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Pattern of burden cancer breast and relationshipin to human development index in Iran 2009 to 2019: an observational study based on the Global Burden of Diseases

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Abstract

Objective Breast cancer is one of the most common cancers in women worldwide. This study aims is to investigate the burden of breast cancer in Iran and its relationship with the Human Development Index (HDI) during 2009 to 2019.

Study design The present study is an observational study in Iran during the years 2009 to 2019. Data related to the incidence, mortality, Years of Life with Disability (YLD), Years of Life Lost (YLL) and Disability-Adjusted Life-Years (DALY) of breast cancer in Iran were extracted from the Global Burden of Disease 2019 (GBD-2019) website. Correlation tests are used to check the relationship between these indicators and the human development index.

Results The highest incidence rate of breast cancer in 2019 is related to the provinces of Gilan (29 per 100,000) and Tehran (28.55 per 100,000) and the highest rate of death from breast cancer is related to the provinces of Gilan (10.71 per 100,000). and Semnan (9.97 in 100,000). The results showed that there is a positive and significant correlation between DALY ($r=0.626$, $P<0.0001$), YLL ($r=0.611$, $P<0.0001$) and, YLD ($r=0.773$, $P<0.0001$) breast cancer with HDI index. There is a positive and significant correlation between the incidence ($r=0.794$, $P<0.0001$) and mortality ($r=0.503$, $P=0.003$) of breast cancer with the HDI index.

Conclusions Considering that a positive correlation was observed between the incidence and burden of breast cancer and the human development index in the country, it is suggested to implement preventive measures such as public education programs to reduce the incidence and burden of breast cancer and the necessity of screening programs in areas with low human development index. It confirms the diagnosis of disease cases.

Keywords Breast carcinoma, Morbidity, Death, Burden of Disease, HID

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Introduction

Breast cancer is one of the biggest causes of death in women in the world, today it accounts for 1 out of every 8 cancer diagnoses and a total of 2.3 million new cases in both sexes [1]. Breast cancer accounts for a quarter of all cancer cases in women, was the most common cancer diagnosed in women in 2020, and its burden is increasing in many parts of the world, especially in developing countries [2, 3]. Although cancer exists everywhere in the world, its incidence rate is higher in developed countries and the incidence rate of breast cancer varies greatly depending on race and ethnicity [4]. Approximately 24% of all breast cancer cases occur in the Asia-Pacific region, with the highest rates observed in China, Japan, and Indonesia. Breast cancer mortality rates are higher in less developed areas. Due to the improvement of treatment and diagnostic methods and promotion of breast cancer management in high-income countries, a significant decrease in the mortality rate of breast cancer is observed in these countries [5].

According to studies conducted among different countries, China (18.4%) and the United States (11.8%) have the highest number of breast cancer cases in the world [6].

The age-standardized incidence rate of breast cancer varies among countries, ranging from 113.2 per 100,000 population in Belgium to 35.8 per 100,000 population in Iran [6].

In Iran, the incidence of breast cancer was 35.8 per 100,000 and the mortality rate was 10.8 per 100,000 [7].

In Iran, the prevalence and mortality rate of breast cancer in 2014 were 9795 and 14.2% respectively [8]. Studies conducted in different regions of Iran such as Kerman [9, 10], Mazandaran [11], Gorgan [12]and Ilam [13] have shown that the screening rate of breast cancer It is not optimal. Various demographic, economic, social and cultural factors such as age, education level, employment status and economic status can affect women's participation in breast cancer screening programs [12, 14, 15].

On the other hand, previous studies investigated the relationship between the incidence and mortality of breast cancer and the human development index or other development indices. The progression of breast cancer and other neoplasms is often related to per capita income at the country level, and countries are requently classified into low-, middle-, and high-income countries according to the World Bank classification [16–18]. A region's human development index, a composite measure of education (average years of schooling and expected years of schooling), income (gross national income (GNI)) and life expectancy at birth, is a better measure of that region's development and, more broadly, efficiency. The healthcare system reflects that [19–21].

Although the incidence of breast cancer is still higher in areas with a high human development index, demographic and lifestyle changes in countries with a low and moderate human development index have increased the incidence of breast cancer [22]. In these areas, limited resources and the lack of organized health policies can lead to ineffective diagnoses and treatment strategies and increase the burden and mortality of the disease [9, 23, 24].

Breast cancer can significantly affect patients' health and impose a large economic burden on their families and communities. Most women with breast cancer are diagnosed in the final stages and after the end of optimal treatment. Therefore, when cancer reaches its final stage, higher costs and poor response to treatment are imposed along with an increased economic burden on the entire family [25].

By understanding the epidemiological situation of diseases, policymakers and health planners can act for the optimal allocation of health resources and cost estimation [26].

Also, by knowing the epidemiological situation of diseases in different regions of the country, researchers can focus on key diseases and reduce the economic burden of diseases with preventive measures and screenings [27].

Therefore, the current study aims to investigate the epidemiology of the incidence, mortality and burden of breast cancer in Iran during the years 2009 to 2019 at the national level.

Materials and methods

The present study is an observational study in Iran during the years 2009 to 2019. The results are considered using the incidence, mortality, years of life with disability (YLD), YLLs and DALY of breast cancer in Iran during 2009–2019. Data for this study at Available at http://ghdx.healthdata.org/gbd-results-tool.

