# Cancer Dashboard for Singapore – Gynaecological cancers

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THE SWEDISH INSTITUTE FOR HEALTH ECONOMICS
ENABLING INFORMED DECISION MAKING

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## Purpose

In 2023, the Swedish Institute for Health Economics (IHE), with support from MSD, launched an international initiative to facilitate the exchange of best practices in cancer care among European countries. This initiative, called "Cancer Dashboards in Europe", was developed in response to Europe's Beating Cancer Plan from 2021 and the need to translate political commitment into concrete action. Its objective was to produce country reports in a "dashboard" format, presenting in a comprehensive and visual way a selected set of key performance indicators across all areas of cancer care. These indicators make it possible to compare a country's current situation with target values defined in national cancer plans or by international organisations or values observed in other countries. In addition, the reports provide evidence-based recommendations to improve the situation in each context.

Since 2024, IHE has started to extend the cancer dashboard concept beyond Europe. This dashboard for Singapore focuses on the three main gynaecological cancers: cervical cancer, ovarian cancer, and uterine (endometrial) cancer. It seeks to identify gaps, benchmark performance, and support targeted actions to improve cancer care in the country. The report is designed to support policymakers in decision-making and in prioritising actions. The dashboard is intended to be a living document that can be updated as new data become available and expanded to include areas and indicators that become relevant as the national context evolves.

## Contents




**Prepared by IHE – The Swedish Institute for Health Economics**

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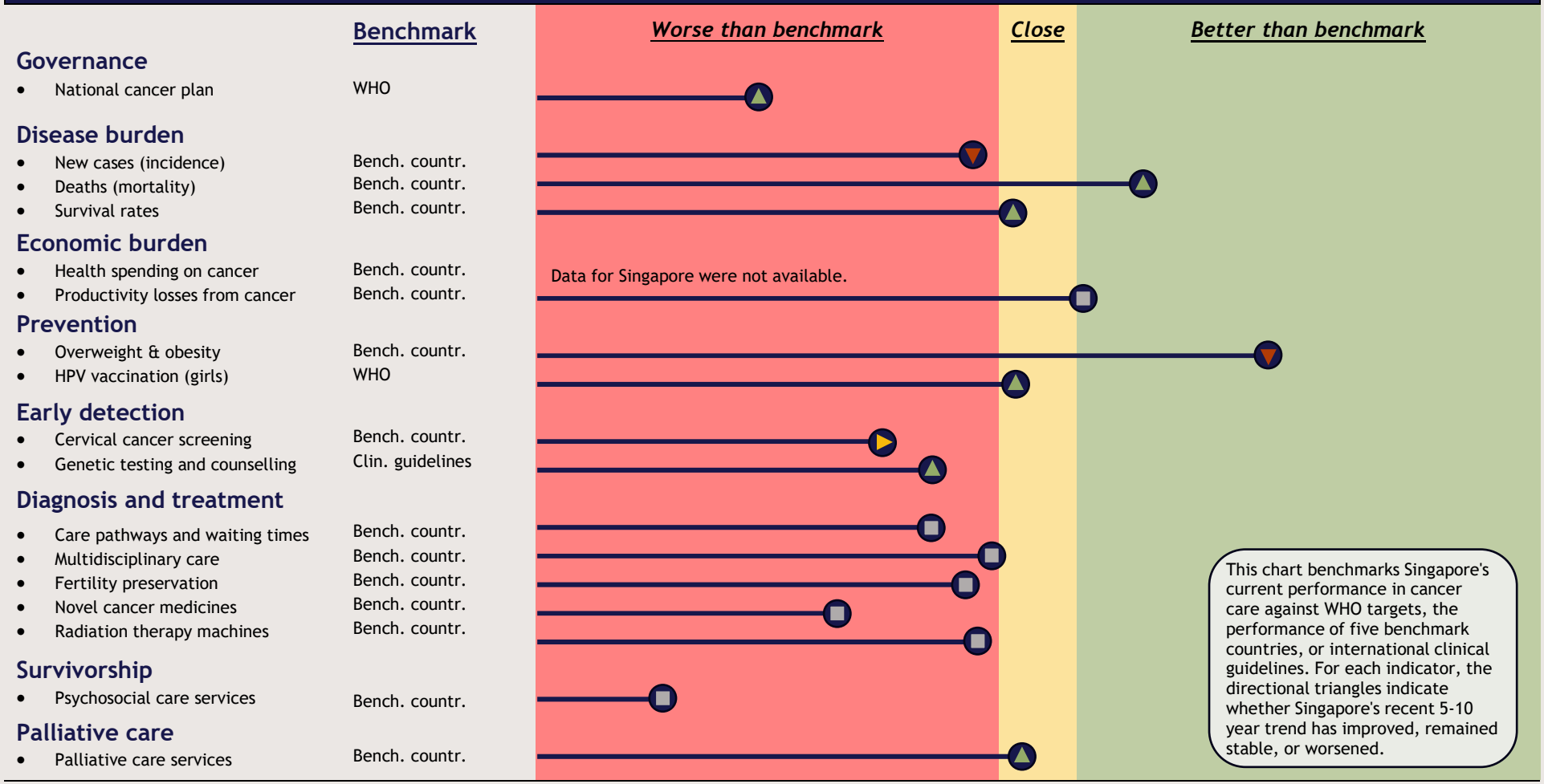
# Dashboard overview Singapore

## Comparative Performance: Singapore vs. Benchmark




*Legend:* ▲ Positive development, ▶ Stable development, ▼ Negative development, ▢ No data or not applicable

*Abbreviations:* Bench. countr. = Benchmark countries (Australia, Japan, South Korea, UK, US), Clin. guidelines = Clinical guidelines, HPV = human papillomavirus, WHO = World Health Organization.
*Notes*: All indicators are defined in % or per capita terms; see the main text for a detailed description and the Appendix for the exact definition used.

# High-level recommendations

## Governance

- ✓ Build on existing national cancer governance by considering a clearer implementation framework for "Singapore's Approach to Cancer", with defined objectives, responsibilities, and accountability.
- ✓ Consider increasing the visibility of gynaecological cancers within national cancer priorities by reflecting them more explicitly in targets and implementation plans.

## Funding

- ✓ Continue strengthening monitoring of cancer expenditure and economic burden, including direct, indirect, and informal care costs, to support cost-effective resource allocation and long-term planning.

## Prevention

- ✓ Build on existing prevention initiatives and public messaging by further highlighting modifiable risk factors for gynaecological cancers, particularly excess body weight, diet, and physical inactivity.
- ✓ Explore opportunities to further strengthen HPV prevention strategies, including the potential value of gender-neutral vaccination.

## Early detection

- ✓ Explore options to further improve cervical cancer screening participation, including through the piloting and evaluation of HPV self-sampling.
- ✓ Further strengthen risk-based early detection for women with inherited cancer predisposition.

## Diagnosis and treatment

- ✓ Continue strengthening national standardisation across the cancer care pathway and increasing transparency of performance indicators across institutions.
- ✓ Support timely and equitable access to high-quality treatment by ensuring that capacity, financing, and treatment availability evolve alongside standards of care.
- ✓ Further integrate supportive and patient-centred services into routine cancer treatment planning.

## Survivorship

- ✓ Build on existing psychosocial oncology services by developing national guidance and standardised referral pathways to promote consistent and personalised care across institutions.

## Palliative care

- ✓ Continue supporting implementation of the National Strategy for Palliative Care and strengthen timely public reporting of monitoring indicators to facilitate regular evaluation of progress and inform further action.

# Background

## IHE Cancer Dashboards

In recent years, cancer has gained greater priority on the international public health agenda due to its growing burden on mortality, quality of life, and health systems (1). In many countries, including Singapore, significant challenges exist due to population ageing and evolving technologies in all areas of cancer care. Although plans to strengthen cancer response exist in several settings, gaps often remain between the priorities defined in public policy and their effective implementation. Among the fundamental challenges are the limited availability of timely data and their evaluation, lack of practical tools to monitor progress, and difficulties in prioritising interventions according to societal value.

To help bridge this gap between policy and action, the Swedish Institute for Health Economics (IHE) has developed a series of Cancer Dashboards which are publicly available on IHE's website. The first dashboards were produced for several European countries, and this work has since evolved into a second generation of dashboards with a broader international scope and a more adaptable approach across different health systems. These dashboards provide a structured and intuitive overview of country performance in key areas of cancer care. By combining data, benchmarking, and evidence-based recommendations, they aim to support policymakers, healthcare professionals, and other relevant stakeholders in identifying progress, gaps, and priorities for investment and action.

## Gynaecological cancers

During the reporting period 2019-2023, 6,469 new gynaecological cancer cases were recorded in Singapore, representing 14% of all cancers diagnosed in women (2). Uterine cancer (also called endometrial cancer, although strictly speaking only about 90% of uterine cases are endometrial cancer and the remaining 10% uterine sarcoma) was the most commonly diagnosed gynaecological cancer, accounting for 53% of cases, followed by ovarian cancer at 29% and cervical cancer at 18%. Over the same period, gynaecological cancers cancer caused 1,527 deaths among women in Singapore, corresponding to 11% of all cancer-related deaths in women. Progress in survival since the 1990s has been relatively modest for gynaecological cancers compared with progress observed for other major cancers affecting women, including lung, breast and colorectal cancers. In 2019–2023, the five-year age-standardised relative survival rate was 73% for uterine cancer, 62% for cervical cancer and 45% for ovarian cancer (2).

Major opportunities - particularly through prevention, earlier detection, and more effective treatment - exist to reduce the burden of gynaecological cancers, although these opportunities differ by cancer type (3). For instance, uterine cancer is most strongly linked to overweight and obesity, whereas ovarian has a weaker link and cervical cancer no established link. Virtually all cases of cervical cancer are caused by persistent infection with human papillomavirus (HPV), while HPV does not cause ovarian or uterine cancer. An effective screening method suitable for population-based screening only exists for cervical cancer but not for ovarian and uterine cancer. Unlike cervical cancer, ovarian and uterine cancer cases may both include a hereditary component, making genetic counselling and testing relevant. The main treatment of all gynaecological cancers typically includes surgery to remove the tumour and nearby tissue and organs, which has negative implications for the fertility of women of reproductive age. Radiation therapy and cancer medicines are also widely used in the treatment of gynaecological cancer cases. Relatively few new medicines have been approved from the mid-1990s to 2020, but since then there have been more launches. Psychosocial care services and palliative care services are important for all gynaecological cancers, yet the former more for cervical and uterine cancer patients (due to their higher survival rates) and the latter more for ovarian cancer (due to its lower survival rate).

Beyond their clinical impact, gynaecological cancers also impose a substantial economic burden (3). A considerable share of this burden arises from - often overlooked - indirect costs, including productivity losses and premature mortality. Despite their significant and growing impact, ovarian and uterine cancers continue to receive disproportionately limited attention and public research funding internationally compared with other cancer types. This mismatch between burden and investment highlights an important gap in current cancer control efforts.

## Structure of the dashboard and choice of indicators

This report opens with an overview of Singapore's approach to cancer control. It then presents an analysis of the disease and economic burden of gynaecological cancers, specifically cervical, ovarian, and uterine cancer, highlighting their impact on patients, the healthcare system, and society more broadly. These contextual elements help establish the scale of the challenge and the need for coordinated national action. The report then examines the gynaecological cancer care pathway through the lens of the five pillars of "Singapore's Approach to Cancer". Taken

together, the dashboard provides a comprehensive picture of the current state of gynaecological cancer care in Singapore and helps identify key gaps and opportunities for improvement.

The dashboard is structured as follows:

- **Governance** (1 indicator): National cancer strategy
- **Disease burden** (3 indicators): New cases (incidence), deaths (mortality), survival rates
- **Economic burden** (2 indicators): Health spending on cancer care, productivity losses from cancer
- **Prevention** (2 indicators): Overweight and obesity, human papillomavirus (HPV)
- **Early detection** (2 indicators): Cervical cancer screening, genetic testing & counselling
- **Diagnosis and treatment** (5 indicators): Care pathways and waiting times, multidisciplinary care, fertility preservation, novel cancer medicines, radiation therapy machines
- **Survivorship** (1 indicator): Psychosocial care services
- **Palliative care** (1 indicator): Palliative care services

The starting point for the selection of indicators were indicators used in previous cancer dashboards by IHE, which originally were compiled by IHE for the European Cancer Pulse of the European Cancer Organisation (4). The initial selection was discussed with MSD Singapore, and the final selection also took into account local data availability.

For each indicator across the cancer care pathway, this report provides:

- A general explanation of its relevance and related governance approaches in Singapore
- A description of the current situation in Singapore, with international comparisons
- Recommendations for improvement and alignment with national and international targets

Data sources for all indicators are summarised in the Appendix. All data were drawn from publicly available sources. Whenever data are available, the comparative analysis incorporates international reference points, particularly other high-income countries in the region and beyond – Australia, Japan, South Korea, United Kingdom (UK), United States (US).

# Governance

In 2017, the World Health Assembly (the decision-making body of the World Health Organization, WHO) adopted resolution WHA70.12 on cancer prevention and control (5). It calls on governments to commit themselves to accelerating action against cancer. Specifically, it urges governments to develop and implement national cancer control plans that are inclusive of all age groups, that have adequate resources, monitoring and accountability, and that seek synergies and cost-efficiencies with other health interventions.

## *National cancer strategy*

Singapore does not have a standalone National Cancer Control Plan. Instead, cancer control is embedded within a broader national health strategy and is currently articulated through the Ministry of Health's 2026 report, Singapore's Approach to Cancer (6). The report presents a comprehensive framework for cancer control across five stages of the care continuum: prevention, early detection, cancer management, survivorship, and palliative care. This reflects a broader approach than in the past, moving beyond prevention, diagnosis, and treatment to also address the longer-term needs of people living with and beyond cancer. The overall aim is to reduce cancer incidence and mortality in Singapore, while improving quality of life and survivorship for people affected by cancer. The five key areas are:

- **Prevention**
    - The aim is to reduce exposure to preventable risk factors. This involves a mix of regulation, public health campaigns, and preventive services to address major contributors to cancer burden, including tobacco use, unhealthy diet, physical inactivity, alcohol consumption, and obesity. Vaccination also plays an important role, particularly through Singapore's national HPV vaccination programme for school-aged girls and routine hepatitis B immunisation. These efforts have been further reinforced through Healthier SG (Singapore's national preventive health initiative), which aims to embed prevention more firmly in primary care and support healthier lifestyles through regular monitoring and early intervention.

- **Secondary prevention (early detection)**
    - Efforts focus on improving outcomes through timely diagnosis of cancers for which screening is evidence-based and nationally supported. In practice, this means providing heavily subsidised screening for breast, cervical, colorectal cancers, while regularly reviewing recommendations to ensure they remain aligned with emerging evidence. The strategy also recognises that access alone is not sufficient, as screening uptake remains moderate, and therefore combines population-wide programmes with more tailored efforts to encourage participation among specific groups. In parallel, Singapore is exploring the role of genetic testing for hereditary cancer syndromes, which could help identify individuals at higher risk and enable earlier intervention.

- **Cancer management (diagnosis and treatment)**
    - The cancer management strategy aims to ensure that care is evidence-based, affordable, and accessible, while also becoming more holistic and community-oriented. It combines national clinical guidance, subsidised access to cost-effective therapies, and delivery through specialised cancer centres and public healthcare institutions. At the same time, it seeks to strengthen workforce capacity, expand supportive and rehabilitative care, and shift suitable services closer to patients' homes.

- **Survivorship**
    - Greater attention is given to life after treatment, with an emphasis on helping cancer survivors and their caregivers regain stability and maintain quality of life. This includes strengthening follow-up care, psychosocial support, rehabilitation, and peer support, while also expanding community-based services for those with ongoing needs. Shared care programmes for certain groups, particularly breast and colorectal cancer survivors, reflect efforts to improve continuity between specialist and primary care and to manage suitable cases closer to home.

- **Palliative care**
    - Recent policy efforts have centred on expanding capacity, improving affordability, and strengthening palliative care delivery in community settings. More broadly, palliative care is positioned within a supportive care framework that extends across the cancer journey rather than being confined only to the end of life.

The strengths and limitations of Singapore's approach are also reflected in a recent ANCCA review of cancer control strategies across 21 member countries (7). Singapore scored 11 out of 24 on cancer policy, equivalent to 45%. The review highlighted stakeholder involvement and the use of national evidence to inform planning as Singapore's strongest areas, while oversight arrangements, implementation planning, and budget inclusion were rated more moderately. However, lower scores for legal basis and plan type, together with no points for formal evaluation or public progress reporting, suggest that Singapore's cancer strategy remains less formalised than a standalone National Cancer Control Plan with explicit accountability mechanisms.

While Singapore's cancer strategy is designed to apply across the full continuum of care, gynaecological cancers are not given a distinct strategic priority in the current framework. Among them, cervical cancer is the most clearly represented cancer type, primarily through established public health measures such as HPV vaccination and subsidised screening. Ovarian cancer receives more limited attention, mainly in relation to the possible future use of genetic testing for hereditary cancer syndromes. By contrast, uterine cancer is not explicitly addressed. More generally, the sections on cancer management, survivorship, and palliative care are framed in broad system-level terms and do not identify gynaecological cancers as a specific focus for service development, care pathways, or outcome improvement. The examples provided under survivorship are also centred on breast and colorectal cancer rather than gynaecological cancers. Overall, this suggests that, although gynaecological cancers fall within the scope of Singapore's broader cancer strategy, they remain comparatively underrepresented, particularly ovarian and uterine cancer.

