

# National Policy of Comprehensive Women's Health Care and Mortality in Menopause: Has Anything Changed?

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## Research article

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# Abstract

**Background:** The National Policy of Comprehensive Women's Health Care was implemented more than two decades ago, and the monitoring of potential benefits should be explored. Menopause is a period of life for which there are prevention and health promotion actions carried out by the government's all-encompassing sole Unify Health System (UHS) and factored into Brazilian policies. It is thus our purpose to identify menopausal women's main causes of death, as well as the mortality trend of such causes, especially after PNAISM implementation.

**Methods:** This is an ecological study with secondary data analysis conducted by the Setor de Atenção Primária, Disciplina de Ginecologia, Departamento de Obstetrícia e Ginecologia da Faculdade de Medicina da Universidade de São Paulo from 2018 to 2019. Data were retrieved from the Brazilian Health Department by accessing the mortality information system of the IT Department of SUS between 1996 and 2016, divided in two periods 1996 to 2004 and 2005 to 2006 according to implementation of the National Policy. The data included the death records of Brazilian women aged 35 to 64 years who had a precise diagnosis (ICD-10). Trend and differences between periods were evaluated by linear regression. The significance level was set at 5%. Stata 11® (StataCorp, LCC) was used.

**Results:** Menopausal women's main causes of death were the circulatory system diseases (29.39%, 736,972 deaths), neoplasms (26.17%, 656,385 deaths), respiratory system diseases (7.29%, 182,812 deaths), endocrine (29.39%), nutritional, and metabolic (6.81%, 170,881 deaths) diseases, and external causes of morbidity and mortality (5.49%, 137,674 deaths). Implementation of PNAISM led to increasing reduction in mortality from circulatory system diseases ( $\beta=-0.58$ ; 95% CI, -0.68 to -0.48;  $r^2=0.93$ ;  $p<0.001$ ), but not to any significant changes in neoplasm mortalities ( $\beta=0.07$ ; 95% CI, -0.01 to 0.15;  $r^2=0.22$ ;  $p=0.070$ ).

**Conclusions:** The leading causes of death among menopausal women are circulatory system diseases, neoplasms, respiratory system diseases, nutritional, metabolic, and endocrine diseases, and external causes of morbidity and mortality. The trend of mortality rates among menopausal women, following PNAISM implementation, was a decline in circulatory system diseases and in nutritional, metabolic, and endocrine diseases, with no changes for neoplasms and respiratory system diseases.

## Background

The National Policy of Comprehensive Women's Health Care, PNAISM (Política Nacional de Atenção Integral à Saúde da Mulher), launched by the Brazilian Health Department in 2004 and presently being carried out in conjunction with the Unify Health System (UHS) - Sistema Único de Saúde (SUS), aims at reducing women's morbidity and mortality, especially the deaths resulting from preventable causes in all life cycles.<sup>1</sup>

Menopause is the transition period in a woman's life from the reproductive to the nonreproductive cycle.<sup>2</sup> At such a time, clinical changes occur in association with prolonged, permanent, and physiological

hypoestrogenism,<sup>3</sup> and they may be related to the onset or aggravation of chronic noncommunicable diseases.<sup>4</sup> In this period, ranging from age 40 to 65 years, a woman can benefit from health prevention and promotion actions taken by SUS and PNAISM.

The epidemiological mortality profile in Brazil has a marked prevalence of chronic noncommunicable diseases and shows a tendency towards reduction in the deaths – specifically of menopausal women – brought on by the circulatory system<sup>5</sup> and ill-defined causes, as well as a trending increase in neoplasms.<sup>6</sup>

Studies conducted in recent years of the impact of PNAISM on women's health and on the tendency of the causes of disease and death among menopausal women are scarce<sup>5,6,7</sup> and little do they explore the subject. Studies of the mortality of Brazilian women may contribute to changes in health promotion strategies and to the monitoring of the organization and implementation of public health care policies. Thus, it is thus our purpose to identify menopausal women's main causes of death, as well as the mortality trend of such causes, especially after PNAISM implementation.

