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Surveillance and monitoring of major chronic diseases in Brazil – National Health Survey, 2013

A vigilância e o monitoramento das principais doenças crônicas não transmissíveis no Brasil – Pesquisa Nacional de Saúde, 2013

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ABSTRACT: *Objective:* To describe the major noncommunicable diseases (NCDs) in Brazil, according to the information collected from individuals aged 18 years or older. *Methods:* Data from the National Health Survey (PNS), 2013, a transversal population-based study, were used. The proportions of each NCD were calculated and presented according to sex, with a 95% confidence interval (95%CI), with the absolute values. *Results:* Of the total respondents, 45.1% reported presenting at least one NCD. The region with the highest prevalence of NCDs was the South (52.1%). Hypertension showed the highest prevalence among NCDs, with 21.4%, followed by chronic back problem (18.5%), depression (7.6%), arthritis (6.4%), and diabetes (6.2%). The intense / very intense degree of limitation showed a higher prevalence of other mental illnesses (37.6%) and cerebrovascular accident (25.5%). *Conclusion:* The improvement of health services is essential for an effective response to the double burden of illness in the middle- and low-income countries.

Keywords: Health surveys. Chronic disease. Hypertension. *Diabetes mellitus*. Low back pain. Epidemiological surveillance.

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RESUMO: *Objetivo:* Descrever as principais doenças crônicas não transmissíveis (DCNT) no país segundo as informações coletadas em indivíduos de 18 anos ou mais de idade. *Métodos:* Foram utilizados dados da Pesquisa Nacional de Saúde (PNS), 2013, estudo transversal de base populacional. As proporções de cada DCNT foram calculadas e apresentadas segundo sexo, com intervalo de confiança de 95% (IC95%), com os valores absolutos. *Resultados:* Do total de entrevistados, 45,1% referiram ter pelo menos uma DCNT. A Região com maior prevalência de DCNT foi a Sul (52,1%). A hipertensão arterial apresentou a maior prevalência dentre as DCNT, com 21,4%, seguida por problema crônico de coluna (18,5%), depressão (7,6%), artrite (6,4%) e diabetes (6,2%). O grau de limitação intenso/muito intenso apresentou maiores prevalências para outra doença mental (37,6%) e acidente vascular cerebral (AVC) (25,5%). *Conclusão:* A melhoria dos serviços de saúde é indispensável para uma resposta efetiva à dupla carga de adoecimento de países de média e baixa renda.

Palavras-chave: Inquéritos epidemiológicos. Doença crônica. Hipertensão. *Diabetes mellitus.* Dor lombar. Vigilância epidemiológica.

INTRODUCTION

Chronic noncommunicable diseases (NCDs), currently, are a major public health problem and have generated large numbers of premature deaths, loss in quality of life (with a high degree of limitation and disability in activities of daily living) and economic impacts for families, communities, and society at large[1,2].

Each year, NCDs account for 36 million (63%) deaths, with an emphasis on cardiovascular diseases, diabetes, cancer, and chronic respiratory disease. About 80% of deaths from NCDs occur in low- or middle-income countries, where 29% are people aged younger than 60 years, while in high-income countries, only 13% are early deaths[1,2].

In Brazil, NCDs also constitute a health problem in a large magnitude and account for 72% of causes of death, especially cardiovascular diseases (31.3%), cancer (16.3%), diabetes (5.2%), and chronic respiratory disease (5.8%). NCDs affect individuals of all socioeconomic strata and, more intensely, those belonging to vulnerable groups such as the elderly people and those with a low education level and income[3,4].

NCDs are characterized by multiple causative factors, many risk factors, long latency periods, prolonged course, and noninfectious origin and associate themselves with functional limitations and disabilities. Their occurrence is strongly influenced by living conditions, by social inequalities, not only being a result of lifestyles. NCDs still require a systematic approach to treatment, requiring new strategies from health services[4,5].

The World Health Organization (WHO) includes the diseases of the circulatory system (cerebrovascular and cardiovascular), neoplasms, chronic respiratory diseases, and diabetes mellitus as NCDs. These diseases have a set of risk factors in common, resulting in the possibility of presenting a common approach to prevention[2,4,5].

