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ORIGINAL ARTICLE

Plan for Combating Non-Communicable Chronic Diseases in Brazil, 2011-2022: What goals were achieved?

Plano de Enfrentamento das Doenças Crônicas Não Transmissíveis no Brasil, 2011-2022: quais metas foram alcançadas?

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ABSTRACT Brazil has made a commitment to reducing Noncommunicable Diseases (NCDs) by implementing the Strategic Action Plan to Tackle NCDs (2011-2022), which established specific targets for control and prevention. This study aimed to assess the achievement of these targets and to project the reduction in NCD mortality by 2030. It is an evaluative study using data from the Surveillance of Risk and Protective Factors for NCDs by Telephone Interviews and the Global Burden of Disease study. Mortality rates from NCDs and the prevalence of risk and protective factors were analyzed. Among the indicators monitored, the targets for curbing the growth of obesity (an increase from 15.1% in 2010 to 24.3% in 2023), for cervical cancer screening coverage (a drop from 82.2% to 76.8%), and for reducing mortality from NCDs (an average annual decrease of just 1.4%) were not achieved. However, there was a 9.7% increase in fruit and vegetable consumption, and the targets for physical activity, tobacco use reduction, and mammograms were met. The prevalence of risk factors fluctuated over time, highlighting the need for continuous monitoring and adjustments in NCD prevention strategies.

KEYWORDS Chronic disease indicators. Sustainable development. Health evaluation.

RESUMO *O Brasil firmou compromisso para a redução das Doenças Crônicas Não Transmissíveis (DCNT) mediante a implementação do Plano de Ações Estratégicas para o Enfrentamento das DCNT (2011–2022), que estabeleceu metas específicas de controle e prevenção. Objetivou-se avaliar o cumprimento das metas e projetar a redução da mortalidade por DCNT até 2030. Estudo avaliativo com dados provenientes da Vigilância de Fatores de Risco e Proteção para DCNT por Inquérito Telefônico e do estudo Carga Global de Doenças. Analisaram-se as taxas de mortalidade por DCNT e a prevalência de fatores de risco e proteção. Entre os indicadores monitorados, não foram atingidas as metas relativas à contenção do crescimento da obesidade (aumento de 15,1% em 2010 para 24,3% em 2023), à cobertura do exame preventivo de câncer do colo do útero (queda de 82,2% para 76,8%) e à redução da mortalidade por DCNT (queda anual média de apenas 1,4%). Todavia, observou-se aumento de 9,7% no consumo de frutas e hortaliças, com alcance das metas relativas à prática de atividade física, à redução do tabagismo e à realização de mamografias. As prevalências dos fatores de risco oscilaram ao longo do tempo, evidenciando a necessidade de monitoramento contínuo e ajustes nas estratégias de enfrentamento.*

PALAVRAS-CHAVE *Indicadores de doenças crônicas. Desenvolvimento sustentável. Avaliação em saúde.*

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Introduction

Chronic Noncommunicable Diseases (NCDs) are responsible for the majority of deaths worldwide, in addition to causing premature deaths, disabilities, long treatment times, high hospitalization rates, and decreased productivity among affected individuals[1].

NCDs can be prevented through a comprehensive action plan involving integrated, intersectoral efforts. Over the past two decades, initiatives have been undertaken to control their occurrence and reduce the impact of these diseases on the global burden of morbidity and mortality. On the international stage, the High-Level Meeting on NCDs, hosted by the United Nations (UN) in September 2011, stands out. It advanced the 2008-2013 action plan, aiming to continue the discussion of the challenges related to these diseases and their risk factors, as well as to establish new global commitments. As a result, the participating countries approved a political declaration committing to adopt measures to curb the growth of NCDs, prioritizing the prevention of their main risk factors and ensuring the promotion of adequate health care[2]. The meeting solidified the support of heads of state for this issue and led to the approval of global and regional plans for the control and prevention of NCDs and their risk factors[3].

At this same meeting, Brazil presented the 'Strategic Action Plan for Confronting Chronic Non-Communicable Diseases (NCDs) in Brazil, 2011-2022', based on three pillars: surveillance, information, assessment, and monitoring; health promotion and adoption of healthy lifestyles; and comprehensive care[4,5]. This plan, in turn, was the result of partnerships involving representatives from civil society, educational and research institutions, all departments of the Ministry of Health, and more than 20 government sectors, with broad multisectoral participation.

