroid cancer being the most common causes of death. Increasing numbers of survivors in this age group need long-term clinical follow-up, including for surveillance for second cancers, treatment toxicities, and to address the effects of their diagnosis and treatment on their social wellbeing (eg, return to school or work, and reproductive effects such as having children or sexuality), which are issues that have not received adequate research and attention.

### *Older women with cancer*

Today, a substantial proportion of cancer cases among women occur in those aged 65 years and older, with 46·4% of all cancer cases in 2020 (4 277 847) diagnosed in older women.<sup>36</sup> To put this in perspective, there are approximately 411 million women aged 65 years and older in the world, which means that almost half of all cancer cases among women occur in just under 12% of the world's female population, highlighting cancer as a disease strongly associated with ageing. Furthermore, due to population ageing and growing life expectancy worldwide, the number of cancer cases among older women will continue to grow, with an expected increase of 73% in the number of new cases by the year 2040, compared with an increase of 19% among those younger than 65 years.<sup>36</sup>

Unfortunately, older women with cancer face many barriers to accessing age-appropriate care because of intersecting individual and system factors. Poverty at older ages is typically higher among women, and older women are more likely to live alone, have a higher burden of disability, and experience economic insecurity.<sup>57</sup> Studies have shown that women aged 65 years and older have a worse overall survival than do younger women, which increases among those aged 80 years and older, and which can be attributed both to competing causes of death and to a higher cancer-specific mortality.<sup>58–61</sup> This survival disparity might be caused by undertreatment of older women with cancer, which has led to a widening gap in survival between older adults and their younger counterparts in some regions of the world, including Europe and the USA.<sup>62</sup> This undertreatment partially stems from a vast under-representation of older adults in cancer clinical trials, and to a lack of knowledge regarding how factors specific to older adults influence response and

tolerance to treatment.<sup>63</sup> A 2021 analysis of clinical trials sponsored by the Southwest Oncology Group found that only 29% of participants were older adults.<sup>64</sup> Guidelines from the American Society of Clinical Oncology (ASCO) and from the US National Institutes of Health (NIH) recommend moving away from the use of chronological age as an inclusion criteria for clinical trials, and instead suggest the use of functional and geriatric assessments to select patients for inclusion.<sup>65</sup> Unfortunately, although older adult participation has increased over time, under-representation in drug-registration trials is still an issue, particularly among those aged 80 years and older.<sup>66</sup> Barriers for the inclusion of older adults in clinical trials include communication issues, economic constraints, restrictive inclusion criteria, and ageism.<sup>67</sup>

Ageism refers to the preconceived notions, stereotypes, prejudice, and discrimination directed towards older people on the basis of their age.<sup>68</sup> Ageism can be institutional, interpersonal, or self-directed, and often intersects with other forms of prejudice, including sexism and racism.<sup>68</sup> In cancer care, ageism can lead to a lack of appropriate diagnostic approaches to patients, to undertreatment, and to deficient patient–physician communication.<sup>69,70</sup> Importantly, the interaction between sexism and ageism is strong, with age discrimination against older women being highly prevalent in the workplace, in the distribution of pensions, in long-term care, and in access to the health-care system.<sup>71</sup> This is further worsened by accumulation of historical sexism, in terms of the gender pay gap and pensions, and in other gender inequalities in older age, including a higher incidence of disability among older women when compared with older men.<sup>72</sup> Several organisations, including ASCO and the International Society of Geriatric Oncology (SIOG) have issued recommendations aimed at including geriatric principles into cancer care and are working towards closing the gap in outcomes between older and younger individuals with cancer.<sup>70</sup> SIOG has published a list of 12 priorities for the global advancement of the care of older adults with cancer;<sup>70</sup> however, neither sex nor gender are mentioned, which can lead to disparities and suboptimal care for older women with cancer. Disregarding sex or gender can mean that we potentially miss data-driven opportunities to make substantive improvements to cancer care among older adults.

### *Maternal orphans*

Cancer also has a wide range of social consequences due to the fact that women play essential roles in their families. When we looked at cancer among women of reproductive age, of the 3 million adults diagnosed with cancer younger than 50 years in 2020, two thirds were women.<sup>73</sup> Maternal death from any cause has long-term impacts for families, including increased child mortality, reduced educational attainment for children, and catastrophic expenses aggravated by a loss of income

from a family member. A recent analysis showed that in 2020 alone, there were an estimated 1 million maternal orphans (children left motherless) due to a death from cancer. Most of these children lost their mothers due to breast cancer (25%), cervical cancer (20%), or upper-gastrointestinal cancer (13%), and most maternal deaths occurred in Asia and Africa.<sup>74</sup> Additional research is needed to further understand the magnitude and complexities of the effects of maternal deaths from cancer on the social and emotional wellbeing of the children left behind.

### The commercial determinants of health and cancer risk in women

WHO recognises that one of the most important ways of reducing deaths from non-communicable diseases is by controlling exposures to modifiable risk factors; namely, tobacco use, harmful alcohol use, unhealthy diet, and physical inactivity (which are all of particular relevance to cancer risk), and exposure to infections (including human papillomavirus, *helicobacter pylori*, hepatitis B, and hepatitis C, among others).<sup>75</sup> Civil society organisations such as the NCD Alliance and its component organisations (including the Union for International Cancer Control) have long advocated for global efforts to develop and implement effective policies to mitigate these risks and

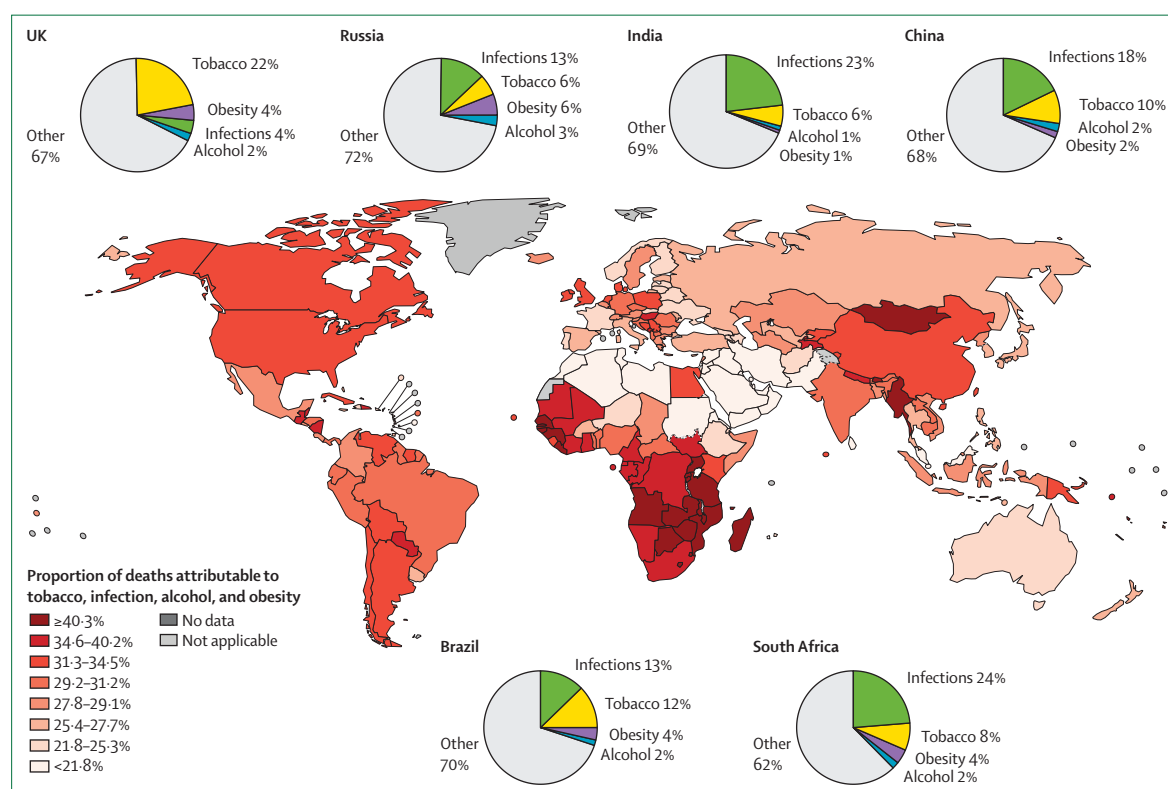
their impact on the health of all people. These efforts include advocacy campaigns, community mobilisation, and legal-based and rights-based capacity-building by groups such as the McCabe Center for Law and Cancer to increase the use of legislative instruments to protect citizens from harmful, cancer-causing products and practices (eg, tobacco, alcohol, and sugary beverages).

Our new global analysis shows that 1·3 million women's lives of all ages could be saved if just four of the known risk factors, namely, tobacco, alcohol, obesity, and infections, were addressed. Our original analysis of the relative contributions of risk factors in selected countries in different world regions, comparing the large emerging economies (comprising those of Brazil, China, India, Russia, South Africa, and the UK), is presented in figure 6. We present the complex and gendered challenges and opportunities to counter alcohol, tobacco, and obesity, and reduce exposures to these commercial determinants of health.<sup>76</sup>

We undertook a literature review on the commercial determinants of health and cancer, risk, and women (appendix pp 2–3).

#### Tobacco

Tobacco smoking is perhaps the single most important preventable cause of cancer, contributing to one of every



**Figure 6: Proportion of cancer deaths linked to tobacco smoking, alcohol consumption, obesity, and infections**

Risk-factor-specific data retrieved from the Global Cancer Observatory,<sup>36</sup> for the Commission analysis. Percentages are rounded, and therefore might not total to 100%.

four cancer deaths globally. The tobacco-related cancer burden differs considerably by sex (12% for women vs 36% for men) and reflects the global prevalence of tobacco smoking. Globally, in 2019, only 6·6% of women smoked tobacco products, compared with 32·7% of men; however, tobacco smoking among women is high in some world regions, notably Europe and Oceania (eg, Australia and New Zealand), where the prevalence of smokers among adults exceeds 20%.<sup>77</sup> Fidler-Benaoudia and colleagues<sup>78</sup> compared the incidence of lung cancer in younger cohorts of men and women (aged 30–64 years) in the years 1993–2012 in 40 countries. Over time, the incidence of lung cancer declined among men in all countries and all age groups, whereas among women, lung cancer trends varied widely by country. In the younger age group of age 30–49 years, the rate was higher in women than in men in several countries, including Canada, the Netherlands, New Zealand, and the USA, in the later years of this study (2008–12). Similar patterns were noted in 23 other countries across different income levels, but these were not significant.

Higher lung cancer rates among women are commonly driven by an increased incidence in adenocarcinoma, a subtype seen in smokers and non-smokers, and which appears to be more common among women in Asia and of Asian ancestry.<sup>79</sup> Smoking rates might only partially account for these differences, and at least in some high-income countries, the lung cancer burden in women will equal and even surpass that of men over time.<sup>1</sup> An analysis of lung cancer by sex in China and the USA reported a decreasing incidence in China of lung cancer among men but increasing trends among women in younger age groups (30–54 years).<sup>80</sup> Tobacco smoking is increasing among women in some countries such as Portugal, Kyrgyzstan, and Bolivia, with historically low rates of tobacco use among women, as cultural norms are shifting, and where gendered targeting of tobacco marketing is on the rise.<sup>81,82</sup> Gendered marketing strategies include promoting tobacco as a sign of autonomy and glamour.<sup>81,82</sup> These strategies that exploit feminist movements were developed as a response to the growth of the women's tobacco market,<sup>77</sup> and were specifically designed to increase smoking uptake in women.<sup>81,82</sup> The prevalence of smoking is also notably greater among women and men from marginalised communities worldwide, including those of lower socioeconomic status<sup>83</sup> and incarcerated people.<sup>84</sup> Smokeless tobacco is also a cancer risk of great concern for women. It is a major risk factor for oral cavity cancer, particularly in the South-Central Asia region, where its usage is most prevalent.<sup>85</sup> There is an especially high prevalence of smokeless tobacco use among women in some countries in this region, and in one global survey of tobacco use among people older than 15 years, smokeless tobacco usage in Bangladesh was higher in women (24·8%) than in men (16·8%).<sup>85</sup> Previous evidence from a systematic review suggests that the risk of oral cavity cancer

attributable to smokeless tobacco use might be greater for women than for men.<sup>86</sup> Calls for intersectional approaches to mitigate the overlapping systemic dimensions of tobacco use among women are increasing.<sup>87</sup>

Tobacco control remains a major tool in the fight against preventable cancer globally, with challenges in control around the intersection of complex commercial and social factors.<sup>88</sup> Although effective policies to reduce tobacco smoking are well-understood, and despite global progress in the implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC), challenges remain; a gendered approach to implementation will be required to address the tobacco epidemic across all sub-populations.<sup>88</sup> The WHO FCTC was adopted by the World Health Assembly in 2003, and in 2008 the MPOWER package of evidence-based interventions was introduced;<sup>81,82,89</sup> most countries have since signed on to what is considered one of the most widely adopted UN treaties.<sup>90</sup> The WHO FCTC article 4.2(d) advocates for tobacco control measures addressing gender-specific risks, including the disproportionate burden of second-hand smoke for women, who are often exposed due to partners smoking in the home.<sup>89</sup> In 2018, WHO published a technical document entitled *Gender-responsive tobacco control: evidence and options for policies and programmes*.<sup>91</sup> This seminal work lays the groundwork for policy making, stating how tobacco use is strongly tied to “constructions of gender—[that] can shift as norms and notions of gender change over time”, and how gender norms have been “manipulated and exploited by the tobacco industry over many decades...[including] ideas of independence from restrictive gender norms and options for weight control among women and girls”. Moreover, they cite the lack of gender analyses and gender-responsive interventions as contributing to the relative impunity with which the tobacco industry continues to operate in this manner, calling for “strategic actions areas and priority collaborations”, that as a Commission, we endorse.

At a country level, specific policies have been implemented to reduce tobacco usage. Ireland became the first country worldwide in 2004 to implement smoke-free indoor work and public places to reduce the impact of second-hand smoking.<sup>92</sup> In Argentina (which is not party to the WHO FCTC), civil society groups worked through international human rights law (the Convention on the Elimination of All Forms of Discrimination Against Women) to portray the gendered marketing of tobacco products in Argentina as a violation of women's rights. Subsequently, national legislation was changed, marking a landmark victory tackling the role of the commercial determinants of non-communicable disease risk.<sup>93</sup> 48 countries globally have instigated a comprehensive ban on tobacco advertising, promotion, and sponsorship, with bans implemented since 2014 by Afghanistan, Kuwait, Moldova, Nigeria, Qatar, Senegal,

and Uganda. There is evidence proving that banning tobacco advertising, promotion, and sponsorship reduces smoking rates, although it does not affect the smoking rates of women as effectively as it does for men.<sup>92</sup>

### *Women and lung cancer*

Lung cancer is a leading cause of cancer deaths worldwide in men and women.<sup>1</sup> In 1987, lung cancer surpassed breast cancer as the most common cause of cancer deaths among women, and is currently ranked first in 25 countries, including Australia, Canada, China, the UK, the USA, and many countries in Europe.<sup>1</sup> Risk factors for lung cancer vary by sex, geographic location, socioeconomic status, and occupation. Regarding tobacco consumption, smoking among women increased substantially between 1930 and 1960, as tobacco companies began a relentless effort to direct tobacco advertisements towards targeting women in the USA, Canada, western Europe, and Latin America.<sup>81,82</sup> The adverts, which almost all featured young, svelte women, were designed to prey on women's concerns about weight, while portraying smoking as a sign of women's empowerment, strength, and independence.<sup>94</sup> These strategies increased cigarette sales to women by more than 300% over three decades.

Although smoking is overall more prevalent in men in all countries, women are more likely than men to be exposed to second-hand smoke.<sup>95</sup> Second-hand smoking is more prevalent among women than first-hand tobacco smoking in some settings, particularly where it remains common in restaurants and cafes, and where smoking rates are very high among men. Patriarchal norms, occupational segregation by gender, and other socioeconomic and cultural norms can make it difficult for women to negotiate a smoke-free environment.<sup>95</sup> Yang and colleagues<sup>96</sup> estimated the prevalence of and trends in tobacco use, second-hand smoke, and household solid fuel use among 1598111 women of reproductive age (15–49 years; including 104705 pregnant women) between 2000 and 2018 (via the Demographic and Health Survey). They found a low prevalence of tobacco smoking at 3.2% (95% CI 3.1–3.3), but a much greater prevalence of second-hand smoking at 23% (22.8–23.2), and 65.6% (65.3–65.9) for household solid fuel use. About 16% of those surveyed reported multiple exposures while pregnant women reported even greater exposures to both second-hand smoke and household solid fuel. There was a substantial downward trend for tobacco use in 24 of 37 countries, and in 20 of 40 countries for household fuel use over the study period.

There is a high burden of lung cancer in women in China and other countries in Asia and Africa, probably due to household air pollution and high levels of biomass exposure from burning coal and wood for cooking in unventilated stoves.<sup>97</sup> In a large retrospective cohort study in southwestern China, lung cancer mortality was

compared between lifelong users of either bituminous coal or anthracite coal. Using bituminous coal increased lung cancer mortality 36-fold in men and 99-fold in women compared with anthracite coal users.<sup>98</sup> Such results highlight differential risk factors for lung cancer between women and men and provide foundations for future research exploring sex and gender regarding exposures to different coal types, as well as gender roles and societal norms in different communities. In low-income and middle-income countries, emissions from solid fuel combustion were estimated to account for about 17% of all lung cancer deaths in men and 22% in women.<sup>98</sup> Results such as these offer a chilling yet stark reality; in many lower-resource settings, where a substantial proportion of women do not smoke, cancer risk assessments due to household emissions can be made without the confounding effect of tobacco use.<sup>99</sup>

In many high-income countries, lung cancer screening is now a recommended strategy to reduce lung cancer mortality for high-risk individuals.<sup>100</sup> The NELSON trial, a pivotal randomised CT-based lung cancer screening study involving about 15000 current or former smokers in the Netherlands and Belgium, showed a significant effect on lung cancer mortality and can be considered practice-changing.<sup>101</sup> However, women were under-represented, encompassing only 16% of study participants. A 2017 survey showed that women were 32% less likely than were men to receive counselling regarding lung cancer screening.<sup>102</sup> In the USA, Black women are less likely to be counselled about lung cancer screening than are White men.<sup>102</sup> Notably, at the time of writing this Commission, high-quality, population-based lung cancer screening has only been recommended for and introduced in a small number of countries, all of which are classified as high-income according to World Bank ranking.

Women are also under-represented in therapeutic lung cancer trials, representing 39% of trial participants;<sup>103</sup> in immunotherapy trials, only 30% of participants are women. The neglect of women with lung cancer also applies to their treatment by caregivers. Women presenting with potential symptoms of lung cancer are often not suspected of the disease by their primary care providers, causing potential delays in diagnosis.<sup>104</sup>

We recommend that all preclinical and clinical trials on lung cancer (as with all non-sex-specific cancers) should adequately incorporate sex and gender dimensions into the design, data collection, and reporting. More research should also be funded to better understand the biological, environmental, and sociocultural drivers of lung cancer risks and outcomes for women. Future research can examine the role of gender norms and power dynamics, culture, and commercial determinants of lung cancer risks and outcomes. Women should be actively recruited into lung cancer clinical trials and be offered equal opportunities to participate in lung cancer screening and a stigma-free treatment environment.



### Alcohol

Since 1988, alcohol has been classified as a group 1 carcinogen by the International Agency for Research on Cancer, the specialised cancer agency of WHO,<sup>105–107</sup> and is linked to seven cancer types: cancer of the oral cavity, oropharynx, oesophagus, liver, larynx, colorectum, and female breast. In 2020, it was estimated that 741 300 cases globally, or 4·1%, of all new cancer cases among women and men were attributable to alcohol consumption.<sup>108</sup> Although globally, women accounted for less than one in every four of the total cases attributable to alcohol (172 600 cases, or 23·2%), in many countries, including those in North America, Europe, and Oceania, alcohol consumption in women contributes a greater proportion to the overall burden of cancer. For example, in the USA, breast cancer represented more than a quarter (27%) of the total alcohol-attributable cases among women and men combined.<sup>108</sup> Ethanol, the active substance of alcoholic beverages, induces cancers through multiple pathways,<sup>109</sup> but breast cancer appears distinct among cancers related to alcohol, accounting for as much as one in five cases due to alcohol, in both sexes combined. This disproportionate effect by cancer type points to the interference of the oestrogen pathways that put women at particular risk.<sup>109</sup>

Although alcohol drinking has been decreasing in many countries with historically high consumption, diverging trends in alcohol drinking by sex has resulted in a narrowing of the gap between drinking in men and women.<sup>110</sup> Studies suggest culturally defined gender roles as key determinants of this pattern,<sup>111</sup> which are exemplified by low awareness among young girls and women regarding the harms of alcohol (eg, only 19% of women attending breast cancer screening in the UK are aware that alcohol is a risk factor),<sup>112</sup> alongside inefficient prevention programmes, which are important factors to address for reduction in alcohol consumption and its impact on cancer in women and men alike.

