Epidemiological Report

Noncommunicable Diseases (NCD):
Standardized rate of premature mortality from noncommunicable diseases

Historic Series 2015 – 2020

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BRIEF HISTORY OF INJURY/DISEASE

Noncommunicable diseases (NCDs) are responsible for about 70% of all deaths in the world, whose cardiovascular (CVD) diseases correspond to the majority of these deaths, followed by malignant neoplasms, chronic respiratory diseases and diabetes.[1] These groups are responsible for more than 80% of all premature deaths (adults aged 30 to 69 years) from NCDs.[1]

In order to address this problem, in 2011 the Ministry of Health (MH) launched the Strategic Action Plan to Combat NCDs in Brazil, 2011-2022. As this plan comes to an end, and in agreement with the United Nations (UN) Sustainable Development Goals (SDGs), a new Strategic Action Plan to Combat Chronic Diseases and Chronic Noncommunicable Diseases in Brazil was prepared (DANT) in the country, for the period 2021-2030 (DANT Plan).[2] In addition to NCDs, DANT comprises accidents and violence, thus reaffirming and expanding the proposals for coping, as well as presenting themselves as a guideline for the prevention of risk factors for NCDs.[2]

To achieve the new global agreement on the SDGs, the new plan establishes five NCD indicators and goals to be achieved by Brazil by 2030: 1) reduce by 1/3 the standardized rate of premature mortality (30 to 69 years old) from NCDs; 2) reduce by 1/3 the unconditional probability of premature death (30 to 69 years old) from NCDs; 3) reduce premature mortality (30 to 69 years) from breast cancer by 10%; 4) reduce premature mortality (from 30 to 69 years old) from cervical cancer by 20%; and 5) reduce premature mortality (30 to 69 years) from cancer of the digestive system by 10%.[2]

The objectives of this epidemiological bulletin are to present the monitoring of the premature mortality rate (30 to 69 years old) by NCDs in the State of São Paulo (SSP) and in Brazil for the period from 2015 to 2020 and to analyze the achievement of the target recommended in the SDGs and in the DANT Plan.

RISK FACTORS

The four main factors that increase the risk of illness from NCDs are: smoking, alcohol consumption, unhealthy diet and physical inactivity.[1] These factors can be modified by behavior changes and governmental actions, with the adoption of regulatory measures or reduction of commercialization, consumption and exposure of products harmful to health.[2]

METHOD OF EPIDEMIOLOGICAL SURVEILLANCE

The NCD premature mortality rate represents the number of deaths (aged 30 to 69 years) from NCDs each year and location x 100,000, divided by the resident population (aged 30 to 69 years), in a given year and location.

The deaths considered by NCDs included the following codes from the International Classification of Diseases version 10 (ICD-10): I00-I99 (CVD), C00-C97 (malignant neoplasms), J30-J98, except J36 (chronic respiratory diseases) and E10 -E14 (diabetes mellitus).[2] The data source for these deaths was Datasus, from the MH.[3]

As the gross rate is strongly influenced by the age structure, the comparative analysis between populations of different compositions requires age standardization. Standardized rates should only be used for comparative analysis.[4] Age standardization was calculated using the direct method, using the standard population from the 2010 Brazil Census, including adults aged 30 to 69 years.

Standardized premature mortality rates were calculated for the state of São and for Brazil according to sex and period from 2015 to 2020, as the DANT Plan adopts 2015 as the reference year for reaching the goal in 2030.[2] In addition, targets were calculated for both the SSP and the country. It is worth clarifying that to reach the goal of reducing the premature mortality rate by NCDs by 1/3, it is necessary to reduce the rate value by 2% per year, as the value is divided by 1/3 (that is, 30%) by 15 years (which is the difference between 2030, the final year of the SDGs, and 2015, the reference year of the DANT Plan).[2]

Standardized premature mortality rates were also calculated for each group of NCDs: cardiovascular diseases, malignant neoplasms, diabetes mellitus and chronic respiratory diseases, according to sex.

EPIDEMIOLOGICAL SITUATION

1. Standardized premature mortality rate (30 to 69 years old) from NCDs

The standardized premature mortality rates in the SSP were higher than those in Brazil from 2015 to 2020. In Sao Paulo, the percentage change over the period was -8.4% and nationally it was -8.2%, with a tendency to decline (Graph 1 and Table 1). The target set by the SDGs, however, was not reached in 2020, neither in São Paulo nor in Brazil.

