From Chaos to Rationality: A Contingent Meta-Model for Evidence-Informed Health Policymaking in Diverse Contexts

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Abstract

Background: Evidence-informed policymaking is a complex process that requires adapting to diverse contexts characterized by varying degrees of certainty and agreement. Existing models and frameworks often lack clear guidance for dealing with such contexts. This study aimed to develop a novel contingency model to guide the context-specific use of evidence in health policymaking.

Methods: The study conducted a meta-ethnographic synthesis of 15 existing models and frameworks on evidence-informed policymaking, integrating key factors and concepts influencing the use of evidence in policy decisions. The study also adapted the Stacey Matrix, a tool for understanding the complexity of decision-making, into a quantitative scoring system to assess the levels of certainty and agreement in a given policy context.

Results: The study proposed a contingency model that delineates seven modes of decision-making based on the dimensions of certainty and agreement, ranging from rational to molasses-slow collective. For each mode, the model suggests configuring four aspects: team composition, policy idea generation, problem analysis, and consensus building. The model also highlights the multifaceted influences of evidence, interests, values, and beliefs on policy decisions.

Conclusion: The contingency model offers researchers and policymakers a flexible framework for aligning policymaking processes with available evidence. The model also underscores the importance of context-specific approaches to evidence-informed policymaking. The model could enhance evidence-informed policymaking capacity, improving health outcomes and system performance. Further research should validate and extend the model empirically across diverse contexts.

Keywords: Evidence-Informed Health Policymaking, Contingency Model, Meta-Model, Meta-Ethnography, Decision-Making

Introduction

The ideal model of evidence-based policymaking assumes a smooth and reciprocal interaction between scientists and policymakers, who produce and use evidence respectively, but the reality is often hampered by various challenges that stem from their mutual distrust and divergent perspectives(1). Moreover, some critics question the feasibility and desirability of basing policy decisions only on research evidence, arguing that such a linear model oversimplifies the complex and multifaceted nature of policymaking, which also involves other influences such as ideology, values, public opinion, and lobbying, and suggest that a more modest goal of 'evidence-inspired' or 'evidence-informed' policy may be more realistic (2). Evidence-informed policymaking (EIPM) is an approach that

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↑*What is "already known" in this topic:*
Evidence-informed health policymaking aims to use research evidence in policy decisions but faces various challenges, such as time, skills, values, and interests. Existing frameworks do not address diverse and complex policy contexts and scenarios.

→*What this article adds:*
This article presents a contingency model for evidence-informed health policymaking based on a meta-ethnography of 15 frameworks. The model assesses policy contexts based on certainty and agreement and suggests tailored strategies for different evidence scenarios. The model aligns policymaking with evidence and bridges gaps between evidence and policy.

aims to ensure that decision-making is well-informed by the best available research evidence (3). However, EIPM is not simple or easy, as it involves various actors, sources, and evidence, as well as diverse political, social, and organizational factors that affect how evidence is generated, accessed, appraised, and used in policymaking (4, 5). Furthermore, the existing research on the evidence and policy nexus has not bridged the gap between science and policy, which often leads to policy decisions that are not evidence-informed or scientific research that is not aligned with national priorities (6). The discrepancy between evidence and policy and practice is a well-known and widely studied phenomenon, and many efforts have been made to understand and overcome this divide (7-9).

Policy decisions often face barriers that limit the use of evidence, which is a complex and diverse concept that includes various types of evidence, knowledge, and expertise from different sources (6). Evidence is not always used effectively or appropriately, partly because policymakers are overwhelmed by the issues and information they have to deal with (10). To understand these barriers, we should consider that policy actors are influenced by the "ideas" derived from research evidence rather than by the evidence itself (11); and the political elites pay more attention to ideas associated with a body of research than to evidence-based information, either because they are more interested in the inspiration from ideas or because they find ideas easier to process than evidence, or both (12).

A key barrier to evidence use is time pressure. Policymaking is often a fast and messy process, unlike the slow and rigorous nature of scientific inquiry, and evidence needs to be timely and relevant for decision-making (6, 13). However, finding and accessing reliable and pertinent evidence can be challenging, especially in complex and uncertain situations (14-16). Moreover, decision-makers need to have the technical skills to access, appraise, interpret, and apply evidence, but these skills are often lacking or uneven among policy actors and organizations (17, 18).

Another barrier is the communication gap between researchers and policy and media audiences, who may have different formats and language preferences for evidence (19). Also, researchers and policymakers have different values, expectations, languages, and cultures that affect their collaboration and trust (20). Co-production is an approach that aims to overcome these barriers by involving both researchers and policymakers in the production and use of policy knowledge (21). However, co-production is not simple, and it requires clear strategies for initiating, facilitating, and sustaining the collaboration among multiple stakeholders (22).

Finally, a common challenge for EIPM, especially in emerging countries, is the lack of strong incentives to encourage the use of scientific evidence in policy decisions (23). Incentives can play a key role in motivating individuals to adopt certain behaviors, and they can be used to enhance the willingness to support the use of evidence in policy-making (23).

Despite extensive scholarship on research-policy barriers (16, 18) an integrative contingency model is needed to guide evidence use in diverse policy contexts. A contingency model is a decision making theory that suggests that the best decision depends on various situation-specific factors, such as the problem, the environment, the decision maker, and the other people involved (24).

This paper proposes a comprehensive contingency model for EIPM in healthcare based on a meta-ethnographic synthesis of existing models and frameworks. Meta-ethnography is an interpretive approach that inductively develops new conceptual understandings from qualitative studies (25). The contingency model identifies key factors related to the policy development process, evidence ecosystem, and broader political and health system contexts that shape evidence uses in policy decisions. It describes configurations of contingencies that influence policy processes and outcomes across different situations.

Methods

The study used meta-ethnography to combine EIPM models and frameworks for healthcare. Meta-ethnography is a method that lets researchers compare and translate ideas across studies and create new models or theories (25).

The meta-ethnographic synthesis process consisted of seven steps, as follows:

Literature search (step 1): We searched PubMed, Scopus, and Web of Science for studies that presented a model or framework for EIPM in healthcare, using terms related to evidence, policy, and models or frameworks. The details of the search strategy, keywords, and selection criteria are provided in Appendix 1.

Screening studies (step 2): The titles and abstracts of the retrieved studies were screened independently and those that presented a model or framework for evidence-informed health policymaking were included for further analysis. Any disagreements were resolved by discussion or consultation.

Reading studies (step 3): The included studies were read closely, and the main concepts and components of each model or framework were extracted and summarized.