The World Health Organization (WHO) published the 'Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020' in 2013. The plan recognized the primary role and responsibility of governments in responding to the challenge of controlling these diseases and emphasized the importance of international cooperation in supporting national efforts to address them. The core objective of this plan was to reduce the preventable burden of risk factors, morbidity, mortality, and disabilities resulting from NCDs through multisectoral cooperation at the national, regional, and global levels. Thus, the document aimed to ensure that populations achieve the highest possible standard of health and productivity at all ages, without NCDs hindering their well-being or the socioeconomic development of their countries. In 2015, the UN established, among its Sustainable Development Goals (SDGs), the target of reducing NCD mortality by 30%. This goal is being monitored and will be followed by member countries until 2030[2].

In 2021, the Brazilian Ministry of Health launched the 'Strategic Action Plan to Combat Chronic Diseases and Non-Communicable Diseases in Brazil 2021-2030' (Dant Plan), which extended the deadline of the previous plan until 2030 and included goals to address external causes[6].

Monitoring NCDs and their risk factors is essential to assessing progress and reviewing adopted strategies when necessary. Therefore, after more than a decade since the implementation of the National NCD Plan, it is essential to assess which goals have been achieved, identifying advances, challenges, and gaps in the implementation of planned actions. This analysis is crucial in order to provide key information future public policies, improve prevention and control strategies, and ensure the continuity of initiatives aimed at reducing risk factors and improving the population's quality of life. Furthermore, understanding the plan's impacts becomes even more relevant in the post-COVID-19 pandemic context, which has brought additional challenges to combating NCDs. Therefore, this study contributes to the critical evaluation of public policies aimed at

combating NCDs in Brazil, providing support for the improvement of future strategies.

In this light, the objectives of this study were: to evaluate the achievement of the goals of the Strategic Action Plan to Combat NCDs in Brazil, 2011-2022, regarding mortality indicators and risk and protection factors, as well as to achieve the projections for the reduction in mortality targets by 2030.

Material and methods

Study type

This is an evaluative study, with data from the Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico – Vigitel) from 2010 to 2023 and the Global Burden of Disease (GBD) study from 2000 to 2021, from the Institute of Health Metrics and Evaluation (IHME).

Scenario

Vigitel is a population-based telephone survey conducted annually by the Ministry of Health. It collects information on NCDs and the main risk and protective factors for these diseases, such as diet, tobacco use, physical activity, cancer screenings, self-reported illnesses, and weight and height.

The target audience for this survey is adults, aged 18 or older, of both sexes, living in Brazilian capitals and the Federal District, who have at least one landline telephone line in their household. Approximately 2,000 interviews are conducted in each capital, totaling approximately 54,000 interviews per year[7]. Due to operational reasons, in 2020 and 2021, the number of interviews was reduced to approximately 1,000 interviews per capital, and in 2023, to approximately 800. In this last year, cell phone interviews were included. Vigitel uses a post-stratification weighting method to ensure statistical inference of the results for the population[8]. The GBD began in 1990 under the coordination of the IHME at the University of Washington. This institute produces and refines a set of estimates of regional and global health indicators that are consistent and comparable across different regions of the planet[9]. The GBD study database was used for mortality data. IHME mortality estimates are obtained from data from the Ministry of Health's Mortality Information System (Sistema de Informações sobre Mortalidade – SIM)[10], adjusted for garbage codes, according to redistribution algorithms for underlying causes of death by age, sex, and year[11-13].

Variables

• Risk and protective factors for NCDs: Vigitel data were analyzed, and the following indicators and targets were considered:

a. Tobacco use (report smoking, regardless of quantity). Goal: reduce the prevalence of smoking in adults by 30%.

b. Obesity (Body Mass Index ≥ 30 kg/m^2). Goal: halt growth.

c. Leisure-time physical activity (individuals who engage in at least 150 minutes of moderate-intensity physical activity per week or at least 75 minutes of vigorous-intensity physical activity per week). Goal: increase physical activity by 10%.

d. Recommended intake of fruits and vegetables (five or more servings daily on five or more days a week). Goal: increase fruit and vegetable consumption by 10%.

e. Binge drinking (five or more drinks for men and four or more drinks for women on a single occasion in the last 30 days). Goal: reduce the prevalence of harmful alcohol use by 10%.

f. Mammograms (for women aged 50 to 69 in the last two years). Goal: Increase mammogram coverage for women, aged 50 to 69, to 70%.

g. Cervical cancer screening (for women, aged 25 to 64, in the last three years). Goal: Increase cervical cancer screening coverage for women, aged 25 to 64, to 85%.

