Trends in female breast cancer among adolescent and young adults in Southeast Asia

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Breast cancer was the most common cancer among women in 2022.[1] While most cases occur in women over 50 years of age,[2] the incidence of early-onset, premenopausal breast cancer has risen in many countries over recent decades.[3] Breast cancer among adolescent and young adult (AYA) patients (ages 15–39)[4,5] is a relevant public health challenge.

Home to nearly 700 million people, Southeast Asia (SEA) is a region defined by extraordinary diversity.[6] To gain deeper insights into breast cancer trends among AYA patients in this dynamic region, we employed the Global Burden of Disease (GBD) tool to analyze incidence and mortality across 11 countries in SEA for patients aged 15–39 years old.[7]

The GBD dataset provides comprehensive global cancer incidence and mortality statistics. The GBD 2021 database on mortality causes incorporates data from diverse sources, including vital registration systems, verbal autopsies, cancer registries, police records, sibling histories, surveillance systems, and survey or census data collected since 1980.[8] Data were extracted for 11 SEA countries: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste, and Vietnam. To evaluate temporal trends, we calculated Estimated Annual Percent Change (EAPC, see Supplementary Methods).

Between 1990 and 2021, breast cancer incidence rates among patients aged 15–39 years rose across all Southeast Asian countries (Fig. 1a, Figure S1a; Table S1a). In 2021, the highest incidence rates were recorded in Thailand (11.78 per 100,000), Singapore (8.46), and Malaysia (7.64). Thailand experienced the most pronounced increase (EAPC 4.06), driven by a sharp rise beginning in the mid-1990s. Other countries with significant EAPC increases included Vietnam (2.92), Cambodia (2.63), and Laos (2.57) (Table S1b).

In 2021, breast cancer mortality rates among patients aged 15–39 years were highest in Myanmar (2.54 per 100,000), Thailand (2.36), and the Philippines (2.17), while the lowest rates were observed in Singapore (0.86) and Timor-Leste (0.81) (Fig. 1b; Table S2a). Singapore experienced a significant decline in mortality (EAPC −2.00). In contrast, mortality rates remained stable in Malaysia, Myanmar, and Brunei but increased in several countries (Figure S1b; Table S2b).

As breast cancer screening programs typically target women aged 40 and above, the rising incidence of AYA breast cancer suggests the growing prevalence of hormonal and lifestyle risk factors, in the setting of socioeconomic transformations.[9] Epidemiologic studies have highlighted the role of early menarche,[10] oral contraceptive pill (OCP) use,[10] and delayed childbearing.[11] SEA has among the highest rates of modern contraceptive use globally.[12] Similarly, studies of several Southeast Asian countries show (1) downward trends in age at menarche since the 20th century[13] and (2) rising mean age at first birth.[14] Alcohol consumption increases the risk for breast cancer at all ages,[15] while a smoking history is a risk factor for ER-positive breast cancer.[16] Ethnicity may play a role as well.[17]

Importantly, 2020 marks a crucial inflection point for several countries, including Singapore, Malaysia, Thailand, and Brunei Darussalam. U.S.-based research revealed a staggering 90% decline in breast cancer screenings during the early months of the pandemic.[18] This sharp drop in screenings has led to projections of approximately 2500 excess breast cancer deaths over the next decade.[19] Widespread evidence[20] demonstrated significant reductions in screening rates, diagnosed cases, and mammography volumes during the pandemic.

Our analysis also revealed significant variations in breast cancer incidence across countries. While countries like Vietnam, Cambodia, and Laos currently report low breast cancer incidence rates, they exhibit notably high EAPCs. These trends suggest that, despite the low current burden, incidence rates may continue to rise.