## Recommendations

- Formalise cancer control objectives within a dedicated national framework or equivalent implementation plan. Singapore has a clear five-area approach across prevention, early detection, management, survivorship, and palliative care, but a more explicit cancer control framework with defined objectives, timelines, and responsibilities could strengthen coordination and accountability.
- Make gynaecological cancers more explicit within national targets and implementation priorities. Singapore could define measurable targets or named initiatives specially for ovarian and uterine cancer.

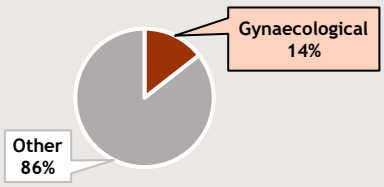
# Disease burden of cancer

During the reporting period 2019-2023, 44,751 new cancer cases in women were recorded in the Singapore Cancer Registry (SCR), excluding non-melanoma skin cancer (2). Of these, 6,469 were gynaecological cancers, corresponding to 14% of all cancers diagnosed in women. Uterine cancer was the most common diagnosed gynaecological cancer (53%), followed by ovarian cancer (29%) and cervical cancer (18%) (2). In the same period, cancer caused 14,146 deaths in women in Singapore (2). Gynaecological cancers accounted for 1,527 of these deaths, corresponding to 11% of all cancer-related deaths in women. Ovarian cancer was the leading cause of gynaecological cancer mortality (51%), followed by uterine cancer (26%) and cervical cancer (23%) (2).

Singapore had an estimated crude incidence rate of gynaecological cancers of 58 new cases per 100,000 women in 2024. This was slightly lower than in Japan (62 per 100,000), the UK and the US (59 per 100,000 each), but notably higher than in Australia (44 per 100,000) and South Korea (37 per 100,000) (8). Singapore had an estimated crude mortality rate of 14 deaths per 100,000 women, lower than in the UK (23 per 100,000), Japan (21 per 100,000), the US (18 per 100,000), and Australia (16 per 100,000), but slightly higher than in South Korea (12 per 100,000).

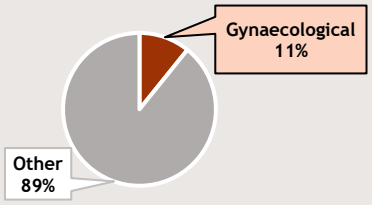
In Singapore, age-standardised incidence and mortality rates for gynaecological cancers have shown diverging trends over time. Between 1993-1997 and 2019-2023, uterine cancer incidence increased from 8 to 20 cases per 100,000 women, while cervical cancer incidence fell from 14 to 7 per 100,000 (2). Ovarian cancer incidence showed a more modest increase from 11 to 12 per 100,000 (2). During the same time, age-standardised cervical cancer mortality declined substantially, from 5.4 to 1.8 deaths per 100,000, while ovarian cancer mortality remained stable at around 4 per 100,000 (2). Uterine cancer mortality increased from 1.3 to 1.9 per 100,000 (2).

**Cancer incidence in Singapore in 2019-2023**
**Number of new cases among women: 44,751**



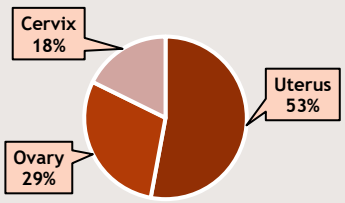

All cancers excluding non-melanoma skin. Source: SCR

**Cancer mortality in Singapore in 2019-2023**
**Number of deaths among women: 14,146**



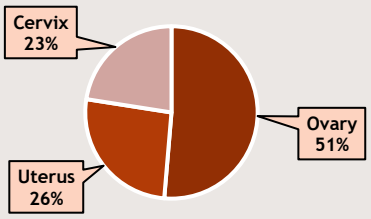

All cancers excluding non-melanoma skin. Source: SCR

**Gyn. cancer incidence in Singapore in 2019-2023**
**Number of new cases among women: 6,469**



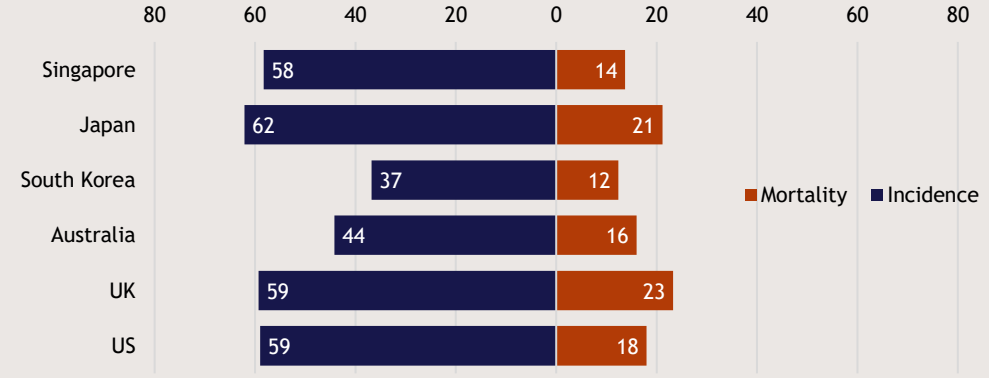

Source: SCR

**Gyn. cancer mortality in Singapore in 2019-2023**
**Number of deaths among women: 1,527**

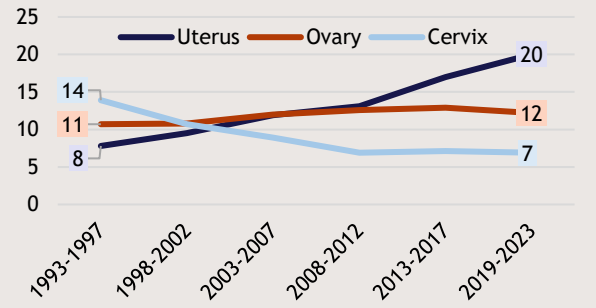



Source: SCR

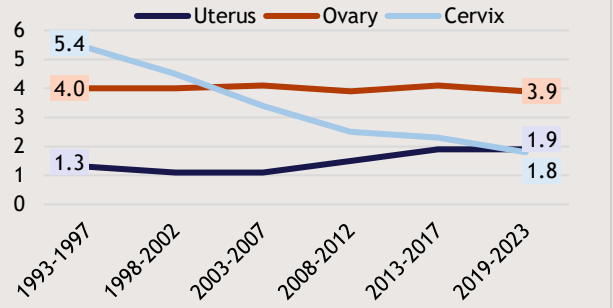
**International comparison of gynaecological cancer incidence and mortality per 100,000 women in 2024**




Notes: Crude rates per 100,000 women. Source: IARC



Age-standardised rates per 100,000 inhabitants. Source: SCR

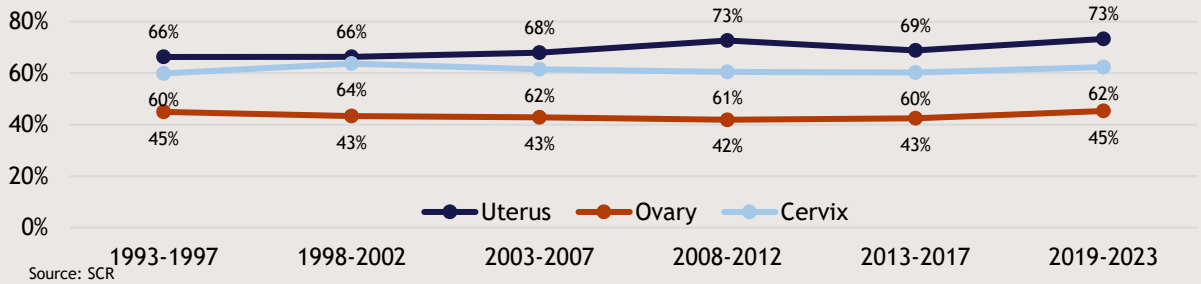


Age-standardised rates per 100,000 inhabitants. Source: SCR

In recent decades, progress in survival has been modest and uneven across gynaecological cancers in Singapore. Data from the SCR show that age-standardised five-year relative survival increased from 66% to 73% for uterine cancer and from 60% to 62% for cervical cancer between 1993–1997 and 2019–2023 (2). By contrast, ovarian cancer survival remained low at 45% in 2019–2023, with no improvement over time. Survival gains in gynaecological cancers over this period were smaller than those seen for several other major cancers in women, including lung, breast, colorectal, lymphoid, and pancreatic cancers. This mirrors trends observed in the European countries and the US (9, 10).

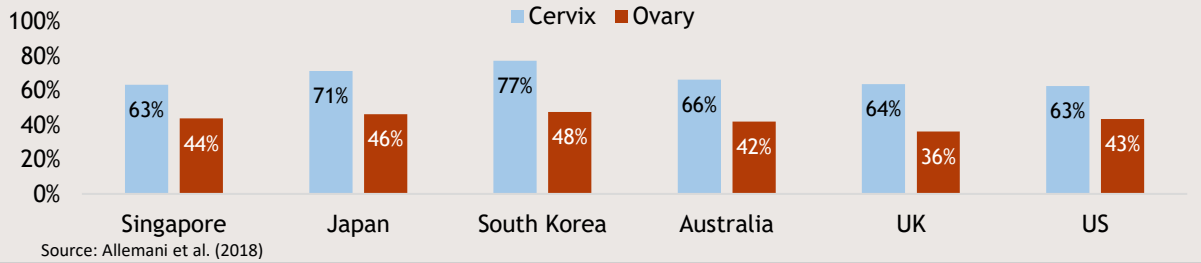
International comparisons of cancer survival are limited and largely based on outdated data. The most recent available estimates, from the CONCORD-3 study for patients diagnosed between 2010 and 2014, indicate that Singapore's five-year age-standardised relative survival for cervical cancer was lower than in Japan, South Korea, and Australia, and broadly similar to the rates reported in the UK and the US (11). For ovarian cancer, Singapore's survival rate was lower than in Japan and South Korea, but higher than in Australia, the US, and the UK.

**Trends in gynaecological cancer survival rates in Singapore**
(five-year age-standardised relative survival by cancer site and time period, women aged 15 years or older)



Source: SCR

**International comparison of gynaecological cancer survival rates in the diagnosis period 2010-2014**
(five-year age-standardised relative survival by cancer site and country, women aged 15-99)



Source: Allemani et al. (2018)

## Recommendations

- Build on the SCR's existing stage-at-diagnosis reporting by expanding public reporting of stage-specific survival across cancer types. This would support closer monitoring of progress in early detection and treatment outcomes.
- The SCR should strive to publish on a more predictable timetable. At present, the public release dates of the registry reports suggest that they are not issued on a fixed annual schedule.
- The SCR should add annual downloadable tables for site-specific incidence and mortality by sex, age, and ethnicity, beyond the 5-year rolling summaries. This would make it easier to monitor shorter-term changes.

# Economic burden of cancer

In Singapore, the overall economic burden of cancer is not well documented in publicly available sources. While the Ministry of Health (MoH) prioritises cancer care across the full continuum, from prevention and early detection to survivorship and palliative care, no national estimate of the total economic burden of cancer has been identified. As a result, the full burden of cancer in Singapore, including healthcare expenditure, productivity losses, and informal care, remains unclear. Evidence from the member states of the European Union (EU) helps illustrate the potential scale and composition of this burden: in 2018, healthcare expenditure accounted for about half of the total economic burden of cancer, while productivity losses represented just over one-third and informal care the remaining part of the total (12).

The economic burden of cancer consists of:

**Healthcare expenditure (direct costs):**

- Resources of the healthcare system (medical equipment, staff, medicines, etc.) funded both by public and private sources

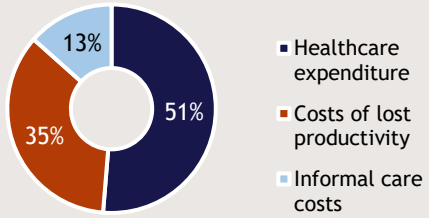
**Costs of lost productivity (indirect costs):**

- Productivity losses from absence due to sickness, permanent incapacity/disability, and premature mortality of working-age patients

**Informal care costs:**

- Value of the time forgone by relatives and friends to provide unpaid care

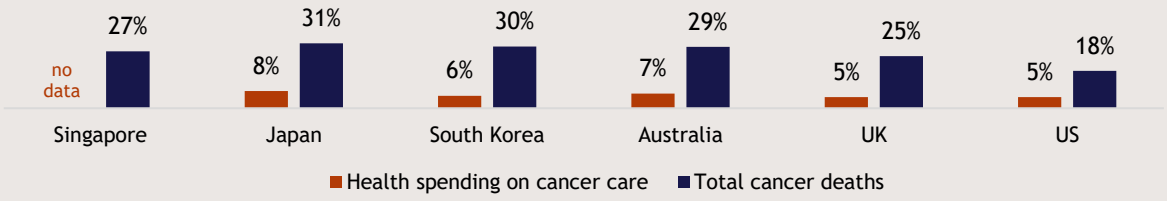
Composition of the economic burden of cancer in the European Union in 2018




Source: Hofmarcher et al. (2020)

A recent population-based analysis provides new evidence on direct medical expenditure associated with cancer in Singapore. Among people diagnosed with 15 common cancers, total first-year expenditure increased from SGD 135 million in 2005 to SGD 400 million in 2016, while mean first-year expenditure per patient increased from SGD 20,600 to SGD 36,200 (13). Initial treatment accounted for 50% of the direct medical costs captured in the study, while end-of-life care accounted for 35%. Expenditure grew particularly rapidly for stage IV cancers, highlighting the potential economic importance of prevention, early detection and timely diagnosis (13). Nevertheless, comparable data on total cancer care expenditure or cancer care expenditure as a proportion of total health spending remain unavailable for Singapore. International estimates show that cancer accounts for 5% to 8% of total health spending in benchmark countries (9, 14-18), despite accounting for 18% to 31% of deaths across these countries (9, 19).

Health spending on cancer care vs total cancer deaths by country

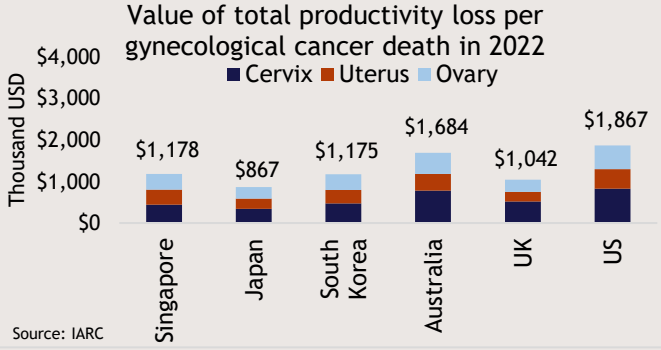



Notes: Cancer deaths as a share of total deaths were obtained from the WHO Global Health Estimates (2021). Total current health expenditure was obtained from the WHO Global Health Expenditure Database. Cancer spending data were obtained from CMS (US), AIHW (Australia), NHIS (South Korea), MHLW (Japan), and Manzano et al. 2025 (UK) from different years. See more in the appendix.

## Costs of lost productivity

In the absence of national estimates of the total economic burden of cancer in Singapore, productivity-loss indicators provide useful insight into one important dimension of the burden. According to 2022 IARC global estimates, the total productivity loss per gynaecological cancer death in Singapore was USD 1,178,000 (20). This figure surpasses the economic burden seen in the UK and Japan and aligns closely with South Korea, though it remains lower than the values for Australia and the US. Cervical cancer accounts for the largest share of this economic loss (37%), followed by ovarian cancer (32%) and uterine cancer (approximately 31%). Given that cervical cancer is largely preventable through HPV vaccination and regular screening, this large share points to a substantial and potentially avoidable

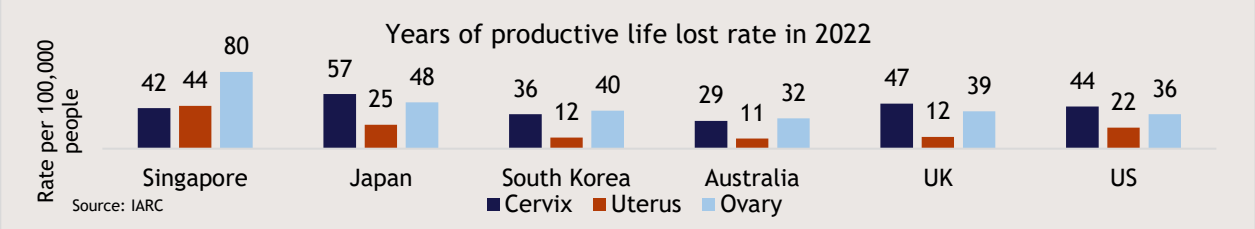
Value of total productivity loss per gynecological cancer death in 2022



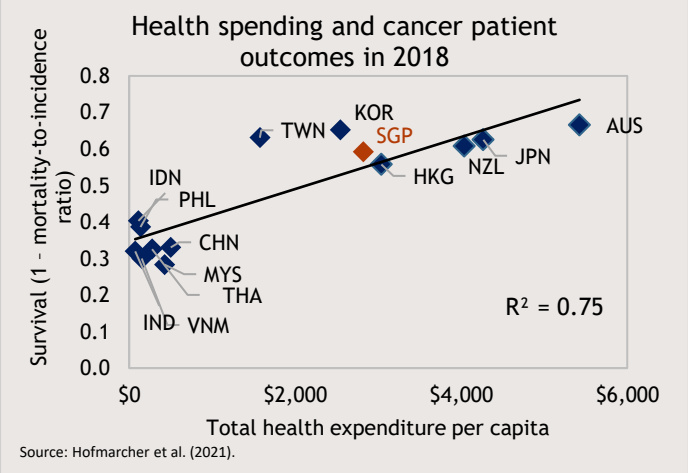

Source: IARC

economic burden. This indicator does not measure the total national burden of gynaecological cancers. Rather, it estimates the productivity loss associated with each death, capturing the economic value of both paid work and unpaid contributions, such as caregiving and domestic work. Cross-country differences therefore reflect not only mortality patterns, but also differences in wages, labour-force participation, and the valuation of unpaid activities (21). Even so, the magnitude of this value suggests that gynaecological cancer deaths in Singapore are associated with substantial losses of productive life, with important consequences for families and for the wider economy.