Other chronic conditions contribute greatly to the increased burden of disease, such as mental and neurological, bone and joint disorders, autoimmune diseases, among others[5].

However, these chronic conditions differ from the NCDs group named by WHO, because they generally do not share the same risk factors, requiring different intervention strategies and public policy efforts, as in the case of mental disorders[4-6].

NCD surveillance is of great importance in public health, as it is a tool for knowing the distribution, magnitude and trend of these diseases, and their risk factors in the population and identify their social, economic, and environmental conditions, aiming to support the planning, implementation, and evaluation of prevention and control actions[7].

Aimed at structuring NCD surveillance, the Ministry of Health developed, starting in 2003, a set of initiatives for gaining knowledge on the distribution, the magnitude and trends of chronic diseases and their risk factors, and supporting public health promotion policies. As part of the process, Brazil outlined a system based on the information on risk factors and mortality and risk factor surveys, which are divided in household- and telephone-based surveys and in specific populations, such as school-aged children[8].

Thus, the National Health Survey (PNS) in 2013 — the most comprehensive survey on health and its determinants ever held in the country — makes up the NCD surveillance system and includes both information about risk factors and morbidity.

The objective of this study was to describe the major NCDs in the country according to the information collected from individuals aged 18 years or older, all respondents of the PNS in 2013.

METHODS

The PNS is a household survey that is part of the Integrated Household Surveys System (SIPD), of the Brazilian Institute of Geography and Statistics (IBGE), and uses the Master Sample of this system, with greater geographical spread and gain of accuracy in the estimates[9].

With its own design, developed specifically to collect health information, the PNS is designed to estimate several indicators with adequate precision. The PNS is a survey conducted by IBGE in partnership with the Ministry of Health and is the most complete survey on health and its determinants[9].

The sample size was defined based on the desired accuracy level for estimating the number of indicators of interest, which are basically proportions of people in certain categories.

The sample plan employed was conglomerated sampling in three stages, with stratification of the primary units. The census tracts, or set of tracts, form the primary sampling units (PSUs), households are the secondary units, and residents aged 18 years and older define the tertiary units. Within each selected household, one resident aged 18 years or older was selected to respond to the specific questionnaire, also by simple random sampling, from a list of residents made during the interview.

Sample weights were set for the PSUs, households, and all its residents and the weight for the selected resident. The latter was calculated considering the weight of the corresponding household, the probability of the resident selection, nonresponse adjustment by sex, and calibration by the total population by sex and age groups estimated with the weight of all residents.

All the information collection agents, supervisors, and coordinators of the PNS were trained to thoroughly understand the entire survey. The interviews were conducted with the use of personal digital assistants (PDAs) and handheld computers that were properly programed for the critic process of the variables.

The respondent of the individual questionnaire was selected at random from the residents of each household, and this individual was asked questions about previous diagnosis of several NCDs. Interviewers asked if "any doctor has given you the diagnosis of hypertension (high blood pressure)?" The response options were yes; yes, but only during pregnancy (for women); or no. The response considered was "yes."

For diabetes, it was similar: "Has a doctor ever given you the diagnosis of diabetes?" The response options were yes; yes, but only during pregnancy (for women); or no. The response considered was yes.

The same question was posed to other morbidities [heart disease, stroke, asthma, arthritis or rheumatism, work-related musculoskeletal disorders (WMSDs), cancer, and chronic kidney disease (CKD)]. The response options were yes or no.

In the case of back pain, the question asked was: "Do you have any chronic back problem, such as back pain, neck pain, low back pain or sciatica, vertebrae or disc problems?" Then, response options were yes or no.

For depression, the question was: "Has a doctor or mental health professional, such as a psychiatrist or psychologist, ever given you the diagnosis of depression?" The response options were yes or no. For other mental illnesses, the question was: "Has a doctor or mental health professional, such as a psychiatrist or psychologist, ever given you the diagnosis of other mental disorders [schizophrenia, bipolar disorder, psychosis, or obsessive-compulsive disorder—OCD]?" The response options were yes or no. The PNS questionnaire is available online at: http://www.pns.icict.fiocruz.br/arquivos/Novos/Questionario%20PNS.pdf.

