Health Research Policy and Systems

REVIEW

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A scoping review of future research trends and priorities in health systems

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Abstract

Background Health systems worldwide are increasingly influenced by rapid and complex changes across various domains. Anticipating and responding to these changes is critical to ensuring the sustainability and effectiveness of health systems. Future-oriented research plays a key role in informing policy and planning, especially in the face of emerging global health challenges. This study aimed to identify and synthesize the emerging trends and megatrends shaping the future of health system research across different contexts and countries.

Methods A scoping review was conducted in 2024 following the Joanna Briggs Institute (JBI) methodology. Systematic searches were performed in three major databases – PubMed, Web of Science and Scopus – up to 8 November 2024. Inclusion criteria focussed on English-language articles that addressed future trends or priorities in health systems research. Data were analysed qualitatively and categorized using the Social, Technological, Economic, Environmental, Political, and Values (Legal) (STEEPV) framework .

Results From 5414 initially retrieved records and after 3 phases of screening, 22 studies met the eligibility criteria. The analysis revealed six major categories influencing future health systems research: sociocultural, technological, economic, environmental, political and values (legal) factors. Sociocultural and economic dimensions were the most frequently cited drivers. Key issues identified included ageing populations, technological innovations (e.g. artificial intelligence (AI), telemedicine), climate change, rising healthcare costs, political decision-making and legal–regulatory frameworks.

Conclusions The future of health systems research is multifaceted and shaped by intersecting global trends. Understanding these dimensions can guide policymakers and researchers in setting priorities, designing adaptive strategies and enhancing the resilience and responsiveness of health systems. Comprehensive and coordinated planning at the macro level is essential for addressing upcoming challenges and optimizing health outcomes.

Keywords Foresight, Health system, Future trends, Megatrend, Research priorities, Scoping review, STEEPV analysis

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Background

The health system is considered one of the vital systems amongst social organizations [1]. The WHO defines the functions of the health system as including stewardship, financing, resource generation and service delivery [2, 3]. It states that the three main objectives of the health system are to promote and maintain the health of individuals and communities, respond to people's expectations and provide financial protection against health costs. The health sector in any society encompasses a broad area, and ensuring appropriate conditions for it requires national commitment. Ensuring health is one of the primary responsibilities of governments, and the laws of each country reflect the status of health within its governing framework [4].

Rapid changes in various social, political, economic, technological and environmental domains introduce complexity and risk to the future of the health system. The evolution of the health system represents a global challenge; therefore, foresight and preparedness to confront hazardous conditions are necessary for the health system [4, 5]. In less developed countries, future-oriented research in various health system sectors has been conducted, but most of this research has been exploratory in nature. A review of studies indicates that if this trend does not change, the formulation of effective and appropriate strategies for implementing future programs and addressing the challenges facing the health system will likely fail [5].

The healthcare system in the future will be significantly impacted by major changes aimed at improving the quality of health and treatment services and enhancing public health [6]. The changes in the healthcare system are driven by rapid technological advancements, social and economic changes and the evolving needs of society [7, 8]. With the emergence of new technologies such as artificial intelligence and big data, the healthcare system will be able to provide health services more accurately [9]. This not only contributes to increasing the efficiency of treatment services, but can also lead to the early detection of diseases and the prevention of their spread [10]. Additionally, global trends such as climate change and the emergence of new diseases, especially epidemics, place additional pressure on healthcare systems and increase the need for flexibility and innovation [11, 12]. Another issue that affects the future of the healthcare system is the existence of social and economic inequalities in access to health and treatment services, which is of increasing importance. In this regard, policymakers and researchers need to seek solutions that help reduce these inequalities [13].

Therefore, examining the trends influencing the future of the health system is essential, as it can aid in predicting demographic changes and the emergence of new diseases, thus helping identify the future needs for healthcare services. Additionally, technological innovations and resource optimization lead to improvements in service quality. These trends enable policymakers to make more informed decisions and prevent future crises. Furthermore, analysing trends significantly contributes to enhancing public health in the community through education, awareness-raising and disease prevention. Hence, this study has been conducted with the aim of identifying trends affecting the future of health system research and is presented as a systematic review.

Methods

The study was a systematic scoping review conducted in 2024. To design and conduct this scoping review, the protocol of the Joanna Bridge Institute (2015) was used [14]. A scoping review was therefore conducted on the basis of the framework provided by the Joanna Bridge Institute protocol, and includes six stages, each of which is discussed below:

Specifying the research question and relating it to the purpose of the study

At this stage, according to the mentioned instructions, the main question of the research was determined as follows: "What are the trends and mega-trends affecting health systems' future research?" The clear research question in a scoping review acts as a guide for determining and selecting the criteria for entering studies into the review. In addition, this transparency helps to better design the study protocol, facilitate the search for evidence and studies and create an appropriate structure for reporting the scoping review. A scoping review question should include population, concept and context (PCC) components [15]. In this study, community (P) included all the studies that examined the trends and mega-trends affecting health systems; the concept (C) included trends and mega-trends and factors affecting health systems' future research; and the context (C) was the experiences of different countries in the world.