The number of years of productive life lost is also notable. Singapore's productive life loss rate for ovarian cancer (80 years per 100,000 people) and uterine cancer (44 per 100,000) is more than twice that seen in most benchmark countries. This suggests that gynaecological cancers in Singapore are generating a comparatively heavy societal burden through premature mortality and lost productive life years.




## Health spending on cancer care & survival rates




The ultimate aim of health spending is to improve patient outcomes, both in terms of survival and quality of life. The figure to the right offers a crude way of exploring the link between healthcare spending and patient outcomes across the Asia-Pacific region; see Hofmarcher et al. (2021) for clarification of methodology (22). The upward-sloping trend line suggests that countries with higher healthcare spending tend to achieve higher survival. In contrast, countries with low spending generally report lower survival. Singapore is positioned above the trend line, suggesting that survival outcomes are higher than might be expected based on spending levels alone. Several features of Singapore's health system may help contextualise this comparatively strong performance, including broad financial protection through public subsidies and national health insurance, subsidised cancer screening, and well-developed specialist cancer services. While this correlation does not imply direct causality, it aligns with global evidence showing that countries investing more in healthcare and cancer care tend to achieve better survival outcomes (23, 24). The scattered pattern in the graph also underlines that spending alone is not enough. Patient outcomes are shaped by how resources are allocated and used across the entire care pathway. Strategic prioritisation, such as early detection, timely diagnosis, and equitable access to effective treatment, is essential to translating spending into tangible survival benefits. Going forward, further gains in survival will likely depend on the broad adoption and expansion of effective technologies, many of which come at a higher cost. Health systems must therefore ensure that investments in cancer care are used in a cost-effective and outcome-oriented way. This means not only evaluating the value of new interventions but also identifying and addressing existing inefficiencies along the entire care pathway.

# Recommendations

- Build on the recent analysis of direct medical expenditure by conducting a comprehensive cancer cost-of-illness study that captures all cancer types and that also captures productivity losses and informal care requirements.
- Develop routine national reporting on cancer expenditure across the care continuum. The limited availability of comprehensive and regularly updated estimates of total cancer spending makes it difficult to assess the scale and composition of the burden, identify spending gaps, and prioritise resources effectively.
- While Singapore has already strengthened survivorship support (see governance), further expansion of national structured return-to-work services, rehabilitation, and employer engagement could help reduce productivity losses during and after treatment.
- Consider complementing existing health-economic assessments with broader societal impacts, such as productivity losses, patient time and caregiver burden, where robust evidence is available.

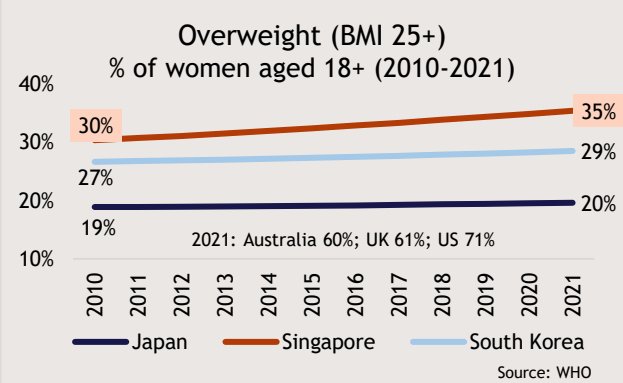
# Prevention
## Overweight & obesity

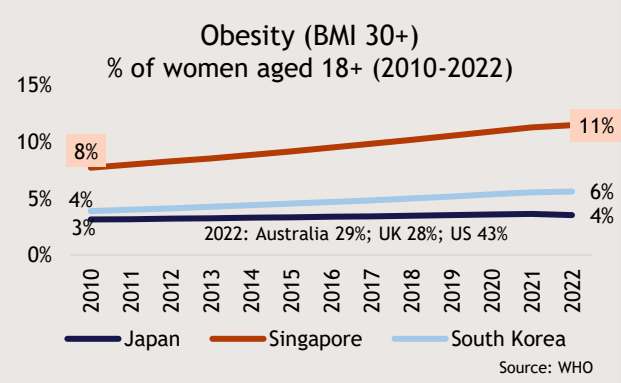
### Background

- Overweight (defined as a body mass index, BMI ≥25) and obesity (BMI ≥30) is a medical condition that increases the risk of several health conditions, including the development of 13 cancer types (25, 26). Globally, around 4% of new cancer cases are estimated to be attributable to high BMI (27). In the UK, excess body weight is linked to an estimated 34% of uterine cancer cases and 11% of ovarian cancer cases, while current evidence for a link with cervical cancer remains unclear (28).
- The WHO "Acceleration plan to stop obesity" endorses approaches relating to prevention, health literacy, and implementation of fiscal policies, including taxes and subsidies to promote healthy diets, to fight obesity (29).
- Singapore's approach to tackling overweight and obesity has focused on prevention through a mix of regulation, healthier food policies, and lifestyle interventions (6). This includes Nutri-Grade labelling and advertising restrictions, a ban on partially hydrogenated oils, industry partnerships to expand healthier food and beverage options, and national initiatives such as the National Steps Challenge, MOVE IT, and the Healthy 365 app to promote physical activity and healthier habits (6). Healthier SG further supports this approach through personalised Health Plans developed with family physicians, including agreed health goals, diet and exercise recommendations, annual check-ins and, where relevant, weight-management interventions (30).

### Current status in Singapore

- According to WHO data, overweight and obesity rates have risen in Singapore and all benchmark countries since 2010 (31, 32). In Singapore, 35% of women were overweight in 2021 and 11% obese in 2022. Overweight prevalence was considerably higher in Australia, the UK, and the US, reaching 60% to 71% in 2021, while obesity prevalence ranged from 28% to 43% in 2022 (32). By contrast, overweight and particularly obesity rates were lower in Japan and South Korea compared to Singapore. Singapore also experienced a steeper increase in overweight and obesity over time than its Asian peers (31).




- According to the National Population Health Survey (NPHS) 2024 report, obesity prevalence among women aged 18 to 74 years reached 12.3% in 2023-2024 (33). During the same period, 20% of women were at risk of high BMI, defined as a BMI above 27, while 45% had abdominal obesity, defined as a waist circumference greater than 80 cm (33). The same report also identified significant changes in obesity trends for men and women combined between 2019-2020 and 2023-2024. Obesity prevalence increased significantly among those aged 18 to 29 years and 50 to 59 years, whereas a significant decline was observed among those with only primary school education (33).
- Physical inactivity may also contribute to overweight and obesity. In 2023, 77% of women reported sufficient total physical activity in the NPHS, compared with 86% in the 2007 National Health Surveillance Survey (34). As these figures were derived using different methodologies, they are not directly comparable. Nevertheless, they may indicate a potential decline in physical activity over time.

## Recommendations

- Integrate information on the links between excess body weight and (gynaecological) cancer, particularly ovarian and uterine cancer, into public health messaging and preventive care for women.
- Continue to monitor and strengthen existing measures, including Nutri-Grade labelling, advertising restrictions, and reformulation incentives. If further action is needed, consider complementary fiscal policies, such as subsidies for fruits and vegetables or taxes on sugar-sweetened beverages, in line with WHO recommendations.

# Prevention

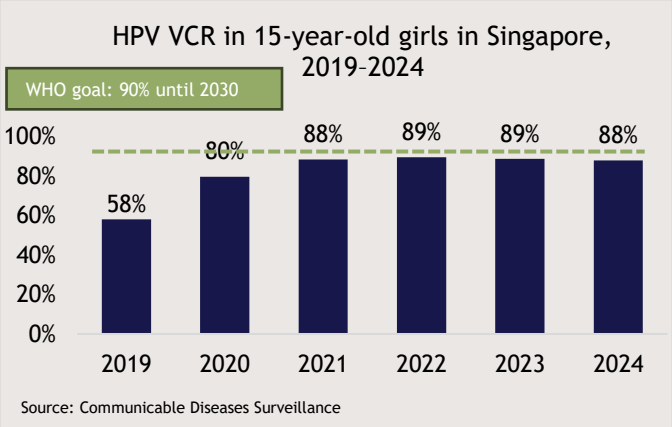
## Vaccination against human papillomavirus (HPV)

### Background

- HPV (human papillomavirus) is a group of sexually transmitted viruses that causes about 8.6% of all cancers in women worldwide (35). The first HPV vaccine in the WHO Western Pacific Region was approved in 2006, and the first national vaccination programme was launched in 2007, both in Australia (36, 37). HPV vaccines have been found to be an effective and cost-effective way to prevent cervical cancer and other HPV-related cancers (38). According to the WHO, the primary target group is girls aged 9 to 14 years, before they become sexually active (39). As part of its Cervical Cancer Elimination Initiative, the WHO calls on all countries to achieve a 90% HPV vaccination coverage rate (VCR; fully vaccinated) in girls by age 15 by 2030 (40).
- WHO also recommends extending vaccination to secondary target populations, including females aged 15 years and older, where feasible and affordable (41). Women who were not vaccinated earlier may still benefit from HPV vaccination up to age 45, as vaccination can provide protection against HPV types to which they have not previously been exposed (42, 43). WHO also identifies boys and older males as potential secondary target populations where vaccination is feasible and affordable (41). Gender-neutral vaccination can directly protect boys and strengthen herd protection for unvaccinated girls and women. Its cost-effectiveness is context specific and depends on factors including vaccine price, vaccination coverage among girls, and the range of HPV-related health outcomes considered (44). By July 2026, 87 WHO Member States had included boys in their HPV vaccination programmes, representing 54% of the 162 Member States that had introduced HPV vaccination (45).
- In Singapore, HPV vaccination was first incorporated into the national childhood and adolescent immunisation framework in 2010 through the National Childhood Immunisation Schedule (NCIS) (46). It was subsequently added to the adult schedule in 2017 for women aged 18 to 26 years (47). HPV vaccination is currently delivered through school-based and clinic-based routes (48). Since April 2019, a national school-based programme has offered HPV vaccination to Secondary 1 female students. Although participation is voluntary and requires parental consent, HPV vaccination is nationally recommended for females aged 9 to 26 years, and completion as early as possible is advised (49, 50). Students who choose not to receive the vaccine at school, or who miss or do not complete the required doses, can receive vaccination through clinic-based services (50). Eligible Singapore citizens can receive subsidised HPV vaccination at Community Health Assist Scheme (CHAS) general practitioner (GP) clinics and polyclinics, while permanent residents are eligible for subsidies at polyclinics only (50); MediSave may be used to offset remaining out-of-pocket costs (50).

### Current status in Singapore

- In 2024, 88% of girls (citizens and permanent residents) at 15 years old had received 2 doses of HPV vaccination, very close to the WHO goal of 90% for 2030 (53). Following the introduction of school-based vaccination in 2019, completion coverage increased rapidly, reaching almost 90% as early as 2022 and remaining at this high level thereafter (53). Singapore has therefore come within a few percentage points of the WHO target several years ahead of 2030, representing a major vaccination achievement.




- The school-based rollout included coordinated efforts by the Ministry of Health, the Health Promotion Board, and participating schools to inform and engage parents before vaccination visits. The rollout achieved an outstanding level of participation, with 93% of students in the first 25 schools opting to receive the vaccine in 2019 (54). To facilitate informed decision-making, parents were provided with an information package comprising a factsheet on HPV vaccination, a brochure on HPV risk and prevention, and a letter containing further information on the HPV vaccination programme (54). The programme also includes a follow-up mechanism whereby Secondary 1 students who miss school-based HPV vaccination are contacted by Health Promotion Board vendors and offered the option to complete their vaccination at the vendor's clinic (55). Parental opt-out appears to have been limited. Only about 2% of parents opted out (56).
- There is currently no routine recommendation by the Singaporean MoH for HPV vaccination of boys (51). Boys and men who consider themselves at higher risk are advised to consult a GP (51). Japan's national routine HPV vaccination programme also remains limited to girls, whereas Australia, the US, the UK and South Korea (since 2026) have gender-neutral programmes (45, 52).

# Recommendations

- Extending vaccination to boys could provide direct protection against HPV-related diseases among men while also benefiting women indirectly through reduced risk of transmission. This may warrant further assessment of the cost-effectiveness of a gender-neutral vaccination strategy.
- Increase granularity of public reporting on uptake and disparities. National coverage is reported for girls aged 15, but public reporting does not provide further stratification by socio-economic or geographic variables.

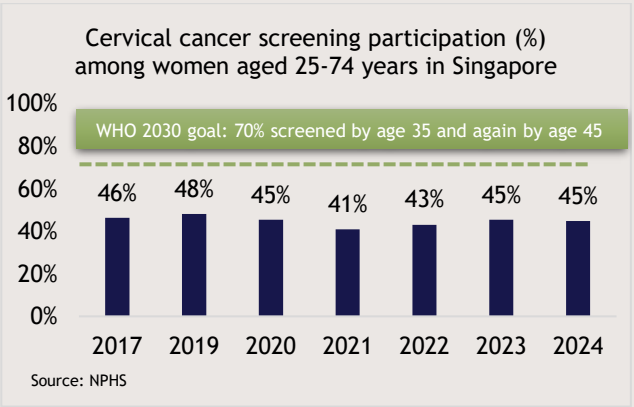
# Early detection
## Cervical cancer screening

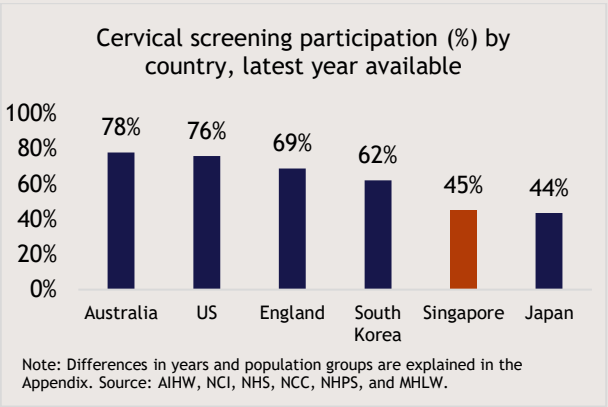
## Background

- The aim of cervical cancer screening is to detect a cancer before the onset of symptoms or even earlier in its pre-stages. In early disease stages, survival rates are highest and treatment costs lowest (57, 58). Cervical cancer screening used to be done with a Pap smear test every three years. The discovery of HPV as the cause of cervical cancer has led to the development of HPV tests as a primary screening method (59).
- The WHO sets a screening goal within the Cervical Cancer Elimination Initiative that, by 2030, at least 70% of women have been screened with a high-performance test before the age of 35 and again before 45 (40).
- Since 2004, Singapore has run an organised programme for cervical cancer screening (60). Women aged 25 years and older are eligible for screening (61); those 25–29 are advised Pap smears every three years, and those ≥30 receive HPV testing every five years (62). The Health Promotion Board's Screen for Life programme, now known as Healthier SG Screening, invites eligible women and subsidises screening (63). Eligible Singapore citizens pay a fixed fee of S$5 or less at participating CHAS GP clinics, while eligible Healthier SG enrolees pay S$0 at their enrolled clinic (63). Screening is also available at polyclinics.

## Current status in Singapore

- In 2024, the cervical cancer screening participation rate among women aged 25 to 74 was 45%, defined as having had a Pap smear within the past three years or an HPV test within the past five years (33). Screening participation was highest among women aged 30 to 59, with rates ranging from 49% to 60%. Overall, participation has remained largely stagnant since 2017, except during the COVID-19 period, when it declined temporarily before returning to pre-pandemic levels.
- Screening uptake is uneven across the Singaporean population, according to the 2024 NPHS (33). Malay women have lower screening rates (33%) than Indian (42%) and Chinese (47%). Participation is also lower among women with less education, as only 22% of women with primary education had been screened, compared with 51% of women with post-secondary education (33). Screening estimates are based on Singapore residents and therefore do not reflect uptake among non-residents, including migrant workers.




