

Bibliometric analysis of scientific output on the impact of demographic and social variables on chronic diseases in the Scopus database

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Abstract:

This study aims to analyze scientific production and objective trends associated with the impact of demographic and social variables on chronic diseases within the field of social sciences, based on the Scopus database (Scopus). The study was based on an approach that assumes the explanation of chronic diseases is no longer limited to biological-clinical models, but has shifted towards integrating social and demographic determinants into health and disease analysis.

The study relied on a quantitative bibliometric approach in accordance with PRISMA systematic reporting standards, and the final sample comprised 68 peer-reviewed, open-access scientific articles in English, classified within the field of sociology, published between 2000 and 2025. The analysis included the development of temporal production, geographical distribution of countries, and co-authorship networks, in addition to keyword analysis and conceptual networks.

The results showed a qualitative shift in explanatory approaches to chronic diseases, as socioeconomic status is now viewed as a cumulative health risk factor that interacts with life trajectories. The results also revealed the dominance of the ‘big science’ model based on extensive research teams, longitudinal cohort studies, and extensive databases. Geographically, a clear American–European centrality emerged in scientific production, compared to a limited presence of countries in the Global South. Thematically, conceptual networks have centered around health inequalities and mortality, with growing interest in topics of social aging and spatial epidemiology.

The study concluded that chronic diseases represent complex social-temporal processes, which call for the adoption of comprehensive prevention policies that integrate biological and social determinants within multi-level research and collaborative frameworks.

key words: Chronic diseases; Demographic determinants; Bibliometric analysis; Health disparities; Social epidemiology.

Introduction

Chronic diseases, most notably high blood pressure, diabetes, and heart disease, are witnessing widespread interest in medical and clinical fields, where biological, genetic, and environmental approaches dominate the explanation of their causes and treatment pathways. However, the epidemiological and demographic shifts that societies have experienced in recent decades have redirected scientific debate toward other dimensions of these diseases, extending beyond biological determinants to social and demographic determinants. Aging, disparities in educational levels, income disparities, and urbanization patterns are all factors closely linked to the prevalence of chronic diseases and their varying burden among population groups.

Early literature in population sociology has highlighted that epidemiological transformation not only means societies moving from the dominance of infectious diseases to the dominance of noncommunicable diseases, but also reflects a reshaping of the social structure of health risks. In a pioneering study published in the *Journal of Urban Health*, Agyei-Mensah and De-Graft Aikins (2010) analyzed the dynamics of the 'double burden of disease' in Accra, Ghana, highlighting how patterns of urbanization and social inequality overlap with the epidemiological shift to intensify the spread of chronic diseases within the urban space. This approach confirms that chronic disease is not just a biological phenomenon, but rather the product of a changing socio-economic context.

In the context of population aging, Gu et al.'s (2009) study published in the *Journal of Gerontology Series B Psychological Sciences and Social Sciences* showed that frailty is strongly associated with social and contextual factors among older adults in China, and that mortality patterns at older ages cannot be understood without analyzing educational and economic backgrounds and life trajectories. Hank (2011) also showed in the same journal that 'successful' aging in Europe is not evenly distributed, but is affected by the accumulation of benefits or deprivation across the life course.

On the other hand, the study by Masters, Link, and Phelan (2015) published in *Social Science and Medicine* provided an examination of the 'root cause' theory (Fundamental Cause Theory), demonstrating that educational gradients in preventable deaths persist despite medical advances, reflecting the continued influence of social resources in shaping health outcomes. The Freedman et al. (2008) study in the same journal also showed that a decline in disability in late life is associated with early and middle life factors, which reinforces the social accumulation of health risks thesis.

These works, among the most cited studies in the search results (68 documents) extracted from the Scopus database in the field of social sciences, reveal a qualitative shift in the approach to chronic diseases: from a biological-clinical explanatory model to a multi-level socio-demographic model. Age is no longer just a temporal variable, but rather represents a life path during which opportunities and deprivation accumulate; The literature indicates clear differences between men and women in exposure to chronic health risk factors, the effects of smoking, alcohol consumption, and central obesity, in addition to differences in the prevalence of psychological disorders and metabolic diseases (Vlassoff, 2007; Nguyen & Park, 2021). These findings show that gender functions not only as a biological variable, but also as a social system that determines patterns of healthy behavior and risk exposure.

The socio-economic status is also considered one of the most stable and influential determinants in explaining health disparities associated with chronic diseases. Multiple studies have shown that individuals with lower educational levels and income face higher risks of non-communicable diseases, with a greater prevalence of behavioral risk factors and reduced opportunities for prevention and healthcare (Masters et al., 2015; Vozikis et al., 2021). Field studies in various contexts, such as Korea, Kenya, and rural India, have shown that poverty, poor education, and limited healthcare coverage are directly linked to high rates of chronic diseases (Lee et al., 2020; Mwangi et al., 2020; Kinra et al., 2010).

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On the other hand, geographical and environmental factors, particularly settlement patterns and urbanization, are significantly reflected in the redistribution of health risks. Urban studies have revealed a complex interplay between rapid urbanization, social inequality, and the increasing burden of chronic diseases, especially in major cities in the Global South (Agyei-Mensah & De-GraftAikins, 2010). Other studies have also shown clear differences between rural and urban areas in health behavior patterns and exposure to risk factors (Mwangi et al, 2015).

