Review Paper

Role of Artificial Intelligence in Health Policy-making: An Evidence-mapping Review

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ABSTRACT

Background and Purpose: Artificial intelligence (AI) is increasingly used to analyze population-level data, forecast health needs, support resource allocation, and automate parts of health system decision-making. These opportunities are accompanied by risks related to biased data, privacy, accountability, weak regulation, and uneven digital capacity, which are particularly consequential when AI informs population-level policy rather than individual clinical decisions. This study aimed to map and summarize how AI is used across stages of the health policy cycle, identify reported benefits and challenges, and highlight evidence gaps relevant to equity, governance, and resource-constrained health systems.

Materials and Methods: We conducted an evidence-mapping review, informed by preferred reporting items for systematic reviews and meta-analyses extension for scoping reviews (PRISMA-ScR) reporting principles, to characterize the distribution and nature of evidence on AI across the health policy cycle. PubMed, Scopus, and Web of Science were systematically searched for English-language publications from 2015 to August 2026, with Google Scholar used as a supplementary source for citation searching. Sources were eligible when they examined an AI application, implementation approach, or governance issue with an explicit link to health-policy agenda setting, formulation/design, implementation, monitoring, or evaluation. Data were charted by AI application, policy-cycle stage, evidence type, benefits, risks, and implementation barriers. Findings were summarized descriptively and presented as an evidence map. No formal quality appraisal was undertaken because the objective was to characterize the distribution and content of the evidence rather than estimate intervention effects.

Results: The searches identified 2,579 records, of which 46 sources met the eligibility criteria. Evidence was concentrated in implementation (n=42) and formulation/design (n=41), while monitoring/evaluation (n=18) and agenda setting (n=11) were less frequently represented. Because sources could address multiple policy-cycle stages, these counts were non-mutually

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exclusive. Reported opportunities included decision support, forecasting, improved access, workflow support, and policy monitoring. Recurrent concerns involved bias, privacy and security, infrastructure, workforce capacity, accountability, and regulatory uncertainty. Prospective, longitudinal and comparative implementation evidence remained limited.

Conclusion: The evidence map shows a rapidly expanding but unevenly developed literature on AI in health policymaking. Current evidence is concentrated in policy formulation, implementation, governance, and organizational readiness, with comparatively less evidence on agenda setting, sustained monitoring and evaluation, empirical equity outcomes, and implementation in resource-constrained settings. The findings describe the distribution of available evidence rather than the effectiveness of AI. Future research should prioritize prospective and longitudinal evaluation of AI-supported policy applications under routine health system settings.

Keywords: Artificial intelligence (AI), Health policy, Evidence mapping, Evidence map, Policy cycle, Decision support, Health equity, Governance, Digital health

Introduction

Artificial intelligence (AI) has moved rapidly from a largely technical and clinical topic to a health system and policy concern. Machine learning, natural language processing, predictive analytics, and related methods can process large and heterogeneous datasets, identify patterns that may be difficult to detect manually, and generate forecasts or classifications that can inform planning and resource allocation [1, 2]. For policymakers, the attraction of AI lies less in replacing judgment than in augmenting the speed, scale, and timeliness with which evidence can be assembled and interrogated.

The policy relevance of AI has grown alongside the wider expansion of AI in healthcare. A recent peer-reviewed review reported that Web of Science publications on AI in healthcare increased from 158 in 2014 to 731 by October 2024 and cited commercial estimates placing the 2023 global healthcare-AI market at approximately USD 11.2 billion, with rapid projected growth [3]. These figures reflect technology and research activity rather than policy adoption, and comparable statistics on government investment specifically for AI-enabled health policymaking remain limited. This distinction is important: High investment in AI does not necessarily translate into accountable, equitable, or evidence-informed policy use.

Potential policy applications include identifying emerging population needs, forecasting disease burden, targeting scarce resources, monitoring system performance, analyzing public feedback, and supporting scenario modelling [4]. At the same time, policy-level use can amplify harms if training data are incomplete or unrepresentative, if algorithms are difficult to explain, or if responsibility for AI-supported decisions is unclear [5]. Digital infrastructure, interoperability, cybersecurity, technical capacity, and sustained financing are therefore policy prerequisites rather than secondary implementation details.

Existing reviews have examined AI in healthcare broadly and AI in health policymaking more specifically. Secinaro et al. described a rapidly expanding multidisciplinary healthcare-AI literature centered on health-service management, patient data, predictive medicine, and clinical decision-making [1]. Ramezani et al. mapped 90 studies published between 2000 and 2023 using a policy-triangle framework and concluded that AI may support multiple policymaking functions, with particular emphasis on evaluation [2]. Public health reviews have also highlighted surveillance, risk prediction, and epidemic forecasting, while noting infrastructure, data, and ethical constraints [6].

The present review was designed to add a different lens: A structured evidence map organized by policy-cycle stage and AI application area, with explicit attention to where evidence is concentrated and where important gaps remain. These issues are particularly relevant to health systems undergoing digital transformation while managing fragmented information sources, variable infrastructure, and workforce constraints. In Iran, for example, big-data approaches have been discussed as a means of supporting universal health coverage and health system monitoring [7]. More broadly, Panch et al. highlighted that algorithmic bias can arise from limitations in underlying data and model development and may reproduce or amplify existing inequalities when AI is introduced into health systems [8]. Together, these concerns emphasize that the value of AI for health policymaking depends not only on technical capability, but also on data quality, representativeness, governance, and the capacity of health systems to use AI responsibly.

This review therefore addressed three questions: 1) How is AI applied across stages of the health policy cycle? 2) What benefits, risks, and implementation challenges are reported? 3) Where are the main evidence gaps, particularly for equity, governance, primary care, and resource-constrained health systems? The objectives were to map the distribution of available evidence, summarize reported opportunities and challenges, and identify priorities for policy and future research.

Materials and Methods

Study design and reporting approach

An evidence-mapping review was undertaken because the available literature spans heterogeneous study designs, AI applications, and policy functions. The purpose was to systematically identify, categorize, and display where evidence is concentrated and where gaps remain, rather than to estimate pooled effects or determine intervention effectiveness. The review was conducted using a scoping-style approach and reported with reference to preferred reporting items for systematic reviews and meta-analyses extension for scoping reviews (PRISMA-ScR) principles to improve transparency in searching, selection, data charting, and synthesis [9]. A completed PRISMA-ScR checklist is provided as Appendix 1. The evidence map was designed to identify concentrations and gaps in evidence across AI application areas and policy dimensions.

No protocol was prospectively registered or publicly deposited for this evidence-mapping review.

Operational definitions and review questions

For this review, AI included machine learning, deep learning, natural language processing, predictive analytics, conversational AI, and other computational approaches explicitly identified by the source as AI. Digital health technologies without an identifiable AI component (such as conventional electronic health records, telemedicine platforms, mobile-health applications, or electronic referral systems operating without AI-enabled analysis or decision support) were excluded. Clinical decision-support applications were eligible only when the source explicitly linked them to a health system or policy function.

Policy relevance required more than a general mention of policy. A source was considered policy-relevant only when the AI application was explicitly connected to at least one health-policy or health-system function: Agenda setting or priority identification; policy or programme formulation/design; resource allocation; implementation; monitoring/evaluation; regulation or governance; or equity-related decision-making. Studies describing AI solely for individual-level diagnosis, prognosis, or treatment without an explicit health-system or policy connection were excluded.

Each included source was coded against the policy-cycle stage or stages explicitly addressed in its objectives, methods, results, or policy implications. Sources could receive more than one policy-stage code when they substantively addressed multiple stages. Codes were therefore non-mutually exclusive and were assigned on the basis of the reported function of AI rather than a simple mention of a policy-stage term.

