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Fiscal austerity measures hamper noncommunicable disease control goals in Brazil

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Abstract *Given the Constitutional Amendment 95 and the economic crisis, we discussed the possible effects of austerity measures on the achievement of the goals established for the control of chronic noncommunicable diseases (NCDs) in the country. The trends of NCDs and risk factors were analyzed, according to data from epidemiological surveys and mortality data from the Global Burden of Disease study. The resultsindicate a trend of stability in mortality rates by NCD in 2015 and 2016. Brazilians with low schooling, in general, have a higher prevalence of risk factors and a lower prevalence of protective factors. In the 2015-2017 period, previously favorable trends reversed for indicators such as fruit and vegetable consumption and physical activity, tobacco trends stabilized, and alcohol intake increased. In conclusion, should these trends be maintained, it is unlikely that Brazil will achieve the goals previously agreed upon with the World Health Organization and the United Nations to curb NCDs and their risk factors.*

Key words *Noncommunicable diseases, Risk factors, Mortality, Austerity, Sustainable development*

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Introduction

Noncommunicable Diseases (NCD) are an immense challenge to human health and development. They account for about 36 million annual deaths[1] and can also lead to high rates of disability, causing suffering and material costs directly and indirectly to patients and their families, as well as generate essential demands on the health system's costs[2,3].

Due to the magnitude of NCDs and the evidence that it is possible to advance in public policies to address them, in 2011, the United Nations held an international meeting on the subject, which resulted in the approval of the 2013-2020 Global Plan to Combat the NCDs[4] in 2013, and by 2015, in the inclusion of the theme in Agenda 2030 of the Sustainable Development Goals (SDG) by the United Nations[5].

In this context, in 2011, in the United Nations Assembly, Brazil launched the "Strategic Actions Plan for Coping with NCDs in Brazil, 2011-2022"[6] and implemented in the last decade a NCD Surveillance system that allows the monitoring of national and global levels of NCDs, which was a breakthrough in NCD Surveillance in the country[7].

There is also evidence that highlights the relevance of social determinants, particularly poverty, in the occurrence of NCDs, with the worst indicators recorded in the most vulnerable population[7,8]. Studies on the impact of the 2008 financial crisis in Europe and the fiscal austerity measures implemented in several countries show essential effects on public health expenditure, deterioration of child and mental health, and increased heart diseases[9,10].

The austerity measures adopted in Brazil in the last period, consolidated with the approval of EC95 in 2016[11], generate unemployment and increased poverty and affect the health system and the entire social protection system. In this new context, it is essential to monitor the behavior of the risk factors agreed in the NCD coping plans to understand whether they were affected by these measures. Thus, this research note discusses the possible effects of fiscal austerity measures on achieving the goals established for the NCDs' control in the country.

Methods

We analyzed trends in the prevalence of risk factors and chronic diseases that are consistent with the goals related to national and global commitments in tacklingNCDs[4-6]. Concerning the goal of reducing the NCD-related mortality rate, according to the WHO, four groups of causes are considered: cardiovascular diseases (I00-I99), respiratory diseases (J30-J98), neoplasms (C00-C97) and diabetes mellitus (E10-E14)[4]. We used the estimates of Global Burden of Disease (GBD) database of the Institute of Health Metrics and Evaluation (IHME), and the Ministry of Health's Mortality Information System (SIM) is the primary source of GBD mortality information in Brazil. Sub-registries with ill-defined causes and garbage code have been adjusted and can be read in other publications[12]. Concerning the NCD Brazil Plan[6], the target of a 2% reduction in the premature mortality rate (30-69 years of age) by 2022 was assessed.

Regarding risk factors (RF), information from the Surveillance System for Risk and Protection Factors for Chronic Diseases by Telephone Inquiry (VIGITEL) was used for Brazilian capitals, carried out annually among adults aged 18 and over who have a landline. The VIGITEL 2010 data served as the baseline[13].

Goals established in the NCD Plan for 2022 and indicators measured between 2010 and 2017 in the Brazilian capitals

a) *Obesity*: to contain the growth of obesity in adults aged 18 years and over, according to self-reported weight and height data of VIGITEL for this population.

b) *Alcohol*: 10% reduction in the prevalence of alcohol abuse in adults, four or more doses in women and five doses or more in men in the last 30 days.

c) *Tobacco use*: 30% reduction of tobacco use prevalence in adults.

d) *Physical activity*: 10% increase in the prevalence of physical activity (PA), considering the weekly practice of 150 minutes of leisure time PA among adults in the week, regardless of the number of days.

e) *Food*: 10% increased prevalence of fruit and vegetable consumption, or consumption of 5 daily servings or more.

f) Two indicators of the global NCD coping plan were also inserted[4]: to reduce arterial hypertension by 25%, and halt the growth of diabetes, both assessed by VIGITEL through the question "Did any doctor give you a diagnosis of high blood pressure or diabetes?"[13] Prevalence was compared from 2010 to 2017, by years of schooling (0 to 8, 9 to 11 and 12 years and over). Differences between 2010 (baseline), 2014 and 2015 and 2017

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were calculated, as well as the prevalence ratio by schooling levels, with 12 years and more as a reference (PR = 1.0) and Confidence Interval of 95% (95% CI) using Poisson Regression.

