



Exploring Budget Impact Research: A Quantitative and Visual Bibliometric Analysis

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Abstract

This research has the aim of studying the effects of budgets on different sectors, specifically healthcare and social welfare, through the research trends, themes, and emerging topics, with the help of bibliometric methods. Budget execution is a very imperative process because it oversees resources allocation in order to achieve organizational and societal objectives thus plays a vital part in effective resource management, economic planning and sound decisions making. The PubMed database was searched to identify 9,837 records (bibliometric analysis) and after filtering the records based on relevance, document type, and language, 4,916 of the research articles related to human beings were identified. Keywords occurrence and co- occurrence were analyzed, and visualization of the network, overlay, and density were established using VOSviewer 1.6.19 to visualize the connection and trends in the research. The findings showed that, studies majorly concentrate on the anthropocentric outcomes, healthcare spending, and economic analyses like the cost-benefit analysis. The demographic variables that became common in the study included the age and the gender, whilst such new fields as technology assessment, quality-adjusted life years, and performance-based budgeting were frequent. Network and density maps indicated the related research themes and areas of intensive scholarly interest. The results show that budget research has changed to be not only a simple financial planning to more demanding analyses, which incorporate demographics, economics and healthcare aspects, but also more focused on evidence-based decision-making, efficiency and sustainable resource allocation. In general, the research shows that the knowledge of the effects of budgets can inform policymakers and organizations to effectively and fairly distribute resources efficiently to enhance economic planning, service delivery, and sustainability.

Keywords: Budget impact, Healthcare expenditures, Cost-benefit analysis, Bibliometric analysis, Resource allocation, Performance-based budgeting.

Background

Budget execution is an act of gathering the planned revenues and effectively utilizing them to achieve the objective of the health system. The problems encountered in the budgeting process at the low- and middle-income countries (LMICs) exist at all budgeting levels, although they tend to be more profound at the implementation stage (Musiega et al., 2023). A budget is an approximation of the revenues or expenses of a specific time. Budgeting process involves establishing a plan to spend or to distribute resources. One can make it towards an individual, project, business, government, or other organization (Corporatefinanceinstitute,10/09/2025). A budget is a financial plan which forecasts expenditure as well as plans to utilize funds within a given time. It is accountable, assists in resource management and is an indicator of economic policies by the government. The budget allows the country to understand what its financial state is like and helps achieve proper economic development by demonstrating how funds are distributed to various sectors and programs (Parmar, George, and Trilok, 2020). The budget balance is an essential instrument to the financial stability of a country in that it determines important macroeconomic factors and the general economic wellness. It is specifically important to comprehend the role of budget balance in Vietnam because the country has a dynamic economic environment in the last decades (Ho Thuy et al., 2024). The concept of budgeting is as old as mankind itself where Joseph in Egypt used to save and keep resources in times of plenty so that he can use them in times of shortage. The process of budgeting became an important aspect of running the business during the Industrial Revolution when the companies utilized it to plan and manage their finances (Nakayiki, Ngiri, and Akampurira, 2023). The budget annually is very important in the shaping of the economic growth and development of India. This paper is dealing with the effects of the national budget on several key dimensions including the GDP, income distribution, and fiscal stability. It also discusses the dilemma of policymakers in terms of economic growth and social welfare in the face of political, international and domestic factors. The analysis of data and comparison of the practices that are applied by the global industries will assist in comprehending the strengths, weaknesses, and opportunities of the budgeting system in India (Sharma. R. C, 2014).

The traditional budgets are regarded as not very efficient in budgeting the resources, particularly in the contemporary business environment that changes rapidly. Budgets ought to be incorporated with organizational strategies, planning, and control in order to be effective. Budget management and strategic planning are effective in manufacturing firms to enhance decision-making, performance, and competitiveness. In this work, attention is paid to the possibility of budgeting to assist planning and control in such organizations (Gupta and Deena, 2021). Budget based payment systems are not novel, and their application has been restrictive due to the practical issues and legal constraints imposed by federal and state healthcare regulations. Within the past few years, however,