Estimates of global alcohol exposure from 1990 to 2017 indicate that although patterns of alcohol consumption have not changed much in most high-income countries, many countries with transitioning economies, particularly in east Asia, have been witnessing a surge in consumption, with trends expected to continue over the next decade.<sup>113</sup> Historically, alcohol consumption was higher among males than among females, but the absolute number of female drinkers has been increasing globally, correlating with social and economic development. Additionally, the COVID-19 pandemic forcing a national shutdown resulted in a rise in alcohol consumption, especially among women.<sup>114</sup>

The WHO Global Alcohol Action Plan 2022–30 set a goal of reducing per capita consumption by 20% by 2030 using 2010 consumption levels as the baseline. Within this framework, WHO urges nations to develop and enforce “high-impact policy options”, including higher alcohol taxes, restrictions on advertising, and

emphasising awareness of health risks. Despite these recommendations, targeted marketing of alcohol to women is ongoing, with recent campaigns, such as the Johnny Walker Black Label introduction of a supposedly feminist counterpart, “Jane Walker”, being designed to increase female alcohol consumption. Another example is the sponsorship of Spotify by Smirnoff designed to equalise listening to female musicians, promoting the alcohol brand in the process. Globally, commercial interests from the alcohol industry present a challenge to reducing the burden of alcohol consumption on cancer risk in women.<sup>82</sup> Gender-responsive policy changes within national alcohol and cancer action strategies, supplemented by enforcement and regulation, are imperative to drive progress in this sphere.

### Obesity

Obesity has long since been recognised as a key driver of the global rise in non-communicable diseases, including several cancers.<sup>4</sup> Obesity has particular importance regarding cancer risk among women. Our new analysis, which used the same approach as Arnold and colleagues,<sup>62</sup> found that excess body weight accounted for 3·9% of cancer cases (or 339 000 cases) among females in 2020, with the attributable burden by sex almost double for women than for men.<sup>115</sup>

According to WHO, the prevalence of people living with obesity globally has tripled since 1975.<sup>116</sup> The 2023 World Obesity Atlas estimates that by 2035 more than 4 billion people, 51% of the global population, will be living with obesity, with the greatest prevalence seen among girls and women in most countries and world regions.<sup>117</sup> Some regional comparisons in the World Obesity Federation report are worth noting. Between 2020 and 2035, in the eastern Mediterranean region (northern Africa and the Middle East) the obesity prevalence among women is predicted to rise from 30% to 41% compared with from 20% to 31% in men; and in sub-Saharan Africa, from 18% to 31% in women versus 7% to 13% in men. In the Americas (including north and central America, and South America) 49% of women and 47% of men are expected to be living with obesity, while slightly higher obesity rates are expected among men than among women (39% vs 35%) by 2035 in the European region.<sup>117</sup> Although the numbers are staggering for women and men alike, these data alone do not fully reflect the effects on women and girls due to obesity, which will continue to drive the risks of obesity-related cancers for half of the world's population.

At the 2011 UN High Level Meeting on non-communicable diseases, a global nutrition target to “halt the rise in obesity at 2010 levels, by 2025”, was established. However, the latest data suggest there are no countries on track to meet this target.<sup>117</sup> Consistent with this report, few countries are on track to meet global nutrition targets.<sup>118</sup> To assess obesity preparedness,

the World Obesity Atlas 2022 developed the Obesity–Non-Communicable Disease Preparedness Ranking,<sup>119</sup> which is a composite measure that encompasses indicators for health service coverage of non-communicable diseases, including obesity and its sequelae. This ranking highlights a lack of obesity services (health services to support weight management and related diseases) in low-income and middle-income countries, which is likely to further widen global disparities in the incidence and mortality of obesity-associated cancers among women.

On a more positive note, gender-responsive obesity policies are emerging, such as that in the ROOTS Framework<sup>120</sup> which recommends building “gender inequality into all obesity policy making”. It also highlights the need for equitable access to green spaces in urban areas, to increase access to physical activity. The importance of increasing physical activity, particularly for women, is also noted in the WHO Global Action Plan on Physical Activity 2018–30<sup>121</sup> that highlights the gendered challenges of access to physical activity, including the need for safe and affordable access to exercise spaces for women, particularly in low-income and middle-income countries. Women are more likely to be insufficiently active (31·7% vs 23·4% in men), according to the World Health Statistics Report 2021, due to inequity in opportunities for physical activity and economic empowerment.<sup>122</sup> Specifically, the World Health Statistics Report promoted health education and information dissemination as imperative to reduce obesity prevalence among women. The relationship between diet and physical activity in different contexts, and opportunities to increase equitable access to healthy diets and exercise (in light of gender and related dimensions of inequality) represents an important topic that warrants further research—not only with regards to cancer risk, but also to health and wellbeing more broadly.

Of particular relevance to our Commission, the World Obesity Federation highlights the importance of weight stigma, “[that includes] negative social stereotypes and misconceptions surrounding people living with overweight and obesity, and is a harmful manifestation of social inequity”.<sup>117</sup> Although the 2023 report does not specifically address the degree to which weight stigma disproportionately affects girls and women, in their landmark paper: *Obesity, SDGs and ROOTS: a Framework for impact* Ralston and colleagues<sup>120</sup> call for gender inequality to be built into all obesity policy making, including obesity prevention, treatment, and management within universal health coverage packages; implementation of WHO’s Best Buys for non-communicable diseases (eg, taxation of unhealthy food products); and “incorporating the rights of all people with obesity within human rights legislation, workplace regulations, health-care systems and education, to tackle pervasive and unacceptable stigma, discrimination, and bullying”. Additionally, the World Obesity Federation calls for the full

implementation of the WHO International Code on Marketing of Breast-milk Formula, and more broadly for funding and action on research and surveillance into the effects of commercial determinants of health on obesity.

Overall, no countries are on track to halt the rise in obesity, which will continue to contribute to the increase of obesity-associated cancer, particularly among women. The introduction of robust, actionable global policy will be imperative in stopping the rise in obesity around the world. The Commission also acknowledges the far-reaching impacts for women and girls from societal pressures regarding physical appearance, including weight, which are beyond the scope of this Commission, but warrant further attention in terms of research and gender-responsive policy making. In the next subsection, we highlight a few examples of commercial products containing chemicals with emerging evidence of cancer risk, which are disproportionately used by women or girls and fall under the broad category of the beauty industry.

### Emerging cancer risks and women

We did not undertake a systematic or otherwise exhaustive review of potential cancer hazards or risks linked to exposures at work or in the environment. However, we acknowledge the importance of advancing high-quality research in this domain and provide a few examples of chemicals in commercial products that are predominantly used by women and for which there has been sufficient concern to warrant bans or consumer advisories in several jurisdictions, including from the USA Food and Drug Administration (FDA) and the European Commission.

There is growing evidence that suggests a link between certain types of breast implants and several cancers, such as squamous cell carcinoma (around the implant capsule), and anaplastic large cell lymphoma (a relatively rare type of lymphoma), the latter of which WHO in 2016 classified as “breast implant-associated anaplastic large cell lymphoma”, a T-cell lymphoma that appears to be rare but is potentially fatal.<sup>123</sup> Concerns about breast implants have prompted the FDA and the European Union (EU) in 2022 to emphasise the need for more research into the links between breast implants and these malignancies.<sup>124,125</sup>

There are also longstanding concerns regarding endocrine-disruptive chemicals and the possible risk of hormonally driven cancers; however, high-quality evidence is lacking. A recent systematic review of parabens, ubiquitous as preservatives in cosmetic products, underscored a scarcity of in vivo and epidemiological studies of their possible health effects,<sup>126</sup> with limited current evidence suggesting that parabens might play a role in breast carcinogenesis. The FDA states that “under the Federal Food, Drug, and Cosmetic Act, cosmetic products and ingredients, other than colour additives, do not need FDA approval before they

go on the market".<sup>127</sup> Meanwhile, some parabens have been restricted by the EU regulatory body, citing insufficient evidence of their safety,<sup>128</sup> while the American Cancer Society also notes that while such products are tested for immediate effects such as skin or eye irritation and allergic reactions, "whether cosmetics or certain ingredients in them cause more subtle or long-term health problems is not entirely clear... [because] there are no long-term studies, little is known about the health effects of long-term exposure to many ingredients in cosmetics".<sup>129</sup>

The widespread use of products marketed as skin lighteners is another worrying trend, among growing concerns of a potential link between the main chemical ingredient, hydroquinone, a tyrosinase inhibitor that inhibits melanin production, and skin cancer.<sup>130</sup> The EU has recently banned hydroquinone altogether and the FDA no longer approves products containing this chemical for over-the-counter sale.

Finally, a large prospective cohort study reported an association between regular use by consumers of hair relaxer products and endometrial cancer, with an adjusted hazard ratio of 2.55 (95% CI 1.46 to 4.45 for frequent use, >4 times in the past 12 months).<sup>131</sup> Further studies assessing routine consumer use as well as possible occupational risks among the largely female workforce who handle these products is warranted.

The aforementioned examples represent a few commercial products containing chemicals that are currently under review or that have been banned in some jurisdictions due to lack of long-term safety data or specific concerns about cancer risk. Although as a Commission we did not undertake specific research on this topic, we believe it is worthy of inclusion here for several reasons. The examples we cite can be thought of as exemplars of so-called beauty industry products, marketed to and used primarily by women (and in some cases girls). Moreover, we believe that questions about regulatory oversight and policy decisions regarding an industry that is arguably fuelled by sexist and racist notions of beauty demands greater scrutiny.

### Breastfeeding and cancer prevention

Breastfeeding is associated with a lower lifetime risk of breast cancer, and potentially lower risks of ovarian and endometrial cancer, as well as of osteoporosis and coronary heart disease.<sup>132</sup> A comparative risk assessment found that breastfeeding can prevent as many as 20 000 breast cancer deaths annually worldwide.<sup>133</sup> Although exclusive breastfeeding and longer durations of breastfeeding are associated with a greater benefit in terms of breast cancer risk, there is increasing evidence that the benefit might differ by breast cancer subtype, such that breastfeeding could be more protective against more aggressive breast cancer types.<sup>134</sup> Further research is required to better understand how and to what degree breastfeeding might influence breast cancer and other

cancer risks. However, we wish to note that the promotion of breastfeeding as a risk reduction strategy for certain types of cancer must take into account the broader structural and societal factors, along with related gender and power dynamics, such as parental leave policy and financial conditions, that can facilitate or hamper opportunities to breastfeed for those who are able and choose to do so, while respecting women's autonomy and bodily integrity in terms of decisions related to breastfeeding.

### Law, gender, and cancer

The law is fundamental to addressing cancer, including the gender dimensions of cancer. Law encompasses a wide range of instruments and practices which can include legislation, regulation, court cases, international agreements, administrative instruments, executive orders and decrees, and custom. These intersect with gender and cancer in a number of ways. (1) By establishing rights, such as the right to be free from discrimination or the right to health; human rights treaties, constitutions, and legislation enshrine a number of rights that protect women and people of diverse SOGIE from discrimination and establish freedoms and entitlements in relation to the right to health; (2) by shaping gender norms; (3) by establishing social protections, such as spending on social programmes, protection from discrimination in workplaces and services, and workplace rights such as sick and caregiver's leave; (4) by governing how health systems respond to people affected by cancer; and (5) by regulating risk factors for cancer: such as laws to regulate tobacco, alcohol, or food; laws regulating environmental and occupational exposures; and laws to promote physical activity such as planning laws that enable active modes of transportation. These risk factors are also governed by legal instruments at the international level, including through the WHO Framework Convention on Tobacco Control, whose article 4.2(d) acknowledges and commits to addressing gender-specific risks, and environmental treaties.

Gender intersects with other factors such as age, socioeconomic status, and ethnicity, among others. When used well, law can also play a role in addressing the way in which gender-based discrimination can intersect with other forms of diversity, such as belonging to a First Nations community, cultural diversity, disability, religion, gender diversity, and sexual orientation.

### Summary

The true burden of cancer in women has gone largely unrecognised and has far-reaching consequences for families and society more broadly. Nowadays, cancer is a leading cause of mortality in women and among the top three causes of premature mortality in almost all countries worldwide. Most of these cancer-related deaths occur in low-income and middle-income countries, and a large proportion of women die at their prime of life,

leaving behind an estimated 1 million maternally orphaned children each year. Multilateral organisations and governments alike should and can develop, implement, and enforce policies—including at the subnational levels (ie, state, district, and municipal)—to counter industry efforts to increase uptake of known cancer-causing products such as tobacco, alcohol, and those that influence overweight and obesity. Moreover, more research should be funded and undertaken to better understand and act upon the potential risks of products that are especially targeted towards girls and women. Organisations and governments should also sustainably fund more inclusive health information systems, ensuring that data on sex, gender, and other socio-demographic variables are collected and reported. Only then will the current and future impact of cancer be accurately described among women in all their diversities.

### Section 3: gender, intersectional discrimination, and the lived experience of cancer

A feminist approach emphasises the importance of centring any efforts around the gendered experience of women in private spheres and society, and importantly, in institutions (eg, health systems or research institutions). This approach recognises deep-rooted societal and institutional gender dynamics as a reality that influences every aspect of our lives. A way of learning about these dynamics begins with a woman's own knowledge and experience, and women and marginalised groups are instrumental in co-creating this knowledge.<sup>135</sup> The current (but flawed) assumption of the biomedical model, that if only “women are aware of their risk, they can be medically managed through compliance with their medical providers” is harmful. This perception fails to understand the multiplicity and interlocking effects of systemic and structural factors on access to information and services, along with availability, acceptability, affordability, and quality of such services. Central to feminist research is putting centre stage the voices and experiences of women in all their diversities: young girls, post-menopausal and older women, women of different ethnicities, migrant and refugee women, transgender women, lesbians and bisexual women, women living with HIV or a disability, women who use drugs or incarcerated women, mothers (including single mothers), those without children, and many more; acknowledging and accounting for their unique experiences.

A cornerstone of the proposed approach is the recognition of the interlinking dimensions of social power with cumulative and multiplicative effects on health, seeking to understand gender as a “multidimensional process operating and embodied within a complex network of institutions”.<sup>23,25–28,136</sup> This approach distinguishes our intersectional feminist approach from the Social Determinants of Health framework, which when simplified takes an additive approach in which demographic categories are often “ranked and summed”.<sup>28</sup>

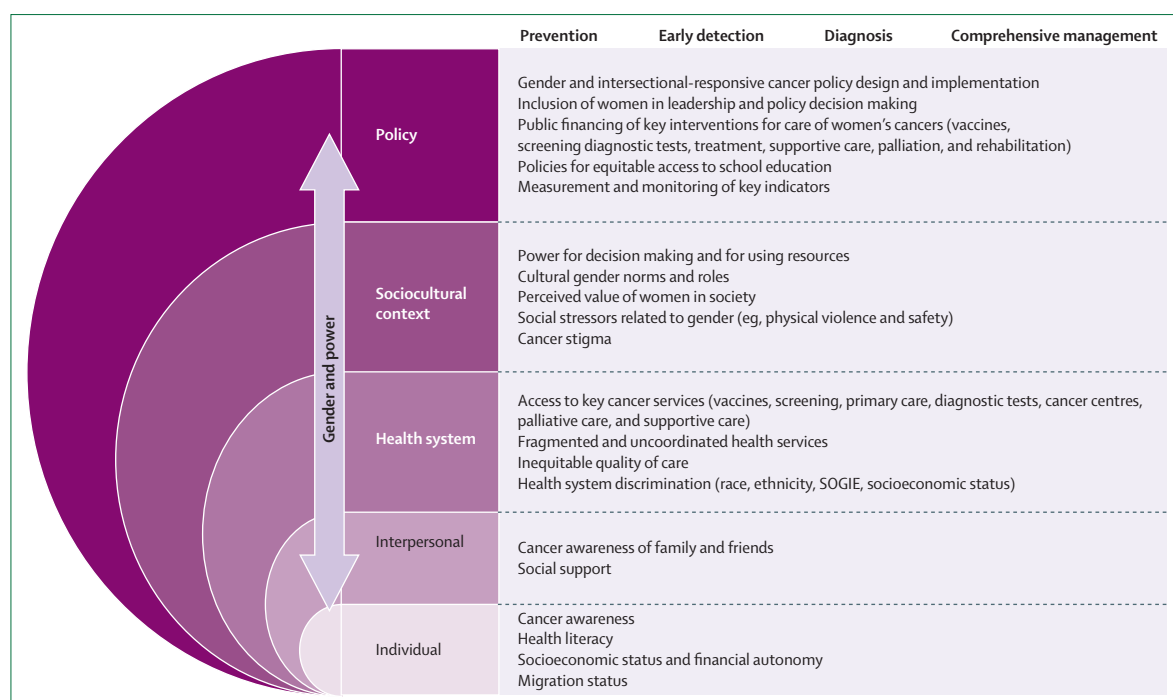
The additive approach can lead to “intersectional invisibilities”, exemplified by studies that often look at poverty or geographical location (eg, rural vs urban) without due attention to the intersections of gender, religion, or other sociocultural factors.<sup>27,28</sup> By contrast, the intersectional approach cautions researchers to resist the temptation of assuming various categories “as distinct variables rather than interactive processes”.<sup>28</sup> Analysis of intersectional dimensions seem challenging given the complexities of inter-related factors; however, this analysis is crucial for capturing and addressing gendered health inequities for social and gender justice.

This section of the report is informed by a literature review of cancer awareness, perceived need, access barriers, and quality of cancer-related health-care seeking and health-care use by gender (appendix pp 3–4). We present evidence on gender and intersectional inequalities throughout the cancer care continuum.<sup>137</sup> We discuss the important and crucial influence of gender norms on the perceived need for care, and on one's opportunity to access timely diagnosis and quality cancer care, throughout the continuum of care.<sup>137,138</sup> Key factors affecting cancer prevention, early detection, diagnosis, comprehensive management (including the lived experiences of women during active phases of anti-neoplastic treatment and supportive and palliative care), and quality of life beyond cancer, organised by the different levels of the Social Ecological Model, originally proposed by Bronfenbrenner,<sup>139</sup> are depicted in figure 7. The Social Ecological Model postulates that health behaviours both shape and are shaped by the social environment with five levels of influence: individual, interpersonal, organisational, community, and public policy levels.<sup>139</sup> Gender and other dimensions of discrimination intersect throughout these levels.<sup>140</sup>

Gender norms affect health care differently for men, women, and people of diverse SOGIE.<sup>141</sup> Defined as the often unspoken rules that govern the attributes and behaviours that are valued and considered acceptable for men, women, and people of diverse SOGIE,<sup>142</sup> we hypothesise that gender, in intersection with other dimensions of inequality, account for much of the observed cancer inequalities and differential experiences of cancer prevention and care. This includes differential exposure to cancer risk factors, preventive and help-seeking behaviours, and patient interactions and experiences with health-care institutions and personnel.

#### Perceived need for cancer care

Entry into the continuum of care can occur in a variety of ways, including through screening programmes or seeking health care for a symptom or as part of an assessment for another health condition. How symptoms are detected, interpreted, and managed, and whether screening programmes are effective is influenced by a complex interplay of individual, contextual, sociocultural, economic health system, and policy factors.



**Figure 7: Gender and intersectional determinants at different levels of the Social Ecological Model across the cancer care continuum**

The Social Ecological Model was first proposed by Bronfenbrenner.<sup>139</sup> SOGIE=people of diverse sexual orientation, gender identity, and gender expression.

An important initial step in appraising bodily changes as being potential cancer symptoms is comfort with examining one's body and confidence in detecting changes. Studies from South Africa,<sup>143</sup> Iran,<sup>144</sup> and Ethiopia,<sup>145</sup> a review of women living in South Asia,<sup>146</sup> and another review that included Latin American countries<sup>147</sup> have shown that women might experience shyness, modesty, and awkwardness about palpating their own breasts, all of which might contribute to reduced breast appraisal and hesitancy in seeking help. Gender-related cultural and religious norms contribute to these behaviours<sup>145</sup> and highlight the need not just for improvement of individual confidence in examining one's body, but also for culturally embedded interventions.

According to the Common Sense Model of Illness Self-regulation (CSM),<sup>148</sup> once a bodily change is detected, the next step in appraising the change is a construction of illness representation and the level of interference posed by the change. Once a level of threshold interference is passed the change is deemed a symptom and a complex process to make sense of the symptom is activated.<sup>149</sup> Several studies have shown the importance of symptom sense-making and appraisal in timely cancer diagnosis and care.<sup>143,150–153</sup> The CSM argues that various rules, such as the optimistic bias rule in which previous experience might result in an explanation of a symptom as being harmless or the age-illness rule in which symptoms are considered to be part of the normal ageing process, are used in interpreting symptoms.<sup>148</sup> For example, studies

have shown that attribution of breast symptoms to benign conditions,<sup>143,151</sup> and perceiving breast changes as a normal part of ageing might lead to a delay in seeking care or receiving a timely referral for further investigations and diagnosis.<sup>143,154,155</sup> Similarly, vaginal bleeding could be ascribed as being due to contraceptive use or to a sexually transmitted infection by both women and health-care providers, leading to a delay in cervical cancer diagnosis.<sup>154–156</sup> Understanding the multi-level factors influencing symptom sense-making and appraisal are therefore important in facilitating timely diagnosis.

Although studies from different geographical and cultural settings report mixed findings regarding the association between colorectal cancer symptoms and screening awareness between men and women,<sup>157,158</sup> a recent systematic review found that higher health literacy levels were significantly associated with higher screening participation rates for breast, cervical, and colorectal cancer.<sup>159</sup> This emphasises the importance of designing and implementing screening programmes that are gender sensitive and provide information in ways that are easy to understand for those with lower literacy rates.