Global Burden of Diseases 2019 (GBD-2019) has calculated the death rates, YLL, YLD, and DALY for 23 age groups in men and women for 204 countries between 1990 and 2019, including Iran [28]. The Global Burden of Diseases (GBD) study followed a systematic and scientific approach to provide sufficient evidence on the extent of human health consequences as well as trends. The data used by the GBD study were obtained from several sources [29, 30]. The detailed estimation framework for GBD 2019 has been discussed previously [29, 31, 32]. Information related to this study, including disease burden index, years of life lost due to premature death and years of life lost due to disability were extracted from Brest cancer patients on the Global Burden of Disease website.

Disability-Adjusted Life Years (DALY)

The disability-adjusted life year (DALY) is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death. It was developed in the 1990s as a way of comparing the overall health and life expectancy of different countries [33, 34].

Years of life lost due to premature death (YLL)

The years of life lost (YLL) is a summary measure of premature mortality. YLL estimates the years of potential life lost due to premature deaths. YLL takes into account the age at which deaths occur, giving greater weight to deaths at a younger age and lower weight to deaths an older age. YLL can be used to calculate the YLL due to a specific cause of death as a proportion of the total YLL lost in the population due to premature mortality. Such indicators can be used in public health planning to compare the relative importance of different causes of premature deaths within a given population, to set priorities for prevention, and to compare the premature mortality experience between populations [33, 35].

Years Lived with Disability (YLD)

YLD is a measure reflecting the impact an illness has on quality of life before it resolves or leads to death [33].

Data analysis

In this study, the bivariate correlation method was used to analyze the extracted data to check the correlation between breast cancer burden and HDI. The significance level was $P>0.05$. Analyzes were performed using Stata software version 12 (Stata Corp, College Station, TX, USA). In the next step, to evaluate the spatial pattern, the amount of DALY attributed to breast cancer was obtained in each of the provinces during the years 2009 to 2019, and then the zoning of DALY in Iran was drawn using ArcGIS 10.3 environment.

Result

The incidence and mortality of breast cancer in Iran is increasing from 2009 to 2019, and the incidence rate of breast cancer increased from 3.20 per 100,000 in 2009 to 54.35 in 2019, and the incidence rate of breast cancer increased from 81.7 per 100,000. In 2009, it has increased to 34.11 per 100,000 in 2019 (Fig. 1).

The results showed that the highest incidence rate is related to the age group of 84−80 years (119.91 per 100,000) and the highest mortality rate is related to the age group above 85 years (84.67 per 100,000) (Fig. 2).

The results showed that the incidence, mortality, number of years lost due to premature death and DALY increased in 2019 compared to 2009 (Fig. 3).

Figures 4 and 5 show the incidence and mortality rate of breast cancer during the years 2009–2019 based on different provinces in Iran. As can be seen, the highest incidence rate of breast cancer in 2019 is related to the provinces of Gilan (29). per 100,000), Tehran (28.55 per 100,000) and Mazandaran (27.88 per 100,000) and the lowest incidence is respectively related to the provinces of Sistan and Baluchistan (7.5 per 100,000), Kahkiluyeh and Boyer Ahmad (11.46 per 100,000) and Hormozgan (12.01 per 100,000). The highest death rate from breast cancer is related to the provinces of Gilan (10.71 per 100,000), Semnan (9.97 per 100,000) and Tehran (9.96 per 100,000), and the lowest death rate is also related to the provinces of Sistan and Baluchistan (3.8 per 100,000). 100,000), Kehkiluyeh and Boyar Ahmad (4.24 per 100,000) and Hormozgan (5.43 per 100,000).

Table 1 Shows the burden of breast cancer by province in 2019 compared to 2009. As can be seen, in 2009, the highest number of years lost due to premature death from breast cancer was in the provinces of Qom 415.32 (368.25, 466.43), Bushehr 356.79 (326.38, 391.47) and Tehran 350.35 (302.68, 402.62) and in 2019 the highest years lost due to premature death are related to the