Search for related studies

At this stage, studies were searched from three databases including ISI Web of Sciences, PubMed and Scopus using the specified search strategy. The search timeframe was from inception of the databases up to 8 November 2024. No lower date limit was applied to ensure the inclusion of foundational and highly influential studies on future trends in health systems, even if published in earlier decades. Table 1 presents the search strategy used to search for relevant studies in the present scoping review. The

Table 1 Scoping review search strategy

Databases	**ISI Web of Science, PubMed, Scopus,**
Search restrictions	Language (English), title, full-text available, document type: article, review
Search time	8 November 2024
Search terms	"trend*" OR "Mega-trends" OR "change*" OR "priorit*" OR "driver*" OR "Wild cards" OR "shocks" OR "Discontinuities" OR "Weak signals" OR "structure breaker" in [Title]
	"forecast" OR "foresight" OR "foretell" OR "foresee" OR "future*" OR "coming" OR "forthcoming" OR "upcoming" OR "emerging" OR "leading" OR "next" OR "prospect*" OR "expect*" OR "outlook*" OR "predict*" OR "prognosticate*" OR "project*" in [Title]
	"health system" OR "health care system" OR "healthcare system" OR "health care sector" OR "healthcare sector" OR "health" in [Title/Abstract]

complete search strategy for each database is provided in Supplementary File 1.

Screening and selection of studies

The inclusion criteria of the studies included those studies that were in the form of original or review articles or dissertations and were in English language and had full text and examined trends and mega-trends and factors affecting health systems' future research. In addition, the exclusion criteria included studies that did not have a full-text or English language or were in the form of book review, opinion articles, commentaries, letter to editor and proceedings that lacked the necessary framework to review the articles' specifications and evaluate their quality.

At this stage, an attempt was made to access grey literature or studies that were not found in the search process with a supplementary search in Google Scholar as well as by checking the reference lists of the obtained studies. After searching for studies from the considered databases and removing duplicates, the studies were screened and reviewed by two members of the research team independently in three phases based on the title, abstract and full text of the studies. In each phase, the final decision regarding the selection of reviewed studies was made on the basis of the agreement of both people, and in cases of disagreement, the opinion of a third member of the research team was obtained. Endnote version 8 software was used to manage the systematic search process and study screening. In addition, PRISMA[1] protocol [16] was used to manage the selection process of related studies and also to report this scoping review.

Analysis and classification of key information

After selecting the final studies on the basis of the desired inclusion and exclusion criteria, the data related to the trends and mega-trends and factors affecting health systems' future research were extracted from the studies and entered into the study specification table resulting from the scoping review. This table included the name of the first author, year of publication, study title, location, study design, participants and key findings from the study.

Then, for the qualitative analysis of the obtained data, the data were examined several times. The purpose of qualitative data analysis was to ensure that all complex topics and concepts were related to the context of the scoping review study in the text of the studies covered.

Summarizing and reporting

At this stage, two authors independently integrated and summarized the data obtained from the text of the studies to identify the items related to trends and mega-trends and factors affecting health systems' future research on the basis of studies from different countries. In case of possible disagreements, the third person in the research team helped to reach a consensus. Then, the main themes and subthemes related to the subject were defined, clarified and categorized according to the social, technological, economics, environmental, political and values (STEEPV) analysis tool.

Results

The systematic search yielded 5414 records from three databases. After removing duplicates, 2190 studies were screened by title, of which 106 proceeded to abstract screening. Following full-text assessment of 60 studies, a total of 22 met the inclusion criteria and were included in the final synthesis (see Fig. 1).

Most studies in the scoping review were review studies ($n=11$; 50%) that were mostly conducted in 2009 ($n=4$; 18%) and 2024 ($n=4$; 18%). In addition, the majority of the included studies were related to the United States ($n=8$; 36%). A summary of the final studies selected on the basis of the present scoping review is presented in Table 2.

The results of qualitative analysis and classification of the data obtained from the text of the selected studies result in the classification of extracted items based on six main categories of STEEPV analysis. According to the study's findings, the most important factors that determine the direction of health system research in the future, both based on the number of topics and the number of studies that have addressed these topics, are sociocultural,

[1] Preferred Reporting Items for Systematic Reviews and Meta-Analyses-extension for Scoping Review (PRISMA-ScR).

economic and then political and technological factors, respectively (Table 3).

Discussion

On the basis of the findings of the present study, the trends influencing the future of health system research have been categorized into six areas: political, economic, sociocultural, technological, environmental and legal issues (values). These trends are not only ongoing trends, but are gaining traction, as seen with the surge of investment in digital health, the increasing rate of climate-induced health emergencies and the increased policy awareness focussing on health equity during this post-pandemic context. Due to its complexity and dynamism, health system research must pay close attention to these trends to contribute to the improvement of the quality of healthcare and medical services. Taking these factors into account, a brighter and healthier future can be anticipated.