- In international comparison, Singapore's cervical cancer screening rate is lower than in Australia, US, England, and South Korea, which achieved rates from 62% to 78% (64-67). Only Japan (44%) had a similar rate as Singapore (68).
- The main deterrents to cervical cancer screening in Singapore are fear of diagnosis, cultural stigma, and misconceptions about who needs screening, including the belief that screening is only necessary if symptoms or a family history are present (69). The intimate nature of Pap smears, physical discomfort, cultural sensitivities, and competing work and family priorities may further reduce uptake.
- In a Singaporean primary care study, HPV self-sampling showed high acceptability and strong potential to improve screening uptake, with 92% of participants reporting that they would be more likely to attend future cervical cancer screening if self-sampling were offered (70).

## Recommendations

- Consider piloting HPV self-sampling, either as a primary screening method or as a complementary option for women who do not respond to regular invitations, and evaluate its uptake, acceptability, effectiveness, and feasibility before broader implementation.

# Early detection
## Genetic testing & counselling

### Background

- Genetic testing for gynaecological cancer predisposition identifies inherited mutations associated with increased cancer risk (71). In practice, hereditary risk is often first suspected when a person is diagnosed with cancer at a young age, has certain tumour features, or has a strong personal or family history of cancer. Genetic testing may then identify an inherited mutation, allowing genetic counselling and testing to be offered to relatives who may also be at risk (71). This enables tailored prevention, surveillance, earlier detection strategies, and risk-reducing interventions for unaffected family members (72, 73).
- Hereditary risk is particularly important in ovarian and uterine cancer, whereas its role is limited in cervical cancer. In ovarian cancer, inherited risk is most commonly linked to Hereditary Breast and Ovarian Cancer syndrome (HBOC), especially BRCA1 and BRCA2 mutations, although other genes may also contribute (74). Inherited BRCA1/2 variants are estimated to occur in approximately 0.3–0.5% of the general population but cause 10-15% of ovarian cancer cases (75). In uterine cancer, the main inherited condition is Lynch syndrome, which affects about 0.1–0.3% of the general population but causes 3-5% of uterine cancer cases (72). Lynch syndrome also increases the risk of ovarian and other cancers (72).
- Both NCCN and ESMO support family-based genetic counselling and testing in hereditary gynaecological cancer risk. ESMO recommends counselling and testing for relatives in HBOC and Lynch syndrome, including referral to specialised genetics services and germline testing when indicated (76-78). NCCN similarly supports counselling and testing of at-risk relatives in hereditary cancer syndromes, including Lynch syndrome (79).
- In Singapore, the clearest formal basis for genetic testing was the 2015 Singapore Cancer Network (SCAN) guideline on referral for genetic evaluation of common hereditary cancer syndromes (80). Individuals who meet referral criteria should be referred to a specialist genetics service centre, but genetic testing services were not subsidised (81). Formal cancer genetics programmes have long been established at two tertiary cancer centres: the National Cancer Centre Singapore (NCCS) and the National University Cancer Institute, Singapore (NCIS) (80).

### Current status in Singapore

- On 5 March 2026, MoH announced that subsidised genetic testing for HBOC will begin in December 2026 (81). The decision was based on an assessment that the overall HBOC care pathway, from genetic testing to downstream interventions such as surveillance and risk-reducing care, was both clinically effective and cost-effective. Eligible Singapore citizens and permanent residents will be able to access income-based subsidies of up to 70%, alongside MediSave coverage. The subsidy will follow a targeted eligibility model rather than a universal one. To qualify, individuals must receive a genetic test for a listed clinical indication, meet the relevant clinical criteria, and be referred through an eligible referral source. Eligible family members of individuals who test positive may undergo subsidised cascade testing. Financing support will extend to intensified surveillance and other relevant follow-up care, while MediShield Life will cover selected risk-reducing surgeries, including risk-reducing bilateral salpingo-oophorectomy (removal of both the fallopian tubes and ovaries).
- Currently, no comparable national subsidy policy for Lynch syndrome is in place (82).

Genetic testing and counselling pathway for hereditary gynecological cancer risk in Singapore


Source: Singapore Cancer Network Guidelines

- No national genetic testing uptake rates are available for Singapore but published data suggest that completion of genetic testing increases substantially once individuals receive financial support (83). In a tertiary cancer genetics cohort of 2,687 individuals, uptake exceeded 90% among subsidised individuals (including cancer patients) across socioeconomic strata, compared with 56-68% among non-subsidised individuals (83). Subsidies also appear to improve the uptake of cascade testing among relatives: in one local study, uptake was close to 22% when testing was free compared with 6% when testing was self-paid (84). The planned introduction of subsidised HBOC testing and downstream interventions from December 2026 is therefore likely to improve access and equity in BRCA-focused hereditary cancer care.
- As a comparison in the UK, NICE explicitly states in its ovarian cancer familial/genetic risk guideline that unaffected first-degree relatives of a person with a known pathogenic variant should be offered genetic

counselling and testing (85, 86). NICE also supports testing of unaffected relatives in familial breast cancer and Lynch syndrome pathways (87). NHS testing is free when appropriately referred (88).

## Recommendations

- The planned introduction of subsidised testing for HBOC marks an important step forward in Singapore's approach to hereditary cancer prevention. Building on this momentum, MoH could evaluate the extension of coverage to include Lynch syndrome.

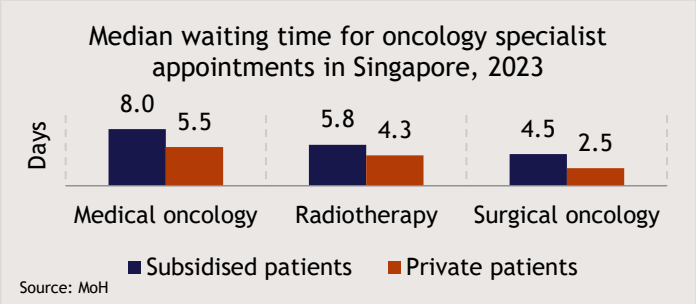
# Diagnosis and treatment
## Care pathways and waiting times

### Background

- Standardised cancer pathways are structured, agreed routes from suspicion to diagnosis, staging, multidisciplinary review, treatment, and follow-up. Their purpose is to reduce unnecessary variation, clarify responsibility at each step, and prevent avoidable delays. The WHO emphasises that timely diagnosis and initiation of cancer treatment are critical to improving survival (89). International evidence indicates that even a 4-week delay between diagnosis and treatment initiation is associated with a 6–8% increased risk of death across various cancer settings (90). Time-bound standards and pathway benchmarks are therefore important tools for monitoring whether patients move through the cancer care pathway in a timely manner.
- WHO recommends, for example, for breast cancer that comprehensive diagnosis should be completed within 60 days of suspicion (91). Many high-income countries have introduced standardised cancer pathways for various cancer types at the national level (92). In England, NHS cancer waiting-time standards apply across all cancer types, while Australia's Optimal Care Pathways provide cancer type-specific benchmarks for consistent, safe, evidence-based care across the cancer continuum (93, 94).

### Current status in Singapore

- MoH does not report median waiting times from diagnosis to treatment initiation, noting that timing varies by cancer type and stage, treatment modality, comorbidities, pre-operative needs, treatment sequencing, and patient preferences (95). This limits assessment of the timeliness of existing care pathways, although some waiting-time information is available from MoH responses to parliamentary questions.




- In 2023, median waiting times for new oncology specialist outpatient appointments were slightly shorter for private patients than subsidised patients, but remained short for both groups: 2.5–5.5 days versus 4.5–8.0 days, respectively (95).
- Additional information is available for selected diagnostic tests and cancer-related services, although it does not provide a complete picture of waiting times across the care pathway. For gynaecological cancers specifically, no routinely published national data were identified on waiting times for colposcopy, biopsy, diagnosis, surgery, chemotherapy, or radiation therapy. Singapore Cancer Society states that Pap or HPV test results are provided 4 to 6 weeks after the test (96).

| Additional waiting-time data gathered for Singapore | |
|---|---|
| Suspected cancer | In public hospitals in 2017, over 95% of patients with suspected cancer were given an appointment within three weeks (97). |
| Colonoscopy | Median time to investigation was about 38 days in 2021 (98). |
| CT or MRI scan | Within two weeks for initial cancer diagnosis, but it could be arranged within two to three days for urgent cases (97). |
| PET-CT scan | Waiting time for cancer patients was within one week (97). |

- In comparison, Australia's cancer-specific "optimal care pathways" include recommended timeframes for gynaecological cancers, such as specialist review within two weeks for suspected or confirmed ovarian cancer, pre-treatment diagnosis and staging within two weeks of the first specialist appointment for endometrial cancer, and treatment within four weeks of the decision to treat for cervical cancer (94, 99, 100). NHS England also has national cancer waiting-time standards, including diagnosis within 28 days, treatment within 31 days of the decision to treat, and treatment within 62 days of urgent referral, although these apply across cancer types rather than specifically to gynaecological cancers (93).
- Comparable data are limited. In England, data from June 2022, 2023, and 2024 show that on average 78% of patients urgently referred by a GP for suspected cancer were seen by a specialist within 14 days (101-103).

## Recommendations

- Consider routinely measuring and publishing cancer pathway waiting times, including for gynaecological cancers. This would help to assess whether current care is consistently timely and to identify potential bottlenecks along the care pathway.

# Diagnosis and treatment
## Multidisciplinary care

### Background

- Gynaecological cancers involve complex care pathways that often require coordinated input from gynaecologic oncology, medical oncology, radiation oncology, pathology, radiology, specialist nursing, urologists, among others (104, 105). International guidance treats multidisciplinary team (MDT) care as a core component of high-quality management (105-107). Multidisciplinary care may improve outcomes in gynaecologic oncology. For example, in endometrial cancer, a registry-based cohort found higher 5-year overall survival among women managed through an MDT pathway (108), and in advanced ovarian cancer, implementation of a multidisciplinary surgical team was associated with improved complete cytoreductive surgery and survival outcomes (109).
- Multidisciplinary care is well embedded in specialist gynaecologic oncology services in Singapore (110). The main tertiary cancer centres appear broadly aligned with international guidance, including NCCN and ESMO-ESGO-ESTRO recommendations. For instance, the NCCS describes multidisciplinary care as a core tenet of cancer management and states that tumour boards convene regularly, including for women's cancers such as breast and gynaecological cancers (110, 111). Similarly, the NCIS describes its gynaecological cancer clinic as a one-stop multidisciplinary centre with tumour board and multidisciplinary tumour clinics (112), and KK Women's and Children's Hospital (KKH) - the largest gynaecological cancer centre in the country - provides integrated care for cervical, ovarian, and uterine cancers and includes tumour board conferences (113).

### Current status in Singapore

- Singapore has dedicated specialist tertiary referral centres for gynaecological cancer surgery, where patients are managed through multidisciplinary care (114, 115). Clinical nurse specialists and patient navigators also contribute to coordinated multidisciplinary care by supporting patients, facilitating access to services, and maintaining continuity across the care pathway (116, 117). However, public reporting in Singapore focuses more on service structure than on measurable MDT performance. No public data were identified on the proportion of cervical, ovarian, or uterine/endometrial cancer cases discussed at MDT meetings before treatment initiation.
- Although not specific to gynaecological cancers, a cross-national expert survey conducted in 2021 on gastric cancer provides broader insights into MDT practices within Singapore's health care system (118). The study indicates that MDT use in Singapore is encouraged through institutional guidelines, while patient participation in MDT meetings is not mandatory, as in most of the benchmark countries (118). One important strength is that MDT discussions are encouraged within one to two weeks of diagnosis, which compares favourably with settings that have no defined timeframe or a broader one, such as South Korea, where MDTs are expected to occur within eight weeks of diagnosis.

**Multidisciplinary team implementation characteristics in selected countries**
adapted from Park et al. (2025), *Patient participation in multidisciplinary management in gastric cancers*, (118)

| Country | Legal status | Main implement-ation driver | Patient participation | Timing / operational feature |
|---|---|---|---|---|
| **Singapore** | Not legally required | Institutional practice | Not mandatory | Encouraged within 1 to 2 weeks of diagnosis |
| **Japan** | Required for designated cancer hospitals | Accreditation | Not mandatory | Required for hospital accreditation |
| **South Korea** | Not legally mandated | National KPI and reimbursement requirements | Mandatory, patient present | Within 8 weeks of diagnosis |
| **UK** | Legally required | NHS pathway requirements | Not mandatory | Weekly MDT for all new cases |
| **US** | Not legally required | Local hospital / insurer arrangements | Not mandatory | No national standardisation |

## Recommendations

- Strengthen quality assurance in gynaecological cancer care by systematically measuring and publicly reporting the proportion of gynaecological cancer cases that are reviewed in an MDT meeting before treatment.
- Monitoring and publicly reporting the time from diagnosis to MDT discussion would help assess whether current practice is meeting the expected timeframe of 1 to 2 weeks and would support more consistent, timely, and accountable care across institutions.

# Diagnosis and treatment

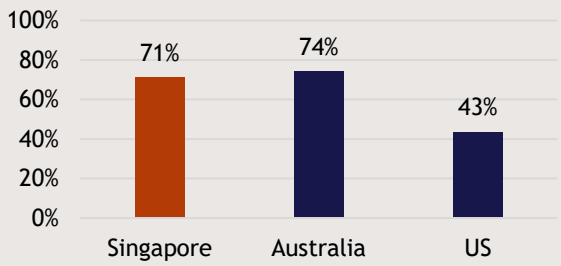
## Fertility preservation

### Background

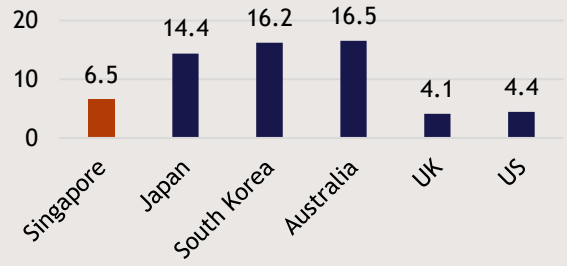
- Fertility preservation is an important dimension of cancer diagnosis and treatment discussions for patients of reproductive age (119, 120). The American Society of Clinical Oncology (ASCO) and the International Federation of Gynecology and Obstetrics (FIGO) recommend personalised patient counselling with all patients, ideally before the start of treatment (119, 120) with the involvement of oncologists, reproductive endocrinologists, and fertility specialists (119). ESMO also recommends that all cancer patients of reproductive age receive complete and individualised oncofertility counselling as early as possible, accompanied by the provision of written and/or online resources, as well as that all patients with potential interest in fertility preservation should be immediately referred to a fertility specialist/unit (121).
- Methods for fertility preservation in female patients include egg and embryo freezing as well as ovarian tissue freezing (121). Ovarian transposition and gonadal shielding are two options for protecting the ovaries before or during radiotherapy, respectively, whereas medical gonadoprotection during chemotherapy aims to shield the ovaries from cytotoxic damage (121). In addition, fertility-sparing treatments in gynaecological cancers mainly involve surgical methods which allow for the preservation of uterus and at least one part of one ovary (when possible) with the aim to achieve (spontaneous) pregnancy (122, 123). In endometrial cancer, fertility-sparing treatment may also include hormonal therapy (123).
- Singapore introduced co-funding for assisted reproduction treatments in 2008, and subsequently expanded the level and scope of support (124). Following parliamentary discussion on fertility preservation for young cancer patients in 2024, MoH announced further financing reforms in 2025. Subsidy enhancements for medically necessary fertility preservation took effect in June 2025, followed by broader MediSave and MediShield Life coverage in June 2026 (125, 126). A 2025 review reported that Singapore lacked a formalised national oncofertility referral protocol, identifying inconsistent referral as a barrier to fertility preservation uptake (127). In 2020, an OncoFertility Clinic was established at KKH (128).

### Current status in Singapore

- Data from female cancer patients at KKH show that around 71% of women referred to fertility preservation options opted for them in 2010-2019, whereas about 66% had a successful fertility preservation procedure (127). However, these numbers are not gynaecological cancer-specific and thus do not necessarily reflect fertility preservation uptake among gynaecological cancer patients. In Australia, during a similar time period (2013-2019), the share of women with gynaecological cancers who used some kind of fertility preservation at one tertiary centre was 74% of those referred to a fertility specialist (129). In the US, during 2011-2016, 43% of cancer patients (not gynaecological cancer-specific) who met a reproductive specialist chose to undergo fertility preservation (130).
- Among women treated for gynaecological cancers (median age 31 years) at the OncoFertility Clinic at KKH in 2020-2023, around 76% of patients with endometrioid adenocarcinoma (a subtype of endometrial cancer) underwent fertility-sparing management, whereas approximately 91% of ovarian cancer cases underwent fertility-sparing surgery (128). Among cervical cancer patients, 50% underwent fertility-sparing management (128).
- As of 2019, Singapore had 11 assisted reproductive technology (ART) facilities, which means that there were 6.5 ART facilities per 1,000 gynaecological cancer patients (8, 131). This places Singapore below Japan, South Korea, and Australia (14.4, 16.2, and 16.5 ART facilities per 1,000 gynaecological cancer patients respectively), but above the UK and the US (4.1 and 4.4 ART facilities per 1,000 patients respectively) (8, 131).