Cervical cancer, a cancer for which there are highly effective prevention, screening, and treatment strategies,<sup>160</sup> remains a global public health problem and the leading cause of cancer deaths among women in 36 countries, the majority of which are in sub-Saharan Africa, Melanesia, South America, and South-Eastern Asia.<sup>1</sup> Although high population coverage of effective cervical cancer screening



programmes, including effective management of precancerous lesions, has resulted in declining incidence rates over several decades in high-income countries, cervical screening coverage remains low in many countries.<sup>138,161</sup> A review and synthetic analysis of cervical cancer screening programme coverage in more than 200 countries and territories worldwide found that although 84% of women aged 30–49 years living in high-income countries have ever been screened in their lifetime, only 27% of women in low-income and middle-income countries have ever been screened.<sup>161</sup> Within low-income and middle-income countries, coverage for ever being screened varied, with rates of 48% in upper-middle-income countries, 9% in lower-middle-income countries, and 11% in low-income countries.<sup>161</sup> Screening coverage rates also vary within regions and between and within countries. For example, among the ten countries that make up the Association of Southeast Asian Nations (ASEAN), screening participation rates vary from less than 10% in Myanmar and Indonesia, to 10–50% in Cambodia and Viet Nam, to 50–70% in Thailand, Singapore, and Brunei.<sup>162</sup> A systematic review that pooled results from 26 studies done in sub-Saharan Africa between 2010 and 2019 estimated a 12·9% uptake of cervical cancer screening.<sup>163</sup> The authors did not report on whether the countries had dedicated screening policies or not, but did note the heterogeneity of studies in terms of screening modalities. Women's knowledge of cervical screening was significantly associated with an increased uptake of screening (OR 4·81 [95% CI 3·07–7·51]).<sup>163</sup> Educational level and awareness of screening locations were also predictors of cervical cancer screening uptake, emphasising the importance of improving overall education levels among women.<sup>163</sup> To circumvent some of the gender-related barriers to accessing cervical cancer screening, consideration should be given to self-sampling strategies, which have been shown to not only be comparable to physician-collected samples in terms of diagnostic accuracy, but also highly acceptable, particularly in terms of convenience, privacy, and emotional comfort.<sup>164</sup> Addressing education and literacy levels and introduction of different screening methods cannot be seen in isolation, but rather together with investments in building a broad-based gender-sensitive health-care system with an emphasis on strong high-quality primary care systems and suitable, timely referral routes.

Symptom awareness is an important first step for many on the journey to cancer care. Raising awareness of cancer risk factors and symptom recognition contributes to the increased likelihood to seek care and might influence timely diagnosis, which is a predictor of cancer outcomes.<sup>150,165–167</sup> Therefore, understanding levels of symptom awareness and associated factors are important in improving cancer outcomes. A 2022 scoping literature review that examined the factors associated with time to breast and cervical cancer diagnosis in low-income and middle-income countries reported that low health literacy

was associated with longer times between symptom recognition and first health-care provider visit for breast cancer.<sup>153</sup> In another population-based study in the USA examining the associations between sociodemographic factors and awareness of eleven potential cancer symptoms, lower education level was consistently associated with lower cancer symptom recognition.<sup>168</sup> Several studies have also shown that higher education and literacy levels are associated with increased awareness of colorectal cancer risk factors and symptoms, and increased screening uptake.<sup>157,158,169,170</sup> Improvements in symptom and risk awareness and raising literacy levels are thus important, but timelier cancer diagnosis also requires addressing of other infrastructural, financial, and societal barriers.

The UN SDG 4 on quality education, recognises the effect of women's access to education on their own health as well as that of their children.<sup>171</sup> Despite recent advances in closing the education access and completion gender gap, the 2022 Gender Report<sup>172</sup> highlights ongoing gender education inequality, particularly in sub-Saharan Africa, where one in four women are still unable to read and write. This gender education and literacy gap has serious implications for improving knowledge of cancer risk factors, symptoms, and screening options; it points to the need for innovative, targeted public and patient health awareness strategies, and highlights the need for a multisectoral (or whole of government) response to improve equity in cancer care and control.

Social networks and cultural beliefs play an important role in symptom sense-making, perceived need for care, and decisions to seek care.<sup>143,150,153,173,174</sup> Studies show that family and community members can play an important role in potential cancer symptom interpretation and can serve as prompts for seeking care.<sup>143,154,175</sup> Culturally based gendered beliefs that women should prioritise the health of their family above their own,<sup>142</sup> as well as reliance on traditional medicines, can also result in both a longer symptom appraisal and help-seeking interval.<sup>142,150</sup>

The belief that cancer is a uniformly fatal disease linked with punishment, shame, and blame can lead to reluctance to discuss symptoms with others due to fear of social rejection of both individuals and their families.<sup>173,175</sup> Cancer-related stigma can thus lead to self-blame and symptom denial and act as a barrier to seeking health care.<sup>150,175</sup> Among patients with breast cancer, stigma related with mastectomy has been associated with women avoiding seeking care, refusing treatment, or concealing their diagnosis from other people, thus impeding them from accessing social support.<sup>173</sup> Cancer stigma related to self-blame has appeared highest among patients with lung and cervical cancers due to their links with smoking and sexually transmitted diseases.<sup>175</sup> The fact that cervical cancer is caused by HPV (a sexually transmitted disease), is linked with HIV, and that symptoms are of a more intimate nature, means that women with cervical cancer are often reluctant to discuss

their symptoms and fear being stigmatised and considered by other people as spoiled or ruined.<sup>154,155,175</sup> Akeyo's story represents an example of the stigma that

patients with HIV and cervical cancer often face, and how this can affect timely care seeking as well as a person's wellbeing (panel 3).

### Panel 3: Akeyo's story, Kenya—finding social support beyond friends and family

Akeyo is a 51-year-old woman living in a town close to Magadi, Kenya, with two of her five daughters and a granddaughter. She works as a hairdresser at people's homes. Her husband died 16 years ago when she was 4-months pregnant with her youngest daughter. A year later, she found out that she had HIV after months of non-stop headaches. She is fearful to come out openly about her HIV-positive status because many people think they can get infected if they touch the same cup, pencil, or even use the same soap. "Stigma is still strong in the ground, though we are trying to fight it. No one wants to come close when you have HIV." Her sister is afraid that Akeyo can infect her children, and even has a specific cup for Akeyo's exclusive use in her house. She decided to stop visiting her: "it is too stressful for me".

In 2014, Akeyo approached Woman Fighting AIDs and HIV in Kenya (WOFAK) for the first time. "My friend brought me because I was losing my mind." Even though she had heard about the organisation 10 years before, she had not reached out to them because she was in denial about her HIV status. Here, she found the support she needed: "In WOFAK I realised I was not alone. That's really when I started accepting myself, knowing that HIV is not a death sentence."

Through WOFAK, she participated in cervical cancer screening for the first time. Her result was positive. "I was going mad. I couldn't believe being diagnosed with HIV and cervical cancer. I thought I was dying." Clinicians at the health-care services in Magadi explained that this was not a death sentence. "But when the doctor called ten other doctors to see me, then I thought it was the end of me. I cried... I called my dad and my brother and told them I was soon dying. I decided to split my children and give them to friends, because I knew my family wouldn't accept them."

Fortunately for Akeyo, she had in situ cancer and was treated with cryotherapy, but did not understand this at the beginning; she heard the word cancer and thought it was a death sentence. "Cancer is still very stigmatised. Since cancer is a wound, no one wants to get close to you. Some people think that it is infectious, so they don't even want to share spoons, they don't like you anymore." She is happy to be currently cancer-free and continues to screen yearly.

Akeyo collaborates with WOFAK as an ambassador promoting HIV awareness, fighting stigma, and teaching those who test positive with HIV how to live with the condition. Within this organisation, she found the support she needed to cope with her diagnoses, and more than that: "I feel like in WOFAK I have found my sisters, brothers, and parents. They are more than my family. I can share my big stories with them."

### Access barriers to care

Gender, race and ethnicity, and socioeconomic status intersect, resulting in distinct patterns of health experiences and health-care access, utilisation, quality, and outcomes. Once a woman recognises a need to seek care, gender norms can influence her decision regarding when and where to seek care. There are studies that show gender differences in anticipated barriers to accessing care, in which women are more likely than men to anticipate barriers to obtaining an appointment or have had a past bad experience with a health-care provider.<sup>176</sup> Women are expected to care for and prioritise the needs of their families at the expense of their own health, and this often translates into women's postponement of seeking health care for themselves.<sup>142</sup> This has been described in women's narratives of perceived barriers to participation in cancer screening and help-seeking for potential cancer symptoms.<sup>150</sup> Additionally, since gender norms often exclude men from participating in childcare in many settings, covering these care-taking roles can act as a barrier for women to seek care for their own health needs.<sup>177</sup>

Furthermore, gender norms combine with the ability of individuals to seek care on the basis of their financial resources, time availability, and power to act.<sup>178</sup> Low socioeconomic status, lack of health insurance, and lack of universal health-care coverage have been shown to be associated with lower rates of participation in cancer screening and general access to cancer care, and longer times to receiving medical attention.<sup>153</sup> Women from low-income households in socially conservative settings can lack financial autonomy and must rely on men to cover costs of transportation to health-care facilities and costs of medical care. In some settings, a husband's consent is often required for a woman to consult a doctor, and this consent is often not given if the doctor is a man and the consultation could require a woman to show intimate parts of her body.<sup>173,179–181</sup> Rama's (pseudonym) story provides an example of a woman in India who lacks financial autonomy, and relies on male family members for financial support (panel 4).

Physical violence and concerns for safety have also been shown to be important barriers to accessing health care that affect women more than men. A study reported patients' concerns for safety as a barrier to seeking care for potential cancer symptoms among older rural women who have to travel long and often dangerous routes for health-care services.<sup>154</sup> Women in urban areas have also reported safety concerns—for example, related to gang crime—as reasons for their delay in seeking care.<sup>143</sup>

Studies on barriers to accessing care for stomach and colorectal cancer symptoms showed that women were more likely than were men to report barriers such as

difficulty arranging transport, fear, embarrassment, and concerns about possible findings.<sup>182</sup> There is evidence from African, Arab, and Latin American countries, that the health-care provider's gender is also an important consideration for women when seeking cancer care. In these regions, having a female physician or female provider for clinical breast examinations and to assist with mammography screening has been reported to be important for women to participate in screening and examination of their breasts.<sup>180,183</sup>

### Gender inequalities, cancer stage, and time to cancer diagnosis

Previous evidence has shown gender inequalities in cancer stage at diagnosis across different settings, with women being diagnosed at more advanced stages for cancers of the colon-rectum, bladder, and urinary tract.<sup>184–186</sup> More advanced cancer stage has also been reported for ethnic and racial minorities in the USA, and the highest risk of advanced disease at diagnosis has been reported to occur among African American, Hispanic, and Native American women compared with non-Hispanic White women.<sup>187,188</sup>

A possible explanation for the reported gender disparities in cancer stage is that women in general, and in particular women from minority groups, might face longer intervals from first presentation to health care to a definitive cancer diagnosis. Although not conclusive for all cancers, longer intervals between symptom presentation and final diagnoses are associated with more advanced stages for many types of cancers, including breast, lung, colorectal, bladder, and urothelial.<sup>189</sup> There are several studies reporting gender disparities in the time from first presentation to diagnosis for lung, colorectal, urinary tract, bladder, and pancreatic cancers, with women facing longer times than men before referral for cancer diagnostic confirmation.<sup>185,190–195</sup> Further research is warranted to understand the reasons for these longer times for referral of women with cancer symptoms than for men.

In high-income countries, gender disparities have been reported when analysing emergency presentations of patients with cancer. Patients diagnosed with cancer in the context of an emergency presentation have been shown to have poorer outcomes than do patients who present through routine primary care services.<sup>196</sup> Several studies have found women to be more likely than men to first present with cancer symptoms through emergency rooms, and these differences appear to be more striking for colorectal, lung, and upper gastrointestinal cancers.<sup>197,198</sup> This higher risk of emergency presentation has also been described among other vulnerable populations such as older patients, those with lower socioeconomic status, and those identifying as a racial minority.<sup>197,198</sup> There is a gap in research explaining the reasons for these differences, yet it is hypothesised that patients who present as emergencies have had some delay on the pathway to diagnosis and present to the emergency room in an attempt to accelerate

access to care.<sup>197,199</sup> Some studies have shown that not having had previous contact with a primary care practitioner is associated with emergency presentation.<sup>198</sup> There is a need for research to understand why women and other marginalised populations are diagnosed through emergency room presentations more commonly than are men.

### Health-care quality: integrated people-centred care

According to the health-care quality framework of the US-based Institute of Medicine (now the National Academy of Medicine) quality health care should be safe, effective,

#### Panel 4: Rama's story, India—living with cancer, domestic violence, and poverty

Rama's parents gave her away for marriage when she was age 16 years, to a man 15 years older than her. She has two daughters, aged 18 years and 13 years, and a son, aged 5 years. Rama's husband drives an auto-rickshaw in the day and drinks in the night. "I'm glad that my father-in-law is nice. He became nice when my son was born."

Rama is 36 years old. She lives in Nala Sopara, a small town in the Mumbai Metropolitan Region. In 2015, she suffered from headaches and vomiting. For 2 years, Rama regularly consulted a local doctor. "He never used to say anything. He told me to get glasses and to consult an eye doctor. I went to an eye doctor and he gave me glasses for 1000 rupees [\$US14.6]. But I didn't get any relief." The headaches and the vomiting continued and she was admitted to a hospital and diagnosed with brain cancer. Rama called her sister and said, "Bindu, come, I am in this condition." So she came. Rama's husband did not care. "My husband drinks a lot. When the doctor asked me what my husband is doing, then I told him that he's drinking, and so, out of fear, he stopped coming." When she fell sick, Rama's children started managing the household, washing clothes, and cooking food. They were studying, but then Rama asked them to leave their studies because of financial problems. "My elder daughter got a job in a factory. She told me, 'Mother, you look after yourself and I will go to work.' She does some work of buttons and hooks. They said they would pay her 5000 rupees [\$73] per month. My daughter said, 'Mother, it's shameful, tell people it's 10 000 rupees [\$146].'"

Rama's father-in-law sells women's underwear. He supports his daughter-in-law every month with 5000 rupees. "When there's no money, I ask him and I say, 'Father, I'm sorry.' Then he gives. He has to hide it from my brother-in-law, because he will fight with him if he comes to know. My brother also sends me money from the village."

"Whatever jewelry I had, I sold it. I sold my earrings and I got 7000 rupees [\$102]. And I had a chain made for my daughter. I sold that as well. And then from my mother's house I got money. I have two brothers and both of them sent 10 000 [\$146] each. I was using that. Then my father-in-law gave me money. His father's friend is also there. We asked for financial help from him. He gave 60 000 [\$876]. We asked for 30 000 [\$438]. On his own, he gave 60 000. He's an engineer. He earns all 12 months. We asked for 30 000 and he sent 60 000."

"There was a time when I didn't even have 2 rupees [\$0.03] in my purse. When I met the big doctor, he wrote medicines for about 1500 [\$22] and asked me to get two photocopies done. I didn't even have 2 rupees. How could I get two photocopies? I was so ashamed. I left. There were many patients outside. Then I went inside again and the doctor asked me what happened. Then I told him that I didn't have money. Then he asked me how I came here from Nala Sopara? I told him that I had a travel pass, so I came and now I'll go, but how will I get the photocopies? They had to be submitted. So he gave me 2 rupees. Then I thought that I should give him the 2 rupees back."

Rama's husband does not care. "If you die, then die. If you live, then live."

patient-centred, timely, efficient, and equitable.<sup>200</sup> Patient-centred care refers to being respectful of and responsive to individual patient preferences.<sup>201</sup> In 2016, member states passed a World Health Assembly Resolution on people-centred care and the related Framework for an Integrated Approach to Health Service,<sup>202</sup> with the vision of “a future in which all people have equal access to quality health services that are co-produced in a way that meets their life course needs and respects their preferences, are coordinated across the continuum of care and are comprehensive, safe, effective, timely,

efficient, and acceptable and all carers are motivated, skilled and operate in a supportive environment”.<sup>203</sup> However, too often, health systems fail patients in the provision of people-centred care, reinforcing racial and gender stereotypes and perpetuating discriminatory practices.<sup>13,17</sup> Gender norms are embedded in institutions, including health institutions, and gender and other power hierarchies are reproduced in them, both between and among women and men, and people of diverse SOGIE.<sup>142</sup>

Within health-care institutions, unconscious gender biases and heuristics based on gender stereotypes<sup>204</sup> affect patient care, resulting in differential health outcomes for men, women, and people of diverse SOGIE.<sup>13</sup> Patriarchal ideas about women and women’s complaints often manifest in prevalent mistreatment, disrespect, negligence, and abuse of female patients by medical staff.<sup>13</sup> Traditional power dynamics and communication styles between male health-care providers and female patients have been shown to decrease patient participation in their care decision making and affect the doctor–patient relationship.<sup>205</sup>

These gender biases can be further compounded when health-care providers are faced with patients who are not only women but are also poor, from a rural community, belonging to a marginalised ethnic or indigenous group, are of diverse SOGIE, or who have a disability.<sup>206</sup> The lack of physician cultural competency and implicit bias by clinicians toward people of various ethnic or racial groups, and diverse SOGIE, have been shown to result in the provision of unequal health care and disparities in cancer outcomes.<sup>207</sup> There is increasing evidence of women’s health-related complaints often being dismissed by health-care personnel across the globe, particularly for women from rural communities, those of lower socioeconomic status, those who have indigenous ethnicity, belong to a non-White racial group, or who are of diverse SOGIE.<sup>154,206–210</sup> In turn, these experiences of mistreatment and discrimination damage patients’ trust in health-care providers and thus, can act as barriers to participation in screening and in timely health-care seeking for cancer symptoms and treatment.<sup>154,208,209,211</sup> In Sara’s case, we see how she postponed seeking care for a breast mass due to prioritisation of her family needs and the perception that she needed to save money to be able to pay for quality and respectful health care (panel 5). We also see how after finally accessing health care, Sara is repeatedly reprimanded by male doctors for having delayed seeking care, which subsequently affected her emotional wellbeing.

Increasing evidence across the world has shown that people of diverse SOGIE experience disrespectful and poor quality care due to health-care providers’ biases, prejudice, and discrimination.<sup>212–215</sup> In the USA, there is evidence of higher levels of mistrust in the health system among African American and SOGIE communities than among White heterosexuals.<sup>216</sup> This has been explained

#### Panel 5: Sara’s story, Mexico—saving money to cover the costs of medical care

When Sara was diagnosed with breast cancer she was 48 years old. She lived with her 18-year-old son in a rural community approximately 2 h from Mexico City, and fully depended on her daily wage as a peasant collecting seasonal harvests of fruits and flowers. “I work twelve hours a day, and sometimes I work seven days a week in order to be able to cover my expenses, food, water, transportation for my son.”

When Sara discovered a painless lump in her breast, she was worried. She prioritised her daily work to keep supporting her son’s studies as he was soon to finish high school. “It was my economy that stopped me from consulting a doctor, because what I have, I need for today, for my food, and so you postpone and, when you realise, it is late.” Due to previous bad experiences with the local public health clinic, she avoided seeking care. “At the health centre they treat you like an undesirable person.” She instead continued to work with the aspiration of saving money to consult a private doctor, which she perceived as better quality. This went on for approximately a year. By that time, the lump had grown and become painful.

Sara finally sought care at the local public clinic, as she had not managed to save money for private care and the pain was interfering with her work. After an abnormal mammogram, she was referred to a large cancer centre in Mexico City. She describes feeling overwhelmed with the size of the place, the number of patients, and having to wait for hours in the waiting room while listening to sad stories and complaints of other patients with cancer. She was reprimanded several times by different doctors for having delayed seeking care, which made her feel sad, misunderstood by her doctors, and guilty for having postponed seeking care. Throughout her treatment period she wished that her doctors (who were men) had been “more sympathetic”.

Sara’s cancer was diagnosed at a very advanced stage, but it had not metastasised. She felt “an internal chaos, suddenly all the anguish and despair entered my mind: what are you going to do for a living now?” What she feared most was losing her independence and not being able to support her son’s education. After her diagnosis, she kept working as long as she could, even while receiving chemotherapy, and endured pain and discomfort. “I have to be under the Sun. I put a cotton cloth under my bra, but there comes a point when it hurts, because I need to work with my hands, and move around, and so it pinches.” She stopped after the third dose of chemotherapy, due to fatigue and dizziness.

Following a year of treatment, Sara reflects on her personal transformation. She went from self-isolation to sharing her feelings and needs with family and friends. From fighting to keep her independence and enduring cancer alone to accepting social support and learning to ask for the support she needs. She has come to terms with the many losses related to her cancer, the hardest being her loss of independence and her personal aspirations for her son completing higher education studies. She is thankful for all the emotional and financial support she has received from family and friends. She is optimistic and starting a new business from home growing flower plants that her neighbour then re-sells.



as a consequence of the systemic racism, homophobia and transphobia, and unequal treatment they have experienced in the past, and too often still experience.<sup>213</sup> For example, in a national survey in the USA published in 2021, African American women of diverse SOGIE reported higher intersectional stigma than did any other group, and stigma was associated with a 2·4-fold increased risk in delays for seeking breast cancer care compared with White, heterosexual, and cisgender women.<sup>214</sup> Sally's experience is a tragic example of a woman's experience facing systemic racism in the USA due to her race, which was further compounded with gender discrimination for being lesbian (panel 6). Although she presented with colorectal cancer at a young age, which could have made diagnostic suspicion of colorectal cancer more challenging for her medical team, the repeated disrespectful and prejudiced health-care episodes she experienced caused a diagnostic delay of colorectal cancer of almost a year, despite the multiple times she sought medical care, and almost cost her her life.