Political issues: Political topics play a crucial and decisive role in the future of health system research. These influences can directly or indirectly affect the research priorities of the health system. One key political issue is the role of the government or the impact of government decisions on the health system. Chaudhry and colleagues (2020) conducted a study to examine the impact of government actions, national preparedness and socioeconomic factors on coronavirus disease 2019 (COVID-19) mortality and related health outcomes. The results revealed that low levels of national preparedness were associated with a higher overall mortality burden amongst patients [39]. Therefore, government policies can play a significant role in the health system.

In another study, Pal (2020) examined the role of the government in India's healthcare system and concluded that a well-planned and decentralized public healthcare system, capable of efficiently utilizing resources, supported by strong political will, community participation, health legislation and substantial prioritization of healthcare investments, is deemed an essential necessity [40]. Another critical political issue is the political power of interest groups or the pressure exerted by various political factions. One of the major challenges in the healthcare sector is the presence of multiple stakeholders [41]. Stakeholder engagement in health policymaking is a crucial process that can lead to improved decision-making quality and enhanced effectiveness of health policies [42].

Masefield and colleagues (2021) conducted a qualitative study focussing on stakeholder engagement in health policy processes in Malawi. This study identified significant challenges for meaningful and equitable stakeholder engagement at the local level in health policymaking. Issues related to trust, accountability, hierarchy and the culture of interaction need to be addressed to facilitate stakeholder participation in health policy development [43]. In another study, Kapiriri and Razavi (2021) assessed the influence of stakeholders in prioritizing healthcare services. The results revealed that amongst the identified stakeholders, politicians were the most prominent and belonged to groups with considerable power. However, the prominence of stakeholders varies depending on the type of decision, the nature of the health issue and who raises the health issue and how it is framed [44].

Another political issue discussed in the present study is the role of high-level documents and development programs. Sajadi-Jazi (2024) highlighted in a study that legal documents act as a guiding framework for the direction of a country's health system. The desired vision for the health system is often reflected in policies and development programs and can be seen as a hallmark of good governance in health systems [45]. Therefore, it can be argued that high-level documents serve as a roadmap for policymakers and healthcare managers. These documents can contribute to improving public health and enhancing the quality of healthcare services by setting broad goals and strategies.

Economic issues: One of the key topics in the field of economic issues is the discussion of increased competition in the healthcare and medical treatment market. Competition is considered a key mechanism for controlling healthcare costs [46]. Research also indicates that competition amongst healthcare providers can lead to improved quality of care [47, 48]. In a study, Levaggi (2024) emphasized the importance of competition in healthcare and medical treatment markets, stressing that policies should be designed in such a way as to prevent adverse effects on the quality of health services [49]. Liao and colleagues (2018), in a study aimed at evaluating the relationship between competition in the healthcare market and the quality of medical care under Taiwan's National Health Insurance program, concluded that simply strengthening competition in the market may not be sufficient to achieve the goal of improving healthcare quality. Other comprehensive and multifaceted policy measures must also be considered to contribute to the creation of a sustainable and efficient health system [50].

Another topic addressed was the increase in healthcare costs and the emphasis on cost containment. Nwosu (2024) noted in a study that operational costs in healthcare continue to rise, presenting significant challenges for healthcare organizations globally. As a result, he explored the potential for reducing operational costs through the strategic implementation of advanced business intelligence (BI) tools and data integration solutions, concluding that by leveraging data-driven insights and optimizing processes, healthcare providers can achieve

