

Review

# Dynamics of Health Financing among the BRICS: A Literature Review

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**Abstract:** Despite economic progress, government efforts, and increased healthcare investments, health deprivation continues to persist in the countries of Brazil, Russia, India, China, and South Africa (BRICS). Hence, addressing the growing demand for health financing in a sustainable way and adopting unique approaches to healthcare provision is essential. This paper aims to review publications on the existing health financing systems in the BRICS countries, analyze the core challenges associated with health financing, and explore potential solutions for establishing a sustainable health financing system. This paper adhered to the PRISMA guidelines when conducting the keyword search and determining the criteria for article inclusion and exclusion. Relevant records were obtained from PubMed Central using nine keyword combinations. Bibliometrics analysis was carried out using R software (version 4.1.3), followed by a comprehensive manual narrative review of the records. BRICS countries experienced increased health expenditure due to aging populations, noncommunicable diseases, and medical advancements. The majority of this increased spending has come from out-of-pocket payments, which often lead to impoverishment. Due to limited fiscal capabilities, administrative difficulties, and inefficiency, providing comprehensive healthcare through public funding alone has become exceedingly difficult for these countries. Public-private partnerships are essential for achieving sustainable health financing and addressing challenges in healthcare provision.

**Keywords:** health expenditure; health spending; health financing; emerging markets; BRICS



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## 1. Introduction

Academia believes that the social and economic changes that will occur over the next 30 years will be characterized by the ‘Rise of Emerging Markets’, driven by the BRIC nations [1], which is the acronym for Brazil, Russia, India, and China. South Africa and the other BRIC countries comprise the much-discussed BRICS bloc. Emerging market economies such as the BRICS, which are the developing world’s flagship economies, have seen significant growth in their health spending and contribute to global health spending on a larger scale [2]. The rapid economic growth in these nations is largely responsible for increased health expenditure [3,4], so much so that the aggregated income elasticity of health expenditure equals that of high-income countries [5].

Government policies are one of the other reasons driving up health spending in these nations [6]. Each of the BRICS countries has experienced a period of geopolitical stability. Local governments have been successful in using societal welfare to increase access to and quality of healthcare through various means. Long-term neglect of rural communities, many of whom are poor, has now resulted in more determined policies to address these challenges [2].

In this context, health insurance coverage has improved significantly over the years through government efforts. The affordability of healthcare to ordinary individuals was expanding, but not quickly enough to keep up with the disproportionately high rise in out-of-pocket (OOP) spending [7]. Increasing OOP expenditure jeopardized the affordability of healthcare for impoverished people in these countries [8]. These countries face a lack of universal insurance coverage, and, in particular, the challenge of provision of just and equitable access to healthcare among the poor in both urban and rural communities.

A major portion of these societies' problems may be traced to poor resource allocation tactics in healthcare and inadequate and regressive health financing systems [9,10]. A regressive health financing system led by rising OOP expenditure also jeopardized the sustainability of the health financing system among BRICS. The financial sustainability challenges that these health systems face are primarily due to population aging, prosperity diseases or noncommunicable diseases (NCDs), and the advancement in medical treatment.

Health financing comprises much more than simply obtaining funds for health. It also depends on who is asked to pay and how [11]. Either general or specific taxation; mandatory or voluntary health insurance contributions; direct OOP payments; and donations can all be used to raise funds. Yet, with the rapid pace of industrialization, urbanization, and population aging, as well as economic development, the contradictions between the economy's downturn, a shortage of health resources, and the public's rising health requirements are becoming increasingly apparent. With COVID-19, the financial needs of these nations' healthcare sectors have risen [12,13]. Multinational organizations such as the WHO and IMF have been working hard to achieve this demand. Yet, the demand for immediate financial support in these developing nations exceeds the available funds [12,14]. Owing to their weak economic capacity to combat the health crisis, COVID-19 deaths were especially severe for these economies [15].

A lack of a financing strategy has frequently resulted in the wastage of scarce resources. Attempts have been made to reduce wasteful spending on overconsumption of care [16]. Health financing and related economic risk have emerged as critical concerns and strategies in discussions about SDG 3.8, which is achieving universal health coverage (UHC). Despite economic progress, continuous effort towards UHC, and increased healthcare spending, health deprivation persists in these countries [17]. Socioeconomic factors also play a role in these poor health outcomes [18–21]. While health finance demands were fast increasing, increased OOP expenditure and the resultant financial hardship were widespread across health systems. Nonetheless, each national health system has adopted a distinct approach to providing and paying for healthcare. Yet, there is little information and guidance regarding the health financing challenges that this bloc has experienced and the different alternative health financing tactics that they have used to address existing challenges.

The BRICS are becoming the focus of scholarly interest. Owing to their increasing economies, many policymakers regard the BRICS as a tool for transforming the global health scenario. A considerable amount of focus is now being paid to the bloc's health system and financing. Publications on these health systems have increased in the BRICS bloc, with China at the forefront [22]. Therefore, this current paper has focused on reviewing publications addressing the core challenges of health financing and the existing health financing systems and looking for potential solutions to a sustainable health financing system for the BRICS.

## 2. Database & Methods

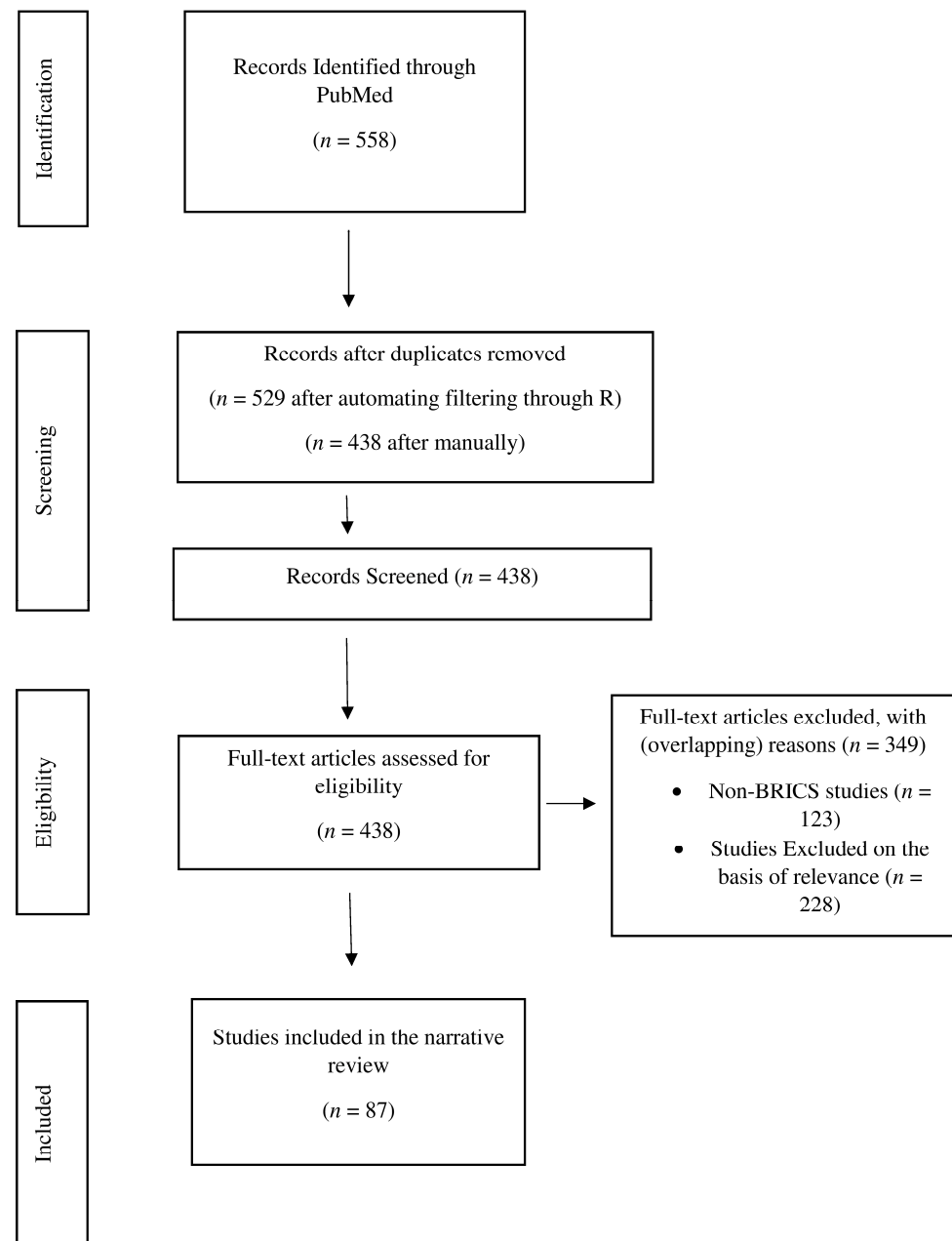
PubMed Central, the biggest database for health literature and a widely used source of literature, was used to obtain relevant records relating to health expenditure across the BRICS nations and to conduct a corresponding bibliometric analysis of those obtained records. Since the term 'BRICS' first became popular after 2010 [23], the term 'Emerging Markets' was used for the record search to include research on these nations that was published before 2010. To accommodate the variation in terminology, three versions of the word Health Finance were utilized, such as 'Health Expenditure', 'Health Spending',

and 'Health Financing'. All three terms were searched in several pairings with the phrases 'BRICS' and 'Emerging Markets'. Lastly, nine distinct keyword combinations were utilized to search documents in PMC's advanced search tool. The combined keywords are as follows: 'Health Expenditure AND BRICS', 'Health Expenditure AND Emerging Markets', 'Health Expenditure AND BRICS AND Emerging Markets', 'Health Spending AND BRICS', 'Health Spending AND Emerging Markets', 'Health Spending AND BRICS AND Emerging Markets', 'Health Financing AND BRICS', 'Health Financing AND Emerging Markets', and 'Health Financing AND BRICS AND Emerging Markets'. Database searches identified 558 entries covering the years from 1977 to 2023. To acquire only English records, the language filter was used for each search. The review process did not involve any filters for selecting record types. All types of records including books and documents, clinical trials, meta-analyses, randomized controlled trials, reviews, and systematic reviews were taken into consideration, ensuring a comprehensive and inclusive analysis. Records identified for each keyword search are given below in Table 1.

**Table 1.** Records identified and period covered per keyword search.

Sl. No.	Keywords Searched	Records Identified	Period Covered
1	Health Expenditure AND Emerging Markets	183	1977–2023
2	Health Spending AND Emerging Markets	121	1984–2023
3	Health Financing AND Emerging Markets	178	1981–2023
4	Health Expenditure AND BRICS	20	2012–2023
5	Health Spending AND BRICS	15	2010–2023
6	Health Financing AND BRICS	17	2012–2023
7	Health Expenditure AND BRICS AND Emerging Markets	7	2012–2023
8	Health Spending AND BRICS AND Emerging Markets	7	2015–2023
9	Health Financing AND BRICS AND Emerging Markets	10	2012–2023

The 'bibliometrix' and 'biblioshiny' commands in R software were used for bibliometric analysis. After auto-filtering duplicate data through bibliometric analysis, this study identified 529 results. After bibliometric analysis of the obtained records from the database, manual filtering and selection of records was performed through screening of record titles and abstracts to conduct a final narrative review and write review findings. Out of the 529 records, 91 duplicate records were dropped manually. Then, a total of 438 records were screened, and then the full text of the records was assessed for eligibility, out of which 123 records were excluded which were not related to the BRICS countries (i.e., individual country studies outside of BRICS). Additionally, 228 records were further excluded, as they pertained to scientific background studies, biological sciences, or other topics unrelated to the subject under consideration. Finally, 87 records were selected for the narrative review. The inclusion and exclusion criteria and the steps followed during the review process are given in Figure 1. The review process starting from records identification to writing the final draft was carried out from 30 January 2023 to 15 April 2023.



