

Noncommunicable diseases in the *Journal Ciência & Saúde Coletiva*: a bibliometric study

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Abstract *Noncommunicable Diseases are an important public health issue in Brazil and worldwide. This study aimed to analyze the scientific production published by the “Journal Ciência & Saúde Coletiva” in order to shed light on its contributions for the dissemination of scientific knowledge and the debate regarding noncommunicable diseases. A bibliometric study on the publications from 1996 to 2019 related to noncommunicable diseases was carried out. A total of 458 documents that met the eligibility criteria were selected. An increasing trend in the number of publications per year was found; at some points, it coincided with political and institutional milestones in Brazil. Quantitative research papers stood out, as did studies on risk and protective factors. Public educational and research institutions led the publishing and the financing of the studies. Most authors were female. The journal has been reflecting the magnitude of the theme and its prioritization on the public agenda by promoting the debate and providing a scientific dissemination of content related to noncommunicable diseases.*

Key words *Noncommunicable diseases, Public Health, Risk factors, Scientific communication and diffusion, Bibliometrics*

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Introduction

Noncommunicable diseases (NCD) are an important public health issue, since they are the main cause of death in the world, in addition to causing premature mortality, disabilities, loss of quality of life, overload of the health system^{1,2}, and contribute to increase spending on health care and social security^{3,4}.

The increase in morbidity and mortality due to these diseases is related to the effects of the epidemiological, demographic, and nutritional transition⁵⁻⁷, and also to the growth of modifiable risk factors such as tobacco consumption, harmful use of alcohol, physical inactivity, and inadequate diets⁸. Besides these elements, the occurrence and distribution of NCDs and their risk factors^{11,12} are related to the effects of economic crises and austerity measures^{9,10}, and other social determinants, such as poverty. As a consequence, worse health indicators are observed in the most socially vulnerable population, and higher prevalence of risk factors for NCDs in individuals with low education and income¹³⁻¹⁵.

NCDs, their risk and protective factors, aspects related to treatment and strategic actions to cope with them are among the themes addressed in publications from the *journal Ciência & Saúde Coletiva (C&SC)*, a reference in both national and global settings. Edited by the Brazilian Association of Collective Health (Abrasco), the journal was created in 1996 with the aim of disseminating high-quality health research studies to the scientific community and society in general, in Brazil and abroad. This is an important national vehicle for scientific communication of discussions, debates, research, and for the exposure of new ideas in the field of Public Health, in addition to being indexed in the main health databases.

Considering the relevance of NCDs in Brazilian and global contexts, and in the perspective of shedding light on important contributions from C&SC in this field, the present study sought to analyze the scientific production related to NCDs published throughout the journal's 25 years of existence.

Methods

This is an exploratory and descriptive study that consisted of a bibliometric analysis of C&SC's collection published from 1996 to 2019. Bibliometrics corresponds to a set of research methods

that combines quantitative approach, statistics, and data visualization techniques¹⁶, applied to the analysis and evaluation of bibliographic production. Its intention is measuring production indexes and scientific knowledge dissemination¹⁷.

C&SC is indexed in several databases. To retrieve the publications of interest, the database Medical Literature Analysis and Retrieval System Online (Medline) was used, via United States National Library of Medicine National Institutes of Health (PubMed), as well as Scientific Electronic Library Online (SciELO). PubMed was used as a search engine for being extremely robust and reliable and for allowing the development of a search strategy with all the terms necessary to represent the universe searched. It should be noted, however, that it was not possible to retrieve via PubMed the C&SC content published between 1996 and 2006; the publications of this period are not indexed in Medline. Therefore, the production mapping process carried out at C&SC had to be segment in three stages:

First stage: survey of general information about what was published in the journal from 1996 to 2019, for contextualization. They were taken from SciELO Analytics, since the full content of the journal is indexed on this platform.

Second step (manual recovery): recovery of publications referring to NCDs. A "manual" search was performed; a SciELO scan of everything published between 1996 and 2006 in order to map the eligible manuscripts not indexed in Medline.