## Methods

### Study design

Secondary data analysis was performed by the Setor de Atenção Primária, Disciplina de Ginecologia, Departamento de Obstetrícia e Ginecologia, Faculdade de Medicina, Universidade de São Paulo from 2018 to 2019. Health information is centralized in the official database of the Brazilian Health Department with data managed and supplied by the IT Department of SUS (DATASUS) and by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística [IBGE]), which is the main office responsible for sociodemographic data in Brazil. In this study, data were obtained from DATASUS through access to the Systems of Information on Mortality (Sistemas de Informação sobre Mortalidade) (SIM) for retrieval of vital statistics indicators and through access to the System of Health Information (Sistema de Informações de Saúde [TABNET]) for extraction of demographic and socioeconomic indicators.

### Data source

The DATASUS database covers approximately 96%<sup>8</sup> of the Brazilian population and provides socioeconomic data and information related to health and health care. The data made available by DATASUS are the computerized records of procedures, actions, and services performed by SUS. The data go through an internal validation process before being made available for free public access. However, the individuals treated at SUS are not identified by name, rendering the more recent data on the general health of the population vulnerable to subsequent alterations. Hence, they are not utilized for analysis.

### Participants

Participants were selected from databases. Only the records of women who died between 35 and 64 years of age, but not during pregnancy or the postpartum period, who were residents of Brazil, and who had a precise diagnosis were retrieved. The deaths occurring during pregnancy and the postpartum period were excluded because of the age bracket. The women who had signs and symptoms and whose clinical examinations and laboratory tests showed abnormalities were left out owing to a lack of diagnostic precision. All deaths occurring in this population between 1996 and 2016 that were reported to SIM were included in this study.

## **Variables**

### **Age patterns of mortality**

Retrievals were carried out according to the tenth edition of the International Classification of Diseases (ICD-10<sup>9</sup>). The women who died between 35 and 64 years of age had their records retrieved and they were stratified into 4-year age brackets (35–39;40–44; 45–49; 50–54; 55–59; 60–64) and year of death.

The estimates of the resident population were obtained from two projections made by IBGE.<sup>10</sup> The population estimate for the years between 1996 and 2000 based on the intercensal projections covering the years between 1981 and 2012 was organized by age bracket, sex, and housing status, and that between 2001 and 2015 from projections for the 2000 to 2006 period was classified by sex and age. The resident population was arranged into 4-year age brackets.

Mortality was calculated as the relationship between the number of deaths and the resident population for every 100,000 people. The resultant rate was standardized by age by the direct method, having the world population as a reference.<sup>11</sup>

### **Periods related to PNAISM**

Rate behavior was analyzed according to ranges related to the year of PNAISM implementation. The preimplementation period corresponds to the 1996 to 2004 range and the postimplementation period to the subsequent 2005 to 2016 range.

### **Ethical aspects**

This study analyzed secondary data freely accessible to all and thus it respects work ethics and good research practices. Nevertheless, it cannot show any approval number given by the research ethics committee. According to resolution number 510 of the National Health Council published on April 5, 2016, studies conducted with secondary data or with public data that render identification of the individual impossible should not be submitted for approval or evaluated by the research ethics regulatory system in Brazil, be it the Research Ethics Committee or the National Council on Research Ethics.<sup>12</sup>

### **Data analysis**

Frequency distribution of deaths following the ICD-10<sup>9</sup> sections was done with absolute numbers and frequency relative to the number of deaths notified during the period. Trend was evaluated by linear regression and the slope (B) and the respective 95% confidence interval, the coefficient of determination ( $R^2$ ), and the probability value (p) were calculated. The significance level was set at 5%. Stata 11® (StataCorp, LCC) was used.

## Results

Deaths from nonobstetric causes of women aged 35 to 64 years totaled 2,286,723 between 1996 and 2016. The major causes of death were classified as circulatory system diseases (29.39%, 736,972 deaths), neoplasms (26.17%, 656,385 deaths), respiratory tract diseases (7.29%, 182,182 deaths), nutritional and metabolic endocrine disorders (6.81%, 170,881 deaths), and external causes of morbidity and mortality (5.49%, 137,674 deaths), adding up to 75.1% of the deaths in that period (Table 1).