**Figure 1.** Flow Chart of Inclusion and Exclusion Criteria.

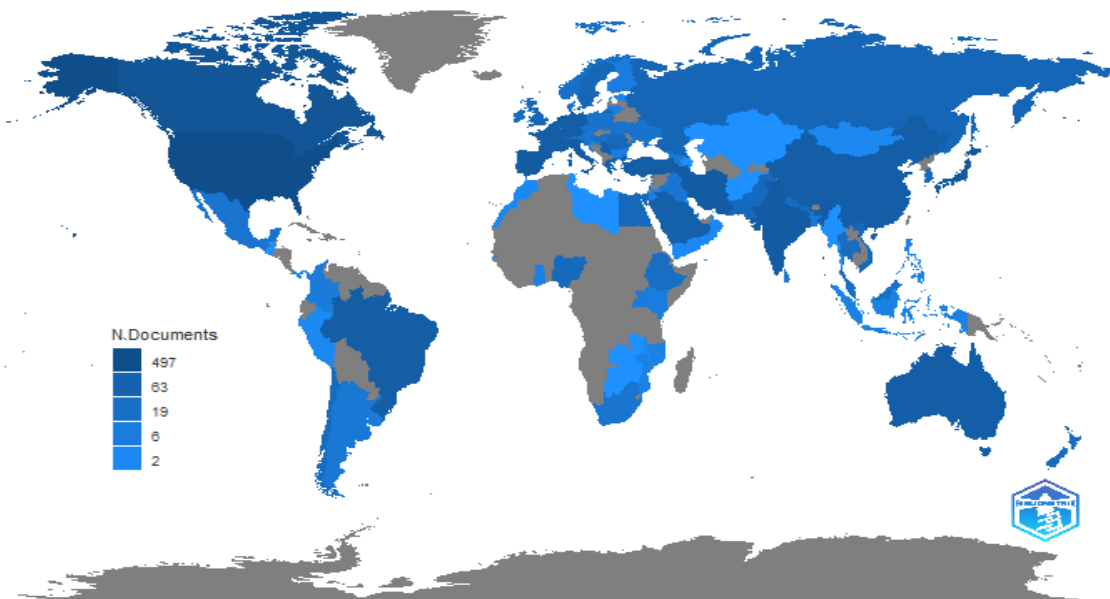
### 3. Literature Review

#### 3.1. Bibliometric Analysis

A bibliometric investigation was carried out to explore themes connected to health expenditure and the BRICS using graphical visualization and data record categorization.

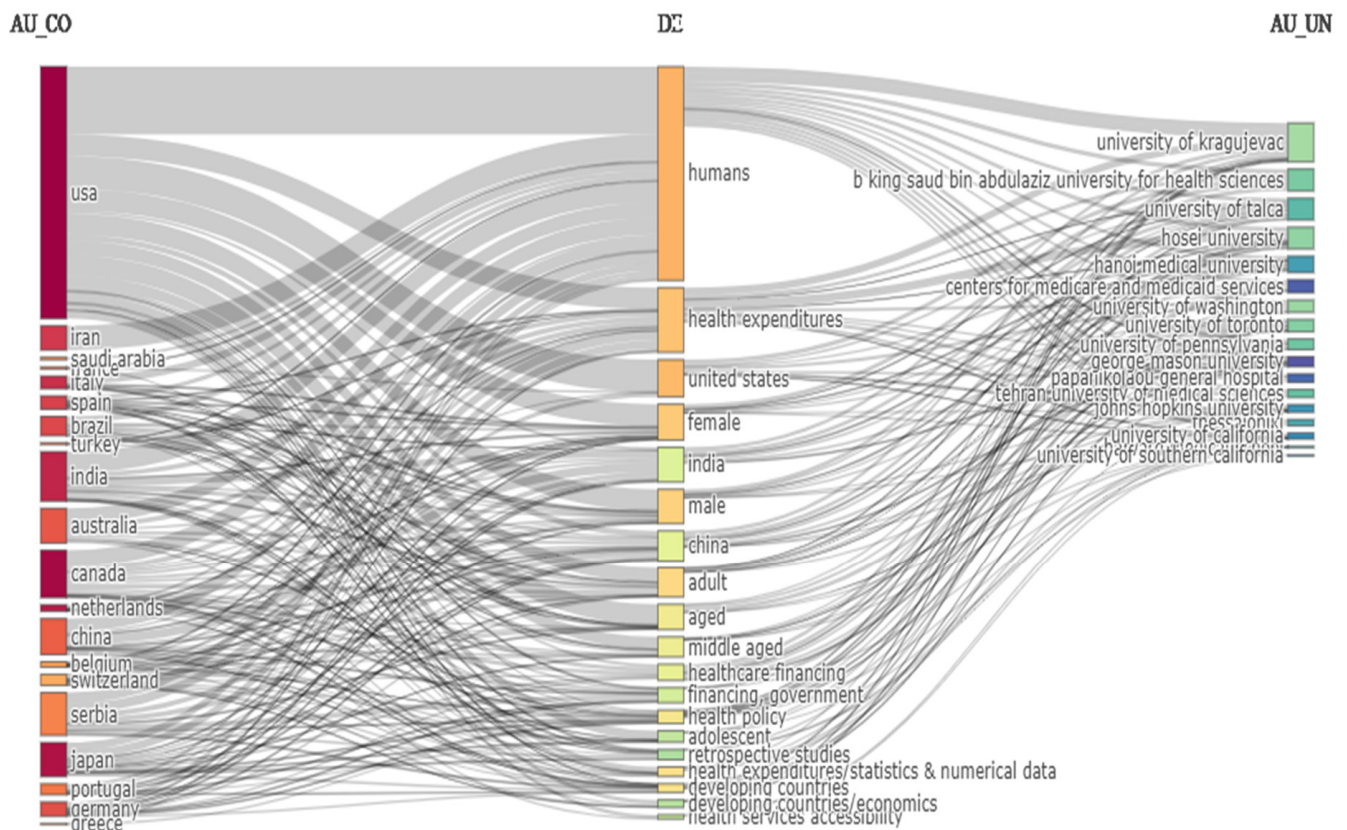
Figure 2 depicts the distribution of literature by country. The deeper the shade of blue, the greater the literature contribution. The map indicates that most of the literature is produced in North American nations, with the United States having the greatest publishing rate. In terms of scientific publications, Asia is second only to North America. Africa contributes the least to the literature. The number of records appearing in the visualization is higher than the number of records found in both the database search and the number of final records after filtering for duplicate and irrelevant records. This is due to collaborative work between the countries. One record can be co-produced by two countries that will be represented in the visualization.

## Country Scientific Production



**Figure 2.** Country Scientific Production Map.

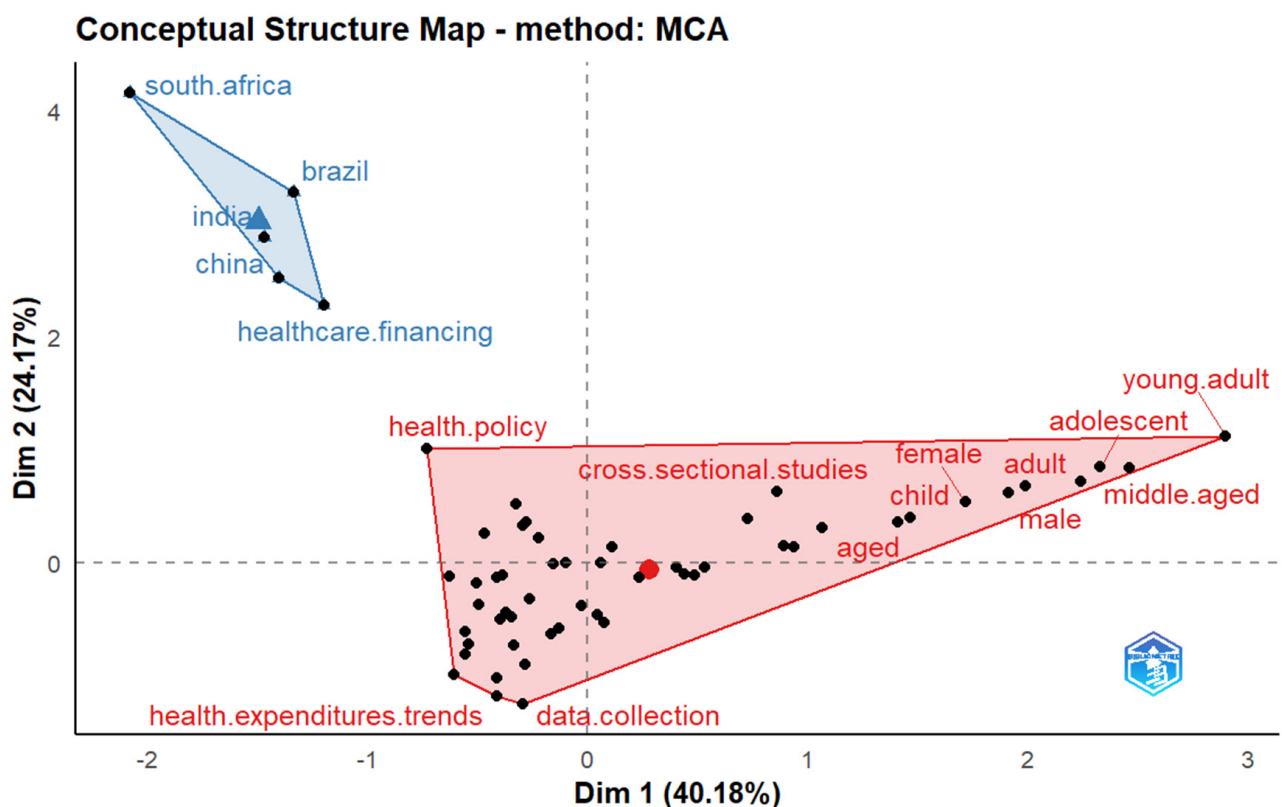
Figure 3 illustrates a multi-field plot displaying the top 20 countries, keywords, and affiliations. Countries are given on the left, keywords in the center, and affiliations on the right-side panel of the three-field plot.



**Figure 3.** Bibliometric analysis—three-field plot: countries on the left, keywords in the center, and affiliations on the right.

It is evident from the plot (Figure 3) that several key keywords are highly relevant to the topic under review. Specifically, the keywords ‘Health Expenditures’, ‘India’, ‘China’, ‘Healthcare Financing’, ‘Health Policy’, ‘Health Expenditures/Statistics & Numerical Data’, ‘Developing Countries’, ‘Developing Countries/Economies’, and ‘Health Service Accessibility’ all feature prominently and hold significance in the context of this study. Notably, the term ‘BRICS’ is noticeably absent from the represented keywords, however, the only related member countries represented in the keywords are India and China.

Based on the data in Figure 3, the United States (USA) stands out as a significant contributor nation to almost all of the top 20 keywords found from the records. Following the USA, Serbia, India, Canada, Australia, and China are also noteworthy contributors to keyword publications. Among these countries, the USA has the highest contribution to the keyword category “human”, with other countries also making substantial contributions. Additionally, when examining the relationship between countries and affiliations, it is evident that the USA’s contribution to the keyword “human” is distributed quite evenly across various affiliations. Moreover, it is worth noting that out of the BRICS countries, only Brazil, China, and India are listed as having generated records related to the top 20 keywords identified in the dataset. Notably, Russia and South Africa, which are also BRICS member countries, are absent from this list. To analyze the existing data records with a diverse bibliometric approach, we used the factorial analysis presented in Figure 4.