• Mortality: Estimates produced in the GBD study from 2000 to 2021, the last available year of the GBD, were used. The following NCDs were considered: cardiovascular diseases (I00-I99), chronic respiratory diseases (J30-J98), neoplasms (C00-C97), diabetes mellitus (E10-E14), and the total of these NCDs. Goal: to reduce the premature mortality rate (30 to 69 years) due to NCDs by 2% per year.

Statistical analyses

To analyze risk and protective factors related to NCDs, the period from 2010 to 2023 was considered, taking into account the period from 2010—the year defined as the Plan's baseline—to 2023, since Vigitel did not collect data in 2022. Linear regression was used to estimate the average annual variation of the indicators, identifying upward, stable, or downward trends. A trend whose slope (β) was statistically different from zero, with a p-value ≤ 0.05, was considered significant. Furthermore, the percentage change over the period was calculated, comparing it to the goals established in the Plan in order to assess progress toward the assumed commitments.

For mortality data, rates were calculated and annual variations were analyzed from 2001 to 2021, covering both the pre-Plan period and the period during which it was in effect. The average rates between 2010 and 2021, the period corresponding to the Plan's validity, were also calculated, considering the target of a 2% annual reduction. The analysis started with 2010, defined as the Plan's baseline, and continued until 2021, the last year with available mortality data provided by the IHME. Additionally, mortality rate projections were calculated using a linear regression model, considering the 30% reduction target established by the 2030 Agenda for Sustainable Development (SDGs). For this purpose, the rates observed between 2015 and 2021 were used.

Data Analysis and Statistical Software (Stata), version 16[14], was used.

Ethical aspects

The estimates and data used come from secondary databases, with aggregated information that is publicly accessible and in the public domain. Therefore, this work does not require review by the system comprised of Research Ethics Committees coordinated by the National Research Ethics Commission (CEP/CONEP System), as established by Resolution No. 674 of May 6, 2022, of the National Health Council[15].

Results

Table 1 presents the indicators of risk and protective factors for NCDs defined in the 'Plan to Combat NCDs in Brazil 2011-2022', as well as the status of achievement of the established goals. The prevalence of smoking among adults in Brazilian capitals fell by 34%, from 14.1% in 2010 to 9.3% in 2023, indicating that the goal was achieved. Conversely, excessive alcohol consumption increased by 14% in the same period, from 18.1% to 20.8%, failing to reach the 10% reduction target. The prevalence of obesity, on the other hand, showed a significant increase of 62%, rising from 15.1% in 2010 to 24.3% in 2023, also indicating that the goal was not met (*table 1*). Fruit and vegetable consumption increased by 9.7%, from 19.5% in 2010 to 21.4% in 2023, approaching the 10% growth target. The target of increasing leisure-time physical activity by 10% was exceeded, as

the indicator increased from 30.1% in 2010 to 40.6% in 2023, representing a 34% increase. Regarding mammography coverage, all years in the series maintained rates above 70%, thus achieving the established target. By contrast, cervical cancer screening coverage decreased, from 82.2% in 2010 to 76.8% in 2023, indicating that the 85% target was not met (*table 1*).

Table 1. Evolution of indicators related to risk and protective factors for NCDs and assessment of the achievement of targets in Brazil. Vigitel 2010-2023

Meta	2010 (baseline)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2023	Inclination	Percentage of change
Tobacco use	14.1	13.4	12.1	11.3	10.8	10.4	10.2	10.1	9.3	9.8	9.5	9.1	9.3	-0.359*	-34%
Alcohol consumption	18.1	16.5	18.4	16.4	16.5	17.2	19.1	19.1	17.9	18.8	20.9	18.3	20.8	0.254*	14%
Consumption of fruits and vegetables	19.5	21.9	22.7	23.6	24.1	25.2	24.4	23.7	23.1	22.9	22.5	22.1	21.4	0.023	9.7
Leisure-Time Physical Activity	30.1	31.6	33.5	33.8	35.3	37.6	37.6	37	38.1	39	36.8	36.7	40.6	0,651*	34
Obesity	15.1	16	17.4	17.5	17.9	18.9	18.9	18.9	19.8	20.3	21.5	22.4	24.3	0.621*	62
Mammography	73.4	74.4	77.4	78	77.8	78.1	78.2	78.5	78	76.9	78	72.8	73.1	-0,068	-0.13
Preventive exam	82.2	81.8	82.3	82.9	81.4	81	82	82.8	81.7	81.5	80.1	77.2	76.8	-0.36*	-6.6

Source: Created by the author.