Source: Tang et al. (2025), Robson et al. (2022), McCarter et al. (2022)




Source: Own calculations based on data from Ojo et al. (2022) and IARC

- Access to fertility preservation is shaped by the timeliness of counselling and referral and by the availability of financial support, all of which vary across and within countries. In Singapore, medically necessary fertility preservation is supported through government subsidies and MediSave. Since June 2026, MediShield Life also covers surgical costs for embryo, egg, and ovarian tissue freezing for patients at risk of treatment-induced infertility (126). Patients who continue to face affordability challenges may seek additional financial assistance, including through MediFund (132). In countries like South Korea, certain costs may be partially covered by insurance, such as operation costs for ovarian tissue freezing (133). Coverage may also vary by geographical area, as is the case in the US, where different laws apply in each state, and the UK where coverage varies in different parts of the country (England), and depends on the area where the patients' GP is located (134-136). In Australia, the ART Storage Funding Program supports cancer patients with the cost of cryostorage; this applies to people with a valid Medicare card so that they can freeze eggs, sperm or embryos because they have a cancer diagnosis and the cancer treatment will affect their fertility (137).

**Fertility preservation coverage in selected countries**
**Source: Harzif et al. (2019) (133), Ministry of Health (126), Australian Government (137), NHS Guy's and St Thomas'(136), Macmillan Cancer Support (134), Alliance for Fertility Preservation (135)**

| | Singapore | Japan | South Korea | Australia | UK | US |
|---|---|---|---|---|---|---|
| **Public/ insurance financing support** | Yes, through subsidies, MediSave and MediShield Life | No | No (certain costs may be partially covered) | Yes (if certain criteria are fulfilled) | Yes (varies by case and geographical area) | Yes (legislation varies by state) |

# Recommendations

- Establish nationally standardised oncofertility referral protocols that build on existing specialist services and ensure consistent referral pathways across cancer types.
- Monitor the implementation and uptake of recently expanded fertility preservation financing and assess any remaining access gaps.

# Diagnosis and treatment

## Novel cancer medicines

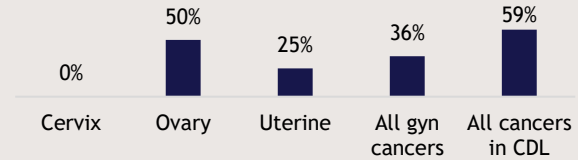
### Background

- New cancer medicines have been introduced at an accelerating pace over the past decades. In the US, the Food and Drug Administration (FDA) approved over 200 new cancer medicines and almost 600 areas of use (indications) from 2000 to 2022 (138). These advances have been driven mainly by targeted therapies and immunotherapies, which have expanded treatment options and changed standards of care across multiple cancers. Gynaecological cancers have seen comparatively few approvals (138). From 1995 to 2024, the European Medicines Agency (EMA) approved 5 indications for cervical cancer (3 of which in 2020-2024), 7 indications for uterine cancer (all of which in 2020-2024), and 14 indications for ovarian cancer (4 of which in 2020-2024), which is much lower than the 57 indications approved for breast cancer (3).
- In Singapore, the Health Sciences Authority (HSA) is the national regulatory authority responsible for the approval of therapeutic products (22). Regulatory approval, however, is only one step in patient access to new cancer medicines. Public funding and out-of-pocket costs are shaped by ACE recommendations together with MoH financing policies implemented through the Cancer Drug List, MediShield Life, MediSave, and Integrated Shield Plans (139-141). The Standard Drug List (SDL) primarily includes essential and cost-effective medicines, many of which are available as generics, and these medicines are subsidised. Higher-cost medicines that are clinically proven and cost-effective for specific indications may be subsidised through the Medication Assistance Fund (MAF) on a means-tested basis in public sector care (142).
- In 2022, Singapore introduced the Cancer Drug List (CDL) as part of a major reform of outpatient cancer medicine financing (143). Since then, MediShield Life, MediSave, and Integrated Shield Plans have covered only CDL-listed outpatient cancer treatments, with treatment-specific claim limits replacing the previous general monthly claim model. This means that patients can seek reimbursement for these treatments, up to the applicable claim limits, through MediShield Life, MediSave, and usually their Integrated Shield Plan. The CDL applies only to outpatient cancer treatments; inpatient cancer medicines are covered separately under inpatient claim limits (143).

### Current status in Singapore

- Available comparative evidence suggests that Singapore performs strongly on regulatory availability but less clearly on publicly visible reimbursement and uptake (22). A report covering 14 Asia-Pacific markets found that Singapore's HSA was among the most effective in making US FDA-approved cancer medicines available on the local market (22). However, reimbursement rates were substantially lower, with a smaller proportion of indications reimbursed than in Australia, Japan, or South Korea. These rates likely underestimate actual access in Singapore, as broader coverage available through MediShield Life and MediSave was not fully captured.
- As of April 2026, the CDL included 14 indications covering cervical, ovarian, endometrial (uterine) cancer (144). This is a lower number than the 23 indications approved by the EMA in Europe for these cancer types in 2010-2024. Ovarian cancer had the highest number of CDL-listed indications. Four of its eight indications and one of the four endometrial cancer indications had MAF coverage, while neither of the two cervical cancer indications had MAF or SDL coverage (144). Overall, five of the 14 gynaecological cancer indications had MAF coverage.

MAF/SDL-subsidised share of outpatient cancer medicines from the CDL as of April 2026




**Note:** All subsidised gynaecological cancer indications were covered through MAF; none were classified under the SDL. The "All cancers" category includes indications covered through either MAF or SDL.

Gynaecological cancer medicines in the CDL (April 2026)

| Metric | Cervix | Ovary | Uterine |
|---|---|---|---|
| EMA-approved indications (2010-2024) | 4 | 12 | 7 |
| CDL-listed indications | 2 | 8 | 4 |
| Subsidised indications (MAF) | 0 | 4 | 1 |

## Recommendations

- Regularly review subsidised support for CDL-listed gynaecological cancer medicines in the MAF/SDL to ensure that subsidy and claimability keep pace with evolving standards of care.
- Prioritise listing of new gynaecological cancer medicines with high clinical value (e.g., as assessed by the European Society for Medical Oncology - Magnitude of Clinical Benefit Scale; ESMO-MCBS) and cost-effective profile on the CDL.

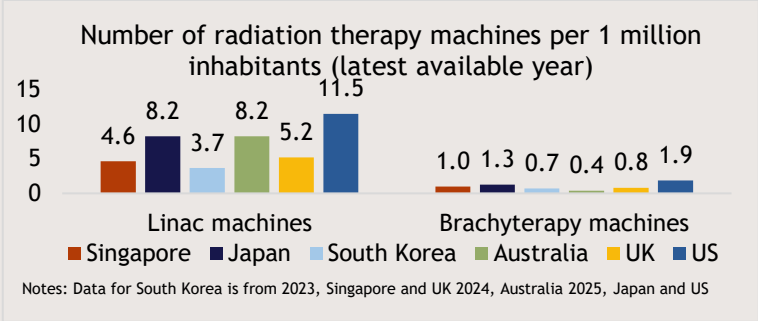
# Diagnosis and treatment
## Radiation therapy machines

## Background

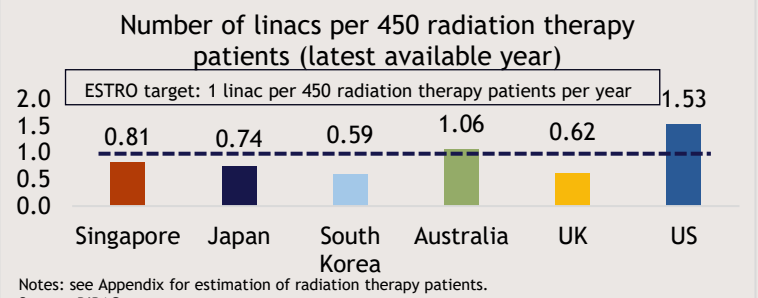
- Radiation therapy is essential in treating common cancers, with around 50% of all cancer patients requiring radiation therapy at some point during their treatment (145). The effectiveness of radiation therapy in targeting and eliminating tumours significantly influences patients' survival rates and quality of life (146, 147). Expanding access to radiation therapy requires both sufficient equipment and trained personnel to operate it. Strategic investments in infrastructure and specialist personnel are essential to ensure timely and equitable access to radiation therapy for all patients (148).
- Gynaecological cancers may generally be treated with external beam radiation therapy, using linear accelerators (linacs) to shrink large tumour volumes, or internal radiation therapy, using brachytherapy to deliver highly concentrated radiation directly to the tumour site (149-151).
- The European Society for Radiotherapy and Oncology (ESTRO), through the ESTRO-QUARTS capacity planning work, suggests a benchmark of one linear accelerator (linac) per 450 cancer patients requiring radiation therapy per year (152). This benchmark is widely referenced in radiation therapy capacity planning resources and is utilised as input by the International Atomic Energy Agency (IAEA) in regional capacity assessments (148).
- Radiation therapy is an important and well-established component of cancer care in Singapore. Recent major developments have included the expansion of capacity at the NCCS and the launch of proton therapy in the public sector (153), which is recommended for selected cancer indications (154).

## Current status in Singapore

- Singapore has 4.6 linac machines per 1 million inhabitants[1] according to the IAEA's Directory of Radiotherapy Centres (DIRAC) (155), below all benchmark countries except South Korea (3.7). Singapore has 1.0 brachytherapy machines per 1 million inhabitants, higher than Australia, South Korea, and the UK, but lower than Japan (1.3) and the US (1.9). These comparisons should also consider differences in geography and service organisation, as Singapore's compact geography and centralised cancer services may support more efficient equipment use.



Notes: Data for South Korea is from 2023, Singapore and UK 2024, Australia 2025, Japan and US



Notes: see Appendix for estimation of radiation therapy patients.
Source: DIRAC

- Measured against cancer burden, Singapore performs relatively well against the ESTRO benchmark of one linac per 450 cancer patients requiring radiation therapy per year (see Appendix for clarification) (152). Singapore's ratio is 0.81 linacs per 450 patients, which is above Japan, South Korea, and the UK (155). A global study estimated that 25 additional linac machines will be needed by 2045 in Singapore, or even 50 linac machines when replacement of obsolete machines is taken into account (156).
- Workforce capacity appears relatively strong at present. Another global study identified Singapore as one of the few countries with a sufficient supply of radiation oncologists in 2022 (157). However, to meet projected cancer care demand by 2050, the number of radiation oncologists, medical physicists, and radiation therapists will still need to increase.

## Recommendations

- Singapore should continue to strengthen long-term national planning for radiation therapy capacity – both for linac and brachytherapy machines - combining investment in additional acquisition and replacement with continued expansion of the radiation oncology workforce.

[1] Patient-based capacity estimates are sensitive to the population definition used. In Singapore, using resident-only cancer incidence, covering citizens and permanent residents, rather than the IARC estimate presented above, which applies resident incidence rates to the total population including non-residents, would result in lower estimated radiotherapy demand and therefore a more favourable capacity estimate for Singapore.

# Survivorship
## Psychosocial care services

## Background

- Reported prevalence of psychosocial distress among cancer patients varies widely, at approximately 35–80%, depending on the population studied and the assessment methods used (158). Routine distress screening is one of the solutions to detect and satisfy cancer patients' psychosocial needs (158).
- ESMO recommends that all cancer patients are regularly screened and assessed for anxiety and depression in all phases of illness, using validated screening tools (159). Common tools used for distress screening include the Edmonton Symptom Assessment System (ESAS) and the Distress Thermometer rating scale (159).
- In Singapore, the Accessible Cancer Care to Enable Support for Cancer Survivors (ACCESS) supportive care model was launched at the NCCS, enabling the triage of cancer survivors based on their care needs and personalisation of care for the multi-ethnic and multilingual population (160). Through integrated care pathways, the referral to different health disciplines is enabled, integrating survivorship care in the tertiary setting and primary care sectors (160). Through the ACCESS model, survivors receive a supportive care needs assessment via the Distress Thermometer and Problem List (DTPL); those who report high distress/needs are provided with further support for symptom and distress management, and a smaller group may require more complex interventions (160).

## Current status in Singapore

- Implementation and effectiveness data from September 2019 to February 2021 at the NCCS, which serves around 65% of adult cancer patients in Singapore's public sector, indicate that 78.6% of eligible breast and gynaecological cancer survivors were screened for distress through the ACCESS model (160).
    - Most survivors with multiple visits completed the screening tool at all visits (54.3%). Completion rates differed across ethnic groups and were 15% lower among Malays compared to Chinese (160).
    - Some 28.6% of screened survivors reported high distress minimally once, and 79.6% of those were ultimately contacted and reviewed by the supportive care team (160). Among highly distressed survivors, 13% were referred to hospice services, followed by cancer-specific community services (5.3%) (160).
    - Women with breast and gynaecological cancers who received the programme (recruited from October 2019 to June 2021) reported lower psychological distress compared to usual care recipients at 12 months after the ACCESS programme (161).
- Other countries are also using distress screening or psychosocial needs assessment for cancer patients in varying ways. In Australia, a clinical guidance for responding to suffering in adult cancer patients as well as a clinical pathway for screening, assessment, and management of anxiety and depression in cancer patients were published in 2014 and 2015 respectively (162, 163). Although routine screening for distress is performed in some settings, it is not conducted systematically across the country (164). Since 2015, the American College of Surgeons' Commission on Cancer required that cancer programmes in their accredited facilities establish methods to screen all newly diagnosed patients for distress level and offer psychosocial care based on their needs (165, 166). NCCN guidelines also recommend distress screening to be conducted routinely at health visits (167). In Japan, distress screening in inpatient and outpatient settings has been a requirement for designated cancer hospitals since 2015 (166). In the UK, the 2026 National Cancer Plan for England aims to provide all cancer patients with a personalised assessment of need and cancer plan that will include mental health and social needs, and enhanced psychological support to patients with extensive needs (168). The Cancer Alliances work towards the direction of providing personalised care and improving quality of life through, among others, improving psychosocial support for cancer patients (169).. In South Korea, the National Cancer Center published the "Recommendations for Distress Management in Cancer Patients" in 2009; however, awareness of psycho-oncology remains low (170). Despite the existence of guidelines and distress screening programmes in different countries, recent data on the uptake of such services among gynaecological cancer patients are scarce.

**Psychosocial assessment guidelines at the national level in selected countries**
Source: Ke et al (2023) (160), Okuyama et al. (2016) (166), Lee et al. (2017) (170), Cancer Australia (162), Butow et al. (2015) (163), Department of Health & Social Care, (168) , NCCN (167)

| Singapore | Japan | South Korea | Australia | UK | US |
|---|---|---|---|---|---|
| No national guidelines identified | Yes (distress screening required for designated cancer hospitals) | Yes (distress management recommendations published in 2009) | Yes (clinical guidance for responding to suffering; distress screening not mentioned) | Yes (actions in National Cancer Plan; distress screening not mentioned) | Yes (national guidelines available, distress screening required for accreditation) |

## Recommendations

- Build on existing psychosocial oncology services, such as the ACCESS model at NCCS, by developing national guidance and standardised referral pathways for distress screening and psychosocial care across institutions.

# Palliative care

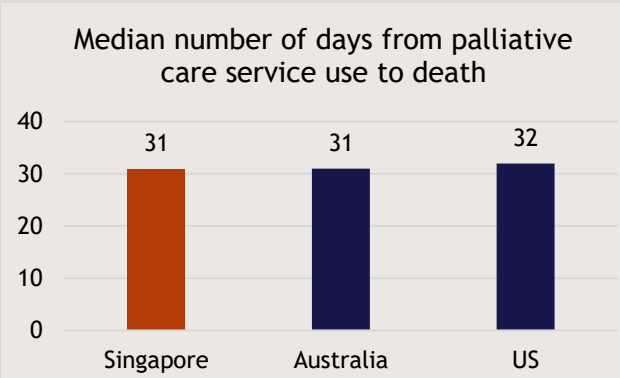
## Palliative care services

### Background

- Cancer is the second most common cause of need for palliative care (PC) among adults globally (171). Within oncology, PC has traditionally had a strong focus at the end of life, but more recently there is a shift of integrating it earlier in the disease pathway (172). ASCO recommends the referral of patients with advanced cancer to specialised interdisciplinary PC teams that provide outpatient and inpatient care, beginning early in the course of the disease, and suggests dedicated specialist PC services for patients with unaddressed physical, psychosocial, or spiritual distress (173).
- Population ageing, accompanied by increased healthcare needs, is expected to result in growing demand for PC services in Singapore (174). Acknowledging these needs, Singapore published the 2023 National Strategy for Palliative Care which aims to ensure access to quality PC services for all Singaporeans and their caregivers (174). The Strategy is built around three focus areas - access, quality, and the PC environment (174). Eleven recommendations constitute the Strategy, alongside implementation plans and indicators for monitoring progress (174).

