



## REVIEW ARTICLE

### Health insurance trends from 2004 to 2022: a bibliometric analysis

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#### ABSTRACT

The goal of health systems implemented at international, national, or regional level is to improve health effectively and efficiently by all available means, including community efforts, special education, military, and government, thereby improving public health at all levels. Health issues as national issues need top priority. Inequalities in mortality risk are inseparable from issues surrounding the health policy debate. Public health level is assessed through several indicators. Health Policy in law regulates the right to health. Proposed health system goals at international, national, or regional levels are usually not measured by human rights standards and instruments. Universal Health Insurance is expected to provide benefits. Health services are provided as medicines and treatments. This review aimed to determine trends in number of publications and visualize linkages of health insurance topics through bibliometric analysis. This was a systematic review with steps following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram using 661 scientific articles published between 2004 and 2022, followed by inclusion and exclusion criteria from Dimensions database. Review of articles was by means of Vosviewer app. Our study results contributed to research roadmap development on health insurance. The limitation is that app.dimension.ai and google scholar databases are periodically updated, such that bibliometric analysis of health insurance should be repeated in the near future. Because this bibliometric analysis only extracted scientific article data from app.dimension.ai database, further research should add another database for broader and more comprehensive understanding of health insurance.

**Keywords:** Bibliometric analysis, health insurance, recency, trends

## INTRODUCTION

The goal of health systems implemented at the international, national, or regional level is to improve health effectively and efficiently through all available means, including the efforts of the community or general public, special education, military, and government, so as to improve the degree of public health at all levels. Health issues are national issues that need top priority.<sup>(1)</sup> The inequality of mortality risk cannot be separated from the issues surrounding the health policy debate.<sup>(2)</sup> The level of public health is assessed through several indicators.<sup>(3)</sup> Health Policy in law regulates the right to health.<sup>(4)</sup>

Rights are everything that has been inherent in man, which has been possessed since man was born into the world and is absolute or inviolable by others, and cannot be separated from its essence so that its essence remains sacred.<sup>(5)</sup> Health is one of the basic human needs, therefore health is a right for every citizen that is protected by law.<sup>(6)</sup> Every country recognizes that health is the greatest capital to achieve prosperity. The role of the state in meeting the basic needs of the people is urgently needed, especially in the form of comprehensive health services.<sup>(7)</sup>

Universal health insurance is expected to provide benefits. Meanwhile, to accelerate the achievement of the Millennium Development Goals (MDGs) in 2015, especially to reduce maternal and infant mortality, the Indonesian Ministry of Health launched the Maternity Insurance program. In reducing maternal and infant mortality rates, cooperation from all sectors is needed.<sup>(8)</sup>

The National Health Service, which offers universal access to health care, is facing increasing pressure. The National Health Service is regionally based, with local authorities responsible for the organization and delivery of health services.<sup>(9)</sup> Health services are provided in the form of medicines and treatments.<sup>(10)</sup> Health care providers must contribute to the provision of health services.<sup>(11)</sup> Health workers, medical and non-medical, are responsible for optimal services.<sup>(12)</sup>

Medical personnel, in this case doctors, have responsibility for the applied treatment.<sup>(13)</sup> Treatment measures and determination of needs in the treatment process are the authority of the doctor.<sup>(14)</sup> The development of patient safety and health is an absolute foundation for doctors in carrying out their professional practice.<sup>(15)</sup> A doctor must make every possible effort to treat his patients.<sup>(16)</sup> To create legal protection for patients, parties must understand the rights and obligations attached to them, including healthcare providers, so that they are responsible for the professional service provided to healthcare recipients.<sup>(17)</sup> Midwives as health workers must thoroughly understand midwifery practices.<sup>(18)</sup> Health workers, especially midwives, are a major factor in maternity insurance services.<sup>(19)</sup> Midwives, especially those with many tasks and an essential role in childbirth

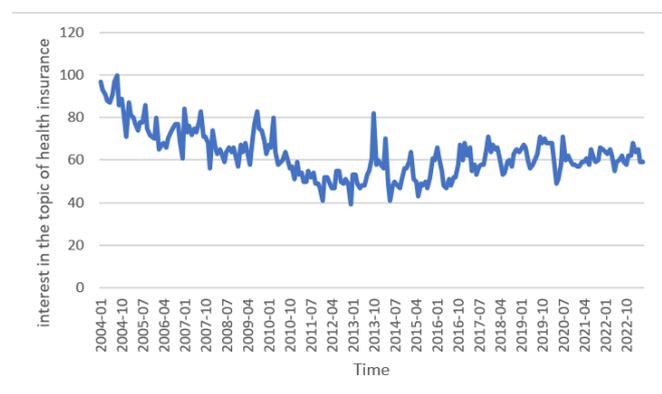
insurance services, have problems with limitations, so there must be a balance between patients receiving childbirth insurance and health workers who provide maternity insurance services.<sup>(20)</sup>