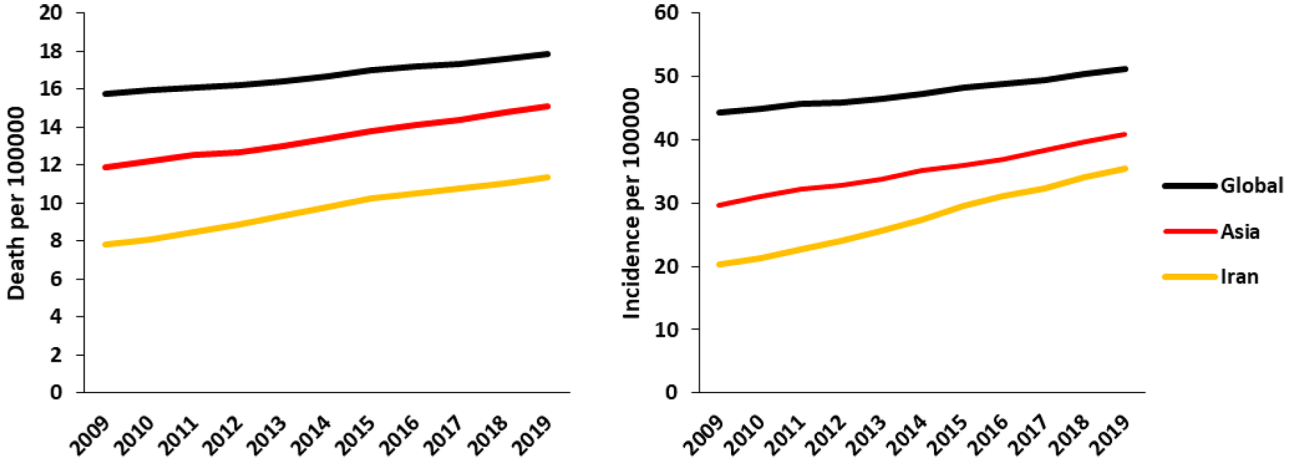

Fig. 1 Trend Incidence and Death Rate Breast Cancer in Global, Asia and Iran (Source: Global Burden of Disease)

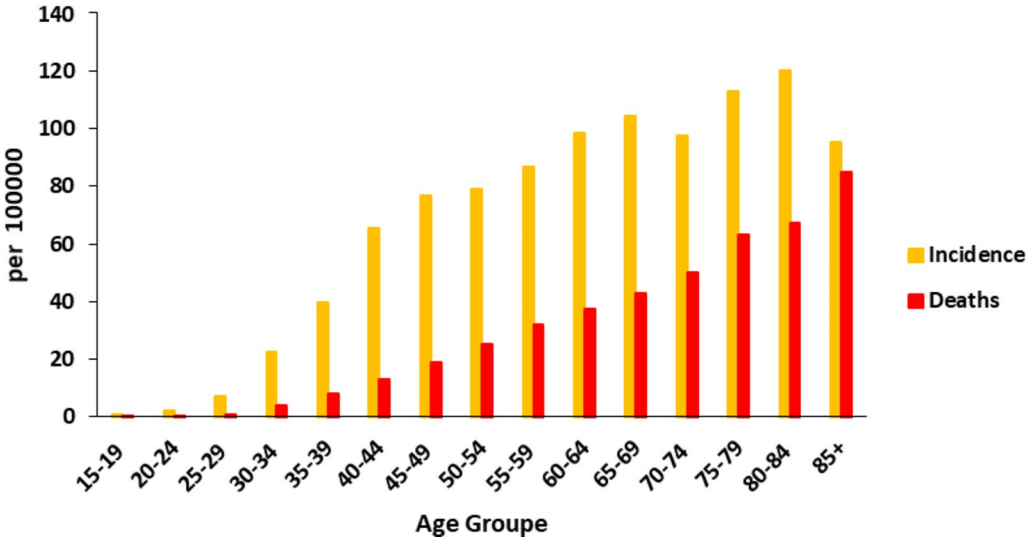

Fig. 2 Estimate Incidence and Death Rate in Iran in 2019 By age group (source: Global Burden of Disease)

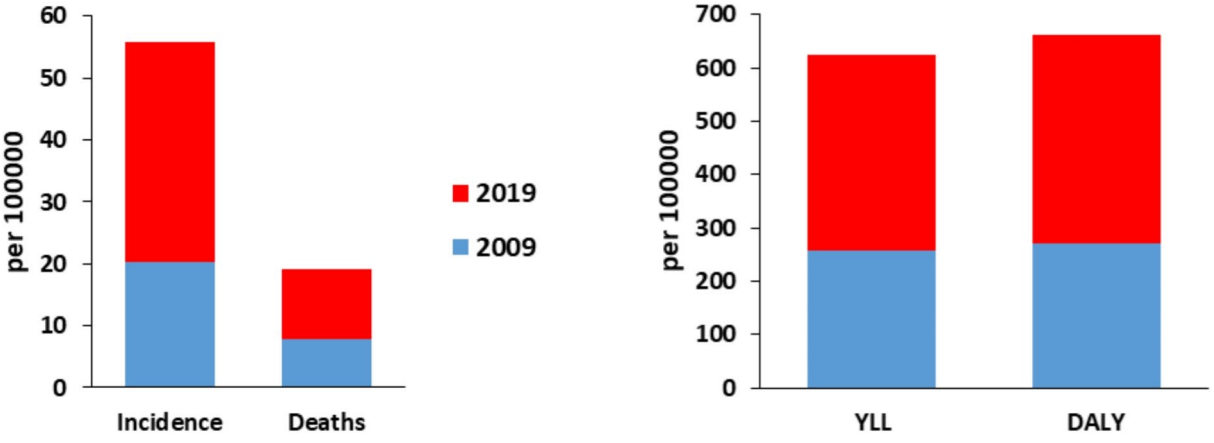

Fig. 3 Compare Incidence, Death, YLL, and DALY Breast Cancer in Iran in 2009 VS 2019 (Source: Global Burden of Disease)

provinces of Qom 404.32 (326.26, 495.89), Mazandarzn 376.12 (303.45, 464.06) and Khuzestan 375.16 (302.4, 460.79). The highest years lost due to disability in 2009 related to the provinces of Tehran 21.5 (15, 29.4), Alborz 21.36 (14.75, 29.48) and Yazd 20.28 (13.83, 28.1) and in 2019 related to the provinces of Alborz 27.99 (18.8, 39.79), Mazandaran 27.57 (17.94, 39.31) and Yazd 27.37 (17.6, 39.97). The highest rate of DALY in 2009 was related to the provinces of Qom 435.02 (387.21, 485.85), Yazd 392.75 (337.02, 451.27) and Bushehr 375.92 (342.52, 411.71) and in 2019 related to the provinces of Qom 429.02 (347.6, 521.71), Yazd 410.52 (321.42, 508.46) and Mazandaran 403.69 (329.84, 495.97) (Table 1).

