

## Empowering Indian Women Sanitary Workers: A Need for Awareness About Breast Cancer among Them

Moghal Roshni, Ajay. A, Kesav, Sriram Alagappan

Department of Pharmacy Practice, SRM College of Pharmacy, SRMIST, Katankulathur, Tamilnadu, India

Corresponding author: **Sriram Alagappan**

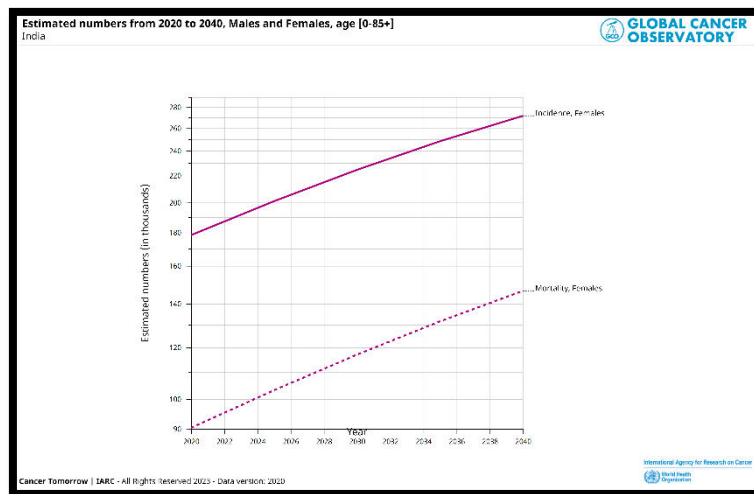
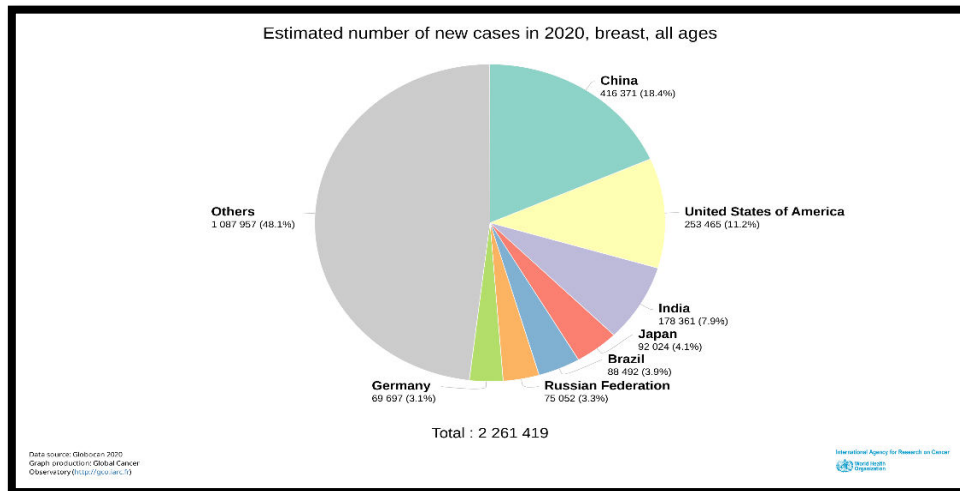
### Abstract:

Breast cancer (BC) poses a global health challenge, demanding proactive measures for prevention and early detection. While developed nations have made strides in reducing bc mortality, the same cannot be definitively claimed for developing countries like india. This article explores the heightened breast cancer risk among female sanitation workers, a predominantly affected workforce in hazardous conditions. Factors such as gender, age, obesity, and night shift work contribute to their increased vulnerability to breast cancer. Examining India's bc landscape reveals a 50% incidence surge over two decades, with a projected substantial increase in new cases. A concerning shift from cervical to breast cancer prevalence is noted, coupled with lower survival rates due to delayed treatment. The study elucidates bc detection methods, emphasizing breast self-examination's potential in resource-limited settings. Given limited infrastructure, the article underscores the need for comprehensive awareness programs tailored to sanitation workers. **Introduction:** In developed countries, breast cancer (BC) mortality has been significantly decreasing due contributions from developed treatment strategies, yet the incidence of the disease has been found to increase. Although this increase can be accounted by improvements in diagnostic technologies it can also be stated that there is a failure in implication of existing BC prevention maneuvers<sup>(1)(2)</sup>. Despite being the leading cancer-related disease burden among women, it is also stated as a fact that bc will affect 1 in every 8 women by 85 years in high-GDP nations. It is a well-known fact that prevention is better than cure and in order to apply that into practise for bc we must make sure the awareness about the disease among women is in an adequate level. Bc development is influenced by both genetic and non-genetic factors. When compared, the non-genetic factors are easier to be kept in check to exercise maximum prevention for, let alone bc but, any disease. The non-genetic factors for bc are age, exposure to radiation, personal history of breast pathologies, high Body-mass index (BMI), exogenous usage of female hormones, alcohol, reproductive factors (shortened breast-feeding periods, low parity, late menopause and early menarche) and exposure to hazardous(carcinogenic) chemicals<sup>(3)(4)(5)</sup>. The 4'd's that describe the work of a sanitation worker are dangerous, dirty, drudgery and dehumanizing. In India, there are almost five million people whose work come under this category. These workers are exposed to various hazardous chemicals and toxic gases from the waste they handle despite having safety equipment that have a questionable quality<sup>(6)</sup>. This is indicated by higher death rates among sanitation workers (9 in every 1000) when compared to general population (7 in every 1000) <sup>(7)</sup>. Women sanitation workers are at a greater risk of exposure, when compared to men, since most of them are engaged in collection and waste segregation<sup>(8)</sup>. The stats discussed about breast cancer were taken from studies conducted in developed countries. India being a developing country it would require much more efforts in prevention strategies than those of the developed countries. The fact that India is one of the leading countries in population should be taken into consideration when discussing the amount of waste handled by sanitation workers. It is found that most women in sanitation work environments are non-literate <sup>(9)</sup>. This would mean that these people would fall short in the awareness level when it comes to a disease like breast cancer. Hence this article aims to emphasise the need for executing prevention and awareness programs about breast cancer among women sanitation workers.