This study examined the following indicators related to NCDs:

1. proportion (%) of individuals aged 18 years or older who reported physician-diagnosed:
   * high blood pressure;
   * diabetes;
   * any heart disease;
   * stroke;
   * asthma;
   * arthritis or rheumatism;
   * WMSDs;
   * cancer; and
   * CKD;
2. proportion (%) of individuals aged 18 years and older who reported chronic back problems;
3. proportion (%) of individuals aged 18 years and older who reported diagnoses of depression by a mental health professional;

4. proportion (%) of individuals aged 18 years and older who reported diagnosis of other mental illnesses [schizophrenia, bipolar disorder, psychosis, or obsessive compulsive disorder(OCD)]) by a mental health professional;
5. proportion (%) of individuals aged 18 years and older who reported diagnosis of any lung disease [pulmonary emphysema, chronic bronchitis or chronic obstructive pulmonary disease (COPD)].

The total number of individuals aged 18 years and older who reported having at least one of these NCDs was calculated; then, the proportions and the total subjects with each above-mentioned NCD was calculated, according to sex.

Moreover, the proportion of individuals aged 18 years or older who reported high / very high degree of limitation in activities of daily living was calculated and the degree of incapacity declared by the respondent for each of the NCDs. The individuals who responded that the disease limits them intensely / very intensely were considered.

All indicators were presented by gender, with 95% confidence intervals (95%CI). Data were analyzed using Stata software, version 11.0, using the survey module, which incorporates the effects of complex samples.

The PNS was approved by the National Research Ethics Committee, under protocol number 328.159 in 26 June, 2013. All the subjects were consulted, informed, and agreed to participate.

RESULTS

At the end of collection, the records from the interviews in 64,348 households and with 60,202 individuals were obtained, which resulted in a nonresponse rate of 8.1%.

Of the total respondents in the PNS, the prevalence of individuals who reported having at least one NCD was of 45.1% and the prevalence was 50.4% and 39.2% for female and male subjects, respectively. It is estimated that there are more than 66 million Brazilians with a previous diagnosis of some NCD (Table 1).

The region with the highest prevalence of individuals with NCDs was the southern region, with 52.1%, followed by the southeastern (46.1%), midwestern (43.9%), northeastern (42.2%), and northern (37.2%) regions. Still, the Brazilian state with the highest prevalence of NCDs was Rio Grande do Sul, with 54.2%, and the other states of the southern region also showed high prevalence of NCDs: Paraná (52.3%) and Santa Catarina (48.4%). The southeastern region, which concentrates most of the population, showed a high prevalence in the states of São Paulo (46.9%) and Minas Gerais (48.0%). Among the states of north, Pará showed the lowest prevalence, with 34.4% or, in absolute numbers, 1.7 million (Table 1).

Regarding morbidities, hypertension was the most reported among the respondents, with a prevalence of 21.4% in the population aged 18 years or older or, in absolute numbers,

Table 1. Individuals who reported having at least one chronic disease, according to sex, in absolute numbers and proportions (data for Brazil, macroregions, and Federative Units – National Health Survey, 2013).