Search strategy

PubMed, Scopus, and Web of Science were systematically searched for English-language publications published between January 2015 and August 2026. The search was conducted on 30 August 2026 using the same core search concepts and eligibility criteria. Search terms combined concepts relating to AI with terms relating to health policy, governance, decision-making, agenda setting, policy formulation, implementation, monitoring, and evaluation. Google Scholar was used as a supplementary source for citation chasing and identification of potentially relevant publications and was not included in the database-specific record counts reported in the PRISMA flow diagram. Search Strategy is presented in Appendix 2.

No dedicated systematic search of organizational grey-literature repositories, government or ministry websites, international agency repositories, or policy think-tank databases was undertaken. Institutional reports identified through database searching, Google Scholar, or citation chasing were considered when they met the eligibility criteria. Google Scholar was used as a supplementary source to identify potentially relevant publications and citation leads; it was not treated as a separate database for the database-specific record counts reported in Figure 1. A targeted supplementary search of major international health-policy sources, including World Health Organization (WHO) and Organization for Economic Co-operation and Development (OECD) publications, was also conducted for the update period to identify recent AI governance and health system policy documents.

Eligibility criteria

Study selection

The database searches identified 2,579 records: 769 from PubMed, 1,542 fromWeb of Science core collection, and 268 from Scopus. After removing records that did not meet the predefined language, full-text availability, and publication-date criteria, as well as duplicate records, 1,205 unique titles and abstracts were screened. Of these, 1,114 were excluded because they did not meet the eligibility criteria (Table 1).

The full texts of 91 reports were retrieved and independently assessed for eligibility. Forty-five reports were excluded, leaving 46 studies for inclusion in the evidence map. Two reviewers independently conducted the title-and-abstract screening and full-text assessment. Disagreements were resolved through discussion; when consensus could not be reached, a third reviewer acted as an arbitrator. The study selection process is presented in Figure 1.

Data charting and coding

Data were charted using a structured extraction form covering publication year, geographic focus, study design/evidence type, AI application, policy-cycle stage, reported benefits, risks, governance issues, and implementation barriers. Initial data extraction was conducted by Roya Rajaee, and the extracted information was independently checked by Marziyeh Najafi. Discrepancies were discussed and resolved by discussion with the third author (Tejas Wakde) and consensus. Studies could receive more than one AI-application or policy-stage code.

Policy-stage coding followed the operational definitions established a priori. Where a source addressed more than one substantive policy function, all applicable stages were coded. This multiple-coding approach was retained to reflect the multidimensional nature of AI applications rather than forcing each source into a single category.

Evidence synthesis, mapping, and quality appraisal

No formal risk-of-bias or methodological quality appraisal was undertaken because the primary purpose of this evidence map was to characterize the distribution, scope, and nature of a heterogeneous body of literature rather than to estimate intervention effectiveness or pool effect sizes. The included evidence also comprised diverse source types, including empirical studies, reviews, policy analyses, guidance documents, and perspectives, for which a single appraisal instrument would not have been directly comparable. Study design and evidence type were therefore charted to help readers interpret the maturity and nature of the evidence base. Consequently, the presence or frequency of evidence within the map should not be interpreted as indicating its methodological quality or strength.

Results

Study selection and publication trend

The searches identified 2,579 records. After applying the predefined database filters and removing duplicates, 1,205 unique titles and abstracts were screened. Of these, 1,114 were excluded, and 91 full-text reports were assessed for eligibility. Forty-five reports were excluded following full-text assessment, leaving 46 sources for inclusion in the evidence map (Figure 1).

Table 1. Eligibility criteria

Domain	Included	Excluded
Topic	Explicit AI application relevant to a health-policy or health-system function	No AI component, or AI discussed only as a general technological trend
Policy relevance	Agenda setting, policy/program design, implementation, monitoring/evaluation, regulation, governance, equity or resource allocation	Purely clinical diagnostic/treatment performance with no explicit system or policy link
Evidence type	Primary empirical studies, reviews/evidence syntheses, policy/legal analyses, frameworks/guidance and full conference papers when policy-relevant	Editorials, short opinion pieces without analytic content, incomplete conference abstracts
Date	2015– August 31, 2026	Before 2015 or after August 31, 2026 for the mapped evidence base
Language	English	Non-English publications
Availability	Sufficient information including full text or report for policy coding	Insufficient information to determine eligibility or code policy relevance

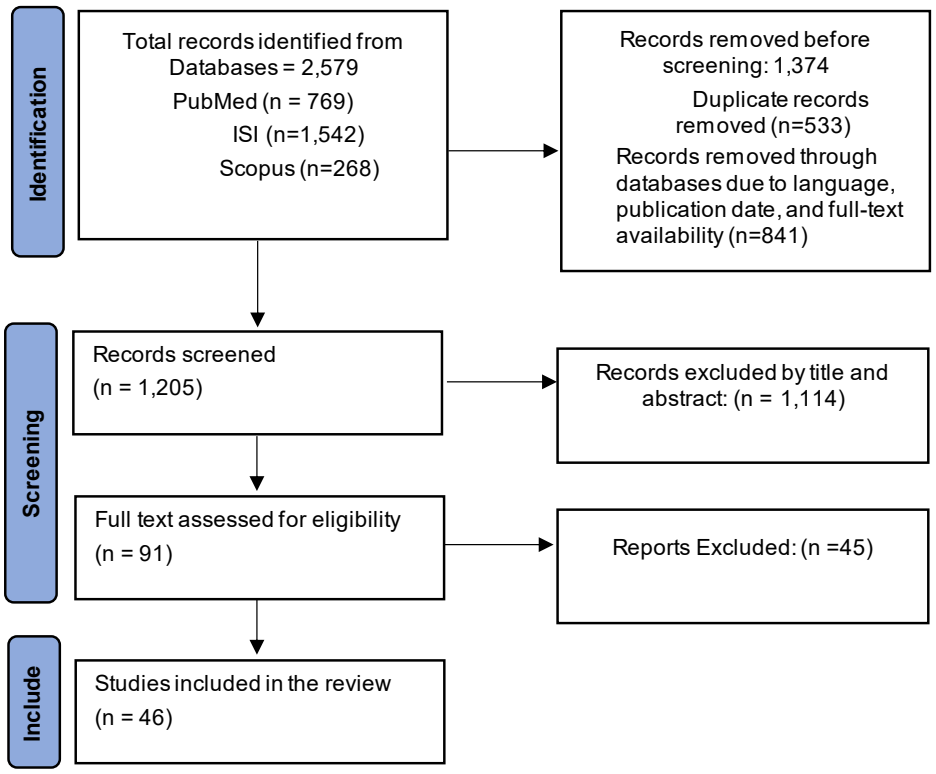


Figure 1. PRISMA-adapted flow diagram of study identification, screening, eligibility assessment, and inclusion

Publication activity increased substantially in recent years. Of the 46 included sources, five were published in 2023, 11 in 2024, 14 in 2025 and four between January and March 2026. The remaining 12 sources were published between 2017 and 2022 (Figure 2). The search covered publications available up to August 31, 2026.

Distribution of evidence across artificial intelligence application areas and policy dimensions

AI application areas were identified: Data-driven decision support, predictive modelling, digital access tools, and ethics/governance analysis. For the quantitative evidence map, each source was assigned to its dominant AI application area, while policy-cycle stages were coded non-mutually exclusively. Equity was treated as a cross-cutting dimension. The selected evidence was strongly concentrated in ethics and governance, particularly in formulation/design and implementation (Table 2).

Across policy-cycle stages, implementation was most frequently represented (n=42), followed by formulation/design (n=41), monitoring/evaluation (n=18), and agenda setting (n=11). Equity was explicitly represented in 19 coded sources. These counts describe the distribution of the mapped literature and should not be interpreted as measures of effectiveness or evidence strength.

Studies could receive more than one policy-stage code when they substantively addressed multiple stages. Four dominant AI application areas were identified: Data-driven decision support, predictive modelling, digital access tools, and ethics and governance analysis.