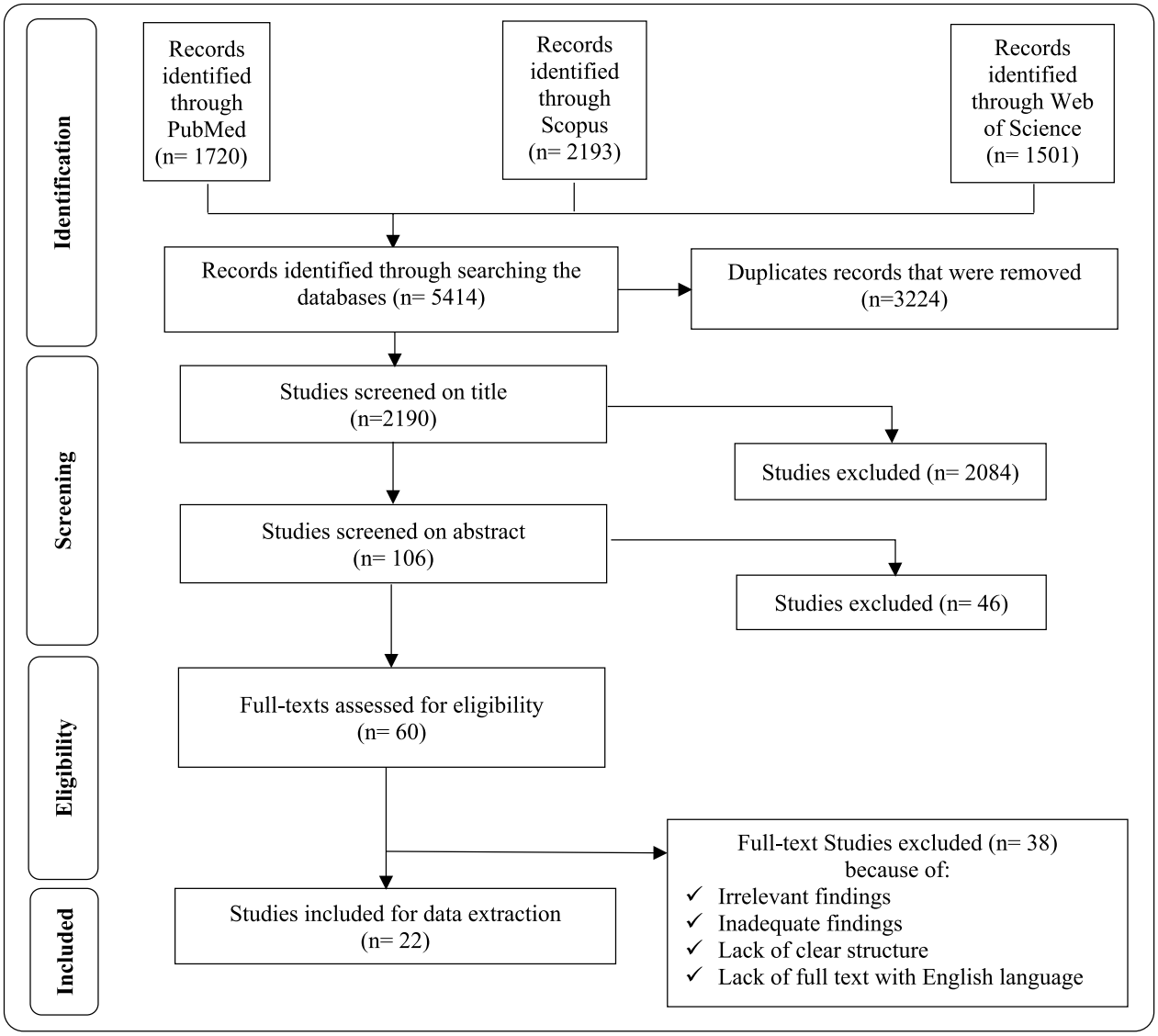

Fig. 1 PRISMA diagram for the process of selecting studies in the scoping review

cost efficiency whilst maintaining the highest standards of patient care [51]. Enthoven and colleagues (2019) reached the conclusion in another study that controlling healthcare costs has major implications for government budget deficits, as it enhances the government's capacity to finance education, infrastructure and other essential services. Therefore, managed care and managed competition should be expanded to control costs [52].

Therefore, it can be argued that controlling healthcare costs is one of the major challenges faced by health systems in various countries. Increasing costs in particular can lead to reduced access to healthcare services and exacerbate social inequalities. Another important issue discussed in the context of economic factors is access to healthcare services, which is influenced by various factors. In a study, Tzenios (2019) concluded that individual factors (socioeconomic status, education level and health awareness), structural factors (availability and access to specialists and healthcare facilities) and systemic factors (government regulations, healthcare costs and healthcare systems) significantly impact access to healthcare services [53].

Cultural and social issues: Cultural and social factors play a critical role in the health system and can have profound effects on the quality of health services, access to treatment and the overall health status of the community. One of the issues addressed in the present study is the increase in the elderly population, which may have a