Financial protection is one of the important dimensions of Universal Health Coverage (UHC) in low- and middle-income countries (LMICs).<sup>(21,22)</sup> Government-sponsored health insurance is increasingly promoted as a means of protection against catastrophic costs and financial hardship due to health costs, to achieve UHC.<sup>(23)</sup>

Currently, the Social Security Organizing Agency [*Badan Penyelenggara Jaminan Sosial (BPJS) Kesehatan*] as a service facility in fulfilling human rights in the health sector has again become the target of criticism from various circles of society, especially regarding the occurrence of various frauds in health services provided under the National Health Insurance program implemented by the Social Security Organizing Agency at level I health facilities and advanced health facilities.<sup>(24)</sup>

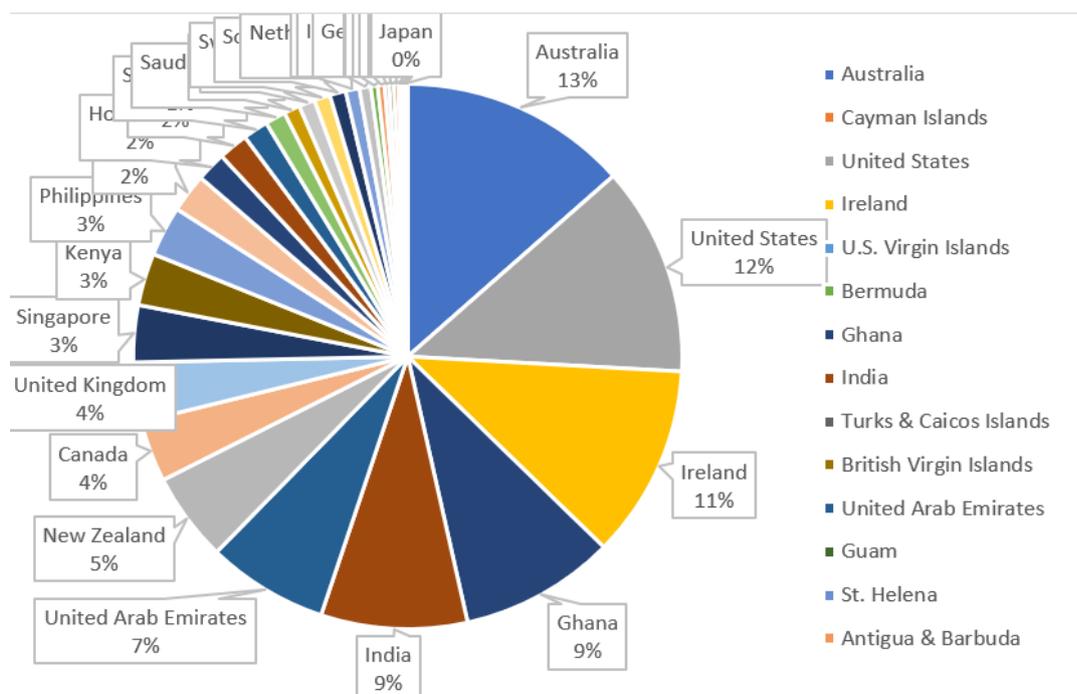
National health insurance is part of the national social security system which is organized using a mandatory social health security mechanism based on its purpose, namely to meet the basic needs of decent public health provided to everyone who has paid contributions or whose contributions are paid by the Government.<sup>(13)</sup> This shows that national health insurance is an important and useful topic.

Over time, interest in the topic of health insurance around the world has declined. The data on the interest in the topic can be searched through Google Trends by typing in the keyword: "health insurance". For this study, the search was conducted from January 2004 to December 2022 by selecting a web search and all categories that yielded the data presented in Figure 1. These data were taken on June 3, 2023.



**Figure 1.** Interest in the topic of health insurance

In addition to time [year of publication], interest in health insurance topics can be viewed by country of publication (Figure 2).