Note: For this evidence map, each source was assigned to its dominant AI application area, while policy-cycle stages were coded non-mutually exclusively; therefore, a source could contribute to more than one policy-stage column. Equity was treated as a cross-cutting dimension and was coded when equity, fairness, disparities, or differential access were explicitly addressed. Row totals represent coded application–dimension intersections rather than unique studies and may therefore exceed the number of included sources (n=46). These counts describe the distribution of mapped evidence and should not be interpreted as prevalence estimates, measures of effectiveness, or indicators of methodological quality.

The evidence shows a strong concentration in formulation/design and implementation, reflecting the growing body of literature on governance frameworks,

Table 2. Quantitative evidence map of coded intersections between AI application areas and policy dimensions

AI Application Area	Agenda Setting	Formulation/Design	Implementation	Monitoring/Evaluation	Equity Focus*	Row Total
Data-driven decision support	3	8	7	2	2	22
Predictive modelling	1	4	4	2	0	11
Digital access tools	1	5	7	1	4	18
Ethics and governance analysis	6	24	24	13	13	80
Column total	11	41	42	18	19	–

*Equity focus denotes evidence addressing equity implications of AI in health policymaking, including disparities in access, representation, resource allocation, digital inclusion, and impacts across population groups or settings.

organizational readiness, regulation, and responsible AI deployment. Monitoring and evaluation were represented less frequently, although several recent studies addressed post-deployment monitoring, lifecycle governance, and algorithmic oversight. Agenda setting remained the least represented policy-cycle stage, despite newer work examining national AI strategies, regulatory priorities, and health system preparedness.

Figure 3 presents the distribution of coded intersections between the four AI application areas and the policy dimensions. Bubble size reflects the number of coded intersections, allowing areas of evidence concentration and relative sparsity to be visualized while retaining the non-mutually exclusive nature of the coding.

Bubble size represents the number of coded intersections. Larger bubbles indicate areas with a greater concentration of mapped evidence. Equity is presented as a cross-cutting dimension rather than a formal policy-cycle stage. Bubble size does not represent effectiveness or methodological quality.

The evidence map shows the strongest concentration in ethics and governance analysis, particularly within formulation/design and implementation. Data-driven decision support was also represented across several policy dimensions, whereas predictive modelling and digital access tools were less widely distributed. Agenda setting remained comparatively underrepresented, while monitoring/evaluation appeared more frequently in governance-related studies. Equity was concentrated mainly in ethics/governance and digital access literature. These patterns describe the distribution of the mapped evidence and should not be interpreted as indicating effectiveness or methodological strength.

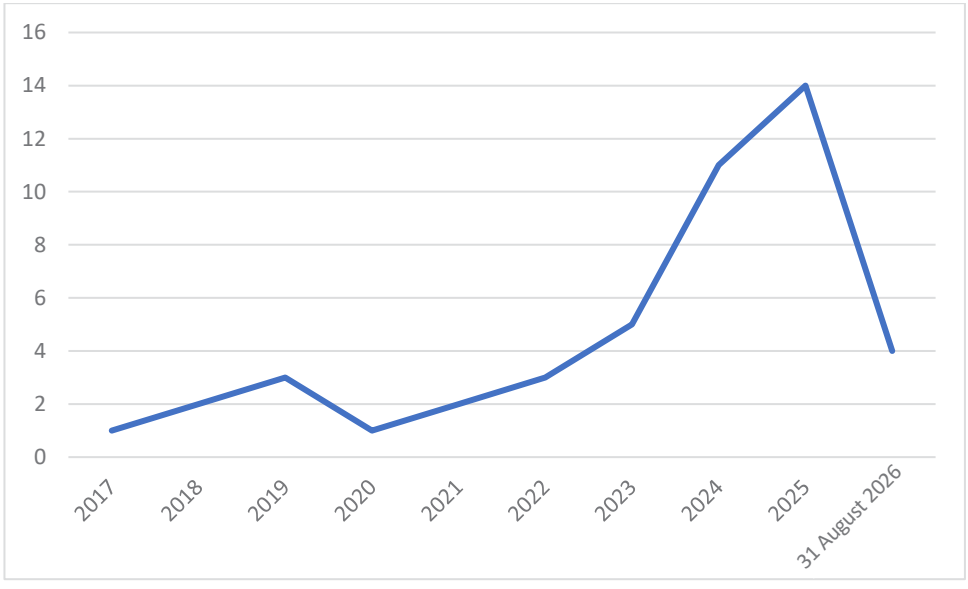


Figure 2. Distribution of the included publications by year (n=46)

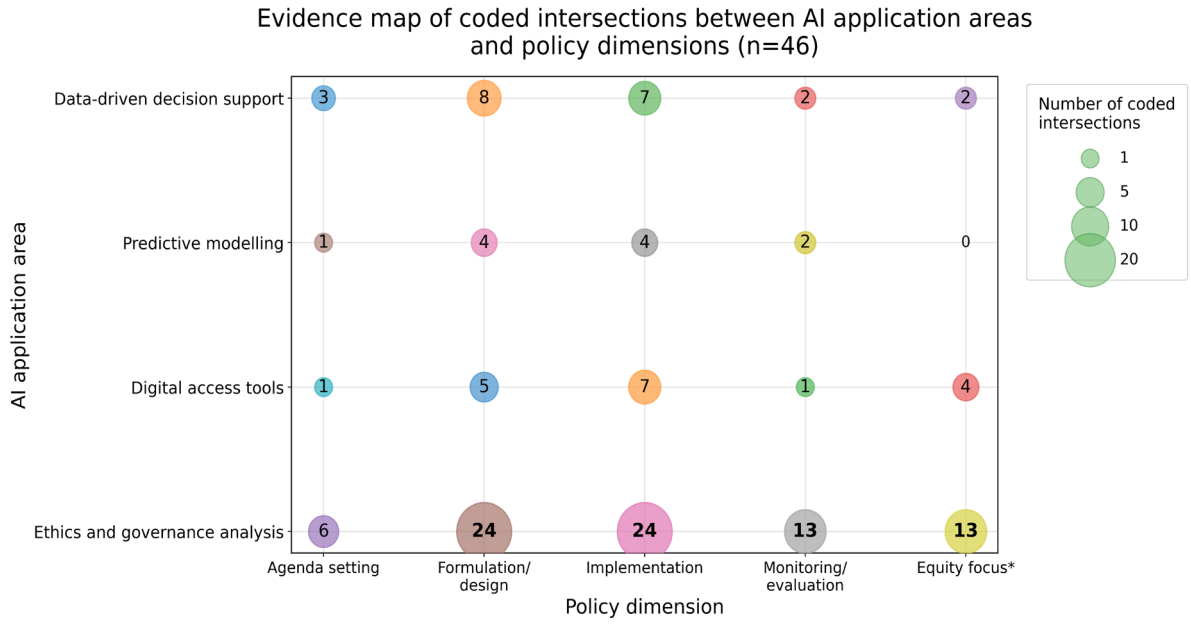


Figure 3. Evidence map of coded intersections between AI application areas and health policy dimensions

Reported benefits of artificial intelligence in policymaking

Figure 4 shows five recurrent areas of potential benefit were identified across the included literature: data-driven decision support, predictive modelling and forecasting, expanded access through digital tools, quality and workflow improvement, and support for policy formulation, surveillance, and monitoring. Because individual sources could contribute to more than one benefit theme, the supporting-source counts are descriptive and non-mutually exclusive.

Table 3 shows across the included literature, the potential benefits of AI were closely linked to the health system context in which it was implemented. Reported opportunities included applications in primary health care, public health decision-making, organizational implementation, system monitoring, prediction, service delivery, and workflow improvement. However, these benefits were generally dependent on adequate data infrastructure, appropriate governance, workforce capacity, validation procedures, and ongoing monitoring to support safe and sustainable implementation [36, 41, 43, 44, 49].

