RESEARCH ARTICLE

Years of Potential Life Lost Due to Breast and Cervical Cancer: a Challenge for Brazilian Public Policy

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Abstract

Background: The purpose of the article was to analyze the years of potential life lost (YPLL) of women who died from breast and cervical cancer in the State of Paraná, Southern Brazil. This was a temporal trend study (2000 to 2010) about the coefficients of mortality and the years of potential life lost in women aged 20 to 70 years. Materials and Methods: Data were obtained through the database of the Department of the Unified Health System (DATASUS) and the National Mortality Information System. Results: There was a loss of 125.075 YPLL due to breast cancer, with an average of 11.370 YPLL. Regarding cervical cancer, the figure obtained was 91.625 YPLL from 2000 to 2010, with an average of 8.329 YPLL. Increased risk of death from breast cancer was observed for women aged 50 to 59 years, with a significant increase among those in the age group from 40 to 49 years. There was an increased rate of cervical cancer among women 40 to 69 years. Conclusions: The risk of death grows with increasing age, being higher from 40 years. Prevention is paramount for both cancers. Thus, preventive measures are required and a reassessment of political strategies should be adopted.

Keywords: Breast neoplasms - uterine cervical neoplasms - potential years of life lost

Introduction

Breast cancer and cervical cancer is a serious public health problem in Brazil. Breast cancer has achieved high prevalence and is among the leading causes of death worldwide. Data from the International Agency for Research on Cancer indicate that 1.677 million new cases are diagnosed each year. The cervical cancer is the fourth most common type of cancer among women and it's responsible for approximately 527.624 mil new cases and 265.653 mil deaths per year worldwide (World Health Organization, 2012).

In Brazil, according the National Cancer Institute (NCI), will occur 57.120 new cases of breast cancer in 2014, corresponding to 20.8% of new cases in women and 15.590 new cases of cervical cancer. Breast cancer is the cancer of the highest incidence among women in the state of Parana (Brazil, 2014).

For Pan American Health Organization (PAHO), the estimate of 27,500 deaths in the Americas by cervical cancer represents an economic loss of approximately U$ 3.3 billion per year (Pan American Health Organization, 2008).

The Health Ministry spent R$ 2.2 billion in 2011 in the area of cancer care. This investment was four times higher in comparison to 1999, and improved hospital care within the Unified Health System (SUS). Of this total, approximately R$ 261 million were spent in measures for prevention of breast and cervical cancer, respectively R$ 176 and R$ 85 million (Brazil, 2012a).

In Brazil, the individual with cancer receives several benefits, such as sickness pay and disability retirement, which represent high spending for public service (Brazil, 2012b). The impact of the disease is not only in relation to economic costs, but also in relation to the lost years of a young and economically active population.

Death from breast and cervical cancer is preventable due the possibility of early diagnosis. However there are obstacles to preventing these neoplasms as the hesitation to visit the physician, patient's embarrassment and lack of knowledge about the risk factors and screening methods (Nilaweera et al., 2012). Public policy in this area has been developed in Brazil since the 1980s aimed at preventing and reducing cancer. The recent National Plan of Policies for Women (PNPM) the Brazilian Federal Government, launched in 2013, proposes to reduce the cancer mortality

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in the female population, as well as promote increased access to quality mammography in the public health system, ensuring detection and treatment in a timely manner. It was also proposed expanding access to breast and cervical cancer treatments and psychosocial support to women (Brazil, 2013a).

To our knowledge there are no studies in Parana to assess the impact of mortality and years of potential life lost (YPLL) of women with cancer. Studies on YPLL are indicators that estimate the time that the person would have lived if they do not die prematurely, and has been the most used measure for the monitoring of these deaths and to redefine priorities in public health (Arnold et al., 2007). The objective of this study was to analyze the YPLL to women who died of breast and cervical cancer in the State of Parana, Brazil.

Materials and Methods

This is a temporal trend study (2000 to 2010) about the coefficients of mortality and the YPLL of breast and cervical cancer in women aged 20 to 70 years in the state of Parana, Brazil.