#### Living with and beyond cancer: unmet needs of women

Approximately two thirds of people living with and beyond cancer have unmet physical, psychosocial, or palliative care needs.<sup>217</sup> Central to this discussion is that delivery of both palliative care and cancer survivorship services are absent or wholly inadequate, particularly in countries and settings with fragmented or fragile health systems. There is poor documentation on gender-based disparities in the management of early and long-term sequelae from cancer, but some studies from countries across different world regions suggest that women can experience gender-based disparities in the management of early and long-term sequelae of a cancer diagnosis such as pain, fatigue, depression, sleep disturbances, short-term memory problems,<sup>218</sup> and effects on sexual and reproductive health.<sup>219</sup> We chose to briefly highlight the evidence regarding sexual and reproductive health and palliative care.

Although both women and men can experience varied physical, psychological, and social effects of cancer treatment, including effects on sexual health, some studies suggest that women are less likely than men to be asked about sexual dysfunction by their cancer care provider physician.<sup>219</sup> This is despite the fact that women undergoing cancer treatment often face a risk of sexual and reproductive health sequelae, such as premature ovarian failure and treatment-related menopausal symptoms that can result in hot flashes, genitourinary changes with resultant dyspareunia (painful intercourse), and decreased libido. Downstream effects of treatment-related menopause on sexual health can include the avoidance of intimacy, and feelings of sexual inadequacy. A systematic review on communication about sexual concerns in patients reports from cancer survivors from Australia, Brazil, Canada, China, Malaysia, Morocco, and

the Netherlands, stated that satisfaction with providers raising the issue of potential treatment effects on sexual function was generally inadequate. Notably, only 28% of women reported that their physician raised the issue of potential treatment effects on sexual function, compared with 64% of men.

In addition to adverse effects on sexuality, cancer treatment can also affect a patient's fertility. For women

#### Panel 6: Sally's story, USA—discrimination: a woman's experiences of disrespectful and prejudiced health care

Sally is a 53-year-old American Black gay woman who has survived colorectal cancer. She grew up in a military and Catholic family, in a neighbourhood near military bases "in a place where they would put Black folks". Her great grandmother's parents were slaves, and her great grandmother fled from Kansas at age 18 years in the 1920s after the mass killings of Black Americans. When she was young, there were addictions in the household, and her house was "a cacophony of chaos". At age 16 years, she met her current wife, who is White and from an "extremely racist" family, and they ran away together. Sally has experienced multiple events of racial and gender discrimination throughout her life: "unfortunately I live in a racist society".

Early in 2014, when she was 45 years old, things were looking positive for Sally. She had decided on a career change, found a job she really liked, was planning her wedding, and was saving money to buy an apartment. Her abdominal symptoms gradually worsened: bloating, gas, nausea, diarrhoea, tiredness, feeling cold, darkening of the stools, weight loss, and increasing abdominal pain. In August she discovered that her iron levels were unacceptably low when trying to donate blood. "All the signs were there", she recalls. After a year of symptoms and first seeking care, she was finally diagnosed with colorectal cancer after presenting to the emergency room due to massive bleeding in the stools.

During that year she was not properly assessed even though she consulted three different doctors and ended up in the emergency room three times due to severe abdominal pain. Without proper examination she was diagnosed with: "you probably ate something red", irritable bowel syndrome, haemorrhoids, and gastroenteritis. Additionally, she experienced stigmatisation by health-care providers on two occasions. A doctor assumed she was an addict looking for painkillers because of her black skin and would speak only to her White wife: "I don't give drugs to patients, so don't even ask." In a different emergency room, a Black doctor told her: "I can't help you, you are going to Hell anyway because you are gay."

By the end of the year, she had lost her job due to her symptoms, was struggling financially, and her symptoms were so bad that she would avoid eating "because it only made things worse". After a long weekend of vomiting and not being able to eat, she started feeling excruciating pain, "the right side of my abdomen was screaming—listen to me, listen to me!" and ended up with massive bleeding in the stools. Her wife took her to the emergency room in a state of blurry consciousness, and she finally got the full diagnostic investigation she needed. She had a large tumour (7 cm) but it was encapsulated: "I am a goddamn living miracle."

She then started speaking with other patients and discovered that the negligent and discriminant health-care episodes she had experienced were too often shared by Black people, and even more so if they were additionally openly gay. "I realised this shouldn't have happened, and then I went down sort of a dark path with my anger, so I had to turn it into something else." She became an activist, first fighting for awareness, now also fighting for her fellow Black and LGBTQ communities' rights to high quality and respectful health care. "I was born this way, I am sorry you don't like it, I will not hide for your comfort, I am here as a patient, just acknowledge my humanity."



younger than 40 years, the effect on fertility and reproductive capacity is even more pronounced, especially when cancer and related treatments affect the pelvic and reproductive organs. To mitigate the risk of fertility consequences, pre-treatment fertility preservation measures, including cryopreservation of

oocytes and embryo, and assisted reproductive technologies, have given rise to the discipline of oncofertility. Although some countries have the subspecialists and technology to bridge the gaps between oncology and reproductive endocrinology, as with other aspects of resource-intensive oncology care, many countries do not have the reproductive technologies and trained personnel to provide these services. Additionally, religious and cultural norms, out-of-pocket costs, and lack of awareness among providers and patients have affected its use in many countries.<sup>220</sup> The Oncofertility Consortium Global Partners Network (OCGPN), an expansion of the 2007 NIH-funded Oncofertility Consortium, was established to provide oncofertility support globally. The OCGPN has since merged with global networks to form the Oncofertility Professional Network with the aim of bridging domestic and global programmes by sharing resources and technologies to develop culturally appropriate oncofertility programmes that will be available in all countries.<sup>220</sup>

Finally, we wish to reflect, albeit too briefly, on inequities in access to palliative care, which is essential to quality of life and alleviation of suffering from controllable symptoms due to cancer or its treatment. Although women have been reported to be more likely than men to have favourable attitudes to palliative care,<sup>221</sup> lack of resources, physician's reluctance to make early referrals,<sup>222,223</sup> as well as geographical and financial barriers<sup>224</sup> can still restrict their access to these essential services.<sup>225</sup> As discussed in section 5, financial barriers can be especially magnified for women with cancer. Women often have fewer resources to cope with cancer-related hardship brought about by increased out-of-pocket expenses, loss of pay equity, or higher employment in informal sectors such as house cleaning, dress making, or self-employment in a family business, that are not subject to benefits, taxation, or social protections.<sup>226,227</sup> Moreover, in countries where health systems are struggling to provide even the most basic diagnostic tests and treatments for cancer, palliative and supportive care often sits lower on the list of priorities.<sup>228</sup> Even when palliative care is accessible, gender discrimination can affect the quality of care received. Multiple studies have shown that women with cancer are more likely to report inadequate pain relief and be at greater risk for undertreatment of pain than are men.<sup>229,230</sup> Women are also more likely to report higher pain, longer pain duration, and chronic pain associated with a cancer diagnosis than are their male counterparts.<sup>231–233</sup> These disparities in access to care might differentially affect women with other minority identities, who could experience further challenges resulting from discrimination such as racism and ableism.

Although existing research has highlighted the gender disparities in access and quality of survivorship and

#### Panel 7: Esperance's story, Rwanda—waiting to get cancer care during the COVID-19 lockdowns

Esperance is a 49-year-old woman living with HIV in a rural community in western Rwanda. She lives with four of her children, who she cares for alone. She has an adult son who works as a teacher in a different town. She used to depend mainly on her daily wage cleaning houses and doing laundry for other people, before her cancer treatment started.

Esperance discovered a painless lump in her breast while bathing. 2 weeks previously, she had heard a nurse recommending breast self-exam in an educational session at a health centre where Esperance was accompanying an older neighbour. Her friend reassured her it was not that serious and recommended some ointment for massaging the breast. Esperance decided to consult her local health centre. After the health centre nurse examined her breast, she referred her to her district hospital for further evaluation. She was then referred to a cancer centre in the country's northern province, approximately 4 h away from where she lives. Esperance felt scared as she knew that only people with cancer were sent to that hospital and also worried about the logistics: "I asked myself how shall I get there?... And I wondered who would look after my children in my absence."

One day before her first medical appointment at the cancer centre, the Rwandan Government declared lockdown due to the COVID-19 pandemic; no travel was permitted in the country. She called a nurse at the cancer centre whose number she had received, who explained that "they were not currently receiving patients with mild problems". A month went by, and Esperance's referral documents expired, so she consulted her local health centre again for a new referral. A second lockdown was then declared, and so another month went by, and her referral documents expired once again.

In her first visit to the cancer centre, almost 3 months after the first referral, she arrived at 6 AM to the hospital. She was examined and a biopsy was taken. 2 weeks later, a cancer diagnosis was confirmed. "I could not believe what I heard. I went out in tears. I cried bitterly... it was my first time to hear such things! It was too much for me to take in." She was immediately admitted to the hospital and started treatment the next day. She was comforted by other women with cancer and by the health-care provider who administered the medication: "she chatted with me because she probably realised that I was experiencing hard times; this put an end to my despair and tears".

When Esperance learned that she needed a mastectomy after completing preoperative chemotherapy, she was devastated. She consulted with a few relatives for their opinions, and finally decided to get the mastectomy, although she was unhappy with the idea. "I feel ashamed of having only one breast. Look at the layers of clothes I am wearing, even on a sunny day... it is still too much for me to bear".

Although Esperance has *mutuelle de santé*, Rwanda's community-based health insurance, and cancer treatment is heavily subsidised, she still struggles to pay the out-of-pocket proportion, which is 10% of treatment costs. She is also worried about the lack of money to cover the travel expenses necessary to get continuous treatment at the cancer hospital. Her eldest son is trying to help her but cannot afford all the traveling expenses himself. She has also received help from other relatives. Her son advised her to seek assistance from local authorities, but she has not yet done this because of reluctance to share the details of her medical condition: "I am not comfortable going to see the leaders and disclose my situation to them".

palliative care, more research to develop and evaluate the efficacy of gender-responsive interventions is needed.

### Gendered aspects of cancer in a public health crisis

The COVID-19 pandemic, widespread effects of climate change, and recent geo-political conflicts have combined to threaten hard-won progress on gender equality. The increase of gender-based violence, disproportionate effects on women's employment, and increasing levels of unpaid care work have heightened the economic and social burden of the public health crisis on women.<sup>234</sup>

A report by UN Women found that during the COVID-19 pandemic, countries with higher proportions of women in leadership positions, irrespective of national income, adopted more policies that included gender considerations. The report emphasises the need for recovery and emergency preparedness strategies to be gender responsive, integrated, and resilient.<sup>235</sup>

The long-term effects of the COVID-19 pandemic on cancer control globally will be notable, including an estimated rise in late-stage breast, cervical, and colorectal cancers due to disruptions in screening and delays in the initiation of treatment. Disproportionate effects of the COVID-19 pandemic on women in the cancer workforce and in academic medicine have also been well documented.<sup>236,237</sup> Mitigation strategies to prevent the widening of the gender and resource gaps in cancer outcomes will require advocacy efforts to ensure the implementation of gender responsive policies in all health-care settings. Esperance's story shows the effect that the lockdowns implemented because of the COVID-19 pandemic had on patient care for other serious diseases, such as cancer (panel 7). Esperance faced months of delay to get diagnosed due to the lockdown policies, and she has shared details about the accompanying emotional turmoil and uncertainty.

For women who live in the world's most socially and economically disadvantaged communities, exposure to cancer risk factors and barriers to health-care access are context-specific. For forcibly displaced populations and those in fragile and humanitarian settings or active conflict zones, cancer control falls low down on the priority list and policy agenda with few reliable data and low health-system capacity.<sup>238</sup> This is despite an increasingly urgent need to address the growing burden of cancer in ageing populations affected by a protracted crisis.<sup>239</sup> International assistance to develop innovative, impactful, and gender-sensitive cancer control plans will be challenging to implement; however, without attention directed to this issue, global cancer disparities will continue to increase. In Eman's case, we can see the complexities of accessing cancer treatment in Gaza, where cancer services are inadequate, and therefore patients are required to travel to neighbouring countries for treatment, in the middle of a conflict (panel 8). These challenges translate into unacceptable waiting times that have a negative impact on patient lives.

### Panel 8: Eman's story, Gaza—how war and conflict impact cancer care

Protracted wars and persistent conflicts have impacted health and health-care systems in many regions in the world. For patients with cancer, basic oncology services are often unavailable, forcing people to borrow money, sell property, and leave their homes to find health care elsewhere.

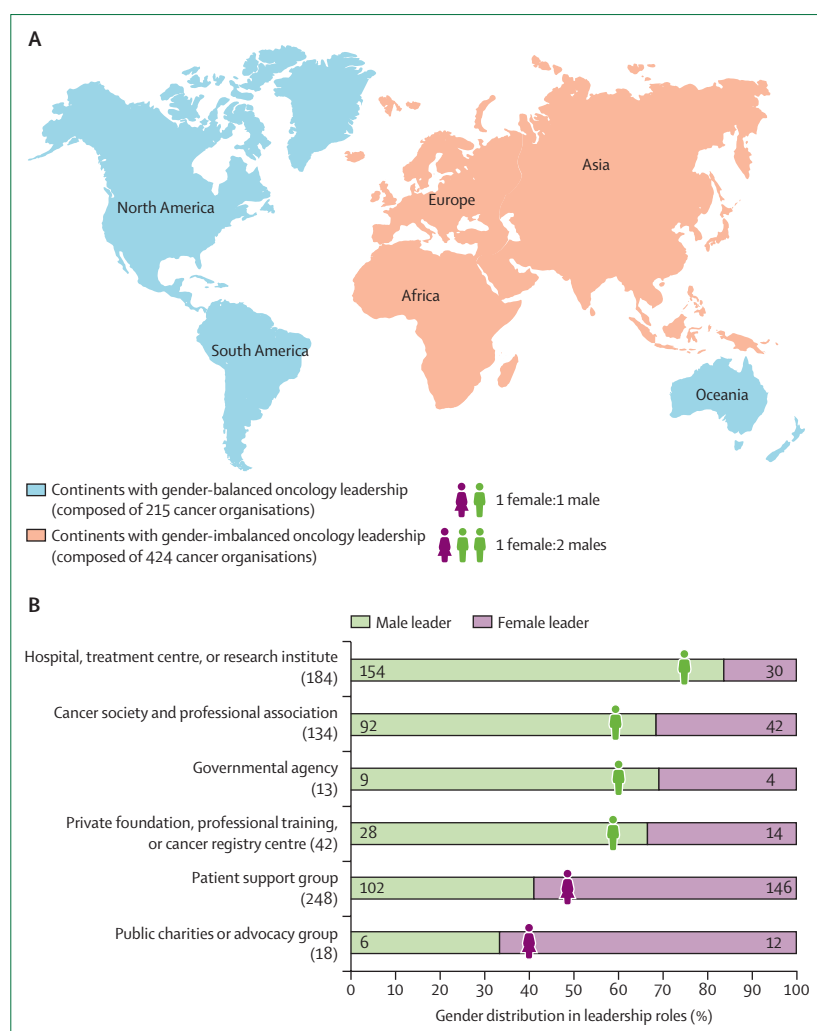
Eman is age 53 years, has a daughter and a son, and lives in Gaza. She was diagnosed with breast cancer when she was 29. "At that time, I couldn't understand the meaning of cancer." As she remembered, "back then talking about cancer meant talking about death", and so the topic was generally avoided. Over time, Eman started to share her experiences with other women in Gaza and today she is a prominent advocate for women's health rights in Palestine. While providing support to individual patients, she works with government institutions, lawyers, journalists, and human rights organisations to raise the voice of women in Gaza, fight for social justice, and make treatment for patients with cancer a funding priority in the region.

Similar to many other women in Gaza, Eman accessed cancer services abroad, in Egypt, Jordan, and Israel, where she had to stay for weeks, sometimes even months. Her treatment trajectory is far from linear; it is fragmented, dispersed across states and institutions, and marked by multiple interruptions. As she emphasised, it is not easy for patients with cancer to move across borders and travel to Egypt, Jordan, and Israel because of security regulations and the constantly changing, fragile political situation. To travel abroad, patients often have to wait for 3 or 4 months until they get permission from all the government authorities. "Cancer patients die in Gaza because they're not allowed to travel for treatment."

The situation in Gaza is dire. The health infrastructure is weak and fragile due to 15 years of conflict. Medications are scarce and equipment is frequently broken and therefore not functional. Only about a quarter of basic cancer treatment and evaluation procedures are available in Gaza. There are three trained oncologists for more than 8000 patients with cancer. When and how patients can travel abroad is decided by Palestinian, Israeli, Jordanian, and Egyptian authorities. "It's very hard to travel to any place if you're a cancer patient, it's very exhausting to wait for your permission, for your papers." Sometimes patients are refused passage at the border without explanation. "Nobody, not even cancer patients, can negotiate security reasons with state officials." As Eman notes, "waiting is the most common word in Gaza."

### Summary

Gender and related power imbalances increase women's social vulnerability, resulting in lower health literacy,<sup>172</sup> fear and experience of stigmatisation, and discrimination by the health system, all of which can impede their timely access to diagnosis, treatment, and quality cancer care. These asymmetries and power dynamics are



**Figure 8: Gender distribution of leadership in oncology by continent (A) and type of organisation (B)**  
Data was retrieved from The Union for International Cancer Control's 639 member organisations, for the Commission analysis. The Presidents or Chairs of the member organisations were classified as Oncology Leadership. The numbers in parentheses correspond to the number of member organisations.

For more on the **Union for International Cancer Control** see <https://www.uicc.org/>

For more on the **gender identification software** see <https://gender-api.com/>

under-reported and poorly measured. We recommend that all relevant international organisations, national and subnational governments, and civil society (and private sector actors, in appropriate cases), co-design and implement gender-transformative strategies to mitigate barriers to early cancer diagnosis at the sociocultural, health system, interpersonal, and individual levels. Moreover, the co-creation of accessible and gender-responsive health systems can provide respectful, quality cancer care for women in all their diversities who have cancer.

#### Section 4: gender, intersectional bias, and the cancer workforce

In this section, we present new analyses in the context of gender and intersectional biases that affect professional health-care providers; clinician and non-clinician

researchers; leaders of cancer centres, research institutes, and professional societies; and the unpaid caregivers, community health workers, and the countless advocates who fight for the rights of patients with cancer.

#### Gender composition of global oncology leadership

Addressing the complexities of global cancer control from policy making, prevention, diagnosis, and treatment demands that we value diversity in creating innovative and context-specific solutions from multi-disciplinary teams. This process includes identifying and addressing key barriers responsible for the gender gap in leadership and research to leverage the benefits of diversity in striving towards better health for all.<sup>240,241</sup> One of the most important factors influencing gender equity and equality in the health workforce is broad representation of women among leaders at every level.<sup>242</sup>

To gain a global insight into the gender balance of cancer control organisations, we have undertaken an analysis of leadership of the Union for International Cancer Control (UICC) member organisations. A total of 1195 member organisations were screened via their websites and email address. 402 did not have valid contact information and 154 were regional branches of organisations already represented by national offices and were thus excluded, which resulted in 639 organisations included in the analysis. The gender of the Chief Executive Officer, President, or Chair of each organisation in 2022 was determined using publicly available data and gender identification software. Although the organisations in North America, South America, and Oceania appear to have fostered gender-balanced oncology leadership profiles, women's representation in leadership roles remains substantially lower in Asia, Africa, and Europe (figure 8A). These results are not dissimilar to other global health fields.<sup>243</sup> The heterogeneity of UICC membership enables us to also view gender balance according to type of organisation, with men over-represented as leaders of hospitals, treatment centres, and research institutes, and women over-represented as leaders of patient support groups, public charities, or advocacy groups (figure 8B). In our global analysis of the 184 UICC member organisations classified as hospitals, treatment centres, or research institutes, only 16% were found to be led by women. These results are congruent with a survey of 82 cancer centres in the USA by the American Association of Cancer Institutes, which showed that women are significantly under-represented in leadership roles (16% of directors and 45% of associate directors).<sup>244</sup> The authors also identified a concerning lack of gender, ethnic, and racial diversity in the traditional cancer centre leadership pipeline.<sup>244</sup>

This gender imbalance in leadership has a detrimental effect on the career trajectory of oncologists, nurses, and other allied health personnel.<sup>245</sup> The metaphors of the glass ceiling and the leaky pipeline are often used to depict the barriers that prevent women from advancing in health

leadership positions.<sup>246</sup> The first metaphor refers to widespread gender bias and discrimination, which keep women from succeeding in their careers, despite having favourable qualifications and work performance. The second metaphor conceptualises women's gradual disengagement from leadership paths due to conflicting work-life obligations. In a survey of more than 600 female oncologists in the USA, most respondents perceived their gender to adversely affect job promotion, and more than 20% of respondents were considering leaving academia.<sup>247</sup>

Women in the cancer workforce, as in other disciplines, report frequent and severe experiences of gender-based discrimination, including bullying and sexual harassment, both during their medical and residency training and at the workplace.<sup>248–253</sup> These harassment practices are usually perpetrated by male superiors and colleagues, although also by male patients and patients' relatives,<sup>248,251</sup> and have been reported to negatively affect women's mental health, perception of workplace safety, job satisfaction, and career development.<sup>252</sup> These unacceptable and highly prevalent practices persist due to a hierarchical, male-dominated culture that accepts abusive behaviour as part of medical training and workplace socialisation, and avoids holding offenders accountable.<sup>240,254</sup> Although most studies reporting on gender-based discrimination and harassment practices are from high-income settings, it is also a widely (albeit silently) recognised problem among women who train or practice in low-income and middle-income countries. Dr Cheng-Har Yip's story reflects the myriad ways that gender bias, discrimination, and sexual harassment can pose huge challenges for women to succeed as oncology professionals, particularly in historically male-dominated specialties such as surgery (panel 9).