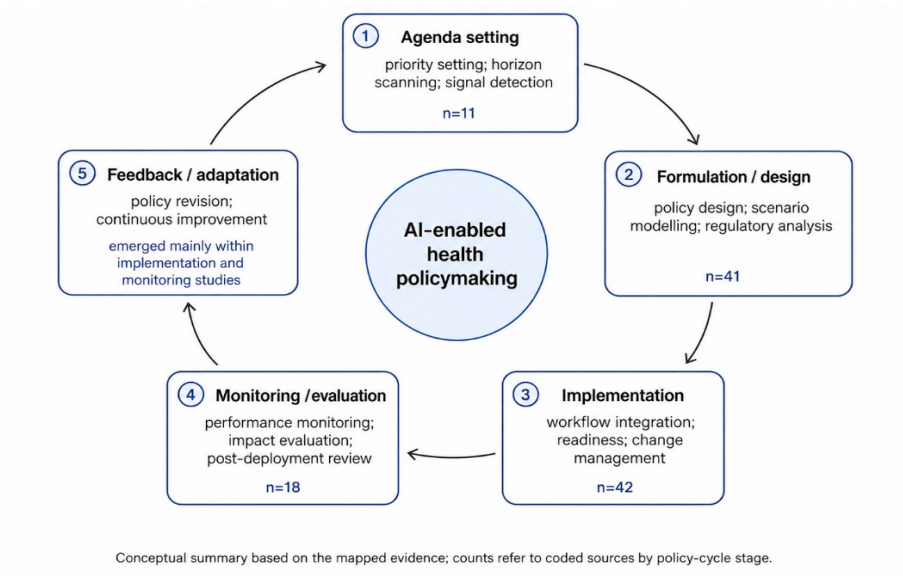


Figure 4. AI across the health policy cycle

Table 3. Reported benefits of ai in health policymaking

Benefit Area	Policy Relevance	Supporting Sources (n)	Ref.
Data-driven decision support	Analysis of complex datasets; identification of service and population health needs; and support for health system and policy decisions	10	[1, 2, 4, 7, 10-15]
Predictive modelling and forecasting	Prediction of disease trends, health risks, and service needs to support planning, prevention, and resource allocation	7	[1, 2, 4, 11, 12, 14, 15]
Expanded access through digital tools	Potential to improve access, navigation, screening, and service reach, particularly in underserved and primary care settings	6	[14-19]
Quality and workflow improvement	Automation and augmentation of professional work; improvement of service processes; and support for more efficient health system workflows	11	[1, 11, 14, 15, 20-26]
Policy formulation, surveillance and monitoring	Use of AI-enabled data, surveillance, analytical tools, and feedback mechanisms to support policy development, monitoring, and adaptive decision-making	11	[2, 4, 7, 10-12, 14, 15, 27, 28, 49]

Note: Supporting-source counts are non-mutually exclusive. Individual sources could contribute to more than one benefit theme. Counts indicate the number of included sources explicitly contributing to each thematic finding and should not be interpreted as prevalence estimates, effect sizes, measures of effectiveness, or assessments of evidence strength.

Reported challenges and risks

Five recurring areas of concern were identified across the included literature: bias and inequity, data privacy and security, infrastructure and workforce limitations, ethical and accountability gaps, and regulatory uncertainty. These themes were reinforced by more recent studies, particularly in relation to governance, organizational readiness, equity, lifecycle oversight, and regulatory requirements. Because individual sources could contribute to more than one challenge theme, the supporting-source counts are non-mutually exclusive (Table 4).

Across the included literature, governance-related challenges were prominent, particularly those concerning algorithmic bias, data privacy and cybersecurity, workforce and infrastructure readiness, accountability, and regulatory oversight. These challenges were often interrelated, as limitations in data quality and infrastructure could affect both technical performance and equity, while weak governance arrangements could increase concerns related to transparency, liability, privacy, and public trust. The evidence also indicates that responsible AI implementation requires continuous monitoring and oversight throughout the AI lifecycle, particularly as models, data environments, and regulatory requirements evolve over time [13, 14, 26, 33, 35, 36, 45-47].

Evidence gaps

Several gaps remained apparent across the updated evidence map. First, the literature continued to be concentrated in the formulation/design and implementation stages of the policy cycle. Formulation/design accounted for 41 coded sources, and implementation accounted for 42, compared with 18 sources addressing monitoring/evaluation and 11 addressing agenda setting. Although recent studies have expanded attention to governance, organizational readiness, regulation, and lifecycle oversight, comparatively less evidence examines how AI influences the initial setting of health policy priorities or how AI-supported policies perform after sustained implementation.

Second, equity was explicitly represented in 19 sources, but much of this evidence addressed equity through concerns about algorithmic bias, fairness, access, representation, and governance. Empirical evidence demonstrating whether AI-supported policies reduce, maintain, or widen health inequalities in routine health-system settings remains limited. This distinction is important because identifying equity risks does not demonstrate the distributional effects of AI after implementation.

Third, evidence from prospective and sustained real-world implementation remained relatively limited. The updated literature includes several organizational governance frameworks, implementation case studies, policy analyses, and systematic reviews, but comparatively few studies evaluate long-term adoption, sustainability, costs, unintended consequences, or measurable policy outcomes. Recent implementation-focused studies have begun to address these issues, particularly in relation to organizational governance and post-deployment monitoring, but the evidence base remains at an early stage [25, 26, 35, 36, 43, 44].

Table 4. Reported challenges of AI in health policymaking

Challenge	Policy Concern	Supporting Sources (n)	Ref.
Bias and inequity	Non-representative data, algorithmic bias, digital exclusion, or unequal access may produce differential performance or reinforce existing health inequalities	21	[5, 8, 12-16, 19, 25, 26, 28-38]
Data privacy and security	The collection, linkage, secondary use, storage, and AI processing of health data raise concerns about privacy, consent, confidentiality, cybersecurity, and data governance.	14	[5, 12-15, 26-28, 33, 36, 39-42]
Infrastructure and workforce limitations	Sustainable implementation requires appropriate digital infrastructure, interoperable and high-quality data, technical expertise, workforce training, organizational readiness, and sustained financial resources.	18	[7, 10, 11, 13-15, 17-19, 22, 23, 26, 28, 33, 35, 38, 43, 44]
Ethical and accountability gaps	Responsibility, transparency, explainability, fairness, human oversight, liability, contestability, and accountability for AI-supported decisions may remain unclear.	23	[5, 8, 12-14, 25-29, 31-39, 41, 45-47]
Regulatory uncertainty	AI development and deployment may progress faster than legal, regulatory, professional, and institutional safeguards, creating gaps in oversight and responsibility	19	[5, 12-15, 24, 26-28, 33, 36-39, 41, 45-48]

Note: Supporting-source counts are non-mutually exclusive. Individual sources could contribute to more than one challenge theme. Counts indicate the number of included sources explicitly contributing to each thematic finding and should not be interpreted as prevalence estimates, effect magnitudes, measures of effectiveness, or assessments of methodological strength.

Fourth, representation of resource-constrained and underserved settings has improved but remains limited relative to the evidence from higher-resource health systems. The included literature now covers resource-poor and rural settings, Association of Southeast Asian Nations (ASEAN) countries, Iran, and selected Middle Eastern contexts [14, 15, 17, 19, 28, 47]. However, empirical evidence on sustained implementation, scale-up, financing, workforce requirements, interoperability, and governance in low-resource settings remains comparatively sparse.

Evidence in some settings and policy areas should also be interpreted cautiously because the review did not include a dedicated systematic search of grey-literature repositories, government websites, or policy think-tank databases. Government evaluations, implementation reports, and other policy documents that are not indexed in bibliographic databases may therefore be underrepresented.

