Providing a Regional Policy-Making Ecosystem Model for the Ministry of Health and Medical Education of Iran

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Objective: The purpose of this study was to provide a regional policy-making ecosystem model for the Ministry of Health and Medical Education of Iran.

Methodology: The research method was descriptive-analytical, with an applied nature. The statistical population of this study consisted of experts in the Ministry of Health and Medical Education. Considering the type of research, 20 individuals with master's and doctoral degrees and more than five years of experience in this field were purposefully sampled and selected. Data collection was conducted using field methods, including interviews and questionnaires. The obtained data were analyzed using interpretive structural modeling.

Findings: The findings indicated that 12 factors were identified as part of the regional policy-making ecosystem for the Ministry of Health and Medical Education of Iran. The (process value network) was identified as the most influential component of the regional policy-making ecosystem for the Ministry of Health and Medical Education of Iran. Following this, the factors of (sustainable development) were identified, with (resource management and monitoring and evaluation) in the third level, (current situation analysis) at the second level, and finally (coordination and cooperation, infrastructure and technology, public participation, international cooperation, national policies, and process achievements) occupying the first level.

Conclusion: Therefore, it can be concluded that these factors influencing the regional policy-making ecosystem for the Ministry of Health and Medical Education of Iran may lead to further development and success of this organization.

Keywords: *Ecosystem, Regional Policy-Making, Ministry of Health and Medical Education.*

1 Introduction

Health is one of the most important aspects of human life and is a central pillar of social development, making it a crucial component of social policy-making. It plays a decisive role in building and energizing other areas of development, including economic and political development. A healthy person is the cornerstone of sustainable development, and health is essential for people to enjoy the blessings of life. Therefore, attention to health and efforts to maintain and improve it have always been a priority. Health is a broad concept, and according to the World Health Organization's latest definition, health is complete physical, mental, and social well-being, not merely the absence of disease and infirmity (Jafari et al., 2020; Ojagh & Ramezanali, 2019).

The main objectives of all health systems are to improve community health, ensure equitable resource allocation, and satisfy patients. In the last two decades, health systems in developed and especially developing countries have been under pressure to implement reforms due to their failure to meet health needs and expectations. Health system reform, as a strategic issue worldwide, involves making sustainable and targeted changes to increase efficiency, equity, and effectiveness in the health sector. Thus, increasing public access to medical services, equity, quality, and fair payments is the primary goal of innovation in health systems (Mohammadi et al., 2022; Munakampe, 2020).

The health system reform plan was launched nationwide on May 5, 2014, with three approaches: financial protection for patients, equity in access to health services, and quality improvement of services through eight packages (Mohammadi et al., 2022). These packages include reducing inpatient payments in public hospitals, supporting the retention of physicians in deprived areas, ensuring the presence of resident specialists in public hospitals, improving hoteling services in public hospitals, enhancing the quality of outpatient services in public hospitals, promoting natural childbirth, financially protecting patients with severe illnesses, and launching air emergency services in hospitals affiliated with the Ministry of Health and Medical Education (Mohammadi et al., 2022; Nasabi et al., 2019). The aim of this plan was to increase satisfaction, provide and improve service quality, reduce patient costs, and emphasize responsiveness and follow-up on issues and questions regarding the plan at medical universities and healthcare centers. Despite significant achievements, there are numerous deficiencies, problems, and inefficiencies,

much of which are related to inappropriate policy-making or insufficient implementation and monitoring of health system reform policies. Extensive research on the pathology of the Ministry of Health's health system reform plan has shown that many proposed plans are ineffective in the vision document (Ramzankhani et al., 2018).

Based on research conducted on the lack of progress in implementing the Ministry of Health's health system reform plan, as partly discussed in the previous section, it appears that policy-making in the Ministry of Health cannot ultimately implement health equity among people. These policies are not aligned with the health of individuals in society. Policy-making in this organization should be within a citizen-centered ecosystem that moves toward the goals of public health to ensure that policies interact with the health objectives of society.

Policy-making has significant long-term impacts on determining the direction of an organization and achieving or not achieving its goals and aspirations. Weak policy-making in the human capital domain can lead to a choice of path or prioritization that may have consequences for decades, or its negative impacts might emerge in critical future moments, diverting the organization's mission. The multitude of variables affecting policies and their high rate of change, influenced by new global conditions, may prevent policymakers from understanding the consequences of their major actions on the organization and society. Based on conducted research, policy-making in the organization can have multiple factors (Ramzankhani et al., 2018).

Public policies significantly affect the quality of daily life for citizens. Public policy refers to the process of creating changes in formal laws, such as regulations and legal principles, to solve an issue or achieve a goal (Vahdaninia & Darodi, 2019). The public policy-making process is a set of interactive activities and actions that identify public issues, determine government ideas and priorities for decision-makers, and decide which option should be implemented and when. This complex process involves at least four groups of variables: public events, actors (including official actors such as the three branches of government and unofficial actors such as parties or interest groups), policy implementers, and decisions and actions (Samadzadeh et al., 2022; Zolfagharzadeh & Shahsavari, 2019).

