

REVIEW

A policy analysis of agenda-setting of Brucellosis in Iran using a multiple-stream framework: health policy and historical implications

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Keywords

Agenda setting • Brucellosis • Iran • Policy analysis

Summary

Background. *Brucellosis, a major zoonotic disease, is highly present in Iran, especially in Lorestan province. The aim of this study was to understand the issues related to Brucellosis utilizing the multiple streams framework.*

Methods. *A two-step method was adopted: 1) assessment of brucellosis-related documents and 2) interviews with stakeholders. As a first step, all documents related to Brucellosis were reviewed at provincial and national levels. Policy documentation on health issues included the consultation of guidelines, rules and regulations, websites, reports, books, guides, and conferences. These documents were collected by referring to specialized centers, institutions, and organizations. In the second step, semi-structured interviews were conducted to determine the burden of disease with actors and stakeholders involved with the brucellosis program in the Lorestan province. More in detail, physicians, healthcare workers, managers, policy- and decision-makers were selected for interviews.*

Results. *The problem stream was characterized by: 1) high prevalence of the disease, 2) traditional livestock production, 3) unsafe animal slaughtering, 4) centers for the sale and distribution of non-authorized dairy products, 5) raw milk and 6) traditional unsafe dairy products consumption, 7) incomplete livestock vaccination, 8) lack of knowledge of Brucellosis, 9) neighboring countries with high prevalence of Brucellosis, 10) lack of livestock quarantine, and 10) nomadic immigration. The policy stream was characterized by 1) primary healthcare networks, 2) guidelines, 3) medicines, insurance, and 4) diagnostic services. Finally, the political stream was characterized by: 1) support of the University of Medical Sciences, 2) sponsorship by the Ministry of Health and Medical Education, 3) Health transformation plan, and 4) Working Group on Health and Food Security in Lorestan.*

Conclusion. *This study examined the brucellosis-related agenda setting: if different issues are taken into consideration, it can be perceived as a health priority.*

Introduction

Health decision- and policy-makers worldwide have to face a variety of increasingly complex and multi-factorial health challenges, which can have both direct and indirect effects on people's health [1]. Brucellosis is one of these challenges, being one the major causes of zoonotic disease [2], which imposes a considerable epidemiological, clinical and economic burden in several countries [3]. Brucellosis is a great public health concern, resulting in significant health and economic losses [4], especially in low-income and developing countries [5].

Various factors such as socioeconomic status, hygiene, cattle husbandry practices, and dairy production procedures can affect the transmission of this disease [6]. Brucellosis can be transmitted to humans through milk, cream, butter and non-pasteurized cheese [7]. Bacteria responsible of the disease can also be transmitted through raw or semi-milled meat

of infected animals. They can be easily dispersed in the air and farmers, laboratory technicians and slaughterhouse workers can inhale them [8]. From the blood and semen of infected animals, bacteria can enter the bloodstream through the wound and lead to the development of the disease [9].

Brucellosis interferes with the patient's family and social activities [10], dramatically impacting on his perceived health-related quality of life. Weight loss, fever, joint pain, headache, sweating and fatigue are complications of the disease, which may take from weeks to months to manifest and may lead to testicular, endocarditis, bone abscess formation, and neurological complications [11].

Brucellosis is commonly widespread in areas like the Middle East, Latin America, the Mediterranean basin, Asia and Africa [12]. However, the prevalence varies among the different countries due to the various economic, social, occupational and demographic factors. The low quality of the health system in some

countries has led to an increase in the incidence and prevalence of the disease [12]. It is estimated that around 500,000 new people become infected each year, and this trend can increase with the absence of disease control and management policies [13].

ACTIVITIES RELATED TO BRUCELLOSIS IN THE IRANIAN HEALTH SYSTEM

Currently, Brucellosis-related healthcare programs in Iran are carried out with a coherent and extensive structure within the health system of the Iranian Ministry of Health and Medical Education (MoHME). The Center for Disease Control (CDC) of the MoHME conducts various activities related to the management of this disease. The National Technical Committee at the level of the MoHME is responsible for macro-policy making for the programs, monitoring the disease status on an annual basis, and determining care and treatment guidelines. At the provincial level, medical universities are responsible for implementing the programs. Public and private laboratories perform diagnostic tests on suspected cases. After an ascertained diagnosis of the disease, people are referred to specialized doctors for treatment. In the case of livestock vaccination, the veterinary organization also does this extensively. The number of newly identified cases is reported to the MoHME on a monthly basis (Fig. 1) [14].