Finally, evidence related to primary health care and community-based applications has increased in the updated literature, including recent work on AI implementation and future health system preparedness in primary care [14, 15]. Nevertheless, empirical evidence on community-level implementation, social determinants of health, patient and public participation, and the longer-term effects of AI-supported policies on access and service delivery remains limited. Future research should therefore prioritize prospective implementation studies that examine feasibility, adoption, sustainability, cost, equity, governance, and policy outcomes across diverse health-system contexts.

Discussion

This evidence-mapping review provides a descriptive overview of how AI has been examined across health policy functions and should not be interpreted as an assessment of comparative effectiveness. The updated evidence base indicates a field that is expanding rapidly but remains uneven in its maturity. Earlier literature largely positioned AI as an analytic tool for processing large datasets, supporting prediction, surveillance, and decision-making [1, 2, 4]. More recent studies have broadened this focus toward governance, organizational readiness, regulatory oversight, lifecycle monitoring, equity, and implementation within health systems [12-15, 25, 26, 28, 33-38, 43-47]. Across the mapped evidence, formulation/design and implementation remained the most frequently represented policy-cycle stages, while agenda setting and monitoring/evaluation were less prominent. This pattern suggests that considerable attention is being given to how AI should be designed, governed, and introduced into health systems, but comparatively less empirical evidence is available on how AI shapes policy priorities or performs over sustained periods after implementation.

The smaller evidence base identified in this review compared with the 90 studies reported by Ramezani et al. [2] reflects important differences in scope, time period, eligibility criteria, and evidence classification. Ramezani et al. examined studies published from 2000 to 2023 and considered a broad range of AI applications using a policy-triangle framework. The present review

focused on literature published from 2015 through August 2026 and required an explicit connection between the AI application and a defined health policy or health system function. Purely clinical studies concerned only with diagnostic or treatment performance were excluded when no wider policy or system relevance was evident. The present evidence maps also included a heterogeneous range of source types, including empirical studies, reviews, policy and ethical analyses, governance frameworks, guidance documents, and selected conference papers. The resulting 46-source evidence base should therefore be interpreted as a focused map of policy-relevant evidence rather than a comprehensive inventory of all healthcare AI applications.

The apparent underrepresentation of some policy areas and settings should also be interpreted cautiously. Evidence from resource-constrained and underserved settings has increased, with studies addressing rural healthcare, resource-poor settings, ASEAN countries, Iran, primary health care, and selected Middle Eastern contexts [14, 15, 17, 19, 28, 47]. Nevertheless, this literature remains less extensive than evidence from higher-resource health systems. The observed gap may reflect both a genuine lack of sustained implementation research and limitations in evidence retrieval. Restriction to English-language publications, reliance primarily on indexed bibliographic databases, and the absence of a dedicated systematic search of grey literature may have reduced the visibility of government reports, programme evaluations, and locally produced policy documents from resource-constrained settings.

The practical value of AI applications depends on balancing potential benefits with corresponding risks. Data-driven decision support can make service gaps, population-health patterns, and resource needs more visible, while predictive modelling may support earlier action and planning. Digital and conversational tools may extend access, and automation may improve selected workflows. However, these benefits depend on the quality, representativeness, and interoperability of underlying data and on the ability of organizations to integrate AI into existing systems and decision processes. Incomplete data, model drift, limited external validity, and poorly communicated uncertainty can undermine apparently precise outputs. Likewise, digital tools may widen rather than narrow inequalities when access differs by language, literacy, connectivity, disability, socioeconomic position, or trust [12, 14, 16, 19, 29, 30, 32, 34].

The updated literature places particularly strong emphasis on governance throughout the AI lifecycle. Recent frameworks and implementation studies highlight the need for clear accountability, transparent decision rules, appropriate validation, human oversight, fairness assessment, privacy and cybersecurity safeguards, and post-deployment monitoring [25, 26, 33-36, 43-47]. This represents an important development from earlier conceptual discussion toward more operational approaches to AI governance. Nevertheless, much of this work still consists of frameworks, organizational case studies, policy analyses, or early implementation experience. Evidence showing whether specific governance arrangements produce better policy outcomes, reduce harms, or improve equity over time remains limited.

The growing focus on organizational readiness also highlights that AI implementation is not primarily a technical issue. Recent studies consistently identify workforce capability, leadership, infrastructure, interoperability, financing, governance arrangements, and implementation processes as important conditions for sustainable adoption [14, 15, 25, 26, 28, 33, 43, 44]. This is particularly relevant in health systems where electronic information systems remain fragmented or where technical and financial capacity is limited. Introducing AI without strengthening underlying data systems and organizational capacity may reproduce existing weaknesses rather than overcome them.

Primary health care is beginning to receive greater attention in the recent literature. Studies addressing AI implementation and future preparedness in PHC identify opportunities for decision support, screening, service coordination, monitoring, and resource planning, while also emphasizing stewardship, infrastructure, financing, workforce readiness, and governance [14, 15]. However, evidence on community-based implementation, public participation, social determinants of health, and longer-term effects on access and service delivery remains limited. This represents an important area for future implementation research, particularly because policy decisions in PHC directly influence population-level access and equity.

Evidence maps are useful in this context because a larger concentration of publications should not be interpreted as demonstrating effectiveness or stronger evidence. Similarly, a sparsely populated area may represent a genuine research gap, limitations of the search strategy, or differences in how policy functions are described and indexed. The present findings therefore characterize where research attention has been

concentrated and where further empirical evaluation is needed rather than ranking AI applications according to effectiveness or methodological quality.

Implications for health systems and policy

The findings suggest that responsible adoption of AI in health policymaking requires attention to the wider health system environment in which these technologies are introduced. Reliable and interoperable health information systems are important foundations for policy-facing AI, particularly where applications depend on routinely collected population or service-delivery data. In settings with fragmented information systems, variable data quality, or limited technical capacity, introducing AI without first addressing underlying information-system weaknesses may reduce rather than improve the reliability of policy decisions.

Initial implementation may therefore be most appropriate for clearly defined and auditable functions in which AI supports rather than replaces human decision-making. Potential applications include identifying geographic or socioeconomic gaps in service coverage, forecasting service demand, strengthening public-health surveillance, supporting resource planning, and prioritizing information for human review. Such applications require appropriate validation, transparent decision rules, defined accountability, and mechanisms through which AI-supported decisions can be reviewed, challenged, or modified.

Governance should extend throughout the AI lifecycle, from problem definition and data acquisition to implementation, monitoring, modification, and eventual withdrawal. Particular attention is required for data quality and representativeness, privacy and cybersecurity, subgroup performance, transparency, human oversight, accountability, and mechanisms for responding to performance deterioration or unintended consequences. Equity should be incorporated throughout this process because differences in representation, digital access, language, socioeconomic position, geography, and disability may influence who benefits from AI-supported policies.

Implementation research should accompany real-world deployment. Evaluations should move beyond technical accuracy to examine feasibility, acceptability, adoption, cost, workflow effects, sustainability, unintended consequences, equity, and policy outcomes. Longer-term monitoring is particularly important because AI models, underlying datasets, organizational environments, and regulatory expectations may change after deployment. Greater attention is also needed in public health, primary care, community-based, and resource-constrained settings, where evidence remains comparatively limited despite their importance for population health and health equity.

Implications for future research

Future research should move beyond descriptive, conceptual, and early implementation studies toward prospective and longitudinal evaluations of AI-supported policy and health system applications under routine conditions. Priority questions include whether AI improves policy decisions, resource allocation, service delivery, and population health outcomes compared with existing approaches; whether these benefits are sustained over time; and whether implementation reduces or widens inequalities between population groups. Further research should evaluate which governance arrangements are most effective in supporting transparency, accountability, human oversight, privacy, and appropriate responses to model or system failures.

