BREAST CANCER MORTALITY RATES IN SINGAPORE

IPHPRP Global Public Health Case Competition | Spring 2025

All characters, organizations, and plots described within the case are fictional and bear no direct reflection to existing organizations or individuals. The case topic, however, is a true representation of circumstances in Singapore. The case scenario is complex and does not necessarily have a correct or perfect solution, and thus encourages a judicious balance of creative yet perceptive approaches.

The authors have provided informative facts and figures within the case to help teams. The data provided are derived from independent sources, may have been adapted for use in this case, and are clearly cited such that teams can verify or contest the findings within their recommendations, if it is pertinent to do so. Teams are responsible for justifying the accuracy and validity of all data and calculations that are used in their presentations, as well as defending their assertions in front of a panel of knowledgeable judges representing different stakeholders.

The information and data given in the following text is meant as a suggestive guide but is not considered all-inclusive. Teams may choose any area(s) of approach that they deem impactful and feasible.

NARRATIVE

Isa, aged 47, and her husband, Ibrahim aged 49, live in Singapore. Isa's sister, Minah aged 51, also lives in Singapore and they are all Malay. Isa and Minah spend a lot of time together now that their children are adults. Minah noticed a lump on her breast, but with a limited knowledge on breast cancer, fear of the fatality of breast cancer, and cultural stigma, she sought out traditional healing practices to treat her lump. She chose not to tell anyone to ensure she would not be an emotional and financial burden to them. She also chose not to tell anyone because she was shy and embarrassed about the cancer being in her breast, and she feared losing her husband and wrecking her marriage.

A few months later with the lump even bigger and bloody discharge from the nipple, Minah consulted a doctor. She was diagnosed with Stage 3 breast cancer. The doctor recommended Minah to undergo chemotherapy and surgery.

After receiving the results and treatment advice, she decided to talk to her son about the diagnosis and treatment. He recommended that she does not seek treatment because she will lose her hair making her less attractive to her husband and her breast surgery might be perceived as bodily mutilation. Several weeks later, Isa found Minah crying in her room. Minah told Isa about the diagnosis and fear around telling her family. Isa encouraged her sister to seek treatment explaining that she and many in her family would be there for her every step of the way. A year later, with all her treatment complete, Minah was told she is in remission.

After watching and learning about what her sister went through, Isa was determined to see if her circle of friends, made up of Malay women primarily, experienced similar hesitation, stigma, and barriers to getting diagnosed with and treatment for breast cancer. She began meeting with women who have been diagnosed with breast cancer and those who are eligible for breast cancer screening. Isa spoke with many women including those who preferred to die saying it was up to God, did not want treatment because bodily mutilation was against their religious beliefs, and did not complete screening because there is no family history of breast cancer.

Through these conversations, Isa sees how perceived religious beliefs, breast cancer knowledge and awareness, cultural customs, gender and family dynamics, fear, and financial concerns are connected to the likelihood of delayed detection and treatment. Rather than only focusing on individual short-term gains, Isa would like to change the current societal perceptions related to breast cancer in a greater way leading to equitable, sustainable change for her and her community in the short- and long-term future.

BACKGROUND ON SINGAPORE

Singapore is home to a population of around 6 million (4), and the city-state spans roughly 85 miles made up of Singapore Island and 60 small islets (2). Formerly a British colony, Singapore is now a member of the Commonwealth and an independent state (2). Singapore also has experienced economic growth since diversifying in 1960 and contains one of the largest and busiest ports in Southeast Asia (1,2).

Over time, urbanization has resulted in built-up areas covering a large portion of the city-state (2). The government's Housing and Development Board (HDB) has worked to separate commerce and residential districts resulting in 80% of the population now living in high-rise HDB apartments within housing estates and new towns (2).

Singapore's population is 75% Chinese, 13.5% Malay, 9% Indian, and 3.5% other, but these groups are more heterogeneous with many dialects and people groups being represented within these broad categories (1). English is the primary language in commerce, industry, and school, but Mandarin Chinese, Malay, and Tamil are also official languages (1). Many major religions also have a significant presence in Singapore (3). As of 2021, males ages 15 and above have a literacy rate of 99% and females ages 15 and above have a literacy rate of 96% (19, 20).

Singapore has the lowest birth (8 per 1,000 people) and population growth (4.9%) rates in Southeast Asia, and high population density (7,595 people per sq. Km of land area) (1, 11). As of 2023, the general marriage rate in Singapore is between 42.2-44.6 per 1,000 unmarried persons with fluctuations for males vs females and citizens vs residents (4). The median age of mothers at first birth was 31 years old in 2023 (4) and, in 2022, the fertility rate was 1 birth per woman (11). As of 2019, 75% of deaths are caused by non-communicable diseases (11).

Singapore provides universal healthcare coverage to all citizens and permanent residents through a multi-payer financing framework (6, 7). Healthcare is delivered in both private and government hospitals, outpatient clinics, and mobile centers (1). Welfare services are provided to those who are sick, unemployed, and 65 years of age or older by the government and voluntary associations (1). Singapore is ranked very highly on measures that determine the state to which people are healthy and have access to services needed to maintain good health (7). However, healthcare spending is expected to increase as there are changes in demographics and the population ages (7).