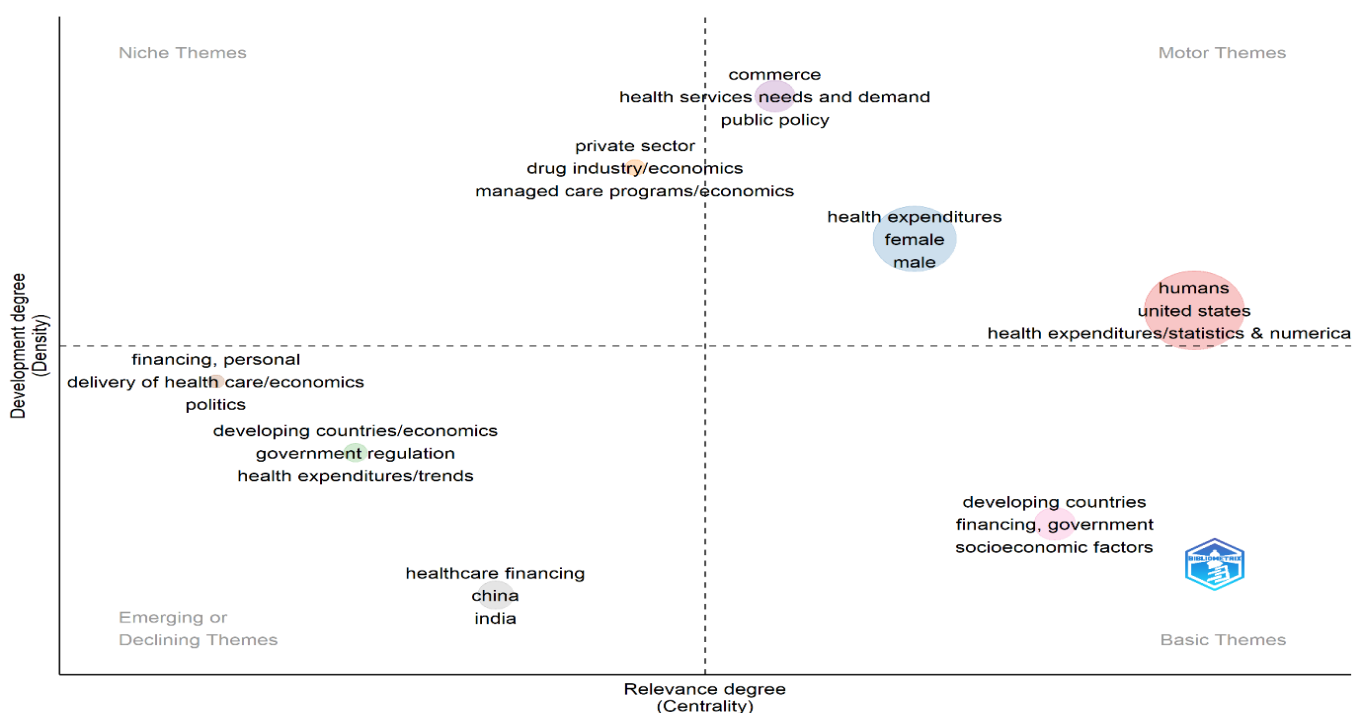
**Figure 4.** Bibliometric conceptual structure map-factorial analysis.

Figure 4 illustrates the conceptual structure map of the keywords. The map follows multiple correspondence analysis (MCA) of the keywords. By summarising large amounts of data with several variables in a low-dimensional space, a multiple correspondence analysis generates a two-dimensional map. In the two-dimensional map, plane distance is used to indicate the similarity of the keywords. Keywords towards the center suggest that they have garnered a lot of attention in recent years, while those on the outer edges indicate that they have been used less in this study or were incorporated into other themes.

The findings are interpreted based on the relative placements of the points and their distribution along the dimensions; the closer words appear on the map, the more similar

their distribution is. There are primarily two research clusters that emerge from the MCA. Cluster 1 (red) is the most important, with 12 keywords focusing on publications about health policy, cross-sectional studies, female, child, adult, aged, male, middle-aged, adolescent, young-adult, data collection, and health expenditure trends. Publications in Cluster 2 (blue) has five keywords, which include healthcare financing, Brazil, India, China, and South Africa. Even though Russia is not included in that cluster, and BRICS as a whole does not appear as a keyword within the cluster, the second cluster is more closely related to the BRICS. The present review is interested in this smaller blue cluster. The term 'Health Expenditure' is mentioned in the red cluster but not in the BRICS country cluster. This implies that, while there are very few related research papers on BRICS and health expenditure, the research community is actively exploring these themes in conjunction with individual BRICS countries.

Figure 5 presents a thematic map of the keywords. The thematic map falls under co-word analysis, which creates keyword clusters. They are called themes, and their density and centrality may be used to classify and map themes in a two-dimensional diagram. A thematic map is a simple layout that allows us to analyze topics based on the quadrant in which they are placed: (1) the upper-right quadrant: motor themes; (2) the lower-right quadrant: basic themes; (3) the lower-left quadrant: developing or vanishing themes; and (4) upper-left quadrant: extremely specialized/niche themes. Figure 5 shows that healthcare financing, China, and India are the emerging themes, indicating the significance of studying healthcare financing in these countries, along with other emerging market economies.



**Figure 5.** Thematic Map.

This map aids in understanding the social structures of authors as well as the countries to which they belong.

Figure 6 illustrates the collaboration between countries in generating the records, presented in two distinct clusters: the blue and red clusters. The blue cluster is specifically relevant to the topic under review, indicating the collaboration among USA, Japan, Serbia, Canada, and India in producing the records. Notably, the partnership between the USA and Japan emerges as the most significant collaboration within this cluster.

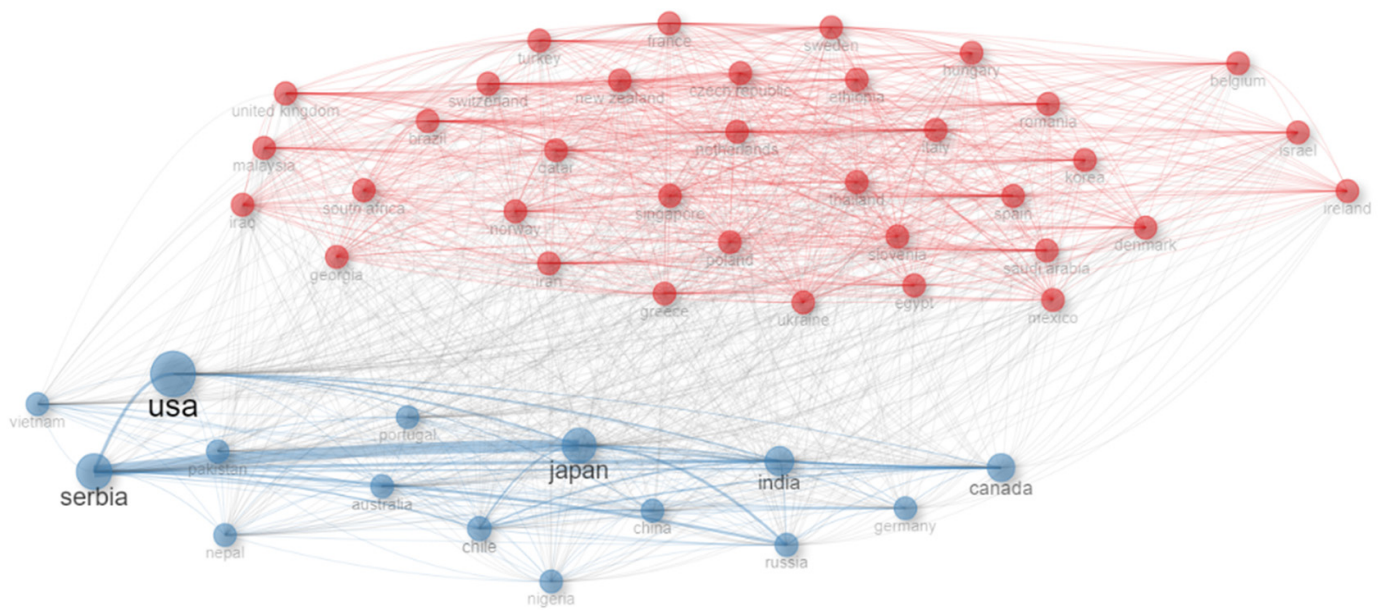


Figure 6. Collaboration Network.

Figure 7 depicts the annual scientific production of records. The vertical axis on the left represents the number of articles published, while the horizontal axis represents the years-1977–2023. The chart shows that output has grown dramatically in recent years.

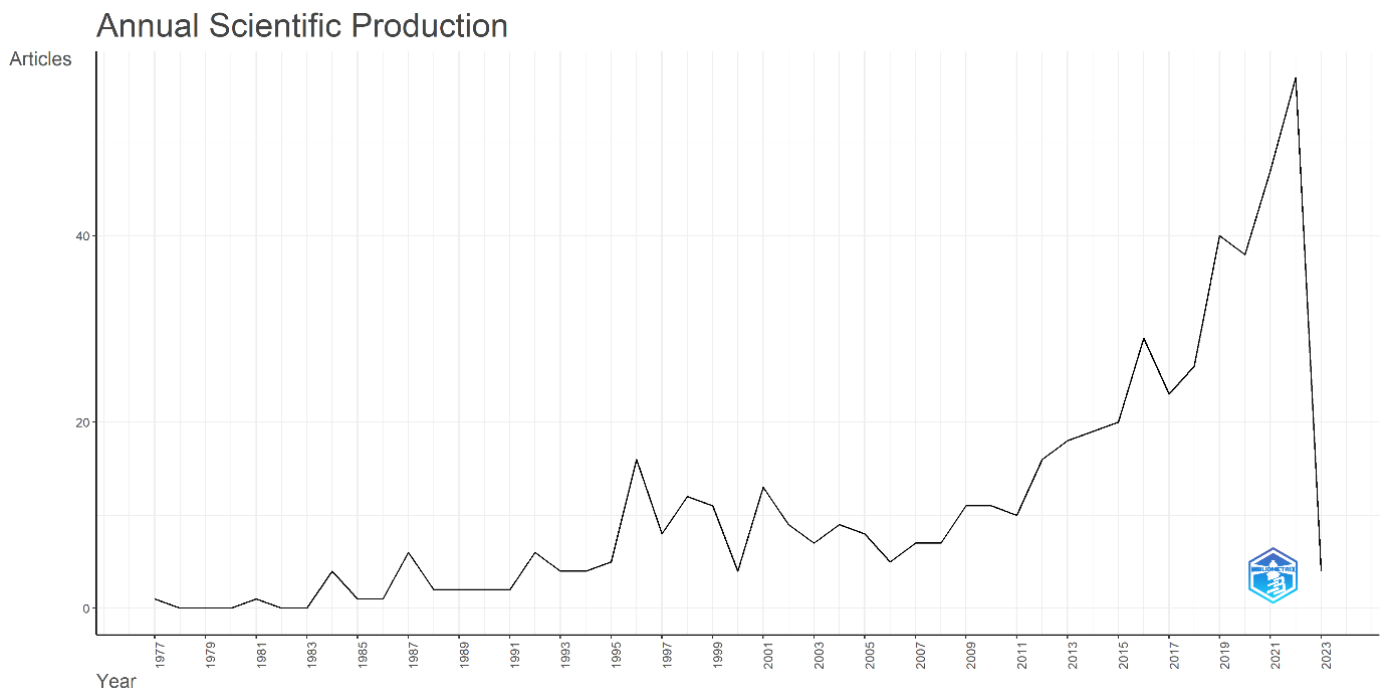


Figure 7. Annual Scientific Production.

Figure 8 shows the tree map of the keywords. Health expenditure, Healthcare Financing, Developing Countries, China, and India appear significantly in the records. However, neither the term BRICS nor emerging markets appear on the tree map.