After several decades of utilizing policy-making knowledge, experience has shown that specific groups may always seek to exploit public benefits for personal gain, attempting to divert public policies toward their goals. When policies fall short in practice, observers often point to policy

capture. Policy capture refers to the deviation of policy from its objectives by individuals or interest groups (Montazer Ataei et al., 2019; Panahifar, 2021). Critics argue that capture hinders competition and innovation. For example, interest groups and individuals can effectively utilize state power through policy capture and even use it as a weapon to prevent the entry or success of competing groups. Some critics blame policy capture as one of the main causes of financial crises and human disasters (Khoobroo & Ebrahimi, 2019; Mazaheritehrani et al., 2023; Samadzadeh et al., 2022).

Given that the health system is a very important area for social development in all countries, special attention should be paid to policy-making and monitoring in this area. The Ministry of Health in Iran is directly related to public health, which is of great importance to governments. If the health system in society is ineffective, the government incurs high costs to eliminate diseases (physical and mental) and has a significant portion of its workforce ill and unhealthy, disrupting the country's production cycle. Therefore, health system policy-making and implementing health policies in society are critical from the perspective of governments. This research aims to provide a model for a regional policy-making ecosystem for the Ministry of Health of Iran, ensuring that policy-making in the health system is regional and aligned with the health objectives of society. The overall goal of this research is to move from the current state of policy-making to an optimal policy-making state, as discussed in detail in the problem statement, and to bridge the existing gap in policy-making in the Ministry of Health by providing a model based on a regional policy-making ecosystem. The main research question is: What is the model of a citizen-centered policy-making ecosystem in the Ministry of Health of Iran?

2   Methods and Materials

In this study, qualitative data is first collected based on the grounded theory research strategy, followed by quantitative data collection using the survey research strategy. Therefore, the research method is mixed. Since mixed-method research designs and implements research using both quantitative and qualitative methods, the main characteristics of mixed-method research are influenced by how these methods are utilized. The mixed approach introduces qualitative and quantitative parts.

To examine and extract the components of a citizen-centered policy-making ecosystem, the present study's statistical population includes experts and scholars in public policy and academics from medical universities. These experts will help extract the model based on the grounded theory method by reviewing the literature, conducting interviews with medical university professors and experts (scholars) in policy-making. Grounded theory involves studying library texts and interviewing experts to examine factors affecting policy-making, ultimately extracting causal, intervening, contextual, strategic factors, and their consequences, presented in a single category. After coding these factors, interviews with experts will be conducted to identify the factors mentioned (causal, intervening, contextual, strategic, and their consequences) from the expert interviews, eventually creating a model and framework. The expertise test of this section's statistical population, which consists of experts in the Ministry of Health, measures the influence and impact of research components. Expert interviews will be arranged with several relevant experts, conducted with two objectives and using the principle of pretended ignorance. This principle means investigating the causes in the phenomenon under study without prior judgment. The variables extracted from library studies are presented to the experts, and their opinions on the enabling variables not considered in the library studies are sought. Additionally, another objective of expert interviews is to better understand the variables for their operational definition and appropriate categorization. The sampling method in this section is total enumeration, where the sample selection basis varies according to research objectives and nature, and interviews continue until the saturation point, i.e., when the researcher obtains new and different data from previous data. Given that the research aims to explore and describe the opinions and attitudes of the interviewees in the first phase, a number of academic experts who meet criteria such as university faculty membership, managerial experience, and participation in health policy-making were selected.

Tools are the means of data collection in research. The type of tool chosen by the researcher depends significantly on the research method, questions, and objectives pursued. Therefore, it is evident that, given the different questions and objectives of the qualitative and quantitative parts of the research, the tools used in these two parts are also different. Data collection methods are generally divided into two phases: library and field methods.

Phase One: In the first phase of the present research, the library method will be used to achieve the research objective. This method involves reviewing the literature on public

policy-making, its components, and then citizen-centered organizations. After extracting the influential factors and determining the model, these factors will also be reviewed in expert interviews, and the factors identified by the experts using the principle of pretended ignorance will be coded.

Phase Two: In field studies, after reviewing the components, a questionnaire will also be used. The questionnaire for this research will be Warfield's questionnaire, distributed among the statistical population.

For data analysis, grounded theory initially employs three stages: open coding, axial coding, and selective or theoretical coding. Max-QDA software is used for coding and analyzing data in various qualitative research approaches. Thus, in this research, to increase the study's validity, this software was used to analyze qualitative data, facilitating data reduction and code combination, guiding the researcher toward a theoretical model. Semi-structured interview data were initially categorized. These categories were often named codes or key terms. In open coding, data were coded and conceptualized sentence by sentence, line by line, and sometimes paragraph by paragraph. In axial coding, similar codes were collected under the title of family management codes, and a network of connections between concepts was created. In the final stage, a super family was formed, and the main categories were determined. The main categories have analytical power, encompassing the meaning of other categories, guiding the researcher toward a theoretical model. The main categories represent the concepts, ideas, attitudes, meanings, and behaviors of focus groups extracted from the conducted interviews. Finally, in the quantitative part of this study, after distributing and collecting the questionnaire and conducting an expertise test, the interactive relationships of the influencing and influenced variables will be assessed using the Interpretive Structural Modeling (ISM) method. Initially, the qualitative data obtained from expert interviews will be extracted, coded, and categorized, and the final research model will be presented. Subsequently, the model will be tested among experts. The statistical population of the research consists of a number of experts, with whom interviews will be conducted to identify the necessary categories for coding and conceptual categorization. Warfield's questionnaire will be used to examine the relationship between components using the ISM method in the quantitative section.