SUMMARY OF THE ISSUE

Global incidence rates of breast cancer are on the rise and more than two million women are diagnosed with the disease every year. Similar to other countries, breast cancer rates in Asia now continue to rise possibly due to changes in lifestyle and reproductive profiles over several decades. Of the 2.3 million breast cancer diagnoses in 2020, just under half were from Asia (15), and in Singapore, breast cancer accounts for around 30% of all cancers diagnosed in females making it the most common cancer among Singaporean women (8, 12, 14). This has been a persistent issue with breast cancer being the most common cancer among women in Singapore for the last three decades (16). Breast cancer incidence in Singapore is still on the rise, almost quadrupling from 20.1 per 100,000 females in 1968 to 1972 to 76.2 per 100,000 females in 2018 to 2022 (17). Of the ten most frequent incident cancers among Singaporean women ages 40-49 years of age between 2018-2022, breast cancer makes up 46.5% of the cancer diagnoses (17). While breast cancer made up the largest portion of cancer diagnoses across each age group, the 40-49 years of age group had the highest portion attributed to breast cancer by 9 percentage points or more depending on the age group (17). Between 2018-2022, 57.7% of Singaporean

women with breast cancer were diagnosed at Stage I and 19% were diagnosed at Stage II (17). 17.1% of all cancer deaths among women are caused by breast cancer each year with 1 in 6 deaths being attributed to breast cancer between 2018 and 2022 making it the leading cause of cancer death in Singaporean women (17). The five-year age-standardized relative survival rate in women for breast cancer between 2018-2022 was 83.1% (17).

Cells lining the milk ducts and glands are typically the origin of breast cancer. At this stage, breast cancer is considered non-invasive, so when it is detected at this point patients usually have easier treatment and a higher chance of recovery (8). As cancer cells invade surrounding tissue, they can spread throughout the lymphatic and circulatory system potentially leading to the formation of metastatic tumor growth (8, 9). Breast cancer has several risk factors including age, sex, family history, reproductive history, weight, nutrition, and physical activity (8, 9). There are many early detection and diagnostic tools, but mammogram screening is currently the most reliable early detection tool used to identify cancerous lumps before they can be felt (8, 9).

Motivating Factors and Barriers. Many barriers leading to delayed diagnosis and treatment exist in Singapore. Studies highlight limited breast cancer knowledge and awareness, risk perception, fear, perceptions of fatality, preference for complementary and alternative medicine, influence of family responsibilities, family dynamics, and financial concerns as potential barriers (22). Many of the same barriers have remained over the last three decades as breast cancer incidence and mortality rates persist (22).

National Breast Cancer Screening Program. Breast Screen Singapore, the population-based mammogram screening program, was established in 2002 and invites women 50-69 years of age for screening every two years (10, 22). While its western counterparts like the United States sees a breast screening participation rate of 75.9% for women aged 50 to 74 between 2020 and 2021, Singapore reports a 37.6% participation rate for women aged 50 to 69 attending mammograms in the last two years, according to the National Population Health Survey 2022. Despite the multiple outreach programs implemented to increase the participation rate for breast screening and a high awareness of mammography among Singaporean women, efforts to increase the participation rate have been futile (22). 5-year survival rates have improved with this program, but breast cancer remains the most common cancer and is a leading cause of cancer death in Singaporean women (10).

COMPLICATING FACTORS

Ethnicities. The three major ethnic groups in Singapore are Chinese, Malay, and Indian. Chinese women are more likely to have a higher age-standardized incidence of breast cancer (66.0 per 100,000 females) compared to Malay Singaporean women (60.4 per 100,000 females) and Indian Singaporean women (58.8 per 100,000 females) (10, 16, 22). However, among the three ethnic groups, Malay women have the worst five-year survival rate (58.5%) because they are at a higher likelihood to develop cancer at a younger age, be diagnosed with more advanced cancer, and with more aggressive cancer (10, 16). The exact reasons for this disparity are unclear, but many believe cultural, genetic, and socioeconomic

differences are to blame (10, 16). In fact, according to the 2019 Joint Breast Cancer Registry for Singapore, Malay women have the highest percentage (47%) of late-stage tumors (Stage III and IV) compared to Indian women (34%) and Chinese women (28%) (21). Additionally, Indian Singaporean women have the highest breast screening participation (43.9%) compared to Chinese Singaporean women (39.5%) and Malay Singaporean women (21.5%) (22).

Cultural Norms. Seeking care from traditional healers is popular, and many want to pursue complementary or alternative medicine to address their breast cancer, making biomedicine a last resort and increasing the likelihood they are not using biomedicine until their cancer is in later stages (2). Additionally, many women in Singapore have a fear of becoming a burden to the family emotionally and financially which prevents them from seeking care even though, when informed of the situation, family members usually step into beneficial, supportive roles (22). While this is not always the case, family members remain a key piece in the decision to either encourage or discourage women from seeking treatment (2). Feelings of shyness or embarrassment of where the cancer is and the fear of losing their husband may also contribute to delayed treatment or the choice not to treat (22).

Religion. In Singapore, about 31% are Buddhist, 19% are Christian, 16% are Muslim, 9% are Taoist, 5% are Hindu, and 20% are none of the religions (1). In Islam specifically, there is a perceived understanding amongst some that you cannot mutilate any part of the body which is then in conflict with some breast cancer treatment options, like surgery, which is more common when breast cancer is at later stages (18). Some women also believe that their breast cancer diagnosis is “in God’s hands”, and they would prefer to die (22).

CONCLUSION

A local organization is looking for proposals to reduce breast cancer mortality of Malay women in Singapore. With the overall goal of reducing breast cancer mortality in Singaporean Malay women, your task is to create an equitable and sustainable proposal addressing issues in the broader societal system that decrease breast cancer mortality rates in the Malay population.

The proposed intervention should focus on short- and long-term solutions that empower and incorporate the local community while also considering the health of the community system. The local organization requests a realistic and applicable **multifaceted approach** to address breast cancer mortality rates in Singaporean Malay women which includes, **but should not be limited to**, an intervention proposal for increased breast cancer screening. A rough budget for all short- and long-term proposed interventions with at least one funding source identified must be included in the proposal.

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WRITING AND EDITING TEAM | SPRING 2025

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