Third step (automatized recovery): recovery of publications referring to NCDs. To identify the eligible manuscripts published between 2007 and 2019, a search strategy was built on PubMed. It was carried out in February 2020, using descriptors taken from the Medical Subject Headings (MeSH), plus the respective synonyms and keywords that were not included in the list of synonyms. Terms related to the four large groups of NCDs and their modifiable risk factors were used, which were associated through "OR" and "AND" operators. The following MeSH were considered: Non-communicable Diseases, Cardiovascular Diseases, Diabetes Mellitus, Respiratory Tract Diseases, Neoplasms, Hypertension, Healthy Lifestyle, Health Behavior, Body Weight, Obesity, Body Mass Index, Body Weights and Measures, Weight Gain, Overweight, Healthy Diet, Sedentary Behavior, Motor Activity, Tobacco, Tobacco Use Disorder, Tobacco Use, Tobacco Smoking, Smokers, Smoking, Cigarette Smoking, Tobacco Products, Alcoholism, Alcoholic Bever-

ages, Alcoholics, Dyslipidemias, Binge Drinking, Risk Factors.

As an inclusion criterion, all types of publication (editorial, thematic articles, articles on free themes, review articles, opinion, reviews, debates and letters) were considered that would focus on: a) the four main groups of diseases prioritized by the World Health Organization in the “Global Action Plan for the Prevention and Control of NCDs 2013-2020”⁷ and in the “Strategic Action Plan for Coping with NCDs in Brazil, 2011-2022”¹⁸ (circulatory, cancer, chronic respiratory, and diabetes); b) its modifiable risk factors (tobacco, alcohol, physical inactivity, inadequate diet) and metabolic risk factors (obesity, high blood pressure, altered blood glucose); c) policies, programs, and actions related to NCDs, surveillance, promotion, prevention, diagnosis, care, and treatment. The exclusion criteria included publications that did not present NCDs as the main objective according with the above-mentioned dimensions of approach.

Guided by the eligibility criteria, the selection of publications was made, in both stages (manual search and through PubMed), based on title, abstract, and keywords for articles, and full text for editorial, opinion, debate, review, and letter documents. This selection was carried out by peers, the divergences were discussed and resolved by consensus between the parties and the reasons for the exclusion of publications were registered.

Data of interest for the selected publications were extracted into a spreadsheet Microsoft Office Excel (Microsoft® 2016). The following variables were considered: publication identification number, with PubMed Unique Identifier (PMID) for those indexed in MEDLINE and Document Object Identifier (DOI) for those not indexed in this database; year of publication; language; publication section; authorship (number of authors per article and name of the authors); institutional affiliation of authors; key words; financing; thematic categories; link to access publications on the SciELO platform.

Thematic categories were guided by the dimensions of approach to NCDs mentioned in the inclusion criterion. Therefore, each publication was classified into one of those four categories: 1) Morbidity and Mortality; 2) Risk and Protective Factors; 3) Therapeutic and Care Strategies; and 4) Policies, Programs and Actions. In Morbidity and Mortality were included articles related to the four major groups of NCDs, their diagnosis and mortality rate. For Risk and Protection Factors, publications were included whose object

was risk factors (behavioral, lifestyles, biological, metabolic, environmental, social, economic, and demographic inequalities) and protective factors for NCDs (healthy lifestyles, health promotion and prevention). Therapeutic and Care Strategies grouped studies with a focus on the treatment of NCDs, pharmacological research, comprehensive NCD care strategies and self-care. The Policies, Programs and Actions category included publications that addressed policies, programmatic actions for NCDs, surveillance, and monitoring.

A descriptive analysis of the data was carried out based on the survey of absolute and relative frequencies for each variable. In addition, a simple linear regression method was used to verify the occurrence of a linear trend in the number of publications from 1996 to 2019. The publication year of *C&SC* manuscripts was considered as an explanatory variable and the number of publications (absolute frequencies) was taken as a variable response. Temporal variations were interpreted as statistically significant when the regression coefficient of the model was different from zero for a p value less than or equal to 0.05. Statistical analyzes were performed using Microsoft Office Excel software (Microsoft® 2016).

Clouds of keywords and authors' institutional affiliations were created with the aid of an online data visualization tool named Infogram (<https://infogram.com/>). The “word cloud” or “text cloud” is a visual strategy for presenting linguistic data; it shows the frequency with which the terms appear and allows identifying the importance of a certain word in relation to the total number of words¹⁹. The keywords included in the selected articles were grouped according to their synonyms, the vocabulary of the Health Sciences Descriptors (DeCS), as well as terms in plural and singular and words in different languages, but with the same meaning. Besides, for a better visualization of the terms, it was decided to establish a cutoff point based on the distribution of absolute frequencies, ordered from the highest to the lowest frequency, so that the keyword cloud presented 29 terms of one total of 625, and the cloud of institutional affiliations of authors gave visibility to the 50 most recurring, out of a total of 251 institutions.