These research accumulations reveal a qualitative shift in the approach to chronic diseases, from a reductionist biological-clinical model to a multi-level socio-

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demographic model, in which disease is viewed as a temporal process shaped over the life course within an unequal structural context.

Despite this accumulation of knowledge, there remains a clear gap represented by the absence of a comprehensive bibliometric evaluation that determines the volume and trends of contributions from the humanities and social sciences in the study of chronic diseases, compared to the quantitative dominance of medical sciences. Most bibliometric analyses remain focused on medical or clinical production, without unpacking the socio-demographic dimension within this field. Hence, the importance of this study, which aims to analyze the scientific production classified within the field of social sciences in Scopus, monitor publishing patterns, research networks, and thematic trends related to the demographic and social factors of chronic diseases.

This bibliometric study seeks to answer a central question: **To what extent are demographic variables present in the analysis of chronic diseases within the field of social sciences?** By attempting to answer the following questions:

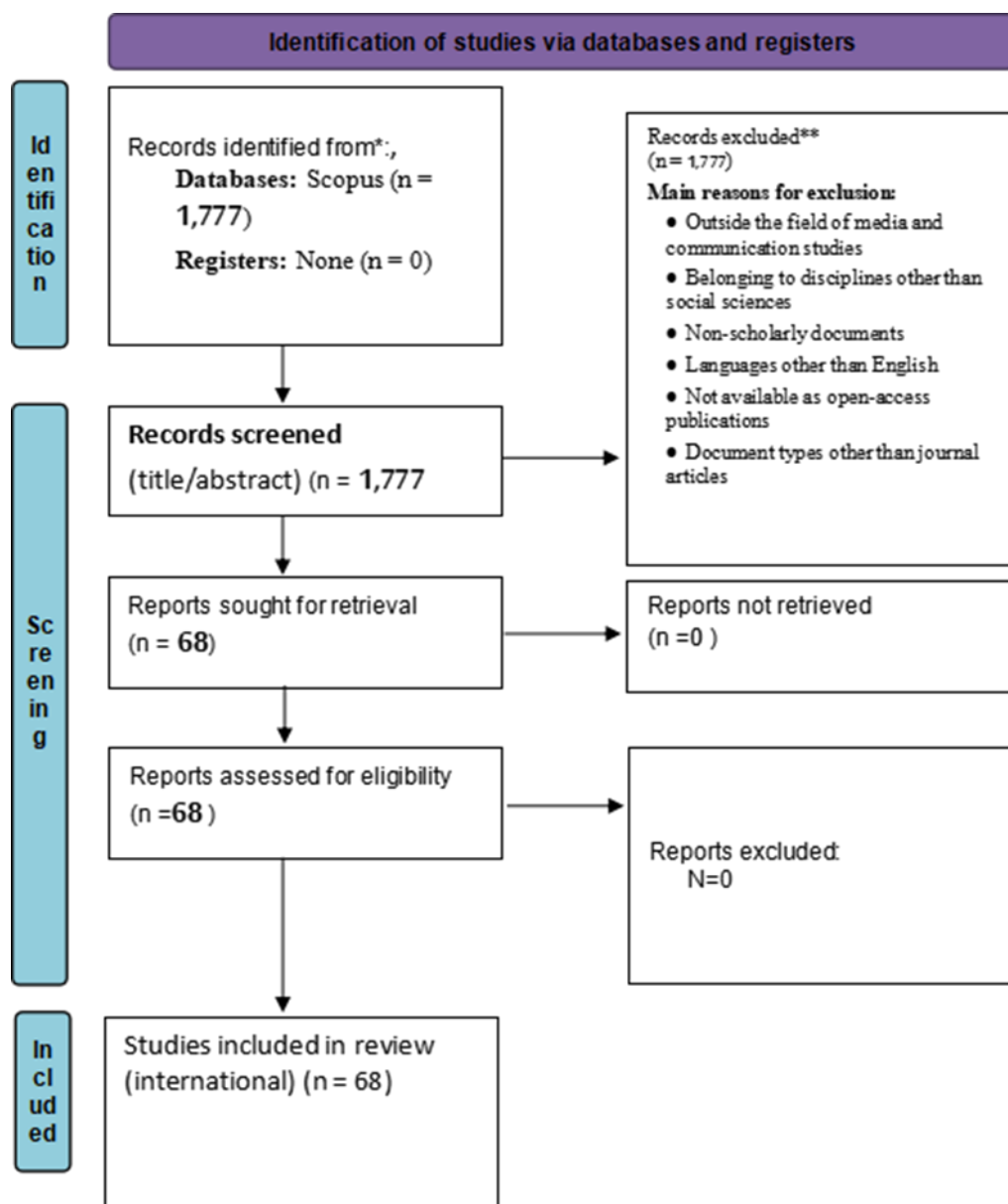
1. What is the volume of scientific production on the impact of demographic variables on chronic diseases within the field of social sciences, and how has this production evolved over the period from 2000 to 2025? What is the volume of scientific production on the impact of demographic variables on chronic diseases within the field of social sciences, and how has this production evolved over the period from 2000 to 2025?
2. What are the most productive countries in studies linking demographic transition to chronic diseases? Which countries are the most productive in studies linking demographic transition and chronic diseases?
3. What are the most published scientific journals in this field, and who are the most influential authors? What are the most published scientific journals in this field, and who are the most influential authors?
4. What are the most prominent keywords and prevailing thematic trends in this research field? What are the most prominent keywords and prevailing thematic trends in this research field?