Data were obtained through the database of the Department of the Unified Health System (DATASUS) and the National Mortality Information System (Brazil, 2013b) according with the coding of the International Classification of Diseases, 10th revision (ICD-10), referring to deaths from breast and cervical cancer represented by the codes C50, C53 e C54.

The state of Paraná is one of three states of southern Brazil and is the fifth state in economic importance in the country. It is composed of 399 municipalities and has a total population of 10.444.526 inhabitants, and of these, 5.242.543 are women (Brazil, 2010).

Data were obtained according to the distribution of

deaths by age groups. To establish the calculation of YPLL was adopted a technique that establishes an age limit for the calculation of YPLL based on the average life of the population (Romeder and Mcwhinnie, 1978). Was subsequently multiplied the number of deaths in each age interval by the number of years remaining before attaining the age limit of 70 years. This difference is obtained from the midpoint of each age group. The sum of these products gives the total YPLL, which represents the estimated losses for a specific cause, in this case of breast and cervical cancer (Arnold et al., 2007).

Maximum age 70 years was considered due to a projected life expectancy of Brazil's population by sex and age from 1980 to 2050 according the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatistica-IBGE), suggested by the Ministry of Health for the calculation of YPLL (Brazil, 1998).

The descriptive statistical analysis (media and frequency distribution) was performed using the statistical program Epi Info 3.5.1. The research was approved by the Ethics Committee in Research of the Maringa State University with opinion no. 369.926.

Results

During the study period occurred 5003 deaths due to breast cancer and 3665 deaths from cervical cancer in women in the state of Paraná. Most deaths occurred in women aged 50 to 59 years (34.5%) for breast cancer and 60 to 69 years for cervical cancer (32.1%). It was also highlighted the death of married women and white (Table 1).

The risk of death from breast cancer increased over the study period. Regarding cervical cancer the average mortality rate for the period was 2.45 per thousand women (Figure 1).
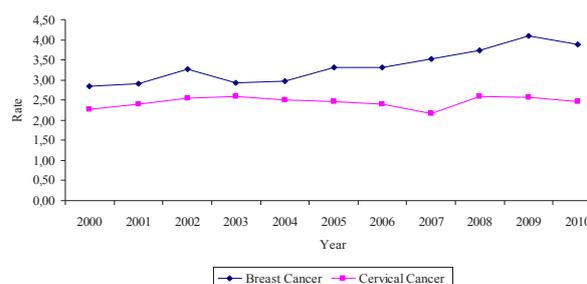
Table 1. Distribution of Deaths Caused by Breast Cancer, Cervical Cancer, According to Demographic Data. Parana, Brazil, 2000-2010

	Breast cancer		Cervical cancer	
	n	%	n	%
Age				
20-29	3/5	1.3	4/10	2.7
30-39	5/6	9.9	4/7	12.6
40-49	6/27	25.4	5/16	23.6
50-59	9/21	34.5	11/28	28.9
60-69	12/21	28.9	3/21	32.2
Race				
Yellow people	1/20	0.4	1/24	0.6
White people	11/23	86.8	8/15	85.9
Brown people	9/30	5.5	10/6	7.6
Black people	5/15	2.7	4/6	2.8
Amerindian	1/3	0.04	1/10	0.2
Ignored	8/18	4.6	4/19	2.9
Marital status				
Married	12/8	57.9	11/25	48.8
Single	5/3	17.0	12/25	19.7
Widower	1/7	14.7	10/18	17.9
Divorced	11/9	6.3	10/11	7.7
Ignored	6/19	3.4	5/30	4.1
Others	2/2	0.6	3/2	1.6

Figure 1. Distribution and Rate of Potential Years of Life Lost According Breast Cancer and Cervical Cancer per Year. Parana, Brazil, 2000 to 2010
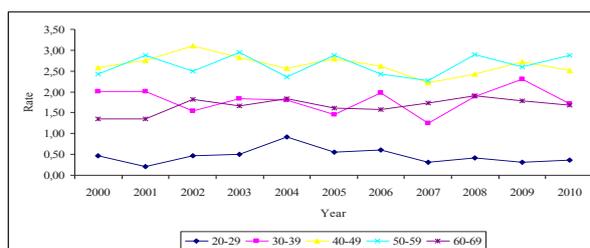

Figure 2. Rate of Years of Potential Life Lost According Cervical Cancer in Women 20 to 69 Years, by Year of Occurrence and Age. Parana, Brazil, 2000 to 2010.