**Keywords:** Breast cancer, Sanitary workers, Awareness programs ,Risk factors.

**Status of breast cancer in India**

The incidence of bc in india had increased by 50% during a 20-yearperiod (1965-1985) (10). A higher proportion of bc occurs in younger Indian women when compared to the western countries<sup>(11)</sup>.The 2020 globacon data[fig.1]estimates that india will account for 7.9% (178,361) of new bc cases globally only behind china (18.4%) and the United States of America (11.2%). It also shows there will be gradual increase in the number of new cases from 180,000(2020) to 270,000(2040) within a period of 20 years[fig.2]



In the 1990s, cervical cancer (cc) was a bigger burden than bc across India with only a few exceptions like Mumbai (24.1% bc vs 16.0% cc). The registries of Bangalore, Delhi, Chennai and Bhopal had higher incidence of cervical cancer when compared to bc. However, this scenario had changed in the early 2000s when bc overtook cc in almost all registries except the rural registry of barshi (16.9% bc vs 36.38 cc)<sup>(12)</sup>.

The survival rates in different stages of cancer decreases gradually from stage i to stage iii(95%, 92%, 72%) but a drastic drop can be observed when the cancer reaches stage iv (21%)(13). The survival rates are low in india when compared to the western countries mainly due to the early onset, late stage of disease when consulting the physician and delayed treatment<sup>(14)</sup>.

According to the international agency for research on cancer(IARC), the best and most effective intervention to control bc is earlier detection of disease and thus rapid treatment. In order to achieve that,

there is a need for a good knowledge, attitude and practices among women of all ages and occupation in the prevention of bc.

### **Risk factors associated with sanitation workers**

#### ***Gender:***

As obvious as it seems, bc has higher incidence among women than in men due to the differences in the levels of female hormones. This can be accounted by the fact that only 1% of all breast cancer cases were men<sup>(15)</sup>. While the exact statistical data for gender destitution among sanitary workers in india is unavailable, a significant number of women are engaged in door-door waste collection, waste segregation, street sweeping and other such sanitary activities. Many studies done with sanitary workers in india have shown that the weightage of women among sanitary workers are not much different than men and in fact similar to that of men<sup>(16)(17)(18)</sup>.

#### ***Age:***

Following gender, age is considered one of the most important known risk factors for bc. As age increases, the incidence rate of the disease also increases and reaches its peak at the menopausal period<sup>(19)</sup>. A study conducted among sanitation workers in india during the covid 19 lockdown had participants with a mean age of 37.5 years<sup>(20)</sup>. While the small sample size of the study may seem as a limitation, due to the lack of statistical evidences in large scale, this study can be used to interpret that the majority of women in sanitary works are in their pre-menopausal age.

#### ***Obesity:***

In adipose tissue, the conversion rates of androgenic precursors to oestrogen through peripheral aromatization is higher. This results in an increased incidence of breast cancer among women who are obese (Bmi $\geq$  25.00). Additionally, the increased levels of insulin and insulin-like factors in an obese person are found to spur the growth of cancer cells<sup>(21)</sup>. In a study conducted among 311 sanitary workers, it was found that around 51.5% were obese and 21.5% were overweight<sup>(22)</sup>.