Brucellosis is present in all provinces of Iran and is reported to be particularly prevalent in provinces such as Khorasan, Hamedan, East Azarbaijan, Fars, West Azarbaijan, Kermanshah and Lorestan [15]. Between 2009 and 2015, the trend has increased from 34.6 to 71.4 cases per 100,000 persons. The incidence and

the death rate have as well increased from 120.74 to 251.43 cases per 100,000 persons and from 198 to 412 cases per 100,000 persons, respectively [16].

According to the available reports and epidemiological studies on Brucellosis in Iran, in the last years the burden of disease has been rising and is significantly higher than in the past. Health decision- and policy-makers should pay particular attention to this increasing trend. Developing and implementing *ad hoc* disease management policies and putting this disease on the health sector agenda could help better control and reduce the brucellosis-generated burden of disease.

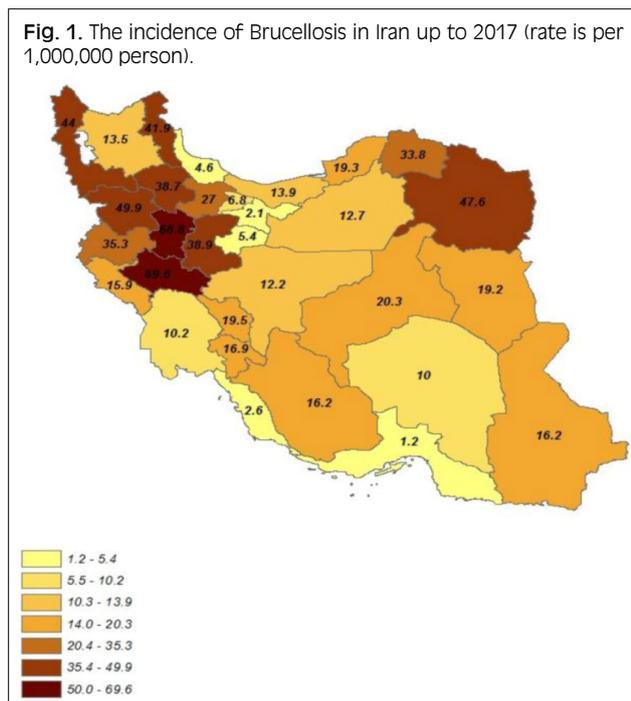
A proper understanding of the factors underlying the development and spreading of Brucellosis is vital for making effective decisions and plans that can reduce the burden of disease. The aim of this study was to understand the issues related to Brucellosis in Lorestan province and to investigate whether this disease has been put on the agenda of healthcare policy- and decision-makers, utilizing the multiple streams framework (MSF) as conceptual tool.

Methods

Lorestan province with a total area of 28064 square kilometers is located in the western part of Iran, north of the central provinces of Hamedan, east of Isfahan province, southeast to Chahar Mahal and Bakhtiari, south to Khuzestan province, and west to Kermanshah and Ilam provinces. According to the latest available census, the province's population comprises of 1,760,649 people. This province has 11 cities. Lorestan is located on the slopes of the Zagros Mountains, throughout the forest area. Vegetation has led livestock farming to become one of the most popular jobs in the province. Lush meadows, rainy lakes in Lorestan provide a good environment for nomadic life. Since Lorestan has a suitable climate, and a fertile soil, and therefore the mainstay of the people's economy is the livestock and agriculture.

MSF is one of the most important and practical tools used in the healthcare decision-making process [17]. It defines what constitutes a policy and why a given policy is put on the agenda, and includes three streams: problem, policy, and political. The theoretical framework states that when these three streams are interconnected, a window of opportunity is formed. This framework emphasizes the role of policy entrepreneurs, who are actors trying to link these three streams together. When the window of opportunity is formed, policy entrepreneurs should take advantage of this and take further steps to put politics on the agenda, in such a way that is taken into consideration by decision- and policy-makers.