Graph 1. Monitoring of standardized premature mortality rates (SPMR), current value and expected value, in the SSP and in Brazil, 2015 to 2020.
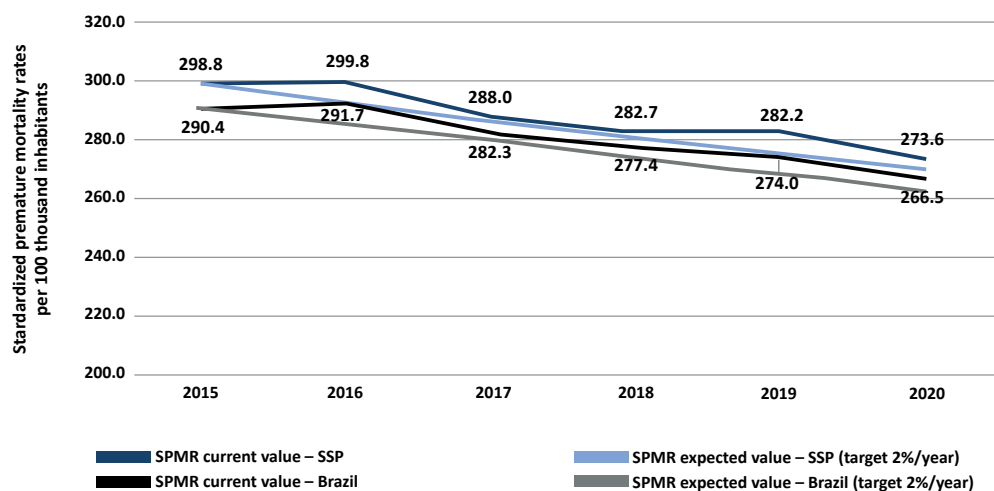
Source: Deaths: Datasus – Vital Statistics – Mortality. Resident population: Datasus – Demographic and socioeconomic – Resident population. Deaths classified with codes C00-C97, E10-E14, I00-I99, J30-J98 (except J36) (noncommunicable diseases – NCDs) of the ICD-10 were considered. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030. Data extracted on April 6, 2022.
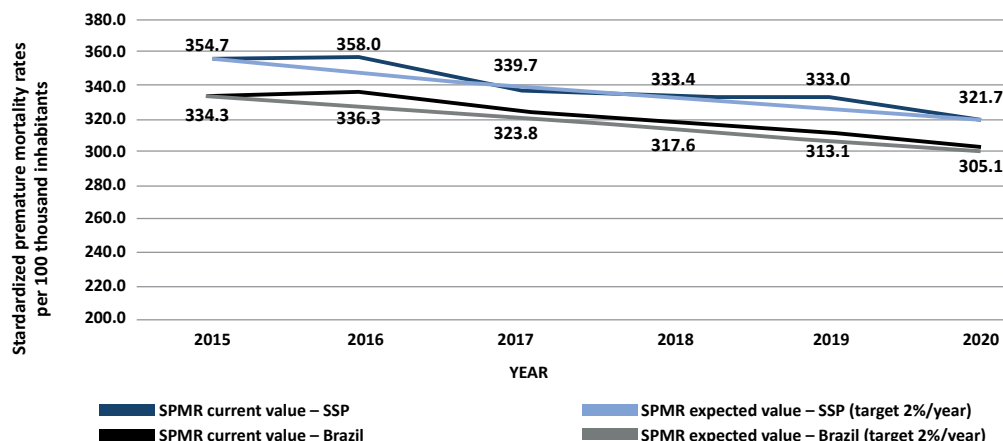
Table 1. Standardized premature mortality rates (SPMR), current value and expected value, in the SSP and in Brazil, 2015 to 2020.

	2015	2016	2017	2018	2019	2020
SPMR current value – SSP	298.8	299.9	288.0	282.7	282.2	273.6
SPMR expected value – SSP (target 2%/year)	298.8	292.9	287.0	281.3	275.6	270.1
SPMR current value – Brazil	290.4	291.7	282.3	277.4	274.0	266.5
SPMR expected value – Brazil (target 2%/year)	290.4	284.6	278.9	273.3	267.9	262.5

Source: Deaths: Datasus – Vital statistics – Mortality, resident population: Datasus – Demographic and socioeconomic – Resident population. Data extracted on April 6, 2022. Note: age standardization using the direct method. Standard population: Brazil 2010 Census. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030.