**Figure 2.** Pie chart of interest in health insurance by country  
Data Source: Google Trends

This review aimed to determine the publication trends in health insurance topics, number of citations, research fields on health insurance topics, journals published, authors, relationships between topics, topic grouping, future research topic directions, rare health insurance topics, relationships between authors, research groups, network visualization, overlay visualization, and density visualization related to health insurance topics through bibliometric analysis. Therefore, bibliometric analysis will provide a comprehensive system for investigating articles on topics of interest.

**METHODS**

Bibliometric analysis is used to analyze the data collected on a selected subject. The data used in the study were based on online searches through <https://app.dimensions.ai/> and were taken on June 2, 2023. The research method uses a systematic review with stages following the flowchart of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).<sup>(25)</sup> The phases in PRISMA include identification, screening, and articles included, as shown in Figure 3. Phase 1 (Identification) detected 661 records from dimensions.ai by writing down health insurance keywords that appeared in titles and abstracts ranging from 2010 to 2022, taking into account, for each primary health insurance search term, "article document types and processes" and "all published data in the data range from 2010 to 2022". In phase 2 (filtering), the option "article title, abstract" was

selected in the field of each search term, so that 60 records were excluded. In phase 3 (articles included), the final sample produced 601 accessible articles.

**Software and data cleaning**

The collected articles were analyzed using VOSviewer. The information obtained in the first phase was exported to an Excel spreadsheet for analysis and organization. VOSviewer is a computer program for creating and viewing bibliometric maps.<sup>(26)</sup> To create a map, for "type of data" was selected "create a map based on text data". In this study, the analysis was reviewed from concurrent events.

The procedure for joint event analysis<sup>(27)</sup> was as follows. For "data source" was selected "read data from references manager files". For "choose fields" was selected "fields from which terms will be extracted are title and abstract fields". For "counting method" was selected "full count". For "threshold" was selected "minimum number of occurrences of a term is 10". For "choose number of terms" was selected 135.

**RESULTS**

**Time distribution**

A search from 2002 to 2022 yielded 661 scientific article publications. The number of health insurance publications per year from 2004 to 2022 is presented in Figure 4. The highest increase of 111221 occurred in 2022. Meanwhile, the lowest increase occurred in 2004 with an increase of 28030.