#### ***Night work:***

Working in night hours causes an individual an exposure to artificial light. This exposure, at a time when melatonin levels are supposed to be at its peak, causes a decrease in melatonin production<sup>(23)</sup>. This reduction in melatonin production causes an increase in reproductive hormones such as oestrogen, which is responsible for the hormone-sensitive breast tumours<sup>(24)</sup>. A meta-analysis done to assess the relationship between night work and breast cancer found a 48% increase in the risk of breast cancer<sup>(25)</sup>. A study published in the indian journal of applied economics and business shows that sanitary workers are made to work on irregular shift basis without proper resting intervals for 12 hours which includes both morning and night shifts<sup>(26)</sup>.

### **Breast cancer detection & screening techniques**

#### ***Mammography:***

This is a medical imaging technique that uses x-rays to detect changes in the breast tissues. It has a sensitivity that varies from 34%-90% and a specificity up to 32%-93%<sup>(27)</sup>. Indian women are found to have dense breasts and adding to this the fact that there is a lack of adequate mammography machines and lesser trained professionals to perform the diagnostic technique might lead to false positives<sup>(11)</sup>. Advancements in technology has given rise to digital mammography which uses computer aided detection software resulting in better detection at the cost of an increased price.

### ***Ultrasonography:***

The ultrasonography uses high pitched sound waves to image the breast tissues. It has a sensitivity ranging from 53%-67% with specificity of 89%-99%<sup>(28)</sup>. This can be highly useful in detection among younger women aging from 40-49 years but the hurdle in this technique is the availability of trained professional.

### ***Breast self-examination:***

The breast self-examination is a technique that requires an individual to assess or examine their breast themselves to feel and detect any abnormalities or changes in the breasts. It is not accepted as an early detection technique but when used with proficiency and meticulously it is considered a useful auxiliary to make women aware of their normal breast<sup>(29)</sup>.

### **Need for awareness assessment programs among sanitary women**

Early detection followed by immediate institutional therapy is considered the best course of management in bc to decrease the morbidity/ mortality rates and thus improve the long-term survival of bc patients. This can be achieved by regular diagnostic procedures. However it is not feasible to implement such methods in a developing country due to the lesser availability of infrastructure and limited trained professionals<sup>(29)</sup>.

Breast self-examination (BSE) is considered as a simple and inexpensive method in early detection of breast lumps<sup>(30)</sup>. When a study assessed the awareness levels about the bc risk factors and BSE practices, it was found that health care professionals (hcp) had a better awareness level about cancer than women of other socio-economic status. Although this might seem as an obvious observation, around 10% of those hcp did not consider age of menarche & menopause and age at first child birth as a risk factor while those are actually one of the key risk factors when looking into bc<sup>(31)</sup>. If that's the case of educated and trained professionals, we can say the levels of awareness among lesser educated sanitary workers would be comparatively lesser as well. This calls for a nation- and state-wide awareness assessment and promotion programs.

### **Conclusion:**

This study discusses about the risk factors of breast cancer and how those risk factors correlate with the lives of sanitary workers, the current breast cancer status in India and the available detection techniques. Upon discussion on the above topic, it was found that really not many, if not none of the, studies assessed the awareness levels and the prevention practices among sanitary women. This article calls for research institutions and organisations to promote studies that assess the awareness levels and prevention practices of breast cancer among sanitary women at various levels to achieve a better understanding and promote healthy life practices among sanitary workers and thus a better society.

### **References**

1. Narod SA, Iqbal J, Miller AB. Why have breast cancer mortality rates declined? *Journal of cancer policy*. (2015) Sep 1;5:8–17.
2. Althuis MD, Dozier JM, Anderson WF, Devesa SS, Brinton LA. Global trends in breast cancer incidence and mortality 1973-1997. *Int J Epidemiol*. (2005) Apr;34(2):405–12.
3. He C, Kraft P, Chasman DI, Buring JE, Chen C, Hankinson SE, et al. A large-scale candidate-gene association study of age at menarche and age at natural menopause. *Hum Genet*. (2010) Nov;128(5):515–27.