The SSP's standardized male premature mortality rates were higher than the Brazilian rates from 2015 to 2020. In the SSP, the percentage change in the period was -9.3%; and in Brazil it was -8.7%. The goal was not reached in 2020, neither in São Paulo nor in Brazil; however, current values are close to expected targets. For the SSP, in 2020, the difference between current value and expected target was 1.1; for Brazil, the difference was 2.9 (Graph 2 and Table 2).

Graph 2. Monitoring of standardized premature mortality rates (SPMR, current value and expected value, for males in the SSP and in Brazil, 2015 to 2020.

Source: Deaths: Datasus – Vital Statistics – Mortality. Resident population: Datasus – Demographic and socioeconomic – Resident male population. Deaths classified with codes C00-C97, E10-E14, I00-I99, J30-J98 (except J36) (noncommunicable chronic diseases –NCDs) of the ICD-10 were considered. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases and Noncommunicable Diseases in Brazil, 2021-2030. Data extracted on April 6, 2022.
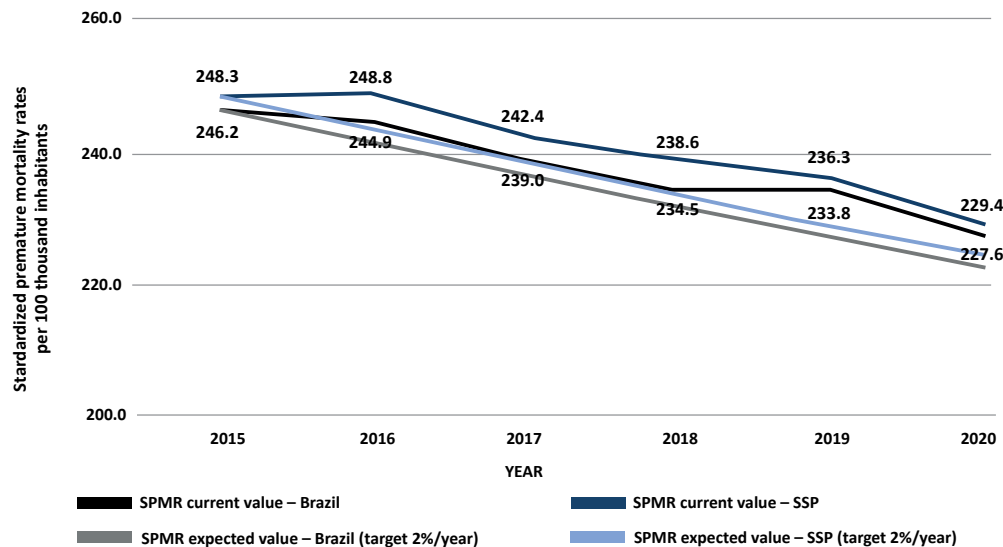
Table 2. Standardized premature mortality rates (SPMR), current value and expected value, for males in the SSP and in Brazil, 2015 to 2020.

	2015	2016	2017	2018	2019	2020
SPMR male – current value – SSP	354.7	358.0	339.7	333.4	333.0	321.7
SPMR male – expected value - SSP (target 2%/year)	354.7	347.6	340.6	333.8	327.1	320.6
SPMR male – current value – Brazil	334.3	336.3	323.8	317.6	313.1	305.1
SPMR male – expected value - Brazil (target 2%/year)	334.3	327.6	321.0	314.6	308.3	302.2

Source: Deaths: Datasus – Vital statistics – Mortality, resident population: Datasus – Demographic and socioeconomic – Male resident population. Data extracted on April 6, 2022 Note: age standardization using the direct method. Standard population: Brazil 2010 Census. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030.

Standardized premature mortality rates for females in the SSP were lower than those in Brazil from 2015 to 2020. In the SSP and in Brazil, the percentage change for the period was -7.6%. The goal was not reached in 2020, neither in São Paulo nor in the country; it was found that recent values are still far from the expected targets, despite the clear downward trend in mortality rates. For the SSP, in 2020, the difference between current value and expected target was 5; for Brazil the difference was 4.9 (Graph 3 and Table 3).

Graph 3. Monitoring of standardized premature mortality rates (SPMR), current value and expected value, for females in the SSP and in Brazil, 2015 to 2020.

Source: Deaths: Datasus – Vital Statistics – Mortality. Resident population: Datasus – Demographic and socioeconomic – Female resident population. Deaths classified with codes C00-C97, E10-E14, I00-I99, J30-J98 (except J36) (noncommunicable chronic diseases – NCD) of the ICD-10 were considered. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030. Data extracted on April 6, 2022.