### Current status in Singapore

- Singapore collects data on the time from first palliative assessment to death through the Singapore National Palliative Care Minimum Data Set (MDS). According to the latest available data, which cover the period from 1 April 2023 to 31 March 2024 across 20 institutions, the median time from first palliative care assessment to death was 31 days for cancer patients (175). Overall, the MDS suggests a cautiously positive but uneven trajectory: access to specialist palliative care has continued to increase and national monitoring has become more systematic, but referrals remain late and timeliness challenges persist, particularly in home care.




Source: Singapore Hospice Council (2025), Australian Institute of Health and Welfare (2024), Ernecoff et al. (2020)

- Data from other countries show a similar time interval between use of PC services and death, although the terminology used differs by country and could include different time points, thus affecting comparability. In Australia, the median number of days from receipt of first specialised PC service to death was 31 days for cancer (data for deaths between July 2019 and June 2020) (176). In the US, 2017 data from one hospital indicate that the median time from specialty palliative care consult to death for cancer patients was 32 days (177).
- Although the median time from palliative care service use to death is similar in Singapore, Australia, and the US, it remains shorter than the 3 to 4 months suggested in some studies as beneficial for fully realising the effects of palliative care, although no universally accepted threshold for the length of palliative care exists (178).

## Recommendations

- Continue strengthening timely public reporting of National Strategy for Palliative Care monitoring indicators to facilitate regular evaluation of implementation progress and inform further action.

# References


1. World Health Organization. Global cancer burden growing, amidst mounting need for services. 2024 [Apr 9, 2026]. Available from: https://www.who.int/news/item/01-02-2024-global-cancer-burden-growing--amidst-mounting-need-for-services.
2. National Registry of Diseases Office. Singapore Cancer Registry: Annual Report 2023. 2025.
3. Manzano A, Košir U, Hofmarcher T. Bridging the Gap in Women's Cancer Care: A Global Policy Report on Disparities, Innovations and Solutions. Lund: IHE, 2025.
4. European Cancer Organisation. European Cancer Pulse - Tracking Inequalities in Cancer. [Oct 2, 2025]. Available from: https://www.europeancancer.org/pulse.
5. World Health Organization. Cancer prevention and control in the context of an integrated approach (WHA70.12). 2017.
6. Ministry of Health. Singapore's approach to cancer. 2026.
7. Gatellier L, Cairo C, Jr., Ong SK, Haruyama R, Shankar A, Hussain QM, et al. National cancer control plans in ANCCA member countries: advancing a pan-Asian cancer initiative. Lancet Glob Health. 2025;13(8):e1476-e83.
8. Ferlay J, Ervik M, Lam F, Laversanne M, Colombet M, Mery L, et al. Global Cancer Observatory: Cancer Today (version 1.1). Lyon, France: International Agency for Research on Cancer2024 [Aug, 2026]. Available from: https://gco.iarc.who.int/today.
9. Manzano A, Svedman C, Hofmarcher T, Wilking N. Comparator Report on Cancer in Europe 2025 - Disease Burden, Costs and Access to Medicines and Molecular Diagnostics. Lund, Sweden: IHE, 2025.
10. Siegel RL, Kratzer TB, Giaquinto AN, Sung H, Jemal A. Cancer statistics, 2025. CA Cancer J Clin. 2025;75(1):10-45.
11. Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, Niksic M, et al. Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. Lancet. 2018;391(10125):1023-75.
12. Hofmarcher T, Lindgren P, Wilking N, Jonsson B. The cost of cancer in Europe 2018. Eur J Cancer. 2020;129:41-9.
13. Wong EYT, Wee I, Low JL, Heong V, Tey HJ, Tay SB, et al. The cost of cancer care in Singapore: A population-based analysis of healthcare expenditures and survivorship. Journal of Clinical Oncology. 2026;44(16_suppl):e23397-e.
14. National Cancer Institute. Cancer Trends Progress Report. 2025 [Mar 18, 2026]. Available from: https://progressreport.cancer.gov/after/economic_burden.
15. Australian Institute of Health and Welfare. Health system spending on disease and injury in Australia 2023-24. 2025 [Mar 18, 2026]. Available from: https://www.aihw.gov.au/reports/health-welfare-expenditure/health-system-spending-disease-injury-aus-2023-24/contents/summary.
16. National Health Insurance Service. Status of Treatment for Severe Diseases Under Special Calculation Exemptions (중증질환 산정특례 진료현황). 2024 [Mar 18, 2026]. Available from: https://www.nhis.or.kr/announce/wbhaec11416m01.do.
17. Ministry of Health Labor and Welfare. Overview of National Medical Expenses for Fiscal Year 2023 (Reiwa 5). Tokyo, Japan2023 [Mar 18, 2026]. Available from: https://www.mhlw.go.jp/toukei/saikin/hw/k-iryohi/23/index.html.
18. World Health Organization. Global Health Expenditure Database. [Mar 18, 2026]. Available from: https://apps.who.int/nha/database/ViewData/Indicators/en.
19. World Health Organization. Estimated deaths ('000) by age, cause and sex. [Mar 18, 2026]. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death.
20. Kong Y, Lam F, Ervik M, Soerjomataram I. Global Cancer Observatory: Cancer Impact, Cancer Economics: Productivity Loss. Lyon, France: 2025.
21. Kong Y, Lam F, Ervik M, Soerjomataram I. Data sources & methods. [Mar 19, 2026]. Available from: https://gco.iarc.who.int/economics/productivity_loss/en/data-sources-methods.
22. Hofmarcher T, Keel G, Lindgren P. Cancer care and access to cancer drugs in Asia-Pacific. Lund, Sweden: 2021.
23. Jönsson B, Hofmarcher T, Lindgren P, Wilking N. Comparator report on patient access to cancer medicines in Europe revisited. Lund: IHE, 2016.
24. Vrdoljak E, Bodoky G, Jassem J, Popescu R, Pirker R, Cufer T, et al. Expenditures on Oncology Drugs and Cancer Mortality-to-Incidence Ratio in Central and Eastern Europe. Oncologist. 2019;24(1):e30-e7.
25. World Health Organization. Obesity. [Mar 30, 2026]. Available from: https://www.who.int/health-topics/obesity#tab=tab_1.
26. Centers for Disease Control and Prevention. Obesity and Cancer. [Mar 30, 2026]. Available from: https://www.cdc.gov/cancer/obesity/index.htm.
27. World Health Organization. Obesity as an Avoidable Cause of Cancer (Attributable Risks). [Apr 09, 2026]. Available from: https://www.iarc.who.int/reference/obesity-as-an-avoidable-cause-of-cancer-attributable-risks/.
28. Brown KF, Rumgay H, Dunlop C, Ryan M, Quartly F, Cox A, et al. The fraction of cancer attributable to modifiable risk factors in England, Wales, Scotland, Northern Ireland, and the United Kingdom in 2015. Br J Cancer. 2018;118(8):1130-41.
29. World Health Organization. WHO acceleration plan to stop obesity. Geneva: 2023.
30. Ministry of Health Singapore. What is a Health Plan? [Aug, 2026]. Available from: https://www.healthiersg.gov.sg/stay-healthy-for-longer/.

31. World Health Organization. Overweight among adults, BMI >= 25, prevalence (crude estimate) (%). [March 30, 2026]. Available from: https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-overweight-among-adults-bmi-greaterequal-25-(crude-estimate)-(-).
32. World Health Organization. Obesity among adults, BMI >= 30, prevalence (prevalence (crude estimate) %). [Mar 30, 2026]. Available from: https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-obesity-among-adults-bmi--30-(crude-estimate)-(-).
33. Disease Policy and Strategy Division and Health Analytics Division Ministry of Health Policy Research & Surveillance Group. National Population Health Survey 2024. Singapore: 2025.
34. Singapore Department of Statistics. Prevalence Of Overweight, Obesity, Daily Smoking, Hypertension, Diabetes Mellitus, Hyperlipidaemia, Sufficient Total Physical Activity And Binge Drinking Among Residents Aged 18-74 Years. 2026 [Mar 30, 2026]. Available from: https://data.gov.sg/datasets/d_711586488b23182801c94bd7b6807833/view.
35. World Health Organization. Worldwide burden of cancer attributable to HPV by site, country and HPV type. [Apr 1, 2026]. Available from: https://www.iarc.who.int/reference/worldwide-burden-of-cancer-attributable-to-hpv-by-site-country-and-hpv-type/.
36. Australian Government. GARDASIL quadrivalent human papillomavirus (types 6, 11, 16, 18) recombinant vaccine 20,40,40,20 micrograms/0.5mL sterile liquid vial (124408). [Apr 1, 2026]. Available from: https://www.tga.gov.au/resources/artg/124408.
37. Australian Government. Human papillomavirus (HPV) immunisation data. [Apr 1, 2026]. Available from: https://www.health.gov.au/topics/immunisation/immunisation-data/human-papillomavirus-hpv-immunisation-data.
38. European Cancer Organisation. A Four Step Plan for Eliminating HPV Cancers in Europe. 2020.
39. World Health Organization. Human papillomavirus vaccines: WHO position paper (2022 update). Weekly epidemiological record: 2022.
40. World Health Organization. Cervical Cancer Elimination Initiative. [Apr 1, 2026]. Available from: https://www.who.int/initiatives/cervical-cancer-elimination-initiative.
41. World Health Organization (WHO). WHO updates recommendations on HPV vaccination schedule. 2022 [Aug, 2026]. Available from: https://www.who.int/news/item/20-12-2022-WHO-updates-recommendations-on-HPV-vaccination-schedule.
42. Ang J, Chan G, Kanneganti A, Lim LM. SCCPS Scientific Committee Position Paper on HPV Vaccination. Singapore: Society for Colposcopy & Cervical Pathology of Singapore, 2025.
43. Health Hub. Preventing HPV infection: HPV Vaccination. 2026 [Aug, 2026]. Available from: https://www.healthhub.sg/health-conditions/faqs-on-hpv-and-hpv-immunisation.
44. European Centre for Disease Prevention and Control. Guidance on HPV vaccination in EU countries: focus on boys, people living with HIV and 9-valent HPV vaccine introduction 2020. Stockholm: ECDC, 2020.
45. World Health Organization. HPV Dashboard. [Apr 06, 2026]. Available from: https://www.who.int/teams/immunization-vaccines-and-biologicals/diseases/human-papillomavirus-vaccines-(HPV)/hpv-clearing-house/hpv-dashboard.
46. Ministry of Health Singapore. HPV vaccination in cervical cancer prevention. 2018 [Apr 1, 2026]. Available from: https://www.moh.gov.sg/newsroom/hpv-vaccination-in-cervical-cancer-prevention/.
47. Ministry of Health Singapore. Chapter 7: Childhood immunisation. 2018.
48. Ministry of Health Singapore. HPV School-based Programme. 2019 [Apr 1, 2026]. Available from: https://www.moh.gov.sg/newsroom/hpv-school-based-programme/.
49. Health Hub. Child Immunisation and Screening Services. [Apr 1, 2026]. Available from: https://www.healthhub.sg/programmes/parent-hub/student_immunisation_and_screening.
50. Ministry of Health Singapore. Protect yourself against cervical cancer. [Apr 1, 2026]. Available from: https://vaccine.gov.sg/hpv.
51. Ministry of Health Singapore. Human Papillomavirus Vaccination take-up rates by gender and age groups for past five years. 2026 [Apr 06, 2026]. Available from: https://www.moh.gov.sg/newsroom/human-papillomavirus-vaccination-take-up-rates-by-gender-and-age-groups-for-past-five-years/.
52. Child Policy Division. Announcement of the Lee Jae-myung Administration's Child Policy Implementation Strategy for Realizing a Basic Society Where Children Are Healthy and Happy. 2025 [Apr 08, 2026]. Available from: https://www.mohw.go.kr/board.es?act=view&bid=0027&cg_code=&list_no=1488372&mid=a10503010100.
53. Communicable Diseases Agency. Overview of the immunisation programmes in Singapore. 2025.
54. Ministry of Education. Facts regarding vaccines. 2019 [Apr 06, 2026]. Available from: https://www.moe.gov.sg/news/parliamentary-replies/20190506-facts-regarding-vaccines.
55. Health Hub. Parent Hub: Student Immunisation And Screening. [Aug, 2026]. Available from: https://www.healthhub.sg/programmes/parent-hub/student_immunisation_and_screening.
56. Utravathy V. Singapore: HPV vaccination programme landscape. HPV Vaccination Programs in LMICs from Southeast Asia and West Pacific regions Symposium: Coalition to Strenghten the HPV immunization Community, 2024.
57. Cancer Research UK. Survival for cervical cancer. [April 15, 2025]. Available from: https://www.cancerresearchuk.org/about-cancer/cervical-cancer/survival.
58. McGarvey N, Gitlin M, Fadli E, Chung KC. Increased healthcare costs by later stage cancer diagnosis. BMC Health Serv Res. 2022;22(1):1155.
59. World Health Organization. Cervical cancer. [April 28, 2025]. Available from: https://www.who.int/news-room/fact-sheets/detail/cervical-cancer.
60. IARC Working Group. Cervical Cancer Screening Programmes. Cervical Cancer Screening. Lyon (FR)2022.
61. Primary Care Pages. Cancer Screening. 2026 [May 20, 2026]. Available from: https://www.primarycarepages.sg/healthier-sg/care-protocols/preventive-health-care-protocols/cancer-screening.

62. Ministry of Health Singapore. Healthier SG Screening – National Health Screening Programme. [Apr 08, 2026]. Available from: https://www.healthhub.sg/programmes/healthiersg-screening/screening-journey.
63. Ministry of Health Singapore. Healthier SG Screening - National Health Screening Programme. [cited Apr 08, 2026]. Available from: https://www.healthhub.sg/programmes/healthiersg-screening/#home.
64. National Cancer Institute. Cervical Cancer Screening. 2025 [Apr 08, 2026]. Available from: https://progressreport.cancer.gov/detection/cervical_cancer.
65. NHS. Cervical Screening Programme, England - 2023-2024. 2024 [Apr 08, 2026]. Available from: https://digital.nhs.uk/data-and-information/publications/statistical/cervical-screening-annual/england-2023-24.
66. National Cancer Center. Cancer screening rate in 2024 is 70.2%, an increase of 3.8% compared to 2023. 2025 [Apr 08, 2026]. Available from: https://www.ncc.re.kr/prBoardView1.ncc?nwsId=10237&.
67. Australian Government. National Cervical Screening Program monitoring report 2025. 2025 [Apr 08, 2026]. Available from: https://www.aihw.gov.au/reports/cancer-screening/ncsp-monitoring-report-2025/contents/recruitment/pi-1-participation.
68. Ministry of Health Labour and Welfare. Regarding the ideal approach to cancer screening programs. 2024 [Apr 08, 2026]. Available from: https://www.mhlw.go.jp/content/10900000/001280634.pdf.
69. Kanesvaran R. Singapore's cancer screening gap is widening at a critical moment. National Cancer Centre Singapore; 2026 [Apr 08, 2026]. Available from: https://www.nccs.com.sg/news/patient-care/singapores-cancer-screening-gap-is-widening-at-a-critical-moment.
70. Chan GMF, Ong LSD, Shen L, Ng SYJ, Low JHJ, Lim LM. High acceptability of HPV self-sampling in a Singapore primary care setting. Ann Acad Med Singap. 2025;54(5):319-21.
71. National Cancer Institute. Genetic Testing for Inherited Cancer Risk. [Apr 13, 2026]. Available from: https://www.cancer.gov/about-cancer/causes-prevention/genetics/genetic-testing-fact-sheet.
72. National Cancer Institute. Genetics of Breast and Gynecologic Cancers (PDQ®)–Health Professional Version. [cited Apr 13, 2026]. Available from: https://www.cancer.gov/types/breast/hp/breast-ovarian-genetics-pdq.
73. National Cancer Institute. Cancer Genetics Risk Assessment and Counseling (PDQ®)–Health Professional Version. [Apr 13, 2026]. Available from: https://www.cancer.gov/publications/pdq/information-summaries/genetics/risk-assessment-hp-pdq.
74. National Institute for Health and Care Excellence. Ovarian cancer: identifying and managing familial and genetic risk. 2024 [Apr 13, 2026]. Available from: https://www.nice.org.uk/guidance/ng241/chapter/Context.
75. The Jackson Laboratory. Hereditary Breast and Ovarian Cancer Syndrome. [May 9, 2026]. Available from: https://www.jax.org/education-and-learning/clinical-and-continuing-education/clinical-topics/cancer-resources/hereditary-breast-and-ovarian-cancer-syndrome-factsheet.
76. Sessa C, Balmana J, Bober SL, Cardoso MJ, Colombo N, Curigliano G, et al. Risk reduction and screening of cancer in hereditary breast-ovarian cancer syndromes: ESMO Clinical Practice Guideline. Ann Oncol. 2023;34(1):33-47.
77. Daly MB, Pal T, Berry MP, Buys SS, Dickson P, Domchek SM, et al. Genetic/Familial High-Risk Assessment: Breast, Ovarian, and Pancreatic, Version 2.2021, NCCN Clinical Practice Guidelines in Oncology. J Natl Compr Canc Netw. 2021;19(1):77-102.
78. Stjepanovic N, Moreira L, Carneiro F, Balaguer F, Cervantes A, Balmana J, et al. Hereditary gastrointestinal cancers: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-updagger. Ann Oncol. 2019;30(10):1558-71.
79. Hodan R, Gupta S, Weiss JM, Axell L, Burke CA, Chen LM, et al. Genetic/Familial High-Risk Assessment: Colorectal, Endometrial, and Gastric, Version 3.2024, NCCN Clinical Practice Guidelines In Oncology. J Natl Compr Canc Netw. 2024;22(10):695-711.
80. Singapore Cancer Network Cancer Genetics W. Singapore Cancer Network (SCAN) Guidelines for Referral for Genetic Evaluation of Common Hereditary Cancer Syndromes. Ann Acad Med Singap. 2015;44(10):492-510.
81. Ministry of Health Singapore. Keeping Healthcare Affordable. 2026 [Apr 13, 2026]. Available from: https://www.moh.gov.sg/newsroom/keeping-healthcare-affordable/.
82. Ministry of Health Singapore. Subsidies for Genetic Tests. [Apr 15, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/genetic-testing/subsidies-for-genetic-tests/.
83. Saxena A, Phay R, Chiang J, Wong FY, Yuen J, Ishak D, et al. Does financial subsidy equalise cancer genetic testing uptake across socioeconomic groups? A retrospective observational study in Singapore. BMJ Open. 2025;15(12):e107513.
84. Courtney E, Chok AK, Ting Ang ZL, Shaw T, Li ST, Yuen J, et al. Impact of free cancer predisposition cascade genetic testing on uptake in Singapore. NPJ Genom Med. 2019;4:22.
85. National Institue for Health and Care Excellence. Ovarian cancer: identifying and managing familial and genetic risk. 2024 [Apr 15, 2026]. Available from: https://www.nice.org.uk/guidance/ng241/chapter/recommendations.
86. National Institue for Health and Care Excellence. Familial breast cancer: classification, care and managing breast cancer and related risks in people with a family history of breast cancer. 2023 [Apr 15, 2026]. Available from: https://www.nice.org.uk/guidance/cg164/ifp/chapter/genetic-counselling-and-genetic-testing.
87. National Institue for Health and Care Excellence. Testing strategies for Lynch syndrome in people with endometrial cancer. 2020 [Apr 15, 2026]. Available from: https://www.nice.org.uk/guidance/htg557/chapter/1-Recommendations.
88. NHS. Genetic and genomic testing. [Apr 15, 2026]. Available from: https://www.nhs.uk/tests-and-treatments/genetic-and-genomic-testing/.
89. World Health Organization. Guide to cancer early diagnosis. Geneva: 2017.