Results

Between 1996 and 2019, *C&SC* published 247 issues and 5,871 documents, of which 4,860 were research articles. The journal was published every

six months between 1996 and 2001, every four months from 2002 to 2006, every two months between 2007 and 2010 and, starting in 2011, its periodicity began to be monthly, with the annual publication of twelve issues.

Noteworthy was the launch of a first thematic issue dedicated to NCDs in 2004. Nevertheless, chronic diseases or related topics (national surveys, surveillance, risk factors such as obesity and hypertension and related to eating behavior and lifestyle) were also a subject of interest made explicit in titles and topics covered in editorials of thematic numbers, as the reader will find in those editions: 2004 (number 4), 2010 (supplement 2), 2011 (number 1), 2013 (number 2), 2014 (numbers 1 and 6), 2015 (numbers 3, 4 and 8), 2016 (numbers 1, 2 and 4), 2017 (number 2), 2018 (number 12) and 2019 (number 7).

In manual recovery, a total of 794 publications were initially identified; after exclusions, 25 remained. In automated retrieval, the search strategy retrieved 979 documents, of which 433 were selected based on the eligibility criteria. At the end, a total of 458 articles were included.

Table 1 presents the overview of publications according to period, journal section, number of authors, language, thematic category, and funding. When considering the 25-year time frame of *Journal C&SC*, the first manuscript that met the eligibility criteria of this study was published in 2002. There was a big quantitative jump of publications on NCDs in the following years.

The articles correspond to the majority of publications, making a total of 440 documents (96.0%), mostly of which used quantitative methodology (72.1%). There was a predominance of publications with 3 and 4 authors (39.7%) and public institutions represented the most prevalent institutional affiliation (86.0%). Most of the publications were written and published in Portuguese (60.9%), although a notable portion was written and published in Portuguese and English or only in English (38.0%). “Risk and Protection Factors” was the most frequent thematic category (56.1%), followed by “Morbidity and Mortality” (21.4%). Of the analyzed publications, a small percentage declared financial support (26.1%), and, from this, the national agencies for research promotion figured as the biggest financing agent (53.0%), followed by the state foundations for research support (26.5%) (Table 1).

A total of 1,529 different researchers, disregarding repetitions, was responsible for producing all 458 analyzed publications. Of these, 27 contributed in 4 or more publications, either as

Table 1. Publications of the *Journal Ciência & Saúde Coletiva* on NCDs, according to general characteristics, 2002 to 2019.

Features	n	%
Total of publications (N = 458)		
Publication period		
2002 to 2005	22	4.8
2006 to 2011	107	23.4
2012 to 2015	149	32.5
2016 to 2019	180	39.3
Publication section		
Articles	440	96.0
Quantitative	330	72.1
Revision	54	11.8
Qualitative	52	11.4
Mixed	3	0.7
Reflection	1	0.2
Debate	7	1.5
Letter	4	0.9
Editorial	3	0.7
Opinion	3	0.7
Review	1	0.2
Number of authors		
1 and 2	94	20.5
3 and 4	182	39.7
5 and 6	130	28.4
7 to 12	52	11.4
Author institutional affiliation (N = 1912) ^o		
Public Institution	1646	86.0
Private institution	266	13.9
Does not apply	1	0.1
Language		
Portuguese	279	60.9
Portuguese and English	108	23.6
English	66	14.4
Spanish	4	0.9
Spanish and English	1	0.2
Thematic Category		
Risk and Protection Factors	257	56.1
Morbidity and Mortality	98	21.4
Policies, Programs and Actions	54	11.8
Therapeutic and Care Strategies	49	10.7
Funding ^b		
Yes	99	21.6
National agencies for research promotion	80	53.0
State foundations for research support	40	26.5
Government agencies	20	13.2
Other	11	7.3
Not declared	344	75.1
Does not apply	15	3.3

Source: Developed by the authors.

^oThe 458 publications comprehended 1912 institutional affiliations (considering repetitions). ^bThe sum of the absolute frequencies of financing agents exceeds the total number of articles that declared yes (n = 151 versus n = 99), because, in some cases, the same article declared more than one source of funding.

first author or as co-author, and they are mostly female (70.4%). The cutoff point of 4 or more publications was defined for better presentation of the data, considering the large number of authors who participated in 3 or less publications ($n = 1502$; data not shown). The five authors who published the most were: Malta, DC; Barros, MBA; Cotta, RMM; Barreto, SM; Christofaro, DGD. With regard to the institutional affiliation of these researchers, public institutions stand out, with federal universities being the most frequent (Table 2).