The results showed that there is a positive and significant correlation between the incidence rate ($r=0.794$, $P<0.0001$) and mortality ($r=0.503$, $P=0.003$) of breast cancer with the HDI index (Fig. 6).

Also, the results showed that there is a positive and significant correlation between DALY ($r=0.626$, $P<0.0001$), YLL ($r=0.611$, $P<0.0001$) and YLD ($r=0.773$, $P<0.0001$) breast cancer with Human Development Index (HDI). (Fig. 7)

Discussion

According to the 2016 GBD study, breast cancer ranks first among all cancers in Iran with 11,041 new cases in 2016 [36, 37]. It has been reported for all age groups for the years 2000–2009, 2003–2008, and 2014 [38–40]. The results of the present study also showed that the incidence and mortality of breast cancer in Iran during the years 2009–2019 is an increasing trend.

Mubarik et al.'s study showed increasing trends in breast cancer incidence among four Asian countries (Pakistan, China, India and Thailand). The highest

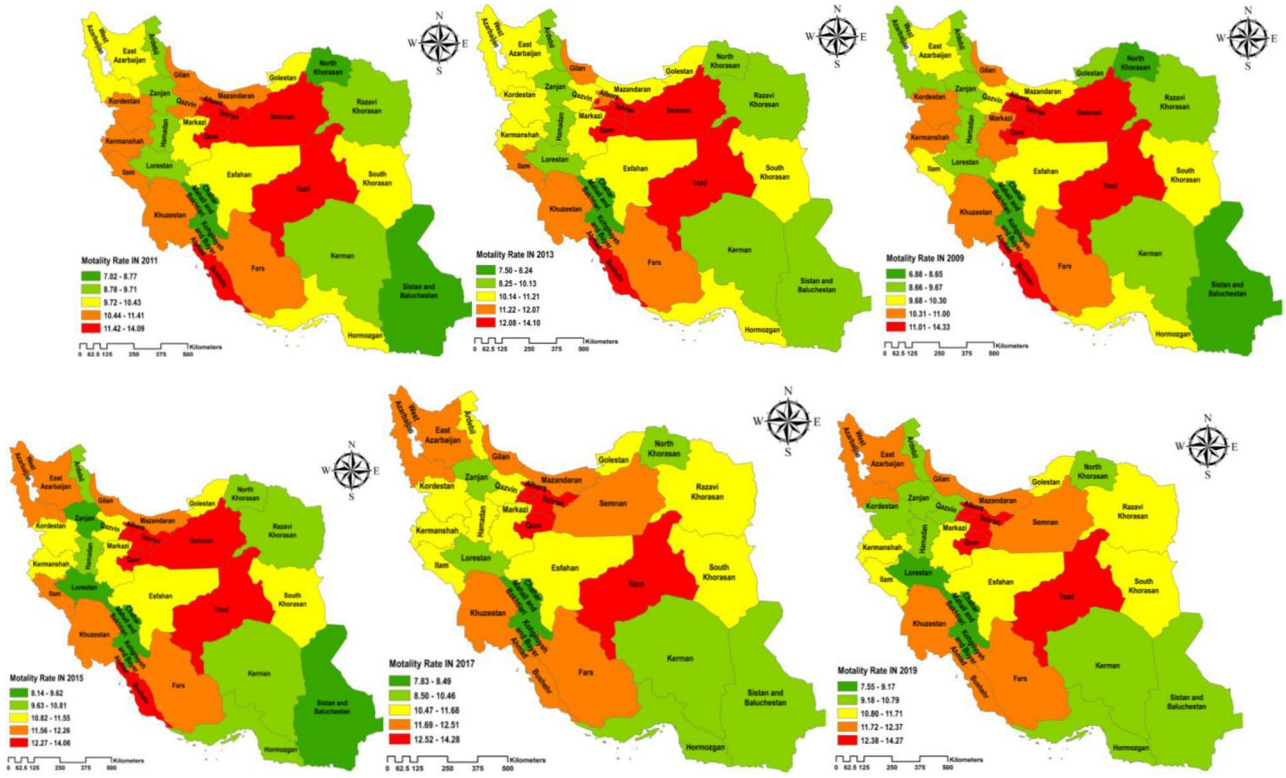

Fig. 4 Mortality Rate Per 100,000 of Breast Cancer in Iran (Source: Global Burden of Disease 2019)