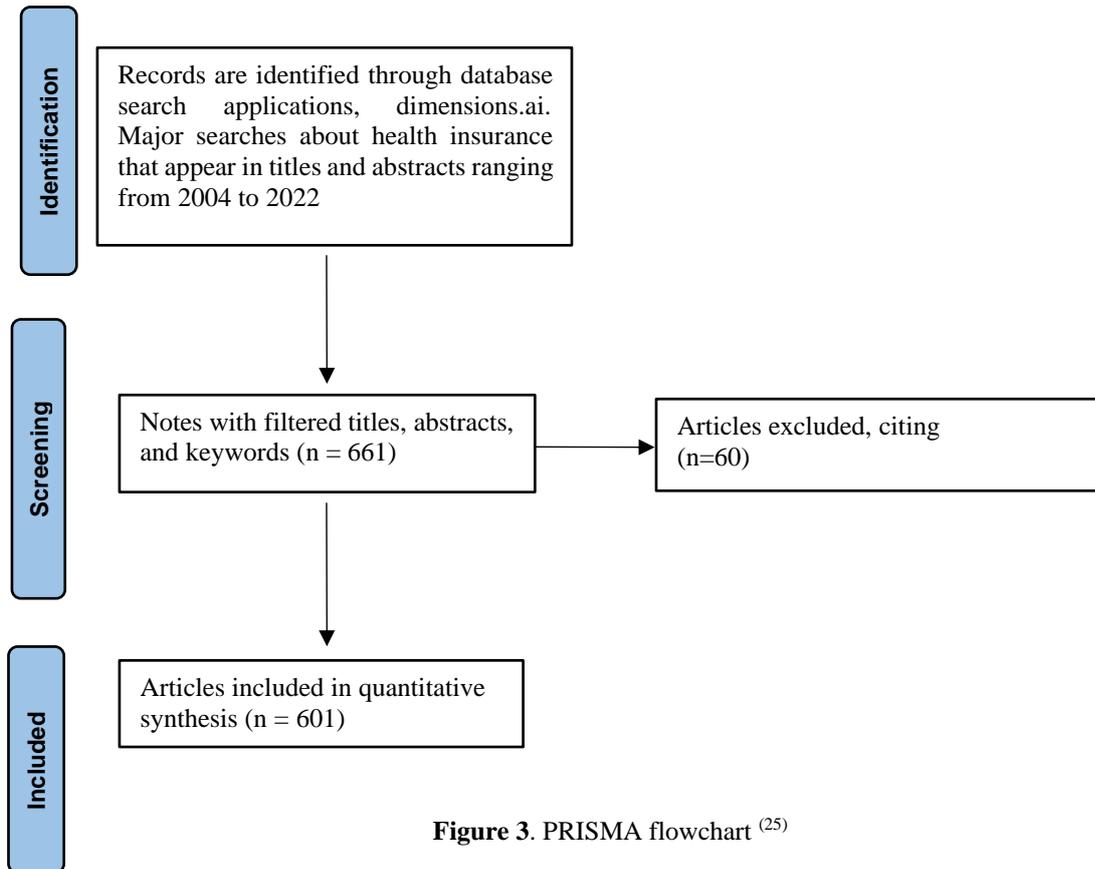


Figure 3. PRISMA flowchart (25)

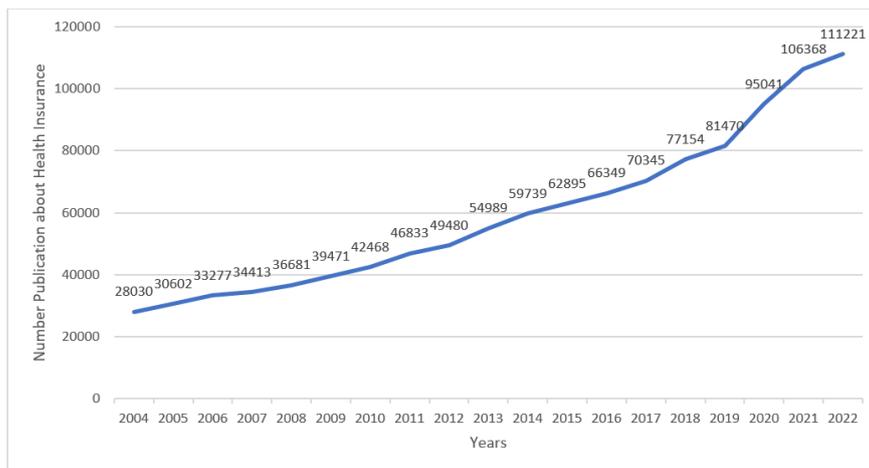


Figure 4. Number of health insurance publications from 2004 to 2022 (source: <https://app.dimensions.ai/>)

**Cited articles**

The number of health insurance quotes per year from 2010 to 2022 is presented in Figure 5. The highest increase occurred in 2022 with an increase of 3680333. Meanwhile, the lowest increase occurred in 2004 with an increase of 10120.