Determining relationships (step 4): The relationships between the models or frameworks were determined based on their similarities and differences in terms of concepts and components. The models or frameworks were classified into three types of relationships: (a) reciprocal, meaning they were directly comparable and had similar concepts or components; (b) refutational, meaning they contradicted each other and had different concepts or components; and (c) line-of-argument, meaning they contributed to a larger whole and had complementary concepts or components.

Translating models or frameworks (step 5): We translated concepts and components from one model or framework to another by using reciprocal or refutational synthesis. We identified key terms and expressions used by each model or framework and found equivalent or opposite terms and expressions in other models or frameworks. We created new terms or expressions when needed.

Synthesizing translations (step 6): The translations were synthesized to determine 3rd order interpretations that encompassed themes across models or frameworks by using

line-of-argument synthesis. Common or contrasting patterns among the translations were identified, and new concepts, metaphors, or themes were developed.

Developing a meta-model (step 7): We developed a contingent meta-model for evidence-informed policymaking based on the line-of-argument synthesis. The meta-model represented a conceptual synthesis of factors influencing evidence-informed health policymaking across contexts. We illustrated the meta-model with a figure and explained it in detail in the results section.

We followed good practice guidance to preserve the meanings and the transparency of the synthesis process. The contingency model is a new and original contribution to the literature on evidence-informed health policymaking.

Results

The literature search yielded 15 models and frameworks for evidence-informed health policymaking, which were included in the meta-ethnographic synthesis. The 15 models and frameworks included:

- Conceptual model of knowledge utilization (26)
- The Ottawa model of research use (27, 28)
- The Canadian Health Service Research Foundation model (29)
- The Framework for Research Dissemination and Utilization (30)
- The Evidence-Informed Policy and Practice Pathway (31)
- The JBI model of evidence-based healthcare (32, 33)
- Theoretical framework for the transformation of knowledge to policy actions (34)
- Knowledge to action process model (35)
- Models for linking research to action (36)
- Tehran University Medical Sciences Knowledge Translation Cycle (37)
- The SPIRIT Action Framework (38)
- FHI 360 Research Utilization Framework (39)
- Working conceptual model for embedded implementation research (40)
- The EVITA framework (41, 42)
- Social Media for Implementing Evidence Framework (43).

The synthesis process involved reading, translating, and synthesizing the concepts and components of each model or framework, as well as developing a meta-model based on the line-of-argument synthesis. The main findings of the synthesis process are presented below.

Reading studies, translating models or frameworks, and developing overarching concepts

We closely read the included studies and extracted and translated the main concepts and components of each model or framework using reciprocal or refutational synthesis. The translations were based on the similarities and differences across models and frameworks. We then grouped the extracted and translated concepts and components into six general overarching concepts: Context of policy-making, Different modes of decision making, Team composition, Problem analysis, Policy idea generation, and Consensus building. Table 1 displays the mapping and translation of the concepts and components across models and frameworks.

Developing a meta-model

We synthesized factors influencing evidence-informed health policymaking across contexts into a contingent meta-model based on the line-of-argument synthesis. The meta-model was shown by a figure and a narrative. Our model provides a flexible framework for decision-makers to use more evidence in policymaking by comparing different approaches based on certainty and agreement. The meta-model has two steps:

1. Choosing the policymaking mode based on certainty and agreement indicators

2. Adapting the policymaking components to the mode

Step one

We applied the Stacey matrix (44), a tool for understanding the complexity of a situation based on certainty and agreement among decision-makers, to the integrated models and frameworks. The Stacey matrix classifies decision-making processes based on certainty and agreement (44). Stacey's matrix is qualitative and subjective, and it does not provide a clear and measurable way to assess the complexity of a policy situation. We adapted the Stacey matrix quantitatively to examine evidence-informed health policymaking scenarios. We assigned numerical values to five indicators for certainty and agreement, and we defined seven modes of decision-making in the matrix based on certainty and agreement. These indicators matched the overarching concepts from synthesizing the 15 models and frameworks, as shown in Table 1. We also described the policy decisions and processes in each mode.

The first step of our model is to score five indicators for each dimension of certainty and agreement and find the mode or region of decision-making. The level of certainty is influenced by evidence availability and policy literacy. Evidence availability means the sufficiency and reliability of evidence to inform policymaking. Policy literacy means the knowledge and capacity among decision-makers to interpret and use evidence. The level of agreement is influenced by conflict of interest and ideological coherence. Conflict of interest means the personal or professional stakes that may override evidence. Ideological coherence means the shared vision and values among stakeholders.

In addition, there are three mutual indicators for certainty and agreement: time pressure, resource availability, and technical incapacity. Time pressure is the time constraints for evidence and options. Resource availability is the adequacy of resources to get and assess evidence. Technical incapacity is the lack of ability or power to do technical tasks or functions.

The indicators are scored on scales from 0 to 6 or 0 to 3, based on our judgments and preferences. We did not use formal or rigorous methods to score the indicators, as we wanted a simple and easy meta-model.

Table 1. Mapping and translation of concept-components and overarching concepts across policy making models and frameworks