Table 3. Standardized premature mortality rates (SPMR), current value and expected value, for females in the SSP and in Brazil, 2015 to 2020.

	2015	2016	2017	2018	2019	2020
SPMR female – current value– SSP	246.2	244.9	239.0	234.5	233.9	227.6
SPMR female – expected value - SSP (target 2%/year)	246.2	241.3	236.5	231.7	227.1	222.6
SPMR female – current value – Brazil	248.3	248.9	242.4	238.6	236.4	229.4
SPMR female – expected value - Brazil (target 2%/year)	248.3	243.4	238.5	233.7	229.1	224.5

Source: Deaths: Datasus – Vital Statistics – Mortality. Resident population: Datasus – Demographic and socioeconomic – Female resident population. Deaths classified with codes C00-C97, E10-E14, I00-I99, J30-J98 (except J36) (noncommunicable chronic diseases – NCD) of the ICD-10 were considered. Data extracted on April 6, 2022. Note: age standardization using the direct method. Standard population: Brazil 2010 Census. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030.

2. Standardized premature mortality rate (30 to 69 years) for NCD groups

A reduction in standardized premature mortality rates for cardiovascular diseases was observed in the SSP from 2015 to 2020. The percentage change for the total population was -16.9%, while for males it was -16.6 % and for females, -17.9%. In addition, males had higher rates than females. Between 2019 and 2020, this reduction was more pronounced for males, from 170.8/100,000 inhabitants to 154.7/100,000 inhabitants, than for females, from 96.2/100,000 inhabitants to 87, 1/100 thousand inhabitants (Graph 4).

EPIDEMIOLOGICAL REPORT OF THE SURVEILLANCE OF NONCOMMUNICABLE DISEASES: STANDARDIZED RATE OF PREMATURE MORTALITY FROM NONCOMMUNICABLE DISEASES

Duarte LS, Shirassu MM, Moraes MA

Graph 4. Monitoring of standardized premature mortality rates (SPMR) for cardiovascular diseases for the total population and for males and females in the SSP, 2015 to 2020.
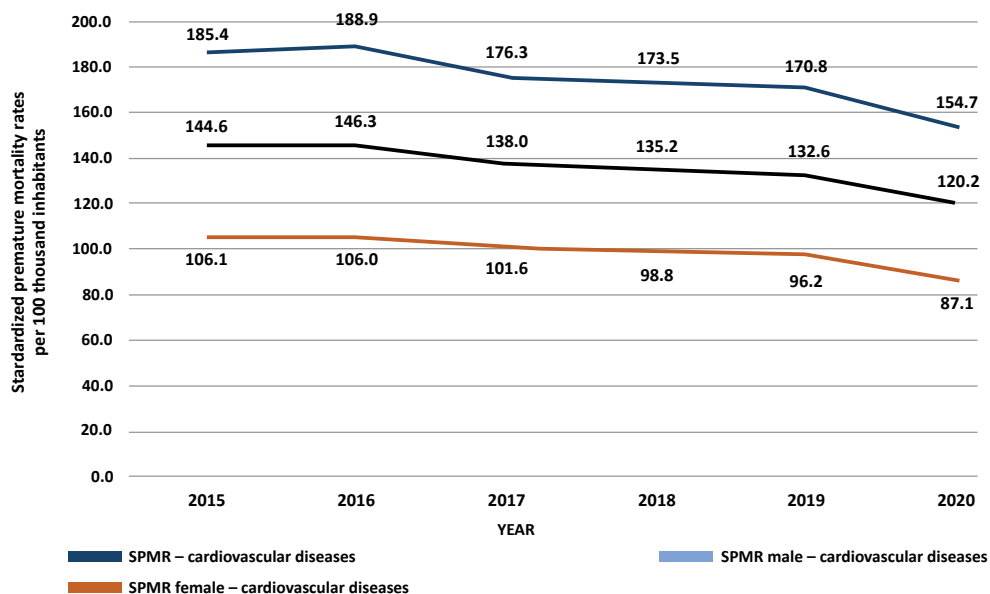
Source: Deaths: Datasus – Vital Statistics – Mortality. Resident population: Datasus – Demographic and socioeconomic – Female resident population. Deaths classified with ICD-10 codes I00-I99 were considered. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030. Data extracted on April 6, 2022.