* p-value < 0.05: statistically significant coefficient

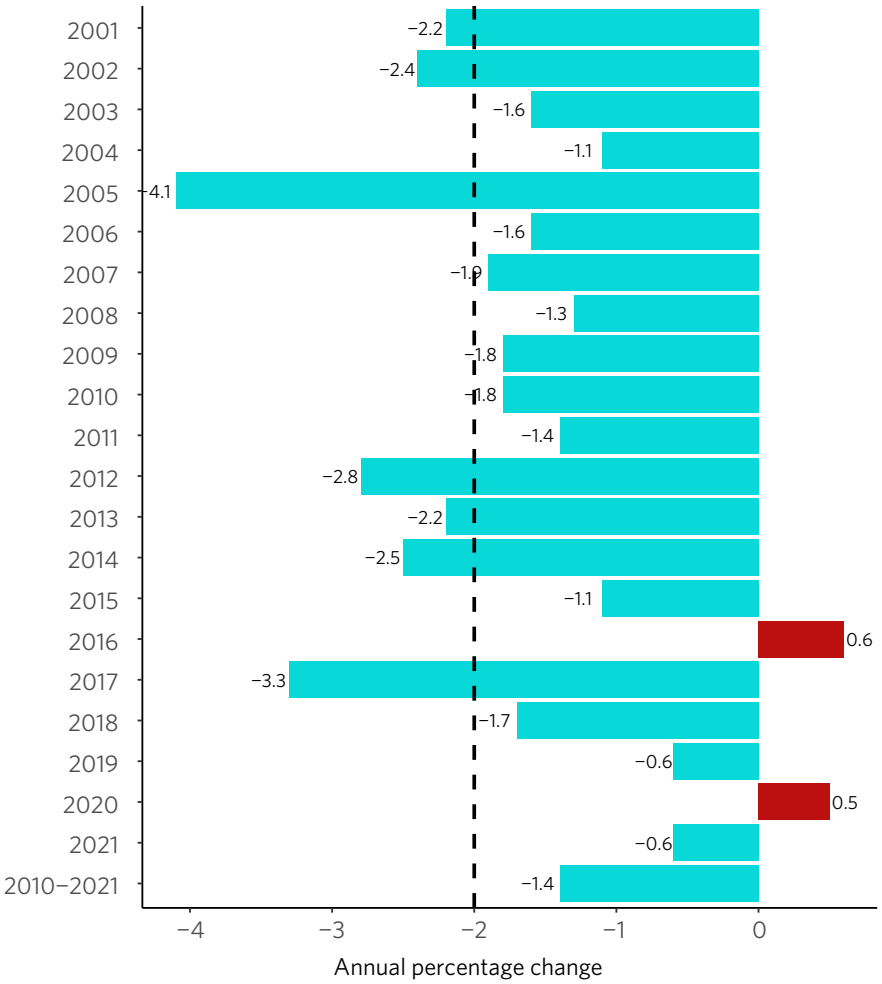
Green: positive result for achieving goals

Yellow: not achieved, but with values close to them

Red: negative result for achieving goals.

Graph 1 shows the annual percentage change in mortality rates between 2001 and 2021. Prior to the Plan's implementation, there were declines in rates, particularly in 2005, which recorded the largest decrease in the period (-4.1%). However, in most years prior to the Plan's implementation, reductions were less than 2%. During the Plan's implementation, significant reductions occurred between 2012 and 2014, all exceeding 2% per year. By contrast, rate increases were recorded in 2016 (+0.6%) and 2020 (+0.5%). Considering the entire Plan's period (2010 to 2021), the average annual reduction was -1.4%, indicating a downward trend, although below the established target (*graph 1*).