Regarding age and YPLL by breast cancer, an increase in rates with the passing of years can be observed. In the first and last years of the study increased risk was observed for women in the age group 50-59 years. However, an important data has been that the age group 40 to 49 years there was also a significant increase (Table 3). The difference between these two age groups shows that breast cancer is occurring in younger women.

Regarding cervical cancer, it was observed an increase in rates for women aged 40 to 69 years with the passing years (Figure 2).

Discussion

To our knowledge there are no studies in Parana to assess the impact of mortality and YPLL of women with breast and cervical cancer. The analyzes conducted in this article about the behavior of breast and uterine cancer in the state of Paraná showed higher mortality rates from these causes, when compared with other states (Arzuaga-Salazar et al., 2011; Leao, 2012). These results demonstrate the immediate need for more effective measures to reduce deaths. Early diagnosis, preparation of health care professionals and public awareness are measures that contribute in a significant way to reduce these rates (Borghesan et al., 2008; Pereira et al., 2011).

Deaths from breast cancer and cervical cancer occurred in women aged 50 to 59 years and 60-69 years, respectively. In relation to breast cancer, according research conducted in all regions of Brazil showed that mortality begins to grow from the 25 years, focusing on the age group above 45 years (Zapponi and Melo, 2010). In the state of Goias, cervical cancer had higher mortality rates in the age group above 70 years (Santana et al., 2013); another study showed similar data regarding age presented in this study (Arzuaga-Salazar et al., 2011).

Regarding the variables race and marital status, the study found a higher prevalence of mortality from breast cancer in white women with a partner (Melo et al., 2013). However other study indentified that African American had statistically worse survival outcome, showing that the race are important determinants of breast cancer outcome (Cheung, 2013). About to marital status, study realized with Indian females about the participation in the breast cancer screening detected that women who were not married were significantly less likely to participate in any level of the screening process than married women (Frie et al., 2013). In relation to the cervical cancer, the black/brown and single women had a higher risk of dying (Mendonca et al., 2008; Meira et al., 2011).

The risk of death from cancer grows over the study period, showing a considerable increase of the breast cancer in the last four years of study. In the state of Rio Grande do Norte, it may be noted that they also increased over the years studied (Pereira et al., 2011). A study conducted in the United States with the objective of quantifying the YPLL for six cancer types (lung, colon and rectum, liver, breast, cervical, and prostate), when considering the annual incidence in 2012, found that breast cancer would be the second largest cause of loss YPLL (1420 mil years) (Liu et al., 2013). In the present study, there was a loss of 125.075 and 91.625 of YPLL due breast and cervical cancer, respectively. Data from the Cancer Institute of the United States (National Cancer Institute, 2012) show YPLL of 766.000 for breast cancer and 105.000 for cervical cancer.

Regarding age and YPLL from breast cancer, increased risk was observed for women 50-59 years old, but with a significant increase between the age group 40-49 years. Although breast cancer occurs most often in women over age 50, reports have been published suggesting an increase in the incidence and mortality in young women in different populations worldwide (Wu et al., 2012; Bouzid et al., 2013; Johnson et al., 2013; Santos, 2013). In young women breast cancer is the leading cause of death in Western and in developing countries (American Cancer Society, 2012), constituting 5% to 7% of cases in some studies (Hayes, 2007).

Breast cancer is one of the problems that are still being discussed at the national and international level in order to identify measures to facilitate actions in the control of breast cancer in countries with limited resources. Besides seeking to structure programs in partnership with local people viable for each region (Barros et al., 2012).