Results

The premature mortality rate standardized by NCD in 1998 was 477.6/100,000 inhabitants. In 2010, the NCD Brazil Plan baseline was 372.4/100,000 inhabitants, with a progressive decline of around 2% per annum in the period. In 2014, the rate was 344.9/100,000 inhabitants, in 2015, 341.8/100,000 inhabitants, and in 2016, 340.4/100,000 inhabitants. The annual decline in premature mortality rates standardized by NCD after the launch of the NCD Brazil Plan was: 2.0% (2011), 2.2% (2012), 1.7% (2013), 1.7% (2014), 0.9% (2015), and 0.4% (2016). Between 2015 and 2016, rates of cardiovascular diseases (261.8 and 261.0/100.000), chronic respiratory diseases (23.6 and 23.6/100,000), diabetes (24.8 and 25.2/100,000) and neoplasms (131.6 and 130.6) were stable (Figure 1).

Regarding the prevalence of risk factors estimated annually by VIGITEL, it can be observed that the behavior in the period 2010-2014 is markedly different from that of 2015-2017. For example, alcohol abuse that had been reduced in the first period increased in the second, in the total and all levels of education. The consumption of fruits and vegetables that grew sharply in the first period decreased in the second, also in all levels of schooling. Physical activity increased in the first period and decreased in the following period in all levels of schooling. Tobacco use declined 23.4% in the first period and only 2.9% in the second, with an increased prevalence in the population with over nine years of schooling. Only obesity increased in the first period and maintained a stable prevalence in the second period, except among the more educated, where they increased the prevalence (Table 1).

The population with the lowest educational level (0-8 years) usually has a higher prevalence of risk factors. Comparing the prevalence ratios (PR) of the population with low schooling (0-8 years) with that of over 12 years schooling, in 2017, the highest PR was found among smokers (PR = 1.8 IC95% 2.0), in the obese population (PR = 1.5, 95% CI 1.3-1.7), with hypertension (PR = 2.7, 95% CI 2.5-2.9), and with diabetes PR = 4.4; 95% CI 3.9-4.9). It is worth noting that in the population with diabetes, the PR increased by schooling level in the period – (2010: PR = 2.6, 95% CI: 2.2-3.1) and (2017: PR = 4.4, 95% CI 3.9 -4.9). The prevalence rates were lower for protective factors: physical activity (PR = 0.5, 95% CI 0.4-0.5), and intake of fruits and vegetables (PR = 0.6, 95% CI 0.5- 0.6) (Table 1).

Discussion

Although NCD mortality trends have declined by more than 2 percent in the last decade and the early years of the NCD Coping Plan, the recent trend towards stabilization may be a consequence of a behavioral change of the risk factors and living conditions and access to services, affected by the economic and social crisis[10,14]. Given this behavior, the goal of reducing premature mortality due to NCDs of the Agenda 2030 (SDG) may not be met.

Brazil is experiencing a deep economic and political crisis with social programs cuts and deteriorating health sector performance[10,11]. Recent studies by Rasella et al.[14], point out that fiscal austerity measures may compromise health outcomes, especially among poor and vulnerable Brazilians.

The 2016 SIM data already indicate increased infant mortality, interrupting a cycle of more than twenty years of continuous decline[15,16]. The same is true of maternal mortality[15,17]. Worth noting are increasing cases of vaccine-preventable diseases, such as measles and yellow fever, and declining vaccine coverage reflecting the deterioration of health services[18,19]. Declining indicators reflect the austerity-related crisis, reduced investment in social programs, and increased poverty and vulnerability[10,14].

The social determination of NCDs has already been pointed out in several studies[8,9]. The 2013 National Health Survey highlighted the weight of social inequalities in risk factors, since the prevalence adjusted for age and gender of them is notably higher among the less educated[20,21]. Poorer populations tend to be more affected[8-10,14,22] in crisis contexts. This is also shown by the data evidenced here.