Figure 1 shows the annual number of publications according to thematic categories (A), and a timeline of the annual total of publications according to institutional frameworks in the field of NCDs (B). As previously mentioned, the first publications on NCDs were verified in *C&SC* from 2002. There is a predominance of publications on the theme “Morbidity and Mortality” in 2002 and 2004. As of 2008, the theme “Risk and Protective Factors” of NCDs became the most frequent, especially in the years 2015, 2018 and 2019, accounting for 30, 34 and 44 publications only in this category, respectively (Figure 1A).

The launch of *C&SC*'s first thematic issue was dedicated to NCDs and took place in 2004. In chronological sequence, highlights are seen in 2008, 2011, 2013, 2015, 2018 and 2019, which can be related to national and international events and actions in the scope of chronic diseases. In 2008, the “Guidelines and Recommendations for Comprehensive Care of NCDs” were listed and information on morbidity and some risk factors was included in the National Household Sample Survey (PNAD in Portuguese), as part of the Global Adult Tobacco Survey (GATS) initiative. National scenery watched in 2011 the publication of the “Plan of Strategic Actions for Coping with Non-communicable Diseases (NCDs) in Brazil, 2011-2022”, and the launch of the “Healthy Gym Program”; internationally, the General Assembly of the United Nations (UN) held, in New York, the High Level Meeting on NCDs. In 2013, the “Global Action Plan for the Prevention and Control of NCDs” was launched by the World Health Organization (WHO), while, in a national context, the Department of Non-communicable Diseases and Conditions and Health Promotion (DANTPS in Portuguese) was being created, along with the first National Health Survey (PNS in Portuguese). In 2018, the WHO launched the SAFER initiative at the Third United Nations High Level Conference on the Prevention and Control of Non-communicable Diseases, with the aim of promoting

and strengthening actions to reduce harmful consumption in the alcohol (Figure 1B).

The interval between 2002 and 2019 presents a tendency for a significant increase ($p < 0.05$) in the number of publications on NCDs, representing an average variation of 0.0072 per year, with an adjusted R^2 of 0.62 (data not shown).

Figure 2 shows the main keywords appearing in the analyzed publications. From a total of 458 publications, 625 keywords were identified (the sum of the frequencies corresponds to a total of 1775 keywords). The word cloud shows a cut of the 29 most frequent keywords, among which obesity ($n = 61$), cancer ($n = 61$), adolescents ($n = 60$), eating behavior ($n = 55$), smoking ($n = 52$), risk and protection factors ($n = 47$), physical activity ($n = 45$), hypertension ($n = 45$), elderly ($n = 45$) and non-communicable diseases ($n = 41$) (Figure 2).

Figure 3 shows authors' most frequent institutional affiliations. The publications resulted 251 distinct institutional affiliations, whose sum of frequencies makes up a total of 1912 citations. The word cloud exposes a section of the 50 most frequent institutions, of which the most outstanding were Universidade Federal de Minas Gerais (UFMG) ($n = 132$), Oswaldo Cruz Foundation (Fiocruz in Portuguese) ($n = 129$), and Universidade de São Paulo (USP) ($n = 118$) (Figure 3).

Discussion

The study points to a continuous growth of scientific production related to NCDs in the *Journal C&SC* since 2002, with 2011, 2015, 2018 and 2019 being years of publication peak on the theme. Of the analyzed articles, most had a quantitative approach; in about two fifths of the publications the number of authors varied between 3 to 4 per article, and more than half were published in Portuguese. The main thematic category corresponded to “Risk and Protection Factors”. Financial support was declared in only one fifth of the studies, but among those who declared it, there was a predominance of public agents. Public institutions were also the ones that most published in the journal, with UFMG, Fiocruz and USP being the authors' main institutional affiliations. Female researchers were the majority among those who appeared as authors in 4 or more publications. The highest volumes of publications coincided with the establishment of political and institutional frameworks at national and international

Table 2. Authors who contributed to 4 or more publications of *Ciência & Saúde Coletiva* on NCDs, according to position of authorship, total volume of publications and institutional affiliation, 2002 to 2019.