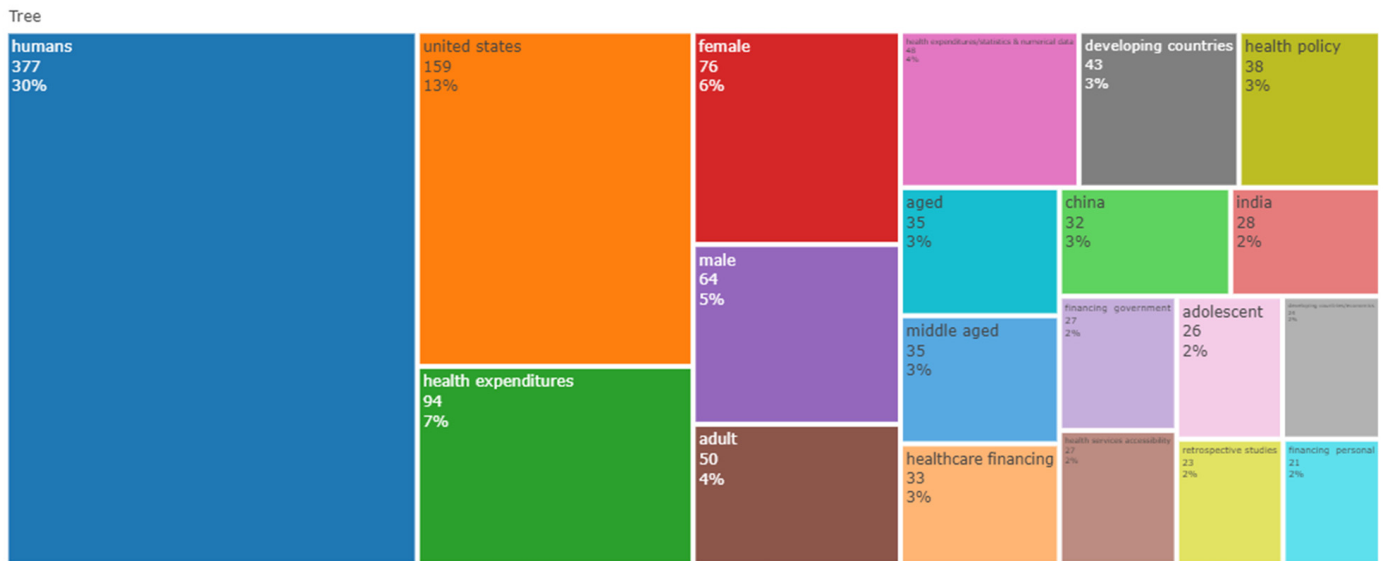


Figure 8. Tree Map.

Figure 9 shows the most relevant 20 sources or journals. A major contribution came from *Frontiers in Public Health*, which contributed 25 records. *Frontiers in Public Health* is followed by the *Journal of Medical Economics* contributing 20 records and *Health Affairs* contributing 17 records.

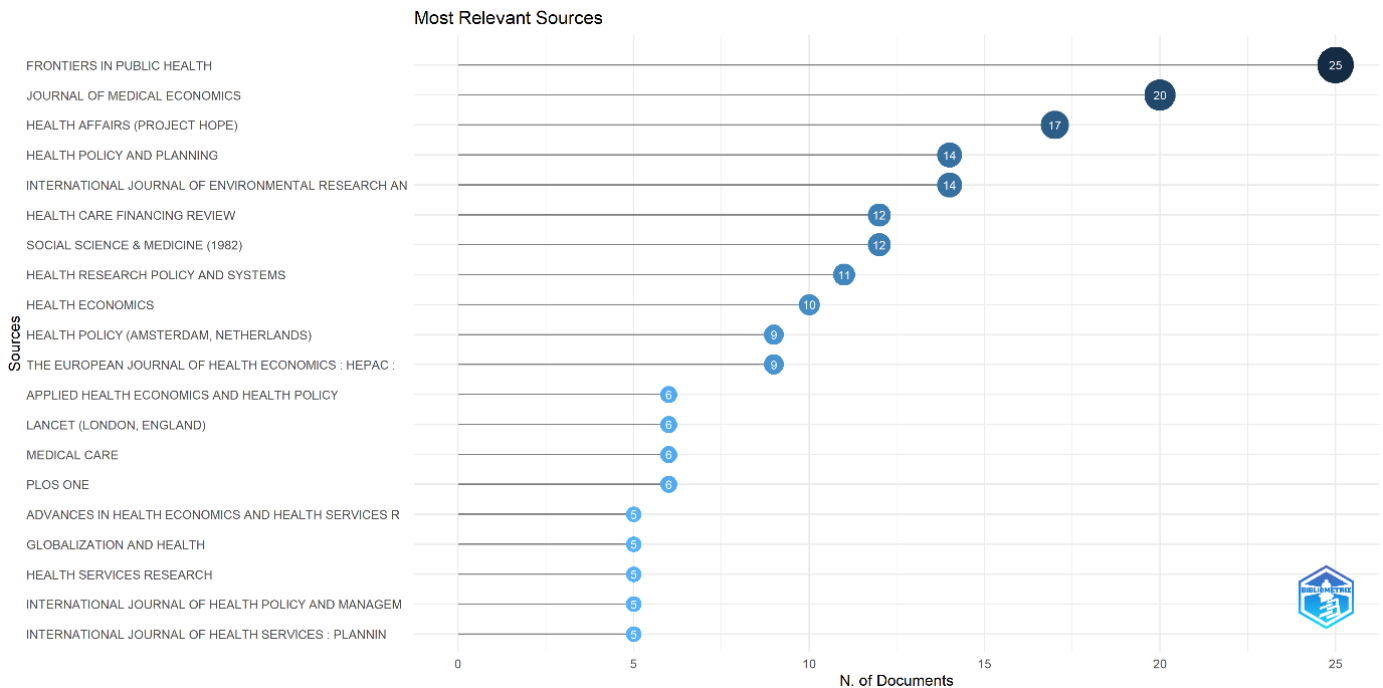


Figure 9. Most Relevant Sources.

Figure 10 shows the most relevant twenty authors for the records. The majority of the contribution came from Jakovljevic M, who authored the highest 52 records. He is followed by Ogura S, who authored 20 records, and Chattu K is in third place by authoring 17 records.

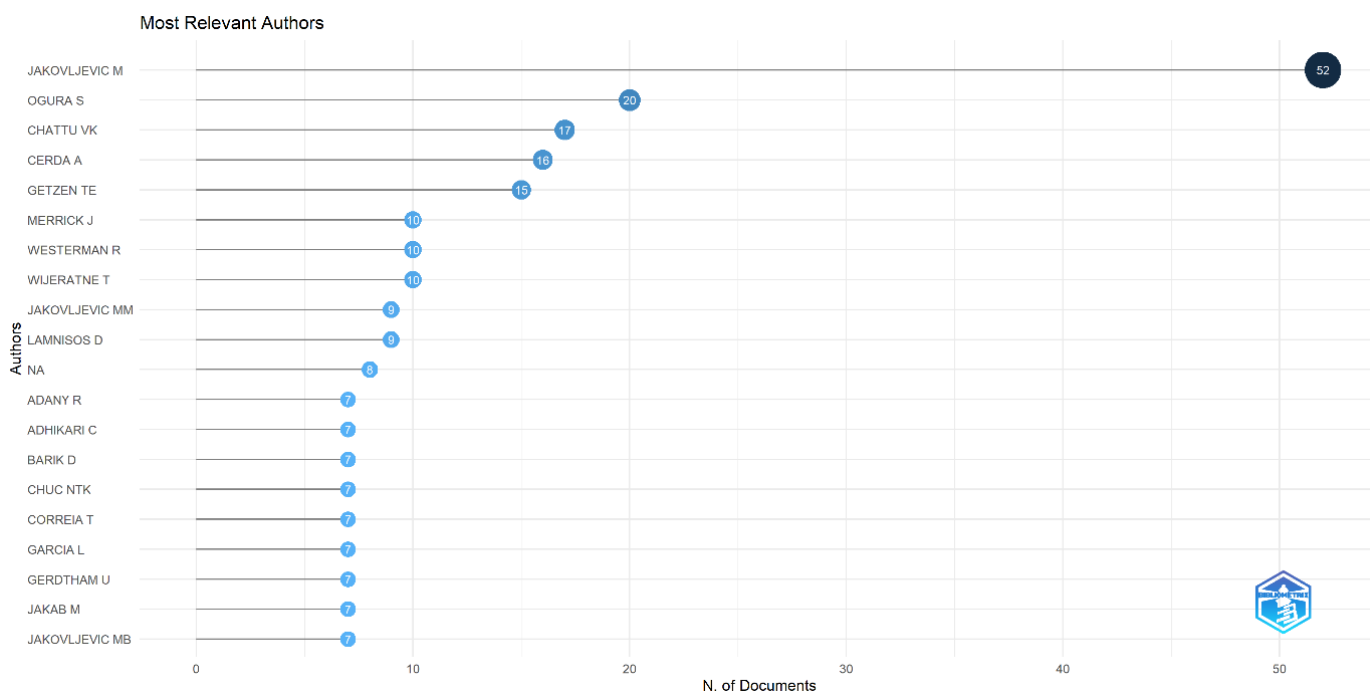


Figure 10. Most Relevant Authors.

Figure 11 shows the most relevant 20 affiliations from the obtained records. The University of Washington tops the contribution by being associated with the highest 48 publications. The second position is acquired by the University of Kragujevac, which is associated with 42 records and the third rank is taken by the University of Toronto, by being associated with 31 records.

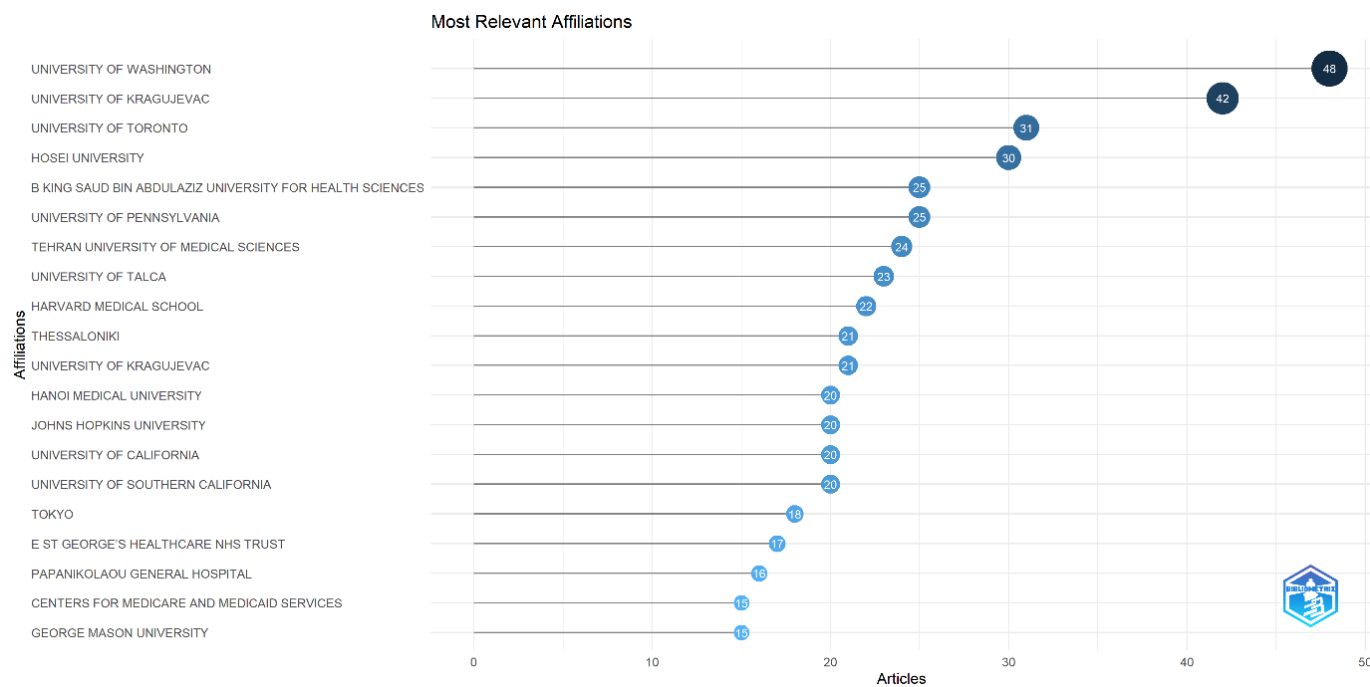


Figure 11. Most Relevant Affiliations.