The increase in the incidence of breast cancer in young women should not be attributed to a rise in the diagnosis of disease due to the fact that young women are not included in the Brazilian public policies for screening for breast cancer. In Brazil, the Ministry of Health recommends the following main strategies for population screening: one mammography at least every two years for women 50 to 69 years of age (Brazil, 2004; 2014), and annual clinical breast exams for women 40 to 49 years of age. For women considered at high risk for breast cancer (with family history of breast cancer in first-degree relatives), it is recommended that clinical breast exam and a mammogram every year starting at 35 years of age (Brazil, 2004).

Thus, is believed that the reduction in delayed diagnosis of breast cancer in our country implies in the revision of the current official recommendations for the start of mammographic screening and adherence to this policy of public health.

In relation to cervical cancer, there was an increase in rates for women aged 40 to 69 years. During the course of the disease there are injuries that may constitute predictive signals representing the probability of cure (Mendonca et al., 2008). The Pap test is a simple method that can detect cervical lesions from exfoliated epithelial cells. The Pap test has been effective and efficient for mass application and is to this day, the most appropriate method for the screening of cervical cancer (Martins et al., 2009). In Brazil, the Ministry of Health recommends the Pap test among sexually active women aged 25 to 64 every three years after two normal or negative for cancer, consecutive, having a one-year apart (Brazil, 2011).

However, a review of the literature between the years 2006 to 2011 shows the reasons for which women not perform the test periodically, including poor education, lack of partner, younger women and also older age, lack of time, poor access to health services, fear of performing it and / or of a positive result for cancer and embarrassment (Silva et al., 2011). Population survey in Southern Brazil

showed that not performing mammography is associated with reported fair and poor state of health and the absence of comorbidities (Romeiro-Lopes et al., 2013). Study evaluating the risk factors associated with not performing the Pap smear showed that the age group 45 to 69 years, gainful occupation, without consulting the gynecologist last year and without conducting mammogram in the past two years, were associated with not performing the examination (Brischiliari et al., 2012).

Performing periodic preventive examination of cervical cancer depends on the sensitization about the benefits and efficacy, besides the performance of the managers, of the health team and, mainly, women's participation (Diógenes et al., 2012).

The governments concern to with this reality is demonstrated in the creation of ordinances and programs concerned with combating the cervical and breast cancer. The publication of Ordinance No. 2.439/2005 and 399/06 which established, respectively, the National Oncological Care Policy and Health Pact, the control of both cancers is one of the priority goals, involving different levels of responsibility for its control (Brazil, 2010).

The reduction in the incidence of cancer is part of a global challenge in healthcare that needs political action combined worldwide (Schmidt et al., 2011).

Study realized by D´Souza et al. (2013) showed that the projection of cancer incidence is essential for reducing rates because it allows planning cancer control actions, health care and better allocation of resources focused on screening.

The disease causes considerable financial and social loss, because beyond the disease, these women can occupy hospital beds, being removed from the labor market, and deprived of family life (Rodrigues et al., 2012).

In conclusion, the risk of death breast and cervical cancer, potentially preventable, increases as age increases, being higher from the age of 40. The measures to prevention of breast and cervical cancer are inexpensive and easy to perform by the Brazilian public health system. However, mortality from these diseases remains high. Thus, a reevaluation of preventive strategies adopted is required.

The trend is that new cases of the disease diagnosed in advanced stages, continue emerging from younger women attending public health services.

Despite of the recommendations made by the technical guidelines of the Ministry of Health, further discussion must be made regarding the cost-effectiveness of implementation of mammography as a screening option for younger women in Brazil.

References

American Cancer Society (2012). Breast cancer facts & figures 2011 e 2012, Atlanta: American Cancer Society.

Arnold MW, Silva MA, Falbo Neto GH, Haimenis RP (2007). Anos potenciais de vida perdidos por mulheres em idade fértil na cidade do Recife, Pernambuco, vitimas de morte por homicidio nos anos de 2001 e 2002. *Rev Bras de Saude Mater Infant*, **7**, 23-28.

Arzuaga-Salazar MA, Souza ML, Martins HEL, et al (2011).

Cancer de colo do útero: mortalidade em santa catarina-Brasil, 2000 a 2009. *Texto & Contexto Enfermagem*, **20**, 541-6.