Authors	1st author	Co-author	Total	Institutional affiliation
Deborah Carvalho Malta	11	10	21	Ministério da Saúde Universidade Federal de Minas Gerais
Marilisa Berti de Azevedo Barros	2	5	7	Universidade Estadual de Campinas
Rosângela Minardi Mitre Cotta	1	6	7	Universidade Federal de Viçosa
Sandhi Maria Barreto	1	6	7	Universidade Federal de Minas Gerais
Diego Giulliano Destro Christofaro	1	5	6	Universidade Estadual de Londrina Universidade Estadual Paulista Júlio de Mesquita Filho Universidade Federal Rural de Pernambuco
Efigênia Ferreira e Ferreira	0	6	6	Universidade Federal de Minas Gerais
Luana Giatti	0	6	6	Universidade Federal de Minas Gerais Universidade Federal de Ouro Preto
Rômulo Araújo Fernandes	2	4	6	Universidade do Oeste Paulista Universidade Estadual Paulista Júlio de Mesquita Filho
Diego Augusto Santos Silva	1	4	5	Universidade Federal de Santa Catarina
Gustavo Velasquez-Melendez	0	5	5	Universidade Federal de Minas Gerais
Patrícia Maria Zarzar	0	5	5	Universidade Federal de Minas Gerais
Pedro Curi Hallal	1	4	5	Universidade Federal de Pelotas
Andréia Queiroz Ribeiro	0	4	4	Universidade Federal de Viçosa
Bruna Celestino Schneider	1	3	4	Universidade Federal de Pelotas
Danielle Cristina Guimarães da Silva	2	2	4	Universidade Federal de Viçosa Universidade Federal do Oeste da Bahia
Eliana Zandonade	0	4	4	Universidade Federal do Espírito Santo
Erika Aparecida Silveira	2	2	4	Universidade Federal de Goiás
Jamile Sanches Codogno	0	4	4	Universidade Estadual Paulista Júlio de Mesquita Filho
Lenildo de Moura	0	4	4	Ministério da Saúde Organização Pan-Americana da Saúde
Maria Helena Costa Amorim	0	4	4	Universidade Federal do Espírito Santo
Maria Teresa Anselmo Olinto	0	4	4	Universidade do Vale do Rio dos Sinos Universidade Federal de Ciências da Saúde de Porto Alegre
Marise Fagundes Silveira	0	4	4	Universidade Estadual de Montes Claros
Mônica Rodrigues Campos	0	4	4	Fundação Oswaldo Cruz
Otaliba Libânio de Morais Neto	0	4	4	Ministério da Saúde Universidade Federal de Goiás
Romeu Gomes	2	2	4	Fundação Oswaldo Cruz
Rosely Sichiari	0	4	4	Universidade do Estado do Rio de Janeiro
Vanessa Alves Ferreira	3	1	4	Universidade Federal dos Vales do Jequitinhonha e Mucuri

Source: Developed by the authors.

levels. The keywords most frequently mentioned were obesity, cancer, adolescents, eating behavior, smoking, and risk and protective factors.

The increase in publications on NCD and its risk and protection factors in *C&SC* over the

years may be related to the prioritization of this topic on the national and international agendas. In this perspective, it is important to highlight the inclusion of NCDs on the global agenda in 2000, when the WHO approved World Health Assem-