90. Hanna TP, King WD, Thibodeau S, Jalink M, Paulin GA, Harvey-Jones E, et al. Mortality due to cancer treatment delay: systematic review and meta-analysis. BMJ. 2020;371:m4087.
91. Caja Costarricense de Seguro Social. ASALUD-0036-2025. 2025.
92. OECD/European Commission. Delivering High Value Cancer Care: European Cancer Inequalities Registry Analytical Report. Paris: OECD Publishing, 2026.
93. NHS England. Clinically-led review of NHS access standards: cancer. [Apr 28, 2026]. Available from: https://www.england.nhs.uk/clinically-led-review-nhs-access-standards/cancer/.
94. Cancer Council Victoria. Optimal care pathways: ovarian. [Apr 28, 2026]. Available from: https://optimalcarepathways.com.au/ocp-ovc-pathways/.
95. Ministry of Health Singapore Median Waiting Time for Cancer Treatment in Public Hospitals by Ward Class and Specialty. 2024 [Apr 28, 2026]. Available from: https://www.moh.gov.sg/newsroom/median-waiting-time-for-cancer-treatment-in-public-hospitals-by-ward-class-and-specialty/.
96. Singapore Cancer Society. Screening and Vaccination for Cervical Cancer. [Apr 28, 2026]. Available from: https://singaporecancersociety.org.sg/screening-for-cervical-cancer/.
97. Ministry of Health Singapore Cancer Scans. 2017 [Apr 28, 2026]. Available from: https://www.moh.gov.sg/newsroom/cancer-scans/.
98. Ministry of Health Singapore Average Waiting Time for Cancer Screening in Public Hospitals. 2022 [Apr 28, 2026]. Available from: https://www.moh.gov.sg/newsroom/average-waiting-time-for-cancer-screening-in-public-hospitals/.
99. Cancer Council Victoria. Optimal care pathways: endometrial cancer. [cited Apr 28, 2026]. Available from: https://optimalcarepathways.com.au/ocp-ec-pathways/.
100. Cancer Council Victoria. Optimal care pathways: cervical cancer. [Apr 28, 2026]. Available from: https://optimalcarepathways.com.au/ocp-cvc-pathways/.
101. NHS. Cancer Waiting Times, June 2022 - Provider Based - Provisional. 2022.
102. NHS. Cancer Waiting Times, June 2023 - Provider Based - Provisional. 2023.
103. NHS. Cancer Waiting Times, June 2024 - Provider Based - Provisional. 2024.
104. Fung-Kee-Fung M, Kennedy EB, Biagi J, Colgan T, D'Souza D, Elit LM, et al. An organizational guideline for gynecologic oncology services. Int J Gynecol Cancer. 2015;25(4):551-8.
105. Cibula D, Mburu A, Planchamp F, Zapardiel I, Atallah D, Al-Rubaish S, et al. European Society of Gynaecological Oncology resource-stratified guidelines for the management of patients with cervical cancer. Int J Gynecol Cancer. 2026;36(1):102747.
106. Oaknin A, Bosse TJ, Creutzberg CL, Giornelli G, Harter P, Joly F, et al. Endometrial cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. Ann Oncol. 2022;33(9):860-77.
107. Ledermann JA, Matias-Guiu X, Amant F, Concin N, Davidson B, Fotopoulou C, et al. ESGO-ESMO-ESP consensus conference recommendations on ovarian cancer: pathology and molecular biology and early, advanced and recurrent disease. Ann Oncol. 2024;35(3):248-66.
108. Mangone L, Marinelli F, Bisceglia I, Braghiroli MB, Mastrofilippo V, Pezzarossi A, et al. Optimizing Outcomes through a Multidisciplinary Team Approach in Endometrial Cancer. Healthcare (Basel). 2023;12(1).
109. Mulligan K, Corry E, Donohoe F, Glennon K, Vermeulen C, Reid-Schachter G, et al. Multidisciplinary Surgical Approach to Increase Survival for Advanced Ovarian Cancer in a Tertiary Gynaecological Oncology Centre. Ann Surg Oncol. 2024;31(1):460-72.
110. Subbiah D. Why patients benefit from multidisciplinary cancer care. National Cancer Centre Singapore; [Apr 17, 2026]. Available from: https://www.nccs.com.sg/about-nccs/news/publications/in-good-health/issue-5/why-patients-benefit-from-multidisciplinary-cancer-care.newsdetails.
111. National Cancer Centre Singapore. Breast & Gynaecological Cancer. [Apr 17, 2026]. Available from: https://www.nccs.com.sg/our-specialties/medical-oncology/breast-gynaecological-cancer.
112. National University Cancer Institute Singapore. Gynaecologic Oncology. Apr 17, 2026. Available from: https://www.ncis.com.sg/our-services/specialties/gynaecologic-oncology.
113. KK Women's and Children's hospital. Gynaecological Oncology. [Apr 17, 2026]. Available from: https://www.kkh.com.sg/our-specialties/gynaecological-cancer-centre.
114. Singapore General Hospital. Gynaecology Oncology. [Aug, 2026]. Available from: https://www.sgh.com.sg/our-specialties/obstetrics-and-gynaecology/gynaecology-oncology.
115. KK Women's and Children's hospital. Gynaecological Oncology. [Aug, 2026]. Available from: https://www.kkh.com.sg/education/training-fellowships/medical/obstetrics-gynaecology/gynaecological-oncology.
116. National Cancer Center Singapore. Obstetrics and Gynaecology. [Aug, 2026]. Available from: https://www.nccs.com.sg/our-specialties/surgery-surgical-oncology/obstetrics-and-gynaecology.
117. Mustapha NZB, Xu Y, Mohd Razali MRB, Najumudin NB, Barman HB. The role of patient navigators: Case studies in Singapore. Proceedings of Singapore Healthcare. 2016;25(3):188-90.
118. Park K, Lee HJ, Kong SH, Park DJ, Chung H, Cho SJ, et al. Patients participation in multidisciplinary management in gastric cancer: regulation comparison and expert survey among major countries. Korean J Clin Oncol. 2025;21(3):143-9.
119. Purandare N, Ruiloba F, Nguyen-Hoang L, Wilailak S, Yanaihara N, Chung JPW, et al. Cancer and fertility management: FIGO best practice advice. International Journal of Gynecology & Obstetrics. 2025;171(1):32-44.
120. Su HI, Lacchetti C, Letourneau J, Partridge AH, Qamar R, Quinn GP, et al. Fertility Preservation in People With Cancer: ASCO Guideline Update. Journal of Clinical Oncology. 2025;43(12):1488-515.
121. ESMO Guidelines Committee, Lambertini M, Peccatori FA, Demeestere I, Amant F, Wyns C, et al. Fertility preservation and post-treatment pregnancies in post-pubertal cancer patients: ESMO Clinical Practice Guidelines<sup>†</sup>. Annals of Oncology. 2020;31(12):1664-78.
122. Morice P, Scambia G, Abu-Rustum NR, Acien M, Arena A, Brucker S, et al. Fertility-sparing treatment and follow-up in patients with cervical cancer, ovarian cancer, and borderline ovarian tumours: guidelines from ESGO, ESHRE, and ESGE. The Lancet Oncology. 2024;25(11):e602-e10.

123. Catena U, Macklon KLT, Rodolakis A, Scambia G. A practical guideline on the fertility-sparing treatment of patients with endometrial carcinoma and atypical endometrial hyperplasia. International Journal of Gynecology & Obstetrics. 2025;169(2):453-5.
124. Ministry of Health. Speech by MOS Rahayu on the Adjournment Motion on Fertility Preservation for Young Cancer Patients. [May 20, 2026]. Available from: https://www.moh.gov.sg/newsroom/speech-by-mos-rahayu-on-the-adjournment-motion-on-fertility-preservation-for-young-cancer-patients/.
125. Ministry of Health Singapore. Speech by MOS Rahayu on the Adjournment Motion on Fertility Preservation for Young Cancer Patients. 2024 [Aug, 2026]. Available from: https://www.moh.gov.sg/newsroom/speech-by-mos-rahayu-on-the-adjournment-motion-on-fertility-preservation-for-young-cancer-patients/.
126. Ministry of Health Singapore. Keeping Healthcare Affordable and Sustainable for All. 2025 [Aug, 2026]. Available from: https://www.moh.gov.sg/newsroom/keeping-healthcare-affordable-and-sustainable-for-all/.
127. Tang TW, Goh SYC, Phoon JWL. A review of fertility preservation in women in Singapore from 2010 to 2019. Ann Acad Med Singap. 2025;54(8).
128. Ng QJ, Ee TX, Goh CSY, Lee SH, Low JEH, Lin J, et al. Oncofertility care and fertility preservation in gynaecological cancer: experience from Singapore's largest tertiary centre. Singapore Medical Journal. 2025:10.4103/singaporemedj.SMJ-2024-094.
129. Robson D, de Vries B, Pather S, Marren A. Fertility preservation in gynaecology oncology patients: Experience from an Australian tertiary oncology centre. Australian and New Zealand Journal of Obstetrics and Gynaecology. 2022;62(4):542-7.
130. McCarter K, Stewart J, Gordhandas S, Aluko A, Shah N, Schattman G, et al. The use of fertility preservation services for cancer patients: a single institution experience. F S Rep. 2022;3(4):349-54.
131. Ojo AS, Lipscombe C, Araoye MO, Akinyemi O. Global uptake of fertility preservation by women undergoing cancer treatment: An unmet need in low to high-income countries. Cancer Epidemiol. 2022;79:102189.
132. Ministry of Health Singapore. Speech by Mdm Rahayu Mahzam, Minister of State, at The Ministry of Health committee of supply debate 2025, on Friday 7 March 2025. 2025 [Aug, 2026]. Available from: https://www.moh.gov.sg/newsroom/speech-by-mdm-rahayu-mahzam--minister-of-state--at-the-ministry-of-health-committee-of-supply-debate-2025--on-friday-7-march-2025/.
133. Harzif AK, Santawi VPA, Maidarti M, Wiweko B. Investigation of Each Society for Fertility Preservation in Asia. Front Endocrinol (Lausanne). 2019;10:151.
134. Macmillan Cancer Support. Fertility preservation. [May 20, 2026]. Available from: https://www.macmillan.org.uk/cancer-information-and-support/impacts-of-cancer/fertility/preservation.
135. Alliance for Fertility Preservation. Laws & Legislation. [May 20, 2026]. Available from: https://www.allianceforfertilitypreservation.org/expenses/laws-legislation/.
136. NHS Guy's and St Thomas'. Freezing eggs or embryos - Fertility preservation for women. [May 21, 2026]. Available from: https://www.guysandstthomas.nhs.uk/health-information/fertility-preservation-for-women/freezing-eggs-or-embryos.
137. Australian Government. Eligibility for the Assisted Reproductive Technology (ART) Storage Funding Program. [May 21, 2026]. Available from: https://www.health.gov.au/our-work/assisted-reproductive-technology-art-storage-funding-program/eligibility#eligible-patients.
138. Scott EC, Baines AC, Gong Y, Moore R, Jr., Pamuk GE, Saber H, et al. Trends in the approval of cancer therapies by the FDA in the twenty-first century. Nat Rev Drug Discov. 2023;22(8):625-40.
139. Ministry of Health Singapore. MediShield Life. 2025 [Apr 20, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/medishield-life/medishield-life/.
140. Ministry of Health Singapore. MediSave. 2026 [Apr 20, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/medisave/.
141. Ministry of Health Singapore. About Integrated Shield Plan. [Apr 20, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/integrated-shield-plans/about-integrated-shield-plans/.
142. Ministry of Health Singapore. Subsidies for drugs on the Medication Assistance Fund (MAF) List at Public Healthcare Institutions. [Apr 21, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/subsidies-for-drugs-on-the-medication-assistance-fund-%28maf%29-list-at-public-healthcare-institutions/.
143. Ministry of Health Singapore. FAQs on cancer treatment financing. 2025 [Apr 20, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/medishield-life/faqs-on-cancer-treatment-financing/.
144. Ministry of Health Singapore. Cancer Drug List. 2026 [Apr 21, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/medishield-life/cancer-drug-list/.
145. World Health Organization. New WHO/IAEA publication provides guidance on radiotherapy equipment to fight cancer. [Apr 21, 2026]. Available from: https://www.iaea.org/newscenter/pressreleases/new-who/iaea-publication-provides-guidance-on-radiotherapy-equipment-to-fight-cancer.
146. Arias F, Arraras JI, Asin G, Zarandona U, Mora I, Errasti M, et al. To What Extent Does Radiotherapy Improve the Quality of Life of Patients With Bone Metastasis?: A Prospective, Single-Institutional Study. Am J Clin Oncol. 2018;41(2):163-6.
147. Tchelebi LT, Shen B, Wang M, Gusani NJ, Walter V, Abrams R, et al. Impact of radiation therapy facility volume on survival in patients with cancer. Cancer. 2021;127(21):4081-90.
148. International Atomic Energy Agency (IAEA). Radiotherapy in Cancer Care: Facing the Global Challenge. 2017.
149. American Cancer Society. Radiation Therapy for Ovarian Cancer. [May 10, 2026]. Available from: https://www.cancer.org/cancer/types/ovarian-cancer/treating/radiation-therapy.html.
150. American Cancer Society. Radiation Therapy for Cervical Cancer. [May 10, 2026]. Available from: https://www.cancer.org/cancer/types/cervical-cancer/treating/radiation.html.
151. American Cancer Society. Radiation Therapy for Endometrial Cancer. [May 10, 2026]. Available from: https://www.cancer.org/cancer/types/endometrial-cancer/treating/radiation.html.