General overarching concepts	Specific overarching concepts	Specific concepts from 15 models and framework	General concepts from 15 models and frameworks
Policy idea generation (The factors that shape the policy idea, such as evidence, interest, beliefs, and ideology.)	Evidence (Various types and sources of information, knowledge, and experience that influence decisions.)	Knowledge acquisition (34), Personal experience (29), Knowledge (27, 30), Evidence (33), Evidence generation (33), Evidence synthesis (33), Knowledge creation (35), Using evidence (31), Generate new research (38), Research (37, 38), Expert advice (38), Message (43), Study size (26), Methodological adequacy (26), Research clouds (42), Research phase (39)	Translating technical facts into political facts (34), Solutions (29, 34, 42). Policy idea (29), Adapt knowledge to local context (33), Innovation (27, 30), Innovation characteristics (30), Innovation attribute (27), Development process (27), Policy idea (31), Sourcing evidence (31), Production of research (36), Actionable message (36), Surfacing and sharing tacit knowledge (40), Framing and alignment (42), Translation phase (39), Uptake and practice (39)
	Beliefs (Mental states that represent how a person thinks or expects the world to be, based on evidence, reasoning, intuition, or faith)	Personal agenda (34), value (29, 30), Assumptions (29), Beliefs (30), Political agenda (31), Clear definition of objective by decision maker (26)	
	Interest (The stake or benefit that an individual or a group has in a policy issue or outcome)	Interest (29, 34), Politics (34), Want (29), Concern (27), Political interest (38), Decision maker interest (26)	
	Ideology (A system of ideas and values that influences how people view and act in the world)	Personal ideology (34), Political ideology (31, 38), Public opinion (38), Decision maker style (26)	
Context of policy making (Set of conditions and circumstances that affect how policy makers use evidence in their decisions)	Technical capacity of researcher (adequate skills or knowledge to perform a specific task or function) & policy maker literacy (The ability to understand, interpret, and use policy-related information and evidence)	Capacity building (34), Considering capacity to implement (31), Capacity (38), Capability (43), Facilitation/support (40), Individual characteristics (30), Intermediaries (42), Capacity (42)	Environmental characteristics (30), Organizational characteristics (30), context analysis (33), Assess barriers to knowledge use (35), Practice environment (27), Awareness (27), Attitude (27), Context and decision-making factors (31), General climate (36), Legislative/policy infrastructure (38), Context (40, 43), Policy sphere (42), External context (42), Decision making characteristics (37), Context of organization (37)
	Scarcity of Resources (The lack of incentives to motivate the use of scientific evidence in policy decisions)	Research funders (29), Economic climate (38), Resources (37, 38), Proposed funding change (26), Resource availability (43), Behavioral incentives (42), Secure sustainable source of financing (39)	
	Time Pressure (The mismatch between the fast and messy policy making process and the slow and rigorous scientific inquiry)	Uncontrolled events (27), Immediate decision needed (26), study timing (26)	
	Certainty (The degree to which the outcomes of an action can be predicted based on past experience, knowledge and clear cause and effect linkages.)	Stories or facts (29), access research (38), Reservoir of relevant & reliable research (38)	
	Agreement (The extent to which the group, team or organization shares a common understanding and perspective about an issue or decision)	Political will (34, 42), Priorities (29), Barriers (27), Supporters (27), Political feasible (26), Amount of conflict (26), Shared understanding/vision (40), Conflict resolution (40)	

Table 1. Continued

General overarching concepts	Specific overarching concepts	Specific concepts from 15 models and framework	General concepts from 15 models and frameworks
Different modes of decision making (Different ways of approaching a problem or a choice, depending on the level of certainty and agreement in the situation)			Puss efforts(36), User pull(36), Exchange efforts(36), Integrated efforts(36), Type of decision(30), Linkage and exchange(40), Windows of opportunity(42), Pull side(37), Exchange efforts(37), Push side(37)
Problem analysis (The approach to analyze the problem and its causes/effects, such as objective or subjective.)	Objective problem (Problem that can be measured or verified by empirical evidence, such as facts, statistics, or observations)	Researchable question(29), Knowledge need(33), Question transfer(37)	Problems(29, 34, 42), Issues(29), Identify problem(35), Catalyst(38, 42), Nature of problem(26), Trigger(43), Problem identification(40), Framing question(40)
	Subjective problem (Problem that is based on the personal perspective or experience of an individual or a group)	Current practice(27)	
Team composition (The mix of members with different knowledge, capacity, and stake in policy making.)	Technical (Specialists in conducting and analyzing scientific research and evidence.)	Researchers(27, 29-31), Service professionals(29), Knowledge purveyor(29), Purveyor of research(36), Research producers(39)	Communication(29), Individual and organization engagement(30), Development process(27), Team composition(43), Developers(43), Embedded research team attributes(40), Collaborative team work(40), Foundational phase(39)
	Administrative (Facilitators of policy implementation and evaluation with practical experience.)	Managers(29), Implementer(27)	
	Political (Negotiators of political interests and ideology in policy making with political experience)	Policy learning(34), Policy makers(27, 29, 31), Decision makers(29, 30), Potential adopters(27), policy actors(31) (EIPPP), Research user(36), Decision maker participation(26), Reception(26), End users(39), Decision makers characteristics(37)	
Consensus building (The approach to reach stakeholder agreement, such as persuasive or non-persuasive.)	Persuasive (Using arguments, information, or influence to convince stakeholders to agree on a policy issue or outcome)	Persuasion(30), Conformation(30), Trust building(40)	Coalition building(34), evidence transfer(33), Engagement(33, 35), Research engagement action(38), Decision maker participation & intensity of engagement(40), Deliberation and collaborative problem-solving(40), Negotiation and approvals(40), Advocacy coalitions(42), Enactor(42), Key individuals(42), Engagement and relationships(42), Knowledge brokers(39), Stakeholder meetings and dialogues(39), Advocacy campaigns(39)
	None persuasive (Using methods that foster information sharing, participation, or structured decision making to reach agreement among stakeholders on a policy issue or outcome)	Active dissemination(33), Education(33), System integration(33), Teachable moment(36), Interact with researchers(38)	

The scales reflect the impact of each indicator on its dimension, as explained earlier. For example, time pressure affects agreement more than certainty. Technical capacity affects certainty more than agreement. Resource availability affects both the same.

Scoring Criteria

Table 2 shows how the indicators for each dimension are scored:

In the worst-case scenario, the cumulative certainty score (sum of X1-X5) could reach 24. The cumulative agreement score (sum of Y1-Y5) could also reach 24. This informs the 24x24 matrix scale.

The certainty score determines the X position ($X=X_1+X_2+X_3+X_4+X_5$), and the agreement score determines the Y position ($Y=Y_1+Y_2+Y_3+Y_4+Y_5$). Plotting the X and Y on a 24*24 grid splits the matrix into seven sections, showing different policymaking approaches based on certainty and agreement. Figure 1 shows the seven modes of decision-making and their approaches.