Two steps were taken to collect data (retrieval and assessment of Brucellosis related documents and interviews with relevant actors and stakeholders).



Tab. I. Types of documents utilized in the present research.

Type of document	Number
National and provincial letter section	5
Health and treatment guidelines	3
Reports	11
Scientific texts (books and articles)	19
Rules, regulations, laws	6
Websites	14

DOCUMENTS RETRIEVAL AND ASSESSMENT

First, all documents related to Brucellosis were reviewed at provincial and national levels. Policy documentation on health issues included the consultation of guidelines, rules and regulations, websites, reports, books, guides, and conferences. These documents were collected by referring to specialized centers, institutions, and organizations. Data were extracted after a proper process of validation. Table I shows the type and number of documents.

Scholarly databases, such as ISI/Web of Science, PubMed/MEDLINE, Scopus, Embase, as well as Iranian repositories, including MagIran, Scientific Information Database (SID), and BarakatKns, were searched by two researchers from inception until December 2020. The purpose of this phase was to collect scientific articles related to Brucellosis and its epidemiology in Iran. Further searches were conducted, mining Google, websites of government agencies, and NGOs involved in the program of controlling and managing Brucellosis. Two authors systematically coded textual data identified according to the MSF.

INTERVIEWS

In the second step, semi-structured interviews were conducted to determine the burden of disease with actors and stakeholders involved with the brucellosis program in the Lorestan province. More in detail, physicians, healthcare workers, managers, policy- and decision-makers were selected for interviews. A sample of 16 people participated in the interview. Interviews were conducted by two authors face-to-face (one PhD and one MS). The selection of participants was done utilizing a snowball and purpose-based sampling approach. Interviews were conducted in the period from July to December 2020. The duration of the interviews varied between 60 and 75 minutes. Three major questions developed based on the MSF were asked. Interview guide used was developed specifically for this study. The questions asked to participants are reported in the supplementary material 1.

Besides these questions, participants were also requested to express further comments regarding the Brucellosis in Lorestan province. The date and place of the interviews were determined with respect to the participants' views and previous coordination with them. At the beginning of the interview, the

researchers provided a thorough explanation of the study and its objectives, ensuring the confidentiality of sensitive data. In addition to taking notes, interviews were recorded with the consent of the participants utilizing a digital voice recorder. In order to increase the validity of the results, specific measures were undertaken and protocols followed, such as involving qualified researchers, selecting relevant participants, and allocating sufficient time to collect data.

Interviews were transcribed *verbatim* and analyzed using the MSF tool. All interview transcripts were imported into MAXQDA Version 10 software. After removing similar and duplicate codes, the content was analyzed according to the three themes of the MSF (problem, policy, and politics). Interviews and related results were reported according to the consolidated criteria for reporting qualitative research (COREQ) [18, 19].

Results

PROBLEM STREAM

1. High prevalence of the disease

In the recent years, studies conducted in the province of Lorestan, the reports of the Ministry of Health and the disease surveillance and response system provided by the University of Medical Sciences at the level of a complex network of laboratories, hospitals and health centers have shown an increasing trend in the incidence and prevalence rates.

2. The traditional livestock production

Despite the many efforts undertaken, many obstacles affect the traditional livestock production, such as the need of using new equipment and developing industrial plans, which require adequate funding. Other barriers are the lack of support from livestock breeders and their scarce knowledge of common zoonotic diseases. Many livestock keep their livestock near their homes, usually in unhealthy situations.

3. Unsafe slaughtering of animals

Many people slaughter livestock at home and, as such, are not fully compliant to the health principles, since they can establish direct unprotected contacts with the livestock. Meat is also consumed immediately after the slaughtering, without being kept in cold. Furthermore, livestock is sold, without taking into account health and hygiene issues.

4. Centers for the sale and distribution of non-authorized dairy products

One of the jobs in the province is the supply and sale of dairy products. These people buy raw milk directly from stocks. Despite being supervised by health care units, negligence in hygiene is very high in the

provision of dairy products. This increases the risk of Brucellosis.

5. *Buying and consuming raw unsafe milk*

To collect milk, people go to villages and utilize caravans, often in unsuitable health conditions. Because of cheaper prices, many people use this milk, so the health chain that is being used by milk mills is prone to Brucellosis.