Greater attention is also needed to the organizational conditions required for sustainable implementation, including interoperable data infrastructure, workforce capability, financing, leadership, procurement, and integration with existing workflows. Research remains particularly important in primary care, community-based services, and resource-constrained settings, where evidence on feasibility, scale-up, sustainability, cost, public participation, and equity outcomes remain comparatively limited. Future studies should also examine AI systems across their full lifecycle, including post-deployment performance, unintended consequences, model drift, modification, and withdrawal.

Conclusion

The updated evidence map indicates that AI-related health policy research is increasingly concentrated in formulation/design, implementation, governance, and organizational readiness, with growing attention to regulation, equity, and lifecycle oversight. However, agenda setting, sustained monitoring and evaluation, empirical equity outcomes, and evidence from resource-constrained and community-based settings remain less developed.

The findings suggest that the policy challenge is no longer simply whether AI can support health system decision-making, but how it can be introduced, gov-

erned, evaluated, and sustained responsibly. Realizing potential benefits will require reliable and interoperable data systems, appropriate workforce and organizational capacity, transparent governance, human oversight, equity-sensitive implementation, and continued evaluation after deployment. Because this review maps the distribution and characteristics of the literature rather than its comparative effectiveness, stronger prospective evidence is still needed before broad policy conclusions about AI's impact can be drawn.

Policy Implications

Implications directly supported by the mapped evidence

AI initiatives should be accompanied by investment in data quality, interoperability, cybersecurity, technical infrastructure, and workforce capability, as these conditions repeatedly influence implementation readiness and sustainability.

Equity and representativeness should be considered throughout the AI lifecycle, including data selection, validation, implementation, and post-deployment monitoring, because bias and unequal digital access may affect who benefits from AI-supported policies.

Policy-facing AI requires clear governance and accountability arrangements, including transparent decision processes, appropriate validation, privacy safeguards, human oversight, auditability, and mechanisms for reviewing or challenging consequential decisions.

Implementation should include ongoing monitoring rather than one-time assessment, because model performance, underlying data, organizational conditions, and regulatory requirements may change after deployment.

Decisions about wider scale-up should be informed by real-world evaluation of feasibility, adoption, cost, sustainability, unintended consequences, equity, and policy outcomes, rather than technical performance alone.

Priorities for health systems

Developing governance arrangements that address the full AI lifecycle, including procurement, data governance, validation, implementation, equity assessment, monitoring, incident management, modification, and withdrawal.

Prioritizing AI applications that address clearly defined health-system needs, such as public health surveillance, service demand forecasting, resource planning, primary care support, and identification of inequities in service coverage.

Integrating AI initiatives with broader health information-system strengthening so that AI does not reproduce existing problems arising from fragmented, incomplete, or poorly interoperable data.

Building interdisciplinary capacity among policymakers, public health practitioners, clinicians, health system managers, data scientists, legal and ethics specialists, and community representatives, with opportunities for public communication and stakeholder participation.

Generating more implementation evidence from primary care, community-based, underserved, and resource-constrained settings to ensure that future AI policy is informed by a wider range of health system contexts.

Limitations

This review has several limitations. First, no formal methodological quality or risk-of-bias appraisal was undertaken. The evidence map therefore describes the distribution, characteristics, and thematic content of the literature rather than the strength of evidence or effectiveness of individual AI applications. Areas with a larger number of mapped sources should not be interpreted as having stronger or more reliable evidence than areas with fewer sources. Second, the search was restricted to English-language publications, which may have reduced the representation of evidence from non-English-speaking and resource-constrained settings. Third, no dedicated systematic search of organizational grey-literature repositories, government websites, ministries of health, or policy think tanks was undertaken. Although some institutional guidance and policy reports were identified through database searching and supplementary citation searching, relevant policy documents and implementation reports may have been missed. Fourth, the included evidence was heterogeneous and comprised empirical studies, reviews, governance frameworks, policy and legal analyses, guidance documents, perspectives, and implementation case studies. This diversity limits direct comparison across sources and restricts conclusions about the effectiveness or long-term impact of AI-supported policy interventions. Fifth, policy-cycle stages were coded non-mutually exclusively because individual sources could address more than one policy function. For the quantitative evidence map, each source was assigned to a dominant AI ap-

plication area to improve interpretability; however, this classification may simplify studies that addressed multiple AI functions simultaneously. Finally, areas that appear sparsely populated in the evidence map may reflect not only genuine evidence gaps but also the search strategy, language restriction, eligibility criteria, indexing practices, and coding framework. The findings should therefore be interpreted as a map of the available and retrievable evidence rather than a complete representation of all AI-related health policy activity.

Ethical Considerations

Compliance with ethical guidelines

This article is a review paper with no human or animal sample.

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Authors contributions

Conceptualization, data analysis, and writing the original draft: Marziyeh Najafi and Roya Rajaee; Methodology: Marziyeh Najafi and Anahita Behzadi; Investigation: Roya Rajaee, Tejas Wakde, and Mohammad Barzegar Rahatlou; Review & editing: Roya Rajaee, Anahita Behzadi, Leila Vali, Tejas Wakde, and Mohammad Barzegar Rahatlou; Supervision: Roya Rajaee and Leila Vali; Final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

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Appendix 1. Completed PRISMA-ScR checklist

Section	Item	Topic	PRISMA-ScR Reporting Requirement	Where Reported in Manuscript
Title	1	Title	Identify the report as a scoping review/evidence-mapping review.	p. 1, title
Abstract	2	Structured summary	Provide a structured summary covering background, objectives, eligibility, information sources, charting/synthesis methods, key results, and conclusions.	p. 1, abstract
Introduction	3	Rationale	Explain why the review is needed in light of existing knowledge and why an evidence-mapping/scoping approach is appropriate.	pp. 2–3, background
Introduction	4	Objectives	State the review questions and objectives explicitly, including the concepts and policy context being examined.	p. 3, final paragraph of background
Methods	5	Protocol and registration	State whether a protocol exists and, if registered or publicly available, provide access details; otherwise, state that no protocol was registered.	p. 3, study design and reporting approach
Methods	6	Eligibility criteria	Specify characteristics used to determine eligibility, including topic, policy relevance, evidence type, date, language, and availability.	p. 4, Table 1 (eligibility criteria)
Methods	7	Information sources	Describe databases and other information sources searched and report the search period/date.	pp. 3–4, search strategy
Methods	8	Search	Present a reproducible electronic search strategy for at least one database, including limits used.	p. 4, Search strategy (PubMed search string)
Methods	9	Selection of sources of evidence	Describe how records were screened and selected, including reviewer involvement and disagreement resolution.	p. 4, Study selection
Methods	10	Data charting process	Describe how data were charted/extracted, who performed extraction/checking, and how discrepancies were resolved.	p. 5, Data charting and coding
Methods	11	Data items	List the variables and concepts charted from included sources.	p. 5, data charting and coding; pp. 15–16, Table A1
Methods	12	Critical appraisal of individual sources (optional)	If appraisal was performed, describe the method and how it informed synthesis; if not performed, state this clearly.	p. 5, evidence synthesis, mapping and quality appraisal (no formal appraisal undertaken)
Methods	13	Synthesis of results	Describe how charted data were summarized, mapped, and synthesized.	p. 5, evidence synthesis, mapping and quality appraisal
Results	14	Selection of sources of evidence	Report numbers identified, screened, assessed, and included, with reasons for exclusions where applicable; present a flow diagram.	pp. 4–5, study selection and Figure 1
Results	15	Characteristics of sources of evidence	Present characteristics of the included evidence and cite the individual sources.	pp. 15–16, Appendix 3, Table A1
Results	16	Critical appraisal within sources (optional)	If critical appraisal was undertaken, present the appraisal results.	Not applicable — no formal critical appraisal was undertaken (see p. 5).
Results	17	Results of individual sources of evidence	Present relevant charted information for included sources in relation to the review questions.	pp. 15–16, appendix 3, table A1; pp. 7–8, Tables 3 and 4
Results	18	Synthesis of results	Summarize and/or map the charted evidence in relation to the review questions and objectives.	pp. 5–9, results; Table 2; Figures 2–3; Tables 3 and 4; evidence gaps
Discussion	19	Summary of evidence	Summarize the main results, including the principal concepts, evidence concentrations, gaps, and relevance to the review questions.	pp. 9–11, discussion and implications
Discussion	20	Limitations	Discuss limitations of the review process and evidence base.	p. 12, limitations
Discussion	21	Conclusions	Provide an overall interpretation of the findings and implications for policy, practice, and future research.	p. 11, conclusion and policy implications
Funding	22	Funding	Report funding/support for the included review and the role of funders, if any.	p. 12, funding (not applicable)