the Centers of Medicare and Medicaid Services (CMS) as well as the private insurance providers have begun to implement such payment structures in order to contain healthcare costs and encourage patients to seek cheaper or better-quality healthcare providers (Hudson, 2015). Due to difficulties in preparing a research proposal budget, new researchers are not always likely to do it. Nonetheless, one can make the process significantly easier once acquainted with the fundamentals of budgeting processes and having an excellent communication with the office of sponsored programs at the institution. All costs of conducting the proposed study should be put into careful consideration, and one should be familiar with university and funding agency budget restrictions. This paper describes effective budgeting strategies that can be used to prepare a research proposal budget (Higdon & Topp, 2004). Performance-based budgeting has the potential of impacting resource allocation and enhancing budget results. This paper discusses its effect on the budgetary behavior of the states and concludes that the adoption of performance-based budgeting influences the efficiency in resource allocation positively (Klase & Dougherty, 2008). The budget impact analysis is useful in enabling the healthcare decision-makers to know the financial implications of the introduction of a new drug. It can be done prior to the incorporation of a drug in the formulary to determine whether the drug in question is cost-effective within the existing budget (Miuskowski and Earnshaw, 2016). To consider the emerging demands and dynamics of the health system, budget impact analysis is to be adjusted to the policy and economic context of a certain country (Chugh et al., 2021). Economic analysis assists in effective allocation of healthcare resources, although it does not care much about the affordability, which is increasingly becoming a major issue. Economic evaluations can be enhanced with the help of budget impact models, which pay attention to costs, population requirements, and resource constraints. The paper mentions transparency, trustworthy data, and availability to the decision-maker as best practices in such models, which can be used to facilitate effective budgeting in healthcare (Trueman et al., 2001). The Budget Impact Analysis (BIA) of medicines assists healthcare managers to make knowledgeable choices and assists in the sustainability of health care systems by assessing the role and worth of novel therapies (Faleiros et al., 2022). Budget Impact Analysis (BIA) is a fairly recent method of healthcare economic analysis. It explores the financial implications of the implementation of new medical technologies in a given environment in the short and medium term. BIA can also be used in conjunction with other economic appraisals, such as cost-effectiveness analysis (CEA) to obtain more data with which to make decisions regarding reimbursement of new treatments. A number of countries, such as Australia, Canada, Belgium, Croatia, Hungary and Poland, have now made manufacturers provide BIA with CEA in order to seek national or regional reimbursement (Garattini and van de Vooren, 2011). Budget standards are the requirements of goods and services to realize a basic standard of living. The low cost acceptable (LCA) criterion provides the households with shelter, nutritious meal, social requirements, and healthcare and education (Nelson et al., 2002). Bibliometric

analysis is a quantitative approach that involves the use of statistical techniques to research the trends in the field, publication rates, and areas of major interest in a particular field (Tang et al., 2023). The bibliometric analysis is the very popular approach to assess the reliability, quality, and impact of researches (Akmal et al., 2020). The bibliometric analysis method quantifies the effectiveness of a study through the number of citations, which is why it is a good method to know the influential article (Reddy et al., 2022). Bibliometric analysis is a quantitative technique that is applied to analyze data on publications, such as number of papers, authors, institution, country and keyword. The application in the field of scientific studies has been increasing at an alarming rate over the past few years, due to the development of powerful software, like VOSviewer, Leximancer, and Citespace, and massive databases, such as PubMed, Scopus, and Web of Science (Ding et al., 2023).

Materials and Methods

Collection of data: -

The current research has been carried out as a bibliometric analysis (BA) based on the information and data stored in the PubMed database until October 8, 2025. PubMed was chosen due to its reputation as a good and credible source of research publications and citation.

Identification of Relevant Data: -

In order to locate the dataset number 9837, the researchers employed the search tool offered on the PubMed resource, and they utilized the keywords and some set criteria. This approach assisted in the proper and quality retrieval of data that was used in the study.

Data Screening and Cleaning: -

Of 9,837 documents that were retrieved 4,921 were filtered out on basis of document type. Only full-text and human related research papers in English were taken to be further analysed.

Record Evaluation for Inclusion: -

At the subsequent step, 4,916 datasets under the inclusion criteria were thoroughly examined, as they were verified to be relevant to the study.

Data Analysis: -

In order to locate the critical themes in the field, this paper was dedicated to the analysis of the number of repetitions of certain keywords regarding the influence of budget. It also sought to emphasize the way in which knowledge in this field has grown and advanced with the course of time. The bibliometric analysis (BA) has been conducted to create a mapping of the relationships between the publications, authors, and keywords, as well as understand the trend in the literature in place. The analysis has been performed with the help of VOS viewer 1.6.19, which allowed working with large data sets and obtain visualizations in the form of network, overlay, and density maps. These visual

aids gave a clear and detailed summary of the field that can be helpful in future research and developments.