In some cases, your position may fall on the edge between two regions of the matrix, indicating a mixed or ambiguous situation that does not clearly fit into one type of policymaking approach. The boundary between the regions is not fixed or rigid but rather flexible and fuzzy. Our model is only a guide to help determine the position and approach, not a rule or a formula. If a policy decision context falls on the borderline between two or more regions, the decision-

Table 2. Scoring criteria for certainty and agreement dimensions

| Dimension	Indicator	Scale[1]	Interpretation
Certainty	Evidence availability (X_1)	0-6	0 - Most favorable, 2 - Mildly unfavorable, 4 - Extremely unfavorable, 6 - Most unfavorable
	Policy literacy (X_2)	0-6	0 - Most favorable, 2 - Mildly unfavorable, 4 - Extremely unfavorable, 6 - Most unfavorable
	Time pressure* (X_3)	0-3	0 - Most favorable, 1 - Mildly unfavorable, 2 - Extremely unfavorable, 3 - Most unfavorable
	Resource availability* (X_4)	0-3	0 - Most favorable, 1 - Mildly unfavorable, 2 - Extremely unfavorable, 3 - Most unfavorable
	Technical capacity* (X_5)	0-6	0 - Most favorable, 2 - Mildly unfavorable, 4 - Extremely unfavorable, 6 - Most unfavorable
Agreement	Conflict of interest (Y_1)	0-6	0 - Most favorable, 2 - Mildly unfavorable, 4 - Extremely unfavorable, 6 - Most unfavorable
	Ideological coherence (Y_2)	0-6	0 - Most favorable, 2 - Mildly unfavorable, 4 - Extremely unfavorable, 6 - Most unfavorable
	Time pressure* (Y_3)	0-6	0 - Most favorable, 2 - Mildly unfavorable, 4 - Extremely unfavorable, 6 - Most unfavorable
	Resource availability* (Y_4)	0-3	0 - Most favorable, 1 - Mildly unfavorable, 2 - Extremely unfavorable, 3 - Most unfavorable
	Technical capacity* (Y_5)	0-3	0 - Most favorable, 1 - Mildly unfavorable, 2 - Extremely unfavorable, 3 - Most unfavorable
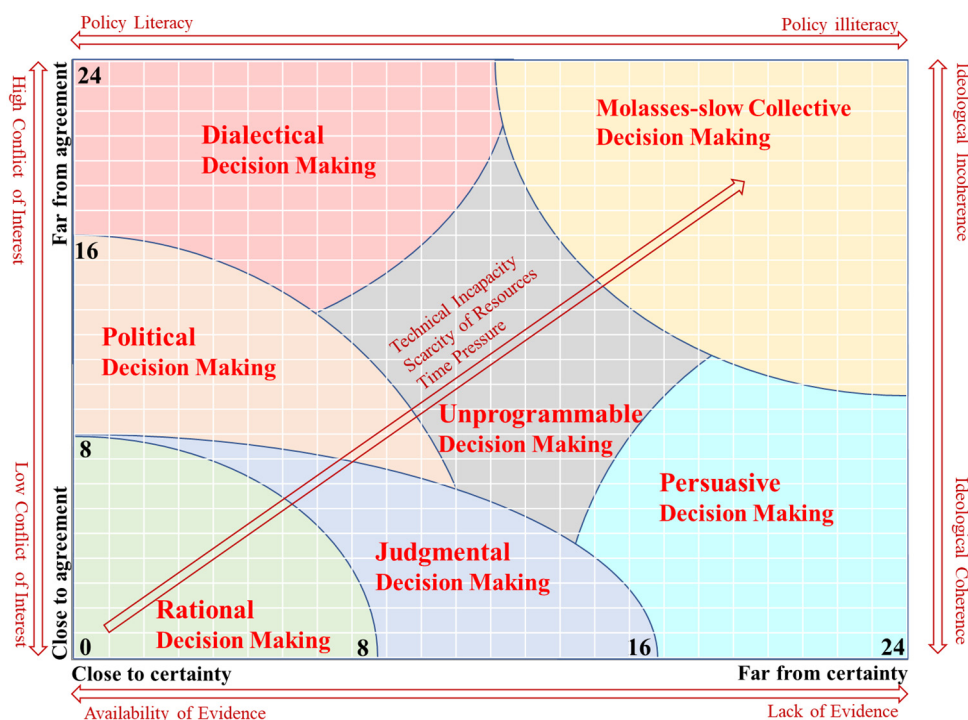
Figure 1. Different modes of decision-making and their corresponding policymaking approach

makers and researchers can use their judgment and discretion to decide which region and approach is more suitable for their situation.

Step 2

The second step of the model is to tailor the policymaking approach to the mode from step 1. This involves adapting four concepts from synthesizing the 15 models and frameworks:

- **Team composition:** The suitable members for each mode, such as technical, political, or administrative. This affects the policy idea.
- **Policy idea generation:** The factors that shape the policy idea, like evidence, interest, beliefs, and ideology. This affects the policymaking process.
- **Problem analysis:** The approach to analyze the problem and its causes/effects, such as objective or subjective. This affects the problem definition and priority.
- **Consensus building:** The approach to reach stakeholder agreement, like persuasive or non-persuasive. This affects stakeholder involvement and cooperation.

For each concept, we propose methods based on certainty and agreement in each mode. We explain and give examples of our approaches and how they align policymaking with the evidence-based mode.

Rational Decision Making

This is a logical and objective decision-making process that uses data, from problem identification to alternative evaluation, to optimize the outcomes (45). This approach happens when there is high certainty and agreement on the policy options and outcomes. With evidence and consensus, decision-making uses systematic, analytical evaluation of alternatives to choose the best policy based on goals and criteria.

Team composition

We recommend more technical members who use evidence, and equal political and administrative members who represent interests and facilitate implementation.

Problem analysis

We suggest using root cause analysis (46) to understand causes and effects and assess the importance of prioritizing and mobilizing stakeholders.

Policy idea generation

The idea is mostly evidence (80%), with some beliefs (15%), and little interest or ideology (5%). We advise compiling evidence using systematic review (47), global experience review (48), and critical interpretive synthesis (49) is advised for policy idea generation.

Consensus building

Using persuasive approaches like policy dialogue (50), Expert scrutinizing (51), and lobbying (52) to actively influence stakeholders through discussion, negotiation and appeals to reason is suggested for consensus building.

Political Decision Making

This decision-making process uses bounded rationality in situations where values and ideologies affect information and choices, and it considers and accounts for stakeholder interests (53). This situation happens when there is high certainty but moderate agreement. The evidence shows policy solutions, but stakeholders differ on goals and values. The policy decision uses evidence but also navigates political tensions and power to build consensus.

Team composition

We advise more technical members to interpret evidence, fewer administrative members to enable implementation, and many political members to represent interests and solve conflicts.

Problem analysis

We recommend using root cause analysis (46) and defining and analyzing the political issues. This develops a multifaceted conceptualization of the problem.

Generate policy ideas

A balanced approach is proposed that mixes evidence and values from different sources and views for policy idea generation. First, evidence (50%), which gives direction, should be combined with beliefs, interests, and ideology (50%), which shape positions and agendas. Second, various analytical methods and tools are advised for these inputs. For example, for evidence, systematic and global reviews (47, 48) are suggested. For beliefs, brainstorming (54) is recommended. For interests, policy and stakeholder analysis (55, 56) are advised. For ideology, the value framework and criteria (57) should be determined.