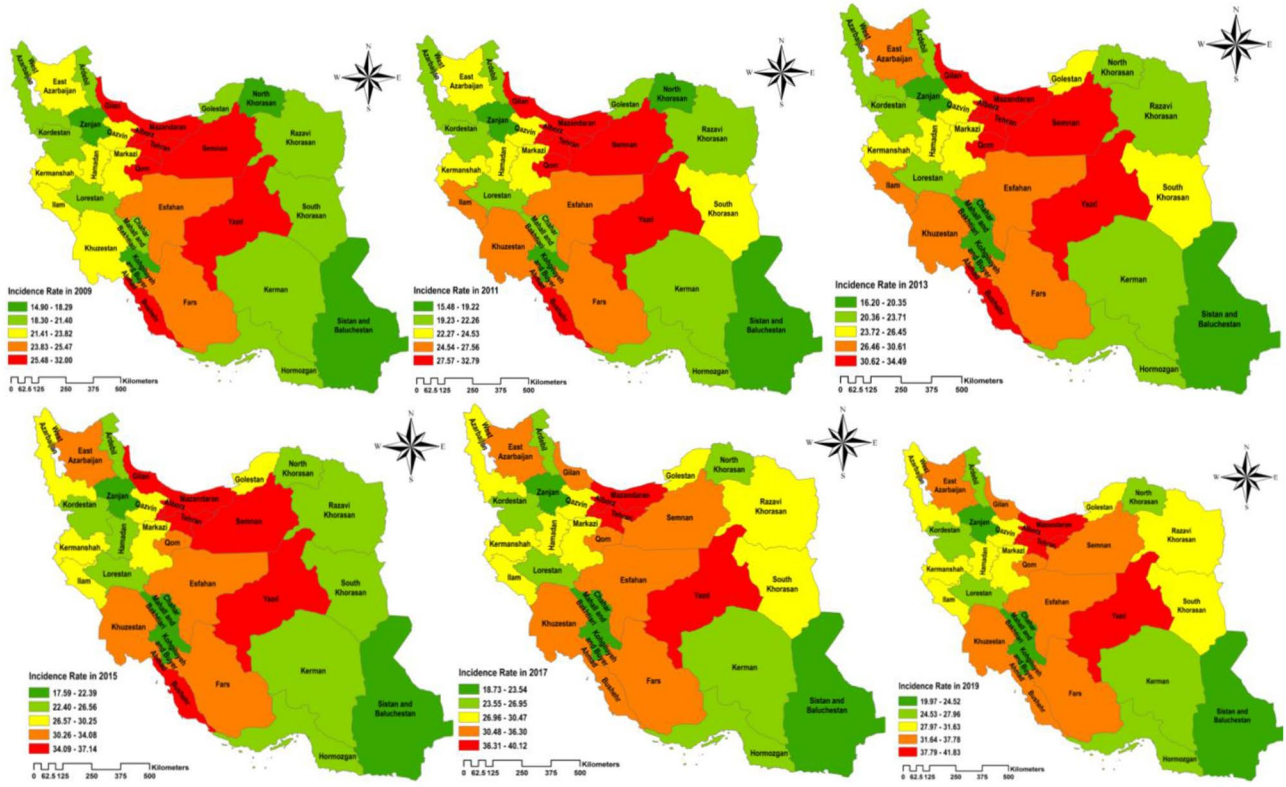

Fig. 5 Incidence Rate per 100,000 of Breast Cancer in Iran of 2009–2019 (Source: Global Burden of Disease2019)

Table 1 Estimated YLL, YLD and DALY rates breast Cancer in Iran in 2019 (source: Global Burden of Disease)