The evidence indicates that the control of the risk factors of NCDs is more effective when regulatory measures are established by the State, intervening on the environment, regulating marketing practices, availability, and provision of services, taxation of products harmful to health, food labeling, among others[23]. Adopting regulatory measures recommended by the WHO, Bra-

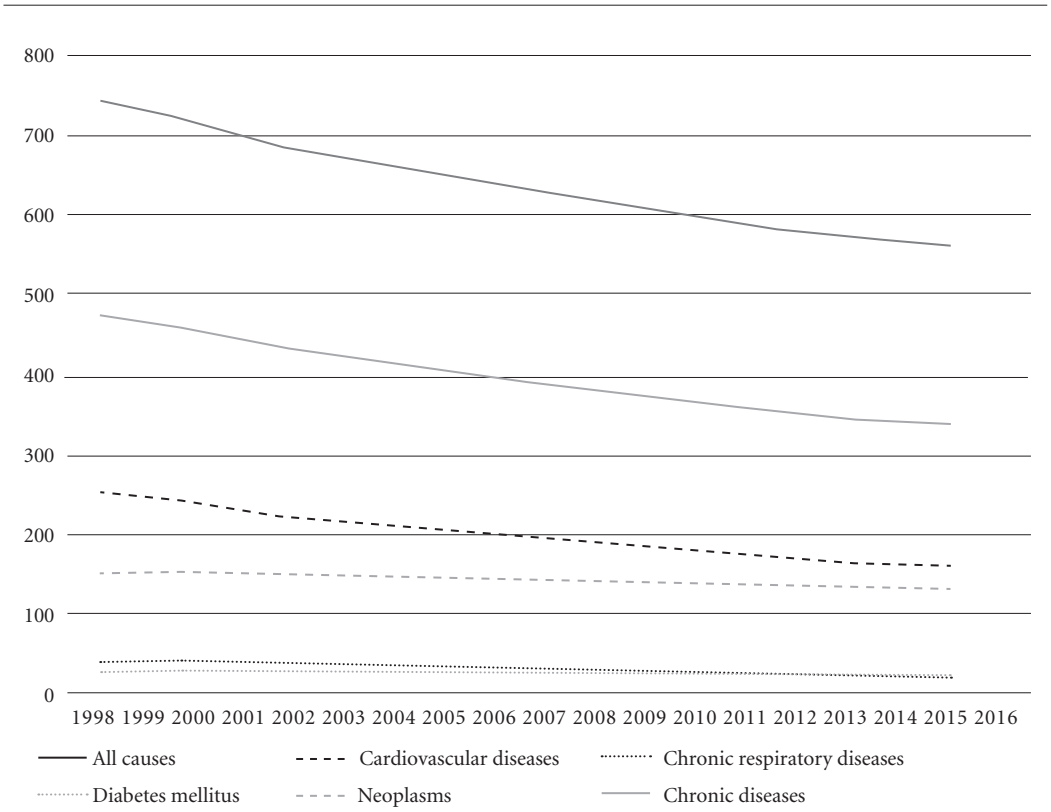

Figure 1. Mortality trend from all causes and major Noncommunicable diseases, 30 to 69 years, Brazil, 1998 to 2016.

zil was considered an example in the world by curbing the prevalence of tobacco use[24,25]. Among these measures, the ban on tobacco advertising stands out: ratification of the 2006 Framework Convention on Tobacco Control (FCTC); Law No. 12.546 of 2011; and the 2014 presidential decree that established smoke-free environments, increasing cigarette warning spaces and cigarette taxation, and setting the minimum price for marketing, among others[25]. The stabilized prevalence of tobacco use identified here indicates that new measures must be implemented. For example, adopting generic packaging, enforcing smoke-free environments and making point-of-sale inspections, preventing illegal smuggling, and investing in supporting small-scale farmers in crop diversification, among other strategies[23].

In the case of alcohol, the country has made progress in implementing the Prohibition Act, which regulates the direction, as well as enforcement measures[25]. However, new actions are still required, such as applying comprehensive prohibitions or restrictions on exposure to alcohol advertising (in the media), imposing restrictions on its marketing (reducing opening hours and sale outlets), adopting measures to restrict or prohibiting the promotion of beverages in "open bars"[23]; changing Law No. 9.294/1996, which considers restrictions on alcohol marketing only for beverages with an alcohol content above 13 degrees Gay-Lussac, to cover beers and "ice" drinks[23,25].

Consumption of healthy foods, such as fruits and vegetables, is costly. As a consequence, fiscal incentive measures would be required to increase their use, as recommended in the NCD Coping Plan[6]. Mexico adopted regulations on high-sugar and ultra-processed foods and beverages in 2013, which resulted in a 10% reduction of the consumption of soft drinks and 15% increase of water consumption[26].