Consensus building

We recommend using persuasive approaches like policy dialogue (50) to overcome resistance and non-persuasive methods like multi-criteria evaluation (58) and Rand method (59) to enhance willing cooperation for consensus building.

Dialectical Decision Making

This approach accepts diverse viewpoints as natural in human systems and tries to produce new solutions or strategies through logical discussion and debate, which uses reasoning and evidence, not emotions, and often needs a power structure to make progress (60). This situation has high certainty but low agreement. There is evidence for some policies, but there are big conflicts between stakeholders' interests and ideologies. The policy debate is adversarial, with groups having opposite viewpoints. Decision-making involves solving these dialectical tensions.

Team composition

Our suggestion is to include equal numbers of technical members to provide evidence and political members to represent interests, along with a minority of administrative members to enable implementation. This balances expert input with conflict navigation.

Problem analysis

We advise focusing on defining the political issues and analyzing their intensity and scope. This develops a shared conceptualization amidst disagreements on solutions.

Generate policy ideas

We recommend a value-driven approach that puts interests and ideology over evidence and beliefs for policy idea generation. First, interests and ideology should lead the idea (50%), with evidence (30%), and little beliefs (20%). Interests and ideology show stakeholder conflicts, evidence gives direction, and beliefs help. Second, we advise using different analytical methods and tools for these inputs. For example, for evidence, we suggest Systematic Review (47) and Global Experience Review (48); for beliefs, we recommend using Brainstorming (54) Methods and Ideological Analysis (61); for interests, we advise using Policy Analysis (55), Discourse Analysis (62), Economic Analysis (63), Organizational Analysis (64), and Stakeholder Attitude Analysis (56); and for ideology, our advice is determining the Value Framework and the Selection Criteria (57).

Consensus building

We propose using non-persuasive approaches like multi-criteria evaluation (58) and stakeholder engagement methods (65) for consensus building for consensus building. Persuasion may worsen tensions when agreement is low. Sharing information and facilitating participation are better strategies.

Judgmental Decision Making

This process uses the ability to predict future conditions instead of following rules and regulations; it is not a teachable skill but an insight from experience and system knowledge (66). This situation has moderate certainty but high agreement. The evidence gives direction, but some ambiguity stays. Stakeholders have common goals and visions, allowing collaborative policy. Decision-making uses a careful assessment of evidence to guide agreed decisions.

Team composition

We recommend a team with mostly technical members for evidence assessment, some political members for interests representation, and a few administrative members for implementation and collaboration.

Problem analysis

We propose root cause analysis (46) for problem causes and system dynamics (67) for future effects. This fosters complex thinking and foresight.

Generate policy ideas

We propose combining evidence (50%) for direction and beliefs, interests, and ideology (50%) for agenda alignment. We use various methods and tools for these inputs. For evidence, we use global experience review (48), critical interpretive synthesis (49), realistic review (68), and meta-ethnography (25); for beliefs, we recommend using brainstorming (54) methods and stakeholder surveys (56); for interests, we advise using policy analysis (55) and discourse

analysis (62); and for ideology, our recommendation is using ideological analysis (61).

Consensus building

We advise persuasive approaches such as policy dialogues (50) and political lobbying (52) for consensus. With high agreement, persuasion can resolve minor conflicts and resistance.

Persuasive Decision Making

This is about using arguments or information to sway different parties' decisions and actions, with message complexity and reasoning level influencing persuasiveness and groups being more rational than individuals (69). With low certainty and high agreement, evidence is scarce or vague. However stakeholders share values and goals. Policymaking depends on persuasion, often emotional or charismatic. Logic and rhetoric are used to persuade others.

Team composition

We propose a team with mostly political members for persuasion and consensus, some administrative members for implementation, and a few technical members for evidence interpretation.

Problem analysis

We recommend predicting consequences, setting objectives, and critiquing current policies, to conceptualize gaps and priorities for change for problem analysis.

Generate policy ideas

We propose a value-driven approach for policy idea generation, with ideology and beliefs (50%) as the main drivers, supported by limited evidence (40%) and aligned interests (10%). We use various methods and tools for these inputs. For evidence, we use realistic reviews (68) and meta-ethnographies (25); for beliefs, we recommend using brainstorming (54) methods and stakeholder surveys (56); for interests, we advise using discourse analysis (62); and for ideology, our advice is using ethical and ideological analyses (61, 70).

Consensus building

We advise using persuasive approaches like policy dialogues (50) and political lobbying (52) for consensus. With high agreement, persuasion can mobilize stakeholders.

Unprogrammable Decision Making

This process requires novel and complex decisions that demand situational judgement and creativity, with a focus on innovation and outcomes (71). This has moderate certainty and agreement. Evidence gives some guidance, but has flaws and gaps. Stakeholders partly agree but have some clashes. Decision-making needs gradual negotiation and compromise for middle-ground policies.

Team composition

We suggest a team with mostly technical members for evidence assessment, some administrative members for

joint work, and a few political members for interests representation.

Problem analysis

We advise focusing on determining shared objectives. With uncertainty on solutions, defining common goals and criteria provides direction.

Generate policy ideas

We propose balancing inputs from evidence, beliefs, interests, and ideology (25% each). With medium certainty and agreement, diverse inputs enable a middle-ground idea. We use various methods and tools for these inputs. For evidence, we use systematic review (47), global experience review (48), and critical interpretive synthesis (49); for beliefs, we recommend using brainstorming (54) methods, stakeholder survey (56), and SCAMPER method (72); for interests, we advise using policy analysis (55), discourse analysis (62), and economic analysis (63); and for ideology, our recommendation is using ethical analysis (70), ideological analysis (61) and value framework analysis (73).

Consensus building

We recommend using both persuasive approaches, including policy dialogue (50), political lobbying (52), Expert scrutinizing (51), consensus-building conference (74), and stakeholder advocacy (56) and non-persuasive approaches specifically the Speakers Council method (75) for consensus. Persuasive tactics and non-persuasive dialogue can address reservations and build understanding for joint solutions.

Molasses-slow Collective Decision Making

This is a slow and natural process of sharing opinions and discussing options among key informants and stakeholders without forcing or faking a consensus but widening the policy debate into a political dialogue (76). This happens when there is very low certainty and agreement on policy impacts and priorities. With scarce, conflicting evidence and diverse stakeholder views, decision-making is an iterative process of building coalitions, making trade-offs, and finding compromise solutions. This can be called chaos (44, 77) or anarchy (78, 79), as it lacks a common leader, a sense of order, and a horizontal relation among equals.