Reference: [9]

Appendix 2. Search strategy

Database	Search Strategy	No. of Records from initial Keyword Search	No. of Records after English-language Filter	No. of Records after Applying the Open Access/free full-text Filter	No. of Records after Applying the Year/Date Filter: Jan 1, 2015– Mar 31, 2026	Date the Search was Conducted
Scopus	TITLE-ABS-KEY (“artificial intelligence” OR “generative AI” OR “generative artificial intelligence”) AND TITLE-ABS-KEY (“health policy” OR “health policymaking” OR “public health policy” OR “health governance” OR “public health governance” OR “health system governance” OR “policy formulation” OR “policy implementation” OR “policy evaluation” OR “agenda setting”	268	267	149	149	August 31, 2026
Web of Science core collection	TS=(“artificial intelligence” OR “generative AI” OR “generative artificial intelligence” OR “machine learning”) AND TS=(“health policy” OR “health policymaking” OR “health policy making” OR “public health policy” OR “health governance” OR “public health governance” OR “health system governance” OR “policy formulation” OR “policy implementation” OR “policy evaluation” OR “agenda setting”)	1542	1522	998	994	August 30, 2026
PubMed	(“artificial intelligence”[Title/Abstract] OR “machine learning”[Title/Abstract] OR “generative AI”[Title/Abstract] OR “generative artificial intelligence”[Title/Abstract]) AND (“health policy”[Title/Abstract] OR “health policymaking”[Title/Abstract] OR “health policy making”[Title/Abstract] OR “public health policy”[Title/Abstract] OR “health governance”[Title/Abstract] OR “public health governance”[Title/Abstract] OR “health system governance”[Title/Abstract] OR “policy formulation”[Title/Abstract] OR “policy implementation”[Title/Abstract] OR “policy evaluation”[Title/Abstract] OR “agenda setting”[Title/Abstract])	769	756	596	595	August 30, 2026

Appendix 3. Study-level extraction table

Study ID	Author(s), Year	Geographic Scope	Evidence Type	Policy/AI application	Policy-cycle Stage(s)	Main Limitation	Key Policy Point
1	Secinaro et al. 2021 [1]	Global/ international literature	Structured literature review	Overview of AI applications in health systems	Formulation/design; implementation; monitoring/evaluation	Broad healthcare scope; limited policy-cycle specificity	Broad AI applications; management and data themes
2	WHO, 2021 [5]	Global	Guidance/ framework	Ethical principles and governance of AI	Formulation/design; implementation	Implementation depends on national/ institutional mechanisms	Human autonomy, safety, transparency, accountability and equity
3	Panch et al. 2019 [8]	Global/ health systems	Health-systems review/ perspective	Algorithmic bias and equity implications of AI in health systems	Formulation/design; implementation; monitoring/evaluation	Primarily conceptual; limited empirical evaluation	AI governance must address biased data and differential impacts across population groups
4	Ramezani et al. 2023 [2]	Global/ international literature	Scoping review	AI applications in health policy	Agenda setting; formulation/design; implementation; monitoring/evaluation	Implementation evidence gaps	Broad policy coverage; evaluation prominent
5	Jiang et al. 2017 [20]	Global/ general healthcare	Narrative/ review article	Evolution of AI in healthcare	Formulation/ design	Limited direct policy guidance	Historical and technical context
6	Cross et al. 2024 [32]	Global/ general healthcare	Review/ perspective	Bias in AI-supported decisions	Formulation/design; monitoring/ evaluation	Primarily clinical decision focus	Bias across AI lifecycle; fairness risk
7	Nadarzynski et al. 2024 [16]	UK/ international healthcare context	Qualitative framework development	Inclusive conversational AI implementation	Formulation/design; implementation	Specific to conversational AI	Equity-focused co-design and implementation roadmap
8	Olawade et al. 2023 [4]	Global/ public health	Narrative review	AI in public health	Agenda setting; formulation/design; implementation; monitoring/evaluation	Heterogeneous real-world applications	Surveillance, forecasting, public-health applications and implementation barriers
9	American Medical Association, 2023 [39]	United States	Professional guidance	Ethics/evidence/ equity framework	Formulation/design; implementation	Enforcement and jurisdictional implementation	Ethical governance and trust
10	Chustecki, 2024 [6]	Global/ general healthcare	Narrative review	Balanced overview of AI risks/ benefits	Formulation/design; implementation	Broad healthcare focus	Benefits, risks and trust
11	Wahl et al. 2018 [19]	Global/ resource-poor settings	Global-health analysis/ review	AI applications and deployment in resource-poor health systems	Formulation/design; implementation	Limited real-world deployment evidence in low-resource settings	Scale-up requires infrastructure, investment, governance and attention to ethical/ legal constraints
12	Johnson, 2022 [48]	United States	Legal and regulatory analysis	Regulation and oversight of AI in healthcare	Formulation/design; implementation	Primarily a legal analysis; limited empirical implementation evidence	Effective healthcare AI regulation requires clear standards for safety, accountability, transparency and oversight
13	Topol, 2019 [21]	Global/ general healthcare	Review/ perspective	Human–AI collaboration	Implementation	Predominantly clinical	Augmentation and integration
14	Sun & Medaglia 2019 [49]	China	Empirical qualitative/ case study	Adoption and governance of AI in public healthcare	Formulation/design; implementation	Single-country/single-technology case limits generalizability	AI adoption involves differing stakeholder perspectives and requires context-sensitive public-sector governance

Study ID	Author(s), Year	Geographic Scope	Evidence Type	Policy/AI application	Policy-cycle Stage(s)	Main Limitation	Key Policy Point
15	Botha et al. 2024 [40]	Global/multiregional literature	Evidence-mapping review	AI tools and confidentiality	Formulation/design; implementation	Patient-care focus	Privacy and perceived benefits
16	Maleki Varnosfaderani & Forouzanfar2024 [22]	Global/general healthcare	Review	AI in hospitals and clinics	Implementation	Cost/training; clinical-service emphasis	Workflow and operational efficiency
17	Singh, 2024 [18]	General/international healthcare	Review/article	Access and outcomes through AI	Implementation	Infrastructure constraints	Reach and accessibility
18	Dankwa-Mullan, 2024 [29]	Global/public health and medicine	Policy/ethics analysis	Equity and ethical AI	Formulation/design; implementation	Bias management remains challenging	Equity and responsible implementation
19	Olugboja & Agbakwuru 2024 [17]	Rural developing-country settings	Conference paper	AI for rural healthcare access	Implementation	Technology and infrastructure constraints	Potential to improve reach in developing-country settings
20	Capraro et al. 2024 [31]	Global/socioeconomic policy context	Policy/socioeconomic analysis	Generative AI and policy decisions	Formulation/design	Risk of increasing inequality	Policy precision and distributional effects
21	Bavli & Galea 2024 [41]	General public-health policy context	Policy perspective	AI adoption in public health	Formulation/design; implementation	Ethical and governance uncertainty	Planning and responsible adoption
22	Berdahl et al. 2023 [30]	Global/international literature	Scoping review	Strategies for AI and health equity	Formulation/design; implementation	Implementation evidence limited	Equity-oriented implementation strategies
23	Panch et al. 2018 [11]	Global/health systems	Health-systems analysis/review	AI and machine-learning applications across health-system functions	Formulation/design; implementation	Primarily conceptual; limited prospective implementation evidence	AI implementation requires alignment with health-system needs, data infrastructure and organizational capacity
24	Chen & Decary 2020 [23]	Canada/health-system leadership	Health-leader guide/review	AI essentials for health leaders	Formulation/design; implementation	Integration and leadership challenges	Leadership support and technical integration
25	Fisher & Rosella 2022 [10]	Global/public-health organizations	Literature review	Organizational priorities for public-health AI	Agenda setting; formulation/design; implementation	Adoption barriers	Strategic capacity and organizational readiness
26	Alowais et al. 2023 [24]	Global/general healthcare	Review	AI in clinical practice	Formulation/design; implementation	Regulation and implementation	Innovation and regulatory considerations
27	Behzadifar et al. 2023 [7]	Iran	Policy/narrative analysis	Big-data potential for UHC in Iran	Agenda setting; formulation/design; monitoring/evaluation	Infrastructure and data limitations	Data-driven policy and UHC monitoring
28	Brookings, 2024 [27]	United States/general health-policy context	Policy commentary	Generative AI opportunities and risks	Formulation/design; implementation	Ethical/regulatory uncertainty	Innovation, governance and policy considerations