3 Findings and Results

This study, based on data obtained from 13 male participants (65%) and 7 female participants (35%), involved professors and experts from medical universities and policymakers (experts) in the field. Of the participants, 15 individuals (75%) had 10 to 15 years of experience, and 5 individuals (25%) had over 15 years of experience. Additionally, 9 participants (45%) held master's degrees, and 11 participants (55%) held doctoral degrees. Finally, it was observed that 3 participants (15%) were between 30 to 40 years old, 8 participants (40%) were between 40 to 50 years old, and 9 participants (45%) were over 50 years old.

Following the interviews, coding was conducted. This stage involved distilling and summarizing the vast amount of information obtained from interviews and documents into concepts and categories that are similar in these questions. In theoretical coding, two approaches are used for data analysis. Some researchers perform a line-by-line and word-by-word analysis of texts and data. Others, due to the time-consuming nature of this method, only code the key points and themes. In this study, a detailed line-by-line analysis of the interview texts was conducted. After open coding the interviews from the statistical sample, related factors were categorized into axial coding categories.

Table 1

Axial Coding Findings

Frequency	Open Coding (Initial Response Level without Literary Concept)	Axial Coding
5	Implementation of regional policies considering the ecosystem and sustainable development	Factor One (Current Situation Analysis)
3	Reducing inequalities in access to health services and facilitating access	
4	Increasing coordination and interaction between institutions, organizations, and individuals	
4	Attention to the ecosystem in regional policies to protect the environment	
4	Prevention of diseases and improvement of health services	
4	Presence of corruption in the health system hindering policy implementation	
3	Environmental and natural changes impacting community health	
3	Inability of organizations and related institutions to better implement regional policies	
3	Conflicts of interest among institutions, organizations, and individuals	
3	Financial and credit constraints affecting regional policy implementation	

2	Political changes influencing regional policy changes	Factor Two (Coordination and Cooperation)
2	Cultural, social, and economic differences in different regions impacting policy implementation	
2	Conducting regular monitoring and evaluation for policy effectiveness	
2	Active participation of people and local communities in the policy-making process	
6	Adherence to international health commitments and agreements	
6	Strengthening the capabilities of organizations and related institutions for better policy implementation	
6	Establishing coordination and cooperation between various institutions and organizations	
3	Securing adequate financial and credit resources for policy implementation	Factor Three (Monitoring and Evaluation)
3	Alignment of regional policies with national health strategies and policies	
2	Economic evaluation of policies and health services to enhance efficiency	
2	Identifying and managing health risks and creating contingency plans	
6	Establishing a system for monitoring and evaluating policy progress	
8	Developing educational and research programs to enhance knowledge and skills	
5	Developing sustainable policies and programs to maintain and improve community health	Factor Four (Resource Management and Evaluation)
6	Utilizing modern and digital technologies to improve health services	
4	Conducting thorough analyses and research for better understanding of health status	
3	Creating mechanisms for policy implementation monitoring and decision-making	
3	Enhancing the capabilities of institutions and staff in various health sectors	
3	Optimal management of financial, human, and technical resources for effective policy implementation	
7	Providing opportunities for active participation of people and local communities in decision-making	
4	Establishing coordination and cooperation between various organizations and centers for policy implementation	
3	Determining macro policies and strategies for developing and improving the health system	
7	Allocating necessary financial resources for policy implementation and productivity management	
7	Enhancing and improving health infrastructure and technologies in the region for effective service delivery	
7	Strengthening coordination and cooperation between various organizations for effective service delivery	Factor Five (Infrastructure and Technology)
5	Providing practical solutions and programs for improving health system performance	
5	Establishing international collaborations with organizations and countries in health-related areas	Factor Six (International Cooperation)
5	Reviewing and evaluating the current health system status in the region and identifying challenges	
6	Determining macro objectives and regional priorities for improving health services	Factor Seven (Sustainable Development)
4	Being organization-centric	
4	Speed in service delivery	
4	Order and discipline	
3	Accountability and responsibility	
3	Low administrative bureaucracy	Factor Eight (National Policies)
3	Low power distance and brotherhood among employees	
4	Increasing the utilization rate of health services	
5	Expanding important information and reducing misinformation	
5	Enhancing public awareness and promoting organizational openness	
7	Feedback on participation and reducing patient waiting time	Factor Nine (Public Participation)
7	Explaining health promotion strategies	
7	Explaining participatory organizational culture	
5	Perceived value by patients	
4	Patient relationship management	
4	Creating multimedia health promotion content	
4	Dynamic relationship and responsibility in advertising	
4	Follow-up and feedback on patient outcomes	
4	Transparency through information provision	Factor Ten (Process Readiness)
4	Knowledge management and patient knowledge discovery	
4	Networking in participatory platforms	
3	Participation process, exchange, and integration of resources	
4	Implementing a patient-centered approach	
5	Changing attitudes	

5	Organizational, institutional, and cultural capability development	Factor Eleven (Process Value Network)
5	Explaining patient participation processes	
6	Flexibility and speed in service delivery	
4	Attention to patient interests and needs	
4	Developing functional, interactive, and critical skills	
2	Developing health promotion and self-efficacy programs	
5	Financial and non-financial incentives	
3	Transformative health sector technologies	Factor Twelve (Process Achievement)
4	Creating attractive communication channels	
4	Reducing risks of service use by patients	
4	Considering and following up on patient experiences and expectations	
4	Emotional and cognitive behavioral characteristics of patients	
3	Possessing a productive consumer personality	
3	Creating a favorable brand image in the patient's mind	
3	Open innovation in health services	
3	Social status of the treatment institution	
2	Providing diverse health services	
2	Participatory vision perceived by patients	
2	Common practices in co-creation of health services	
2	Desirability of the treatment unit environment	
6	Service delivery capabilities of providers to patients	
6	Focus on organizational formality and complexity	
6	Training center staff on patient interactions	
3	Patient participation benefits in the ranking system	
3	Utilizing motivated human capital	
2	Infrastructure equipment for effective patient communication	

Subsequently, based on the research questions, selective codes were extracted. It should be noted that these selective codes, considering the literature and interviews conducted, were converted into more detailed components.