Table 2 Characteristics of studies from the systematic scoping review

Row	First author, year	Place	Title	Method	Design and participants	Key findings
1	Betancourt, J.R., 2005 [17]	United States	Cultural competence and health care disparities: key perspectives and trends	Qualitative	"In-depth and structured interviews were conducted with 37 experts.."	Cultural competence has been considered a potential strategy for improving quality and eliminating racial/ethnic disparities in healthcare. Many healthcare stakeholders are developing cultural competence initiatives. However, the motivations for advancing cultural competence and the approaches adopted vary depending on the mission, goals and area of influence
2	Vandenburgh H., 2001 [18]	United States	Emerging trends in the provision and consumption of health services	Trends analysis	–	"Increasing competition in the healthcare market, rising costs and advancements in medical technology, and the globalization of healthcare services are considered among the most important future trends in the healthcare system."
3	Wait S., 2005 [19]	United Kingdom	Benchmarking health systems: trends, conceptual issues and future perspectives	Overview	Political reports	The aim of this study is to provide an overview of the key conceptual and methodological issues that underpin researchers' current understanding of health metrics. The results indicated that there are concerns about medical errors, inequalities in access to healthcare and consumer demand in health-related decision-making
4	Jennings C.P., 2001 [20]	United States	The evolution of U.S. health policy and the impact of future trends on nursing practice, research, and education	Historical overview	The healthcare system of the United States	This study thoroughly examined the policy changes in healthcare. The key findings of the study included political debates on universal health coverage and the regulations governing managed care programs
5	Taylor D., 2016 [21]	Africa	Health, environmental change and adaptive capacity; mapping, examining and anticipating future risks of water-related vector-borne diseases in eastern Africa	Case study, mixed-methods research methodology	More than 30 collaborating researchers from 15 institutions across Africa, Europe and Asia participated in this project	The future risks of water-related communicable diseases in East Africa were examined, and key trends such as disease modelling, climate change, and water availability were identified
6	Payne G., 2007 [22]	Canada	Counting backward to health care's future: using time-to-death modeling to identify changes in end-of-life morbidity and the impact of aging on health care expenditures	Use of "time to death" modelling	"Quantitative data about healthcare service costs"	A reduction in mortality and slow growth in death-related costs may lower projected healthcare expenditures. However, rapid cost increases for individuals not nearing the end of life and for non-hospital services could impose new economic pressures on healthcare systems
7	Kurane I., 2009 [23]	China	The emerging and forecasted effect of climate change on human health	Quantitative data presentation, trend analysis, modelling, and forecasting	Data	Climate change, including global warming, has a range of effects on human health. Direct effects include an increase in heat stroke cases and higher mortality rates amongst individuals with cardiovascular and/or respiratory conditions. The primary indirect effects are associated with infectious diseases. Vector-borne and waterborne diseases are the two main categories of infectious illnesses expected to be most significantly affected
8	Ronquillo J.G., 2012 [24]	United States	How the electronic health record will change the future of health care	Review of articles and governmental reports	The impact of EHRs on doctors and patients	Genetic testing is expected to play a significant role in patient care in the near future. Advances in genomic research hold the potential to influence medicine in tangible and direct ways, from carrier screening and disease diagnosis to prognosis, targeted therapies and personalized medicine. However, several barriers hinder the widespread adoption of genetic testing, and health information technology will be a critical tool in overcoming these challenges

Table 2 (continued)

Row	First author, year	Place	Title	Method	Design and participants	Key findings
9	Charoenca N., 2015 [25]	Thailand	How Thailand's greater convergence created sustainable funding for emerging health priorities caused by globalization	Retrospective analysis	Tobacco Control Policies and Health Promotion	This study examined how Thailand, a middle-income country, established a mechanism for sustainable health financing. In Thailand, the alignment of priorities amongst national stakeholder groups in support of sustainable health development created an opportunity to leverage domestic tax policies and establish a semi-independent foundation (ThaiHealth) to address a broad range of urgent health priorities, including programs that have significantly reduced road traffic accidents
10	Schwartz S.A., 2011 [26]	United States	Trends that will affect your future…: a portrait of American societal health	Analysis of statistical data	The demographic and statistical data of the entire population of the United States	This study explores emerging trends that impact the world, particularly the United States. It focusses on health issues in a broad sense – including medical concerns, changes in the biosphere, technological developments and policy considerations – all of which contribute to shaping public culture
11	Schmid E.F., 2009 [27]	United Kingdom	Will biomedical innovation change the future of healthcare?	Overview	Articles	Healthcare costs have risen across industrialized countries, prompting payers to seek new ways to contain expenses and adopt innovative financing models. At the same time, the business models of pharmaceutical companies are undergoing rapid transformation. Potentially disruptive innovations – such as RNA interference (RNAi), therapeutic vaccines and cell therapy – are emerging. Meanwhile, research and development (R&D) costs continue to rise annually, and there is growing pressure on drug pricing, efficacy and safety. As a result, changes in both healthcare systems and pharmaceutical companies are not only inevitable, but already underway
12	Spitzer W.J., 2013 [28]	United States	Future trends in health and health care: implications for social work practice in an aging society	Overview	Articles	This study identifies demographic shifts related to population ageing in the United States, examines their impact on health policy legislation, explores factors influencing emerging service delivery paradigms and highlights opportunities for the profession to address health inequities and meet the care needs of the ageing population
13	Azzopardi-Muscat N., 2015 [29]	The Netherlands	EU Country Specific Recommendations for health systems in the European Semester process: trends, discourse and predictors	Mixed	Documents including Economic Adjustment Programs (EAP) or Memoranda of Understanding (MOU)	This study seeks to analyse how national health systems are influenced by European Union institutions through the European Semester. The European Semester is a relatively recent process that affects health systems across the EU. Health stakeholders should aim for greater engagement with this process, which – if properly guided – can offer opportunities for health system reform
14	Kirwan D., 2009 [30]	Japan	Global health: current issues, future trends and foreign policy	Conference ReportComprehensive Review and Examination of Scientific Texts	–	Numerous studies indicate that climate change has multiple adverse effects on human health, including an increased risk of infectious diseases. However, the extent of these impacts is expected to vary across different regions
15	McMichael A.J., 2006 [31]	Australia	Climate change and human health: present and future risks	Overview	Articles	An emerging broader approach addresses a wider spectrum of health risks resulting from the social, demographic and economic disruptions caused by climate change. Evidence and projections of adverse health effects reinforce preventive policies and help guide the prioritization of planned adaptive strategies