	Age Standardized in 100,000 (UI 95%)					
	YLL		YLD		DALY	
	2009	2019	2009	2019	2009	2019
Alborz	347.2 (301.86, 398.76)	366.19 (295.07, 450.69)	21.36 (14.75, 29.48)	27.99 (18.8, 39.79)	368.57 (323.07, 422.64)	394.19 (319.75, 480.37)
Ardebil	268.61 (238.87, 305.17)	299.72 (248.63, 359.97)	14.21 (9.61, 19.52)	18.79 (12.75, 26.17)	282.83 (251.99, 320.08)	318.51 (266.74, 381.55)
Bushehr	356.79 (326.38, 391.47)	359.74 (300.27, 420.69)	19.12 (13.31, 25.72)	24.33 (16.27, 33.84)	375.92 (342.52, 411.71)	384.08 (321.76, 447.82)
Chahar Mahaal and Bakhtiari	239.02 (198.59, 282.65)	219.22 (165.08, 281.82)	13.84 (9.29, 19.58)	16.49 (10.56, 24.09)	252.86 (211.15, 297.13)	235.72 (177.74, 300.86)
East Azarbayejan	303.83 (263.53, 348.5)	369.18 (294.83, 461.7)	15.26 (10.49, 20.93)	23.3 (15.29, 32.93)	319.09 (278.55, 364.68)	392.48 (317.96, 483.1)
Fars	319.51 (277.11, 368.03)	360.81 (287.32, 452.3)	17.11 (11.82, 23.93)	24.62 (16.09, 36.5)	336.62 (293.56, 386.75)	385.44 (311.19, 472.48)
Gilan	332.65 (292.53, 376.07)	371.52 (299.39, 451.84)	18.74 (12.94, 26.01)	25.38 (16.63, 36.39)	351.4 (310.53, 396.75)	396.9 (322.65, 480.12)
Golestan	282.35 (252.92, 320.28)	370.66 (301.22, 451.84)	13.47 (9.31, 18.58)	20.62 (13.5, 29.66)	295.82 (264.15, 335.65)	391.28 (320.13, 475.58)
Hamadan	291.04 (256.44, 330.37)	315.57 (254.21, 386.93)	14.77 (8.53, 17.51)	19.45 (12.76, 27.68)	305.81 (270.7, 344.69)	335.03 (271.66, 408.43)
Hormozgan	283.57 (249.65, 320.86)	292.05 (236.32, 350.67)	12.69 (10.81, 22.3)	16.99 (11.24, 23.93)	296.26 (261.82, 333.98)	309.04 (253, 368.14)
Ilam	288.72 (256.6, 324.14)	323.37 (264.81, 393.59)	15.76 (11.71, 23.88)	21.13 (13.95, 29.66)	304.48 (270.81, 341.14)	344.5 (283.96, 417.63)
Isfahan	303.51 (263.66, 346.91)	340.17 (272.83, 420.25)	17.12 (9.64, 19.31)	23.93 (15.77, 33.92)	320.63 (266.6, 364.4)	364.1 (298.07, 448.12)
Kerman	286.41 (253.93, 321.33)	304.65 (245.09, 368.18)	14.01 (10.38, 20.52)	17.65 (11.71, 25.07)	300.42 (266.6, 337.38)	322.31 (263.03, 387.03)
Kermanshah	318.99 (278.53, 363.07)	334.45 (263.82, 410.38)	15.09 (10.38, 20.52)	19.9 (12.74, 29.08)	334.09 (293.65, 377.91)	354.35 (280.79, 430.3)
Khorasan-e-Razavi	277.01 (246.66, 370.02)	331.1 (271.91, 404.38)	12.98 (11.12, 22.08)	19.69 (13.12, 28.55)	290.00 (259.18, 326.09)	350.79 (290.87, 426.12)
Khuzestan	328.15 (291.7, 370.02)	375.16 (302.4, 460.79)	15.87 (7.43, 15.31)	22.85 (14.91, 32.5)	344.03 (306.82, 385.14)	398.02 (324.58, 484.08)
Kohgiluyeh and Boyer-Ahmad	197.6 (158.93, 243.35)	236.79 (183.62, 306.62)	10.98 (7.43, 15.31)	16.47 (10.51, 23.53)	208.58 (169.64, 255.74)	253.26 (198.64, 323.24)
Kurdistan	301.05 (263.36, 339.56)	304.00 (248.09, 369.26)	13.82 (9.57, 19.73)	18.13 (11.59, 25.3)	314.88 (276.29, 353.86)	322.13 (266.37, 388.25)
Lorestan	273.64 (233.97, 317.17)	267.92 (203.67, 339.42)	14.01 (10.68, 21.35)	17.71 (11.41, 25.52)	287.65 (247.12, 331.75)	285.64 (219.96, 359.23)
Markazi	309.91 (273.17, 349.86)	327.13 (265.08, 394.89)	15.40 (13.17, 26.54)	20.52 (13.44, 29.18)	325.32 (288.34, 366.37)	347.65 (283.33, 418.88)
Mazandaran	315.55 (274.97, 359.68)	376.12 (303.45, 464.06)	19.37 (8.07, 16.14)	27.57 (17.94, 39.31)	334.92 (292.52, 379.84)	403.69 (329.84, 495.97)
North Khorasan	249.19 (220.73, 280.9)	317.02 (260.74, 380.31)	11.68 (8.07, 16.14)	17.72 (11.8, 24.84)	260.88 (232.31, 293.84)	334.75 (278.05, 400.44)
Qazvin	299.17 (263.08, 338.37)	324.53 (258.52, 400.07)	15.07 (10.34, 20.74)	20.76 (13.77, 29.4)	314.24 (279.48, 355.01)	345.29 (279, 422.91)
Qom	415.32 (368.25, 466.43)	404.32 (326.26, 495.89)	19.7 (13.79, 27.27)	24.69 (16.13, 35.6)	435.02 (387.21, 485.85)	429.02 (347.6, 521.71)
Semnan	355.7 (311.76, 406.9)	365.75 (292.68, 457.99)	19.23 (13.31, 26.26)	24.51 (16.37, 35.08)	374.94 (330.26, 426.22)	390.27 (312.2, 485.03)
Sistan and Baluchistan	253.75 (215.31, 299.98)	287.43 (221.92, 362.64)	9.63 (6.59, 13.27)	13.22 (8.83, 19.23)	263.38 (224.91, 310.14)	300.66 (234.64, 377.03)
South Khorasan	295.49 (262.25, 334.58)	336.52 (273.55, 415.89)	14.22 (9.97, 19.75)	19.71 (13.1, 28.15)	309.72 (274.86, 349.71)	356.24 (290.66, 435.63)

Table 1 (continued)

	Age Standardized in 100,000 (UI 95%)					
	YLL		YLD		DALY	
	2009	2019	2009	2019	2009	2019
Tehran	350.35 (302.68, 402.62)	373.6 (293.48, 466.75)	21.5 (15, 29.4)	27.17 (17.55, 39.03)	371.86 (322.26, 424.22)	400.78 (320.53, 501.24)
West Azarbayejan	268.39 (239.61, 303.57)	345.23 (282.48, 420.01)	12.91 (9.21, 17.92)	20.34 (13.42, 28.4)	281.31 (251.03, 316.78)	365.57 (300.43, 442.01)
Yazd	372.47 (318.82, 430.22)	383.15 (298.97, 480.18)	20.28 (13.83, 28.1)	27.37 (17.6, 39.97)	392.75 (337.02, 451.27)	410.52 (321.42, 508.46)
Zanjan	248.51 (222.9, 273.9)	260.29 (214.31, 309.06)	11.81 (8.21, 16.19)	16.27 (11.03, 22.81)	260.33 (233.58, 286.28)	276.57 (230.11, 328.31)