Table 1

Distribution of deaths of women residents of Brazil aged 35 to 64 years between 1996 and 2016 according to the tenth revision of the International Classification of Diseases (ICD-10)

Classification	Section (ICD)	Deaths	%
Diseases of the circulatory system	V	736972	29.39
Neoplasms (tumors)	II	656385	26.17
Diseases of the respiratory system	X	182812	7.29
Endocrine, nutritional, and metabolic diseases	IV	170881	6.81
External causes of morbidity and mortality	XX	137674	5.49
Some infectious and parasitic diseases	I	134545	5.37
Diseases of the digestive system	XI	126787	5.06
Diseases of the genitourinary system	XIV	50040	2.00
Diseases of the nervous system	VI	32301	1.29
Mental and behavioral disorders	V	16038	0.64
Diseases of the musculoskeletal system and connective tissue	XIII	15501	0.62
Blood and hematopoietic organ diseases and some immune disorders	III	15271	0.61
Diseases of the skin and subcutaneous tissue	XII	5976	0.24
Congenital malformations, deformations, and chromosomal abnormalities	XVII	5064	0.20
Diseases of the ear and mastoid process	VIII	355	0.01
Certain conditions originating in the perinatal period	XVI	64	0.003
Diseases of the eye and adnexa	VII	57	0.002

Trend analysis of the five major causes of death showed a mortality reduction in the diseases of the circulatory system ( $\beta = -2.5$ ; 95% CI, -2.9 to -2.2;  $R^2 = 0.91$ ;  $p < 0.001$ ) and of the respiratory system ( $\beta = -0.2$ ; 95% CI, -0.4 to -0.02;  $R^2 = 0.18$ ;  $p = 0.030$ ), in the external causes of morbidity and mortality ( $\beta = -0.2$ ; 95% CI, -0.3 to -0.04;  $R^2 = 0.25$ ;  $p = 0.012$ ), as well as an increase in mortality resulting from neoplasms ( $\beta = 0.7$ ; 95% CI, 0.5 to 0.9;  $R^2 = 0.77$ ;  $p < 0.001$ ) (Fig. 1).

PNAISM implementation stepped up the reduction in mortality caused by diseases of the circulatory system ( $\beta = -0.58$ ; 95% CI, -0.68 to -0.48;  $R^2 = 0.93$ ;  $p < 0.001$ ), but led to no significant changes in neoplasm mortalities ( $\beta = 0.07$ ; 95% CI, -0.01 to 0.15;  $R^2 = 0.22$ ;  $p = 0.070$ ). There were changes in the

behavior of mortalities brought on by endocrine, nutritional, and metabolic diseases, diseases of the respiratory system, and external causes. Mortality from endocrine and nutritional diseases did not change in the pre-PNAISM period ( $p = 0.601$ ); however, it began to decline in the post-PNAISM period ( $\beta = -0.09$ ; 95% CI, -0.13 to -0.05;  $R^2 = 0.64$ ;  $p = 0.001$ ).

Additionally, the decreasing mortality from diseases of the respiratory system in pre-PNAISM ( $\beta = -0.20$ ; 95% CI, -0.29 to -0.10;  $R^2 = 0.73$ ;  $p = 0.002$ ) changed to a slight increase in post-PNAISM ( $\beta = 0.05$ ; 95% CI, 0.001 to 0.09;  $R^2 = 0.28$ ;  $p = 0.043$ ), and the pre-PNAISM decrease in the mortality of external causes exhibited no significant changes in the period subsequent to PNAISM implementation ( $p = 0.456$ ) (Table 2).

Table 2

Changes in the major causes of death of women aged 35 to 64 years from preimplementation to postimplementation of the National Policy of Comprehensive Women's Health Care

Sections	Pre-PNAISM 1996 to 2004			Post-PNAISM 2005 to 2016		
	$\beta$ (95% CI)	$R^2$	$p^*$	$\beta$ (95% CI)	$R^2$	$p^*$
Diseases of the circulatory system	-0.092 (-1.22 to -0.60)	0.85	< 0.001	-0.58 (-0.68 to 0.48)	0.93	< 0.001
Neoplasms (tumors)	0.02 (-0.17 to 0.22)	0.13	0.817	0.07 (-0.01 to 0.15)	0.22	0.070
Diseases of the respiratory system	-0.20 (-0.29 to -0.10)	0.73	0.002	0.05 (0.001 to 0.09)	0.28	0.043
Endocrine, nutritional, and metabolic diseases	0.02 (-0.08 to 0.12)	0.09	0.601	-0.09 (-0.13 to -0.05)	0.64	0.001
External causes of morbidity and mortality	-0.16 (-0.22 to -0.09)	0.80	0.001	0.01 (-0.02 to 0.04)	0.03	0.456
*Linear Regression; 95% CI: 95% Confidence Interval; $R^2$ : predictive capacity; $\beta$ : Slope. PNAISM: Política Nacional de Atenção Integral à Saúde da Mulher (National Policy of Comprehensive Women's Health Care)						