There have been numerous advances in the area of food in the country, such as the preparation of the Food Guide for the Brazilian population (2014); encouraging breastfeeding; the Na-

Table 1. Goals of the Strategic Actions Plan for Coping with Chronic Noncommunicable Diseases (NCDs). Adults, 18 years and over, second years of schooling, Brazilian capitals. VIGITEL, 2010 to 2017.

Factor	Schooling years	2010	2011	2012	2013	2014	2015	2016	2017	% (2014 - 2010)*	% (2015 to 2017)*	PR** (2010)	PR** (2014)*	PR** (2017)*
Smoking	0 to 8	18.1	18.2	16.3	15	14.1	14.4	14.3	13.2	-22.1	-8.3	1.9 (1.7-2.2)	2.1 (1.7-2.5)	1.8 (1.6-2.0)
	9 to 11	12.2	10.7	10	10.3	10.3	9	9.4	9.9	-15.6	10.0	1.2(1.1-1.4)	1.5 (1.3-1.8)	1.3 (1.1-1.5)
	12 and over	10	9.8	9.1	7.4	6.8	7.2	6.9	7.4	-32.0	2.8	1	1	1
	Total	14.1	13.4	12.1	11.3	10.8	10.4	10.2	10.1	-23.4	-2.9			
Obesity BMI ≥ 30 kg/ m2)	0 to 8	18.8	19.7	21.7	22.3	22.7	23.6	23.5	23.3	20.7	-1.3	1.6 (1.4-1.8)	1.8 (1.6-2.1)	1.5 (1.3-1.7)
	9 to 11	13.1	14.2	15.2	15.1	17.2	17.8	18.3	17.8	31.3	0.0	1.1 (1.0-1.2)	1.4 (1.2-1.6)	1.1 (1.0-1.2)
	12 and over	11.7	13	14.4	14.3	12.3	14.6	14.9	16	5.1	9.6	1	1	1
	Total	15.1	16	17.4	17.5	17.9	18.9	18.9	18.9	18.5	0.0			
Fruits and vegetables recommended	0 to 8	15.3	18.9	18.6	19.4	20.2	20.1	19.7	19.5	32.0	-3.0	0.6 (0.5-0.6)	0.6 (0.5-0.6)	0.7 (0.6-0.8)
	9 to 11	19.1	20.6	21.2	23.1	22.5	23.2	23	22.1	17.8	-4.7	0.7 (0.6-0.8)	0.7 (0.6-0.8)	0.7 (0.6-0.8)
	12 and over	27.4	28.9	31.4	30.1	31.9	34.6	30.8	29.7	16.4	-14.2	1	1	1
	Total	19.5	21.9	22.7	23.6	24.1	25.2	24.4	23.7	23.6	-6.0			
Sufficient physical activity at leisure	0 to 8	19.6	21.2	21.6	22	22.9	25.4	24.5	23.3	16.8	-8.3	0.5 (0.4-0.5)	0.5 (0.4-0.5)	0.5 (0.4-0.5)
	9 to 11	34.6	35.3	37.1	37.2	38.5	40.1	40.4	39.7	11.3	-1.0	0.8 (0.8-0.9)	0.8 (0.8-0.9)	0.8 (0.8-0.9)
	12 and over	41.3	42.5	45.4	45.4	47.8	49.6	47.9	47	15.7	-5.2	1	1	1
	Total	30.1	31.6	33.5	33.8	35.3	37.6	37.6	37	17.3	-1.6			
Alcohol abuse	0 to 8	14	13.4	15	12.8	12.3	13.2	14.2	13.8	-12.1	4.5	0.6 (0.6-0.7)	0.6 (0.6-0.7)	0.6 (0.6-0.7)
	9 to 11	19.6	17.5	19.4	17.5	18.4	18.1	19.2	20.2	-6.1	11.6	0.9 (0.8-0.9)	0.9 (0.8-0.9)	0.9 (0.8-0.9)
	12 and over	22.9	20	22	19.7	19.5	20.9	24	22.8	-14.8	9.1	1	1	1
	Total	18.1	16.5	18.4	16.4	16.5	17.2	19.1	19.1	-8.8	11.0			
Arterial hypertension	0 to 8	36.4	36.4	37.9	38	38.1	39.9	41.8	39.7	4.7	-0.5	2.6 (2.4-2.8)	2.6 (2.4-2.9)	2.7 (2.5-2.9)
	9 to 11	17.3	17.6	17.9	17.1	19.3	18.2	20.6	19.6	11.6	7.7	1.2 (1.1-1.4)	1.3 (1.2-1.5)	1.3 (1.2-1.5)
	12 and over	13.9	15.3	14.2	14.6	14.6	15.1	15	14.8	5.0	-2.0	1	1	1
	Total	24.3	24.3	24.3	24.1	24.8	24.9	25.7	24.3	2.1	-2.4			
Diabetes	0 to 8	10.4	10.6	12.1	12.2	14.2	13.5	16.5	14.8	36.5	9.6	2.6 (2.2-3.1)	3.8 (3.2-4.5)	4.4 (3.9-4.9)
	9 to 11	4.6	3.9	5.2	4.2	5.1	4.4	5.9	5.3	10.9	20.5	1.2 (1.0-1.4)	1.4 (1.1-1.6)	1.6 (1.3-1.9)
	12 and over	4	3.1	3.8	3.2	3.7	3.7	4.6	3.4	-7.5	-8.1	1	1	1
	Total	6.8	6.3	7.4	6.9	8	7.4	8.9	7.6	17.6	2.7			