Results

Table 1: Co-occurrence of Keywords Related to Research on the Impact of Budget

S. NO.	Keywords	Occurance	Total Link Strength
1.	Humans	4916	13986
2.	Female	1484	7876
3.	Male	1205	6963
4.	Cost-benefit analysis	1360	5545
5.	Middle aged	796	5300
6.	Adult	873	5187
7.	Aged	670	4278
8.	Budgets	975	4063
9.	United states	786	2836
10.	Adolescent	373	2576
11.	Health care coast	498	2418
12.	Child	394	2067
13.	Young adult	249	1944
14.	Models,economic	350	1760
15.	Aged,80and over	231	1750
16.	Quality adjusted life years	312	1661
17.	Drug coast	320	1456
18.	Child preschool	216	1398
19.	Retrospective studies	251	1265
20.	Infant	203	1196
21.	Health expenditures	296	1193
22.	Trreatment outcome	230	1154
23.	Health policy	325	1061
24.	Coast saving	201	1006
25.	Costs and cost analysis	263	992
26.	Budget impact	219	910
27.	Quality of life	213	910
28.	Survey and questionnaires	213	882
29.	Delivery of health care	254	846
30.	Technology assesment, biomedical	226	763
Total		18902	85242

Table 1.

shows the co-occurrence analysis of the keywords that are frequently utilized in the research regarding the effects of budgets. It is observed in this table that the frequency of appearances of the keywords (Occurrence) as well as the strength of their links with the other keywords (Total Link Strength) give information on the main themes and trends in the studies related to the budget.

1. Humans (Occurrence: 4916; Total Link Strength: 13,986): The most common keyword is “Human beings, indicating that most studies concentrate on human-related budgetary effects, which include the population and private budgetary decisions of human welfare.
2. Female (1484; 7876): It has been found that female studies tend to examine how budgets affect females and this reveals a gender specific research in health, education or welfare oriented budget studies.
3. Male (1205; 6963): Males, as with females, are also a good target indicating that there are gender comparisons, in the budget impact studies.
4. Cost-benefit analysis (1360; 5545): It is a common search term that demonstrates the fact that economic assessments play the key role in budget research.
5. Middle aged (796; 5300): It is a common topic of research to discuss the impact of budget on middle aged populations, potentially in areas such as healthcare, retirement planning, and benefits provided by employment.
6. Adult (873; 5187): Adult are major demographics in the field of budget, as they are major workforce and resource consumers.
7. Aged (670; 4278): Aged populations as well are taken into consideration with a focus on the pensions, healthcare and social welfare budgets.
8. Budgets (975; 4063): This is one of the key words demonstrating that budget allocation, planning and management are the primary subject in the literature.
9. United States (786; 2836): A large part of the literature is based or targets the United States, a reflection of its international impact when it comes to economic and health budget research.
10. Adolescent (373; 2576): Adolescent groups are less examined, but still are applicable, especially in education and health care budgets.
11. Health care cost (498; 2418): Healthcare expenditure is another motif that brings out the issue of budget in medical facility.
12. Child (394; 2067): The topic of child welfare and budget allocations on child services is discussed in several researches.

13. Young adult (249; 1944): Studies that address the research question of young adults tend to concentrate on education, employment and the impacts of early healthcare budget.
14. Economic models (350; 1760): Economic modeling is a device that is applied in the prediction of budget results and policy efficiency.
15. Very old, 80 or more (231; 1750): The very old are sometimes researched to screen pension, health care and social security budgets.
16. Quality-adjusted life years (312; 1661): This keyword can be used in healthcare economics as it refers to the emphasis on the measurement of how the budget allocation affects the health of the population.
17. Drug cost (320; 1456): Pharma costs are put into the limelight, which demonstrates the financial strain in the medical sector.
18. Child preschool (216; 1398): Early childhood education budgets are viewed in research in relation to child development and welfare.
19. Retrospective studies (251; 1265): Retrospective studies are usually involved in research to learn the previous decisions and results made in the budget.
20. Infant (203; 1196): Infant-based researches measure the effects of budgets on the neonatal care, vaccinations and early childhood health programs.
21. Health expenditures (296; 1193): General healthcare expenditure is a persistent theme of research on the budget impacts.
22. Treatment outcome (230; 1154): There are studies which associate budget allocations with health treatment effectiveness and outcome.
23. Health policy (325; 1061): Funding and health regulations are interconnected, as budgets are directly related to health policy.
24. Cost saving (201; 1006): The cost reduction strategies are often examined by the researchers in order to avoid their impact on the quality of the services.
25. Costs and cost analysis (263; 992): Cost analysis is also a fundamental tool of cost efficiency in the budget.
26. Budget impact (219; 910): This is associated directly with research that examines the effects of particular budget decisions.
27. Quality of life (213; 910): Budgetary allocations are frequently researched about the impact on the population well-being.
28. Survey and questionnaires (213; 882): These are also very popular as means of gathering