Table 2 (continued)

Row	First author, year	Place	Title	Method	Design and participants	Key findings
16	Arcaya M.C., 2017 [32]	United States	Emerging trends could exacerbate health inequities in the United States	An analysis of various trends and a multidisciplinary approach	Analysis of different demographic groups	This study highlights trends across four key domains: healthcare technologies, health reform policies, widespread socioeconomic inequalities and environmental hazards. It also proposes approaches to mitigate the impacts of these trends to advance health equity, with a focus on strategies that offer shared benefits across multiple sectors
17	Bianco G., 2024 [33]	United States	Projected impact of climate change on human health in low- and middle-income countries: a systematic review	Overview	Articles	Mortality associated with nonspecific temperature-related conditions had the greatest health impact, followed by tropical infections (primarily dengue fever), malaria and cardiovascular diseases. Nearly all health outcomes examined are projected to increase in burden and/or experience geographic shifts in prevalence over the next century due to climate change. The findings of this study can provide a foundation for future research to inform climate mitigation and adaptation strategies aimed at protecting population health
18	Hajat A., 2024 [34]	Africa	Ramifications of precarious employment for health and health inequity: emerging trends from the Americas	Overview	Articles	Precarious employment, which encompasses the power dynamics between workers and employers, is a social determinant of health with significant implications for both health outcomes and health inequities. This study discusses recent advancements in measuring this multidimensional construct and offers recommendations for addressing associated challenges
19	Kambur E.S., 2024 [35]	Turkey	Future health technology trends, policy and governance perspective: the Turkish case	Qualitative	Senior managers, bureaucrats, policymakers and decision-makers	To align with the evolving health ecosystem in Turkey, it is recommended to enhance digital literacy, perform economic evaluations of technologies, promote domestic production, ensure real-time monitoring, foster collaboration with the engineering sector, strengthen health technology assessment practices, improve access to technologies and ensure that the infrastructure of health institutions is compatible with emerging technologies
20	Poursheikhali A., 2023 [36]	Iran	What do future trends in medical education mean to the scientific development of Iran's health system?	Qualitative	Managers and experts	Future trends in Iran's medical education system have been categorized into six groups: changes in the work environment, demographic shifts, evolving concepts, the emergence of new stakeholders, structural changes in universities and technological advancement
21	Rahimi H., 2019 [37]	Iran	Social trends affecting the future of Iran's health system: a qualitative study using focus group discussion	Qualitative	Experts	The most significant social trends influencing the future of Iran's health system include rising health literacy, demographic transition, changes in dietary patterns, migration and urbanization, marginalization, increasing unemployment and the growing use of personal vehicles
22	Thomson L.J., 2021 [38]	United Kingdom	The role of cultural, community and natural assets in addressing societal and structural health inequalities in the UK: future research priorities	Survey	Experts	The key findings of the study on research priorities in the field of inequality emphasized that achieving health equity is only possible by addressing social and structural inequalities, improving environmental conditions and housing and implementing a proactive prevention program

Table 3 Future research trends and priorities in health systems

Themes	Subthemes
Political issues	Government policies regarding cultural competency education for service providers [17]
	Pressures from various political groups [19]
	Political debates on universal health coverage and regulations related to managed care programs [20]
	Emphasis on healthcare safety and quality [19]
	Approval of Medicare and Medicaid laws and their impacts on the healthcare system [20]
	Government policies in the area of health [25]
	Impact of European Union decisions on health systems [29]
	International cooperation in the field of health [30]
	Health reform policies [32]
	Political power of interest groups [32]
	Participation of international communities [35]
	Strategic policy documents and development programs [36]
	Organizational structure of the Ministry of Higher Education [36]
	Political and economic decisions [38]
Economic issues	Funding for cultural competency training [17]
	Funding for quality improvement initiatives in community health centres [17, 35]
	Increased competition in the healthcare market [18]
	Rising costs of medical technologies [18]
	Globalization of healthcare services [18]
	Increasing healthcare costs and emphasis on cost containment [20, 22]
	Growth of the managed care industry and its effects on costs and access to care [20]
	Sustainable health budgeting [25]
	Worsening economic and social inequalities [32]
	Financial sustainability of health systems [29]
	Racial and ethnic discrimination [32]
	Changes in health policies [32]
	Economic evaluations [35]
	Cuts to government budgets [36]
	Shifts in healthcare financing models [36]
	Costs of elderly care [37]
	Decline in income and access to healthcare services [37]
	Costs associated with traffic accidents [37]
	Standards of living [38]
	Income levels, employment, and income inequalities [38]
	Increase in the unemployment rate [37]
Sociocultural issues	Increase in demographic diversity [17]
	Racial and ethnic inequalities in healthcare [17]
	Increase in consumer information [18]
	Public concerns about medical errors and inequalities in access to care [19]
	Demand for consumer participation in health-related decision-making [19]
	Aging population and increase in ethnic diversity [20]
	Increase in the number of uninsured individuals and challenges related to safety nets for vulnerable populations [20]
	Reduction in social services [26]
	Increase in the elderly population [28, 33]