6. *People tend to consume traditional and local dairy products*

There is an effort to use healthy dairy products from industrial factories. Due to the old beliefs of people and their lack of knowledge concerning the production chain and the observance of the health, many people are keen to consume traditional dairy products. They assume that milk salts are removed in the process of pasteurization and sterilization.

7. *Incomplete vaccination of livestock*

Problems have arisen due to lack of adequate funding and vaccines. In some cases, vaccination of livestock is not complete.

8. *Lack of knowledge of Brucellosis*

Despite all the efforts of the relevant institutions, many people still do not have much knowledge about ways to control, diagnose and treat the disease. Many people know the only way to avoid being infected is boiling milk.

9. *Neighborhood with provinces with high prevalence of Brucellosis*

Lorestan province has neighboring provinces with high prevalence of disease. It should be considered that most livestock is exported to Iraq in western Iran, and the transfer of livestock between these provinces is increasing the chance of entering livestock in the province and infecting people.

10. *Lack of quarantine of livestock*

Ranchers plan to create places where healthcare organizations have little control over direct sales of their livestock on the margins of the city. Livestock is often sold without sanitary control and quarantine.

11. *Nomadic immigration*

Livestock farmers live in nomadic huts both in hot and cold seasons, together with their livestock. Moreover, marginalized residents, in addition to establishing direct, unprotected contacts the livestock, buy contaminated dairy products because of their lower prices.

POLICY STREAM

1. *Existence of primary health care network*

Primary health care network (PHC) is one of the

strongest healthcare organization systems in Iran. The network provides a variety of services in villages and cities. The existence of this network has led to the provision of health-related policies and programs by staff, and information and awareness-raising initiatives on various diseases. Due to the presence of appropriate laboratories in this network, there is a high potential for diagnosis of patients. After diagnosis, treatment is done by the physicians of this network, and the process of direct supervision and ease of access to services have increased the adherence to treatment. Also, the health inspectorates have a duty to perform monitoring controls and these centers must receive the necessary health permits.

2. *Guidelines*

Several programs have been developed to raise awareness, in which target groups are identified and trained with the help of PHC. For hospitals and health centers, guidelines are provided. A comprehensive program for the prevention, control, and treatment of Brucellosis in the form of a systematic comprehensive education model (SHEP model) has been developed.

3. *Medicines and insurance*

Drug companies in the country have no problems with the provision of drugs for patients. Medications are readily available. On the one hand, insurance provides good coverage for medicines. The price of medicines is good for all patients and, if there are any financial problems, drugs will be provided by the healthcare sector.

4. *Diagnostic services*

In addition to having diagnostic laboratories in the PHC, private sector laboratories and government hospitals also provide diagnostic services at an affordable cost. Insurance also covers diagnostic services. The diagnostic policies of the disease are designed in such a way that all individuals can use these services and can benefit from the low-cost services both in the village and the city.

POLITICAL STREAM

1. *Support of the University of Medical Sciences*

The main stewardship is the implementation of health policies in the province, the University of Medical Sciences. Services are provided in all cities under the supervision of the university, which is responsible for planning, decision- and policy-making and coordination within the province. Knowledge, diagnosis and treatment as well as financial and political support are the duties of the university. The various departments of the university, with their local policies and programs, are trying to control the disease. The University has been trying to attract the support of other organizations to properly carry out the implementation of brucellosis-related programs.

2. Sponsor by the Ministry of Health and Medical Education

Brucellosis is one of the most commonly reported diseases. Policies and decisions are made at the national level through the Ministry. The development of effective programs through the establishment of the Zoonotic Disease Organization has led to the special attention paid to the disease and to the control policies.

3. Health transformation plan

The implementation of the health transformation plan (HTP) in Iran in the year 2014 and the political health-oriented approach of the government have created a better health perspective among all people in the community and the issue of health has been prioritized. The use of new financial resources and new approaches to health and the attention of other ministries have led decision- and policy-makers to plan for new interventions for disease control, including Brucellosis.

4. Working Group on Health and Food Security in Lorestan Province

One of the most important coordination levers for implementing health sector programs is the existence of the health and food safety committee in Lorestan province with the administration of the highest political authority, the governor. This group has made the programs run with all stakeholders and actors. If the implementation of the programs encounters a problem, the task force will quickly enter and execute the programs better and more efficiently.