### 3.2. Narrative Review

#### 3.2.1. Rising Health Spending among BRICS and the Contributing Factors

The BRICS' proportion of global health spending has been continuously increasing. If the current global economic trend holds, the BRICS per capita will most likely equal or exceed the Organization for Economic Cooperation and Development (OECD) average in the coming decades [8]. In terms of purchasing power parity, all BRICS countries show a long-term trend of increasing per capita spending. Despite the growth in spending, inadequate healthcare systems and cost-effective allocation of scarce resources continue to be a major concern for these countries [24–26]. Together with rising income in these nations, other major factors contributing to rising healthcare spending include population aging, rising NCDs, and advances in medical treatments [22,27–31].

##### 1. Population Aging

People began living longer as their life expectancy grew due to the bloc's economic prosperity. This, however, came at a cost. The BRICS major economies are now confronted with the impending challenge of population aging. An issue that was previously exclusive to established high-income nations has become a prominent subject in the memos of public health policymakers in BRICS [32]. Both India and China are dealing with the issue of population aging. While China's population is at an advanced stage of aging, India's problem is still approaching because its population is still fairly young. China has the world's largest elderly population; attaining healthy aging is essential for China to realize the benefits of greater longevity while also reducing possible economic and social burdens associated with fast population aging [33]. The Chinese constitution states that society and families have a responsibility to take care of their elderly. These laws are enforced to implement the principles of providing older people with assistance, healthcare, entertainment, education, and prospects for progress [34,35]. In contrast to China, India has no such legal provision for its elderly. Family-based care is used to care for the elderly. The social and demographic changes occurring in these countries necessitate the development of substitutes for family-based care and the assistance of families in caring for their elderly members; to that end, such prospects of elderly care in these countries are dependent on the government's commitment and ability to meet the issues of deficient financial investment, low-quality and inadequate provision of healthcare, and poor monitoring of healthcare standards [34,35]. Achieving such a target will put pressure on the health financing capacities of these nations as the charitable sector for elderly care is underdeveloped.

##### 2. Rising Noncommunicable Diseases

The BRICS already suffer from a high disease burden [18]. In these countries, infectious disease and injury continue to bear a huge percentage of the health burden [36]. The socioeconomic characteristics of these countries play a major role in their poor health outcomes [19,20,22,37,38]. Consider South Africa, which, like other African nations, faces a massive disease burden caused in part by poverty, gender disparities, natural calamities, wars, climate change, and inadequate health systems. In this area, the unfinished public health agenda for mother and child health, HIV/AIDS, tuberculosis (TB), and malaria, as well as neglected tropical diseases (NTDs), need massive health finance and promotion [29].

While the burden of infectious diseases is still challenging to handle for these countries, the incidence and intensity of NCDs are increasing as life expectancy is increasing and the proportion of the older population is growing [39]. NCDs have been on the rise in these countries over the last few decades and represent a significant healthcare concern [40]. NCDs are an economic burden on these countries, increasing their health expenditure. It is projected that NCDs will further dominate the disease profile in developing countries [41]. As a result, a major reallocation of funding is now required in the future to successfully support the treatment and management of these chronic diseases. As a result of the changing disease profile, chronic disease management strategy is gradually replacing acute care in these developing nations. Such a substantial shift in healthcare demand has

some serious economic consequences and necessitates a thorough re-configuration and re-shaping of the health finance mechanisms in BRICS.

In this context, significant challenges are anticipated for these countries as healthcare infrastructure is still predominantly driven by the communicable disease model, and long-term continued healthcare is required for the treatment and management of NCDs, which is at odds with the OOP payment models common in these low–middle income countries (LMICs), posing serious challenges. This shift in healthcare demand is likely to push these emerging countries deeper into poverty. Given the major determinants underpinning NCDs, such as insecure employment and income inequality, unhealthy commercial industries (UCI) providing alcohol, tobacco, and low-nutrient foods require special attention. NCDs must be reframed as the result of a complicated system that includes UCIs. Tobacco-related morbidity and death will have a terrible impact not just on health, but also on the development and economic progress of these countries. In addition to the misery and loss of life, there are far-reaching social and financial consequences as breadwinners succumb to tobacco-related ailments, continuing the poverty cycle. Health expenditure for many illnesses, especially prolonged and expensive treatment, quickly deplete household finances and force families into poverty in low-resource settings [42]. Yet, because of changing health systems and a focus on acute disease, tackling NCDs in these LMICs is difficult [43].

### 3. Advancement in Medical Treatment

Medical treatment has evolved to be technologically advanced in developing countries through the growth of information, communication technology (ICT), and health technology assessment research [44,45]. The pharmaceutical sector deserves much credit for the advancements in medical treatment in BRICS [2]. Throughout the last few decades, governmental policies, global trends, and local economic growth have fostered innovation and expansion within the domestic biopharmaceutical firms in Brazil, India, China, and South Africa (BICS) [27,46]. As a result of this expansion and innovation, several emerging-market firms are now able to participate and compete successfully in world markets rather than serving solely as vendors, suppliers, and outsourcers to multinational pharmaceutical corporations from developed countries. Growth in the pharmaceutical sector of these four emerging nations continues to surpass that of developed countries, and a major credit of this growth can be attributed to government policies. Thus far, the public policies related to the pharmaceutical industry in both Brazil and South Africa have mostly concentrated on import substitution and cutting the cost of healthcare supplies for the residents. In contrast, both India and China intend to foster an innovative environment and a flourishing bio-economy, with bigger goals for sector exporting.

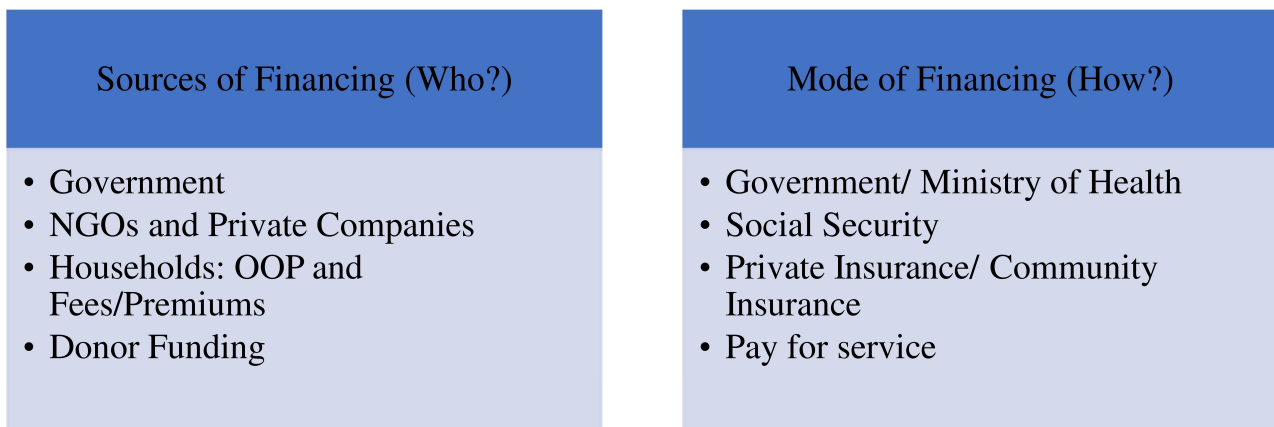
While the rise of the BRICS pharmaceutical industry has given a worldwide reputation and economic success, it has also raised healthcare costs, which has contributed to the inability of the poor in these nations to get necessary medications [47]. Goal 3.8 of the Sustainable Development Goals, which consists of the UHC target, also includes providing a consistent and resilient supply of vital medicines and vaccines. This necessitates a long-term health financing system as well as measures to promote equal and universal access for vulnerable and underserved groups in society [48]. Various national reforms have aimed at improving access to these vital medicines and vaccines through cost containment [49]. Drug reform in China includes specialized tactics to ensure access to, the quality of, and affordability of the most commonly used medicines at primary healthcare centers. The focus on critical medicines has been extended through the categorized pricing strategy, which has established distinct methods for various products [50,51]. Countries are currently attempting to standardize their traditional medication system, which is inexpensive, to address the unaffordability of medical treatment resulting from buying modern medicine. With the efforts of the government and biotech companies, China is standardizing its Traditional Chinese Medicine (TCM) for contemporary usage [27,52]. India, like China, has various traditional medication systems, including Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH). The present government is attempting to standardize

its usage and tackle drug price-driven medical unaffordability, and a separate ministry has been established for this purpose.

### 3.2.2. Existing Health Financing System

SDG 3.8 aspires to achieve universal health coverage (UHC) by 2030. The majority of developing nations are attempting to attain UHC through various means. The establishment of institutions for UHC implementation was primarily based on available infrastructure, with components of the infrastructure requiring accommodation in the total health expenditure for incremental progress toward UHC [53]. Existing health financing systems, such as federal systems, user fees, and pre-existing insurance schemes are a significant part of the infrastructure required to implement UHC [54].

Developing UHC in these low-resource contexts is concerned with an adequate health financing system or strategic spending. Health financing entails far more than simply obtaining funds for health. It is also a question of who is expected to pay and how. Figure 12 depicts a general health finance structure. Funds can be raised from the general government, non-governmental organizations (NGOs), private companies, households, and from donor financing. Government finance, which gathers resources by imposing taxes (either general or specific); either mandatory or voluntary health insurance contributions towards social security; and direct OOP payments towards pay for service are the major means of financing [11].



**Figure 12.** Health Financing Structure.

However, in most Western countries, general taxes and social security are used to finance healthcare. The United Kingdom and some Northern European nations, such as Sweden, Finland, and Norway, use general taxation as the primary source of health financing; Germany, France, and Belgium use social insurance as the primary source of health financing. Nevertheless, direct OOP payment for healthcare cannot be neglected in health financing in the BRICS. Increasing OOP expenditures across the BRICS nations are jeopardizing the affordability of medical treatment for poor populations, as is a low public expenditure in healthcare as a percentage of GDP [17,22,29]. Furthermore, paying for these services OOP increases the risk of economic distress and could drive concerned households into poverty [55].

Risk-pooling systems, such as a tax-financed national healthcare service system, compulsory social health insurance schemes, for-profit voluntary private insurance schemes, community-based health insurance schemes, and prepayment schemes, are intended to equalize and smoothen the costs of obtaining healthcare. Financial techniques corresponding to risk-pooling nature are frequently recommended in efforts to establish affordable UHC because they provide more inclusive access to necessary healthcare than OOP payments. Evolving health financing systems in developing countries lag in terms of providing access to all healthcare services such as maternal care [56]. Including the financial coverage

of those healthcare services in the healthcare package requires the government's attention, including government monitoring and necessary restrictions. These enabling factors mentioned can contribute to the continuing discussion over UHC. The primary goal of a health financing scheme is to reduce economic barriers that individuals experience at the time of healthcare service delivery to reduce any risk in the context of unforeseen health crises. In this framework, financial risk protection against unforeseeable health-related emergencies is a major policy concern.