Table 2

Selective Coding Based on Open and Axial Coding

Frequency	Axial Coding	Selective Coding
36	Factor One (Current Situation Analysis)	Intervening
26	Factor Two (Coordination and Cooperation)	Strategic
24	Factor Three (Monitoring and Evaluation)	Contextual
45	Factor Four (Resource Management and Evaluation)	Causal
19	Factor Five (Infrastructure and Technology)	Contextual
16	Factor Six (International Cooperation)	Strategic
15	Factor Seven (Sustainable Development)	Outcome
41	Factor Eight (National Policies)	Causal
21	Factor Nine (Public Participation)	Strategic
24	Factor Ten (Process Readiness)	Contextual
31	Factor Eleven (Process Value Network)	Strategic
65	Factor Twelve (Process Achievement)	Outcome

To determine the relationship between variables using the ISM method, the indicators have been identified and coded.

Table 3

Indicators

Index	Indicator
OS1	Current Situation Analysis
OS2	Coordination and Cooperation
OS3	Infrastructure and Technology

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OS4	Monitoring and Evaluation	
OS5	Public Participation	
OS6	Resource Management and Evaluation	
OS7	International Cooperation	
OS8	Sustainable Development	
OS9	National Policies	
OS10	Process Readiness	
OS11	Process Value Network	
OS12	Process Achievement	

Next, the ISM method is used to examine the relationship between variables and determine the levels. The Structural Self-Interaction Matrix (SSIM) for analyzing the interrelations between elements and showing their connections uses four symbols:

Table 4

Interrelations Among Variables from the Experts' Perspective

	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OS8	OS9	OS10	OS11	OS12
OS1	A	A	A	A	A	X	O	O	O	O	O	O
OS2	O	A	O	O	O	O	X	X	X	X	X	
OS3	O	A	O	A	A	A	A	V	X	X		
OS4	A	A	O	X	A	V	A	A	X			
OS5	V	A	O	A	A	A	X	A				
OS6	A	A	O	X	A	V	X					
OS7	X	A	O	A	A	A						
OS8	O	O	V	X	A							
OS9	X	O	A	O								
OS10	X	X	X									
OS11	X	X										
OS12	X											

V: One-way relation from i to j;

A: One-way relation from j to i;

X: Two-way relation between i and j;

O: No relation between i and j.

Using the symbols in Table 4, the causal relationships among variables are determined, forming the Structural Self-Interaction Matrix (SSIM). A questionnaire was designed, listing the 12 selected factors in the first row and column, asking respondents to identify the types of binary relationships (V, A, X, O) between factors using the introduced symbols. The resulting relationships can be seen in Table 5:

Table 5

Deriving the Reachability Matrix (RM)

	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OS8	OS9	OS10	OS11	OS12
OS1	1	0	0	0	0	0	1	0	0	0	0	0
OS2	0	1	1	1	1	1	0	0	0	0	0	0
OS3	0	1	1	1	1	0	0	0	0	0	0	0
OS4	0	1	1	1	0	0	1	0	1	0	0	0
OS5	0	1	0	1	1	1	0	0	0	0	0	1
OS6	0	1	1	1	1	1	1	1	0	1	0	0
OS7	1	0	1	0	1	0	1	0	1	1	0	1
OS8	1	0	1	1	1	1	1	1	0	0	0	0
OS9	1	0	1	1	1	1	1	0	1	1	1	1
OS10	1	0	0	0	1	0	0	1	1	1	1	1
OS11	1	1	1	1	1	1	1	0	1	1	1	1
OS12	1	0	0	1	0	1	1	0	1	1	1	1

Once the matrix is converted to a binary matrix (0-1), a secondary matrix is designed to ensure secondary relations. If A leads to B and B leads to C, then A should lead to C. If this direct effect is not present in the matrix, the table should be corrected to show the secondary relation. This means including transitivity in the index relations, creating the final reachability matrix. This matrix ensures internal consistency, indicating that if one goal influences another, the influence should be extended to subsequent goals. For instance, if goal 1 leads to goal 2 and goal 2 leads to goal 3, then goal 1 should also lead to goal 3. If this is not reflected in the reachability matrix (RM), the matrix must be corrected, replacing omitted relationships.

In this research, the Boolean method was used. In the following, the starred numbers indicate values that were initially zero but changed to one after ensuring consistency.