	Total	Sex		Total	Sex		%	Sex	
		Male	Female	(thousand people)	Male	Female		Male	Female
Brazil	66.016.475	27.037.033	38.979.442	66.016	27.037	38.979	45,1	39,2	50,4
North	4.049.280	1.738.670	2.310.610	4.049	1.739	2.311	37,2	32,8	41,4
Rondônia	464.281	194.490	269.790	464	194	270	39,0	33,3	44,5
Acre	184.372	82.169	102.204	184	82	102	38,4	35,9	40,8
Amazonas	858.280	383.699	474.581	858	384	475	37,6	34,4	40,7
Roraima	96.222	43.287	52.935	96	43	53	34,9	31,7	37,9
Pará	1.796.619	739.634	1.056.985	1.797	740	1.057	34,4	29,1	39,5
Amapá	178.803	79.401	99.403	179	79	99	39,4	36,7	41,9
Tocantins	470.703	215.991	254.712	471	216	255	47,7	45,2	49,9
Northeast	16.444.004	6.611.220	9.832.784	16.444	6.611	9.833	42,2	36,2	47,6
Maranhão	1.618.789	611.348	1.007.441	1.619	611	1.007	37,0	29,2	44,2
Piauí	996.825	421.789	575.037	997	422	575	45,0	39,7	50,0
Ceará	2.818.465	1.236.999	1.581.466	2.818	1.237	1.581	45,3	41,9	48,3
Rio Grande do Norte	1.071.244	416.590	654.654	1.071	417	655	44,3	37,1	50,6
Paraiba	1.169.928	464.554	705.374	1.170	465	705	42,1	35,9	47,5
Pernambuco	3.012.792	1.209.398	1.803.395	3.013	1.209	1.803	46,5	40,1	51,9
Alagoas	933.391	379.386	554.005	933	379	554	41,4	36,5	45,6
Sergipe	611.215	257.744	353.471	611	258	353	39,9	35,1	44,3
Bahia	4.211.354	1.613.411	2.597.943	4.211	1.613	2.598	39,5	32,5	45,6
Southeast	29.511.611	12.090.491	17.421.120	29.512	12.090	17.421	46,1	40,4	51,0
Minas Gerais	7.370.922	3.015.625	4.355.297	7.371	3.016	4.355	48,0	41,6	53,9
Espirito Santo	1.134.259	457.148	677.112	1.134	457	677	40,6	34,3	46,3
Rio de Janeiro	5.449.500	2.186.694	3.262.805	5.449	2.187	3.263	42,7	37,9	46,7
São Paulo	15.556.930	6.431.024	9.125.906	15.557	6.431	9.126	46,9	41,3	51,8
South	11.276.123	4.731.838	6.544.285	11.276	4.732	6.544	52,1	46,1	57,6
Paraná	4.207.829	1.790.288	2.417.541	4.208	1.790	2.418	52,3	47,0	57,1
Santa Catarina	2.446.779	1.047.189	1.399.591	2.447	1.047	1.400	48,4	42,6	54,0
Rio Grande do Sul	4.621.515	1.894.362	2.727.153	4.622	1.894	2.727	54,2	47,4	60,1
Midwest	4.735.457	1.864.814	2.870.644	4.735	1.865	2.871	43,9	36,3	50,9
Mato Grosso do Sul	768.122	293.499	474.623	768	293	475	43,4	34,9	51,1
Mato Grosso	993.529	397.509	596.019	994	398	596	43,8	35,6	51,7
Goiás	2.155.887	873.596	1.282.291	2.156	874	1.282	46,1	38,8	52,9
Federal District	817.920	300.209	517.710	818	300	518	39,8	32,3	46,0

approximately, 31 million individuals. As a result, the most mentioned diseases were chronic back problems (18.5%), depression (7.6%), arthritis (6.4%), and diabetes (6.2%). Other diseases showed a prevalence lower than 5% (Table 2).

For male subjects, high blood pressure was the most reported among the respondents, with a prevalence of 18.3%, followed by chronic back problems (15.5%), diabetes (5.4%), depression, and heart disease (3.9%). Other diseases showed a prevalence lower than 4% (Table 3).

For female subjects, hypertension was also the most reported disease, with a prevalence of 24.2%, followed by chronic back problems (21.1%), depression (10.9%), arthritis or rheumatism (9.0 %), and diabetes (7.0%). Other diseases showed a prevalence lower than 5% (Table 4).

With regard to the intense / very intense degree of physical limitation in activities of daily living referred for the NCDs investigated, other mental illnesses (schizophrenia, bipolar disorder, psychosis, or OCD) were mentioned by the most respondents, with 37.6%, followed by stroke (25.5%), arthritis or rheumatism (17.1%), chronic back problems (16,4%), WMSDs, and asthma (15.7%) (Table 5).

Table 2. Total individuals who reported morbidities by proportion and confidence intervals, and total in absolute numbers (data for Brazil – National Health Survey, 2013).

Morbidities	Proportions (%)			Estimated total (absolute no. × 1,000)
	%	IC95% (lower limit)	IC95% (upper limit)	
High blood pressure	21.4	20.8	22.0	31,315
Diabetes	6.2	5.9	6.6	9,122
Asthma	4.4	4.1	4.7	6,438
Depression	7.6	7.2	8.1	11,179
Other mental illness	0.9	0.8	1.1	1,347
Heart disease	4.2	3.9	4.5	6,115
Stroke	1.5	1.4	1.7	2,231
Arthritis	6.4	6.1	6.7	9,382
Back problems	18.5	17.8	19.1	27,021
WMSDs	2.4	2.2	2.7	3,568
Cancer	1.8	1.6	2.0	2,681
CKD	1.4	1.3	1.6	2,080
Lung disease	1.8	1.6	2.0	2,611

WMSDs: work-related musculoskeletal disorders; CKD: chronic kidney disease.