### 3.2.3. Public Financing of the Health System

The BRICS have varying levels of economic growth. The Russian Federation, for example, has a per capita GDP that is nearly seven times that of India. Although the BRICS' health reforms are distinct, particularly in terms of the health system concerns that they have sought to address, they had a major and shared goal in their earlier reforms: strengthening the government's role in health and, in particular, in financing healthcare [57]. The BRICS' history of healthcare reform has always emphasized the role of government in healthcare provision, equitable access to services, and financial security [58,59], believing that a market-oriented approach to a social welfare sector like health would increase inequality [58]. The government serves the following tasks in these nations' contemporary healthcare systems: (i) coordination, management-coordination and management of the overall health system requires sufficient resources, including financial, manpower, time, and space; (ii) implementing innovative health financing policy opportunities to warrant that health-promoting activities have sufficient funding to attain UHC; (iii) using pieces of evidence from the health promotion research outcomes to advise health policies and strategies; and (iv) encouraging community participation during healthcare program development [29,60,61]. In an emergency, the government can also act as a regulator, as governments around the world did during COVID-19 by allocating essential medicines, carrying out mass vaccination, and in an emergency response to the pandemic, some countries rapidly bolstered their workforce by training community-based outreach workers, contact tracers, and paramedics, allowing new graduates to begin direct practice while encouraging retired health workers to return to practice [61].

The role of the government in financing healthcare in these countries is critical, and the national governments of the respective countries are increasing their health spending to tackle diseases and improve health outcomes [62]. Rao et al. [57] discussed the role of government in health financing and available public health financing systems across BRICS.

*Brazil:* The Unified Health System, or Sistema Unico de Suade in Brazil, is a single publicly sponsored system that serves the whole population and is financed through general taxes. Healthcare is provided at no cost at the point of use. Each level of the government is required by the constitution to earmark a minimum share of its resources for health.

*Russia:* In the Russian Federation, reforms established a compulsory health insurance system. Under this system, payroll taxation is utilized as a supplementary source to a healthcare system that is primarily funded by general taxes. Subnational insurance schemes pool payroll tax funds and healthcare services are purchased through insurance companies.

*India:* The Indian reforms increased the government's participation in health by expanding public sector funding—through the National Rural Health Mission, with a focus on primary care—and by providing government-sponsored insurance for the poor. For the poor, government insurance policies finance hospital care at empaneled private as well as public facilities.

*China:* The health reforms in China constituted a significant departure from the traditional system of healthcare by establishing a prominent role for the government in the health sector. One goal was to transition away from using patients as a source of funding. The changes aimed to improve primary care services and expand insurance coverage.

*South Africa:* South Africa's National Health Insurance Fund is supported by taxes and should ensure that high-quality healthcare is provided to all residents through active

purchases. The purchasing power of the fund should allow the government to tap into human resources in both the public and private health sectors.

Earlier, it was believed that a predominance of public finance was an essential requirement for achieving UHC. To minimize medical illness-induced poverty, various government-sponsored micro health insurance (MHI) schemes have evolved as health financing mechanisms [63]. However, government financing of healthcare is not without constraints. A significant result of this arrangement is a lack of understanding of equitable resource allocation/equal access to coverage [64,65], resource implications of allocation and consumption decisions, and a failure to use explicit efficiency criteria in making such decisions [66]. Evidence of wasteful healthcare consumption and expense has been observed under publicly sponsored health coverage schemes [16]. Another limitation associated with government finance is excessive fragmentation of financing—within the health sector, between sectors, and across levels of government—which is a barrier to the effective delivery of timely healthcare to people. Responding to fragmentation necessitates the development of a delivery strategy, followed by the alignment of budgetary procedures, and the development of consistent priorities across sectors and levels of government [67]. It should also be highlighted that the formulation and implementation of health-promoting initiatives and healthy public policies in government monopolies occur within the context of a highly disintegrated and bureaucratic state administration with a largely competitive attitude across divisions. A strategic policy addressing social determinants is also lacking.

Developing healthy multi-sectoral public health policy necessitates political decisions at the highest levels of government [68]. The BRICS leaders reaffirmed at the 2011 summit in Beijing, China, that public health is an integral component of social and economic growth and should be reflected in national and international policy. They also decided to create and promote a global health agenda to provide universal availability of affordable medicines and health necessities [69]. Yet, health issues were conspicuously excluded from intra-BRICS discussions and communiqués, except for the Delhi communiqué in January, which specified numerous priority areas for the nations, including noncommunicable diseases, mental disorders, multidrug-resistant tuberculosis, malaria, and HIV/AIDS. Unfortunately, the communiqué has been missing from intra-BRICS engagements. This absence is unfortunate given the enormous health concerns that these emerging nations face [70].

#### 3.2.4. Private Financing of the Health System

Health system researchers are divided on whether government financing of health in developing countries is suitable. However, there is an almost universal consensus that competitive and private provision of healthcare may be impractical in developing countries due to a lack of resources as well as health necessities [71]. However, in recent years, the importance of the private sector in healthcare has grown, both in terms of demand for services [72] and delivery of care, and the size of government financing of health has been exceeded by private spending. The decline in the grants from the central governments to the states for disease control and overall public health programs has been felt as a result of structural and organizational adjustments in the Indian healthcare sector. This decrease in central grants to states has had a bigger impact on the poorer states, which are finding it challenging to mobilize their local resources to make up for the revenue loss. Considering the current and continuous pace of reforms, the probability of increased government spending on healthcare is limited shortly. As a result, increased investment in the hospital industry by non-resident citizens and private multinational companies is fueling corporatization in BRICS's health systems and attempting to capitalize on the commercial potential of their health insurance markets.

The government's readiness to embrace private participation in this bloc is reflected in policy reactions to private initiatives, which include measures and strategies to draw private sector participation and manage inputs into primary healthcare centers (PHCs), privatization or semi-privatization of the public healthcare facilities such as the provision

of non-clinical services in public facilities, innovative ways to finance public healthcare facilities through tax incentives, and other non-budgetary measures [73,74].

Despite the potential newly developing atmosphere, market forces have limitations; suitable modification in the government's role should be undertaken to minimize unwanted results such as rising costs, increased discrimination and inequity, and consumer exploitation [75,76]. The increasing dominance of the private sector has also raised the cost of health education and training, making it inaccessible and unaffordable, limiting the availability of the health workforce [77]. In a resource-constrained environment, expenditure in the health sector should better reflect needs, particularly during and after events such as COVID-19, and might be increased by leveraging synergies across sectors [78]. Faced with such resource constraints, LMICs, notably the BRICS, are poised to build a new, more resource-effective model of innovation that holds enormous promise for tackling global health needs [79].

### 3.2.5. PPP as a Potential Solution

Several researchers have provided varying perspectives on the best health financing strategy for LMICs. Chernichovsky [71] proposed public funding, while other studies were inconclusive on the suitability of either public or private financing of health [80]. In notable LMICs such as BRICS, the role of private players in reaching health targets has long been contested, beginning with contracting out healthcare services to integrating public and private funding [81]. Financing healthcare entirely through the private sector can be regressive and have a detrimental influence on healthcare access.

Public-private partnerships (PPP) can play an important role in decreasing the public sector's financial burden and lead to creative and sustainable financing [82,83]. Evidence of such good and effective PPP practices is already in place [84]. Recently, increased attempts have been made to carry out effective PPPs in the healthcare sector, particularly in the provision of insurance coverage. Various state governments in India have collaborated with the private sector to increase people's access to hospital treatment through a variety of government-sponsored health insurance programs with varying specifications and appear to have benefited in terms of improved access to and affordability of care [85].

Despite instances of PPP good practices, the conflict for bureaucratic control and authority over resources between insurance companies, insurance funds, and local health administrators is probably one of the causes for the complexity and uncertain legality surrounding various insurance programs in these nations.

- (i) Given their nature as commercial and profitmaking entities, insurance companies are concerned with maintaining a consistent financing source from insurance funds, lowering the magnitude of pay-outs to healthcare institutions and physicians, and, as a result, exerting strong control over the type and volume of healthcare services delivered by their contracted providers.
- (ii) Local funds and their affiliates want to raise the amounts set aside for payment purposes to insurers (or to the providers, in cases where these funds act as the direct insurers). As a result, in many cases, the funds kept a considerable amount of the money they received and invested it in various financial instruments such as stocks.
- (iii) Both the central and provincial health administrations lost a significant amount of bureaucratic turf when resources and responsibility for health finance were moved to insurance companies and funds. Government health authorities have frequently sought (sometimes successfully) to withhold employees' insurance funds and utilize them to meet the shortfall in the state budget areas wholly distinct and unrelated to healthcare [86].

To provide appropriate and sustainable health finance in these developing countries, risk equalization schemes such as health insurance programs in a PPP mode are required. Risk-equalizing financing through cooperation between public and private entities provides the following advantages: (i) revenue collection: income-related contributions and tax-funded revenue might be integrated into one stream and characterized as a National



Health Insurance Contribution system; (ii) pooling of resources: because such schemes would act as a central pool reducing fragmentation of health financing and insurance coverage as risk-adjusted amounts would flow to each healthcare scheme and there would be residual pooling within each scheme, the pooling function of all healthcare schemes would be decreased; (iii) strategic purchasing: implementing risk equalization through PPP should have an impact on the purchasing functions since schemes will be incentivized to compete more based on cost-effective healthcare service delivery and less on risk selection. Healthcare schemes would be facilitated to become more strategic consumers of healthcare, i.e., need-based purchasing of healthcare services to prevent wastage in low-resource contexts [87,88]. Nevertheless, these strategies will be successful only if outcomes are continuously monitored through benchmarking and the identification of best practices [89,90].

This present study holds noteworthy implications for policy-making as it offers valuable insights into the state and extent of the health financing system within BRICS. As a group of emerging economies with constrained fiscal capacities, this study proposes PPP as a potential and cost-effective solution to the health financing challenges in BRICS.

### 3.3. Conclusions

While the concept of sustainability primarily originated from Western countries, its significance has been steadily gaining momentum in the developing world in recent times [91]. In light of the limited fiscal capacity and prevailing public health challenges in developing countries, the current review attempted to identify the major challenges of health financing, and the existing health financing systems, and discussed potential solutions for a sustainable health financing system for the BRICS. In conclusion, this paper emphasizes the significance of collaborative efforts, particularly through PPPs, to overcome the complexities surrounding health financing and ensure a more equitable and sustainable healthcare system for the BRICS nations.

The rise in health expenditure within the BRICS countries, primarily driven by out-of-pocket expenses, has raised concerns due to its impoverishing nature. Addressing this issue requires a multifaceted approach, involving a complex set of initiatives that necessitate cooperation among various sectors and divisions of the healthcare system. While increasing health spending as a percentage of GDP is a crucial step towards tackling health inequity and achieving SDG 3, it alone is not sufficient. The challenges of limited fiscal capabilities, administrative complexities, and inefficiencies make it extremely difficult to rely solely on public financing for comprehensive healthcare. In the context of LMICs, a privately financed health system is not recommended as it tends to overlook equity and social welfare considerations. Hence, to achieve a more equitable and sustainable healthcare system in the BRICS nations, it is essential to explore strategic alternatives, including PPPs and other innovative financing mechanisms. These approaches can provide an opportunity to bridge the gaps in health financing and ensure better access to quality healthcare services for all citizens.

From the review of records, it is evident that to achieve the goal of adequate and sustainable health financing, these nations must engage in strategic PPPs. Special attention should be placed on developing a national risk-equalizing insurance system through the PPP mechanism.

### 3.4. Limitations

Despite its significance, the present study is not without limitations. It focused on a specific set of keywords relevant to the paper's scope during the record search process. As a result, future research in this field could expand by incorporating additional keywords such as "healthcare cost" and "healthcare governance" for a more comprehensive review. Furthermore, the present study did not conduct a meta-analysis of the gathered records, suggesting that future reviews should prioritize performing a meta-analysis of the identified keywords to gain deeper insights.