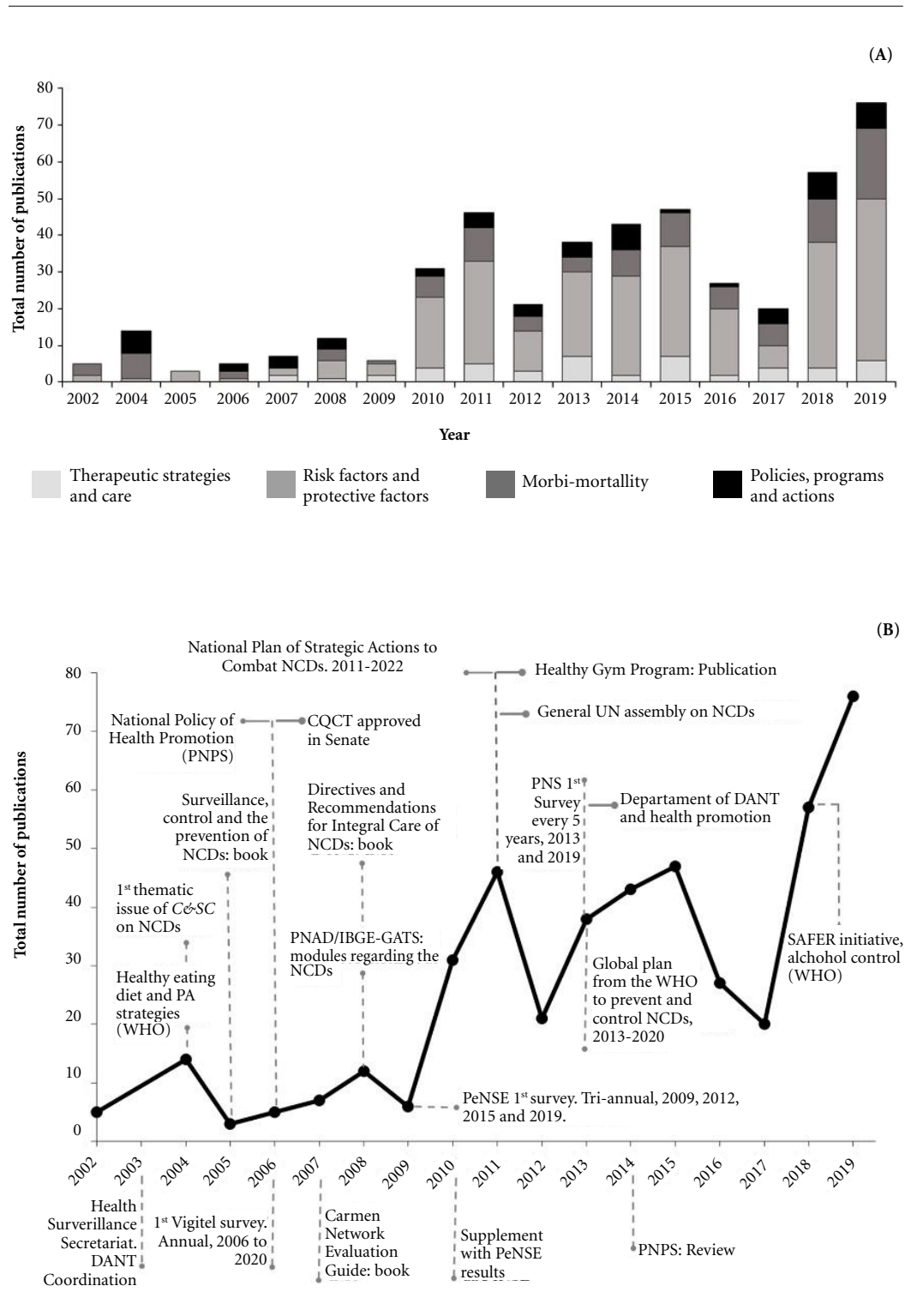


Figure 1. Annual number of publications according to thematic categories (1A) and annual number of publications according to institutional frameworks on NCDs (1B), 2002 to 2019.

Source: Developed by the authors.



Figure 2. Most frequent keywords in *Ciência & Saúde Coletiva* publications on NCDs, 2002 to 2019.

Source: Developed by the authors.

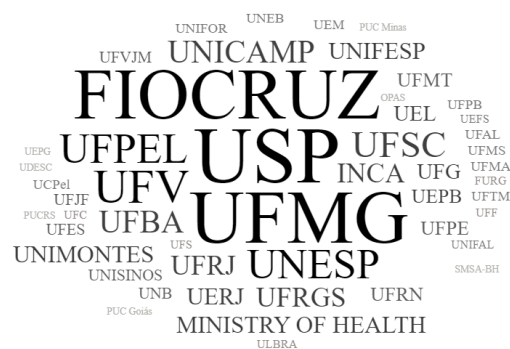


Figure 3. Most frequent institutions related to *Ciência & Saúde Coletiva*'s authors on NCDs, 2002 to 2019.

Source: Developed by the authors.

bly's Resolution 53.17 in order to support Member States in their efforts to reduce the number of morbidities, disabilities and premature mortality associated with non-communicable diseases. To this end, the creation of public policies for health promotion and prevention, as well as innovation in health care and management²⁰ guided an organization concerning the surveillance of these diseases. In the national scenario, the establishment of governmental and scientific milestones, such as the Health Surveillance Secretariat (SVS in Portuguese) in the Ministry of Health (MS in

Portuguese) in 2003, was fundamental to consolidate the theme in the internal agenda. It made possible the conduction of longitudinal studies, of municipal (ISACamp, ISA-SP and others)² and national population surveys (household, telephone, and school). The SVS organization chart established the General Coordination for the Surveillance of Non-communicable Diseases and Conditions (CGDANT in Portuguese), whose mission was to consolidate a surveillance and monitoring system for non-communicable diseases and conditions, implementing, then, major national surveys^{2, 21-22}.