Table 3. Total male individuals who reported morbidities by proportion and confidence intervals, and total in absolute numbers (data for Brazil – National Health Survey, 2013).

Morbidities	Proportions for males (%)			Estimated total (absolute no. × 1,000)
	%	IC95% (lower limit)	IC95% (upper limit)	
High blood pressure	18.3	17.5	19.1	12,601
Diabetes	5.4	4.8	5.9	3,688
Asthma	3.6	3.2	4.0	2,486
Depression	3.9	3.5	4.4	2,714
Other mental illness	0.9	0.7	1.0	588
Heart disease	3.9	3.5	4.4	2,709
Stroke	1.6	1.3	1.9	1,117
Arthritis	3.5	3.1	3.9	2,396
Back problems	15.5	14.8	16.3	10,712
WMSDs	1.5	1.2	1.8	1,037
Cancer	1.6	1.3	1.9	1,105
CKD	1.4	1.1	1.6	933
Lung disease	1.7	1.5	2.0	1,205

WMSDs: work-related musculoskeletal disorders; CKD: chronic kidney disease.

Table 4. Total female individuals who reported morbidities by proportion and confidence intervals, and total in absolute numbers (data for Brazil – National Health Survey, 2013).

Morbidities	Proportions for females (%)			Estimated total (absolute no. × 1,000)
	%	IC95% (lower limit)	IC95% (upper limit)	
High blood pressure	24.2	23.4	24.9	18,715
Diabetes	7.0	6.5	7.5	5,433
Asthma	5.1	4.7	5.5	3,952
Depression	10.9	10.3	11.6	8,465
Other mental illness	1.0	0.8	1.2	760
Heart disease	4.4	4.0	4.8	3,406
Stroke	1.4	1.2	1.6	1,115
Arthritis	9.0	8.5	9.6	6,986
Back problems	21.1	20.2	21.9	16,309
WMSDs	3.3	2.9	3.7	2,531
Cancer	2.0	1.8	2.3	1,576
CKD	1.5	1.3	1.7	1,147
Lung disease	1.8	1.6	2.1	1,405

WMSDs: work-related musculoskeletal disorders; CKD: chronic kidney disease.

Table 5. Total individuals who reported morbidities with an intense/very intense degree of limitation by proportion and confidence interval (data for Brazil – National Health Survey, 2013).

Morbidities	Proportions (%)		
	%	IC95% (lower limit)	IC95% (upper limit)
High blood pressure	4.7	4.0	5.4
Diabetes	7.0	5.5	8.5
Asthma	15.7	11.5	20.0
Depression	11.8	10.3	13.4
Other mental illness	37.6	31.1	44.7
Heart disease	13.5	10.8	16.2
Stroke	25.5	20.1	30.9
Arthritis	17.1	15.3	19.1
Back problems	16.4	15.2	17.6
WMSDs	15.7	12.6	18.8
Cancer	10.3	7.8	13.5
CKD	11.9	8.2	15.5
Lung disease	10.0	6.8	13.2

WMSDs: work-related musculoskeletal disorders; CKD: chronic kidney disease.

DISCUSSION

The PNS revealed that the burden of morbidity of NCDs in the country is high, as about 45% of the population reports at least one chronic disease, and women report more NCDs than men. The medical diagnosis of hypertension is reported by about one-fifth of the adult population, followed by chronic back problems. Other NCDs such as depression and diabetes also showed high frequencies. Other mental disorders showed the highest degree of limitation, followed by stroke, arthritis, and back pain.

Currently, NCDs are the public health problem of greater magnitude, because they represent the highest proportion of causes of death in the country[10]. Brazil has experienced, in recent decades, significant changes in its pattern of mortality and morbidity, owing to epidemiological, demographic, and nutritional transitions. Regarding the epidemiological transition, there was a significant reduction in infectious diseases and an increase in NCDs, accidents, and violence[11,12].