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## References

- Amimo, F.; Lambert, B.; Magit, A.; Hashizume, M. A review of prospective pathways and impacts of COVID-19 on the accessibility, safety, quality, and affordability of essential medicines and vaccines for universal health coverage in Africa. *Glob. Health* **2021**, *17*, 42. [\[CrossRef\]](#)
- Aria, M.; Cuccurullo, C. Bibliometrix: An R-tool for comprehensive science mapping analysis. *J. Inform.* **2017**, *11*, 959–975. [\[CrossRef\]](#)
- Bai, P.; Tang, Y.; Zhang, W.; Zeng, M. Does Economic Policy Uncertainty Matter for Healthcare Expenditure in China? A Spatial Econometric Analysis. *Front. Public Health* **2021**, *9*, 673778. [\[CrossRef\]](#)
- Bärnreuther, S. Disrupting healthcare? Entrepreneurship as an “innovative” financing mechanism in India’s primary care sector. *Soc. Sci. Med.* **2023**, *319*, 115314. [\[CrossRef\]](#)
- Broomberg, J. Managing the health care market in developing countries: Prospects and problems. *Health Policy Plan.* **1994**, *9*, 237–251. [\[CrossRef\]](#)
- Buss, P.M.; de Carvalho, A.I. Health promotion in Brazil. *Promot. Educ.* **2007**, *1*, 7–12. [\[CrossRef\]](#)
- Buttigieg, S.C.; Grima, S.; Camilleri, C. Commentary: Comparison of historical medical spending patterns among the BRICS and G7. *Front. Pharmacol.* **2016**, *7*, 213. [\[CrossRef\]](#) [\[PubMed\]](#)
- Chang, L.; Mohsin, M.; Iqbal, W. Assessing the nexus between COVID-19 pandemic-driven economic crisis and economic policy: Lesson learned and challenges. *Environ. Sci. Pollut. Res.* **2022**, *30*, 22145–22158. [\[CrossRef\]](#)
- Chaturvedi, S.; For INCLIN Study Group; Ramji, S.; Arora, N.K.; Rewal, S.; Dasgupta, R.; Deshmukh, V. Time-constrained mother and expanding market: Emerging model of under-nutrition in India. *BMC Public Health* **2016**, *16*, 632. [\[CrossRef\]](#)
- Chen, X.; Giles, J.; Yao, Y.; Yip, W.; Meng, Q.; Berkman, L.; Chen, H.; Chen, X.; Feng, J.; Feng, Z.; et al. The path to healthy ageing in China: A Peking University–Lancet Commission. *Lancet* **2022**, *400*, 1967–2006. [\[CrossRef\]](#)
- Chernichovsky, D. What can developing economies learn from health system reforms of developed economies? *Health Policy* **1995**, *32*, 79–91. [\[CrossRef\]](#)
- Daemmrich, A. The political economy of healthcare reform in China: Negotiating public and private. *Springerplus* **2013**, *2*, 448. [\[CrossRef\]](#)
- Deussom, R.; Lal, A.; Frymus, D.; Cole, K.; Politico, M.R.S.; Saldaña, K.; Vasireddy, V.; Khangamwa, G.; Jaskiewicz, W. Putting health workers at the centre of health system investments in COVID-19 and beyond. *Fam. Med. Community Health* **2022**, *10*, e001449. [\[CrossRef\]](#)
- Devarakonda, S. Hub and spoke model: Making rural healthcare in India affordable, available and accessible. *Rural Remote Health* **2016**, *16*, 3476. [\[CrossRef\]](#)
- Dilip, T.R. Utilization of inpatient care from private hospitals: Trends emerging from Kerala, India. *Health Policy Plan.* **2010**, *25*, 437–446. [\[CrossRef\]](#) [\[PubMed\]](#)
- Ecevit, E.; Cetin, M.; Kocak, E.; Dogan, R.; Yildiz, O. Greenhouse gas emissions, economic globalization, and health expenditures nexus: Does population aging matter in emerging market economies? *Environ. Sci. Pollut. Res.* **2022**, *30*, 29961–29975. [\[CrossRef\]](#)
- Ezziane, Z. Essential drugs production in Brazil, Russia, India, China and South Africa (BRICS): Opportunities and challenges. *Int. J. Health Policy Manag.* **2014**, *3*, 365–370. [\[CrossRef\]](#)
- Floyd, K.; Fitzpatrick, C.; Pantoja, A.; Raviglione, M. Domestic and donor financing for tuberculosis care and control in low-income and middle-income countries: An analysis of trends, 2002–2011, and requirements to meet 2015 targets. *Lancet Glob. Health* **2013**, *1*, e105. [\[CrossRef\]](#) [\[PubMed\]](#)
- Ganju, A.; Goulart, A.C.; Ray, A.; Majumdar, A.; Jeffers, B.W.; Llamasa, G.; Cañizares, H.; Ramos-Cañizares, I.J.; Fadhil, I.; Subramaniam, K.; et al. Systemic Solutions for Addressing Non-Communicable Diseases in Low- and Middle-Income Countries. *JMDH* **2020**, *13*, 693–707. [\[CrossRef\]](#) [\[PubMed\]](#)

20. Garber, A.M.; Romer, P.M. Evaluating the federal role in financing health-related research. *Proc. Natl. Acad. Sci. USA* **1996**, *93*, 12717–12724. [[CrossRef](#)]
21. Zammar, G.; Meister, H.; Shah, J.; Phadtare, A.; Cofiel, L.; Pietrobon, R. So Different, yet So Similar: Meta-Analysis and Policy Modeling of Willingness to Participate in Clinical Trials among Brazilians and Indians. *PLoS ONE* **2010**, *5*, e14368. [[CrossRef](#)] [[PubMed](#)]
22. Glassman, A.; Giedion, U.; McQueston, K. Priority setting for health in emerging markets. *J. Comp. Eff. Res.* **2013**, *2*, 283–291. [[CrossRef](#)] [[PubMed](#)]
23. Gomes, W.J. EACTS in the future: Second strategic conference. The view from the BRICS countries. *Eur. J. Cardio-Thorac. Surg.* **2012**, *43*, 238–240. [[CrossRef](#)]
24. Grogan, C.M. Urban economic reform and access to health care coverage in the People’s Republic of China. *Soc. Sci. Med.* **1995**, *41*, 1073–1084. [[CrossRef](#)]
25. Gu, L.; Wang, M.C.; Li, F. The correlation between economic fluctuation, workforce employment and health expenditure in the BRICS countries. *Front. Public Health* **2022**, *10*, 933728. [[CrossRef](#)]
26. Harmer, A. The BRICS countries: A new force in global health? *Bull. World Health Organ.* **2014**, *92*, 394–395. [[CrossRef](#)]
27. Head, S.J.; Howell, N.J.; Osnabrugge, R.L.; Ben Bridgewater, B.; Keogh, B.E.; Kinsman, R.; Walton, P.; Gummert, J.F.; Pagano, D.; Kappetein, A.P. The European Association for Cardio-Thoracic Surgery (EACTS) database: An introduction. *Eur. J. Cardio-Thorac. Surg.* **2013**, *44*, e175–e180. [[CrossRef](#)]
28. Lemmi, V. Global collective action in mental health financing: Allocation of development assistance for mental health in 142 countries, 2000–2015. *Soc. Sci. Med.* **2021**, *287*, 114354. [[CrossRef](#)]
29. Jaikumar, S.; Dutta, S.; Sood, N. Impact of lifestyle diseases on income and household consumption: Evidence from an emerging economy. *Health Mark. Q.* **2021**, *38*, 35–49. [[CrossRef](#)]
30. Jakovljevic, M.; Groot, W.; Souliotis, K. Editorial: Health care financing and affordability in the emerging global markets, Volume II. *Front. Public Health* **2022**, *10*, 1054409. [[CrossRef](#)]
31. Local Burden of Disease HIV Collaborators. Mapping subnational HIV mortality in six Latin American countries with incomplete vital registration systems. *BMC Med.* **2021**, *19*, 4. [[CrossRef](#)]
32. Jakovljevic, M.B.; Getzen, T.E.; Torbica, A.; Anegawa, T. 10th World IHEA and ECHE joint congress: Health Economics in the Age of Longevity. *Expert Rev. Pharmacoecon. Outcomes Res.* **2014**, *14*, 781–783. [[CrossRef](#)] [[PubMed](#)]
33. Jakovljevic, M.; Jakab, M.; Gerdtham, U.; McDaid, D.; Ogura, S.; Varavikova, E.; Merrick, J.; Adany, R.; Okunade, A.; Getzen, T.E. Comparative financing analysis and political economy of noncommunicable diseases. *J. Med. Econ.* **2019**, *22*, 722–727. [[CrossRef](#)]
34. Jakovljevic, M.; Lamnisos, D.; Westerman, R.; Chattu, V.K.; Cerda, A. Future health spending forecast in leading emerging BRICS markets in 2030: Health policy implications. *Health Res. Policy Syst.* **2022**, *20*, 23. [[CrossRef](#)]
35. Wong, Y.C.; Leung, J. Long-term Care in China: Issues and Prospects. *J. Gerontol. Soc. Work.* **2012**, *55*, 570–586. [[CrossRef](#)] [[PubMed](#)]
36. Jakovljevic, M.; Liu, Y.; Cerda, A.; Simonyan, M.; Correia, T.; Mariita, R.M.; Kumara, A.S.; Garcia, L.; Krstic, K.; Osabohien, R.; et al. The Global South political economy of health financing and spending landscape—History and presence. *J. Med. Econ.* **2021**, *24*, 25–33. [[CrossRef](#)] [[PubMed](#)]
37. Jakovljevic, M.; Matter-Walstra, K.; Sugahara, T.; Sharma, T.; Reshetnikov, V.; Merrick, J.; Yamada, T.; Youngkong, S.; Rovira, J. Cost-effectiveness and resource allocation (CERA) 18 years of evolution: Maturity of adulthood and promise beyond tomorrow. *Cost Eff. Resour. Alloc.* **2020**, *18*, 15. [[CrossRef](#)]
38. Wang, W.; Hafeez, M.; Jiang, H.; Ashraf, M.U.; Asif, M.; Akram, M.W. How do energy prices and climate shocks affect human health? Insights from BRICS. *Environ. Sci. Pollut. Res.* **2022**, *30*, 32751–32761. [[CrossRef](#)]
39. Jakovljevic, M.; Ogura, S. Editorial: Insights in health economics: 2021. *Front. Public Health* **2022**, *10*, 966741. [[CrossRef](#)]
40. Jakovljevic, M.; Péntek, M.; Wijeratne, T.; Kockaya, G.; Pau, L.F. Editorial: Accelerated Globalization and Its Impact to the World’s Health Care Achievement. *Front. Public Health* **2021**, *9*, 690239. [[CrossRef](#)]
41. Jakovljevic, M.; Potapchik, E.; Popovich, L.; Barik, D.; Getzen, T.E. Evolving Health Expenditure Landscape of the BRICS Nations and Projections to 2025: BRICS Health Spending. *Health Econ.* **2016**, *26*, 844–852. [[CrossRef](#)] [[PubMed](#)]
42. Jakovljevic, M.; Sharma, T.; Kumagai, N.; Ogura, S. Editorial: NCDs—Core Challenge of Modern Day Health Care Establishments. *Front. Public Health* **2021**, *9*, 692926. [[CrossRef](#)]
43. Jakovljevic, M.; Timofeyev, Y.; Ekkert, N.V.; Fedorova, J.V.; Skvirskaya, G.; Bolevich, S.; Reshetnikov, V.A. The impact of health expenditures on public health in BRICS nations. *J. Sport Health Sci.* **2019**, *8*, 516–519. [[CrossRef](#)]
44. Jakovljevic, M.; Timofeyev, Y.; Ranabhat, C.L.; Fernandes, P.O.; Teixeira, J.P.; Rancic, N.; Reshetnikov, V. Real GDP growth rates and healthcare spending—Comparison between the G7 and the EM7 countries. *Glob. Health* **2020**, *16*, 64. [[CrossRef](#)]
45. Jakovljevic, M.B.; Milovanovic, O. Growing Burden of Non-Communicable Diseases in the Emerging Health Markets: The Case of BRICS. *Front. Public Health* **2015**, *3*, 65. [[CrossRef](#)]
46. Jakovljevic, M.B. BRIC’s Growing Share of Global Health Spending and Their Diverging Pathways. *Front. Public Health* **2015**, *3*, 135. [[CrossRef](#)]
47. Jakovljevic, M.M. Comparison of historical medical spending patterns among the BRICS and G7. *J. Med. Econ.* **2015**, *19*, 70–76. [[CrossRef](#)]