Team composition

We recommend a team with equal administrative members for collaboration, political members for compromise, and a few technical members for evidence.

Problem analysis

We suggest predicting consequences and defining shared objectives for problem analysis. This develops some common ground amidst high uncertainty.

Policy idea generation

We propose beliefs (50%) reflect values, supported by interests and ideology (20% each) for factions, and minimal evidence (10%) for limitations and conflicts. We use these methods for each factor: realistic review (68) and meta-ethnography (25) for evidence, brainstorming (54) methods, stakeholder survey (56), SCAMPER (72) method, and distributed ideation based on social network for beliefs, policy analysis (55) and stakeholder attitude analysis (56) for interests, and ethical analysis (70) and ideological analysis (61) for ideology.

Consensus building

We suggest using non-persuasive methods such as structured stakeholder engagement for consensus. With very low agreement, persuasion could harm coalition building. We propose three methods for consensus: the Delphi method (59), the nominal group technique (80), and the Speakers Council method (75). These methods can get stakeholder opinions and preferences, generate and rank ideas, and build understanding and respect.

These methods are not mandatory but rather ideal methodological toolbox for each decision-making mode. They are flexible and creative methods for the model user and the team. They can choose any method for different sections, such as problem analysis, policy idea generation, or consensus building, based on their needs and resources. Figure 2 shows our meta-model for evidence-informed health policymaking based on certainty and agreement levels. The figure shows the seven modes of decision-making and the methods and tools for each concept. The figure summarizes our model development and description. In Appendix 2, we give a PowerPoint file of the models for different scenarios.

Discussion

This study proposed a new contingency model for evidence-informed policymaking in different contexts, based on a meta-ethnographic synthesis of 15 models and frameworks and integrating key factors and concepts for evidence use. The model had a quantitative scoring system to measure certainty and agreement levels in a policy context, adapting the Stacey Matrix (44) into a more measurable tool for evidence scenarios.

Several models aim to guide evidence-informed policymaking (81, 82). However, they often do not delineate specific strategies for diverse policy contexts with varying certainty and agreement (5, 83). Our model addresses this gap by providing a flexible framework that adapts to different policy scenarios. Different authors have used the Stacey Matrix to guide decision-making. For example, some papers have used Stacey's diagram to analyze the complexity and uncertainty of organizational learning (79), coastal infrastructure (77), education and health policies (84), GP consultation s(78), child health policy making (85), and health promotion programs (86). Our model builds on these applications by adapting the matrix into a more measurable tool for evidence scenarios, enhancing its utility for researchers and policymakers. Our model delineates seven approaches to policymaking, from rational to molasses-slow collective, based on certainty and agreement. For each approach, our model suggests configuring four aspects:
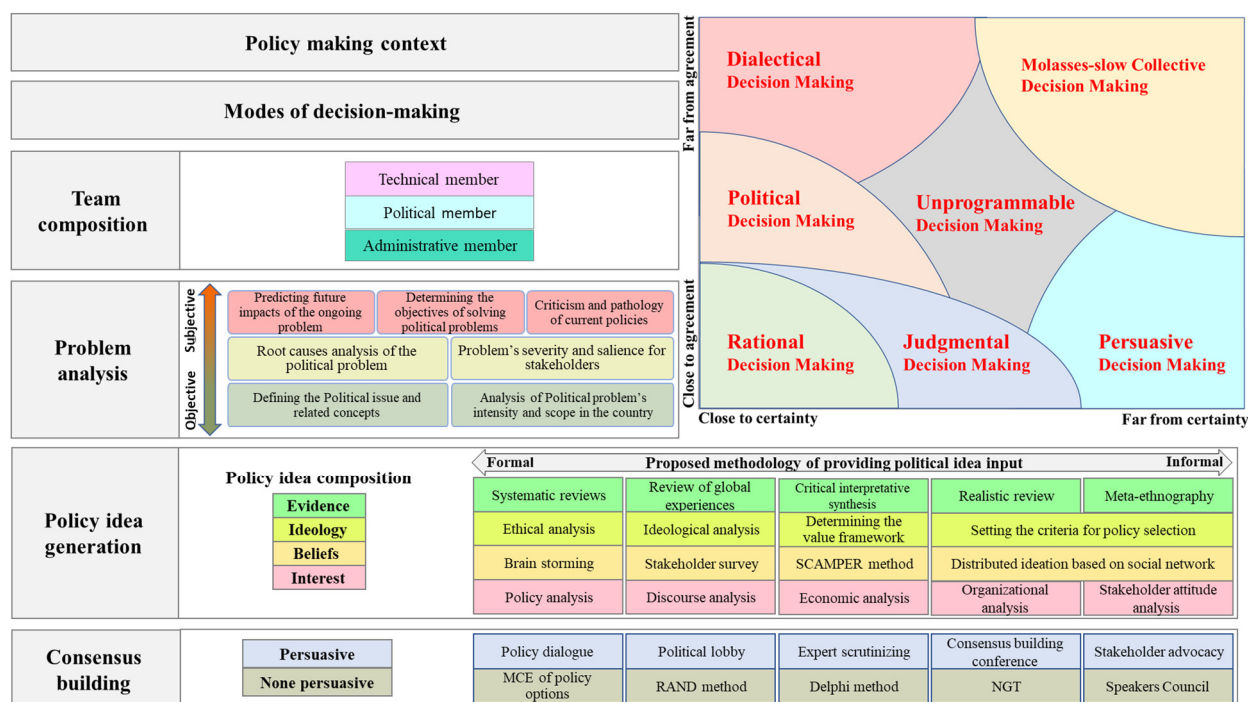
Figure 2. Contingent Meta-Model for Evidence-Informed Health Policymaking in Diverse Contexts

Table 3. Proposed team composition by percentage based on different modes of decision making

		Proposed team composition (% of total)		
		Technical members	Political member	Admirative members
Modes of decision making	Rational decision-making	60%	20%	20%
	Political decision-making	50%	30%	20%
	Dialectical decision making	40%	40%	20%
	Judgmental decision-making	50%	30%	20%
	Persuasive decision-making	30%	50%	20%
	Unprogrammable decision-making	60%	25%	15%
	Molasses-slow decision-making	20%	40%	40%

Table 4. Proposed policy idea composition based on different modes of decision making

		Proposed policy idea composition (% of total)			
		Evidence	Beliefs	Ideology	Interest
Modes of decision making	Rational decision-making	80%	10%	5%	5%
	Political decision-making	50%	20%	15%	15%
	Dialectical decision making	30%	20%	20%	30%
	Judgmental decision-making	50%	15%	15%	20%
	Persuasive decision-making	40%	20%	30%	10%
	Unprogrammable decision-making	25%	25%	25%	25%
	Molasses-slow decision-making	10%	50%	20%	20%

team composition, policy idea generation, problem analysis, and consensus building. The composition and actions for each aspect are summarized in (Tables 3 to 7). This guides policymakers in aligning processes to fit the evidence available. While simplified, our model captures the complex interplay of evidence, interests, values and beliefs in policymaking. The tailored strategies and actions can overcome common barriers between research and policy, promoting evidence use.