data on the perceptions of and outcomes of budget impacts.

29. Health care delivery (254; 846): Emphasis is laid on the impact that budgets have on the delivery of the healthcare services.
30. Technology evaluation, biomedical (226; 763): There are studies that investigate budgetary allocation to technological advancements and biomedical advancements, as a feature of innovation and cost control.

In general, the table shows that the budget research covers various demographics, economical assessments, health results, and policy-related research. Keywords that have increased instances and interrelations denote core areas of interest and connectivity of research issues.

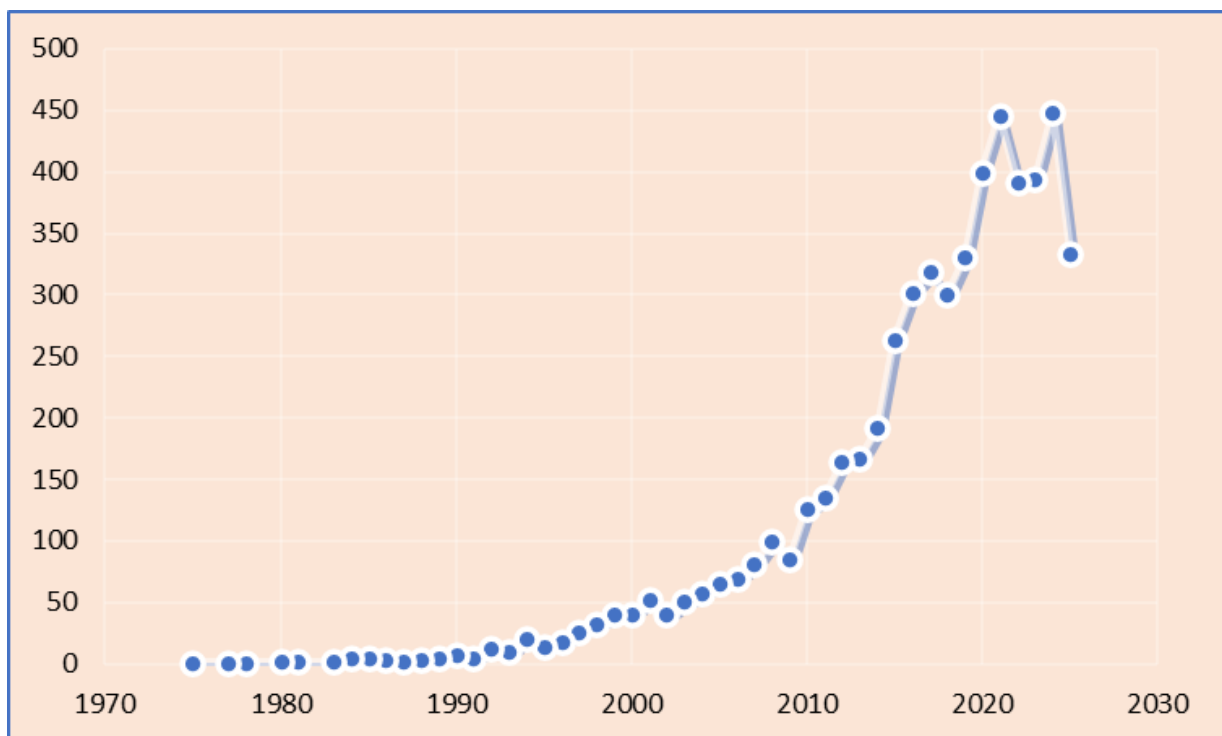
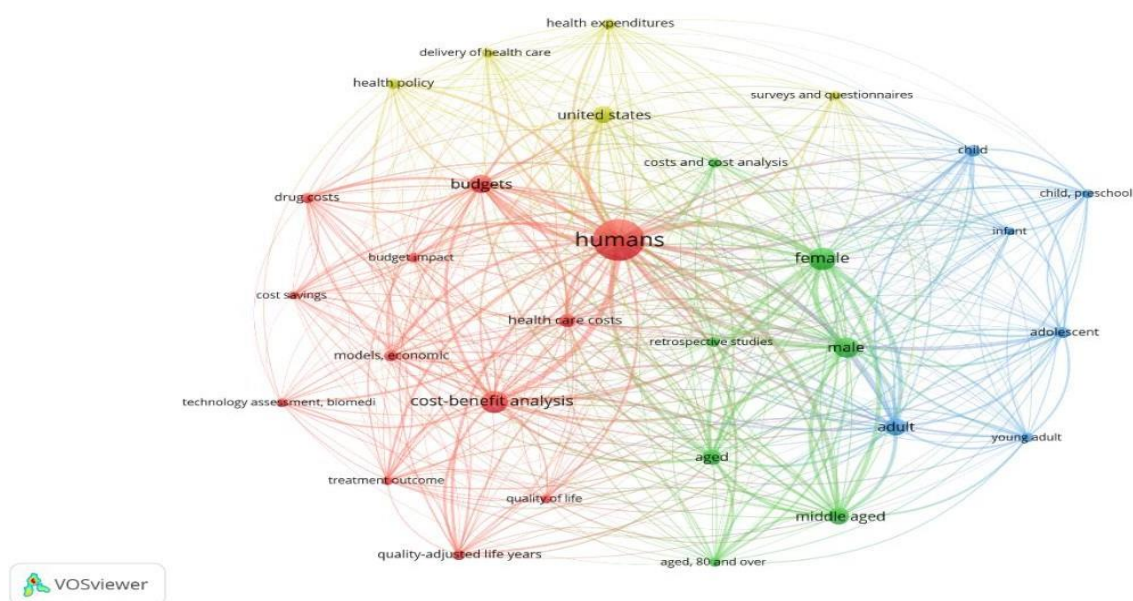