Barros AF, Uemura AG, Macedo JLS (2012). Atraso no diagnóstico e tratamento do cancer de mama e estratégias para a sua reducao. *Femina*, **40**, 32-36.

Borghesan DH, Pelloso SM, Carvalho MDB (2008). Cancer de mama e fatores associados. *Cienc Cuid Saude*, **7**, 62-68.

Bouzid N, Lahmar R, Tebra S, Bouaouina N (2013). Cancer Du sein chez la femme jeune de moins de 35 ans en Tunisie: etude retrospective a propos de 124 cas. *Gynécol Obstét Fertil*, **41**, 356-60.

Brasil (1998). Ministério da Saude. Investigacao sobre perfis de saude. Brasilia, DF.

Brasil (2004). Instituto Nacional de Cancer, Controle do cancer de mama: documento de consenso. Rio de Janeiro: INCA.

Brasil (2010). IBGE (Instituto Brasileiro de Geografia e Estatistica). Resultados da amostra do censo demográfico.

Brasil (2011). Ministério da saude. Instituto nacional do cancer (INCA), Estimativa de incidencia do cancer no Brasil. Rio de Janeiro.

Brasil (2012a). Ministério da saude. Portal da saude. Incidencia do cancer no Brasil.

Brasil (2012b). Instituto nacional do Cancer, Direitos sociais da pessoa com cancer/Instituto Nacional de CÂNCER Jose Alencar Gomes da Silva, Coordenacao Geral de acões estratégicas. Divisao de comunicacao social, 3 ed., Rio de Janeiro: INCA, Brasil.

Brasil (2013a). Presidencia da Republica. Secretaria de politicas para as mulheres, plano nacional de politicas para as mulheres. Brasilia: secretaria de politicas para as mulheres, 114 p.

Brasil (2013b). Datasus. Ministério da Saude, Departamento de Informática do SUS, Informacões de Saude. Available at: http://tabnet.datasus.gov.br/cgi/tabcgi.exe?ibge/cnv/poppr. def. Acessed: 14.04.13.

Brasil (2014). Instituto nacional de cancer josé alencar gomes da silva, coordenacao de prevencao e vigilancia estimativa 2014: incidencia de cancer no Brasil/Instituto nacional de cancer josé alencar gomes da silva, coordenacao de prevencao e vigilancia. rio de janeiro: INCA, Brasil.

Brischiliari SCR, Dell'Agnolo CM, Gil LM, et al (2012). Papanicolaou na pós-menopausa: fatores associados a sua nao realizacao. *Cad Saude Publica*, **28**, 1976-84.

Cheung MR (2013). Assessing the impact of socio-economic variables on breast cancer treatment outcome disparity. *Asian Pac J Cancer Prev*, **14**, 7133-36.

Diógenes MAR, Cesarino MCF, Jorge RJB, Queiroz INB, Mendes RS (2012). Fatores de risco para cancer cervical e adesao ao exame papanicolaou entre trabalhadoras de enfermagem. *Rev Rene*, **13**, 200-210.

Dsouza DRN, Murthy NS, Aras RY (2013). Projection of cancer incident cases for India -Till 2026. *Asian Pac J Cancer Prev*, **14**, 4387-92.

Frie KG, Ramadas K, Anju G, et al (2013). Determinants of participation in a breast cancer screening trial in Trivandrum district, India. *Asian Pac J Cancer Prev*, 7301-07.

Hayes DF (2007). Clinical practice, Follow-up of patients with early breast cancer. *N Engl J Med*, **356**, 2505-13.

Johnson R, Chien, F, Bleyer A (2013). Incidence of breast cancer with distant involvement among women in the United States, 1976 to 2009. *JAMA*, **309**, 800-5.

Leao CR, Texeira UF, Lima EKP, et al (2012). Tendencia da Mortalidade por Cancer de Mama Feminina no Estado da Bahia, Brasil, de 1980 a 2007. *RBSP*, **36**, 299-312.

Liu PH, Wang JD, Keating NL (2013). Expected years of life lost for six potentially preventable cancers in the United States.