## Discussion

In this study, the diseases of the circulatory and respiratory systems, as well as endocrine, nutritional, and metabolic diseases, and those of external causes accounted for approximately 50% of the deaths of women in the 35 to 64 age bracket, while neoplasms alone were responsible for 26% of women's deaths in that same population.

Historically, the assistance and care provided to women by the health system in Brazil were restricted to pregnancy and puerperium, and health actions were specific (verticalized) and oriented towards maternal

and child health.<sup>13</sup> The Program of Comprehensive Women's Health Care, PAISM (Programa de Assistência Integral à Saúde da Mulher), in 1984 included some aspects of women's health care related to longitudinal assistance, along with other aspects relevant to the health of the female population, such as prevalent gynecological diseases; neoplasm prevention, detection, and treatment; menopause; domestic and sexual violence; as well as the incorporation of sexual and reproductive rights.<sup>14</sup>

Implementation of SUS in 1985 and aspects of women's health care at different levels of complexity have been taken into account in the guidelines and principles laid down by the Health Department since then. In 2005 PAISM was restructured into PNAISM (with the insertion of Nacional, and thus it became Política Nacional de Atenção Integral à Saúde da Mulher, that is, National Policy of Comprehensive Women's Health Care) and priority was given to actions taken to ensure health care for women in the climacteric/menopause, a reduction in inequities, and, principally, the humanization of health services.<sup>15</sup>

The epidemiological profile of mortality in Brazil currently shows a marked predominance of circulatory system diseases and neoplasms as causes of death since 1985. In that year such causes overrode infectious and parasitic diseases and became the chief agents of death in the country.<sup>15,16</sup> This tendency, specifically in women in the climacteric, was demonstrated by Schmitt et al.<sup>5</sup>, who found, in decreasing order, circulatory system diseases, neoplasms, symptoms, signs, and ill-defined disorders, respiratory system diseases, external causes (external causes of morbidity and mortality), diseases of the digestive system, infectious and parasitic diseases, endocrine, nutritional, and metabolic diseases, genitourinary system diseases, and nervous system diseases.

In our study, 75.1% of the deaths which have occurred in the last 20 years were caused by circulatory system diseases, neoplasms, respiratory system diseases, endocrine, nutritional, and metabolic diseases, and external causes of morbidity and mortality. The death distribution shown by the sections of the tenth international classification of diseases is similar to the women's death distribution found in the results of national studies.<sup>5-8</sup>

The higher percentages found for cardiovascular diseases, neoplasms, and metabolic diseases constitute a familiar scenario to women in the age bracket corresponding to menopause,<sup>17-20</sup> and they are attributed to factors related to lifestyle, such as smoking, alcoholism, excess weight, and high blood pressure.<sup>17</sup> These are frequent habits and concomitant diseases reported during menopause and may occur or aggravate as a result of physiological and progressive hypoestrogenism.<sup>18</sup>

The downward slope of the mortality tendency of cardiovascular and metabolic diseases and the increase in neoplasm mortality were observed in a study by Mondul et al.<sup>6</sup>, who found that mortality from circulatory and ill-defined diseases was declining and that neoplasms were moving upwards.

One of the guidelines of PNAISM is related to health care in all of women's life phases and mainly to the circumstances which aggravate health, but which can be avoided, prevented, or detected early on, such as breast and cervical cancers.<sup>1,14</sup>

Implementation of PNAISM allowed menopausal women to have access to health care and was an incentive to the family health care strategy teams to act at the level of public policy, orienting the promotion, prevention, and health actions in all of the Brazilian territory.<sup>15</sup> It was also a stimulus for family health care strategy policies aimed at controlling chronic noncommunicable diseases. Both may have contributed towards the reduction in mortality from circulatory system diseases.

In the course of the 20 years of this study (1996–2016), the mortality tendency of neoplasms remained constant when compared to the other major causes of death. Furthermore, mortality from neoplasms did not increase among menopausal women in Brazil according to our results. This was a scenario that maintained its stability independent of and subsequent to the implementation of PNAISM (2005–2016).