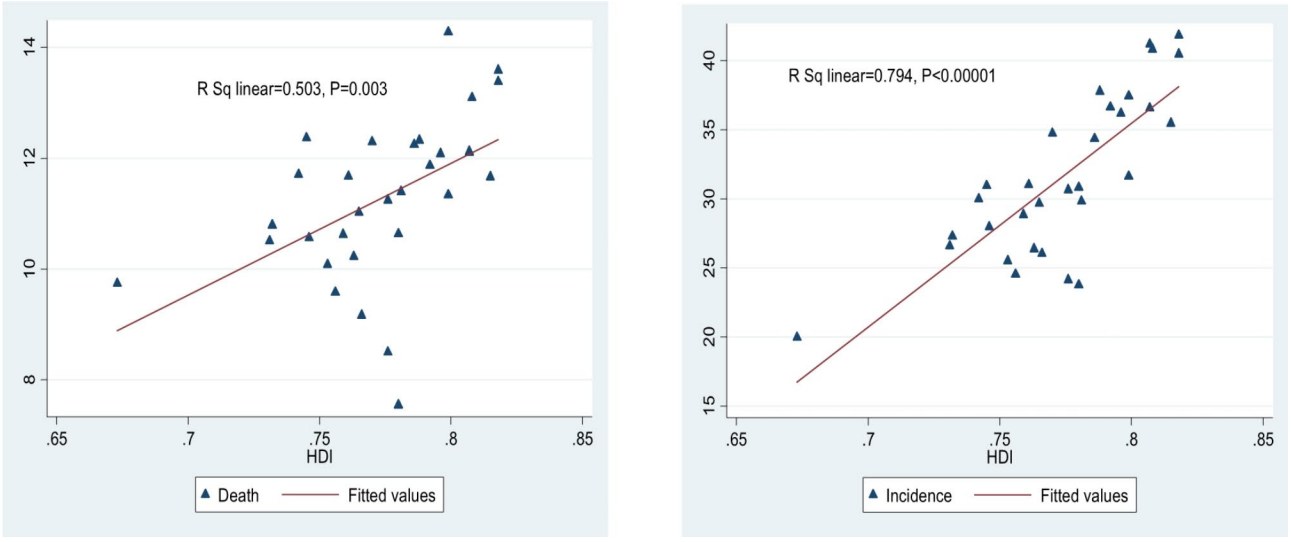

Fig. 6 Correlation Between the Human Development Index, Incidence and Mortality Rates of Breast Cancer in Iran in 2019

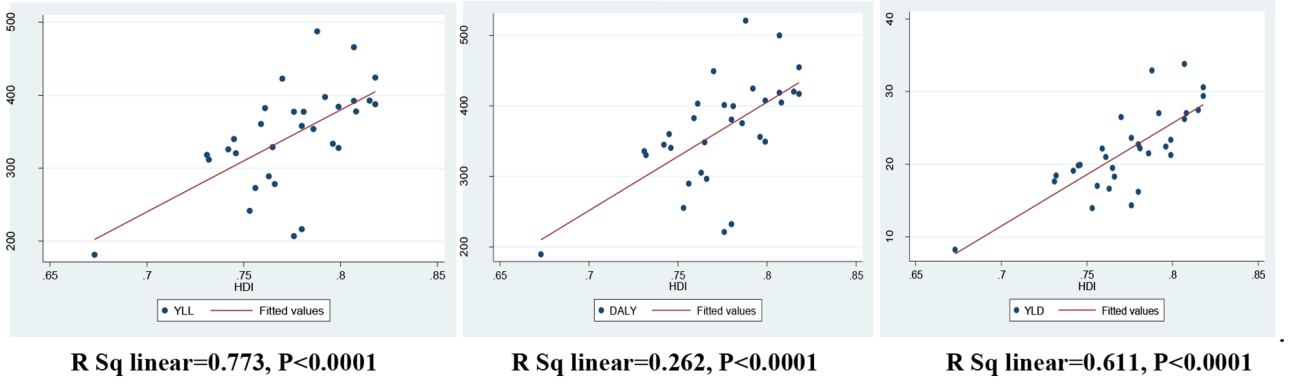

Fig. 7 Correlation Between the Human Development Index, YLL, YLD, and DALY Rates of Breast Cancer in Iran in 2019

incidence rate of cancer was observed in Pakistan and the increasing trend in this incidence rate was observed over time, the lowest rate was in 1990 and the highest rate was in 2015. China was the second country with an increase in the incidence of breast cancer. An increase in the incidence of breast cancer was also observed in India. Also, an increasing trend was observed in Thailand over time. These results were consistent with the results obtained from the present study [41].

Part of the pattern of increasing incidence is related to the improvement of the disease diagnosis system and the increase in the number of registered patients. Improvements in diagnostic tools, broader health care coverage, increased public awareness of breast cancer symptoms, and a greater willingness to undergo screening despite

cultural barriers and the discomfort of mammography were also influential. The same factors can partially explain the pattern of increasing incidence in recent years [42].