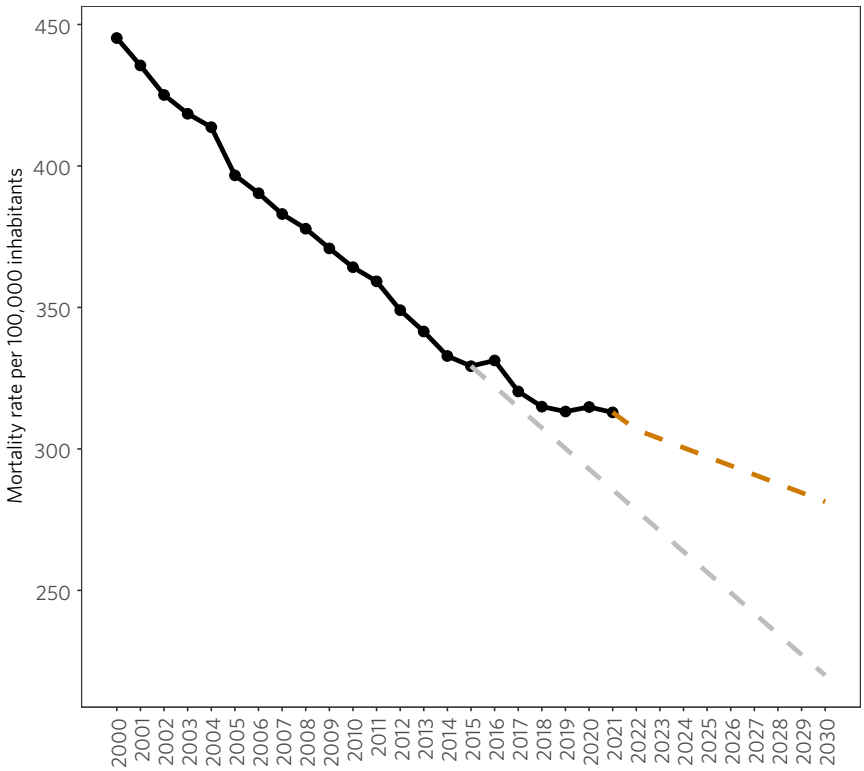
Graph 1. Percentage change in age-standardized premature mortality rates due to NCDs per 100,000 inhabitants in Brazil, GDB, 2001-2021



Source: Created by the author.

Considering the new target of a 30% decline in mortality from NCDs between 2015 and 2030, projections based on data from 2015 to 2021 indicate that this target will also not be met (*graph 2*).

Graph 2. Trends in age-standardized premature mortality rates due to NCDs per 100,000 inhabitants and projections for 2030 in Brazil, GBD 2000 and 2021



Source: Created by the author.

Discussion

Premature mortality from NCDs showed an average annual reduction of 1.4%, although rates increased in 2016 and 2020. Targets related to risk factors were met for tobacco use, physical activity, fruit and vegetable intake, and mammograms. However, targets were not met for alcohol abuse, obesity, and cervical cancer screening coverage.

Among UN Member States, Brazil took the forefront in launching the 'Strategic Action Plan to Combat NCDs in Brazil 2011-2022' in 2011, demonstrating the centrality of the issue on the government's agenda during that period. In 2021, a new plan was instituted, incorporating targets related to accidents and violence, in addition to extending the operational horizon until 2030[6].

However, not all targets were met, making it necessary to seek explanations to help understand these results. To this end, the analysis will be divided into two distinct periods: the first stage (2010 to 2015) and the second stage (2016 to 2022) of the plan. In the initial years, immediately after the plan's implementation, a more favorable performance was observed, with a decrease in premature mortality due to NCDs and a decline in several risk factors. By contrast, from 2016 onward, the indicators worsened when compared to previous years, a result that may be associated with the fiscal austerity policies adopted during that period, as well as the impacts of the COVID-19 pandemic.

The improvement in indicators up to 2015 is associated with a favorable political and economic context, which enabled greater

investment in the health sector, with increased public funding for the Unified Health System (SUS). This scenario contributed significantly to strengthening the system's responsiveness in addressing NCDs. During this period, the Ministry of Health implemented several policies, programs, and strategies, most notably the structuring of NCD and its risk factor surveillance[5], in addition to conducting population surveys (in households, by telephone, and in schools)[17]. Furthermore, the National Health Promotion Policy (PNPS) set priority actions of the promotion of healthy eating, regular physical activity, and the prevention of health risk factors[17]. The expansion of Primary Health Care (PHC) and pharmaceutical services, through the Popular Pharmacy Program, also played a key role in improving the indicators. All of these initiatives were part of the Strategic Action Plan to Combat NCDs (2011-2021), aligned with the Global Plan and the objectives of the 2030 Agenda[2-5,18].