Thus, this study falls within the framework of bibliometric quantitative analysis, aimed at describing the scientific map of this field, identifying its features and trends without delving into qualitative analysis of the study contents, thereby providing a comprehensive picture of the position of social sciences in studying the demographic dimensions of chronic diseases.

Study methodology

This study adopted the bibliometric quantitative method to analyze the scientific production related to the impact of demographic and social variables on chronic diseases within the field of social sciences, based on the transparency and systematic reporting standards adopted in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model. Although PRISMA is primarily used in systematic reviews, its procedural stages (identification, screening, eligibility, and inclusion) have been employed to refine the document selection process and ensure research reproducibility and verifiability. The data source was limited to the Scopus database due to its status as one of the largest and most comprehensive multidisciplinary databases indexing social science journals. As shown in the figure:

Fig.1. Research Protocol According to PRISM (2020)



In the identification phase, the search was conducted using a precise strategy in the fields of title, abstract, and keywords (TITLE-ABS-KEY), according to the following equation:

TITLE-ABS-KEY (("chronic disease" OR "non-communicable disease") AND ("demographic transition" OR aging OR "population aging" OR "fertility rate" OR mortality) AND ("social inequality" OR "socioeconomic factor"))

The initial search process resulted in the retrieval of **1,777** documents.

In the screening phase, temporal filtering criteria were applied by limiting the period between 2000 and 2025, in addition to restricting the selection to peer-reviewed articles classified within the field of sociology (SOCI), written in English, and open access. Documents that do not clearly reflect the intersection of demographic and social variables with chronic diseases within social analysis were also excluded. As follows:

AND (LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (DOCTYPE , "ar"))
AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (OA , "all"))

As for the eligibility stage, titles and abstracts were examined to ensure compliance with inclusion criteria, excluding studies with a medical focus or those that concentrate on clinical aspects without addressing sociodemographic factors. In the final inclusion stage, the number of studies that met all the criteria reached 68 scientific articles, which constituted the final sample for the bibliometric analysis.

The analysis relied on quantitative indicators that included: the temporal distribution of publications, the most cited authors and journals, the geographical distribution of scientific production, and keyword analysis to reveal the prevailing conceptual structure and thematic trends. This sequential methodological approach enabled the construction of a transparent and reproducible analytical framework that aligns with international standards in quantitative research, ensuring the accuracy of sample selection and the objectivity of the results.

2. Chronic diseases and socio-demographic dimensions:

Recent literature shows that chronic diseases represent an integrated challenge to public health, as their outcomes are not attributed solely to individual biological factors, but rather to a complex interaction between socio-economic determinants, environmental pressures, and policy frameworks, translating into an increasing health burden on individuals and communities. At the level of policies and institutions, Ignatow and Gutin (2024) argue that the interests of elite classes indirectly contribute to the entrenchment of health disparities through policies that favor spending on expensive treatments over preventive investments, allowing for organizational capture

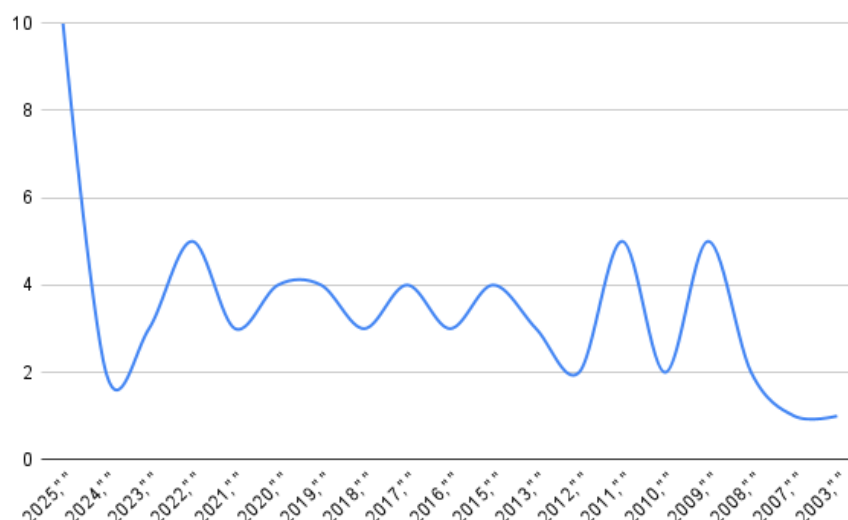
that enhances disparities in access to health services. This idea is supported by Koch's (2022) review, which linked the COVID-19 pandemic to historical disparities in housing, work, and access to healthcare, confirming that institutional and political factors create pathways susceptible to chronic morbidity, and that pandemics act as a revealer of structural fissures in societies.

Biologically, Stewart (2006) presents the concept of allostatic load as a framework to explain how chronic stress resulting from social and economic structures leads to cumulative physiological changes, including weakened immunity and metabolic disorders, which increase the risk of chronic diseases with aging. In contrast, a review by Yap et al. (2016) shows that barriers to medication adherence among the elderly, including therapeutic complexity, economic barriers, and ineffective communication with caregivers, make the practical management of chronic diseases more difficult. The barriers to medication adherence among the elderly, including therapeutic complexity, economic barriers, and ineffective communication with caregivers, increase the practical difficulty of managing chronic diseases, reflecting the interaction of individual and systemic determinants in health outcomes.