These governmental milestones also coincide with the first *C&S* publications, which occurred only in 2002, about six years after the journal's launch. In the first publication, Furquin et al.²³ analyzed data from the IBGE's National Household Sample Survey (PNAD/98). The article discussed the effects of Brazilian population's aging, an increase in NCDs and a strong demand for health services. In another study, Leite et al.²⁴ compared information on the prevalence of chronic diseases obtained by the health supplement of PNAD/98 and those estimated by the study "Load of Disease in Brazil", by Beltrão and Sono²⁵, compared health information of the Brazilian population, based on data PNAD/98, and North American surveys.

In 2004, *C&S* published its first thematic issue dedicated to NCDs. In the editorial, Lessa²⁶ discusses the importance of the topic and the delay in its inclusion in the country's agenda; the inequalities in estimates of mortality due to NCDs, affecting more the low-income population; and the scarcity of data on morbidity. Lessa²⁷ also highlighted the importance of the WHO approval of the Global strategy for healthy eating, physical activity and health, as well as the initiatives of the Secretariat of Health Surveillance, of the Brazilian Ministry of Health, in the implementation of this affirmative agenda. The thematic number included analysis of Achutti and Azambuja²⁸ and the panelists Loureiro²⁹, Lotufo³⁰, Teixeira³¹, who discussed the repercussions of NCDs and the increase in pressure on social security, accompanied by their consequences for society. Still in this issue, Almeida-Filho³² reviewed the benchmarks and theoretical models for social determination of NCDs, and Lima-Costa et al.³³ analyzed data from a household survey carried out in Belo Horizonte and showed the differences in lifestyles and use of preventive health services among adults affiliated or not to a private health insurance, pointing out the worst indica-

tors among those who do not have health insurance plans. Laurenti et al.³⁴ pointed to the NCD mortality results from the Mortality Information System (SIM in Portuguese), while Toscano³⁵ described the experience of population screening for diabetes. The number also presented Solla's government report³⁶, which addressed SUS policies for health promotion and prevention of NCDs and the challenges in training professionals. A second report described the first "Workshop on Surveillance of Non-communicable Diseases and Conditions", held in 2004 at the Epidemiology Congress of the Brazilian Association of Collective Health (Abrasco), with the presence of specialists and the CGDANT, marking the beginning of an organization of the surveillance of NCDs in the country³⁷.

In the following years, new thematic numbers were published, highlighting the analysis of the first National School Health Survey (PeNSE in Portuguese) results (2010), addressing the health of adolescents³⁸, exposure to smoking³⁹, eating behavior⁴⁰, body image⁴¹, physical activity⁴². Other supplements on food and nutrition, obesity, lifestyles, PNS results (2015), alcohol consumption and others followed.

Regarding the number of authors who signed the publications analyzed in this study, group research predominated at the expense of individual research. Other authors point out converging facts and indicate that this is a characteristic of studies in the field of health sciences⁴³⁻⁴⁵. Group research is an expectation in funded research, given that partnerships can enhance the combination of complementary skills and knowledge⁴⁶, in addition to multidisciplinary speeches⁴⁷.

It is also worth mentioning an approximation of the most frequent keywords with the thematic categories identified in this study. The keywords facilitate the retrieval of content, are fundamental for indexing, and act as a gateway to the text⁴⁸, which reiterates the importance of careful selection of keywords that actually portray the theme and content covered. The keywords and thematic categories reflect the goals foreseen in the global and national plans to confront NCDs^{8,19}, the Sustainable Development Goals (ODS in Portuguese) and the national health research agenda, justifying the high frequency of terms such as "non-communicable diseases", "risk factors", "obesity", "smoking", "physical activity", "food", and "alcohol". It should be noted that most articles refer to the risk and protection factors for NCDs, which may also reflect the consolidation of NCD surveillance in the country. Brazil or-

ganized actions to structure and operationalize a specific surveillance system for this group of diseases, in order to understand the distribution, magnitude and trend of NCDs and their risk factors, to support public policies for prevention and health promotion¹⁹, and complementarily, to identify social, economic, and environmental determinants, establishing multi-causal chains of determination^{2,49}. In this regard, mention should be made of the implementation of some surveys in the country.