Implementation of public policies aimed at an early diagnosis and treatment of cancer such as the National Cancer Care Policy (Política Nacional de Atenção Oncológica) in 2005, along with the Greater Health Program (Programa Mais Saúde) in 2009 and the National Plan for a Stronger Network for Cancer Prevention, Diagnosis, and Treatment (Plano Nacional de Fortalecimento da Rede de Prevenção, Diagnóstico e Tratamento do Câncer) in 2011, diminished the cancer load in Brazil.<sup>19</sup>

The mortality rate stability in the post-PNAISM period detected in the present study may be regarded as an expected result, given the cancer progression time from early detection to the time of death with respect to breast<sup>19</sup> and cervical<sup>20</sup> cancers, as well as an improvement in the filling out of forms and in the quality of information of the information systems concerning the causes of death.<sup>21</sup> Still, the stability of the cancer mortality rates may be viewed as a warning for the type of unorganized screening done in Brazil, with breast and cervical cancers at the forefront in women's health.<sup>22</sup>

There was no reduction in deaths from respiratory diseases, a fact also to be found in the Schmitt et al<sup>5</sup> results. The implementation success of other public policies, such as that of smoking,<sup>23</sup> could have changed the outcome. However, it is worth highlighting that, despite the studies<sup>24,25</sup> which demonstrate the harmful effects of environmental pollution, the behavioral changes in our women, who have been smoking less in the past decades, and the smoking cessation campaigns, mortality from respiratory diseases has not decreased.

The reduction in mortality from endocrine, nutritional, and metabolic diseases following PNAISM implementation, as shown in this study, as well as in mortality from circulatory system diseases, may be associated with a reduction in shared risk factors, such as diabetes mellitus and dyslipidemia,<sup>26</sup> and with the health care provided to (Brazilian) diabetic patients, by making available pharmacological treatments (oral hypoglycemic drugs and insulin) to them through SUS.<sup>26</sup>

The mortality analysis of neoplasms as a whole and not as separate entities, some of which top the priority list of women's health care in PNAISM, particularly cervical and breast cancers, is a limitation of the present study. However, PNAISM should reduce morbidity and mortality due to neoplasms in general.

What is novel about this study is that it acknowledges PNAISM as a public health milestone and as a wellspring of thought more than two decades after its implementation. This national policy is one of the pillars in SUS<sup>28</sup> of the maintenance and assurance of actions for prevention and promotion that impact women's mortality, specifically during menopause. Thus, analyses of women's health indicators, such as mortality rates and health diagnoses, are necessary and should make it possible to monitor the benefits of PNAISM, taking into account health care levels and the female life cycle.<sup>29</sup>

## Conclusions

The primary causes of death among menopausal women are still circulatory system diseases and neoplasms, followed by respiratory system diseases, endocrine, nutritional, and metabolic diseases, as well as external causes. Among menopausal women after PNAISM implementation, there is a downward trend in the rates of mortality from circulatory system diseases and from endocrine, nutritional, and metabolic diseases and there is stability in the rates of neoplasm and respiratory system diseases.

## Abbreviations

PNAISM - Política Nacional de Atenção Integral à Saúde da Mulher

UHS - Unify Health System

SUS - Sistema Único de Saúde

DATASUS - IT Department of SUS

IBGE - Instituto Brasileiro de Geografia e Estatística

SIM - Sistemas de Informação sobre Mortalidade

ICD-10 - International Classification of Diseases-10

R<sup>2</sup> - coefficient of determination

CI – confidence interval

## Declarations

**Ethics approval and consent to participate:** Not applicable

**Consent for publication:** Not applicable

**Availability of data and material:**

The datasets generated and/or analysed during the current study are available in the DATASUS repository, <http://datasus.saude.gov.br/mortalidade-1996-a-2017-pela-cid-10-2/>

**Competing Interests:** The authors declare that they have no competing interests

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**Authors' contributions:**

ICES have made substantial contributions to the conception, design of the work; interpretation of data and have drafted the work.

FWFS have made substantial contributions to the design of the work, acquisition, analysis, interpretation of data and have drafted the work.

JLSR have made substantial contributions to the design of the work and have substantively revised it.