Figure: -1 Publication Trends and Citation Metrics in Impact of Budget Research (1970–2025)

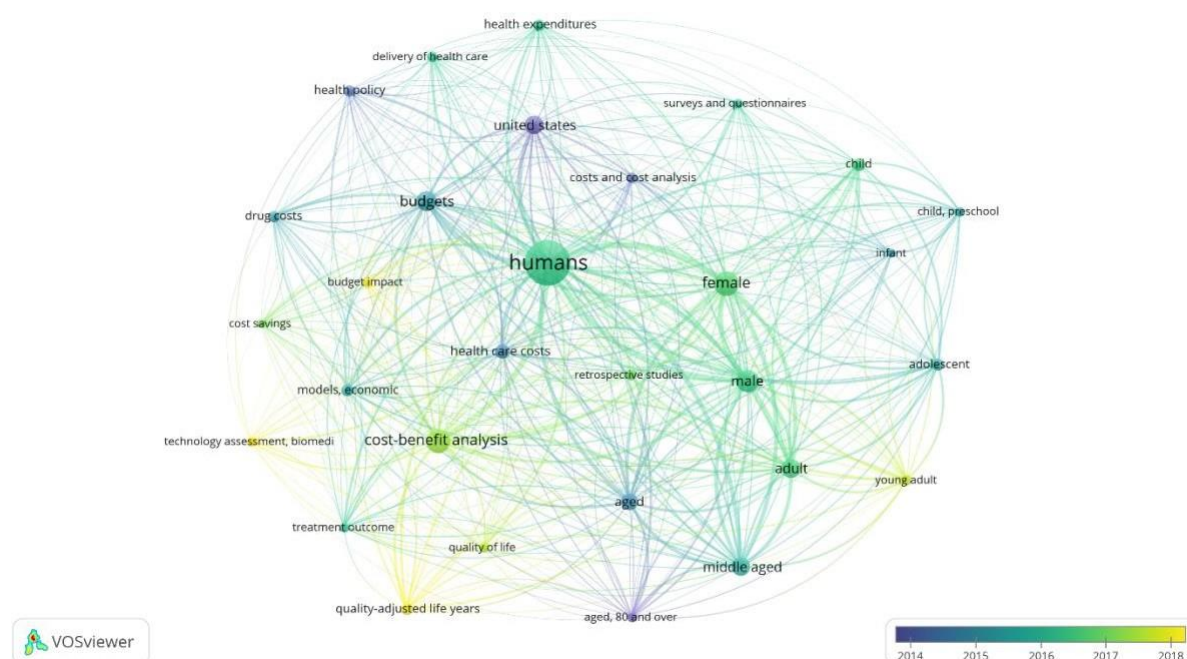
Figure 1 demonstrates the increase in the number of research publications and its citation according to the budget impacts over the years. The trend is positive between 1970 and 2025, and it means that more academicians are interested in the field. The early years are characterized by fewer publications, and the recent years (2000 and later) are characterized by the high rate of increase, perhaps because of the increased sensibility to budget efficiency, healthcare financial issues, and economic analysis. Citation statistics prove that the most cited studies tend to concentrate on the cost-