An ongoing monitoring project by the European Society of Medical Oncology (ESMO) Women for Oncology initiative has observed promising improvements over time with regards to women's leadership and representation on the boards of national and international oncology societies. Between 2016 and 2019, the proportion of female board members increased from 26·8% to 35·8%, with an increase in female presidents from 10·4% in 2016 to 22·2% in 2019.<sup>255</sup>

To maximise the potential of the oncology workforce, gender equity and equality, as well as organisational culture transformation, must be promoted if diverse talent is to be retained and nurtured.<sup>256–258</sup> A recent survey of ESMO members (of all genders) found that approaches with broad support included: promoting work-life balance, development and leadership training supporting flexible working, transparent career paths, and salary structures to shed light on and eliminate gender pay gaps.<sup>259</sup>

### Composition and contribution of the female oncology workforce

Consistent with the composition and contribution of the global health-care workforce, oncology nurses,

#### Panel 9: Cheng Har Yip's story, Malaysia—the challenges for a woman on becoming a surgeon

Cheng Har is a top breast surgeon and professor in Malaysia, where she studied and developed her professional career. Similar to most southeast Asian countries, "Malaysia is a predominantly patriarchal society, where women take on the childbearing and house chores while the men are the breadwinners." When she studied surgery in the late 1970s, there were only three female surgeons in the entire country and none at the teaching hospital where she was a student. One other woman had begun her surgery training in this hospital before her, but did not finish, and Cheng Har would be told: "she is tougher than you and she stopped... one of my senior doctors, a man of course, said he would eat his shoe if I became a surgeon... everybody expected me to give up, but I never let being a woman stop me from doing anything."

She became a surgeon at the age of 28 years. She got a position as a lecturer in a university. She recalls that there were five people applying for this job, and she was the only woman. Her mentor chose her for the position. "They said I was sleeping with him, can you imagine? It's absolutely nonsense, he is like a father figure... I never let these things upset me, I just do my work, but I have to work twice as hard to prove myself... although since I'm a workaholic, I like working twice as hard [she smiles]."

Cheng Har did a Breast Surgery Fellowship in the UK in the late 1980s when the first mammography-screening programme was being established. Back in her home country, she implemented the first Breast Clinic at the University Hospital. She went on to become Head of Surgery and Professor Emeritus. When asked to reflect about the gender barriers she has faced throughout her professional career: "I can say I am actually one of the boys, I know exactly how they think. In fact, I often say that I act more like a man because you have to in order to survive there, but in a way, I felt very lonely as well. My friends said I would never get married because no one would want to marry a female surgeon, things like that. I was probably sexually harassed all throughout my training, but to the men it was teasing, back then there was no such term as 'sexual harassment'."

Despite facing these barriers, which could have hindered her professional development, she focused on her work to achieve what she wanted. "I always ignored the negative comments. I knew what I wanted and I worked for it." In addition to having a very successful clinical career, Cheng Har is a widely recognised researcher both in Malaysia and internationally, with more than 250 publications in peer-reviewed journals. She has also presided several international Associations related to Surgery and Breast Cancer. She recognises that all this has been possible thanks to her inner strength, and a very supportive husband and family who helped her take care of her two sons when they were growing up. "Many women give up surgery because their husbands don't support them."

Since she studied Medicine, almost 50 years ago, things have changed greatly in Malaysia. Back then, only 30% of medical students were women, whereas today the proportion is 75%. When she started studying surgery, there were only two other female surgeons in the country, but nowadays, about 12% of the 500 surgeons are women. Furthermore, sexual harassment is now recognised, although there is still much to be done to change the male surgeons' behaviour who in her opinion "don't understand it, to them it's just teasing".

non-specialist nurses, midwives, and other allied health professionals, along with community health workers involved in cancer-related activities, are mostly female, and represent an essential yet unrecognised global oncology workforce.<sup>9,260</sup> The scarcity of data on cancer human resources for oncology nurses and community health workers should be addressed by prioritising the WHO global health workforce milestone for 2020, which called for the establishment of health workforce



registries.<sup>261</sup> Unfortunately, challenges to a robust oncology nursing workforce include nursing shortages, recruitment barriers (eg, perceptions of a demanding specialty with complex care and hazardous work environments), and burnout. Innovative recruitment strategies, onboarding, continuous education programmes, occupational safety measures, and burnout prevention interventions are documented solutions.<sup>260</sup> Given the fact that women account for about 90% of nurses and midwives worldwide, valuing, rewarding, and retaining women in the health-care workforce should be a priority for global cancer control.<sup>9</sup>

As most countries continue to move towards universal health coverage, strengthening the primary health-care systems which have an essential role in health promotion to reduce cancer risks, as well as in preventive and palliative care for people with cancer, is imperative. Nurse-midwives and community health workers are important drivers for carrying forward the universal health coverage agenda.<sup>262,263</sup> Female health-care workers have an especially important role in primary care for cases in which conservative socio-religious norms are common, as female patients are more open to female staff, and physical examination by male health-care workers is not acceptable in many settings.<sup>264</sup> Nurses and health-care workers based in the community have a thorough knowledge of their patients, their families, their support systems, and their health needs and they have a holistic view of which services are available and which services are less commonly available or accessible.<sup>265</sup>

Most of the sex-disaggregated data regarding the cancer workforce are collected through surveys or workforce information systems and are only available for the physician workforce. Data from the Association of American Medical Colleges Diversity in Medicine 2019 report, including data for cancer-focused physicians in 2018 (which included pathologists, surgeons, haematologists, oncologists, radiation oncologists, and radiologists), showed that 70% of these physicians are men, with a substantial lack of racial diversity compared with the populations served.

The gender imbalance in the oncology physician workforce appears to be improving over time, reflecting increasing proportions of female medical students and trainees. The latest analyses of ESMO membership data showed that 47·5% of members are women, with more than 55% of these younger than age 40 years.<sup>255</sup>

A growing body of evidence from the business world suggests that gender diversity leads to more productive companies, as measured by market value and revenue.<sup>266</sup> Data specific to medical teams in general, and cancer care in particular, are scarce, reflecting a missed opportunity in asking research questions specifically directed to the intersection of gender, communication, and cancer control. In one study from North America, women are more likely to be offered guideline-recommended breast cancer screening when interacting with a female physician.<sup>267</sup> When asked about gender

preferences in colorectal cancer screening, women in many cultures and settings prefer to see female providers or have a multi-gender endoscopy team; these studies suggest that gender preference results in longer wait times or a greater likelihood of paying out-of-pocket.<sup>268</sup> Preference for gender concordance has also been observed for skin cancer screening examinations.<sup>269</sup> Surgeon-provider gender concordance is also associated with increased uptake of breast cancer conserving therapy, compared with mastectomy.<sup>270</sup> All these elements illustrate the need for increasing the diversity of the workforce in addition to curricular reforms to enable gender-sensitive training. Mentorship opportunities, adequate work and family balance, and retention strategies will be required to address barriers preventing women and health-care professionals from under-represented minorities from realising their potential.

### Cancer advocacy—an overlooked discipline

The oncology workforce is generally considered to consist of medical professionals,<sup>271</sup> yet the role and value of cancer advocates (advocacy, or supportive care institutions) should not be underestimated as they represent the population most affected by cancer. Across resource settings, patient organisations fill gaps in the knowledge base for patients, assisting them and their caregivers to better understand treatment and navigate the health-care system,<sup>272</sup> while patient advocates influence health policy, access to treatment and care, and secure patient's rights.<sup>273</sup> Although we recognise the scope and value of advocacy and patient organisations as being integral to all areas of the cancer care continuum, published academic literature that evaluates this vital workforce, its composition, and the challenges they face, is scant.

Advocacy is a catalyst to improve research, access to health care, education, and outreach for all, “regardless of race, ethnicity, sexual orientation, gender, socioeconomic status, or geographic location”.<sup>274</sup> Cancer advocacy has largely been led by women since its inception in the USA in the 1950s. Often, by providing a face and voice to the cancer experience, these pioneers were crucial to mobilising civil society and destigmatising cancer.<sup>275</sup> They challenged perceptions about cancer and treatment, assisting women to go from passive actors in their relationships with medical providers to partners in treatment, able to make informed decisions regarding their own health care, aligned with their values.<sup>276</sup>

Historically, advocacy work is largely volunteer based, with advocates playing crucial roles in research and clinical trial recruitment, yet they are rarely compensated for their participation. Previous research indicates an increased awareness of the importance of fair compensation for the expertise and time of advocates. Providing financial incentives might help offset some of the burdens advocates face, and elevate the value of their work.<sup>274</sup> Advocates should not merely be added to a grant or article out of necessity, but considered as valuable as their clinical



counterparts, a meaningful contributor and equal partner, and compensated as such. Additionally, there is a lack of professional qualifications for cancer advocates, currently no standardised framework for advocacy competencies, and scant opportunities for advocates to hone their skills. Furthermore, knowledge dissemination platforms and funding opportunities are not easily accessible or available to advocacy or patient organisations. Access to grants and data published in peer-reviewed journals is inherently biased to support academic researchers and places unfair barriers on advocacy and patient organisations.<sup>277</sup> These barriers create additional challenges in garnering support for advocates and disseminating the efficacy of their work.

Our analysis of global oncology leadership suggests that cancer advocacy is largely led by women (figure 8b). This was confirmed by a 2021 study by the Multinational Association of Supportive Care in Cancer, in which they performed a global consultation among people who identified as being affected by cancer. Of the respondents (343 from 29 countries, 95·9% from high-income countries) 78·1% identified as female, and 62·1% as younger than 60 years. The respondents further identified barriers to their advocacy work with regards to cost, time, workload, health, and internet access.<sup>278</sup> A 2016 survey of advocacy organisations in the Asia Pacific region, conducted by Rare Cancers Australia, identified that these types of organisations rely heavily on volunteer support by people who have had a personal experience with cancer.<sup>279</sup>

Policy makers and academic and medical institutions must fully recognise the value of patient advocates and patient organisations and integrate them into all aspects of the cancer care continuum. Progress can only happen when the intersection of research, policy, and advocacy act as essential and equal partners. Ultimately, women and all people will benefit if health systems globally can evolve toward a place of sustained and meaningful patient participation and engagement.

### Women in cancer research leadership

Academic career success is often measured in terms of grant funding awards, peer-reviewed publications, and promotion to professorial ranks—processes that are inherently discriminative to women (and individuals belonging to ethnic, sexual, or other minority groups).<sup>280</sup> Data on gender disparities in research roles suggest that women are more likely to be performing experiments whereas men are more likely to be associated with designing experiments;<sup>281</sup> men are also more often in prominent (first or last) authorship positions.<sup>282</sup> Moreover, topics disproportionately studied by women, such as supportive care and educational research, are generally published in lower-impact journals, and cited less often.<sup>283</sup>

Editorial board appointments allow scientists to substantially affect the nature of the published scholarly work and serve as a platform for academic oncology opportunities, yet women continue to be under-represented. In 2008, Jagsi and colleagues<sup>284</sup> reported only

16% of women as editorial board members for major medical journals, spanning a 35-year period. The gender gap in editorial leadership positions persists in oncology journals. In our analysis of the top 100 oncology journals, only 16% of the editor-in-chief positions were held by women.

### Authorship

The gender gap in oncology research with regards to the ratio of men and women as first or senior authors of peer-reviewed manuscripts has been well documented, reflecting the gender imbalance in academic oncology.<sup>285</sup> Despite some improvements over time, the percentage of women in senior authorship positions for the highest-ranking oncology journals remains less than 30%.<sup>255</sup> In order to establish a global overview of women's contributions to cancer research publications over time, we undertook a bibliometric analysis of first and last authors of cancer research papers processed for the Web of Science: Core Collection (Clarivate Analytics)<sup>286</sup> for 2009 and 2019 (appendix p 5). In our analysis of the outputs of 56 countries, in 2009, women were first authors in 37·2% and last authors in 23·3% of papers in our dataset. In 2019, women were first authors in 41·6% and last authors in 29·4% of papers in this dataset. First authorship among women increased by 26%, and last authorship increased by 12% between these two time periods. There was considerable variation in the percentage of women as first and last authors between countries and world regions. Of note, most top performing countries in terms of gender parity for first or last authorship were in eastern or southern Europe or Latin America. Our results revealed a modest increase in the number of publications by women over a 10-year period, suggesting a need for more concerted efforts to promote female authorship in global oncology.

Interventional clinical trials in oncology attract high levels of industry, governmental, and philanthropic funding, and publication of practice-changing phase 3 studies in high-impact journals is a prestigious achievement for investigators. In a review of trends in women's leadership of oncology clinical trials from 1999 to 2019, women served as Principal Investigator in approximately 28% of trials, with improvement in the gender gap over time from 17·5% in 1999 to 30·6% in 2019. Analysis by geographic distribution revealed increased female representation among Principal Investigators in North America (30·7%) and Europe (23·8%) compared with in Asia (15·5%). Industry-funded trials were associated with lower female Principal Investigator representation than non-industry funded, investigator-initiated trials, and female Principal Investigators were found to be under-represented in late-phase rather than early-phase studies.<sup>287</sup>

Apart from the opportunities for academic advancement afforded by leading clinical trials, gender balance in research leadership is likely to improve women's

participation in clinical research. Oncology clinical trials led by women were more likely to recruit women than were trials led by men (50% vs 43% female participants), an observation that remained significant even after excluding sex-specific cancers such as breast, prostate, and gynaecological malignancies that could bias the analysis (44% vs 41%).<sup>287</sup>

### Research funding

Gender imbalances in cancer research funding must be interpreted in the context of the lower proportion of women in research leadership positions than the proportion of men; however, gender biases regarding grant awards and renewals have been identified and reported across all areas of medicine, including oncology.<sup>288</sup> In an analysis of North American funding agencies, Witteman and colleagues<sup>289</sup> concluded that “gender gaps in grant funding are attributable to less favourable assessments of women as principal investigators, not the quality of their proposed research”. Analysis of application critiques from the US NIH also identified gender biases that could lead to reviewers implicitly holding men and women applicants to different standards of evaluation, specifically for female investigators who were required to have more training, publications, and leadership positions than were men to obtain the requested funding.<sup>290</sup> In a comparison of NIH funding to first-time awardees from 2006 to 2017, 43·6% were women, with no differences in the median number of published articles or citations between men and women. Despite these strides, across all grant types and institutions, women received significantly lower funding awards than did their male colleagues.<sup>291</sup> In a systematic analysis of UK cancer research funding by gender of primary investigators between 2000 and 2013, 78% of all grants were awarded to men, with women primary investigators consistently receiving less funding in terms of total investment, number of funded awards, and mean funding awarded.<sup>292</sup> A similar picture was observed in an analysis of NIH research funding awards specifically for haematological malignancies, with 71% of grants being awarded to male primary investigators.<sup>293</sup>

The cancer research agenda remains driven by the priorities of the pharmaceutical industry, which is the primary funder of clinical research globally.<sup>294</sup> For publicly funded research, increasing emphasis is being given to patient involvement in setting research priorities and during the development of clinical trial design, planning, and implementation. To ensure that the specific needs of women with cancer are addressed, all parties involved in clinical research should ensure that women are involved at every level from planning to implementation, as partners and beneficiaries.

### Nurses in cancer research

Although women are under-represented in high-profile research such as clinical trials, they produce important

research in areas such as the lived experience of patients and caregivers throughout the cancer trajectory, symptom management, supportive care, palliative care, and health services. For interventional clinical trials in oncology, nurses (the majority of whom are women) do much of the behind-the-scenes work that is rarely captured or credited in published manuscripts of individual clinical research studies. As cancer clinical trials have increased in number and complexity, cancer research nurses have assumed roles in study coordination, patient education, advocacy, data management and reporting, and interdisciplinary coordination within the research team.<sup>295–297</sup> In a scoping review of 214 interventional studies led by cancer nurses and published between 2000 and 2016, 60% of these studies involved teaching, counselling, and guidance.<sup>296</sup> This finding reflects the vital role of nursing interventions in cancer care that might be undervalued in the traditional academic currency of grant funding and citations. Most literature describing nurses' roles in cancer research has been concentrated in nursing journals, perpetuating professional disciplinary silos and limiting reach.

The role of nurses in cancer research outside of Europe and the USA remains even more under-recognised. For example, in low-income and middle-income countries, nurses were the principal practitioners in Visual Inspection with Acetic Acid (VIA) efficacy trials and implementation studies globally but were rarely acknowledged as part of the research team or authors on publications. In a sample of 61 VIA studies included in our scoping review on nurses' role in cancer prevention in low-income and middle-income countries, only five (8%) of the manuscripts included nurses as the first author, only two (3%) as a senior author, and only seven (11%) included nurses as co-authors at all. Although the majority (89%) of manuscripts included authors from low-income and middle-income countries, only three manuscripts (5%) included nurses from these regions.<sup>298</sup>

We undertook a scoping review of nurses' roles in cancer prevention and early detection in low-income and middle-income countries<sup>298</sup> and found that much of the work that nurses do in community and primary care settings is under-reported in the published peer-reviewed literature. Among the 181 studies in 48 low-income and middle-income countries included in our review, most studies featured nurses' roles in educating patients and performing screening exams for cervical and breast cancer. Despite the emphasis on nurses' role as health educators and role models in their communities, relatively few studies focused on the role of nurses in primary prevention of cancer, through diet or exercise counselling, tobacco cessation counselling, or administering the HPV vaccine. A few studies mentioned nurses' roles in identifying barriers to cancer screening but otherwise did not acknowledge nurses' contributions to implementation, evaluation, or continuous quality improvement for cancer prevention programmes.

The role of nurses in cancer education, prevention, and the continuum of care is largely under-represented in global cancer organisations and cancer policies. It is often nurses (and also midwives) who bear the brunt of gender discrimination and who also bear witness to patients and their families in life's most challenging moments. To illustrate this reality, we present the story of Oumou Kassambara, a nurse working with Médecins Sans Frontières in Mali (panel 10).

### Women as research participants

Clinical trials historically excluded women to ensure homogeneity in treatment effect and reduce potential foeto-maternal harm.<sup>299</sup> Legislative efforts to address the inclusion of female participants have been successful; however, the continuous sex and gender inequalities in clinical research have had an enduring effect. Many drugs were approved before the inclusion of women in trials (eg, insulin and penicillin) and the perception that women do not want to participate in clinical trials remains a myth in modern medicine, fuelling gender biases so that many women are not given opportunities to participate in research studies.<sup>300</sup> In an analysis of more than 20 000 clinical trials in different medical fields from 2000 to 2020, cancer clinical trials had the lowest female representation proportional to each field's disability-adjusted life years.<sup>301</sup>

Sex-related biological differences in cancer biology and treatment effects can affect treatment outcomes, but remain poorly understood and under-researched. There are several examples of increased toxicity associated with chemotherapy and immunotherapy when using standard dosing regimens in women compared with men.<sup>302</sup> ESMO has set up a Gender Medicine Taskforce<sup>303</sup> aiming to raise awareness of the presence of potential sex differences in biology and treatment outcomes of non-sex-related cancers and the effect of gender on access to treatment, quality of life, and long-term consequences of tumour therapy.

The Sex and Gender Equity in Research (SAGER) guidelines were introduced in 2016 to encourage a more systematic approach to the reporting of sex and gender in research across disciplines.<sup>21</sup> The Enhancing the Quality and Transparency Of Health Research (EQUATOR Network) was begun in 2006 by the groups that developed Consolidated Standards of Reporting Trials and related guidelines for reporting. EQUATOR currently has 571 reporting guidelines, including SAGER. Despite global recognition of the importance of these guidelines by major publishers, barriers to systematic implementation of sex-based and gender-based analyses in research and reporting remain.<sup>304</sup> In our analysis of the top 100 cancer research journals (ranked by impact factor) at the time of writing only 28 specifically mentioned the SAGER guidelines and only 31 refer to gender in their information to authors section (appendix p 5).

### Panel 10: Oumou Kassambara's story, Mali—a nurse's reflections on the hardships of bearing witness and caring for patients with cancer

Pain is not just a condition that requires medical treatment; it is also an existential experience that calls for acknowledgement. In hospitals, with their institutionalised hierarchies and gendered divisions of labour, it is usually nurses who respond to the pain of those who suffer from cancer.

Oumou Kassambara has two children. She works as a nurse in a small cancer hospital in Bamako, the capital of Mali. Before joining the Médecins Sans Frontières oncology team, she spent time in other hospitals in the country, working in different wards. "In cancer there's one major difference, it's the suffering of the patients. It's not easy to work in oncology. I'm directly confronted with the pain of the patients, with their suffering."

Every day, Oumou looks after 15 to 20 patients in the wound dressing room. When she arrives at the hospital, she cleans the tables, arranges the equipment, and then calls the patients, who are often suffering with severe pain. Due to the pain, she has to administer morphine before she can begin with the dressing. It's hard work, it's often unbearable, because of the large wounds and the smell. "It's the smell really, the smell is sometimes... it's not easy, it's unbearable."

The organisation of labour in the health-care industry is deeply gendered in both low-income countries and high-income countries. Nurses often end up with work that is difficult, stigmatised, and devalued; work that is essential because it goes beyond the domain of medicine. Not surprisingly, the duty of being with the patient, of acknowledging the pain, can leave wounds in those who are doing the challenging everyday work of care.