The demographic, epidemiological, and nutritional transition processes; urbanization; and social and economic growth contribute to the increased risk of developing chronic diseases by the population[10,11].

11

According to the National Household Sample Survey (PNAD) conducted in 2008, 31.3% of respondents said they experienced at least one chronic disease[13]. Data from the 2013 PNS showed 45.1% cases of NCDs. However, it is noteworthy that the PNAD interviewed individuals aged 15 years or older, in a smaller sample than the PNS in terms of census tracts. Furthermore, the questionnaires are different. Thus, the comparison between the indicators is limited.

Mortality studies point to an increase in the proportion of deaths from NCDs and also increasing the proportion of hospitalizations[14]. Brazil is an aging country, and, as the elderly people tend to have a higher prevalence of NCDs, the burden of chronic diseases in the country tends to increase, requiring a new health-care model for this population[15].

In all the self-reported NCDs, women showed a higher prevalence than men. In self-reported studies, it is common for women to report more high blood pressure, owing to their increased demand for health services and a greater opportunity for medical diagnosis[15-17].

Hypertension was the most mentioned disease, as consistent with other studies that show that it is the most prevalent circulatory disease and often associated with more severe outcomes, such as cardiovascular disease (CVD), fatal and nonfatal cerebrovascular disease, and kidney failure[18,19]. PNAD 2008[13] showed 14% of hypertension in the population aged 15 years or older. More recently, in the Brazilian state capitals, Vigitel 2011 found an average prevalence of 22.7% in individuals aged 18 years or older[20]. Self-reported hypertension, diagnosed previously, was higher among women.

Several studies point out that before the age of 50 or menopause, the prevalence of hypertension is lower among women, suggesting a protective effect of estrogen[21,22]. Still, the WHO points out that, in adults older than 25 years, the prevalence rates are higher among men[23]. Therefore, future hypertension analyzes measured by the PNS may explain whether the difference reflects the bias of higher demand for services in women or if it is real.

Diabetes mellitus is a global health problem, whose prevalence, estimated by the WHO in 2010, is of 6.4% among adults aged 20 – 79 years and with an annual increase of 2.2%[24]. According to the WHO, in 2008, diabetes was responsible for 1.3 million deaths and about 4% of premature deaths (< 70 years)[1]. In addition, it is associated with limitations and disabilities. The PNS pointed to prevalence values that were very close to the global data[2], 6.2% (95%CI 5.9 – 6.6), and near the data from Vigitel 2013[25] in the Brazilian state capitals, 6.9% (95%CI 6.5 – 7.3). This is the first research that points out the high degree of disability in diabetes 7% (95%CI 6.5 – 7.5), or 642,000 Brazilians, who have intense or very intense limitations owing to diabetes. These data reinforce the importance of disease prevention and health promotion.

Musculoskeletal pain and problems may affect a large portion of the population, causing economic impact and impact in the quality of life of individuals. Among the chronic back problems, chronic lower back problems are the most common, affecting mainly the population of working age. In the PNS, this was the second most reported NCD (18.5%). There are many population studies in the country about back pain. According to data

from the Brazilian Ministry of Social Welfare, back pain has been the main reason for absence from work[26].

Data from the 2003 and 2008 PNAD showed that self-reported arthritis/rheumatism was the third most common chronic disease in the Brazilian adult population, affecting about 6% of the population in both the surveys, two times higher in women than in men[27]. The PNS pointed to lower prevalences than the PNAD, 3.5% of people with the disease. Methodological differences, especially in the question, here related to previous medical diagnosis, explain in part this difference.

The WMSDs, characterized as painful and damaging disorders caused by overuse or excessive activity of some part of the musculoskeletal system, often resulting from physical activities related to work, also cause negative consequences for individuals and for the public expenses[28]. The PNS evaluated the issue of WMSDs for the first time, allowing a national overview of these diseases. It is present in 2.4% of the population, predominantly in women, almost double, of which 16.4% reported inability for activities of daily living, revealing the size of the disability and how it affects people, work, business, and the health-care system.