152. Slotman BJ, Cottier B, Bentzen SM, Heeren G, Lievens Y, van den Bogaert W. Overview of national guidelines for infrastructure and staffing of radiotherapy. ESTRO-QUARTS: work package 1. Radiother Oncol. 2005;75(3):349-54.
153. Singapore General Hospital. A look inside the new National Cancer Centre Singapore. 2023 [Apr 22, 2026]. Available from: https://www.sgh.com.sg/news/singapore-health/a-look-inside-the-new-national-cancer-centre-singapore.
154. Ministry of Health Singapore MediShield Life Benefits. 2025 [Apr 22, 2026]. Available from: https://www.moh.gov.sg/managing-expenses/schemes-and-subsidies/medishield-life/medishield-life-benefits/#Approved-Indications-for-use-of-Proton-Beam-Therapy-in-Treatment.
155. International Atomic Energy Agency (IAEA). DIRAC - Directory of Radiotherapy Centres: Countries. [Apr 21, 2026]. Available from: https://dirac.iaea.org/Query/Countries.
156. Moraes FY, Gouveia AG, Freitas Bratti V, Dee EC, Fernandes Pavoni J, Carson LM, et al. Global linear accelerator requirements and personalised country recommendations: a cross-sectional, population-based study. Lancet Oncol. 2025;26(2):239-48.
157. Zhu H, Chua MLK, Chitapanarux I, Kaidar-Person O, Mwaba C, Alghamdi M, et al. Global radiotherapy demands and corresponding radiotherapy-professional workforce requirements in 2022 and predicted to 2050: a population-based study. Lancet Glob Health. 2024;12(12):e1945-e53.
158. Bergerot C, Jacobsen PB, Rosa WE, Lam WWT, Dunn J, Fernández-González L, et al. Global unmet psychosocial needs in cancer care: health policy. eClinicalMedicine. 2024;78.
159. Esmo Guidelines Committee, Grassi L, Caruso R, Riba MB, Lloyd-Williams M, Kissane D, et al. Anxiety and depression in adult cancer patients: ESMO Clinical Practice Guideline<sup>†</sup>. ESMO Open. 2023;8(2).
160. Ke Y, Tan YY, Neo PSH, Yang GM, Loh KW-J, Ho S, et al. Implementing an Inclusive, Multidisciplinary Supportive Care Model to Provide Integrated Care to Breast and Gynaecological Cancer Survivors: A Case Study at an Asian Ambulatory Cancer Centre. International Journal of Integrated Care. 2023.
161. Ke Y, Neo PSH, Yang GM, Neo SH, Tan YY, Tan YP, et al. Impact of a Multidisciplinary Supportive Care Model Using Distress Screening at an Asian Ambulatory Cancer Center: A Cluster Randomized Controlled Trial. JCO Oncol Pract. 2024;20(9):1207-18.
162. Cancer Australia. Clinical guidance for responding to suffering in adults with cancer. 2014.
163. Butow P, Price MA, Shaw JM, Turner J, Clayton JM, Grimison P, et al. Clinical pathway for the screening, assessment and management of anxiety and depression in adult cancer patients: Australian guidelines. Psycho-Oncology. 2015;24(9):987-1001.
164. National Cancer Control Indicators. Screening for distress. [May 25, 2026]. Available from: https://ncci.canceraustralia.gov.au/psychosocial-care/screening-distress.
165. American Psychosocial Oncology Society (APOS). Distress Screening. [May 25, 2026]. Available from: https://apos-society.org/professionals/distress-screening/#:~:text=By%20the%20latter%20part%20of%202015%2C%20the%20American,on%20results%2C%20offer%20appropriate%20levels%20of%20psychosocial%20care.
166. Okuyama T, Kizawa Y, Morita T, Kinoshita H, Uchida M, Shimada A, et al. Current Status of Distress Screening in Designated Cancer Hospitals: A Cross-Sectional Nationwide Survey in Japan. Journal of the National Comprehensive Cancer Network J Natl Compr Canc Netw. 2016;14(9):1098-104.
167. National Comprehensive Cancer Network. Distress During Cancer Care. 2026.
168. Department of Health & Social Care. The National Cancer Plan for England: delivering world class cancer care. 2026.
169. NHS England. Personalised care and improving quality of life outcomes. [May 29, 2026]. Available from: https://www.england.nhs.uk/cancer/living/.
170. Lee HJ, Lee K-M, Jung D, Shim E-J, Hahm B-J, Kim J-H. Psycho-oncology in Korea: past, present and future. BioPsychoSocial Medicine. 2017;11(1):12.
171. World Health Organization. Palliative care. [May 22, 2026]. Available from: https://www.who.int/news-room/fact-sheets/detail/palliative-care.
172. Gouldthorpe C, Power J, Taylor A, Davies A. Specialist Palliative Care for Patients with Cancer: More Than End-of-Life Care. Cancers (Basel). 2023;15(14).
173. Sanders JJ, Temin S, Ghoshal A, Alesi ER, Ali ZV, Chauhan C, et al. Palliative Care for Patients With Cancer: ASCO Guideline Update. Journal of Clinical Oncology. 2024;42(19):2336-57.
174. National Strategy for Palliative Care Review (NSPC) Workgroup. 2023 National Strategy for Palliative Care Report. 2023.
175. Singapore Hospice Council. National Quality Improvement Project - Minimum Data Set (MDS) FY2023 summary report 2025.
176. Australian Institute of Health and Welfare. Palliative care and health service use for people with life-limiting conditions. 2024.
177. Ernecoff NC, Wessell KL, Hanson LC, Dusetzina SB, Shea CM, Weinberger M, et al. Elements of Palliative Care in the Last 6 Months of Life: Frequency, Predictors, and Timing. J Gen Intern Med. 2020;35(3):753-61.
178. Davis MP, Temel JS, Balboni T, Glare P. A review of the trials which examine early integration of outpatient and home palliative care for patients with serious illnesses. Annals of Palliative Medicine. 2015;4(3):99-121.

# Appendix: Methodology and sources for indicators

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| **Governance** | |
| National cancer plan | **For dashboard overview:**<br>Presence of a national cancer plan in 2026 (yes = at benchmark). Although Singapore does not have a traditional national cancer control plan, it has a national cancer strategy. The assessment therefore drew on the study National cancer control plan in ANCCA member countries: advancing a pan-Asian cancer initiative, which reviewed cancer control strategies across 21 ANCCA member countries (7). Singapore scored 11 out of 24 on cancer policy, equivalent to 45%. Its strongest areas were stakeholder involvement and the use of national evidence to inform planning. It scored moderately on oversight arrangements, implementation planning, and budget inclusion, but scored lower on legal basis and plan type, and received no points for formal evaluation or public progress reporting. |
| **Disease burden** | |
| Incidence (new cases)<br>Mortality (deaths) | 1st, 2nd, 3rd, 4th, 6th , 7th, 8th graph: Singapore Cancer Registry (SCR) (2).<br>5th graph: Shows estimates for crude rates per 100,000 women from IARC 2024 (8).<br><br>**For dashboard overview:**<br>• Incidence crude rate of gynaecological cancers per 100,000 women in 2024 (8). For the benchmark countries, an arithmetic mean was used.<br>• Mortality crude rate of gynaecological cancers per 100,000 women in 2024 (8). For the benchmark countries, an arithmetic mean was used. |
| Survival rates | 9th graph: CONCORD-3 study. Unweighted average was calculated based on countries with available data (11).<br><br>**For dashboard overview:**<br>Five-year net survival rates for cervical and ovarian cancer. An unweighted average was used for the benchmark countries. |
| **Economic burden** | |
| Health spending on cancer | 1st graph: Data on the economic burden of cancer in EU in 2018 were sourced from Hofmarcher et al. (2020) (12)<br>2nd graph: Cancer spending data were collected for the latest year available. Data were obtained from CMS for the US (2020) (14), AIHW for Australia (fiscal year 2023–2024) (15), NHIS for South Korea (2024) (16), MHLW for Japan (2023) (17), and Manzano et al. for the UK and EU (2023 estimates) (9). Total current health expenditure was obtained from the WHO Global Health Expenditure Database (18). Cancer deaths as a share of total deaths were obtained from the WHO Global Health Estimates (2021) (19).<br><br>**For dashboard overview:**<br>Healthcare spending on cancer per capita was not available for Singapore, so it was left empty in the overview. |
| Productivity losses | 3rd, 4th graph: Data were gathered from IARC estimates (20).<br>5th graph: Graph was obtained from Hofmarcher et al. (2021) (22).<br><br>**For dashboard overview:**<br>Productivity losses from cancer death per capita in USD in 2022 (20). An arithmetic average based on deaths from gynaecological cancers was estimated for the benchmark countries (Australia, Japan, South Korea, UK, and US). |
| **Prevention** | |
| Overweight and obesity | 1st & 2nd graph: WHO (31, 32). Prevalence of overweight among women aged 18+, BMI ≥ 25 (crude estimate) (%) and Prevalence of obesity among women aged 18+, BMI ≥ 30 (crude estimate) (%). Specifications: women, overweight: 2010-2021, obesity 2010-2022.<br><br>**For dashboard overview:**<br>Prevalence of obesity in women in 2022 (32). An arithmetic average for the benchmark countries was estimated for comparison to Singapore. |
| HPV vaccination | 1st graph: Data are from the Communicable Diseases Agency's overview of immunisation programmes in Singapore. The figures show HPV vaccination coverage among 15-year-old girls in Singapore, including citizens and permanent residents (53).<br><br>**For dashboard overview:**<br>HPV vaccination coverage among 15-year-old girls in 2024 compared to WHO benchmark of 90% by 2030. |
| **Early detection** | |
| Cervical cancer screening | 1st graph: Data corresponds to cervical cancer screening participation of women aged 25 to 74 from the National Population Health Survey 2024 (33).<br>2nd graph: For the international comparison graph, the data are drawn from different years and population groups. Australia: Australian Institute of Health and Welfare (AIHW), women aged 25 to 74, screened in 2020 to 2024 (67). Japan: Ministry of Health, Labour and Welfare (MHLW), women aged 20 years and older, 2022 (68). England: National Health Service (NHS), eligible individuals aged 25 to 64 years, 2024 (65). South Korea: National Cancer Center (NCC), women aged 20 years and older screened within the past two years, 2024 (66). United States: National Cancer Institute (NCI), women aged 21 to 65 years, 2023 estimate (64). Singapore: National Population Health Survey (NPHS), women aged 25 to 74, 2024 (33).<br><br>**For dashboard overview:**<br>Singapore's cervical cancer screening participation rate in 2024 was compared with the arithmetic average of the benchmark countries shown in the second graph. |

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| Genetic testing & counselling | **For dashboard overview:**<br>Singapore scores 80/100 because it has strong referral guidance and specialist service provision for hereditary cancer risk, and it has moved toward public financing for HBOC-related testing and prevention. However, full alignment with international clinical guidelines NCCN and ESMO has not yet been reached, as national funding remains incomplete, the announced HBOC subsidy is only due to start in December 2026, and an equivalent national subsidy framework for Lynch syndrome was not identified. |
| **Diagnosis and treatment** | |
| Care pathways and waiting times | **For dashboard overview:**<br>A pathway timeliness KPI was developed to compare countries on the availability of national time-bound standards and public reporting across the gynaecological cancer care pathway. Scores ranged from 0 to 100: 0 indicated no identified standards or reporting; 33 indicated partial proxy data only; 67 indicated national cross-cancer waiting-time standards; and 100 indicated gynaecological cancer-specific pathway timeframes. Singapore scored 33, as only partial proxy data were identified, including oncology outpatient waiting times and selected diagnostic waiting times, but no gynaecological cancer-specific waiting-time data across diagnosis and treatment. England scored 67 due to national cross-cancer waiting-time standards.<br>To complement the standards-based KPI, a second component was added to capture actual waiting-time performance for suspected cancer referrals. Countries scored 100 where data showed either at least 75% of patients seen within two weeks or at least 90% given an appointment within three weeks. Under this approach, both Singapore and England scored 100: Singapore because over 95% of suspected cancer patients in public hospitals received an appointment within three weeks in 2017, and England because 78% of urgent suspected cancer referrals were seen within the stricter two-week pathway.<br>The benchmark for comparison was calculated for Singapore and England as the arithmetic average of two components: national time-bound standards and public reporting across the gynaecological cancer care pathway, and actual waiting-time performance. |
| Multidisciplinary care | 1st table: Park et al. (2025) (118).<br><br>**For dashboard overview:**<br>A three-component MDT implementation index was developed to compare countries on governance and standardisation, reimbursement and financial support, and operational clarity and timeliness, with equal weight given to each domain. The scores were based on the results reported by Park et al. (2025) (118). Although the information was collected for the management of gastric cancer patients, it was the best available source for understanding the status of MDT implementation in Singapore in a way that was also comparable across countries. Scores ranged from 0 to 100, with higher scores indicating a more formalised, better supported, and timelier MDT model. The UK scored 100, reflecting the most standardised model in this comparison. South Korea scored 73 and Japan 67, indicating strong implementation, supported by national requirements or incentives, although with less consistent timeliness than the UK. Singapore scored 60, placing it in the category of strong implementation with some system gaps: MDT care is encouraged within one to two weeks of diagnosis, but implementation is driven mainly by institutional practice, and reimbursement is not publicly standardised. The US scored 20, indicating a fragmented model, with no national requirement, no clear operational standard, and financing left largely to local arrangements. The arithmetic average across countries was used as a benchmark against Singapore. |
| Fertility preservation | 1st graph: Data on the uptake of fertility preservation services among referred women were taken from Tong et al. (2025) (127) for Singapore; data were from 2010-2019 and were not specific to gynaecological cancers. Data for Australia were taken from Robson et al. (2022) (129) and included data for gynaecological cancers, i.e. cancers of the cervix, endometrium, ovary, fallopian tube, vulva and vagina, for 2013-2019. Data for the US were taken from McCarter et al. (2022); data were from 2011-2016 and were not gynaecological cancer-specific (130).<br>2nd graph: Data on ART facilities in each country were taken from Ojo et al. (131). The number of ART facilities per 1,000 gynaecological cancer patients was calculated based on data from Ojo et al. and the number of new gynaecological cancer cases (cervix uteri, corpus uteri, ovary) in 2022 for each country, derived from IARC (8).<br><br>**For dashboard overview:**<br>A two-component fertility preservation value was created to compare countries on combined scores of the uptake of fertility preservation services and the number of ART facilities per 1,000 gynaecological cancer patients. Singapore was compared against the arithmetic average of benchmark countries. For the uptake of fertility preservation services this was the average of Australia and the US. For the number of ART facilities per 1,000 gynaecological cancer patients, the average of Japan, South Korea, Australia, the UK, and the US was calculated. Numbers were normalised and an equal weight was assigned to the two components constituting the fertility preservation value. The average for the two components was calculated both for Singapore and the benchmark countries. The average for Singapore was compared against the average of benchmark countries. |
| Novel cancer medicines | 1st graph: Shows the percentage of CDL-listed indications that were subsidised through MAF and SDL as of April 2026 (144).<br>1st table: Presents the absolute number of CDL-listed indications for each gynaecological cancer site (144).<br><br>**For dashboard overview:**<br>The dashboard compares the share of outpatient cancer medicine indications listed on the CDL that are subsidised through MAF or SDL as of April 2026. The comparison is shown for all CDL indications and for gynaecological cancer indications specifically, including ovarian, cervical, and endometrial cancer. |
| Radiation therapy machines | 1st graph: IAEA DIRAC (155). Linac = "MV Therapy", Brachytherapy = "Brachy-Therapy". Data for 2026 or latest available year. Population data were sourced from World Bank.<br>2nd graph: own calculations based on IAEA DIRAC data on linac availability ("MV Therapy"); data for 2026 or latest available year (155). Estimates of annual patients requiring radiation therapy were derived from cancer incidence (2022, all sites excluding non-melanoma skin, from IARC (8)), |

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| | assuming a radiation therapy utilisation of 50% and applying a 1.25 retreatment factor; see Slotman et al. (2005) (152).<br><br>**For dashboard overview:**<br>Number of linac machines per 450 radiation therapy patients in 2026 or latest available year (155). |
| **Survivorship** | |
| Psychosocial care services | **For dashboard overview:**<br>A psychosocial services KPI was developed to compare countries on the availability of national guidelines regarding the psychosocial assessment of cancer patients and the inclusion of distress screening. Scores ranged from 0 to 100: 0 indicated no identified guidelines; 20 indicated that identified information related to hospital-specific programmes and that no guidelines at the national level were identified; 40 indicated that guidance on psychosocial assessment of cancer patients was identified but that this was currently retired and/or did not include distress screening specifically; 60 indicated that information on national guidelines, commitments or goals was identified but distress screening was not explicitly mentioned; 80 indicated that information on national guidelines was identified including distress screening; 100 indicated available national guidelines including distress screening and/or that distress screening is required for hospital accreditation either nationally or by specific accreditation programmes. Singapore scored 20, as only a hospital-specific programme was identified and no information on national guidelines was found. Japan and the US scored 100 due to distress screening included in national guidelines and/ required for hospital accreditation at some level. South Korea scored 80 due to information on published guidelines including distress screening, but no identified information on accreditation requirements. Australia scored 60 as national guidelines on responding to suffering were identified but distress screening was not explicitly mentioned. The UK scored 60 due to identified commitments on personalising and improving psychological and social care provision in the National Cancer Plan for England, without the mention of distress screening explicitly. The score of Singapore was benchmarked against the average score of benchmark countries. |
| **Palliative care** | |
| Palliative care services | 1st graph: Data for Singapore were sourced from the Minimum Data Set (MDS) FY 2023 summary report (175); data were collected from 1 April 2023 to 31 March 2024 and covered median time from first palliative care assessment to death. Data for Australia were derived from the Palliative care and health service use for people with life-limiting conditions web report by the Australian Institute of Health and Welfare (176); data refer to the median number of days from receipt of first specialised palliative care service to death, in the last year of life of those aged 40+ who died in the 2019–20 financial year. US data were derived from Ernecoff et al. (2020) (177), and refer to the median number of days from first specialty palliative care consult before death from one hospital during the last six months of life; cancer decedents were eligible if they had a stage IV solid tumour.<br><br>**For dashboard overview:**<br>The number of median days from first palliative care assessment to death for Singapore (175) was benchmarked against the average number of days from first palliative care service use to death (as defined above) in Australia (176) and the US (177). |


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