"I have a lot of stories in my head", says Oumou. She remembers a 34-year old woman, with twins at home, who used to come to the clinic. "Sometimes when the patients come to the dressing room, I put on some music; they say that the music makes them feel comfortable. I chat with the patients. For the young woman we did the dressing almost every day because it was a big wound on the breast, metastatic. She started telling me about her twins. She asked me whether she's going to die and leave her children. I told her, 'You have to calm down. It will be fine.' The last day she came here, she was bleeding so much. I tried to do my best, but it was beyond me. We called the surgeons. They tried to stop the blood and I continued to do the dressing. But it didn't stop. She said to me, 'I'm going to die and leave my children, what am I going to do? You know that I'm going to die, but you don't tell me.' Then she took my hand. She was in the hospital until her... I left for home, but the whole team stayed that evening. She was screaming, the blood didn't stop until she died. She died here."

Nurses such as Oumou Kassambara are not only responding to the suffering of patients, they are also witnessing the death of people they have come to know. Cancer is a gendered disease, not least to the extent that the social consequences of a diagnosis can be harsher for women than for men. For example, it is well known that women with cancer are sometimes abandoned by their husbands. These women with advanced disease are living a life between a social death that has already occurred and a physical death that is about to happen. But in this liminal zone where social relationships fall apart, new ones can emerge in the time that remains. "Sometimes the patients are isolated people, and when they come to the hospital they consider us as if we were part of the family. When they see us, they tell us that they feel comfortable talking with us, chatting with us. They say it feels better here than at home."

### The unpaid cancer workforce

Unpaid care work contributes in essential ways to the wellbeing of societies and individuals.<sup>305</sup> Unpaid care is a part of the everyday life of most individuals, and includes the time spent cooking, looking after children, and of

course, taking care of those who are ill, including those with cancer. Around the world, women provide at least two and a half times more unpaid household and care work than do men, with the International Labour Organization estimating that 76·2% of all unpaid care work is provided by women.<sup>306</sup> In many regions of the world, caregiving has been feminised and women have been socialised into nurturing roles which, more often than not, go unrecognised by family members and by the health-care system.<sup>307,308</sup> A report from Women in Global Health estimated that more than 6 million women work unpaid or underpaid in health system roles at the community level.<sup>309</sup> Furthermore, the global value of women's unpaid work has been estimated to represent between 2·27% and 2·43% of global Gross domestic product (GDP).<sup>9</sup> However, a large proportion of unpaid care is not included in standard economic measures (such as GDP), implying that it has no economic value. This disproportionate contribution of unpaid work is at the heart of gender inequality and intersects with other structures of inequality such as race, disability, class, age, and sexual orientation.

Caring must be considered as a social determinant of health for women, because providing unpaid care, including for patients with cancer, exerts a substantial toll on the caregiver, particularly among those from marginalised populations.<sup>310</sup> Although the burden of unpaid caregiving affects women everywhere, the experience of unpaid care varies greatly not only between those in high-income countries and low-income and middle-income countries, but also between differing income groups within each country.<sup>311</sup> A survey done among caregivers living in high-income countries found that a fifth of them experienced negative consequences in their careers or had to leave their jobs, with a third of female caregivers (compared with 25% of male caregivers) experiencing pressure on their financial situation because of their choice to give care.<sup>312</sup> Furthermore, 57% of female unpaid caregivers did not feel supported in their role by governmental organisations, even in high-income countries. Unpaid caregivers might similarly carry a high burden of mental health disorders, financial toxicity, and loss of productivity, which could be compounded by the scarcity of public programmes aimed at mitigating caregiver burden.<sup>313–315</sup>

The intersectionality between caregiving and other social determinants of health among women also plays a role in the way in which the burden of care is distributed and experienced across regions and cultures. Women from disadvantaged socioeconomic backgrounds and those living in rural settings who are caring for a relative with cancer might also need to devote a substantial amount of time (up to 6 h per day) to other caregiving activities such as cooking, cleaning, or fetching water, since they do not have access to the resources needed to outsource those other chores.<sup>316</sup> Gender discrimination

within patriarchal structures also represents a factor which increases the burden of caregiving for women. The amount of time dedicated to caregiving is the highest in cultures and societies which designate caregiving as a woman's role, with many women starting caregiving at young ages, thus missing opportunities for education and employment.<sup>317,318</sup> Other populations, such as indigenous women and people of diverse SOGIE, are also more vulnerable to the burden of caregiving, and should be considered when creating policies and support programmes.<sup>319</sup>

### Valuing the unpaid cancer care provided by women

Unpaid caregiving affects women around the world and, as such, should be recognised and measured with a feminist perspective that not only considers its monetary value but also the effects of caregiving on women's autonomy and economic potential. One of the most pressing needs to reduce the inequalities in caregiving is an in-depth exploration and valuation of the duration and intensity of unpaid caregiving, as well as the interactions between paid and unpaid work.<sup>311</sup> Previous data show that the most common unpaid work roles globally include maternal and child health activities, nutrition-related education, hygiene and other household practices, and basic health-care utilisation and counselling.<sup>320</sup> Although some of these activities are motivated by altruism, which has intrinsic benefits, they also undermine women's economic rights, and could lead to an inappropriate health-care system dependant on unpaid labour.<sup>309</sup> Tools and research to measure unpaid care are crucial in order to implement public health policies to improve the life of women and to include an equal distribution of unpaid care work at the community and national policy level.<sup>316</sup> Measuring and valuing unpaid care and domestic work is a required indicator as part of the UN's SDG 5.4, and should be a priority for all governments. This is of relevance in the context of women and cancer, as the rapid rise in the number of people diagnosed annually in all countries will result in increased caregiving needs, which will need to be filled by both paid and unpaid caregivers.<sup>321</sup>

To close the evidence gap pertaining to unpaid labour in cancer, we estimated the value of unpaid care that women and men provide to patients with cancer in Colombia, Ghana, India, Mexico, and South Africa (appendix pp 6–7). The foundational data for this study come from a time-use survey of unpaid caregivers conducted through the National University of Colombia in Bogotá.<sup>322</sup> Results from this survey, which covered 145 cancer caregivers and 55 who provided care for other conditions, revealed a higher intensity of care provided for patients with cancer than for other care recipients. Time-use data for caregivers in Ghana,<sup>323</sup> India,<sup>324</sup> Mexico,<sup>325</sup> and South Africa<sup>326</sup> were sourced from the WHO Study on Global Ageing and Adult Health (SAGE) survey, and hours of unpaid care for cancer in these countries were estimated by collecting

For more on the SAGE survey see <https://www.who.int/data/data-collection-tools/study-on-global-ageing-and-adult-health#:~:text=WHO's%20SAGE%20is%20a%20longitudinal,Russian%20Federation%20and%20South%20Africa>



local figures for time contributed to caregiving, applying findings from the Colombian survey, and adjusting according to national cancer burdens and sampling differences between surveys.

We conducted an original analysis based on in-depth review of academic literature on unpaid caregiving, cancer caregiving, and quantitative methods for analysis of unpaid care. We employed the proxy good and opportunity cost valuation methods for our economic analysis. The proxy good method values unpaid caregiving according to the hourly wages of professional caregivers in each country, which are derived from market wage surveys and do not reflect gendered disparities in compensation. Calculations of opportunity cost value unpaid caregiving by assessing caregivers' earning potential according to their sex, education level, and field of work. By contrast to the proxy good results, opportunity cost estimations do reflect gendered pay disparities, as these values are derived from national surveys of income and earnings.

Opportunity cost and proxy good methods do not produce identical value estimates for unpaid caregiving, because they employ different and complementary perspectives on the value of this labour. Proxy good results can be interpreted as the social value produced by unpaid caregivers, whereas opportunity cost represents the potential earnings that caregivers forgo when they provide uncompensated labour. The estimated values of unpaid caregiving for cancer in each country as a share of national health spending are presented in figure 9. Other methodological details of our analysis can be found in the appendix (pp 6–7). The results reflect a high proportion of caregiving hours being provided by women. They are in line with previous studies but with some differences. The share of total caregiving hours contributed by women averaged 67·2% across the five national surveys, which is lower than figures from other studies, including the International Labour Organization's estimate of 76·2%<sup>327</sup> which defines caregiving broadly to include childcare providers, but is similar to the Global Valuing the Invaluable study featured in the *Lancet's* Commission on women and health report.<sup>9</sup> This 2015 report used minimum wage as a proxy value for unpaid health caregiving in Mexico, and found that 54% of the total value was provided by women (\$5·83 billion) compared with 46% provided by men (\$4·97 billion). In comparison, the present study uses the professional caregiver wages as a proxy value, finding that 58% of the value of unpaid cancer caregiving in Mexico is contributed by women (\$1·2 million) compared with 42% provided by men (\$0·9 million).

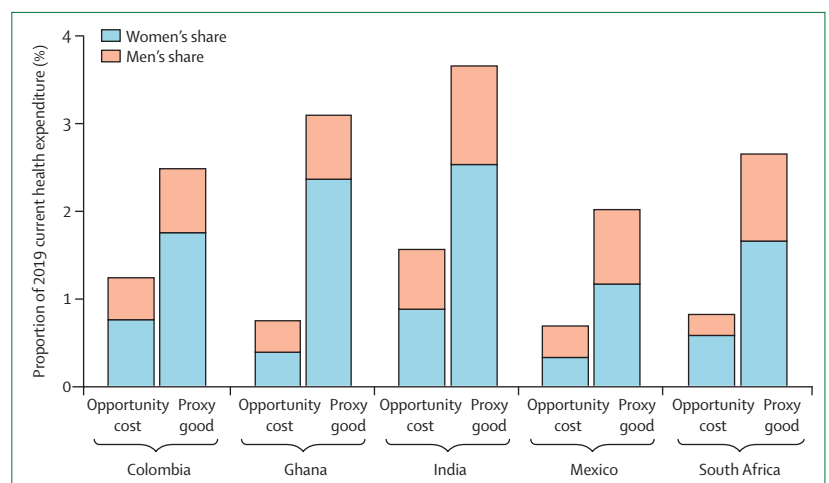
The proxy good method incorporates gender-equitable pay standards for professional caregivers, whereas opportunity costs are calculated on the basis of observed earnings for women and men with education levels and work history that are similar to the surveyed caregivers in each country, reflecting inherent inequities in the labour

market. As such, the proxy good method produces consistently higher estimates of the value of unpaid cancer caregiving by women compared with the opportunity cost method. Across the five countries, the proxy good method produces estimates of the value of unpaid cancer caregiving ranging from 1·17% of the national health expenditure in Mexico to 2·53% in India, whereas the opportunity cost method produces estimates between 0·39% of national health expenditure in Ghana to 0·87% in India.

These findings represent substantial value to the economy and highlight the need to establish fair and inclusive pay standards for cancer caregivers, as this unpaid labour is shown in the present study to represent a substantial proportion of the health economy in each country.

#### Effect of the COVID-19 pandemic on unpaid cancer care

The COVID-19 pandemic has had a profound effect on every aspect of everyday life, and unpaid caregiving is no exception. As with most caregiving-related issues, women have been substantially more affected by the pandemic than have men, particularly due to the ensuing economic fallout. In 2020, the UN published a policy brief which highlighted that, while men carried a higher burden of COVID-19-associated mortality, women were adversely affected through the reallocation of resources and priorities and by the increase in unpaid care work in the context of overburdened health-care systems.<sup>328</sup> The impact of lockdowns and of school closures has been particularly relevant for women, with women spending more unpaid time caring for children, homeschooling, and on household work.<sup>329</sup> Additionally, a substantial proportion of women became caregivers of patients with cancer during the pandemic, with cancer caregivers



**Figure 9: Estimated opportunity cost and proxy good values of informal cancer care as a share of national current health expenditure in 2019, by sex**

Data retrieved from Carreño Moreno and colleagues<sup>322</sup> and the WHO Study on Global Ageing and Adult Health (SAGE),<sup>323–326</sup> for the Commission analysis. SAGE is supported by the US National Institute on Aging through Interagency Agreements (OGHA 04034785, YA1323-08-CN-0020, Y1-AG-1005-0) and through research grants (R01-AG034479 and R21-AG034263). Demographic and time-use data from caregivers in these surveys informed calculations of opportunity cost and proxy good valuations.



## Panel 11: Examples of government efforts to support caregivers

### Uruguay's National Integrated Care System

In 2015, the Government of Uruguay instituted the National Integrated Care System (*Sistema Nacional Integrado de Cuidados*) to provide care for children and dependent populations with a gender-transformative approach.<sup>26,333</sup> The policy consists of the expansion of childcare services and the government-funded provision of home-based paid care (including home caregivers and telemedicine interventions). This programme aims to recognise, reduce, and redistribute unpaid caregiving to reduce gender gaps and empower women. According to the latest statistics reported by the Uruguayan Ministry of Health, more than 6000 people are currently provided care by paid caregivers hired through the system.

Direct support for unpaid caregivers represents a potential solution to improve their physical, mental, and financial wellbeing. Economic compensations for caregivers can be implemented through social insurance programmes, the provision of tax incentives, or the creation of family caregiver agreements leading to direct payments for caregivers.<sup>334</sup> Other options include non-monetary incentives such as mobile phones, improving access to income-generating activities, and providing social recognition.<sup>309</sup>

### Mauritius Carer's Strategy and Action Plan

Mauritius is a high-income African island nation located in the Indian Ocean with an increasing population of older adults. The Carer's Strategy and Action Plan was launched in 2010 to create a pool of formally trained caregivers and to provide basic training to unpaid caregivers to enable them to provide better care to their family members. Additionally, the programme intends to improve access to employment for unpaid caregivers and to provide a platform for caregivers to be included in decision making and policy planning.

To some degree, programmes to support cancer caregivers can be modelled on those developed for caregivers of people experiencing other chronic conditions such as dementia, including, for example, the provision of information, training, and disability benefits for both the caregiver and the person receiving the care. However, consideration of the unique features that distinguish the cancer caregiving experience from caregiving for other chronic conditions, including the more intensive and complex nature of care, the increased financial toxicity associated with cancer, and issues associated with surveillance and fear of recurrence is essential.<sup>335</sup> At the institutional level, programmes should promote shared models of care that include caregivers, clinicians, and patients working as a single decision-making unit.<sup>336</sup> Multicomponent interventions aimed at improving caregiver wellbeing, including psychoeducation, skill building, supportive therapy, psychological care, and integrative medicine, should be further studied across various settings to provide evidence of their feasibility and implementation.<sup>337</sup> At least two systematic reviews have shown that, although many interventions have been designed, existing evidence is of low to moderate quality, and few interventions have the necessary components to bridge the gap between research and practice, particularly in resource-limited settings.<sup>338,339</sup>

An example of a national plan intended to directly support caregivers is the caregiver strategy implemented by the government in Mauritius.<sup>340</sup>

being significantly more likely than non-cancer caregivers to report negative effects of COVID-19 on their emotional, physical, and financial health.<sup>330</sup> Investing in public childcare systems, essential infrastructure, and in social protection schemes for women can help close the gender gap for all caregivers, including those of patients with cancer. Furthermore, such investments can not only improve the livelihoods of caregivers, but also produce

additional payoffs such as improved child health.<sup>331</sup> A good example of such a policy was the implementation of the National Care System of Uruguay, which was the first initiative in Latin America to comprehensively address paid and unpaid care, and the Mauritius Carer's Strategy and Action Plan<sup>332</sup> (panel 11).

Lama's story below demonstrates not only the unique differences and challenges in providing care for a child with cancer versus an adult (her husband) with cancer, but also reveals the added complexities for families affected by cancer in settings where health systems have limited or no caregiving support programmes (panel 12).

## Embedding gender competencies in the education and training of health professionals

The health workforce is entrusted with providing competent and equitable care for women across the cancer continuum. WHO<sup>341</sup> and the 2010 *Lancet* Commission on health professional education in the new century<sup>342</sup> called for the adoption of competency-driven education that is responsive to the local context and population needs. Over the past 10 years, competencies for professional work have increasingly become accepted as the optimal outcome of health professional education,<sup>343</sup> and focus on structural competencies as trained abilities to discern the social determinants of health and their effect on disease diagnosis, treatment, and ultimate outcomes has increased.

The recognition that sex-specific and gender-specific issues require focused attention for optimal care delivery has been articulated in the 2006 WHO call for the integration of gender competencies into the curriculum in both pre-service and professional training.<sup>295</sup> Proposed competencies range from demonstrating an understanding of the differential impact of gender on health outcomes and health services delivery, to utilising a gender lens in providing evidence-based care.

Successful integration of gender competencies into the curriculum would require an intersectional feminist praxis. Although there is no uniform feminist approach to health professional education, several strategies have been proposed to apply feminist theory to medical education. Drawing on the work of Malika Sharma,<sup>344</sup> applying feminist theory can enhance gender responsiveness in oncology education in the following four possible ways. First, the what: understanding gender issues in medical curricula through a feminist approach that incorporates an intersectional lens. This involves the development of competencies and learner assessment tools in gender-responsive medical education and overall educational programme evaluation utilising a gender lens. Second, the who: feminist analyses of the lived experience of health professional trainees in the clinical learning environment. Examples include gender hierarchy among teaching faculty and in training institutions, as well as addressing sexual harassment, microaggressions directed against female faculty and trainees, and the overall hidden curriculum<sup>345</sup> that perpetuates gender stereotypes. Third,

the how: adopting feminist pedagogical approaches in structural competencies and interprofessional education and addressing the prevailing dominance of biomedicine and male-centred diagnoses and treatments. Finally, the why: to promote innovation in gender-responsive medical education and interrogate current practices to determine outcomes, continuity, and processes for quality improvement.

Adopting a culture of feminist critical inquiry, a shared global learning approach, and creation of communities of practice in health professional education are the prerequisites for producing a gender-competent workforce in cancer care to meet the WHO 2030 workforce goals,<sup>346</sup> SDGs, and to improve cancer outcomes across the continuum.

Inspired by feminist approaches to medical education, and synthesising our Commission findings with the current macrotrends in medical education of the increasing adoption of competencies in health professional education—with particular attention to structural competencies—we propose adoption of a curated set of gender competencies for the cancer workforce, which can be tailored to the specific context, workplace, and health-care workers (eg, oncology nurses, oncology physicians, and community health workers; figure 10). These competencies are grouped into domains according to the broad themes that have been raised in the course of our work. They are intended to function as a guide for training programmes and for future research and evaluation of health workforce performance. Enabling strategies include integration into the curriculum utilising innovative pedagogic strategies, faculty development and assessment of trainees in gender competencies, as well as training programme evaluation and incorporation of gender competencies into accreditation standards, while making low-income and middle-income countries equal partners in the cancer workforce gender competency discourse. Additionally, enhancing and maintaining these competencies across the career continuum through well planned professional development activities is essential; a task that is best carried out by professional organisations in collaboration with academic institutions and civil society cancer organisations.

## Summary

Building on the recommendations of the *Lancet's* Commission on women and health to recognise, count, and value the work of women,<sup>9,309</sup> gender-transformative policies are required to achieve gender equity, balanced leadership, and professional development opportunities in diverse workplace settings and cancer control organisations. Additionally, gender bias and discrimination in cancer research and knowledge production can be addressed by ensuring equitable access to leadership opportunities and research resources. Integrating an intersectional gender-responsive competency framework into the education

### Panel 12: Lama's story, United Arab Emirates—a mother looks after her child

Lama is a 37-year-old Lebanese–Australian woman residing in Dubai with her husband and two children. She had a successful professional career as a consultant for social development initiatives, which she put on hold since her 4-year-old son was diagnosed with acute lymphoblastic leukaemia at age 2 years. Unfortunately, this is not her first experience caregiving for a loved one affected by cancer. She took care of her belated first husband who was diagnosed with stage 4 Ewing Sarcoma. "It's a difficult journey... emotionally painful."

Even though she describes similarities between these two experiences, she has found that taking care of a child is more challenging. With her husband, she could talk to him and find out how he was feeling. "But with kids, it's not the case, they sometimes don't know what they are going through or are not able to express themselves." Another important difference is the patients' level of understanding of their disease and treatment. She has struggled to be able to explain things to her child so he would understand why sometimes they need to stay in the hospital, or why other family members are not allowed to visit him. An additional strain is getting a child to take oral medications that do not exist in liquid form or, even worse, that taste awful. "He was only two and giving him medication was really hard. We started by crushing them and mixing them with other foods. Trying to pin a child down and shove medications in his mouth, that is already traumatising, besides the whole experience. We then learned from other parents that 3-year-old kids were swallowing pills, we tried it and it worked like magic."

The greatest challenge throughout Lama's caregiving experience has been "to make medical decisions without having any medical background". Her son did not reach remission after the first month and there was a medical debate on how to treat him. She and her husband researched 15 global specialists, whose opinions were split: "The doctor was confused, we were as confused, and we were expected to decide... as caregivers we have the responsibility to track everything... you have to think all the time of ten possible questions, always have the answer, and on top of all that decide what medication should be given to the child. It's a lot to handle."

When taking care of her belated husband, they were living in Australia, and were supported by a social worker for anything they needed. "I really appreciated having someone we could go back to for advice anytime, someone who was objective, confidential, and not a family member." She has not found this kind of support in Dubai. "I only have two kids, I always think about families who have more than two kids, how do they juggle? And life, and jobs, and relationships, and insurance, where if you don't have insurance, you don't have medical treatment, if you don't have a job you are not allowed to stay in the country, and this all has a ripple effect on the entire life of the human being, and not only one aspect which is taking care of the child who is going through the treatment. And then on top of everything, we, as parents of immunocompromised children, are physically and psychologically isolated."