Depression is an emotional disorder characterized mainly by changes in mood, decreased energy, and decreased activity. It can vary between lighter and more severe episodes. Studies show sociodemographic differences in the prevalence of depression. For example, among women, depression is twice as common as in men[29,30]. The PNS first explored the subject and the data are startling: 7.6% of the population has been diagnosed by a physician or mental health professional. Depression affects almost three times more women, and about 11.8% reported disability owing to the illness.

Asthma is characterized as a chronic disease that affects the airways and other structures of the lungs. According to the WHO, asthma ranks first in the prevalence of chronic respiratory diseases, affecting 300 million people worldwide[31]. In Brazil, it would be about 6.4 million people, or 4.4% of the adult population, with 15.7% reporting disability from the disease. Asthma is responsible for a large number of hospital admissions, resulting in a significant cost to the Unified Health System (SUS)[32].

CKD is characterized by kidney injury or impaired renal function for three or more months, regardless of the diagnosis that caused the injury or the reduction in function. CKD is a public health problem that impacts individuals and their families and society and the health system. The main risk factors associated with CKD are diabetes mellitus, hypertension, family history of renal disease, and aging[33].

Study based on analyses of the Subsystem for Authorization of High Complexity Renal Replacement Therapy Procedure estimated the incidence of CKD for the period 2000–2006 for the country in 119.8/1,000,000 inhabitants/year. The prevalence and incidence increase over the progression of age[33]. The findings of PNS of 1.4% prevalence of CKD is absolutely unprecedented and reveals the extent of the disease in the country, because it results in intense disability (11.9%) and burdens health services, especially National Health System and the individuals and families.

Stroke is a leading cause of death and disability worldwide. It is estimated that, in 2005, about 5.7 million deaths were owing to stroke, and 87% occurred in low- and middle-income countries[34]. One study on the mortality trends by stroke in Brazil for individuals aged 30 years or older, from 2000 to 2009, observed an increasing trend in mortality rates by 2006 and a subsequent decline until 2009[34]. Still, the Longitudinal Study of Adult Health (ELSA-Brazil), conducted in 2014, found a prevalence of 1.3% in the population aged 35 – 74 years[35].

CVDs are the leading cause of death in Brazil. Although mortality has decreased over the years in Brazil (about 34% for cerebrovascular disease and 44% for other heart diseases), it remains high. In 2004, mortality attributable to CVD was of 286 per 100,000 people. Still, CVDs generate the highest costs in relation to hospital admissions[10]. It is estimated that, for 2007, 12.7% of hospitalizations in Brazil were owing to CVD. According to the data from ELSA-Brazil, the prevalence of coronary heart disease and stroke in people aged 35 – 74 years were of 4.7 and 1.7%, respectively[36].

CONCLUSION

The PNS revealed a rich and disturbing panel in the country with a high burden of NCDs and disabilities, which may increase owing to the aging population. It is fundamental to monitor NCDs, its morbidity and mortality burden, and risk factors. Strengthening the surveillance is a national and global priority. The Ministry of Health has invested in improving coverage and quality of data on mortality and morbidity, and the PNS completes the surveillance panel, setting an invaluable baseline.

There is a strong evidence that correlates the social determinants, such as education, occupation, income, gender, and ethnicity, with the prevalence of NCDs and risk factors[2]. In Brazil, despite the existence of SUS, a free and universal health-care system, the individual cost of a chronic disease is still quite high, owing to aggregate costs, sick leave, and loss of productivity, which contributes to the impoverishment of families. Estimates for Brazil suggest that the loss of productivity at work and reduced family income resulting from only three NCDs (diabetes, heart disease, and stroke) will lead to a loss of US$ 4.18 billion in the Brazilian economy between 2006 and 2015[37].

Regarding the burden of morbidity and mortality from NCDs, they are huge challenges for governments, health managers, and the general public[38,39]. One must also consider the increasing elderly population and the disease burden in the coming decades, with an increasing growth in demand for health services. The evidence in the current scientific–technical production point to the benefits of integrated public and intersectoral policies in response to these challenges[31,38,39].

The production of information and analysis of the health situation can support the implementation of sectoral and intersectoral strategies, implementing full care for NCDs and their risk factors. In addition, the improvement of health services, especially the qualification of primary care, can effectively respond to the double burden of illness in middle- and low-income countries[1,2,10].

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