The incidence rate of breast cancer at certain ages for women is less than 25 years and after this age it increases dramatically [6]. The results of the present study showed that the incidence and death rate of breast cancer in Iran is higher in age groups over 80 years old. The peak age of breast cancer is different in different regions of the world [6].

45% of breast cancer patients are 65 years and older [43]. Older patients (over 80 years old) make up a significant percentage of these patients. About one in four breast cancer patients are over 65 years old. This age group often faces challenges due to co-morbidities and weakness in their treatment. Studies have also shown that diagnosis is usually delayed due to reduced screening [44]. Challenges include cardiovascular and cerebrovascular diseases that preclude general anesthesia for surgical treatment and may increase the adverse effects of chemotherapy [43].

The highest incidence rate of breast cancer in 2019 was related to Gilan and Tehran provinces and the highest death rate from breast cancer was related to Gilan and Semnan provinces. The increase in incidence in big cities can be the result of changes in lifestyle and diet and increased exposure to environmental risk factors. Other potential risk factors in lifestyle, such as consuming more fat, smoking, and low physical activity can be effective in increasing the incidence of breast cancer in women and the difference in these factors in different provinces can cause differences in the incidence of this cancer in different provinces of the country [45–48].

The results of our study showed that there is a positive and significant correlation between the incidence, mortality and burden of breast cancer with the HDI index.

In the study of Biranvand et al., who investigated the relationship between the incidence of breast cancer and the human development index in Iran, the results showed that there is a positive and significant correlation between the incidence of breast cancer and the human development index, which was consistent with our study [20].

Sharma in 2020, the results showed that the incidence of breast cancer in countries with very high and high HDI is the highest and has a positive correlation with the HDI of countries ($r=0.77$)), which was in line with the results of our study [49].

A study by Azadnajafabad et al. showed that the incidence of breast cancer was higher in more developed countries and those with higher income and health care costs [50].

Ghanche et al. also showed in their study that there is a positive and significant correlation between the incidence of breast cancer and the human development index in countries [51].

Chou et al. showed that the incidence of breast cancer is higher in areas with high HDI compared to areas with low HDI. Increased life expectancy, lack of breastfeeding, and screening probably contribute to the increased incidence of breast cancer in countries with higher HDI.

In addition, the prevalence of other risk factors associated with Westernization, such as obesity and alcohol consumption, is higher in areas with high HDI [52].

Previous studies on the Global Burden of Disease Study and the Sociodemographic Index as a composite indicator of socio-economic development showed that the incidence of breast cancer was higher in areas with higher development criteria [53, 54]. This finding could be explained by population-wide BC screening programs that are more common in developed countries, which benefit from both health systems and higher spending in the health sector [50, 55]. An ecological study from the United States using an age-period-cohort model to assess the contribution of mammographic screening to breast cancer incidence reported that such screening schemes lead to a higher incidence of early-stage invasive cancers in the population [56].

Several factors such as increased life expectancy, improved cancer registration and improved breast cancer awareness are among the factors associated with higher incidence of breast cancer in areas with high HDI.

Some studies conducted in high- and middle-income countries have reported that marital level, socioeconomic status, and educational status are significantly associated with the use of Breast cancer screening services [57–59].

A review article on the epidemiology of breast cancer in Iran reported that only about 18% of cases were detected at stage one [60]. A recent study in southern Iran reported stage II and higher diagnosis in more than 80% of patients, especially in rural areas [46]. Such findings can be explained by the lack of national screening strategies mentioned above. Therefore, it is recommended to establish national screening and educational policies based on regional risk factors. In addition, health system changes to maximize access and coverage in the entire country, especially in deprived provinces and rural areas. It seems necessary.

The limitations of this study should be understood. First of all, this study was a secondary analysis of data from the 2019 GBD study, and just like most GBD studies, the quality and quantity of data input to the modeling has a significant impact on the accuracy and robustness of the results. The limitations reported in GBD studies and the lack of accurate and reliable data for the incidence and prevalence in some provinces of the country,

especially in areas with a low human development index, can be mentioned. In this study, exposure or outcomes are not collected from every individual in the society, but rather from all the exposed or ill individuals within a specific society or time period. The most important error in these studies is the ecological fallacy. The ecological fallacy attributes the characteristics observed at the group level to the individual. To avoid this error, the results of these studies should be interpreted with caution.A strength of the present study is the longitudinal nature of the GBD dataset with a long follow-up period.

Conclusion

Considering that the incidence rate is still higher in areas with a high level of human development, it can be shown that the rate of diagnosis of the disease is higher in these areas, and in areas where the level of the human development index is lower, the diagnosis of the disease may be less. In the case of breast cancer epidemiology, focusing on risk factors and prognostic factors would be a suitable and cost-effective option for the development of practical guidelines and policies.

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Author contributions
Design: E.G, F.F.SH., and Processing: E.G., S.R.P, Analysis or Interpretation: E.G., F.F.SH. and M.A. Literature Review: E.G. and F.SH. All authors reviewed the manuscript.

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Data availability
All the data used in this research were made available to the public at http://ghdx.healthdata.org/gbd-results-tool.

Declarations

Ethical approval and consent to participate
The study was approved by the ethics committee of Lorestan University of Medical Sciences code of ethics IR.LUMS.REC.1402.007. This article has used the burden of disease data and the data was at the province level and did not require the informed consent of the individual.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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