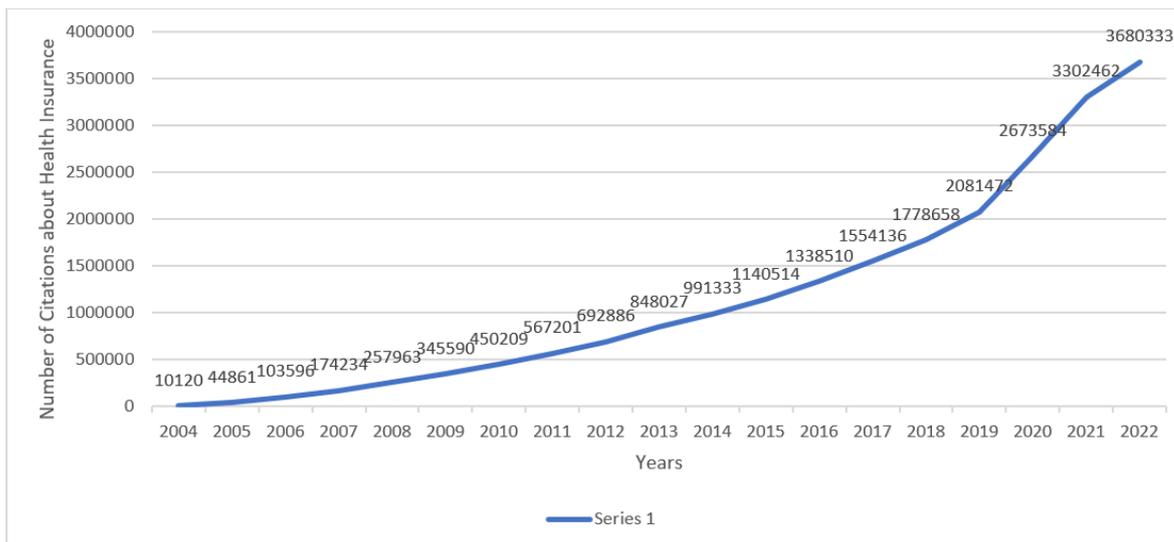
**Subject field**

The subject area of the article is also analyzed based on its field of research related to the topic of health insurance so that it can be grouped. The number of publications in terms of the field of research is presented in Figure 6.

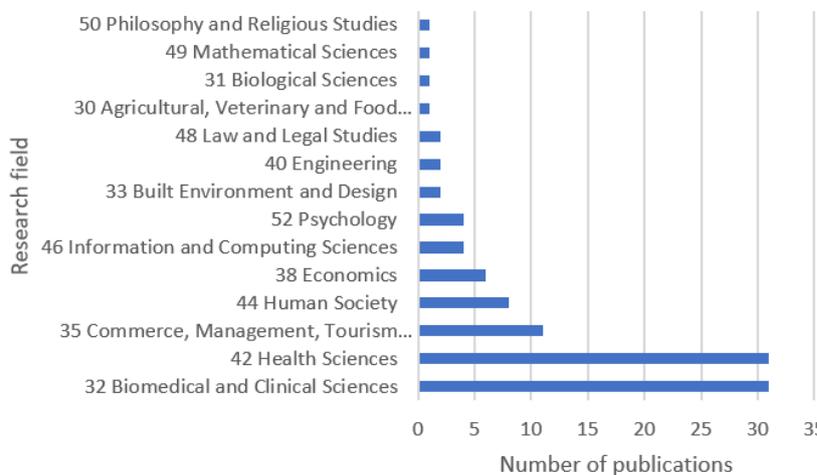
The most numerous research fields related to the topic of health insurance are the fields of health sciences and biomedical and clinical sciences research, with 31 publications.

The selected number of terms was 9055. Two items connected by a line indicate that both items appear together in the title and abstract. Conversely, two items that are not connected by a line indicate that they do not appear together in the title and abstract. In Figure 7, there are 130 items, 4 clusters, 4976 links, and a link strength of 12583.

The network visualization of 9055 terms is presented in Figure 7.



**Figure 5.** Number of citations for health insurance topics from 2004 to 2022 (source: <https://app.dimensions.ai/>)



**Figure 6.** Number of publications in terms of research field (source: <https://app.dimensions.ai/>)

**Keyword cluster analysis**

VOSviewer also provides overlay visualization maps. An overlay visualization of these 130 terms is presented in Figure 8.

The overlay visualization provides analysis based on health insurance keywords from 2004 to 2022 to observe trends in health insurance-related research titles. On the overlay visualization map in Figure 8, the yellow nodes imply that keywords are of current research interest. For example, current research trends in health insurance focus on women, households, and patients.

The density visualization of these 130 terms is presented in Figure 9. Figure 9 shows a density visualization with the number of items found in multiple items, including health insurance schemes, communities, and medications. Some items with yellow knots signify that they have been widely used

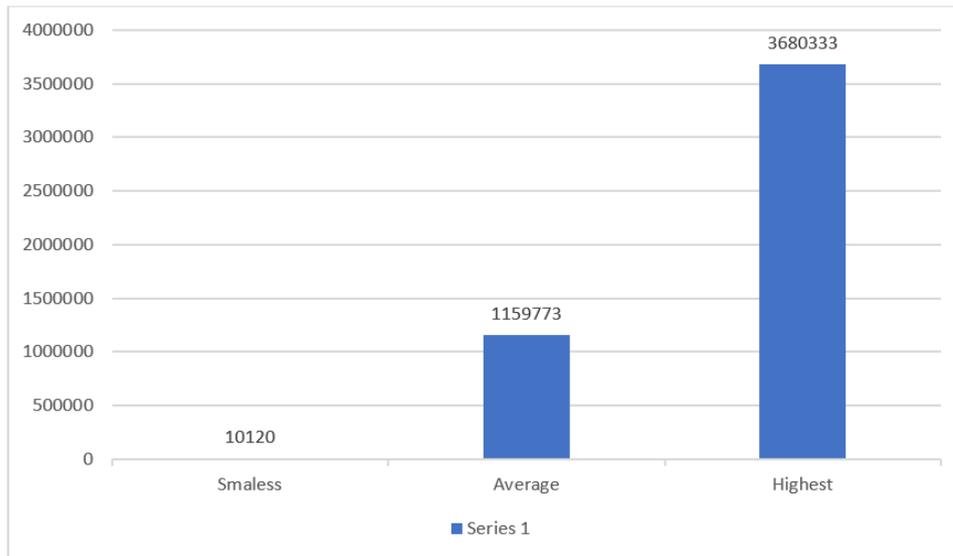
as topics in previous journal publications. Thus, the recommended research topics related to health insurance are the topics that have visualization of density in low categories, such as counseling, types of health insurance, and medical costs.