Her personal experience and identification of these gaps motivated her to create a social enterprise called Abtaluna ("our heroes" in Arabic) to connect and support caregivers of kids affected by cancer, most of whom are women. "Mothers put themselves last when it comes to their children, especially if they are sick. They don't even put themselves on the list of priorities. It's also the expectation. I have learned the hard way to take care of myself. I have an amazing husband and family members who have been very supportive. We have lost friends along the way but gained others." Additionally, she wrote a children's book entitled *Super Kids*, to raise awareness about childhood cancer. "There are no positive takeaways from these experiences, only hope. I have found there are many people who want to support, and I am moved by this. My goal in life is to live a life of purpose."

Provision of care	Workplace and cancer professional team	Health disparities	Policy, quality, and health system issues
<ul style="list-style-type: none"> <li>• Reproductive health and cancer: pregnancy, menopause, and oncofertility</li> <li>• Sex-specific cancer biology, along with pharmacodynamics and pharmacokinetics (toxicity and treatment response)</li> <li>• Prevention: counselling in gender-appropriate risk reduction, including vaccines, lifestyle changes, and genetic testing</li> <li>• Guideline concordance: ensuring women receive evidence-based care</li> <li>• Sexual health: addressing women's sexual concerns during and after treatment</li> <li>• Cancer care for people of diverse sexual orientations, gender identity, and gender expression</li> <li>• Patient-reported outcomes: monitoring of toxicity and psychosocial stresses of cancer treatment in women, especially young adults (aged 15–39 years), women older than 65 years, and women from under-represented minorities</li> <li>• Effective communication with patients, awareness of provider-patient power asymmetry</li> <li>• Addressing barriers compounded by provider-patient discordance across gender and race</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding gender inequities in the workplace, academia, and organisational leadership</li> <li>• Understanding the role of implicit bias and microaggressions</li> <li>• Understanding gender occupational segregation and hierarchies</li> <li>• Adopting interprofessional education and team-based learning in professional development activities</li> </ul>	<ul style="list-style-type: none"> <li>• Recognising proportion of women working in the informal sector, resulting in increased vulnerability to catastrophic spending and financial hardship</li> <li>• Impact of culturally specific gender norms and health beliefs on health care of women with cancer and their caregivers</li> <li>• Understanding the intersection of gender and race</li> <li>• Understanding sexual and gender minorities' unique challenges in access to diagnosis and treatment</li> <li>• Recognising misdiagnosis, mistreatment, and harm due to structural factors and social determinants of health such as poverty and migration status</li> <li>• Understanding the equity gap in global oncology between high-income countries and low-income and middle-income countries and the importance of decolonising global oncology</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding the disproportionately male control over decision making regarding health policies and budgets</li> <li>• Describing how systemic biases, implicit and explicit, influence accessibility and quality of health care</li> <li>• Contributing to a culture of quality improvement: adopting quality performance indicators for evidence-based gender-responsive care and effective communication</li> </ul>

**Enabling strategies for the short term:** adoption of the framework by major organisations such as The Union for International Cancer Control and WHO and incorporation into their policies and position statements; activism and dissemination through mainstream cancer knowledge platforms (journals, professional conferences, and other activities) to create culture change in health professional education; and creation of open access online cancer gender competency modules in collaboration with regional professional cancer organisations and academic institutions to facilitate incorporation into the curriculum.

**Figure 10: Gender competencies for the cancer workforce**

Proposed set of gender competencies for the cancer workforce in four overlapping domains: provision of care; workplace and cancer professional team; health disparities; and policy, quality, and health system issues. These competencies are to be tailored and incorporated into the curriculum of cancer health professional education. Adoption of these competences can be enabled by innovation in pedagogy, sound assessment strategies, faculty development, and creation of communities of practice. Following graduation from training programmes, these competencies are to be maintained by professional development activities and life-long learning across the career continuum of health professionals; a shared task for accrediting and licensing bodies in collaboration with academic institutions and civil society cancer organisations.

and training of the global cancer workforce is essential to ensure high quality and respectful care for all, across the cancer care continuum. We must strengthen current and future research to drive the acknowledgment of the contribution of women to cancer care and address barriers to counting and valuing women in the cancer workforce. Governments should implement fair labour standards including leave benefits, help with childcare, financial assistance, and return-to-work programmes for women living with cancer and their caregivers, which identify and address their economic, social, and cultural needs. Finally, pay standards for cancer caregivers that are fair and inclusive and account for historical disadvantages faced by women and other marginalised populations must be established and implemented.

## Section 5: cancer economics through the lens of feminism

Disparities in social status and access to resources and wealth can put women at an economic disadvantage when facing cancer, whether as patients or as care providers. Despite the myriad ways women's lives are affected by cancer, standard calculations of the global economic cost of cancer do not include the value of many

of the household and societal roles and contributions of women. Although microeconomic evidence pertaining to women and cancer will be crucial for developing a feminist economic agenda for cancer investment, corroborating research is sparse.<sup>7</sup> This section outlines some conceptual and empirical steps to emphasise the economic implications of cancer and its effects on women living with and beyond a cancer diagnosis.

In this section, we focus on values, both as translated into policy declarations and through economic measurement. Health is one of the things most highly valued by people, but is difficult to quantify. Standard economic tools that rely on market indicators do a poor job of valuing health, yet quantifying what we value in health can help society to prioritise and bring those values to light.<sup>347</sup> This weakness in standard economic valuation is exacerbated when gender is considered, because the work that women do often takes place outside the formal market and even the market-based wages paid to women are distorted by discrimination.<sup>348</sup> The previous section addressed economic contributions that women caregivers provide to those living with cancer, and demonstrated the value that the market would place on unpaid cancer caregiving. In this section,

we present three additional ways in which society's priorities concerning women and cancer can be measured: (1) through policy declarations in national cancer control plans; (2) through investment cases that establish benefits and costs of investing in women and cancer to inform priority setting; and (3) through quantifying the economic burden placed on women living with cancer and their households.

We begin with a short primer on the main principles of feminist economics, the approach that guides our understanding of society's valuation of women and cancer. Feminist economics is well established as an alternative to the neoclassical paradigm that dominates contemporary economic thinking, and is especially relevant to women's roles in health care.<sup>349</sup> The neoclassical paradigm relies on strong assumptions—such as full information available to producers and consumers, free movement of goods and labour, and balanced market power—to analyse the economy. Feminist economics<sup>350</sup> arose within the profession in the 1990s to provide a framework for and encourage discourse on the relationship between gender and the economy. The primary contribution of this feminist approach is to encourage a more inclusive perspective on economic activity, especially that which takes place beyond the market, such as women's unpaid work. A core analytical tool of feminist economics is power dynamics, which allows consideration of how disparities in power over economic resources affect outcomes. An example is wage gaps between men and women. Feminist economics scholars have noted that specific activities that relate to reproductive functions of women—namely, raising children, caring for older people, meal preparation, and household maintenance—are increasingly marketised, which allows women greater opportunities in the labour market.<sup>351</sup>

Some principles of feminist economics that are especially germane to our discussion in this section concerning women and cancer are as follows. First, labour includes market-intermediated and non-market-intermediated paid and unpaid work. This includes reproductive (ie, pregnancy and childbearing) and caring work. Second, understanding household economics—and the power imbalances within households—is just as important as understanding economic policies and macroeconomic results. Third, the gender-blindness of macroeconomic aggregates and GDP need to be scrutinised and made context relevant. Fourth, individuals are embedded in social and economic structures and do not act homogeneously as “homo economicus”. Finally, the underlying structure of inequality within the household and in the labour market has produced a double burden on women. Recognising this reality and correcting it is a major political demand of feminist economics.

### Women and national cancer control plans

The WHO Global Action Plan on non-communicable diseases<sup>352</sup> urges national governments to set up

country-specific non-communicable disease plans to move towards the path of achieving SDG target 3.4: reduce the premature mortality from non-communicable diseases by a third by 2030.<sup>2</sup> UICC describes National Cancer Control Plans (NCCPs) as a government's “strategy [document] to set cancer control priorities, or the actions the country should take, for the prevention, diagnosis, treatment, palliation, survivorship care, data collection and monitoring of cancer”. As mentioned earlier in this Commission, the 2017 World Health Assembly resolution on cancer prevention and control urged countries to develop and implement NCCPs that are inclusive for all age groups, adequately resourced, and have components of monitoring and accountability.<sup>3</sup> Since then, there has been a sharp increase in the number of countries with NCCPs, from 77 countries in 2000 to 121 countries in 2023, according to the web portal of the International Cancer Control Partnership (ICCP), a group of international organisations engaged in cancer control planning efforts. Romero and colleagues<sup>353</sup> systematically analysed NCCPs for 158 countries to understand their strengths and limitations. They analysed these plans for 11 domains across the cancer care continuum, focusing on prevention, early detection, treatment, service delivery, and health workforce. However, consideration of gender, equity, and human rights was not included in the evaluation. Therefore, we undertook an analysis of selected NCCPs, including countries from all WHO regions and World Bank income groups, to assess the degree to and ways in which they incorporate principles of equity, human rights, and gender responsiveness in the plans, including cancer control strategies and interventions, and to identify gaps and strengths that can inform the conclusions and recommendations of the *Lancet* Commission on women, power, and cancer.

We conducted a literature review to identify relevant feminist and intersectional frameworks that could be applied in the context of cancer (appendix pp 4–5). Considering its comprehensiveness and applicability in a decision-making context in health policy, we selected Innov8 as the base framework for our analysis and adapted it using components from the other relevant frameworks.<sup>354</sup>

Using the adapted Innov8 checklist,<sup>354</sup> we utilised step 1 (ie, the Diagnostic Checklist) to analyse the content of NCCPs. From all the countries included in Romero and colleagues' study,<sup>353</sup> we selected a subset and applied the adapted Innov8 framework. For the subset, we selected from each WHO region the two countries with the highest age-standardised mortality rates for women (all cancer sites), and whose NCCP met the following inclusion criteria: (1) the full document was available in the ICCP portal; (2) was the most recent version of the NCCP; and (3) was published in English or an official English translation.

Control plans for non-communicable diseases or for cervical cancer, or older versions of NCCPs were

For more on the **International Cancer Control Partnership** see <https://www.iccp-portal.org>



excluded. From the shortlist created using the criteria, we looked at World Bank income levels to determine the final NCCPs for evaluation to ensure that all income levels were represented. 12 countries were selected for analysis, including two countries from each of the six WHO regions. The final list included Malawi and Kenya (African Region), Canada and Jamaica (Region of the Americas), Bhutan and Sri Lanka (South-East Asian Region), Croatia and Ireland (European Region), Qatar and Sudan (Eastern Mediterranean Region), and Papua New Guinea and Guam (Western Pacific Region). Our thematic analysis primarily aimed to identify gaps and opportunities for consideration of gender, equity, and human rights, with a focus on vulnerable populations. We conducted an in-depth analysis focused on identifying similarities and differences within regions and across countries and income levels. We also drew a comparison of our findings with an exemplar country, New Zealand, which covered all principles of being equity-led, knowledge-driven, outcomes-focused, and person and Indigenous community-centred.

Although several NCCPs named priority populations such as children and adolescents, people living with HIV, indigenous people, and rural communities, priority populations were not explicitly mentioned in nine of the 12 NCCPs in our analysis. These nine NCCPs did include sex-disaggregated data on cancer incidence, mortality, and risk factors and identified interventions to address the most common cancers for men and women. For women, the focus was mainly on HPV vaccination, breast cancer screening, and cervical cancer screening. However, a more thorough consideration for the social determinants and gender norms, roles, and relations that influence a patient's experience of cancer was lacking in all 12 NCCPs. Although some NCCPs included equity, universal coverage, and gender sensitivity as guiding principles, they did not include clear and measurable targets to address issues of equity and gender. For example, women who must balance competing responsibilities of household work, childcare, and jobs outside the home might find it difficult to adhere to cancer prevention and screening activities, which require separate visits to a health facility.

An example of a country which has advanced cancer care equity for patients through their NCCP is New Zealand, a high-income country in the Western Pacific region. New Zealand's Cancer Action Plan for 2019–29<sup>355</sup> has four main goals, one of which is equitable cancer outcomes: "The Government has a strong focus on achieving equity of outcomes and contributing to wellness for all, particularly Māori and Pacific peoples. The Ministry's definition of equity underpins this plan: in Aotearoa New Zealand, people have differences in health that are not only avoidable but unfair and unjust. Equity recognises different people with different levels of advantage require different approaches and resources to get equitable health outcomes."<sup>355</sup>

Noteworthy in the New Zealand NCCP is the attention to the Māori, an Indigenous population comprising approximately 17% of the population, who have lower participation in breast and cervical cancer screening programmes than do the general population. The NCCP aims to reduce this disparity and achieve equity, especially for Māori women. Achieving health equity, particularly for Indigenous people, is a strong focus of the NCCP, given that they have the poorest health status in the country. In terms of gender, the plan specifically assesses cancer burden, risk factors, and interventions for Indigenous women.

Compared with New Zealand, none of the 12 selected countries in our analysis appeared to consider gender norms, roles, and relations that influence access to cancer health services and the individual's experience of cancer. The plans also excluded measurable targets for equity, including gender dimensions. Our analysis suggests that among efforts that policy makers can take to reduce cancer health disparities and to advance equity, governments can ensure that national cancer planning and implementation takes into account the unique political, social, cultural, and economic contexts within which women live. Incorporating gender, equity, and human rights into national cancer policies and plans can play an essential role in reducing global and subnational cancer health disparities for all.

### Gender considerations to better inform national investments for cancer control

National investment cases for diseases in general have proven to be useful advocacy and evidence-based tools to prompt resource mobilisation and encourage programme implementation.<sup>356</sup> They have been used to inform investments in HIV and AIDS, tuberculosis, and malaria; reproductive, maternal, newborn, and child health; non-communicable diseases; mental health conditions; neglected tropical diseases; tobacco control; and other health needs.<sup>357</sup> Investment cases are born of a desire to make strategic and well-informed decisions about how to use limited resources when faced with competing demands for funding. As such, an investment case for cancer provides useful information that can be used to promote greater investment in cancer control and treatment.

We first show an example of a cancer investment case prepared by Kenya's national cancer programme to advocate for additional resources for breast and cervical cancer control, as these are leading causes of preventable cancer deaths among women in Kenya. Following this, we offer an example of how feminist economics framing might be used to inform a gendered investment case for cancer, which to our knowledge has not been undertaken or published. In the subsections that follow, while we do not offer actual results of a gender-sensitive cancer investment case, we show conceptually how this approach could be used to estimate differential effects on women and men with colorectal cancer in Peru. We



focus on how investment case methods would be altered if gender is considered.

### **Kenya's investment case for cervical and breast cancer control**

Investment cases for health use a societal perspective that draws attention to the connections between good health and other societal, economic, and environmental goals.<sup>358</sup> With support from the World Bank and Access Accelerated, Kenya's Ministry of Health developed an investment case for cervical and breast cancer prevention and control.<sup>359</sup> The purpose was to produce an assessment of the return-on-investment for priority control actions for women's cancers and, if the results were sufficiently positive, draw greater investment to this agenda. We summarise the results of Kenya's study here to illustrate how the outputs from an investment case can be used to mobilise support for cancer control generally, and for cancers that predominantly affect women.

Breast and cervical cancers cause one in four cancer deaths among Kenyans, with a total of more than 6000 deaths recorded in 2020.<sup>360</sup> Moreover, in 2020, Kenyan women experienced more deaths from cancer than did men (age-adjusted mortality rates 76·2 vs 51·7 for all cancers combined).<sup>360</sup> Because many of these women present with late-stage cancer, thus incurring high costs of treatment and reduced life expectancy, the Kenya Ministry of Health expressed an interest in expanding the reach of its prevention efforts alongside scaled-up treatment for both cancers.

For women with breast cancer, a cost-benefit analysis was done that compared the potential for early diagnosis versus scale-up of population-wide screening. Similarly, the costs and benefits of different HPV vaccination delivery strategies were assessed and compared to indicate whether school-based, facility-based, community outreach, or a combination of delivery strategies would provide the greatest return on investment. Finally, the investment case estimated the reduction in the number of women diagnosed with cervical cancer due to scaling-up HPV vaccination and calculated the economic benefits. The investment case showed a return of US\$2·3 for every dollar spent on the recommended breast and cervical cancer prevention and treatment strategies over 40 years, producing a net economic benefit of 350 million Kenyan shillings (\$2·6 million). A large portion of the economic benefit arises by monetising the value of the 395 000 lives saved over those 40 years. The value to society of the additional years, reduced illness, and greater productivity combine to produce a compelling case for scaling-up and accelerating prevention and care for women at risk of these two cancers.

### **Shifting to a gender-sensitive cancer investment case: an example from Peru**

We suggest that a feminist economics perspective is more suitable than standard neo-classical economics for

conducting investment cases involving women and cancer. Feminist economics highlight the values embedded in economic choices, especially those that relate to how women function in the world as consumers and producers. The data used to build an investment case and the collection of that data—from whom and in which manner—are value-laden choices in economic analyses. Investment cases, similar to almost all other economic analyses, rely on economic assumptions and data that reflect a society's values as expressed in the marketplace, and which might be distorted by regulation, discrimination, and other power imbalances.

The Kenyan breast and cervical cancer investment case used non-sex-disaggregated data and assumptions about women's productivity based on formal employment, along with other standardly measured economic data. Specifically, analysts use average income, wages, employment rates, and productivity measures to analyse the economic activities and outcomes of interest in society. Other standard inclusions of economic evaluations are price indices and national income measures (eg, GDP) that imply how value is created in society.<sup>361</sup> Investment cases monetise labour force gains from avoided mortality, labour force exit, morbidity, and health-care expenditure, and assess the economic and social value of these gains. An inclusive, feminist approach accounts for the sex differences in employment, wages, labour force participation, and in performing unpaid domestic and care work, as these could shift the labour force gains of the investment case.

In recommending a broader view of what is—or should be—measured as economically productive, feminist economics allows us the opportunity to apply the disciplinary tools of economics while demonstrating that it is important to recognise non-market roles in society. With this in mind, we provide some general steps towards creating an alternative gender-sensitive investment case, using the example of colorectal cancer, a non-sex-specific cancer that affects women and men in several important ways.

Colorectal cancer is increasingly prevalent in Peru, an upper-middle income country in South America where colorectal cancer is among the top five most frequently diagnosed cancers in men and women.<sup>362</sup> The age-standardised colorectal cancer incidence and mortality rates for women and men are similar (11·6 cases per 100 000 men vs 11·1 cases per 100 000 women, and 5·9 deaths per 100 000 men vs 5·3 deaths per 100 000 women).<sup>1</sup> To understand how a gendered investment case for colorectal cancer would differ from a non-gendered approach, we first describe the experience of screening and treatment for colorectal cancer, which can differ by gender. Following this, we suggest alterations in the investment case methods, focusing on data used, that would more accurately reflect the benefits and costs of cancer prevention and care for women and men.

There are important gender differences in the sensitivity and efficacy of colorectal cancer screening methods,<sup>363</sup> which include stool-based occult blood tests and the fecal immunochemical test, and direct-visualisation tests such as colonoscopy and flexible sigmoidoscopy. Stool-based occult blood tests appear to be less sensitive in women (sensitivity of 47·6% in men vs 30·7% in women),<sup>364</sup> due at least in part to their lower sensitivity<sup>365</sup> in detecting right-sided colon cancer, which is more common among women.<sup>366</sup> Women are more likely than are men to have incomplete colonoscopies,<sup>367</sup> which is believed to be related to longer (and more often redundant) colons compared with men.<sup>366,368</sup> A study of more than 900 patients showed that female sex was the only independent factor associated with significant discomfort during colonoscopy.<sup>369</sup>

Attitudes towards colorectal cancer screening can also differ by gender, with women reported feeling intense embarrassment in front of medical professionals, anxiety over perforation injuries, and notably, bodily intrusion. A previous history of sexual abuse has been cited as a potential barrier to colonoscopy, particularly among women.<sup>370</sup> Women are also more likely to prefer a female endoscopist, and to wait for an endoscopist with whom they are familiar, factors that might result in delayed or deferred screening.<sup>371</sup> Greater distance from an endoscopy facility, transportation, and finding a companion to go

home with post-procedure have been cited as barriers to screening,<sup>372</sup> as is lower income and unemployment.<sup>373</sup> Health insurance coverage and routine doctor's visits, which are partly a function of health benefits provided by employers, can also affect colorectal cancer screening rates.<sup>374</sup>

Although the unequal distribution of health facilities and services and rural–urban differences in travel time to a health facility affect women as well as men in Peru, socio-economic, gender, and ethnic discrimination are more likely to prevent women from accessing care, particularly women in settings and contexts that render them structurally marginalised, such as poverty and indigeneity.<sup>375</sup> Women face more precarious and vulnerable employment conditions,<sup>376</sup> which means they are less likely to have formal work arrangements that allow them time off for health checks, safety nets and social protections such as health insurance, and sufficient savings to protect themselves against financial toxicities that often accompany cancer.

### The concepts behind a gendered investment case

Gender differences in employment, wages, labour force participation, and unpaid domestic and care work are apparent in Peru. More women are unemployed than men, and the employment to population ratio is 30% lower for women than for men.<sup>376</sup> On average, women earn 22·4% less than do men per month.<sup>377</sup> Notably, women spend more than twice the number of hours on unpaid work,<sup>378</sup> and almost three times the proportion of their time on unpaid domestic and care work than do men.<sup>379</sup> Because these gender differences are not usually accounted for in an investment case, labour force gains from investment in cancer control will be underestimated when standard, non-gender-differentiated methods are used. For example, given the greater proportion of time women spend doing unpaid domestic and care work that impacts their families and communities, it could be expected that the economic and social value of gains from avoided morbidity, mortality, labour force exit, and health expenditures by women would be higher in a gendered investment case.