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29	Tun et al. 2025 [28]	ASEAN	Regional governance/ readiness analysis	Healthcare AI governance readiness and national policy development	Agenda setting; Formulation/design; Implementation	Reliance on publicly available policies and readiness-index data	ASEAN readiness varies substantially; stronger governance, digital infrastructure and human capacity are needed
30	Hassan et al. 2025 [33]	Canada/ healthcare organizations	Governance framework	Organizational governance for AI adoption and implementation	Formulation/design; Implementation; Monitoring/evaluation	Proposed framework with limited external real-world validation	A dedicated governance structure can support safe adoption throughout the AI lifecycle
31	You et al. 2025 [34]	Healthcare stakeholder setting; study geography not explicit in abstract	Mixed-methods governance study	AI governance integrating policy, technology and stakeholder engagement	Formulation/design; Implementation	Purposive sampling and broad healthcare scope may limit generalizability	Effective AI governance requires policy integration, stakeholder engagement and attention to ethical and digital-equity concerns
32	Wells et al. 2025 [25]	United States health system	Framework development informed by review, interviews and workshop	FAIR-AI framework for pre-implementation review and post-implementation monitoring	Formulation/design; Implementation; Monitoring/evaluation	Developed within one large health system; broader validation is needed	Responsible deployment requires structured risk assessment, transparency, equity review and continued monitoring
33	Tsoi et al. 2025 [35]	United States; UNC Health	Empirical implementation review	Implementation of a responsible AI governance framework	Implementation; Monitoring/ evaluation	Single health system; only 12 evaluations; vendor transparency and resource limitations	Responsible AI implementation requires fairness assessment, vendor transparency and robust post-implementation monitoring
34	Kumar et al. 2025 [36]	United States-led/ multi-institutional	Governance/ framework analysis	CAOS framework for AI oversight, risk and equity	Formulation/design; Implementation; Monitoring/evaluation	Primarily conceptual framework; real-world effectiveness not yet established	Adaptive oversight, equity assessment and continuous monitoring can address regulatory and accountability gaps
35	Kim et al. 2025 [43]	Canada	Organizational case study	Establishing organizational AI governance using the PPTO framework	Formulation/design; Implementation; Monitoring/evaluation	Single hospital-system case at an early stage of AI adoption	Practical AI governance requires coordinated capabilities across people, processes, technology and operations
36	Scott et al. 2025 [26]	Australia	Perspective/ health-system guidance	Organizational preparedness for large-scale AI implementation	Formulation/design; Implementation; Monitoring/evaluation	Perspective-based guidance; limited empirical evaluation	Healthcare organizations need governance, infrastructure, AI literacy, risk management and clear accountability before scale-up

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37	Gao et al. 2025 [12]	Global/international literature	Systematic review	AI applications, ethical challenges and governance pathways in public health	Agenda setting; Formulation/design; Implementation; Monitoring/evaluation	Heterogeneous evidence and geographic imbalance toward high-income settings	Effective public-health AI governance requires technical standards, ethical oversight, equity, public engagement and global collaboration
38	Kim et al. 2026 [44]	United States/healthcare delivery organizations	Governance framework development	PPTO framework for establishing organizational AI governance and readiness	Formulation/design; Implementation; Monitoring/evaluation	Framework requires wider evaluation across health systems and contexts	Governance readiness depends on coordinated people, processes, technology, operations, accountability and lifecycle monitoring
39	OECD, 2026 [13]	OECD member countries	Policy report/framework	AI-in-health policy checklist and national readiness for responsible scale-up	Agenda setting; Formulation/design; Implementation; Monitoring/evaluation	Focused mainly on OECD health systems; applicability may differ in resource-constrained settings	Responsible scale-up requires strong data foundations, governance guardrails, workforce capacity, public engagement and trustworthy AI
40	Yousefi et al. 2025 [14]	Global/international PHC literature	Systematic review	Opportunities, challenges and requirements for AI implementation in primary health care	Formulation/design; Implementation; Monitoring/evaluation	Heterogeneous evidence; much of the literature remains early-stage and context-dependent	PHC implementation requires attention to governance/stewardship, financing, workforce, infrastructure and service-delivery readiness
41	Mazzi, 2025 [37]	International; national and supranational policy frameworks	Comparative/normative policy analysis	Health implications of national and international AI policies in relation to SDG 3	Agenda setting; Formulation/design; Implementation	Focuses on selected policy frameworks and normative implications rather than implementation outcomes	AI policies should explicitly integrate health, equity and sustainable-development considerations rather than treating health effects as secondary
42	Yang & Ricciardi 2026 [38]	United States	Policy analysis/document analysis	Federal AI policy, healthcare regulation, workforce, safety, equity and accessibility	Agenda setting; Formulation/design; Implementation	US-specific policy context; limited empirical implementation evaluation	Healthcare-specific safeguards are needed to protect safety, equity, workforce roles and accountability as AI adoption expands
43	Shah et al. 2025 [45]	United States with international regulatory comparison	Regulatory/policy analysis	Regulatory landscape for safe and responsible AI in healthcare	Formulation/design; Implementation; Monitoring/evaluation	Regulatory environment is rapidly changing; predominantly regulatory rather than outcome-based evidence	Responsible AI requires coordinated regulation, ethical safeguards and continued oversight across development and deployment
44	Galatzan et al. 2025 [46]	United States	Structured policy/mapping review of state legislation	AI legislation, professional regulation and accountability in healthcare/nursing	Agenda setting; Formulation/design; Implementation	Snapshot of enacted/proposed legislation through March 2025; legislation may change rapidly	AI legislation should clearly address professional roles, accountability, competency and safeguards for AI-supported healthcare decisions

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45	Solaiman, 2025 [47]	Qatar, Saudi Arabia and United Arab Emirates, with wider international relevance	Legal/policy analysis	Lifecycle governance and regulation of healthcare AI	Formulation/design; Implementation; Monitoring/evaluation	Relies substantially on selected GCC regulatory examples; proposed governance approach requires broader empirical testing	Regulation should extend across AI research/development, approval and deployment rather than addressing individual stages separately
46	Dehnavieh et al. 2025 [15]	Iran	Foresight/health-system analysis	Future integration and strategic preparedness for AI in primary health care	Agenda setting; Formulation/design; Implementation	Country-specific foresight study; does not evaluate implemented AI interventions	Successful PHC integration requires strategic preparedness, governance, infrastructure and attention to existing system challenges