Thru the critical integration of these studies, a multi-layered causal model can be inferred, illustrating the pathway of social, political, and economic factors' impact on chronic health: the process begins with class structures and institutional interests, leading to imbalanced health policies, which in turn result in disparities in exposure to social and economic pressures, and these pressures transform into an allostatic load that increases the likelihood of chronic diseases. When entering the treatment phase, difficulties in individual and systemic adaptation, including medication adherence and access to resources, emerge as factors determining the success of disease management. This model reflects how political, social, and economic determinants intersect with biological and behavioral mechanisms to produce chronic health disparities, and provides a clear indication to researchers of the importance of evaluating interventions at the institutional, individual, and biological levels in an integrated manner.

Thus, these studies (the selected systematic reviews within the Scopus database) relied on an integrated methodological perspective that combines conceptual and empirical analysis, benefiting from theoretical studies (Ignatow & Gutin; Koch) to interpret structural and political influences, and empirical studies (Stewart; Yap et al.). To understand the mechanisms of physiology and behavior associated with chronic diseases, which prompted us to direct the research toward uncovering global publication trends in the Scopus database to identify patterns of geographical and institutional distribution of research, analyzing the relationship between scientific production and social and economic determinants, providing methodological recommendations to enhance preventive and therapeutic research, and maximizing access to data within international databases.

3. 1. Analysis of the study results: They are as follows:

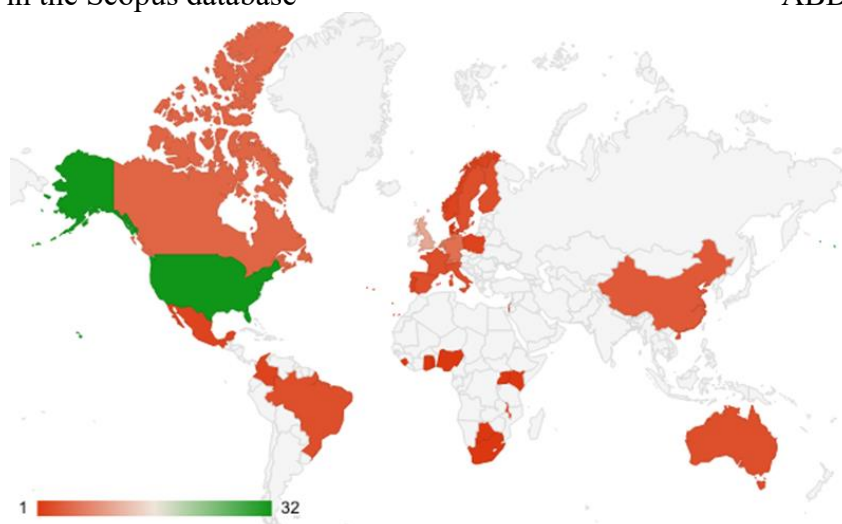


3.1 Analysis of the Temporal Distribution of Scientific Production

Fig.2. Analysis of the temporal development of scientific production on the impact of demographic and social variables on chronic diseases (2000–2025)

The bibliometric data spanning from 2003 to 2025 shows an irregular upward trajectory in the scientific output related to the interpretation of chronic diseases from a socio-demographic perspective, a trajectory that reflects gradual transformations in the theoretical and methodological framework of the field. The early years (2003–2010) were characterized by a noticeable quantitative weakness and fluctuations in the pace of publication, indicating the exploratory nature of the field and its initial attempts to move beyond the biomedical interpretation toward the integration of social

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consolidation of the bio-social approach as a legitimate analytical framework within social and health sciences, supported by the expanded use of longitudinal studies and large-scale databases. However, during the recent period (2024–2025), a notable quantitative surge emerged, reflecting the intellectual and methodological maturity of the field. This indicates a transition in research from partial interpretations to more comprehensive approaches that address the cumulative impact of social and economic pressures, especially in light of global health crises that have forcefully reintroduced the question of health inequality.

3.2 Analysis of the Distribution of Countries Producing Scientific Research

Fig.3. Analysis of the geographical distribution of scientific production on the impact of demographic and social variables on chronic diseases

Source: Scopus (Google Sheets)

The geographical distribution of scientific production reveals an uneven structure that clearly reflects power imbalances in the production of health knowledge, with Northern countries, particularly the United States and Western European countries, dominating the majority of publications. This centralization is explained by these countries possessing advanced research infrastructures, as well as financial and technical capabilities that allow for the completion of long-term and complex studies, making this field part of the "big sciences" associated with large research institutions. In contrast, the presence of Global South countries, especially African ones, is limited and marginal, often in the form of individual contributions, reflecting their continued treatment as field areas for data collection rather than spaces for producing theoretical frameworks. Nevertheless, the relative rise of some emerging demographic powers, such as China and Brazil, in an attempt to build knowledge related to their specific demographic transformations, remains limited in impact compared to the structural dominance of research centers in the Global North, which reproduces patterns of global epistemic dependency.