* Percentage difference in achieving goals between 2010 to 2014, 2015 to 2017. ** Prevalence Ratio and 95% CI, reference 12 years and over schooling, calculated by the Poisson Regression.

tional Fresh Food Acquisition Program, among others[25,27]. Although some stability has been noted in recent years in the phenomenon of obesity in Brazilian capitals, the challenges to detain the growth of this problem are still huge, which requires effective regulatory measures, approval of legislation on taxation of ultra-processed foods, healthy food subsidies, and child food marketing ban[25]. Measures such as taxation of sugary drinks are among the recommendations currently made by the WHO and have already been adopted in many countries[23,26]. One must be aware of bills that try to hamper the marketing of fruits and vegetables by small-sized farmers[28] or the opposition of the national food industry to the implementation of labeling containing health-related warnings aimed at clarifying the consumer about the high levels of sugar, salt and fat in ultra-processed products[29].

Studies point to the importance of physical activity incentive programs, such as the Health Academy, in increasing levels of PA[30,31]. When inserted in primary care, these programs promote improvements in physical space and articulate health promotion actions and are responsible for giving access to such practices to low-income and low-schooling populations, the elderly and women, precisely those with less access to PA[31,32]. The reduced prevalence of PA in recent years should be monitored and can be explained by both the country's economic crisis, which reduces access to these practices, and the smaller expansion of these programs in the SUS.

In the prevention and control of hypertension and diabetes, measures to promote health (reduction of salt, tobacco, alcohol), as well as primary health care and the adoption of self-care practices are effective. Brazil has made notable progress in expanding the Family Health Strategy and in the access to medicines for appropriate treatment, including free treatment for NCDs[6,33-36]. Recent years have witnessed a substantial increase in the prevalence rate of diabetes in the population with low levels of education when compared to those who are 12 years and over. Besides being driven by obesity and aging, this problem can be understood in the context of unequal access to health services, promotion practices, and also in the increased poverty and economic crisis[10,14].

Conclusion

The austerity measures currently implemented in Brazil could significantly affect the supply of SUS actions and services, contributing to the deterioration of people's health. Worse results concerning NCDs and risk factors described here are associated with the context of economic crisis and austerity. The cuts promoted by EC95 are a profound blow to the SUS and social policies, resulting in increased poverty and extreme poverty[37]. Moreover, if added to the results shown here on the generalized increase of a series of risk factors associated with the NCDs, explain the interrupted reduction in mortality in this group of diseases. The continuity of the previously mentioned restriction measure also suggests an inverted trend of the improvement of the indicators studied here.

Also noteworthy is the weakening regulatory role of the Brazilian government in the issue of protective measures. Moving forward in tackling NCDs involves policy decisions and the implementation of regulatory measures that address the interests of the food, alcohol, and tobacco industry[4,23,26].

Performance in the NCDs goals should be continuously monitored by the country, civil society, education, and research institutions, as well as by the WHO and the United Nations, watchful regarding goals for the reductions undertaken at national and global levels, including the Sustainable Development 2030 Agenda[5].

Within its limits, this study observes tendencies and does not lend itself to the analysis of causes. Besides, the observation time is still short and sensitive to random swings. Therefore, the observation process must continue. In spite of these restrictions, in view of studies in other contexts, especially those that analyze the effects of austerity measures on health adopted in several European countries[9,22], the findings described here, together with other accumulated evidence on these effects, become potential signposts that the goals and deadlines for the control of NCDs in the country can be severely affected by the measures contained in EC95 of 2016.

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