Table 6

Classification of Goals

Goal	1	2	3	4	5	6	7	8	9	10	11	12
Influence	7	8	8	11	11	11	12	11	12	12	12	12
Dependence	10	11	12	11	12	11	12	6	12	10	8	12

Table 7

Determining Goal Levels

Goal Number	Reachability Set	Antecedent Set	Intersection Set	Level
1	12-10-9-7-5-3-1	12-11-10-9-8-7-6-5-4-1	12-10-9-7-5-1	2
2	12-9-7-6-5-4-3-2	12-11-10-9-8-7-6-5-4-3-2	12-9-7-6-5-4-3-2	1
3	12-9-7-6-5-4-3-2	12-11-10-9-8-7-6-5-4-3-2-1	12-9-7-6-5-4-3-2	1
4	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2	12-11-10-9-8-7-6-5-4-3-2	3
5	12-11-10-9-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2	12-11-10-9-8-7-6-5-4-3-2-1	1
6	12-11-10-9-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2	12-11-10-9-7-6-5-4-3-2	3
7	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2-1	1
8	12-11-10-9-7-6-5-4-3-2-1	12-11-10-9-8-7	12-10-9-8-7	4
9	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2-1	1
10	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-1	12-11-10-9-8-7-6-5-4-1	2
11	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-7-6-5-4	12-11-10-9-7-6-5-4	5
12	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2-1	12-11-10-9-8-7-6-5-4-3-2-1	1

Table 8

Canonical Matrix

Goal Number	2	3	5	7	9	12	1	10	4	6	8	11
2	1	1	1	0	0	0	0	0	1	1	0	0
3	1	1	1	0	0	0	0	0	1	0	0	0
5	1	0	1	0	0	1	0	0	1	1	0	0
7	0	1	1	1	1	1	1	1	0	0	0	0
9	0	1	1	1	1	1	1	1	1	1	0	1
12	0	0	0	1	1	1	1	1	1	1	0	1
1	0	0	0	1	0	0	1	0	0	0	0	0
10	0	0	1	0	1	1	1	1	0	0	1	1
4	1	1	0	1	1	0	0	0	1	0	0	0
6	1	1	1	1	1	0	0	0	1	1	0	0
8	0	1	1	1	0	0	1	0	1	1	1	0
11	1	1	1	1	1	1	1	1	1	1	0	1

As illustrated in Figure 1, the "Process Value Network" is identified as the most influential component of the regional policy-making ecosystem for the Ministry of Health and Medical Education of Iran. Following this are factors of "Sustainable Development" and "Resource Management and Evaluation," which rank third. "Current Situation Analysis" ranks second, while "Coordination and Cooperation," "Infrastructure and Technology," "Public Participation,"

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"International Cooperation," "National Policies," and "Process Achievement" occupy the first level.

Figure 1

Final Model of the Study
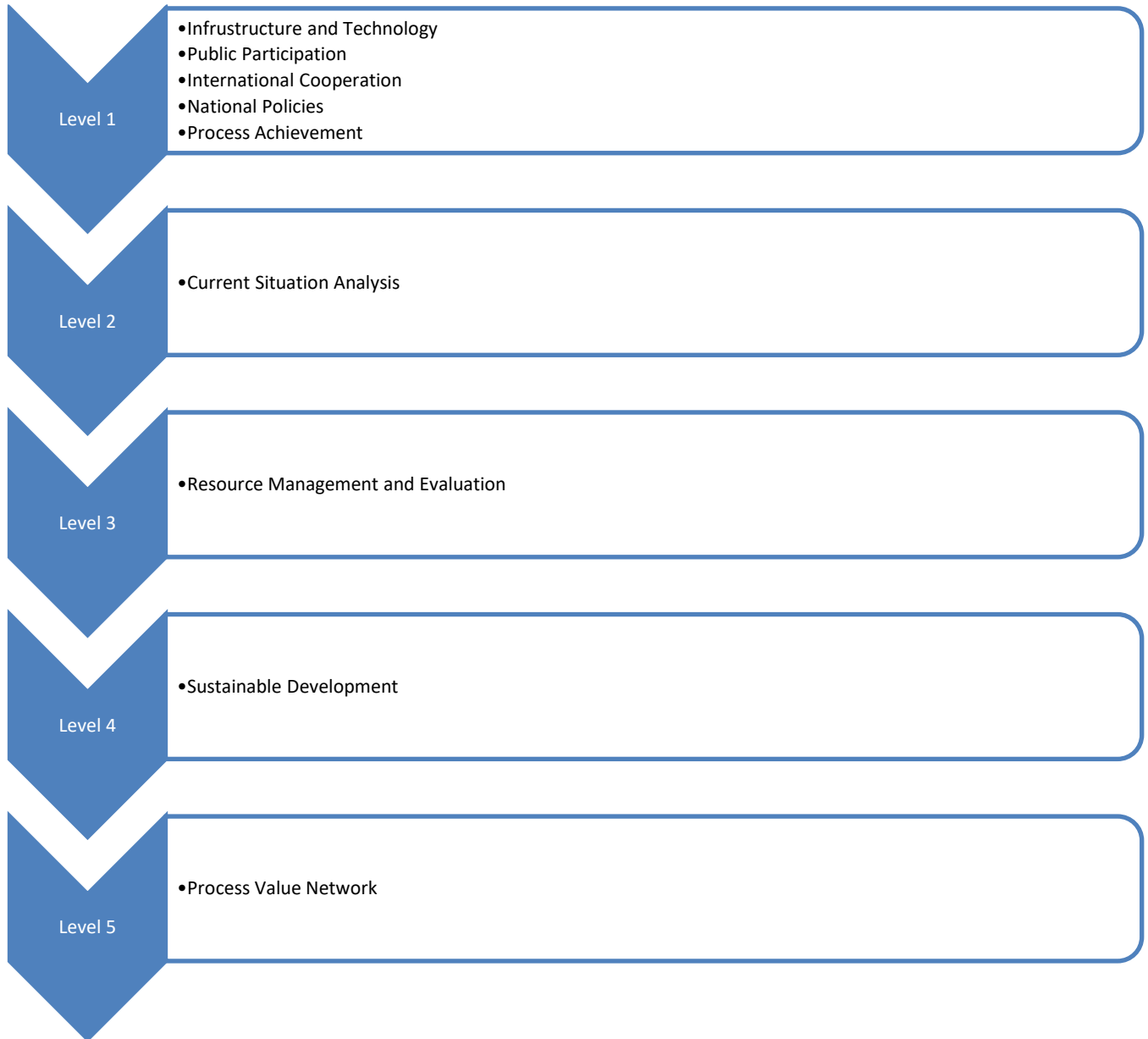
In the ISM model, the mutual relationships and influences among criteria and the connections between different level criteria are well demonstrated, which helps managers better understand the decision-making space. To determine the key criteria, the influence and dependence of criteria in the final reachability matrix are identified.