**DISCUSSION**

Figure 1 shows that the number of publications increases exponentially year over year. The research shows that from 2010 to 2022, the smallest number of health insurance publications occurred in 2004 and was highest in 2022 with an average of 111221 (Figure 10). The number of publications fluctuates from year to year. Therefore, there is a need for research on health insurance that continues to be carried out so that from year to year the number of articles on the topic of health insurance is increasing.







**Figure 11.** Bar diagram of the smallest, average, and largest increase in the number of citations for a health insurance topic

**Table 1.** Clusters for health insurance topics (Source: Vosviewer)

Group	Number of items	Cluster member items
1	44	aca, adolescent, adult, affordable care act, association, cancer, change, confidence interval, covid, diagnosis, disease, disparity, employer, enrolment, expansion, health care access, health insurance literacy, health insurance status, implication, importance, increase, insurance coverage, insurance status, insurance type, January, life, Medicaid, Medicaid expansion, medicare, mortality, outcome, pandemic, patient, percentage point, previous study, private insurance, race, reduction, self, sex, state, treatment, united state, united states.
2	41	Aor, associated factor, cbhi, cbhi scheme, community, county, cross sectional study, education, Ethiopia, experience, financial protection, gender, government, health facility, health insurance policy, health insurance schem, health survey, healthcare service, household, Indonesia, marital status, member, middle income country, national health insurance, national health insurance scheme, nhi, nhis, Nigeria, odds ratio, policymaker, prevalence, quality, region, residence, respondent, rural area, scheme, social health insurance, uhc, universal health coverage, willingness.
3	24	Basic medical insurance, catastrophic health expenditure, che, china, china health, chronic disease, comparison, demand, development, family, financial burden, goal, medical insurance, older adult, oop, pocket, poverty, probability, reimbursement, resident, retirement longitudinal, rural resident, society, urban resident.
4	21	Article, bconclusion, bmethod, bresult, database, form, framework, health system, insurer, interview, issue, lack, literature, management, order, paper, process, provider, provision, review, systematic review.

Figure 6 shows that the fields of “biomedical and clinical sciences” and “health sciences” ranked first by research area, both with 31 articles, followed by the field of “commerce, management, tourism, and services” with 11 articles.

Network visualization can be used to enrich the assessment of bibliometric analysis. In particular, it highlights the relative importance of research constituents, which is not always reflected through

publications or citations. Network visualization is used to enrich the discussion of research areas in bibliometric studies.<sup>(30)</sup> In network visualization (Figure 7), two terms that are connected by a line indicate that these terms appear together in the title and abstract. Conversely, two terms that are not connected by a line indicate that they do not appear together in the title and abstract. The research data shows that there are 130 terms, 4 clusters, 4976 links, and 12583 link

strengths. Therefore, novelty for further research on the topic of health insurance can be obtained through research on terms that are not directly related, for example counseling, types of health insurance, and medical costs.

Figure 5 shows that out of 130 items, there are 4 clusters. Cluster 1 (44 items), cluster 2 (41 items), cluster 3 (24 items), and cluster 4 (21 items) are presented in Table 1.

The overlay visualization (Figure 8) provides an analysis based on health insurance keywords from 2004 to 2022 to observe trends in linear regression-related research titles. Based on the visualization overlay map in Figure 8, the yellow-colored terms imply that the keywords are of current research interest. Therefore, trends of health insurance research show that for trends, keywords include women, households, and patients.