3.3 Analysis of the Distribution of Countries Producing Scientific Research

Table 1: Analysis of the distribution of scientific journals on the scientific output regarding the impact of demographic and social variables on chronic diseases

Journal	Td	Tc	Cite Score	Article (cited by the highest)	Pub
Journals of Gerontology - Series B Psychological Sciences and Social Sciences	952	6422	6.7	Aberrant Structural-Functional Coupling of Large-Scale Brain Networks in Older Women With Subthreshold Depression	Gerontological Society of America
Social Science and Medicine	3176	25764	8.1	The role of artificial intelligence in enhancing healthcare for people with disabilities	Elsevier
Demography	367	1958	5.3	Can Family Policies Enhance Fertility? An Ex-Ante Evaluation Through Factorial Survey Experiments	Duke University Press
Archives of Gerontology and	1026	7557	7.4	The Evolving Landscape of Sarcopenia in Asia: A Systematic review and meta-	Elsevier

Geriatrics				analysis following the 2019 Asian working group for sarcopenia (AWGS) diagnostic criteria	
Economics and Human Biology	354	1211	3.4	Spouses as home health workers, childcare workers, and cooks: Insights for applied research	Elsevier
Health and Place	701	5128	7.3	Mapping socio-spatial contexts of drug use and service access: A community-based rapid ethnography in Northern Ontario, Canada	Elsevier
Journal of Urban Health	407	2732	6.7	New Yorkers Speak Up: Community Perspectives on Improving Healthcare Experiences in New York City	Springer Nature
Population Studies	108	672	6.2	Childlessness trends at different ages by educational attainment for men and women in Finland: A research note	United Nations Publications
Sociology of Health and Illness	412	2185	5.3	Gut Healthism: The Penetrating Gaze and Depoliticising Forces of Direct-to-Consumer Microbiome Testing Kits	John Wiley & Sons
Population Health	867	6023	6.9	The decline in the physical stature of the U.S. population parallels the diminution in the rate of increase in life expectancy.	Elsevier

The bibliometric table reflects a multi-level cognitive structure of a group of scientific journals at the intersection of health sociology, demography, and public health studies, and allows for a comprehensive analytical reading of performance indicators, thematic transformations, and editorial policies of the journals. First, from the perspective of

quantitative performance and scientific impact, there is a significant variation in publication density among the journals; the journal *Social Science and Medicine* leads in high production with 3,176 documents, the highest CiteScore (8.1), and a total of 25,764 citations, reflecting its ability to attract high-impact research within an interdisciplinary field that combines health and social sciences, and indicating the broadness of its readership and the diversity of its research networks. In contrast, the journal *Population Studies* represents a model of high selectivity with only 108 documents, yet with a significant qualitative citation rate (6.2), indicating its focus on foundational demographic studies and in-depth theoretical work, and confirming that publication density is not necessarily an indicator of qualitative impact.

As for journals with a common focus on medicine and social sciences, such as the *Journal of Urban Health* and the *Journal of Gerontology Series B: Psychological Sciences and Social Sciences*, they record relatively high impact rates. This can be explained by the rapid turnover of knowledge in the fields of aging and public health, compared to purely economic fields like *Economics and Human Biology*, which recorded a low CiteScore (3.4) due to longer citation cycles and more specialized knowledge networks.

Secondly, from the perspective of thematic analysis and cognitive transformations, the article titles reflect a clear shift from traditional demographic approaches (fertility, mortality) to bio-social approaches (Bio-Social Integration), where studies integrate biological indicators with social contexts and health policies.

In the *Journals of Gerontology Series B*, the analysis of neural networks in depression below the clinical threshold stands out, while the *Archives of Gerontology and Geriatrics* offers systematic reviews of sarcopenia according to clinical diagnostic criteria, reflecting the integration of biological analysis with demographic and social structures. The technology axis also appears, through the study of artificial intelligence in *Social Science and Medicine*, as an explanatory variable in redefining disability and care management, reflecting a shift from the traditional social model to a technological-functional model. Additionally, studies published in *Health and Place* and the *Journal of Urban Health* highlight the importance of spatial and geographical determinants in interpreting health outcomes, within the framework of what is known as spatial epidemiology. Meanwhile, the *Sociology of Health and Illness* offers a critical approach to analyzing the commodification of health and individual responsibility, elucidating the cultural and political transformations in the understanding of illness.

Thirdly, from the perspective of the institutional structure of publishing, there is a clear dominance of commercial publishers, led by Elsevier, which controls a large number of high-impact journals (*Social Science and Medicine*, *Archives of Gerontology and Geriatrics*, *Economics and Human Biology*, *Health and Place*, *Population Health*). This

Bibliometric analysis of scientific output on the impact of demographic and social variables on chronic diseases in the Scopus database— ABDELAZIZ SIHAM raises questions about the concentration of intellectual power and editorial policies that may shape research agendas. In contrast, the presence of academic publishers and scientific societies such as Duke University Press, the Gerontological Society of America, and Springer Nature reflects a relative balance, as these entities support niche fields and critical discourses that may not be prioritized by major commercial publishers.

Fourthly, the synthetic summary indicates that the cognitive landscape at the intersection of health and social sciences is characterized by significant cognitive overlap, where the importance of approaches that combine biomedical analysis and structural social analysis is increasing. Quantitative indicators also show a relatively direct relationship between the degree of medicalization and the level of citation, as journals closer to biomedical sciences have higher citation indicators compared to demographic or economic journals. Thus, the table reflects deeper transformations in the research field, represented by the rise of the bio-social model and the increasing centrality of issues related to aging, technology, and space, within a contemporary understanding that transcends traditional disciplinary boundaries toward a multi-level model that combines biological, social, spatial, and political dimensions simultaneously.