In the end, the row sums of values in the final reachability matrix for each element indicate the level of influence, while the column sums indicate the level of dependence. Factors at the lower levels of the model have greater driving power and are considered drivers, while factors at higher levels depend on the driving factors and are considered dependent.

Based on influence and dependence, four groups of elements can be identified:

Autonomous: Factors with weak influence and dependence.

Dependent: Factors with low influence but high dependence.

Linked: Factors with high influence and dependence.

Independent: Factors with strong influence but weak dependence.

The "National Policies" factor has the highest influence and the least dependence. Following this, "Current Situation Analysis," "Monitoring and Evaluation," and "Process Achievement" have the highest influence and the least dependence. The factors of "Infrastructure and Technology," "Public Participation," "Resource Management and Evaluation," "Sustainable Development," "Process Value Network," and "Process Achievement" have high influence and dependence and are categorized as linked elements. The "Coordination and Cooperation" factor has low influence and dependence and falls under the monitoring and evaluation element.

4   Discussion and Conclusion

In economics, there are four levels of planning: macro, sectoral, regional, and project-based. In macroeconomic planning, planners outline the status of macroeconomic variables such as growth and inflation rates. Sectoral planning determines the growth rate required for each economic sector, such as health and medical services. Once the growth rate for each economic sector is determined, regional planning identifies the regions where this growth should occur. Regional planning uses spatial planning and land use to determine which regions of the country are suitable for the growth of an economic sector. Spatial planning involves understanding resources and how to exploit them while predicting optimal conditions for human settlement and activities. Due to the lack of regional planning, many health and medical resources have not been identified or utilized. This misalignment results in suboptimal exploitation of the investments made. Inequality in health and medical services across regions indicates differences in the development of health facilities among cities, villages, regions, and countries. This issue is a significant concern for modern societies and holds considerable political importance worldwide. Decision-makers at macro and micro levels need to be aware of regional disparities and inequalities, especially in health and medical services, before proposing solutions to reduce regional disparities and improve quality of life.

The Ministry of Health and Medical Education, on behalf of the government, is responsible for health sector governance, which is reflected in policy-making (setting the overall direction and policy of the health system). This study aimed to analyze and examine evidence-based policy-making as an approach that helps make informed decisions about policies, programs, and projects by placing the best available evidence from research at the heart of policy development and implementation. The critical role of evidence in decision-making cannot be disputed; from contextual to technical and operational evidence, it is always essential. However, evidence and documentation are not always used in policy-making and decision-making. Unfortunately, many developing and middle-income countries do not move in a coordinated and balanced manner toward the growth and development of health facilities, and today, equitable development of health and medical services remains an ideal goal for these countries. Iran is one of these countries. Generally, identifying and classifying regions based on health and medical indicators and their spatial distribution help understand the distribution status of these indicators, leading to better and more equitable urban and regional planning to ensure all individuals have access to such services.

Unfortunately, the lack of planning considering regional capabilities has led to spatial disparities and the concentration of services in specific areas. Most studies and attention in recent years have focused on economic dimensions, neglecting the unequal distribution of health and medical indicators. Despite significant achievements in health and medical fields, substantial gaps and inequalities remain between countries and regions regarding health development.

This research found that (current situation analysis, coordination and cooperation, infrastructure and technology, monitoring and evaluation, public participation, resource management and evaluation, international cooperation, sustainable development, national policies, process readiness, process value network, and process achievement) are influential in this model, each playing a significant role. The results of this study align with the prior research (Jafari et al., 2020; Mohammadi et al., 2022; Munakampe, 2020; Nasabi et al., 2019; Ojagh & Ramezanali, 2019; Ramzankhani et al., 2018).

Explaining each component, we can state that the current situation analysis of Iran's Ministry of Health and its policies, the availability of sufficient resources, and proper budget allocation can significantly impact policy implementation. If resources are not adequately allocated, policy implementation may face challenges. The existence of healthcare infrastructure and necessary equipment is also crucial. If these infrastructures and equipment need

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improvement, policy implementation may encounter problems. The capability and readiness of healthcare staff are vital. If the staff does not possess adequate capabilities and readiness, policy implementation may be inefficient. Structural and policy issues within the Ministry of Health can also negatively impact policy implementation. Therefore, analyzing the current situation of Iran's Ministry of Health and its policies can help identify the organization's strengths and weaknesses, provide suggestions for improvement and development, and determine appropriate strategies for policy implementation. This analysis can facilitate the improvement and productivity of healthcare services for the Iranian community.