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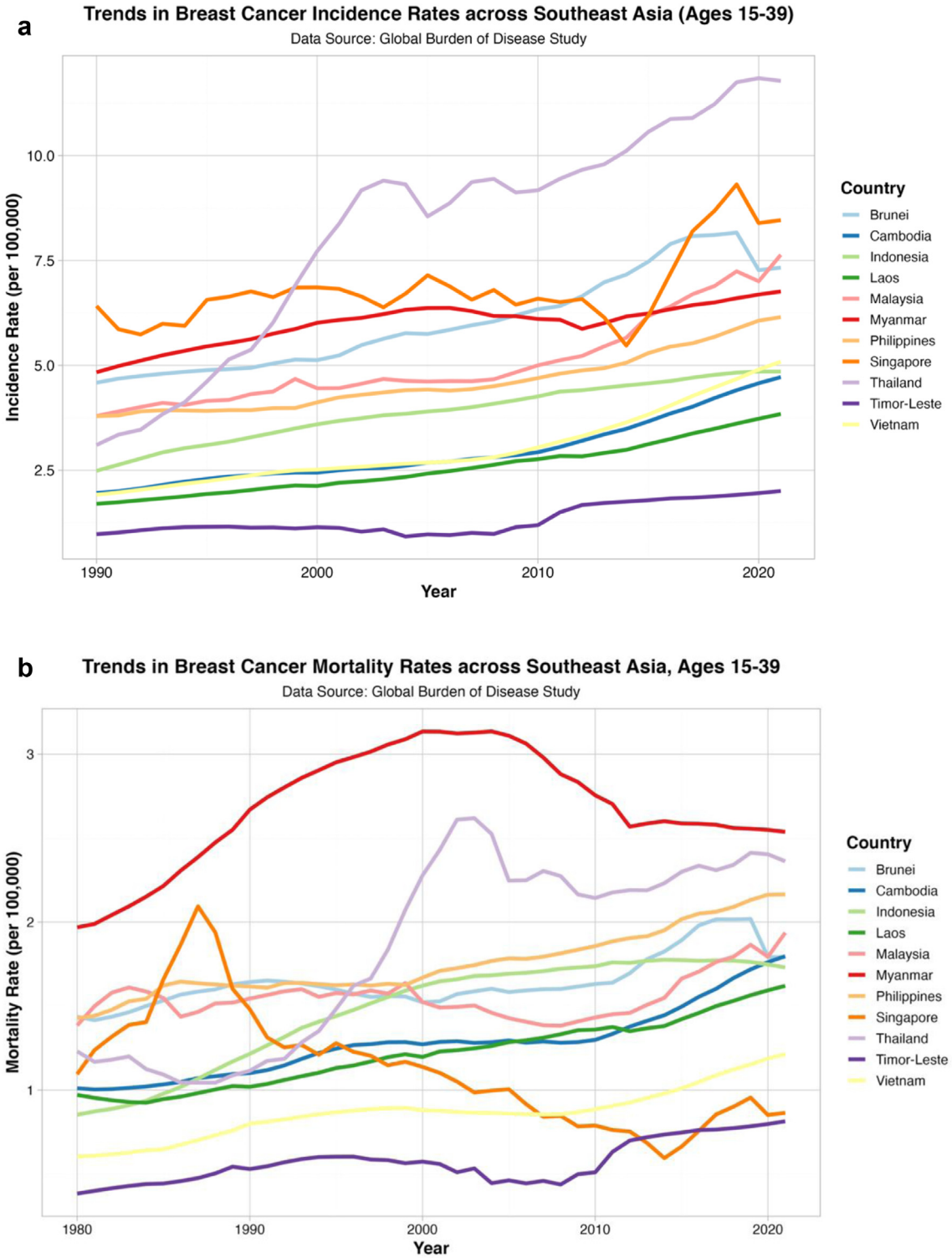

Fig. 1: **a**. Trends in breast cancer incidence rates in Southeast Asia, ages 15–39. **b**: Trends in breast cancer mortality rates in Southeast Asia, ages 15–39.

This anticipated increase underscores the urgent need for proactive cancer system planning.

In contrast, Thailand has seen a sharp rise in breast cancer incidence since the mid-1990s, indicating a distinct trajectory for the country. Along with demographic transitions, this increase may also be partially driven by sustained multisectoral efforts to promote breast cancer screening. Since 2015, the Thai Ministry of Public Health has highlighted breast cancer screening as a crucial policy to decrease mortality.[21] Non-profit organizations, such as the Queen Sirikit Centre for Breast Cancer, have also organized vigorous cancer education campaigns.[22]

Overall, increasing breast cancer mortality in many Southeast Asian countries is concerning; it is unlikely that the rising rates can be primarily attributed to improvements in diagnostic capabilities, as young women are not typically the focus of public breast cancer screening policies. Increasing mortality may reflect late-stage diagnoses in light of poor access to screening. With only 5.6 mammography machines available per 10,000 cancer patients,[23] the focus in many Southeast Asian countries has shifted toward self-breast examinations and annual clinical breast examinations (CBE). In Thailand, CBE remains the primary screening method due to limited healthcare capacity and infrastructure.[24]

The observed decline in breast cancer mortality rates in Singapore is promising. The success of BreastScreen Singapore, combined with government initiatives to raise public health awareness, likely contributed.[25] Furthermore, majority of cancer care in the country is provided by publicly funded cancer centers.[26] The successes of Singapore and Thailand highlight the potential value of comprehensive cancer control programs.

Overall, these findings reflect trends outside of SEA. In Iran, breast cancer mortality rates increased between 1995 and 2004, with women aged 15–49 experiencing higher rates than those 50 years or older.[27] Similarly, from 1973 to 2005, a rise in breast cancer incidence among women aged 15–49 was noted in Shanghai, China.[28] In India, the most prevalent cancers among teenage and young adult females include breast cancer.[29]

Our findings are constrained by the uneven availability of cancer registry data across Southeast Asia. While countries like Singapore maintain comprehensive national registries, others do not. These estimates can provide valuable insights for cancer planning, contingent on the development of national registries in these regions.[30] Additionally, the data does not differentiate between cancer subtypes or underlying etiologies. Future research should prioritize enhancing data granularity and strengthening cancer registries to enable more precise and informed cancer system planning.

These findings highlight the need for tailored interventions that address the unique challenges faced by AYA patients in each country, considering their distinct demographic, cultural, and healthcare contexts. Breast cancer awareness campaigns should be age-specific, as younger populations may not perceive themselves to be at risk. Improving AYA breast cancer outcomes in SEA will require a comprehensive approach, including raising public awareness for this age group, strengthening screening and diagnostic capabilities, and ensuring timely access to affordable treatment options.

Contributors

JC and ECD conceptualised the manuscript. JC, JFW, and ECD conducted the statistical analysis. JC and FDVH wrote the initial manuscript. All authors contributed to review and editing of the manuscript.

Declaration of interests

The authors declare no competing interests.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.lansea.2025.100545.

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