4. Stolk l, perry jrb, chasman di, he c, mangino m, sulem p, et al. Meta-analyses identify 13 loci associated with age at menopause and highlight dna repair and immune pathways. *Nature genetics*. (2012) mar;44(3):260-u55.
5. Stone, j.; dite, g. S.; gunasekara, a.; english, d. R.; mcredie, m. R.; giles, g. G.; cawson, j. N.; hegele, r. A.; chiarelli, a. M.; yaffe, m. J.; boyd, n. F. The heritability of mammographically dense and nondense breast tissue. *Cancer epidemiol. Biomarkers prev.* (2006), 15, 612-7.
6. Salve, p. S.; bansod, d. W.; kadlak, h. Safai karamcharis in a vicious cycle: a study in the perspective of caste. *Econ. Political weekly* (2017), 37-41.
7. Salve ps, chokhandre p, bansod dw. Multiple morbidities and health conditions of waste-loaders in mumbai: a study of the burden of disease and health expenditure. *Archives of environmental & occupational health*. (2020) feb 17;75(2):79–87.
8. Kadlak, h.; salve, p. S.; karwade, p. Intersectionality of caste, gender and occupation: a study of safai karamchari women in maharashtra. *Contemp. Voice dalit* (2019), 11, 130-8.
9. Salve p, jungari s. Sanitation workers at the frontline: work and vulnerability in response to covid-19. *Local environment*. (2020) jul13;25:1–4.
10. Saxena s, szabo ci, chopin s, barjhoux l, sinilnikova o, lenoir g, et al. Brca1 and brca2 in indian breast cancer patients. *Human mutation*. (2002) dec 1;20(6):473–4.
11. Mehrotra r, yadav k. Breast cancer in india: present scenario and the challenges ahead. *World j clin oncol*. (2022) mar 24;13(3):209–18.
12. Takiar, r.; srivastav, a. Time trend in breast and cervix cancer of women in india. *Asian pac. J. Cancer prev.* (2008), 9, 777-80.
13. Arumugham r, raj a, nagarajan m, vijilakshmi r. 327p - survival analysis of breast cancer patients treated at a tertiary care centre in southern india. *Annals of oncology*. (2014) sep 1;25:iv107.
14. Maurya ap, brahmachari s. Current status of breast cancer management in india. *Indian j surg*. (2021) jun 1;83(2):316–21.
15. Giordano sh, buzdar au, hortobagyi gn. Breast cancer in men. *Ann intern med*. (2002) oct 15;137(8):678–87.
16. 17. Rajan, d. Awareness about impacts of heavy workload on health: an empirical study among sanitary workers. *Eur. J. High. Educ.* (2021), dec 26(5), 24-53.
18. 19. Kim, y.; yoo, k. Y.; goodman, m. T. Differences in incidence, mortality and survival of breast cancer by regions and countries in asia and contributing factors. *Asian pac. J. Cancer prev.* (2015), 16(7), 2857-70.
20. Nigam d, dubey s. Condition of sanitation workers in india: a survey during covid-19 and lockdown. (2020) jun.
21. Chen mj, wu wyy, yen amf, fann jcy, chen sls, chiu syh, et al. Body mass index and breast cancer: analysis of a nation-wide population-based prospective cohort study on 1 393 985 taiwanese women. *Int j obes*. (2016) mar;40(3):524–30.
22. Jayaseelan v, debnath k, krishnamoorthy y, kar ss. Prevalence, awareness and control of hypertension among sanitary workers employed in a tertiary care centre in puducherry, south india. *Indian j occup environ med*. (2020);24(2):119–24.
23. Kerenyi na, pandula e, feuer gm. Oncostatic effects of the pineal gland. *Drug metabol drug interact*. (1990);8(3–4):313–9.
24. Stevens rg, davis s. The melatonin hypothesis: electric power and breast cancer. *Environ health perspect*. (1996) mar;104 suppl 1(suppl 1):135–40.
25. Megdal sp, kroenke ch, laden f, pukkala e, schernhammer es. Night work and breast cancer risk: a systematic review and meta-analysis. *European journal of cancer*. (2005) sep 1;41(13):2023–32.
26. Rajan d. Long working hours related factors causing heavy workload: an empirical study among sanitary workers. *Indian journal of economics and business*. (2020) aug 15;2:143–59.
27. Elmore jg, armstrong k, lehman cd, fletcher sw. Screening for breast cancer. *Jama*. (2005) mar9;293(10):1245–56.

28. Mo m, liu g yu, zheng y, di l fang, ji y jie, lv l lang, et al. Performance of breast cancer screening methods and modality among chinese women: a report from a society-based breast screening program (sbsp) in shanghai. Springerplus. (2013) jun 24;2(1):276.
29. Gupta, r.; gupta, s.; mehrotra, r.; sodhani, p. Risk factors of breast cancer and breast self-examination in early detection: systematic review of awareness among indian women in community and health care professionals. *J. Public health* (2020), 42(1), 118-31.
30. Philip j, harris wg, flaherty c, joslin ca. Clinical measures to assess the practice and efficiency of breast self-examination. *Cancer*. (1986) aug 15;58(4):973-7.
31. Gupta a, shridhar k, dhillon pk. A review of breast cancer awareness among women in india: cancer literate or awareness deficit? *Eur j cancer*. (2015) sep;51(14):2058-66.