3.4 Analysis of Author Distribution in Scientific Production

Table 2: Analysis of Author Distribution in Scientific Production on the Impact of Demographic and Social Variables on Chronic Diseases

The author	N o. of C	h- inde x	Citatio n	Most cited article	Year of P	university	country
Carmeli, Cristian	52	21	2,379	Most cited article	2017	Fribourg. The institution will open in a new tab, Fribourg.	Switzerlan d

Stringhini, Silvia	227	46	9,529	Most cited article	2017	Hôpitaux Universitaires de GenèveThe institution will open in a new tab, Geneva,	Switzerland
Crimmins, Eileen M.	321	79	23,458	Most cited article	2011	Southern CaliforniaThe institution will open in a new tab, Los Angeles	United States
Delpierre, Cyrille	263	43	7,294	Most cited article	2017	Toulouse the institution will open in a new tab, Toulouse,	France
Kelly-Irving, Michelle	144	36	5,308	Most cited article	2017	Toulouse the institution will open in a new tab, Toulouse,	France
Kivimaki, Mika Shipley	1,512	185	233,348	Most cited article	2020	LondonThe institution will open in a new tab, London,	United Kingdom
McCrory, Cathal	76	28	3,621	Most cited article	2017	TrinityCollege Dublin. The institution will open in a new tab in Dublin.	Ireland
Vineis, Paolo	1,256	152	118,266	Most cited article	2017	IstitutoItaliano di Tecnologia. The institution will open in a new tab, Genoa.	Italy
Wong, Rebecca A.	164	35	4,353	Most cited article	2017	The University of Texas Health Science Center at San Antonio. The institution will open in a new tab.	United States

Based on bibliometric data analysis, this study reveals the structure of knowledge production on chronic diseases and its relationship with socio-demographic variables, showing a clear variation in research performance indicators among different categories of researchers. The "Big Science" category, represented by Mika Kivimaki and Paolo Vineis, is characterized by a tremendous strength in citations and a high h-index, reflecting the leadership of global research consortia that rely on big data, transforming the researcher from an individual knowledge producer to a manager of cross-continental analytical networks. In contrast, experts in niche specialization like Carmeli and McCrory exhibit limited impact in terms of quantitative volume, but their influence is profound in a specific niche, focusing on the study of the relationship between socioeconomic status and early mortality.

The objective review indicates the dominance of "socioeconomic status" as a central biological risk factor, with the article "Socioeconomic status and the 25 × 25 risk factors" being the most cited paper by five different researchers in 2017. This reflects a paradigmatic shift in perceiving SES not merely as a descriptive variable but as a causal determinant of mortality, equivalent to traditional risk factors. This coincides with the pattern of hyper-authorship and the strategy of using multicohort studies to enhance statistical power, which translates into a benchmark reference that cannot be surpassed in the field.

The methodological structure shows the rise of longitudinal cohort studies, as seen with Eileen Crimmins, who links retirement, aging, and cognitive abilities, and Rebecca Wong, who provides cohort profiles, reflecting a systematic investment to increase citations and establish data as central tools in social epidemiological research. The geopolitics of knowledge highlight Euro-American centrality, while the Global South remains a source of raw data rather than theoretical analysis, reflecting the continued cognitive dominance of Western institutions.

Based on these results, it can be said that research on chronic diseases and the socio-demographic dimension has entered the era of "social epidemiology based on big data," where scientific success is linked to engagement in multinational networks that combine biological indicators, social pathways throughout an individual's life, and meta-analysis of large samples reaching millions of participants. From here, researchers are advised to consider social variables as "pathogenic" factors with specific biological pathways and to join research clusters that possess longitudinal data, to maximize scientific impact and contribute to the formulation of effective, evidence-based health policies.

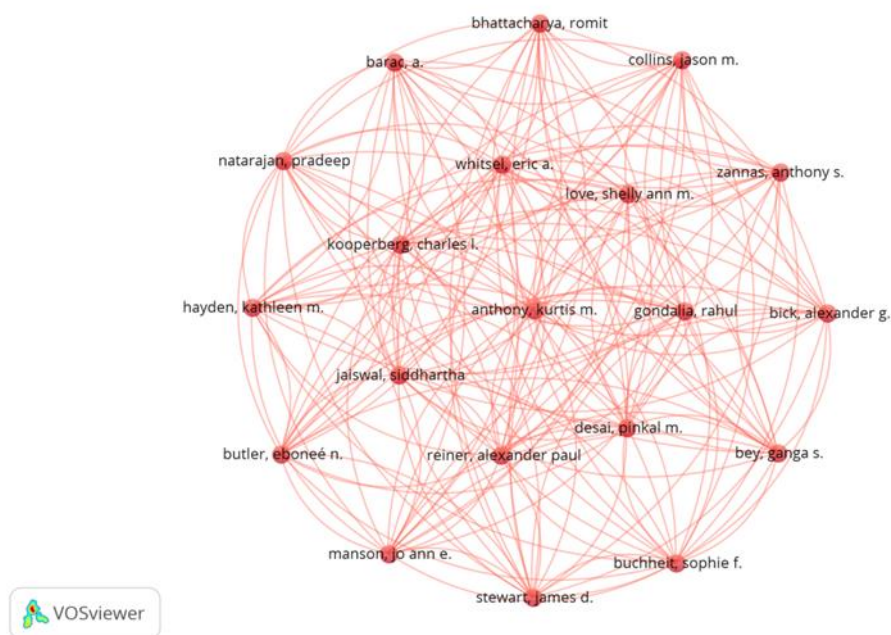
In the same context, for the previous analysis of the research structure in chronic diseases, the co-authorship network represented using VOSviewer software provides a sociometric reading that illustrates the shift from the individual researcher to the multi-level research cluster. The network map reveals a highly specialized morphological structure, represented by a dense closed clique structure where most research nodes are connected by strong and multiple lines. This reflects the prevalent pattern of "hyper-authorship" in large global studies, such as genome and social epidemiology studies, where researchers (Whitsel, Eric A.; Reiner, Alexander Paul; Kooperberg, Charles) work as a unified team to produce scientific papers that include dozens of authors, surpassing the boundaries of traditional bilateral collaboration.