Graph 5. Monitoring of standardized premature mortality rates (SPMR) for malignant neoplasms for the total population and for males and females in the SSP, 2015 to 2020.
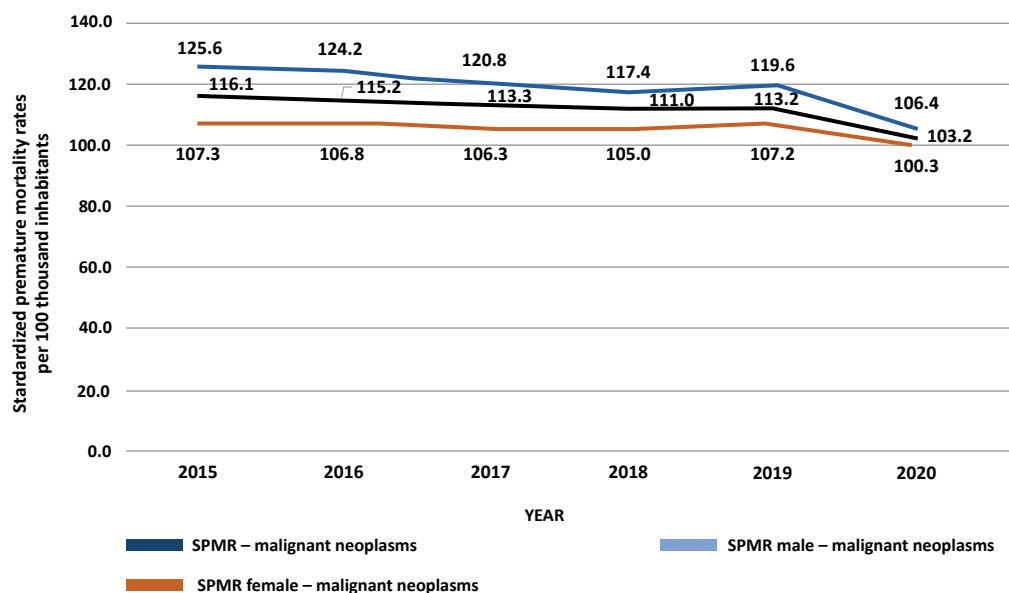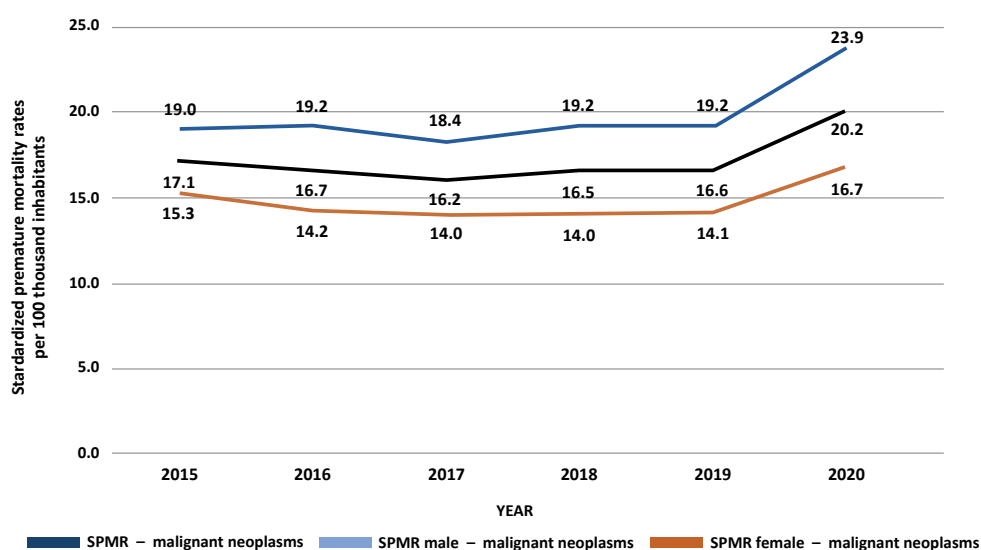

Source: Deaths: Datasus – Vital Statistics – Mortality. Resident population: Datasus – Demographic and socioeconomic – Female resident population. Deaths classified with ICD-10 codes C00-C97 were considered. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030. Data extracted on April 6, 2022.

The standardized premature mortality rates for malignant neoplasms in the SSP from 2015 to 2020 tended to decrease, with the percentage variation of the total population being -11.1%, males -15.3% and females of -6.5%. In addition, males had higher rates than females (Graph 5).

The standardized premature mortality rates for diabetes mellitus in the SSP from 2015 to 2020 tended to increase, with the percentage variation for the total population being +25.8%, for males +18.1% and for the female sex, +9.1%. In addition, males had higher rates than females. It was observed that between 2019 and 2020 the increase in the rate was more pronounced in males, from 19.2/100 thousand inhabitants to 23.9/100 thousand inhabitants, than in females, from 14.1/100 thousand inhabitants to 16.7/100 thousand inhabitants (Graph 6).