The scoring system for certainty and agreement indicators is based on subjective judgments and requires further validation through empirical testing in different contexts. The model also assumes general processes for each zone that may not capture the specificities of different settings. More comparative case studies could evaluate how well the model reflects real-world policymaking. The model could also incorporate different types of evidence and assess their applicability to the policy problem.

The model offers a flexible EIPM framework for healthcare based on previous models and the Stacey Matrix. It guides researchers and policymakers to match evidence and context. This could improve EIPM capacity, health outcomes, and system performance. More research can test and improve the model as an evidence-informed tool.

Table 5. Proposed problem analysis Actions based on different modes of decision making

		Proposed problem analysis Actions						
		Root causes analysis of the political problem	Problem's severity and salience for stakeholders	Predicting future impacts of the ongoing problem	Determining the objectives of solving political problems	Criticism and pathology of current policies	Defining the Political issue and related concepts	Analysis of Political problem's intensity and scope in the country
Modes of decision making	Rational decision-making	✓	✓					
	Political decision-making	✓					✓	✓
	Dialectical decision making						✓	✓
	Judgmental decision-making	✓	✓					
	Persuasive decision-making			✓	✓	✓		
	Unprogrammable decision-making				✓			
	Molasses-slow decision-making			✓	✓			

Table 6. Proposed consensus building actions based on different modes of decision making

			Modes of decision-making						
			Rational decision-making	Political decision-making	Dialectical decision making	Judgmental decision-making	Persuasive decision-making	Unprogrammable decision-making	Molasses-slow decision-making
Proposed consensus building actions	Persuasive	Policy dialogue	✓	✓		✓	✓	✓	
		Political lobbying	✓			✓	✓	✓	
		Expert scrutinizing	✓					✓	
		Consensus building conference						✓	
		Stakeholder advocacy						✓	
	None persuasive	MCE of policy option		✓					
		Rand method		✓					
		Delphi method							✓
		Nominal group technique							✓
		Speaker council method						✓	✓

Conclusion

This paper presented a contingency model for context-specific evidence use in health policymaking. The model, developed through meta-ethnography of 15 frameworks, suggests quantitative and qualitative methods to assess policy contexts and strategies to fit evidence scenarios. This offers a practical framework for aligning policymaking with evidence. The model also shows various influences on policy decisions besides research evidence.

Table 7. Proposed idea generation Actions based on different modes of decision making

			Modes of decision making						
			Rational decision-making	Political decision-making	Dialectical decision-making	Judgmental decision-making	Persuasive decision-making	Unprogrammable decision-making	Molasses-slow decision-making
Proposed idea generation Actions	Evidence	Systematic review	✓	✓	✓			✓	
		Global experience review	✓	✓	✓	✓		✓	
		Critical interpretative synthesis	✓			✓	✓	✓	
		Realistic review				✓	✓		✓
		Meta-ethnography							✓
	Ideology	Ethical analysis						✓	✓
		Ideological analysis						✓	✓
		Policy value framework						✓	
	Belief	Policy selection criteria Brain storming	✓	✓	✓	✓	✓	✓	✓
		Stakeholder survey		✓	✓	✓	✓	✓	✓
		SCAMPER method						✓	✓
		Social network-based ideation							✓
	Interest	Policy analysis		✓	✓			✓	✓
		Discourse analysis			✓			✓	
		Economic analysis			✓				
		Organizational analysis			✓				
		Stakeholder attitude analysis		✓	✓				✓

The model helps researchers and policymakers bridge evidence-policy gaps. Each policy-making body has a secretariat that prepares or approves policy drafts and implements them. The secretariat decides the decision-making mode and guides the team composition. The secretariat can also involve other actors in the policy process based on the model. The team members can use various methods or strategies to generate policy ideas based on their needs and resources. The model enables communication and collaboration among different policy groups.

The model serves descriptive and prescriptive purposes, as it helps researchers and policymakers understand and improve the policy context by using the right methods and tools. The model is useful for policy generation and analysis, as it guides new or existing policies based on certainty and agreement. For example, if a policy decision is unprogrammable, the model suggests less evidence (25%) and more ideology, interests, and beliefs (75%) in policy ideas. Thus, one should expect low evidence use in this mode and not apply the same standards as other modes.

The model is a novel synthesis of key factors and concepts from different disciplines and settings despite limitations. The model could help build EIPM capacity in healthcare with more validation and refinement. This is important for improving population health with more research use in decisions. More research should test the model empirically in various contexts. This paper highlights the importance of flexible, context-specific, evidence-based policymaking, which the model contributes to.

Authors' Contributions

SHJ: Conceptualization, Methodology, Writing - Original Draft MM: Project administration, Supervision, Validation HP: Writing - Review & Editing ShY: Conceptualization, Methodology. All authors read and approved the final manuscript.

Ethical Considerations

This study was approved by the ethics committee of Iran University of Medical Sciences. (Approval No: IR.IUMS.REC.1398.438)

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Conflict of Interests

The authors declare that they have no competing interests.