Table 3 (continued)

Themes	Subthemes
	Shortage of doctors and nurses [28]
	Population growth [33]
	Material deprivation [34]
	Psychosocial stress [34]
	Exposure to workplace hazards [34]
	Discrimination in the labour market [34]
	Digital literacy [35]
	Increasing consumer needs and expectations [28, 35, 36]
	The new generation of students and faculty [36]
	Increasing societal awareness and expectations [36]
	Rising health literacy [37]
	Changing dietary patterns [37]
	Migration and marginalization [37]
	Cultural competency [17]
	Ethnic and racial diversity [17]
	Cultural beliefs and behaviours related to health and illness [38]
Technological issues	Advancements in medical technology [18, 32]
	Growth of information and communication technology [18, 20]
	Use of information technology for collecting and analysing health data [19]
	Modelling of diseases [21]
	Electronic health records [24, 28]
	Biomedical innovations [27]
	New drugs [27]
	New diagnostic methods [27]
	Telemedicine [24, 28]
	Genetic testing [24]
	Technology infrastructure [27, 35]
	Collaboration between the health sector and engineering [35]
	Open science and scientific democracy [36]
Environmental issues	Climate and environmental changes [21, 23, 31, 33, 37]
	Direct impact: such as heat shock and increased mortality in populations affected by other diseases [23]
	Indirect impact: such as infectious diseases and allergies [23]
	Increased environmental risks [38]
	Environmental pollutants such as air and noise pollution [38]
	Access to nature and quality of open spaces [38]
Values (legal issues)	Laws related to genetic discrimination [20, 24]
	Cybersecurity and biosecurity [35]
	Laws and regulations in the field of health and healthcare [34, 35]
	The need to update laws and regulations [36]

significant impact on the future of the health system. The growing elderly population presents a serious challenge to the health system and will have deep effects on health, economic and social structures [54]. In a study, Bloom and colleagues (2015) concluded that the rapid ageing of populations worldwide presents a set of unprecedented challenges: shifting disease burdens, rising healthcare costs and long-term care expenses, workforce shortages,

savings issues and potential income security problems for the elderly [55].

In another study, Lukyanets and colleagues (2021) concluded that neglecting the issue of population ageing could lead to a reduction in the stability of government budgets and negatively affect the country's economic prosperity [56]. Another topic addressed in the present study is the increasing needs and expectations of consumers. In recent years, the needs and expectations of consumers in the healthcare system have risen significantly. These changes are influenced by various factors. Karami and colleagues (2016) found in a study that cultural values have a significant impact on patients' expectations regarding service quality, and healthcare providers must fully understand the cultural values of patients, which may vary on the basis of sociodemographic characteristics [57]. Therefore, it can be interpreted that the increasing needs and expectations of consumers in the healthcare system have created new challenges and opportunities for service providers. To succeed in this competitive environment, providers must respond to consumers' needs and expectations and continuously improve their services.

Technological issues: Advancements in medical technology were highlighted in the field of technological issues. Khan (2021) conducted a study aimed at identifying the challenges facing the application of the Internet of Things (IoT) in medicine and healthcare, concluding that processing algorithms in the IoT domain plays a crucial role in assisting doctors in developing personalized treatments, thus making healthcare more economical [58]. This study highlighted the importance of staying updated with cutting-edge technologies in the medical field. It is clear that technology in medicine not only helps improve service quality, but also facilitates access to treatment and information. With continuous advancements in this field, the future of medicine is expected to be characterized by increased precision and efficiency. Another significant topic is telemedicine. Battineni and colleagues (2021) conducted a study aimed at exploring the benefits of telemedicine in the personalized prevention of cardiovascular diseases (CVD). The results indicated that timely delivery of preventive care for CVD, which can be delivered virtually, can improve outcomes and reduce complications and mortality. This approach can also alleviate pressure on hospitals by reducing the incidence of acute CVD amongst the general population. The use of these technologies can also help reduce the need for emergency hospital visits and access to other medical facilities [59]. Studies by Donald and Irukulla (2022) and Dryden and colleagues (2023) also highlighted the numerous benefits of telemedicine, and this should be taken into consideration by healthcare policymakers [60, 61].