Coordination and cooperation among different sectors within the Ministry of Health in Iran can significantly impact the organization's policy. Key points in this area include coordination and cooperation between various units within the Ministry, which can help appropriately divide work and responsibilities. This can lead to increased productivity and efficiency in delivering healthcare services. Improved information exchange and up-to-date information can result from coordination, leading to better and more accurate decision-making regarding policies. Coordination in planning for policy implementation can enhance the effectiveness of various units and improve service quality. Adhering to national and international standards and guidelines can be ensured through coordination and cooperation, enhancing service quality and maintaining the organization's credibility. Thus, coordination and cooperation among different sectors within the Ministry of Health can accelerate the improvement and development of the organization's policies and enhance healthcare service levels in Iran, improving community relations and public satisfaction.

Infrastructure and technology in Iran's Ministry of Health can assist in collecting, storing, and analyzing health data using advanced and modern information systems. This can lead to better and more accurate decision-making regarding policies. Implementing innovative projects and using advanced technologies can improve service quality and productivity within the Ministry. Modern technologies can streamline medical information management and patient records, improving healthcare services and reducing medical errors. Modern communication technologies can enhance internal and external communications within the Ministry, promoting better coordination. Online healthcare services and mobile health systems can improve public access to services and increase satisfaction. Thus, advanced infrastructure and technologies can accelerate the improvement and development of the Ministry of Health's policies, enhancing service levels, public relations, and satisfaction.

Monitoring and evaluation in Iran's Ministry of Health, through periodic and continuous evaluations of various units' performance, can identify strengths and weaknesses and improve existing policies. Monitoring the implementation of policies and programs can ensure actions align with desired goals and strategies. Evaluating the quality of services provided can identify public needs and demands, leading to service improvements. Cost-effectiveness evaluations of used resources can optimize resource utilization and financial management. Continuous monitoring of health and medical developments can adapt quickly to changes and improve responses to community needs. Effective monitoring and evaluation in the Ministry can improve policies, increase productivity and service quality, optimize resource use, and enhance organizational effectiveness, ultimately boosting public trust and performance.

Public participation can help identify community needs, problems, and expectations, using this information to formulate policies and programs. Public involvement can increase trust in the health organization, improving relations between the organization and the community. Public input in decision-making processes can lead to better healthcare services. Public participation can enhance organizational accountability and transparency, gaining more community support. Promoting health culture and motivating community health maintenance can be facilitated through public participation. Proper management of financial, human, and physical resources can increase productivity and organizational performance, enhancing service quality and effectiveness. Accurate monitoring of organizational activities can identify and address deficiencies in healthcare service delivery. Regular performance evaluations can identify strengths and weaknesses, improving service quality and overall organizational performance. Data and information from monitoring and evaluation can support better evidence-based decision-making for policies and planning. Regular monitoring and evaluation can increase organizational transparency and public trust. Therefore, effective resource management, monitoring, and evaluation in the Ministry can improve policies, productivity, service quality, and public trust, enhancing organizational performance and effectiveness.

International cooperation can facilitate the sharing of knowledge, experiences, and advanced technologies in

health, improving treatment methods and technologies in Iran. It can promote the exchange of specialized human resources, increasing the capabilities of medical and health staff. Joint international projects in health can expedite healthcare service improvements in Iran. Access to international financial resources can support the development and improvement of Iran's health system. International cooperation can influence health policies and standards in Iran, aligning them with global standards. Sustainable development can help preserve the environment and natural resources, improving public health and preventing diseases. It can support the development and enhancement of health systems in Iran, increasing access to healthcare services for all community members. Sustainable development can optimize resource utilization in the Ministry, enhancing efficiency and effectiveness in service delivery. It can facilitate the development and transfer of new health technologies, improving treatment methods and disease prevention. Sustainable development can influence the Ministry's policies and strategies, aligning them with sustainable development goals. Thus, sustainable development in the Ministry can improve policies, increase healthcare access, optimize resources, and advance technologies, improving environmental conditions and organizational efficiency.

National policies can help set strategic priorities and goals in health, guiding policy formulation and implementation in the Ministry. They can secure financial resources for health programs and projects, improving national healthcare access. National policies can support the development and improvement of health systems in Iran, enhancing service quality and patient satisfaction. They can facilitate the development and transfer of new health technologies, improving treatment methods and disease prevention. National policies can influence health-related laws and regulations, creating a conducive environment for health service development and improvement. Thus, national health policies can significantly impact the Ministry's policy and performance, enhancing community health and service quality. Process readiness can develop the organizational culture in the Ministry, creating an effective, cooperative, and motivating work environment. It can boost staff motivation and commitment to providing higher quality and more effective services. Thus, process readiness in the Ministry can significantly impact the organization's policy and performance, improving community health and service quality.