Recently, participation in this topic has focused on the emergence of Universal Health Coverage (UHC) as a new global health direction as it embraces the progressive language terms of inclusion, solidarity, and social justice and advocates for everyone's right to universal health care without financial hardship.<sup>(31)</sup> Patient safety and health development are the cornerstones of health insurance programs.<sup>(24)</sup> In 2019, the UN General Assembly noted that at least half of the world's population did not have access to basic health services.<sup>(32)</sup> Health services are provided in the form of medicines and treatments.<sup>(17)</sup> The National Social Health Insurance Program (JKSN)<sup>(33)</sup> aims at providing comprehensive health service benefits, ranging from preventive services such as immunization and family planning to catastrophic disease services such as heart disease and kidney failure.<sup>(24)</sup> In JKN-BPJS Kesehatan Implementation Guidelines,<sup>(34)</sup> in the subchapter of Obstetrics and Neonatal First Level Health Services, it is stated that this service is an effort to guarantee and protect the processes or stages of pregnancy, childbirth, postpartum period, postpartum bleeding management, and postpartum family planning services as well as complications related to pregnancy, childbirth, puerperium, and postpartum.<sup>(35)</sup>

The various sub-periods in which scholarly activity on this topic developed during 2004-2022 represent a rich set of key terms. In the title, abstract and keywords of the articles in the sample, VOSviewer has identified different keywords. This makes it possible to validate the breadth of the axis of study in research activities. Emerging global health challenges, in general, and conflict-imposed health care, climate change, and lack of economic growth are already impacting well-being and meeting development goals.<sup>(36)</sup>

The keyword density visualization map (Figure 9) shows the visualization of the term density indicated by color. Blue indicates high density while yellow indicates low density. High density means that the topic has been widely used in previous studies while low density means that the topic was little used in previous

studies. Therefore, the recommended research topics related to health insurance are the topics that have low visualization density categories, such as counseling, types of health insurance, and medical costs. These topics offer great opportunities for health insurance-related research, because in previous studies there was still a lot of discussion about the scope of health insurance schemes, communities, and medicines in health care systems that are actively developing and accompanied by a significant increase in the amount of scientific literature.<sup>(37,38)</sup> Analysis of opportunities for research topics can provide some insight for researchers and educational practitioners to identify which research directions are important.<sup>(39)</sup> Through content analysis, it was found that researchers pay attention to these topics.<sup>(40)</sup>

The scope of research is very broad and involves a large amount of research content which causes the research to be unfocused. The research methods used can include qualitative, quantitative, and mixed research.<sup>(41,42)</sup> Issues related to health insurance are the focus of research in the development of health sciences.<sup>(43)</sup> The results of bibliometric analysis show that the field of study of health insurance is broad and interdisciplinary.<sup>(44)</sup> The current study differs from a previous bibliometric analysis<sup>(45)</sup> and literature review.<sup>(46)</sup>

This research helps readers to understand the dynamics of trends in the development of research topics through research findings. It can also help researchers to quickly identify priority research problems, find the most influential references, and select the most influential or important researchers and institutions to collaborate with.<sup>(47,48)</sup> Analysis of the results will help researchers find the contribution of major journals that direct and encourage the development of further research achievements in scientific research institutions.<sup>(49,50)</sup>

## CONCLUSION

The bibliometric analysis shows themes, trends, prolific authors, core journals, leading country rankings and collaborations, and health insurance research groups. This review provides a systematic review of health coverage over time. The results of research on health insurance trends include women, households, and patients. Health insurance-related topics that have opportunities in research are counseling, types of health insurance, and medical costs. Topics that have opportunities in the study can improve health services such as providing counseling to patients communicatively and effectively, explaining the types of health insurance that can be used to help the community with medical expenditures. There is a close relationship between the topic of health insurance and other topics, namely financial protection factors, health, medicaid programs, public health insurance, and personal health insurance.

Therefore, bibliometric analysis of health insurance can be reviewed again in the next few years. In addition, this bibliometric analysis only extracts scientific article data from the app.dimension.ai database. Further research should add another database for a broader and more comprehensive understanding of health insurance.

#### Conflict of Interest

Competing interests: No relevant disclosures.

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#### Author Contributions

All authors are responsible for the conception and design of the research project, data collection, and writing of the manuscript. All authors have read and approved the final manuscript.

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None.

#### Data Availability Statement

The data used in this research was accessed via <https://scholar.google.com/>, <https://app.dimensions.ai/>, <https://trends.google.co.id/>, and VOSviewer.

#### Declaration of Use of AI in Scientific Writing

None.

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