In 2003, it was conducted the first national household survey on risk behavior and reported morbidity of non-communicable diseases, setting the baseline in monitoring the main risk factors for NCDs⁵⁰. Since 2006, the Surveillance of Risk and Protection Factors for Non-Communicable Diseases by Telephone Survey System (Vigitel in Portuguese) was implemented in all capitals of the 26 Brazilian states and in the Federal District; it monitors the frequency and distribution of NCD's main determinants by telephone survey⁵¹. In 2008, PNAD included, as part of the GATS initiative, information on morbidity and some risk factors. In Brazil, it is called: Special Smoking Survey (PETab in Portuguese)⁵². In 2009, in partnership with the Brazilian Institute of Geography and Statistics (IBGE in Portuguese) and with the support of the Ministry of Education (MEC), the PeNSE survey conducted with adolescent students was instituted. The research took place in 2009, 2012, 2015 and 2019, with the objective of subsidizing the monitoring of risk and health protection factors in schoolchildren in Brazil⁵³. In 2013 and 2019, the PNS was carried out by IBGE, in partnership with the Ministry of Health, being the broadest household-based survey in the country; its aim was of collecting information on the performance of the national health system with regard to access and use of available services and continuity of care, as well as on the population's health conditions, surveillance of non-communicable diseases and the associated risk factors⁵⁴. In addition to these surveys, the Family Budget Survey (POF in Portuguese) reveals results related to the nutritional condition of the Brazilian population and the food consumption of Brazilians⁵⁵.

As for the financing of the analyzed publications, it came from public agents (development agencies and government agencies) in more than 90% of the cases in which funding was declared. This is related to the fact that the Brazilian State has a legal framework and normative that guides the articulation between the sectors Health, Edu-

cation and Science and Technology, as well as the national development in science, technology, and innovation in health. The promotion of research and studies in the health area is at the heart of SUS, materialized through Law N^o 8.080⁵⁶.

The public sector also answered for the main institutional affiliation of the authors who published in the journal. This information indicates that, despite the challenges related to scarcity of financial resources destined for public universities and research, especially in times of fiscal austerity and underfunding of science and technology, there is a mobilization in order to foster the fulfillment of the social role played by these institutions and its researchers. Scientific, technological and innovation research constitutes a fundamental element in all sectors of society, particularly in the scope and for SUS, producing significant changes in people's lives, relationships, and work processes⁵⁷. The health field accounts for just over a third of scientific production in Brazil and there are also successful efforts and initiatives by MS^{58,59}.

This study identified researchers who published the most about NCDs in *C&SC*, of which the majority were female. In Brazil, women answered for the authorship of approximately half of the publications between the years 2011 and 2015, representing an increase in relation to the period from 1996 to 2000, whose percentage was 38%⁶⁰. However, women still have a lower proportion compared to men, in terms of receiving productivity grants from the National Council for Scientific and Technological Development (CNPq in Portuguese)⁶¹.

Among the limitations of this study, we can mention the exclusive use of PubMed database for automatic retrieval of publications. The choice of the base can interfere with the recovered material, in quantitative and qualitative terms, depending on the particularities of the search engines used by each base. Furthermore, one must take into account the sensitivity and specificity of the search strategy, which, in this particular case, reflected the researchers' option to focus on the four major groups of NCDs and their risk and protection factors, given a broad scope non-communicable diseases.

NCDs were widely addressed in *C&SC*, which has been reflecting this issue's magnitude, priority, and transcendence. In the political-institutional sphere, the expansion of national surveys – the sources of data on NCDs – was observed, reflecting in an increase in publications and analyzes on risk and protection factors over time, with emphasis on the important leadership of public teaching and research institutions in the production of this scientific knowledge, whose evidence, in the end, can support the formulation of policies and support monitoring and evaluation processes. The journal fulfills its role by disseminating evidence, promoting debate, and expanding scientific knowledge on a topic of such relevance. In addition, NCDs have emerged as a priority in a coordinated manner on the national and global agendas, notably from the national coping plan, the global action plan, and the ODS. Before such a scenario, understanding morbidity and mortality, risk factors and distribution dynamics in the population, monitoring these events, as well as reflecting on the public management of these issues is essential in the scientific debate and also on the governmental agenda.

Collaborations

All authors contributed and approved the final version of the article.

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