Starting in 2016, Brazil faced a period marked by economic crisis and political instability, which resulted in the adoption of austerity policies. These measures contributed to a reduction in Gross Domestic Product (GDP), increased unemployment, and worsened social inequalities, directly affecting the supply and quality of health services. It is widely recognized that policy choices in the face of economic crises generate significant—often unforeseen—impacts on public health. Factors, such as high unemployment, inflation, budget cuts, and fiscal austerity, are associated with persistent negative consequences for health indicators, including increased adult mortality, infant morbidity and mortality, and a slowdown in progress toward the SDG targets[16,19,20].

In 2020 and 2021, the COVID-19 pandemic had significant impacts not only on mortality directly attributed to the virus, but also on various aspects related to lifestyle and NCD care. There were reductions in physical activity, an increase in the consumption of ultra-processed foods, an increased use of tobacco products, and an increase in alcohol consumption. Furthermore, difficulties were faced in the continuous monitoring of patients with NCDs and reduced access to health services. These factors contributed to the increase in NCD mortality, particularly from cardiovascular diseases. The reduction in the prevalence of smoking in Brazil is associated with the advancement of regulatory measures, such as the ratification of the Framework Convention on Tobacco Control in 2006; the presidential decree regulating the Tobacco-Free Environments Law in 2014; the establishment of a minimum price for the sale of tobacco products in 2011; in addition to the ban on the promotion, sponsorship, sale to minors under 18, and commercial advertising of tobacco products, also in 2014. However, the State's regulatory role has weakened in recent years, evidenced, for example, by the virtually unchanged prices of tobacco products, which represents a setback and jeopardizes the continued downward trend in consumption observed until 2014. Furthermore, the growth in the use of electronic cigarettes and hookah among young people and adolescents stands out. In this context, the pressure exerted by the industry to legalize the marketing of electronic cigarettes represents a concrete threat to the sustainability of tobacco control policies in the country.

Similarly, fruit and vegetable consumption continued to increase until 2015, due in part to a more favorable environment for promoting healthy eating in Brazil, driven by federal government initiatives to promote food and nutrition security, such as the Food Acquisition Program, the National Food and Nutrition Security Plan, the National Food and Nutrition Policy, and the Food Guide for the Brazilian Population. Economic factors, such as rising household income and better food prices, also had a positive impact during that period. The economic crises in Brazil could explain the decline in consumption after 2016, given the rise in food prices, decreased income, and increased unemployment due to the country's economic crisis. This situation

was exacerbated by the COVID-19 pandemic in 2020 and 2021, resulting in an increase in hunger, which reached more than 33 million people, and in food insecurity to some degree – mild, moderate, or severe (hunger) – which affected more than half of the Brazilian population[29], This situation favored unhealthy lifestyle habits, such as the consumption of ultra-processed foods and sugary drinks, as they are less expensive for the consumer, and is a significant cause of the steady rise in obesity in the country, which has been steadily increasing over the years[30].

Our study highlighted the importance of greater rigor in implementing regulatory measures aimed at promoting food security, such as the taxation of sugary drinks, the granting of subsidies for the consumption of healthy foods, and the prohibition of food marketing aimed at children. Furthermore, it is essential that macroeconomic policies, especially those aimed at generating employment and income, work in conjunction with social policies in order to contribute to overcoming inequalities and poverty, including guarantees of the right to adequate and healthy food[18,31].

Regarding physical activity, in 2011, the Health Academy Program (Programa Academia da Saúde – PAS) was implemented within the Unified Health System (SUS), aiming to expand access and promote physical activity for the entire population, including the most vulnerable groups. This initiative contributed to improving indicators related to physical activity and health promotion in Brazil, with positive impacts on combating NCDs. However, with the COVID-19 pandemic, leisure-time physical activity indicators worsened, accompanied by an increase in sedentary behavior. Despite this, an improvement in this indicator was observed in 2023.