Given sex differences in biopsychosocial conditions and economic contributions, investment cases must consider gendered factors to maximise health benefits and economic gains. For colorectal cancer, investing in screening methods that women are amenable to might be worthwhile, given their concerns about pain and bodily intrusion and their preference for female providers. Barriers to care that disproportionately affect women must be accounted for, such as vulnerable employment and unpaid domestic and care work, which consequently lead to less time and resources for health care. Finally, policy makers and health economists must consider the far-reaching impact of investing in interventions that cater to women, given their important role in families and communities. Standard and

	Typical data source	Sex-specific data source
Disease and risk factor prevalence by age, population at risk, incidence, and cases	Global Burden of Disease; UN Population Division; National surveillance data	Global Burden of Disease, UN Population Division, and National surveillance data all provide sex-disaggregated data
Interventions, including projected and current coverage	Data from Ministry of Health cancer control programme	Not available, except for cases in which a registry is available or by examining patient records with small samples
Intervention costs, including provider time, instrument, travel time for provider visits, out-of-pocket costs, access to funds, and informal employment	Literature review and calculations to adjust for year and currency	Not available, but could be gathered with a time-and-motion study of providers in clinical settings
Early mortality and morbidity, including examination of health seeking behaviours, follow-up for patients with positive screening tests, and adherence to recommended treatment	UN Population Division; Global Burden of Disease	International Agency for Research on Cancer and WHO have sex-disaggregated cancer mortality rates and disability-adjusted life years by sex; Global Burden of Disease
Health-care expenditure, and whether cost of care varies between women and men	WHO literature review for disease-specific spending	Not available, but could be gathered through surveys
Employment, including employment rate, women's and men's wages, absenteeism, and presenteeism	International Labour Organization; literature review	International Labour Organization provides average wages for men and women; not available from literature
Value in the household, including time used for unpaid work, including caregiving, for women and men	NA	Not available, but could be estimated using national surveys of male and female time expenditure

NA=not available.

**Table 1: Comparison of data needed for standard versus gendered investment cases**

alternative data for development of a gender-sensitive investment case for colorectal cancer are presented in table 1.

### The microeconomic effect of cancer in women

Often neglected in the process of establishing national priorities for investment is the effect of cancer on women and their families. Women living with cancer face unique challenges and financial needs that create high out-of-pocket expenditures for non-health costs such as transportation, childcare, and household help. They also face challenges in accessing medical aids and supportive care items (eg, breast prosthesis, wigs) and social welfare support.

The unequal status and earning power between men and women might translate to unequal purchasing power and decision making within households, including decisions regarding access to diagnostic investigations and cancer care for women.<sup>380</sup> Beyond diagnosis, differences in clinical factors such as in cancer sites and stages at diagnosis, immune mechanisms, drug metabolism, and responses to cancer therapies—when combined with the fact that women with cancer also tend to report a poorer quality of life and higher psychological distress<sup>381</sup>—might require them to undergo additional therapies or prolonged management, potentially contributing to higher costs of care.

Previous studies on the economic effect of cancers in women have largely been focused on breast and cervical cancers.<sup>382</sup> Moreover, such analyses are narrow, highlighting direct medical costs in tertiary care settings, while leaving out indirect and opportunity costs that affect women and their families. Evidence on out-of-pocket costs, particularly related to non-health expenses, spending on complementary medicine, and the effect of cancer on financial wellbeing at the household level, is sparse.

To gain detailed insights on the microeconomic effect of cancer in women, we undertook an original analysis of data from the ASEAN Costs in Oncology (ACTION) study.<sup>383</sup> Briefly, the ACTION cohort comprises adults who were newly diagnosed with cancer between 2012 and 2014 in 47 centres from two upper-middle income countries (Malaysia and Thailand) and six lower-middle income countries (Cambodia, Indonesia, Laos, Myanmar, Philippines, and Viet Nam) in South-East Asia.

The diverse health-care financing in the region includes tax-funded public financing, a national social health insurance scheme, and private health expenditures (out-of-pocket spending and private health insurance).<sup>384</sup> Adults who were newly diagnosed with cancer (within 12 weeks before recruitment), aware of their cancer diagnosis, and willing to participate in follow-up interviews were invited to join the study. Study participants were given cost diaries at baseline to record illness-related payments that were directly incurred by patients and their families, and not reimbursed by

insurance. Data on out-of-pocket expenditures were collected according to three categories of costs: (1) medical costs (costs related to conventional health care), (2) non-health costs (eg, transportation, childcare, lodging, or domestic help), and (3) complementary medicine (therapies that were not part of conventional medicine). The cost diaries were reviewed at the 3-month and 12-month follow-up interviews. Additionally, sociodemographic details, including age, sex at birth, marital status, highest education attained, annual household income, and ownership of health insurance were also collected. Participants were also prompted on their experience of economic hardship, defined as inability to make necessary household payments, at baseline and during the 12-month follow-up interviews. Clinical details including cancer site and cancer stage were retrieved from medical records. Further details of the study have been previously published.<sup>383</sup>

Our original analysis of the ACTION study included data from 3285 women who were newly diagnosed with cancer at various sites including breast, cervical, ovarian, head and neck, colorectal, and lung cancers, as well as haematological malignancies, and survived at least 12 months of follow-up. The proportion of total out-of-pocket expenditures incurred in the 12-months following cancer diagnoses over the overall annual household income was calculated. Overall, we found that women spent a median of 80·2% (IQR 24·7–199·4) of their overall annual household income on cancer-related costs in the 12 months following diagnoses, which amounts to a median of \$2285 (IQR 997–4557). Significant differences were observed by country income group; those from lower-middle income countries spent a median of 161·2% (IQR 70·7–329·7), while women from upper-middle income countries spent a median of 30·3% (11·6–80·2) of their annual household income on cancer-related costs over 12 months from diagnoses (Mann-Whitney *U* test,  $p < 0·0001$ ). Spending patterns were derived by calculating the share of out-of-pocket expenditures spent on medical costs, non-health costs, and complementary medicine from total out-of-pocket expenditures, respectively, and compared by household income, cancer site, and cancer stage. Women from low-income households spent a higher proportion (55·5%) of their overall out-of-pocket payments on non-health expenditures following cancer than did their counterparts from higher-income households (40·6%) in the year after their cancer diagnoses. Spending patterns also differed by cancer site and stage. Compared with other cancer sites, women with lung cancer reported the highest overall out-of-pocket spending (median \$3273 [IQR 1964–5559]), amounting to 78·1% of their annual household income, with close to half of these expenditures having been made for medical costs. Although women with de novo stage 4 cancers also reported the highest overall out-of-pocket expenses compared with women with early-stage cancers and haematological cancers, the costs were attributed to

non-health expenses (52·6%) and complementary medicine (5·8%). Further details on our methodology and data for this original analysis of the ACTION study are presented in the appendix (pp 7–8).

In our analysis, almost three quarters of women newly diagnosed with cancer in the study reported catastrophic expenditures in the immediate year following diagnoses, having spent 30% or more of their annual household income on cancer-related expenses. Spending patterns leading to the observed financial catastrophe tended to vary by country income group; in lower-middle-income countries, where universal health care was not available, medical expenditure served as the major cost driver. In upper-middle-income countries, non-health expenses and complementary medicine were also noted to be important cost drivers. Notably, women from low-income households were vulnerable to catastrophic expenditures attributed to all three types of out-of-pocket costs (medical costs, non-health expenses, and complementary medicine).

The ACTION study only considered the direct costs of cancer, not the indirect costs. Women might also be disproportionately affected in terms of coping financially in the survivorship phase,<sup>385</sup> due to underlying economic inequalities between men and women in society, such as in workforce participation, wages, formal sector employment, and ownership of assets.<sup>348</sup> These economic inequalities can be further accentuated by lack of health insurance, poor access to social programmes and financial assistance,<sup>386</sup> and illness-related challenges in the workplace (including stigma and discrimination, loss of earnings, loss of job, or delayed return to work).<sup>387</sup> Although it is acknowledged that data from the ACTION study were collected in 2012–14, we believe that our findings remain relevant. The COVID-19 pandemic dealt a severe blow to the health systems in ACTION study countries, where there has been little progress in health-care financing for cancer control,<sup>388,389</sup> which was overshadowed by a reallocation of resources to address COVID-19.<sup>390,391</sup> Moreover, the socioeconomic status of women might have been particularly affected by the pandemic,<sup>234</sup> due to soaring unemployment rates as well as loss of income, especially among those in the informal workforce.<sup>392</sup> The microeconomic effect of cancer on households of women with cancer (as demonstrated through the ACTION study) serves as a conservative estimate for low-income and middle-income countries in general.

Because women are often faced with unique economic challenges and financial needs, gender-responsive interventions, such as financial navigation programmes, can be part of the solution to address financial toxicity related to cancer.<sup>385,386,393</sup> Financial navigation programmes differ from traditional financial counselling programmes by proactively reaching out and developing comprehensive plans to meet each patient's unique financial needs,<sup>394</sup> and might include: systematic screening for financial distress

using validated tools; connecting patients to available financial resources (within the health system and the community); navigating the application process for financial aid from governmental and non-governmental sources; navigation to patient assistance programmes; and assistance to obtain payouts or reimbursements from private insurance companies.<sup>395</sup>

The pioneering financial navigation programmes have shown some success in reducing the financial effect of cancer-related costs, as well as its associated psychological distress among patients and their families.<sup>394–396</sup> Financial navigation programmes can be integrated into existing patient navigation programmes or established as a standalone programme within the health-care institution or in the community. Although programmes in the USA typically include dedicated personnel,<sup>395</sup> this might not be feasible in lower-resourced settings. So far, the literature on programmatic effectiveness from other countries is sparse,<sup>397</sup> but is beginning to emerge from several countries, including in South-East Asia.<sup>385,398,399</sup> Gender-responsive financial navigation programmes could connect women with available community resources to alleviate non-medical financial stressors following a cancer diagnosis, such as for care of dependents, household help, food, and mortgages.<sup>385</sup> Similarly, return-to-work programmes can be tailored to meet the needs of women, as gender is an important predictor of return to work after cancer.<sup>400</sup>

## Summary

This section shows that neglect of women's distinctive circumstances in standard policy and economic analyses of cancer produces a distorted vision of priorities that is perpetuated in influential policy documents, such as NCCPs and investment cases. Differences between women's and men's economic opportunities—as measured through standard economic concepts such as employment, wages, GDP, and financial security—create the illusion that the value of women's health and other contributions to society are less than those of men. We suggest that using sex-disaggregated data in investment cases can help reveal these differences, but this is yet to be done in practice. Beyond improving the data, we recommend the development and implementation of a feminist approach to cancer economics, to render a more holistic measure of the value of women's work, and to properly record the substantial losses felt by all when the health of women is undervalued. Structural inequities that are embedded in disciplinary methods can be exposed and replaced, and policy and data development will enable a more nuanced, intersectional analysis of health imperatives.

## Conclusion: a pathway to advance an equity agenda for cancer

Gender is a social construct that permeates and influences all aspects of our society. Gender inequality and health inequities are shaped by patriarchy and colonialism that

maintain and reinforce unequal power dynamics to the detriment of women and other marginalised communities, restricting their access to knowledge, decision making, and economic resources. Gender norms, roles, relations, and their intersection with other power

hierarchies influence women's exposures to known and unknown cancer risk factors and access to accurate health information and quality health services, and impacts their experiences with cancer, whether directly as a patient or indirectly as care providers.

	Priority actions	By which organisation?	Example of action and metric
Recommendation 1	Ensure data on sex, gender, and other sociodemographic factors are routinely collected and publicly reported in cancer-related data	International organisations, national and subnational governments, researchers, and research funders	Action: report sex-disaggregated data in all cancer statistics, including epidemiological and clinical or translational research outputs; metric: by 2030, all public reporting of national cancer statistics includes sex-disaggregated analyses for all cancer sites
Recommendation 2	Develop, strengthen, and enforce laws and policies that reduce exposures to known cancer risks for women	International organisations, and national and subnational governments	Action: implement existing international gender-responsive tobacco and alcohol policies (eg, Gender Responsive Tobacco Control, WHO 2018; Global Alcohol Action Plan 2022–30, Pan American Health Organization 2022); metric: by 2030, all signatories to the Framework Convention on Tobacco Control report sex and gender analyses of the effect of tobacco advertising and sponsorship on exposures
Recommendation 3	Research, monitor, and act on emerging cancer risks that disproportionately affect women, including occupational, environmental, and other factors	International organisations, national and subnational governments, researchers and research funders, and civil society	Action: conduct research on emerging cancer risks and hazards to women; metric: by 2030, all evidence syntheses such as systematic reviews on cancer hazards present disaggregated results by sex and gender in accordance with Sex and Gender Equity in Research guidelines
Recommendation 4	Design and implement gender and intersectional-transformative strategies to increase equitable access to early detection and diagnosis of cancer	International organisations, national and subnational governments, private sector, and civil society	Action: include early cancer diagnosis programmes that consider gender and intersectional transformative strategies at the sociocultural, health system, interpersonal, and individual levels; metric: all NCCPs published in 2025 and beyond include gender and intersectional transformative strategies in their early cancer diagnosis programmes
Recommendation 5	Co-create accessible and responsive health systems that provide respectful, quality cancer care for women	International organisations, national and subnational governments, private sector, and civil society	Action: engage partners to create strategies to provide quality cancer care for women in NCCPs; metric: all NCCPs published in 2025 and beyond include time-bound measurable indicators of gender and related dimensions of equity
Recommendation 6	Ensure equitable access to cancer research resources, leadership, and funding opportunities for women	International organisations, national and subnational governments, private sector, researchers, and research funders	Action: promote representation of women in cancer research, including academic and institutional leadership, authorship of publications, principal investigators of research grants, and editorial leadership in oncology journals; metric: by 2030, at least half of all senior editors and members of editorial boards of oncology journals are women
Recommendation 7	Develop, strengthen, and enforce policies that prevent gender-based harassment and discrimination in the cancer workforce	International organisations, national and subnational governments, and private sector	Action: create gender equity policies that include pay equity and paid parental leave in health-care facilities, research institutions, and other cancer organisations; metric: by 2030, all cancer organisations (ie, health-care facilities, research institutions, or cancer societies) develop and implement policies for paid parental leave
Recommendation 8	Integrate a gender competency framework into the education and training of the cancer workforce	International organisations, national and subnational governments, and private sector	Action: incorporate a gender competency framework into cancer workforce training curricula; metric: by 2030, all academic institutions offering oncology training (including medical, nursing, and allied health professionals involved in cancer prevention and care) ensure that trainees demonstrate understanding of gender competencies
Recommendation 9	Develop and validate a feminist economics approach to investment cases and other economic evaluations of cancer	International organisations, national and subnational governments, researchers and funders, and private sector	Action: recognise the full social values provided by women when developing strategies and studies; metric: a gender-sensitive reference investment case for cancer must be developed (eg, WHO Best Buys, UN Interagency Task Force for non-communicable diseases, World Bank) by 2025
Recommendation 10	Establish, implement, and enforce pay standards for all cancer caregivers that are fair, equitable, and inclusive	International organisations, national and subnational governments, and private sector	Action: measure the economic output of cancer caregivers; metric: by 2030, all countries include estimates and labour organisations (eg, International Labour Organization) report on the economic value of unpaid caregiving for cancer, and provide sex-disaggregated evidence in these reports

NCCPs=national cancer control plans.

**Table 2: Recommended actions from this Commission on women, power, and cancer**



To advance a more nuanced, inclusive, and gender transformative approach to the cancer field, we have endeavoured to reimagine the interaction between women and cancer, to explore and examine a relationship that is complex. We have proposed recommendations to level the playing field for health workers, whether they are health-care professionals or the myriad others working in the so-called informal sector, many who are forced to forgo paid employment to care for others with cancer at home (table 2). We have presented our findings and a set of priority recommendations that we believe are actionable in the immediate or intermediate term and which can inform specific metrics for tracking, evaluation, and monitoring over time. Finally, we have proposed a novel framework for cancer that is inclusive of the lived and diverse experiences of women of a gender-responsive health system, and of a more equitable cancer workforce and research ecosystem.

Our analyses were limited by the availability and nature of the source data. In the case of epidemiological data, our analyses depended on direct or estimated cancer registry data by country, that exist only for the binary male or female, or in other datasets, women and men. This is one of the reasons for our recommended action to ensure that cancer-related data on sex, gender, and other sociodemographic factors are routinely collected and publicly reported. Additional data limitations are the lack of sex-disaggregated economic data, which impairs understanding of the economic effect of cancer in women, and a widespread ignorance about how to value all of women's contributions to society, further underestimating the economic effect of cancer in women.

In the intersectional feminist approach, ethics of care and principles of participation and reciprocity are central. Ethical values of justice, beneficence, and participation must be considered from a gender and diversity point of view from the outset, not only in research but also in decision making about research questions and design, health policies, prevention, and care along the entire continuum, including psychosocial, occupational, financial, and other services and support systems that are often required for those living with and beyond cancer. This approach also challenges researchers, policy makers, and care providers to critically reflect on their positionality within the gender order and power hierarchies—with patients, peers, collaborators, and other stakeholders—and their influence on the design, processes, and outcomes of cancer research, prevention, and care. As we endeavoured to do throughout the process of producing this Commission, we invite all to apply reflexivity and consider one's positionality in the gender and social hierarchies throughout the research and health-care processes and acknowledge that scientific endeavours, regardless of the best intentions, can never maintain a pure objective stance.

We believe that this Commission will help to advance an equity agenda for cancer for the benefit of all.

## Contributors

We are a collective including 21 Commissioners, a 13-member advisory board, a seven-member patient advocacy committee, and ten mentees. We are diverse in gender, country of origin, migration status, and discipline. We are from countries across the globe, with expertise in cancer epidemiology, prevention, and care (which includes surgical oncology, gynaecological oncology, medical oncology, radiation oncology, oncology nursing, and primary care) in addition to health systems research, implementation science, health economics, and the social sciences including anthropology and gender scholarship. We have adopted a feminist approach to our collective work, including the way in which we collaborated as co-chairs, advisors, mentees, partners, and patient advocates. Early in the planning phase of the Commission, we reached consensus on a set of guiding feminist principles available on our website in its first iteration, which guided the work of the Commission. The following authors OG, VV, AMB, NB-P, FB, CC, NF, IF, NH, SH, IK, SK, EL, JM, MM, DM, RN, WKWS, ES-P-de-C, CDT, KU-S, and IS contributed to the conceptualisation and study design, analysis, and writing of the Commission. GA, JB, MTB, MABE, PSH, Y-CK, and SM contributed to the design of analytical methods, analysis, and writing of the report. OG, VV, and IS are the co-chairs for the Commission, and AMB, NB-P, FB, CC, NF, IF, NH, SH, IK, SK, EL, JM, MM, DM, RN, WKWS, ES-P-de-C, and KU-S serve as Commissioners. CDT also serves as the chair of the Patient Advocacy Committee. All authors confirm that they had full access to all data in the study and take responsibility for the decision to submit for publication.

## Declaration of interests

VV reports leadership or fiduciary roles in other board, society, committee or advocacy groups, paid or unpaid from the American Society of Clinical Oncology, European Society of Medical Oncology, African Organization for Research and Training in Cancer, *The Lancet*, eCancer, and JCO Global Oncology, and is co-editor of the *Translational Oncology* journal outside of the submitted work. NB-P reports receiving grants or contracts from Zuellig Pharma, Novartis, Pfizer Malaysia, AIA Sdn Bhd insurance company, and Pharmaceutical Association of Malaysia, outside of the submitted work. NB-P also reports receiving payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Novartis, Pfizer, and Roche; receives support for attending meetings or travel from Roche and the Pharmaceutical Association of Malaysia; reports participating on a Data Safety Monitoring Board or Advisory Board with Pfizer Asia Pacific, Malaysia; reports leadership or a fiduciary role in other board, society, committee, or advocacy groups, paid or unpaid with Together Against Cancer; and reports receipt of equipment, materials, drugs, medical writing, gifts, or other services from Roche Diagnostics, all outside of the submitted work. NF reports receiving consulting fees from Bristol Myers Squibb, Merck, Daiichi Sankyo, Neogenomics, Mirati, and Regeneron; and reports receiving payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from AstraZeneca, Janssen, and Novartis outside of the submitted work. SH reports leadership or a fiduciary role in other board, society, committee, or advocacy groups, paid or unpaid as President of GENDRO, a non-for-profit association that promotes the mainstreaming of gender in academic research and reporting practices. DM reports receiving grants or contracts from Astellas and Pfizer and reports receiving payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astellas, Janssen, Astra Zeneca, Bayer, Pfizer, Amgen, and Merck Sharp & Dohme outside of the submitted work. DM also reports support for attending meetings or travel from Ipsen, and reports participating on a Data Safety Monitoring Board or Advisory Board with Bayer, Janssen, and Ipsen, all outside of the submitted work. JB reports other financial or non-financial interests with Memorial Sloan Kettering Cancer Center (salaried as full-time postdoctoral research associate, supported internally by the Geoffrey Beene Foundation) outside of the submitted work. PSH reports other financial or non-financial interests with the National Institutes of Health, Center for Global Health (partial salary support through an Intergovernmental Personnel Act Mobility Program) outside of the submitted work. SM reports consulting fees for P-95 (based in Leuven, Belgium) outside of the submitted work. All other authors declare no competing interests.

For more on the women and cancer Commission see <https://womenandcancercommission.org/>

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