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Appendix 1. Literature search strategy:

We searched the following databases for relevant studies that presented a model or framework for evidence-informed health policymaking (EIPM) in healthcare:

- PubMed: a database of biomedical and life sciences literature
- Scopus: a database of peer-reviewed literature from various fields
- Web of Science: a database of scientific and scholarly literature

We used the following keywords to search for studies, using Boolean operators (AND, OR, NOT) and truncation symbols (*):

- Evidence: "evidence-informed" OR "knowledge transfer" OR "knowledge exchange" OR "evidence utilization" OR "evidence utilisation" OR "evidence transfer"
- Policy: "health policy" OR "decision-making" OR "decision-makers" OR "policy-makers" OR "policy making" OR "healthcare policy" OR "policy decision"
- Model or framework: "framework" OR "model" OR "models" OR "theoretical framework" OR "theory" OR "theories" OR "conceptual framework" OR "conceptual model"

Pubmed

("Evidence-Informed"[Text Word] OR "knowledge transfer"[Text Word] OR "knowledge exchange"[Text Word] OR "Evidence utilization"[Text Word] OR "Evidence utilisation"[Text Word] OR "Evidence transfer"[Text Word]) AND ("Health policy"[MeSH Terms] OR "Decision-making"[Text Word] OR "Policy-makers"[Text Word] OR "Policy mak*"[Text Word] OR "Healthcare policy"[Text Word] OR "Policy making"[MeSH Terms] OR "Decision mak*"[Text Word] OR "Policy decision*"[Text Word]) AND ("Framework*"[Text Word] OR "Model*"[Text Word] OR "Theoretical framework"[Text Word] OR "Theor*"[Text Word] OR "Conceptual framework"[Text Word] OR "Conceptual model"[Text Word])

The result was 854 records

Webofsience

("Evidence-Informed" OR "knowledge transfer" OR "knowledge exchange" OR "Evidence utilization" OR "Evidence utilisation" OR "Evidence transfer" OR "research-informed" OR "knowledge utilization" OR "knowledge utilisation") (Topic) and ("Health policy" OR "Decision-making" OR "Decision-makers" OR "Policy-makers" OR "Policy making" OR "Healthcare policy" OR "Policy decision") (Topic) and ("Framework" OR "Model" OR "Models" OR "Theoretical framework" OR "Theory" OR "Theories" OR "Conceptual framework" OR "Conceptual model") (Topic) and English (Languages)

The result was 1723 records

Scopus

(TITLE-ABS-KEY ("evidence-based" OR "Evidence-Informed" OR "knowledge transfer" OR "knowledge exchange" OR "Evidence utilization" OR "Evidence utilisation" OR "Evidence transfer")) AND (TITLE-ABS-KEY ("Health policy" OR "Decision-making" OR "Decision-makers" OR "Policy-makers" OR "Policy making" OR "Healthcare policy" OR "Policy decision")) AND (TITLE ("Framework" OR "Model" OR "Models" OR "Theoretical framework" OR "Theory" OR "Theories" OR "Conceptual framework" OR "Conceptual model")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re"))

The result was 1936 records

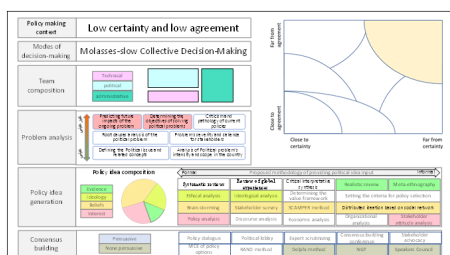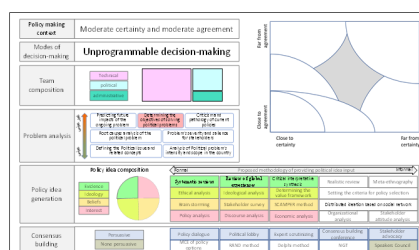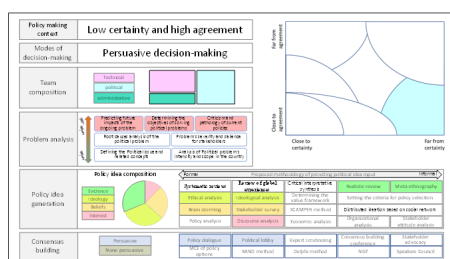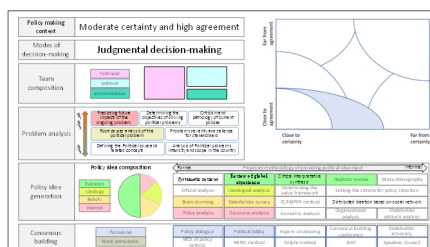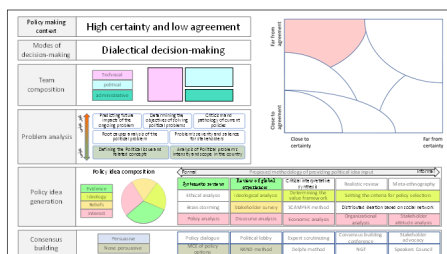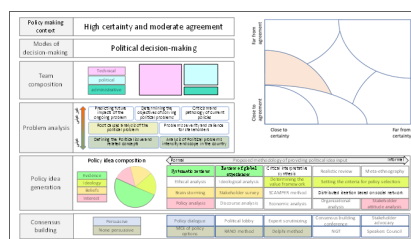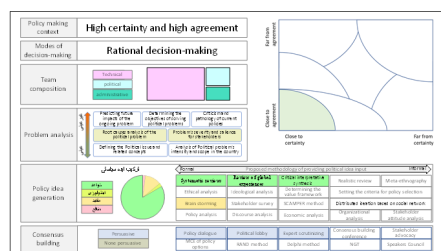We applied the following filters or limits to the search results:

- Language: English
- Study type: articles or reviews

We retrieved 4513 records from the three databases, and removed 674 duplicates. We screened the titles and abstracts of the remaining 3839 records, and selected 25 studies for full-text assessment. We also added 10 studies by reference mining, i.e., checking the references of the included studies and other relevant sources. We read the full texts of the 35 studies, and excluded 20 studies that did not present model or framework for EIPM. We included 15 studies in our qualitative synthesis. The following flow diagram shows the search and screening process:

Study	Citation	Model or framework
1	Lester, J. P. (1993). The utilization of policy analysis by state agency officials. Knowledge: Creation, Diffusion, Utilization, 14(3), 267-290.	Conceptual model of knowledge utilization
2	Graham, I. D., & Logan, J. (2004). Innovations in knowledge transfer and continuity of care. Canadian Journal of Nursing Research Archive, 36(2).	The Ottawa model of research use
3	Canadian Health Services Research Foundation. (2000). The theory and practice of knowledge brokering in Canada's health system. Ottawa: Canadian Health Services Research Foundation.	The Canadian Health Service Research Foundation model
4	Dobbins, M., Ciliska, D., Cockerill, R., Barnsley, J., & DiCenso, A. (2002). A framework for the dissemination and utilization of research for health-care policy and practice. Online Journal of Knowledge Synthesis for Nursing, 9(7).	The Framework for Research Dissemination and Utilization
5	Bowen, S., & Zwi, A. B. (2005). Pathways to "evidence-informed" policy and practice: a framework for action. PLoS medicine, 2(7), e166.	The Evidence-Informed Policy and Practice Pathway
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Appendix 2. Contingency model for evidence-informed policy idea generation