48. Jiang, C.; Chang, H.; Shahzad, I. Digital Economy and Health: Does Green Technology Matter in BRICS Economies? *Front. Public Health* **2022**, *9*, 827915. [CrossRef]
49. Katyal, A.; Singh, P.V.; Bergkvist, S.; Samarth, A.; Rao, M. Private sector participation in delivering tertiary health care: A dichotomy of access and affordability across two Indian states. *Health Policy Plan* **2015**, *30*, i23–i31. [CrossRef]
50. Kocarnik, J.M.; Compton, K.; Dean, F.E.; Fu, W.; Gaw, B.L.; Harvey, J.D.; Henrikson, H.J.; Lu, D.; Pennini, A.; Xu, R.; et al. Cancer Incidence, Mortality, Years of Life Lost, Years Lived With Disability, and Disability-Adjusted Life Years for 29 Cancer Groups From 2010 to 2019: A Systematic Analysis for the Global Burden of Disease Study 2019. *JAMA Oncol.* **2022**, *8*, 420. [CrossRef]
51. Mao, W.; Jiang, H.; Mossialos, E.; Chen, W. Improving access to medicines: Lessons from 10 years of drug reforms in China, 2009–2020. *BMJ Glob. Health* **2022**, *7*, e009916. [CrossRef]
52. Kumar, A.; Juluru, K.; Thimmaraju, P.K.; Reddy, J.; Patil, A. Pharmaceutical market access in emerging markets: Concepts, components, and future. *J. Mark. Access Health Policy* **2014**, *2*, 25302. [CrossRef] [PubMed]
53. Lawrence, M.; Rayner, M. Functional foods and health claims: A public health policy perspective. *Public Health Nutr.* **1998**, *1*, 75–82. [CrossRef] [PubMed]
54. Li, F.; Chang, T.; Wang, M.C.; Zhou, J. The relationship between health expenditure, CO<sub>2</sub> emissions, and economic growth in the BRICS countries—Based on the Fourier ARDL model. *Environ. Sci. Pollut. Res.* **2022**, *29*, 10908–10927. [CrossRef]
55. Littlejohns, P. The BRICS development bank and health. *Lancet* **2013**, *382*, 126. [CrossRef] [PubMed]
56. Liu, J.; Miao, J.; Zhang, D. Dilemma of healthcare reform and invention of new discipline of health fiscalogy. *Glob. Health Res. Policy* **2016**, *1*, 4. [CrossRef]
57. Mv, M.K.; Sastry, N.K.B.; Moonesar, I.A.; Rao, A. Predicting Universal Healthcare Through Health Financial Management for Sustainable Development in BRICS, GCC, and AUKUS Economic Blocks. *Front. Artif. Intell.* **2022**, *5*, 887225. [CrossRef]
58. McLeod, H.; Grobler, P. The role of risk equalization in moving from voluntary private health insurance to mandatory coverage: The experience in South Africa. In *Advances in Health Economics and Health Services Research*; Chernichovsky, D., Hanson, K., Eds.; Emerald Group Publishing Limited: Bingley, UK, 2009; pp. 159–196. Available online: [https://www.emerald.com/insight/content/doi/10.1108/S0731-2199\(2009\)0000021010/full/html](https://www.emerald.com/insight/content/doi/10.1108/S0731-2199(2009)0000021010/full/html) (accessed on 31 March 2023).
59. McPAKE, B.; Banda, E.E.N. Contracting out of health services in developing countries. *Health Policy Plan.* **1994**, *9*, 25–30. [CrossRef]
60. Mielke, G.I.; Brown, W.J. Physical activity and the prevention of chronic illness in the BRICS nations: Issues relating to gender equality. *J. Sport Health Sci.* **2019**, *8*, 507–508. [CrossRef]
61. Munodawafa, D.; Onya, H.; Amuyunzu-Nyamongo, M.; Mweemba, O.; Phori, P.; Kobie, A.G. Achieving SDGs and addressing health emergencies in Africa: Strengthening health promotion. *Glob. Health Promot.* **2021**, *28*, 97–103. [CrossRef]
62. Oortwijn, W.; Mathijssen, J.; Banta, D. The role of health technology assessment on pharmaceutical reimbursement in selected middle-income countries. *Health Policy* **2010**, *95*, 174–184. [CrossRef]
63. Pagliusi, S.; Che, Y.; Dong, S. The art of partnerships for vaccines. *Vaccine* **2019**, *37*, 5909–5919. [CrossRef] [PubMed]
64. Paul, E.; Brown, G.W.; Ridde, V. Misunderstandings and ambiguities in strategic purchasing in low- and middle-income countries. *Int. J. Health Plan. Manag.* **2020**, *35*, 1001–1008. [CrossRef]
65. Peer, N. Current strategies are inadequate to curb the rise of tobacco use in Africa. *S. Afr. Med. J.* **2018**, *108*, 551–556. [CrossRef] [PubMed]
66. Dal Poz, M.R.; Couto, M.H.C.; de Andrade Vidaurre Franco, T. Innovation, development, and financing of institutions of Higher Education in health. *Cad. Saúde Pública* **2016**, *32*, e00139915. [CrossRef]
67. Prasolov, A.V.; Kolbin, A.S.; Balykina, Y.E. Optimization Approach for Estimating the Required Amount of Pharmaceuticals in the Russian Federation. *Value Health Reg. Issues* **2018**, *16*, 39–45. [CrossRef]
68. Purohit, B.C. Private initiatives and policy options: Recent health system experience in India. *Health Policy Plan* **2001**, *16*, 87–97. [CrossRef] [PubMed]
69. RamPrakash, R.; Lingam, L. Why is women’s utilization of a publicly funded health insurance low?: A qualitative study in Tamil Nadu, India. *BMC Public Health* **2021**, *21*, 350. [CrossRef] [PubMed]
70. Rao, K.D.; Petrosyan, V.; Araujo, E.C.; McIntyre, D. Progress towards universal health coverage in BRICS: Translating economic growth into better health. *Bull. World Health Organ.* **2014**, *92*, 429–435. [CrossRef]
71. Rezaie, R.; McGahan, A.M.; Frew, S.E.; Daar, A.S.; Singer, P.A. Emergence of biopharmaceutical innovators in China, India, Brazil, and South Africa as global competitors and collaborators. *Health Res. Policy Syst.* **2012**, *10*, 18. [CrossRef]
72. Rizvi, S.S.; Douglas, R.; Williams, O.D.; Hill, P.S. The political economy of universal health coverage: A systematic narrative review. *Health Policy Plan* **2020**, *35*, 364–372. [CrossRef]
73. Romaniuk, P.; Poznańska, A.; Brukało, K.; Holecki, T. Health System Outcomes in BRICS Countries and Their Association With the Economic Context. *Front. Public Health* **2020**, *8*, 80. [CrossRef] [PubMed]
74. Yip, W.; Hsiao, W. Harnessing the privatisation of China’s fragmented health-care delivery. *Lancet* **2014**, *384*, 805–818. [CrossRef]
75. Sariyer, G.; Kahraman, S.; Sözen, M.E.; Ataman, M.G. Fiscal responses to COVID-19 outbreak for healthy economies: Modelling with big data analytics. *Struct. Chang. Econ. Dyn.* **2023**, *64*, 191–198. [CrossRef]
76. Savitha, B.; Banerjee, S. Education and Experience as Determinants of Micro Health Insurance Enrolment. *Int. J. Health Policy Manag.* **2020**, *10*, 192–200. [CrossRef] [PubMed]

77. Siow, Y.L.; Gong, Y.; Au-Yeung, K.K.; Woo, C.W.; Choy, P.C.; O, K. Emerging issues in traditional Chinese medicine. *Can. J. Physiol. Pharmacol.* **2005**, *83*, 321–334. [[CrossRef](#)]
78. So, A.D.; Ruiz-Esparza, Q. Technology innovation for infectious diseases in the developing world. *Infect. Dis. Poverty* **2012**, *1*, 2. [[CrossRef](#)] [[PubMed](#)]
79. Song, Z.; Zhu, Y.; Zou, H.; Fu, H.; Yip, W. A Tale of Transition: Trends of Catastrophic Health Expenditure and Impoverishment in Urban China, 1986–2009. *Health Syst. Reform* **2020**, *6*, e1836731. [[CrossRef](#)]
80. Sparkes, S.P.; Kutzin, J.; Earle, A.J. Financing Common Goods for Health: A Country Agenda. *Health Syst. Reform* **2019**, *5*, 322–333. [[CrossRef](#)]
81. Stubbs, T.; Kring, W.; Laskaridis, C.; Kentikelenis, A.; Gallagher, K. Whatever it takes? The global financial safety net, COVID-19, and developing countries. *World Dev.* **2020**, *137*, 105171. [[CrossRef](#)]
82. Marshall, K.; Beaden, P.; Durrani, H.; Tang, K.; Mogilevskii, R.; Bhutta, Z. The role of the private sector in noncommunicable disease prevention and management in low- and middle-income countries: A series of systematic reviews and thematic syntheses. *Int. J. Qual. Stud. Health Well-Being* **2023**, *18*, 2156099. [[CrossRef](#)] [[PubMed](#)]
83. Sun, J. International experiences of promoting generics use and its implications to China: Promoting generics use. *JEBM* **2013**, *6*, 74–80. [[CrossRef](#)]
84. The Lancet. Banking on the BRICS for health? *Lancet* **2013**, *381*, 1158. [[CrossRef](#)]
85. Twigg, J.L. Health care reform in Russia: A survey of head doctors and insurance administrators. *Soc. Sci. Med.* **2002**, *55*, 2253–2265. [[CrossRef](#)]
86. Twigg, J.L. Obligatory medical insurance in Russia: The participants' perspective. *Soc. Sci. Med.* **1999**, *49*, 371–382. [[CrossRef](#)] [[PubMed](#)]
87. Usman, M.; Ma, Z.; Wasif Zafar, M.; Haseeb, A.; Ashraf, R.U. Are Air Pollution, Economic and Non-Economic Factors Associated with Per Capita Health Expenditures? Evidence from Emerging Economies. *Int. J. Environ. Res. Public Health* **2019**, *16*, 1967. [[CrossRef](#)] [[PubMed](#)]
88. Bustamante, A.V.; Shimoga, S.V. Comparing the Income Elasticity of Health Spending in Middle-Income and High-Income Countries: The Role of Financial Protection. *Int. J. Health Policy Manag.* **2017**, *7*, 255–263. [[CrossRef](#)]
89. Vargas, V.; Ahmed, S.; Adams, A.M. Factors enabling comprehensive maternal health services in the benefits package of emerging financing schemes: A cross-sectional analysis from 1990 to 2014. *PLoS ONE* **2018**, *13*, e0201398. [[CrossRef](#)] [[PubMed](#)]
90. Vineis, P. Life Trajectories, Biomedical Evidence, and Lessons for Policies. *Front. Public Health* **2020**, *8*, 160. [[CrossRef](#)]
91. Ullah, Z.; Sulaiman, M.A.B.A.; Ali, S.B.; Ahmad, N.; Scholz, M.; Han, H. The Effect of Work Safety on Organizational Social Sustainability Improvement in the Healthcare Sector: The Case of a Public Sector Hospital in Pakistan. *Int. J. Environ. Res. Public Health* **2021**, *18*, 6672. [[CrossRef](#)]

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