The centrality analysis shows the concentration of names like Kurtis M. Anthony and Eric A. Whitsel at the heart of the network, indicating their role as knowledge brokers that connect team members and coordinate knowledge production, while the presence of scientific elites like JoAnn E. Manson on the fringes, with strong connections, lends legitimacy and increases the group's ability to publish in high-impact factor journals.

Essentially, this network represents the applied structure of the previously analyzed structural, physiological, and social theories; it combines precise biological data (Genetics/Biomarkers) with demographic and social data in large cohort studies. This is evident from the contributions of researchers such as Reiner, Whitsel, and Bhattacharya in the intersections of genetic epidemiology, and names like Shelly Ann Love and Ganga Bey, who add psychosocial variables to the analysis, reflecting the integration of biological and behavioral mechanisms with social factors in a comprehensive cognitive model.

The synthetic summary of this network confirms the 'death of the individual author' in the field of chronic diseases; the production of sound knowledge requires a cluster architecture that brings together the statistician, the clinical doctor, and the epidemiologist, forming an epistemic infrastructure necessary for managing big data and its complexities. This enhances the ability of research teams to produce normative, statistically robust, and high-impact research, as illustrated in the following figure:

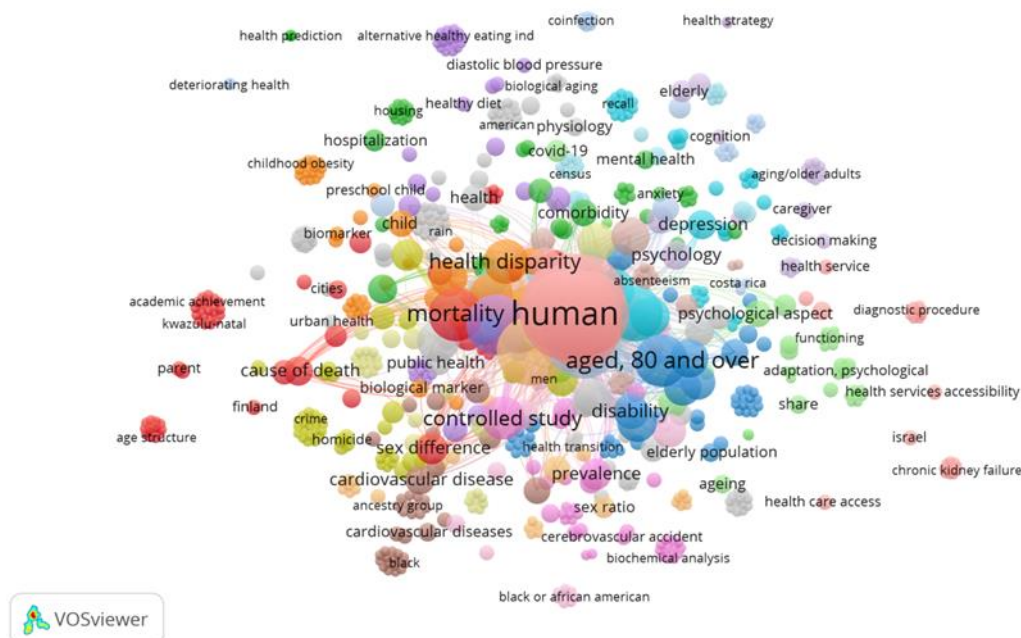
Fig.4: Interpretive Analysis of the Co-authorship Network



Source: *VOSviewer*

3.5 Keyword Analysis for Scientific Production

Fig 5: Keyword Co-occurrence Network Analysis



The analysis of the authorship network and scientific concepts in the field of chronic diseases reveals a central paradigm based on "health disparities" and "mortality" (The Central Dogma). The red and orange nodes dominate the center of the network, such as "Human," "Mortality," and "HealthDisparity," indicating that the research focus is

no longer solely on treating the disease, but on explaining the distribution of disease and death based on social disparities. This proposition is supported by the table that shows "Socioeconomic factors" in the fifth position with 55 occurrences, reflecting its role as the hidden driver of most health outcomes in the field.

To the right, the blue cluster reveals the axis of psychosocial gerontology, represented by terms such as "Aged, 80 and over," "Depression," "Cognition," and "Disability," indicating that research focus is no longer limited to physical illnesses, but includes the complex interactions between advanced age, mental health, and disabilities related to cognitive functions and psychological state. This marks a qualitative shift in demographic and long-term studies.