LTSZ have made substantial contributions to the design of the work and have substantively revised it.

FA have made substantial contributions to the acquisition, analysis and have substantively revised it.

ECB have made substantial contributions to the conception and have substantively revised it.

JMSJ have made substantial contributions to the conception and have substantively revised it.

All authors have approved the submitted version and have agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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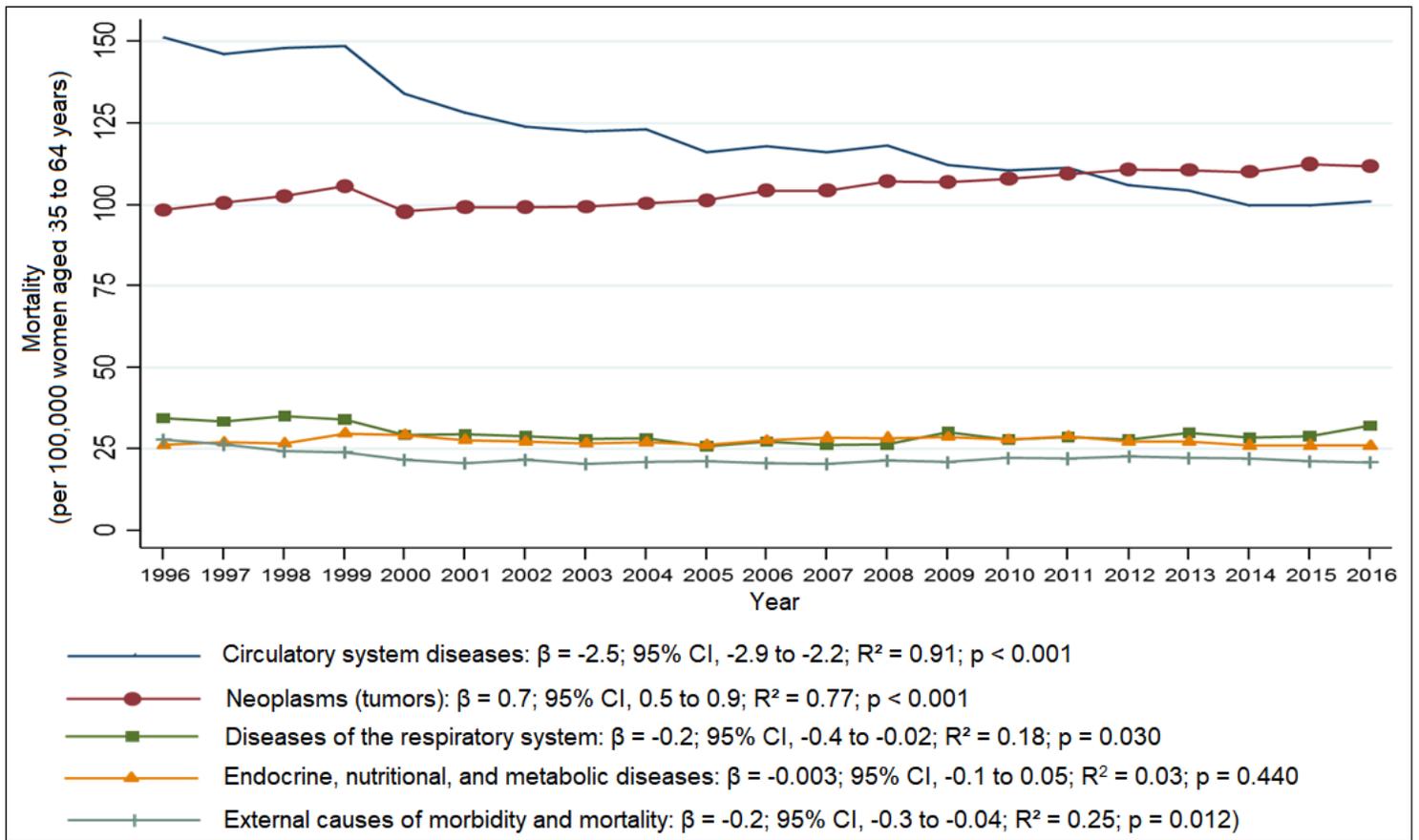
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## Figures



**Figure 1**

Mortality trend of the main causes of death of Brazilian women aged 35 to 64 years between 1996 and 2016.