Graph 6. Monitoring of standardized premature mortality rates (SPMR) for diabetes mellitus for the population and for males and females in the SSP, 2015 to 2020.

Source: Deaths: Datasus – Vital statistics – Mortality, resident population: Datasus – Demographic and socioeconomic – Female resident population. Deaths classified with ICD-10 codes E10-E14 were considered. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030. Data extracted on April 6, 2022.

The standardized premature mortality rates for chronic respiratory diseases in the state of São Paulo from 2015 to 2020 tended to increase, with the percentage variation for the total population of +51.5%, for males +56.8% and for females, +44.2%. In addition, males had higher rates than females. It was observed that between 2019 and 2020 the increase in the rate was more pronounced in males, from 36.7/100 thousand inhabitants to 23.4/100 thousand inhabitants, than in females, from 23.5/100 thousand inhabitants to 16.3/100 thousand inhabitants (Graph 7).

Graph 7. Monitoring of standardized premature mortality rates (SPMR) for chronic respiratory diseases for the population and for males and females in the SSP, 2015 to 2020.
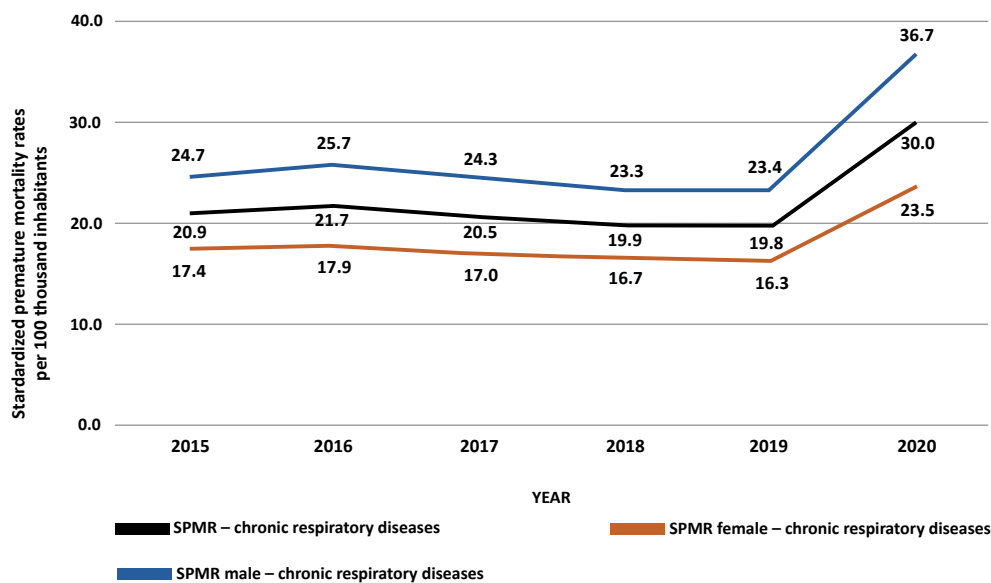
Source: Deaths: Datasus – Vital Statistics – Mortality. Resident population: Datasus – Demographic and socioeconomic – Female resident population. Deaths classified with codes J30-J98 (except J36) of the ICD-10 were considered. Goal according to the Strategic Action Plan to Combat Noncommunicable Diseases in Brazil, 2021-2030. Data extracted on April 6, 2022.

CONCLUSIONS

Despite the reduction in standardized premature mortality rates from NCDs in the total population and according to sex, it was observed that the same did not occur in all disease groups. The trend of mortality due to diabetes mellitus and chronic respiratory diseases is noteworthy, with an increase in the percentage variation, especially between 2019 and 2020. In addition, the goals established by the DANT Plan and the SDGs were not achieved in the period studied.

The reduction in rates does not necessarily represent an improvement in the panorama of NCDs in the SSP, since 2020 was an atypical year due to the covid-19 pandemic, which impacted the health care of the population, notably those with NCD.

Analysis of the years after 2020 is recommended to monitor observed trends from an epidemiological surveillance point of view. However, in relation to care for people with diabetes mellitus and chronic respiratory diseases, the observed trend towards an increase in standardized mortality, as well as access, coverage, and qualification of the various points in the lines of care, must be validated and investigated in different territories of care established for these diseases.

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