Prev Medicine, **56**, 309-313.

Martins LFL, Valente JG, Thuler LCS (2009). Factors related to inadequate cervical cancer screening in two Brasilian State Capitals. *Rev Saude Publica*, **43**, 318-325.

Meira KC, Gama SGN, Silva CMFP (2011). Perfil da mortalidade por cancer do colo do utero no municipio do Rio de Janeiro no periodo de 1999-2006. *Rev Bras Cancerol*, **57**, 7-11.

Melo WA, Souza LAO, Zurita RC, Carvalho MDB (2013). Fatores associados na mortalidade por cancer de mama no noroeste Paranaense. *Rev Eletronica Gest Saude*, 2087-94.

Mendonca VG, Lorenzato FRB, Mendonca JG, Menezes TC, Guimaraes MJ (2008). Mortalidade por cancer do colo do utero: caracteristicas sociodemográficas das mulheres residentes na cidade de Recife, Pernambuco. *Rev Bras Ginecol Obstet*, **30**, 248-55.

National Cancer Institute, Cancer Trends Progress Report - 2011/2012 Update, National Cancer Institute, NIH, DHHS, Bethesda, MD (2012). Available at: http://progressreport.cancer.gov. Acessed: 11.04.13.

Nilaweera R, Perera S, Paranagama N, Anushyanthan AS (2012). Knowledge and practices on breast and cervical cancer screening methods among female health care workers: A Sri Lankan experience. *Asian Pac J Cancer Prev*, **13**, 1193-96.

Pan American Health Organization (2008). Organizacao Mundial da Saude, 48° Conselho Diretor, 60a Sessao do Comite Regional, Washington, EUA.

Pereira MSLC, Ferreira LOC, Silva GA, Lucio OS (2011). Evolucao da mortalidade e dos anos potenciais e produtivos de vida perdidos por cancer de mama em mulheres no Rio Grande do Norte, entre 1988 e 2007. *Epidemiol Serv Saude*, **20**, 161-72.

Rodrigues BC, Carneiro ACMO, Silva TL, et al (2012). Educacao em saude para a prevencao do cancer cérvico-uterino. *RBEM*, **36**, 149-154.

Romeder JM, Mcwhinnie JR (1978). The development of potential years of life lost as an indicator of premature mortality. *Revue d Épidémiologie et de Santé Publique*, **26**, 97-115.

Romeiro-Lopes TC, Dell'Agnolo CM, Rocha-Brischiliari SC, et al (2013). Population inquiry regarding mammography in postmenopausal women in southern Brazil. *Asian Pac J Cancer Prev*, **14**, 6839-44.

Santana CKLSL, Rezende SRF, Manrique EJC (2013). Tendencia de mortalidade por cancer do colo do utero no estado de Goiás no periodo de 1989 a 2009. *Rev Bras de Cancerol*, **59**, 9-16.

Santos SS (2013). Cancer de mama em mulheres jovens: incidencia, mortalidade e associacao com os polimorfismos dos genes NQO1, CYP17 e CYP19. (Dissertacao), 132.

Schmidt MI, Duncan, BB, Silva GA, et al (2011). Menezes, Doencas cronicas nao transmissiveis no Brasil: carga e desafios atuais. **Lancet**, 61-74.

Silva JMA, Souza, RC, Manzo BF, Souza SR, Pereira SM (2011). Fatores relacionados a nao continuidade da realizacao do exame citológico Papanicolaou. *Percurso Academico*, **1**, 225-39.

World Health Organization (2012). International Agency for Research on Cancer, Globocan 2012: Estimated Cancer Incidence, Mortality and Prevalence Worldwide. Available at: http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx. Acessed: 14.05.14.

Wu QJ, Vogtmann E, Zhang W, et al (2012). Cancer incidence among adolescents and young adults in urban Shanghai, 1973-2005. *PLOS ONE*, **7**, 42607.

Zapponi ALB, Melo ECP (2010). Distribuicao da mortalidade por cancer de mama e de colo de utero segundo regiões Brasileiras. *Rev Enferm UERJ*, **18**, 628-31.