Finally, the process value network and achievements in the Ministry can significantly influence the organization's policy. The process value network can improve healthcare service performance and quality, increasing patient satisfaction and community health indicators. It can enhance productivity and efficiency in healthcare delivery, improving resource distribution and utilization. The process value network can facilitate decision-making and policy implementation, increasing decision-making speed and accuracy. It can promote cooperation and coordination among organizational members and health institutions, increasing interaction and coordination. The process value network can help achieve strategic goals and development plans, enhancing the effectiveness and impact of programs and projects. Thus, the process value network in the Ministry can significantly impact the organization's policy and performance, improving community health and healthcare services.

Considering these points, the health policy ecosystem in Iran's regions should aim for continuous and sustainable community health improvement. It is recommended first to identify the obstacles and challenges in the regional policy ecosystem, including organizational limitations, lack of coordination between institutions, and resource constraints. Then, assess the needs and opportunities in the regional policy ecosystem, considering community needs, collaboration opportunities with other institutions, and IT capabilities. Based on the analysis of obstacles and needs, set clear and specific goals and strategies for improving the regional policy ecosystem, ensuring they are measurable and achievable. Plan the implementation of the determined strategies and goals, including resource allocation, appropriate structure creation, and human resource training and development. Over time, evaluate the performance of the regional policy ecosystem and compare results with the goals. These evaluations should show improvements and progress. By following these steps and applying appropriate approaches, the improvement and development of the regional policy ecosystem in Iran's Ministry of Health can be facilitated, helping improve community health.

To enhance coordination and cooperation in Iran's regional policy ecosystem, it is suggested to form joint working groups for situation assessment, solution provision, and program implementation. Creating a shared information management system among institutions can aid coordination and knowledge sharing. Workshops, training sessions, and informational meetings can promote a culture of cooperation and interaction among institutions. Establishing a clear

organizational structure with defined responsibilities and tasks can enhance coordination and cooperation. Continuous communication through publications, joint meetings, and other means can foster proper coordination and cooperation. Setting clear and common goals among institutions and implementing joint programs to achieve these goals can enhance coordination and cooperation.

To improve infrastructure, technology use, and monitoring in Iran's regional policy ecosystem, it is recommended to establish a centralized information system for data collection, storage, and sharing, aiding coordination and knowledge sharing. Using blockchain technology can ensure the security, transparency, and accuracy of data and information transfer and storage, improving regional policy processes. Utilizing sensors and monitoring devices to track and measure critical health and treatment parameters can enhance decision-making and planning. Applying artificial intelligence and data analysis for trend prediction, pattern identification, and optimal solutions for regional policy can improve relevant units' performance. Conducting training courses on modern technologies and promoting their use can enhance productivity and improve regional policy processes.

To strengthen international cooperation and public participation in Iran's regional policy ecosystem, it is suggested to establish active communications with international organizations, centers, and health practitioners to share knowledge, experiences, and resources, enhancing international cooperation. Hosting conferences, seminars, and joint meetings with international and community organizations to exchange views and experiences in regional policy and community health improvement can boost international cooperation. Using virtual spaces and social networks for communication with local and international communities, information dissemination, and public participation in regional policy processes can enhance cooperation and public engagement. Conducting public awareness and training sessions on the importance of regional policy, public participation, and international cooperation methods can increase understanding and public engagement. Creating interactive spaces between the public and health-related institutions, encouraging public suggestions and feedback, and creating participation opportunities in regional policy processes can strengthen cooperation and public engagement.

To align national policies with the regional policy ecosystem in Iran's Ministry of Health, it is suggested to draft and update national health policies with emphasis on prioritization and alignment with regional and international policies, fostering coordination and cooperation among actions. Forming committees and working groups with representatives from various governmental bodies, the private sector, universities, and community organizations to review and draft regional policies can enhance cooperation and coordination. Promoting a culture of collaboration, flexibility, and participation within the regional policy ecosystem can improve communications and positive interactions among institutions. Conducting training sessions, workshops, and informational meetings on regional policy and the importance of cooperation among different entities can increase awareness and capabilities for participation in regional policy processes. Leveraging information technology to facilitate communication and coordination among regional policy ecosystem members can improve policy processes and expedite appropriate decision-making.

To strengthen the regional policy ecosystem in Iran's Ministry of Health using the process value network, it is recommended first to identify and analyze processes related to regional policy. This helps recognize process strengths and weaknesses, increasing productivity and performance. Establishing standard procedures and practices for regional policy can enhance coordination and alignment in processes and decision-making. Creating a central information management system and using process management software can improve communications and facilities in regional policy. Forming working groups with experts and specialists in areas related to regional policy can aid in drafting and implementing effective policies. Conducting training courses to enhance the knowledge and skills of participants in regional policy processes can improve decision-making and execution quality. Promoting a culture of cooperation and effective communication within the regional policy ecosystem is crucial, fostering coordination and positive interactions among institutions.

To reduce healthcare gaps among counties and ensure equitable distribution of health and medical services, it is recommended to prioritize the development of highly deprived counties for spatial development. Policies and development plans should focus on expanding health and medical services in these counties within a one-year program. Simultaneously, expanding these services in moderately deprived and average counties within a mid-term program is necessary. Ultimately, spatial development for all counties in the long term is crucial. Thus, reducing healthcare service gaps among counties will be achieved hierarchically based on spatial order. Counties with higher

scores should be the last priorities for investment, while those with lower scores should be prioritized for planning and deprivation alleviation. Counties should be tiered based on an integrated approach to service distribution, considering economic efficiencies and providing services accordingly.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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