Alcohol consumption is also a leading cause of premature death in Brazil, accounting for approximately 10% of all deaths worldwide among individuals, aged 15 to 49 years. Furthermore, it constitutes a risk factor for several diseases and health problems. A systematic review indicated that economic crises can influence alcohol consumption, especially through increased unemployment and reduced income among the most vulnerable populations[35]. In Brazil, binge drinking has increased among women and increased during the pandemic[36]. Given this scenario, it is essential to advance the adoption of stricter regulatory measures, including the prohibition or broader restriction of alcohol advertising in the media, limiting sales hours and locations, and revising Law No. 9,294/1996, which currently classifies as alcoholic beverages only those with an alcohol content higher than 13-degree Gay-Lussac, to also include beer and other beverages[36].

Finally, it is important to highlight the importance of renewing Brazil's commitment to the NCD agenda through the approval of the 2021-2030 NCD Plan, in alignment with the global goals of the WHO Action Plan and SDGs. The Plan represents progress by establishing clear targets for reducing NCDs and their risk factors. To achieve this, it is necessary to invest in cost-effective policies; expand access to health promotion, prevention, and surveillance; and combat inequities by ensuring access to health technologies for the entire population, especially the most vulnerable groups.

Austerity policies, especially the cuts resulting from Constitutional Amendment No. 95, enacted in 2016 and in effect from 2017 to 2022, were exacerbated by the COVID-19 pandemic, widening inequalities, and potentially negatively impacting NCD indicators. Addressing NCDs requires sustainable intersectoral and regulatory policies that are immune to the disruptions of transitional governments. The resumption of the PNPS and the importance of adopting data-based and evidence-based actions to improve outcomes for the population are also of utmost importance.

This study has some limitations that are important to highlight: 1) the use of self-reported data can lead to an underestimation or an overestimation of prevalence, compromising

the accuracy and validity of the estimates. However, validation studies of the Vigitel questionnaire indicate good reproducibility and validity of the data; 2) the Vigitel sample – up to 2021, comprised exclusively of adults residing in the capital cities and the Federal District, who have a landline – may limit the representativeness of the results. This bias, however, is partially corrected by the use of weighting factors applied using the rake method. Furthermore, changes in the sampling plan across Vigitel editions can impact the temporal comparability of the data, requiring caution in analyzing trends and recommending specific studies to assess the effects of these changes.

Conclusions

The results of this study indicate a general trend toward a reduction in premature mortality from NCDs, with an average annual decrease of 1.4%. However, considering current trends, it is unlikely that the targets for reducing premature mortality from NCDs will be achieved. Meeting targets related to risk factors highlights important progress in specific areas, including tobacco control, the promotion of physical activity, healthy eating, and breast cancer screening. However, the failure to achieve crucial goals, such as reducing alcohol abuse, controlling obesity, and expanding cervical cancer screening coverage, highlights the need to strengthen public policies, especially in health promotion, regulating the food environment, and expanding access to preventive services.

This scenario demands more integrated, sustainable, and evidence-based strategies to ensure continued progress and overcome persistent challenges. It is essential to promote the integration of intersectoral public policies aimed at reducing social inequalities; expanding access to health services for prevention, diagnosis, treatment, and rehabilitation; and strengthening health protection and promotion actions, with priority investments in Primary Health Care (PHC). At the same time, goals must be continuously monitored at the national, state, and municipal levels, as this monitoring contributes to the reorientation of services and work processes according to health priorities. Furthermore, monitoring is essential to support the review of strategies aimed at preventing, addressing, and controlling NCDs, especially in a context of economic crisis and austerity policies that can compromise health outcomes and indicators. Therefore, monitoring must be permanently incorporated into health management, ensuring a constant monitoring of progress toward the new goals proposed in the Action Plan to Address NCDs in Brazil.

Collaborators

Malta DC (0000-0002-8214-5734)* contributed to the conception and design of the work, interpretation of the data, writing, critical review, and approval of the final version of the manuscript. Veloso GA (0000-0002-5348-3793)* contributed to the analysis and interpretation of the data, critical review and approval of the final version of the manuscript. Morais Neto OL (0000-0002-3786-318X)* contributed to the conception and design of the work, critical review, and approval of the final version of the manuscript. Gomes CS (0000-0001-6586-4561)*, Silva AG (0000-0003-2587-5658)*, Morais EAH (0000-0003-0156-3449)*, and Santos FM (0000-0002-0522-0374)* contributed to data interpretation, writing, critical review, and approval of the final version of the manuscript.■

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