Below, the pink/purple cluster represents the axis of biology and gender (Biological & Sex Differences), where terms such as "cardiovascular disease," "Biochemical analysis," and "Sex difference" are associated. The repetition of "Female" and "Male" indicates that recent studies are moving toward Gender Medicine, analyzing chronic diseases through the lens of subtle biological and gender differences.

On the left, the green/yellow cluster highlights the environment and urban context (Environmental & Urban Context) thru terms such as "Urban health," "Cities," "Housing," and "Childhood obesity," reflecting the research trend toward spatial epidemiology that connects the built environment, living conditions, and children's health to explain the trajectories of chronic diseases in the future.

The integration of tabular data with the network map confirms the dominance of demographic variables (Human, Female, Male, Aged) in the research, and the absence of focus on drugs and precise treatments, reflecting the field's shift toward preventive and population-based research (Population-based, Preventive & Epidemiological) that relies on social and economic factors as primary pathogenic factors.

Synthesis summary: The network reflects the field of "Life-course Epidemiology," which connects the onset of disease in childhood (Childhood obesity/Urban health), the pathological environment (Cardiovascular disease/Sex difference), and the outcomes associated with aging and mortality (Aged 80+/Mortality/Depression), all within an institutional and social framework that defines health disparities, emphasizing that chronic diseases are not sudden biological events but interconnected temporal and social processes.

DISCUSSION

In this study, we analyzed the scientific production related to the impact of demographic and social variables on chronic diseases within the Scopus database from 2000 to 2025 as a bibliometric study. The results showed that there is a qualitative shift in the approach to chronic diseases from a biological-clinical explanatory model to a

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multi-level socio-demographic model. Among the sociodemographic characteristics, it has been shown that aging, education level, socioeconomic status, and urbanization patterns have a direct and fundamental impact on the prevalence of chronic diseases. These results align with previous studies that confirm that age is no longer just a temporal variable but a life course during which opportunities and deprivations accumulate, and that education is a structural resource that protects against health risks, not just a superficial indicator. Additionally, the analysis revealed that income and urbanization disparities produce new patterns of exposure to health risks and inequality. This aligns with approaches that consider chronic illness not merely a biological phenomenon, but rather a product of a changing socio-economic context, where class structures and policies intertwine to perpetuate health disparities and the dual burden of disease.

It has also been found that studies with a joint focus on medicine and social sciences, specifically in journals like *Social Science and Medicine*, lead in production with very high impact and citation rates. This reflects that socioeconomic status (SES) has become treated as a central biological risk factor equivalent to traditional risk factors, where social and economic pressures transform into a cumulative physiological burden (Allostatic Load) that increases the likelihood of chronic diseases and weakened immunity with aging. These results are consistent with the literature, indicating that institutional and political factors, as well as inequalities in housing, employment, and access to healthcare, create specific pathways to chronic diseases. At the level of research networks, there has been a clear dominance of "Big Science" and reliance on hyper-authorship and multicohort studies that depend on large samples. This trend highlights the importance of integrating precise biological data (Genetics/Biomarkers) with demographic and social data to comprehensively understand the mechanisms of chronic diseases. Despite this development, the geographical distribution of scientific production has shown a clear Euro-American centrality, where the Global South often remains a source of raw data without active participation in leading theoretical analysis.

This study has some limitations. First, the analysis was limited to 68 peer-reviewed and open-access articles in English within the field of social sciences (SOCi) in the Scopus database, meaning that some important studies in other databases, or published in different languages, or within purely medical specialties, were not included. Secondly, the study focused on the quantitative bibliometric analysis of trends, networks, and indicators, without delving into an in-depth qualitative analysis of the content of each study. However, we conducted a comprehensive analysis of the research field trends, and our study is of great importance because we were able to identify the cognitive map and objective trends of how sociodemographic variables contribute to chronic diseases, which form a promising foundation for policymakers in developing integrated healthcare policies.

CONCLUSION

In order to effectively manage and prevent chronic diseases, the approach taken must be based on the socio-economic characteristics of patients to address the deep disparities associated with age, education, income, and spatial environment. Based on our results, we hypothesize that chronic diseases develop as a result of a multi-layered causal pathway; the process begins with stratified structures and institutional interests that produce unbalanced health policies, leading to disparities in exposure to social and economic pressures, which in turn transform into a physiological and cumulative burden that increases disease prevalence. Based on that, it is not sufficient to rely solely on biological or individual models; a comprehensive management approach is required that takes into account systemic adaptation difficulties, such as medication adherence and economic barriers for the elderly.

To achieve a qualitative leap in this field, it is essential to adopt the "Bio-Social Integration" model to enhance spatial and social epidemiology. This integration contributes to a deeper understanding of health disparities and calls for the engagement of researchers and institutions in research clusters and multinational networks capable of leveraging big data and longitudinal studies to link social pathways with biomarker indicators. Additionally, public health policies should realign their priorities to support preventive investments and address care inequalities, rather than overly focusing on expensive treatments. Enhancing research capacities in less fortunate geographical distributions and applying the outputs of integrated studies will undoubtedly lead to the establishment of effective public health systems that alleviate the burden of health inequalities and improve the quality of life for patients through personalized and evidence-based systems.

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