Environmental issues: One of the most significant factors addressed in the realm of environmental issues is climate change. Abbass and colleagues (2022) concluded in a study that climate change increases the likelihood of waterborne, foodborne and vector-borne diseases, with the COVID-19 pandemic being a recent example. Climate change also accelerates the antimicrobial resistance dilemma, posing an additional threat to human health due to the increased incidence of pathogenic infections [62]. Therefore, mitigating the effects of climate change should be a high priority. As such, this global threat requires a collective international commitment to address its severe consequences and ensure global livelihoods. It could be argued that the participation of governments in long-term development, through effective resource accountability and the enforcement of regulations from the past, is crucial for establishing advanced climate policies.

Legal issues: In the realm of legal matters, one critical issue is the necessity of cybersecurity and biosafety. Cybersecurity and biosafety are emerging topics at the intersection of life sciences and information technology. Cinar and Thomas (2023) concluded in a study that appropriate preventive and protective measures, including the management of rapid and effective responses to pandemics or other potential disruptions, in light of vulnerabilities such as data confidentiality (for example, clinical and genetic information), cloud storage and intellectual property, may create opportunities that can be leveraged with advancements in science, depending on the application of new technologies in fields such as artificial intelligence, process automation, bioinformatics and synthetic biology [63]. Studies by Warzecha et al. (2024) and Mylrea et al. (2021) also emphasize the importance of cybersecurity and biosafety in healthcare, as with the advancement of technology and the digitization of medical data, protecting patient information and healthcare systems has become a necessity [64, 65].

An emerging issue that was not explicitly addressed in the included studies but is evidenced in other publications is the rise of health misinformation in digital and social media contexts. As noted in the World Economic Forum's Global Risks Report 2024 [66], misinformation can erode public trust, make people suspicious of vaccine uptake and contribute to health inequities. This is interrelated with trends in technologies (e.g. AI-generated content), social issues (e.g. polarization) and legal environments (e.g. regulation of digital businesses). Future health systems research should use collaborative working approaches and proactively acknowledge and respond to misinformation via interdisciplinary partnerships including behavioural science, digital regulation and public communication.

To convert the study's findings into research action, we suggest actions on the basis of three levels:

- At the global level, international organizations (i.e. WHO, World Bank), should help LMICs with developing anticipatory capacity and integrating mega-trends into national health strategies.
- At the national level, policymakers should establish cross-sectoral anticipatory units to monitor emerging mega-trends and ensure research priorities are updated and accurate.
- At the institutional level, funding agencies and universities can shift funding programs according to the six STEEPV domains, climate-resilient health systems and ethical AI.

A multitiered approach will enhance the capacity of health systems research to be anticipatory in relation to global trends, demonstrate equity in health systems research and improve health systems research.

Conclusions

The future of health system research is predominantly shaped by six key areas: political, economic, sociocultural, technological, environmental and legal issues. Each of these areas specifically influences the efficiency and effectiveness of the health system, and understanding the interactions between them is crucial for improving health outcomes.

Political issues can lead to changes in policies and resource allocation, whilst economic issues have a direct impact on financing and access to healthcare services. Sociocultural issues play a critical role in the acceptance and implementation of health programs by shaping community behaviours. Technological issues, on the contrary, introduce innovations and scientific advancements that can enhance the quality of healthcare services. Environmental issues become particularly significant as they influence public health and the emergence of diseases. Finally, legal issues and values are essential in protecting patients' rights and ensuring equitable access to healthcare services. In conclusion, paying attention to these trends and their interactions can improve the quality of health system research and contribute to better health outcomes. To achieve an efficient health system, comprehensive and coordinated policymaking at a macro level is essential.

It should be realized that the salience and impact of these trends may vary amongst nations depending on differences in health system organization, economic status, culture and policy environment. Whilst some trends (e.g. population ageing, climate change and digitalization) are of global concern, others (e.g. managed care arrangements or specific insurance reforms) may be specific to high-income or particular regional contexts. Therefore, policymakers and researchers from low- and middle-income nations must translate these global lessons into their respective local settings so that future priority research is prospective as well as context specific.

Strengths and limitations

One of the limitations of the review is the relative paucity of studies from LMICs, and this could reflect a wider imbalance in research capacity and publication. The implication of this is that more needs to be spent on local foresight processes in these countries to ensure that future health systems research is more inclusive and equitable internationally.

Abbreviations

PCC	Population, concept and context
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
STEEPV	Social, Technological, Economic, Environmental, Political and Values (Legal)
LMICs	Low- and middle-income countries

Supplementary Information

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Supplementary material 1.

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Author contributions

T.Sh. and M.H. designed this study, searched and first screened the studies and wrote the first draft of the manuscript. E.H. and S.B. participated in screening the searched studies and extracting the influencing factors from them. T.Sh. and M.H. analysed the qualitative codes extracted from the final studies and categorized the ultimate themes and subthemes. A.R., A.J. and M.J.Kh. have also participated in final analysis and categorizing the themes. All authors read and approved the final version of the manuscript.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The study has been approved by the Research Ethics Committee of Iran University of Medical Sciences, Tehran, Iran, under code IR.IUMS.REC.1402.1135.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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