benefit analysis, healthcare expenses, and quality of life outcomes.



The figure: -2 Network Visualization of Impact of Budget Research Based on Co-Occurring Keywords (Source: Created by the Author using VOS viewer 1.6.19 Software)

Figure 2 presents a network map where keywords are represented as nodes, and their relationships indicate co-occurrence in research articles. Larger nodes represent frequently occurring keywords, while thicker lines indicate stronger relationships. For example, "human," "woman," and "cost-benefit analysis" are central nodes connected to several other keywords, indicating their importance and interconnectedness in budget research.



The figure: - 3 Overlay Visualization of Impact of Budget Research Showing Co-Occurring Keywords (Source: Created by the Author using VOS viewer 1.6.19 Software) Figure 3 uses color-coding to illustrate the evolution of research over time. Keywords that appeared in earlier studies are shown in cool colors (blue), while more recent topics are shown in warm colors (yellow/red). This visualization also highlights emerging areas such as biomedical technology assessment and quality-adjusted life years, highlighting changes in research focus over the decades.

The figure: - 4 Density Visualization of Impact of Budget Research Highlighting Co-Occurring Keywords (Source: Created by the Author using VOS viewer 1.6.19 Software)

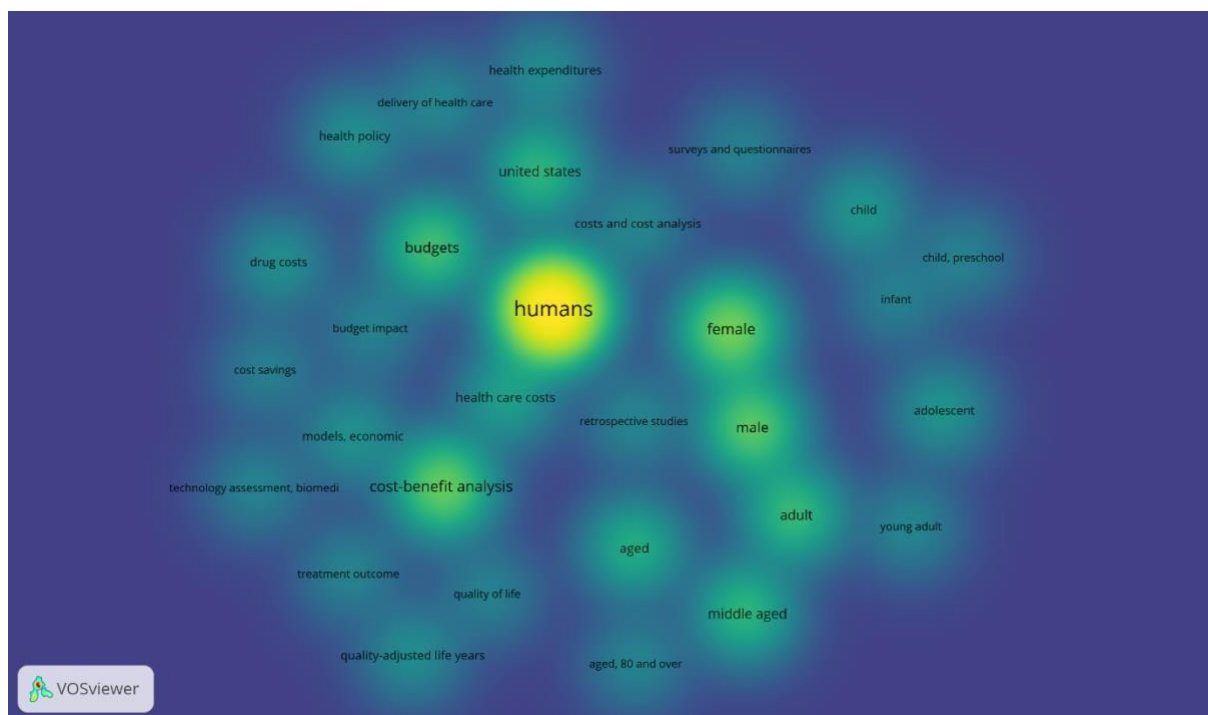


Figure 4 displays a density map where areas with a high concentration of keywords are highlighted in brighter colors. This diagram highlights the most studied topics, with "humans," "cost-benefit analysis," and "healthcare expenditures" forming dense clusters. This visualization helps identify key research points and the intensity of scholarly attention in the field of budget impact.

Discussion of Findings

A bibliometric analysis of research on budget impact reveals several important trends. Table 1 shows

that the most frequently used keywords are "human," "woman," and "man," indicating that budget research often emphasizes human and demographic aspects, especially in healthcare and social welfare (Tang et al., 2023; Reddy et al., 2022). Gender-specific studies show that policymakers and researchers pay attention to how budget allocations affect men and women differently, which is consistent with previous findings on gender-based economic impacts (Musiega et al., 2023). Economic evaluation terms such as "cost-benefit analysis," "cost and cost analysis," and "budget impact" are also among the most prominent keywords, highlighting the central role of efficiency evaluation in budget formulation (Truman et al., 2001; Mauskopf and Earnshaw, 2016). These results indicate that research often focuses on ensuring that financial resources are allocated effectively to maximize outcomes, especially in health systems (Faleiros et al., 2022). Keywords such as "healthcare costs," "health expenditure," and "healthcare delivery" reinforce the importance of healthcare budgeting and its impact on service quality (Chug et al., 2021; Hudson, 2015). The analysis also focuses on different population groups. Terms such as "middle-aged," "adult," "elderly," "adolescent," "child," and "infant" indicate that studies examine budget impacts across all life stages (Ho Thuy et al., 2024; Parmar, George, & Trilok, 2020). This is consistent with the growing focus on life-course approaches in health and social policy budgeting. Emerging themes such as "technology assessment, biomedical" and "quality-adjusted life years" indicate that research is increasingly integrating technological and evidence-based metrics to improve budget efficiency and decision-making (Garattini & van de Vuuren, 2011; Nelson et al., 2002).

Figures 1 to 4 complement these findings. Figure 1 shows a clear increase in publications and citations over the decades, reflecting growing academic interest and global recognition in budget research (Akmal et al., 2020). The network visualization (Figure 2) highlights strong relationships between key keywords, indicating that research is interconnected across economic evaluation, demographics, and healthcare topics (Ding et al., 2023). The overlay visualization (Figure 3) shows the temporal evolution of research, with new areas such as biomedical technology and cost-effectiveness emerging in recent years (Tang et al., 2023). The density visualization (Figure 4) highlights key research points, emphasizing studies focused on human-centered outcomes, cost-benefit analysis, and healthcare expenditures (Reddy et al., 2022). Overall, the findings suggest that budget research has evolved from basic financial planning to complex evaluations integrating demographic, economic, and healthcare considerations. The prominence of keywords related to efficiency, performance-based budgeting, and technology indicates a strong focus on evidence-based decision-making and effective resource allocation (Klasse and Dougherty, 2008; Truman et al., 2001).

Conclusion

The study demonstrates that budget research plays a crucial role in understanding how financial resources impact various sectors, particularly healthcare and social welfare. Research shows that budgets impact all demographic groups, and economic evaluations such as cost-benefit analysis play a key role in assessing budget effectiveness. Over time, the focus of budget research has shifted toward integrating technology, performance metrics, and quality-of-life measures to improve decision-making and resource allocation.

The findings also demonstrate that bibliometric analysis is a valuable tool for mapping research trends, identifying key topics, and highlighting emerging areas of interest. By examining co-occurring keywords, publication trends, and network relationships, this study provides a clear overview of how budget research has evolved and where future research might be focused. In conclusion, understanding the impact of budgets is essential for policymakers, organizations, and researchers alike. Effective budget planning and implementation can promote economic growth, improve public services, and ensure that resources are allocated efficiently and equitably. This study underscores the importance of evidence-based approaches to budgeting to achieve sustainable social and economic outcomes.

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