5. International organizations such as the World Health Organization and the Eastern Mediterranean Region Organization

International organizations, such as the World Health Organization (WHO) and the Eastern Mediterranean Region Organization (EMRO), are responsible for determining global and regional policies, according to their mission. They ask the member states to implement their plans to control Brucellosis. International support for national decision- and policy-makers has increased the commitment to implement these programs. National decision- and policy-makers are trying to focus their plans for controlling illnesses in their country to improve health status.

Discussion

Agenda-setting is a process which entails health-related issues of interest to policy- and decision-makers and is the first stage in the development of policy making process [20]. This study aimed to investigate brucellosis-related agenda setting at a provincial level (in Lorestan province in western Iran characterized by a high prevalence of the disease) by using the MSF. The findings of the study showed that there are

problems and challenges both inside and outside the health sector that affect the process of prioritizing the disease.

PROBLEM STREAM

Brucellosis is a serious health problem in Lorestan province. In relation to the problem stream, what is perceptible is the general public's view of the use of dairy products. The public's belief in the use of local dairy products has led to some kind of resistance and a greater likelihood of developing the disease, despite the efforts of health organizations. To change such a view, comprehensive training at provincial level should be implemented. When the belief has changed and this change has resulted in a different, healthier behavior, valuable results can be obtained for disease prevention. Awareness of the community and adequate level of knowledge are vital for changing misconceptions and achieving disease prevention and control [21]. For instance, in a recent meta-analysis by Zhang et al., livestock breeders and slaughterhouse personnel in Asian and African countries had a low awareness of Brucellosis [22]. This problem is especially high in Lorestan province.

Other problems associated with Brucellosis in Lorestan province are financial problems related to the implementation of prevention programs, which does not allow vaccination of animals to be fully implemented. Sustained funding are, indeed, needed for disease prevention programs [23]. Policy- and decision-makers prioritize between different programs when they do not have all the financial resources necessary and allocate funds on more important programs [24]. Given that Brucellosis is not perceived as a major public health problem in Lorestan province, funding has been dedicated to other illnesses. On the other hand, livestock vaccination is one of the most cost-effective policies for the prevention and control of Brucellosis. However, the implementation of vaccination programs is handled by actors outside the health sector, and the lack of allocation of sustainable financial resources as well as the lack of priority for them has increased the disease trend [6].

POLICY STREAM

Knowledge of a given disease is of crucial importance [25], in order to provide patients with all the facilities and appropriate services [26]. Expert opinions and scientific evidence-based, country-specific recommendations are fundamental for the effective management of diseases.

At the level of the patient, it can be difficult to afford to obtain drugs due to the high costs. The insurance coverage of patients leads to the adherence and completion of the treatment process. Insurance as an important actor can play an important role in social support for patients [27]. The Ministry of Health and Medical Education (MoHME) has continuously considered the issue of Brucellosis as a health problem and has developed national laws in this regard. The

disease has been relatively rooted in the ministry's plans. The preparation of guidelines for the cooperation of other organizations also suggests that the ministry is willing to increase inter-agency cooperation. However, many organizations and individuals who can play an important role in the implementation of disease prevention and control programs in the province have little desire to cooperate. The role of NGOs in the province is very poor in cooperating and coordinating with the University of Medical Sciences. Many other organizations do not fulfill their role and duties. The lack of cooperation between organizations represents a major weakness. Intergenerational co-operation in implementing health programs is very important.

POLITICAL STREAM

In Iran, many factors affect the local, national and international political stream and impact on the health-related agenda setting process. One of the most important events that have attracted attention in recent years is the implementation of the HTP. The change in government and the health-based approach have led to a higher focus on health issues. The process of paying attention to less developed regions and decentralization has created more opportunities for different provinces. Paying attention to local diseases has pushed policy- and decision-makers to make local decisions. They are working with the MoHME and political people in the provinces to focus more on issues that cause more problems in the provinces. Representatives of the people in the Iranian parliament are trying to increase the level of accountability of the provincial political authorities to understand and solve the problems of the provinces. This has led to the creation of political responses and the consideration of health issues at a micro-level. New financial resources have managed to solve many problems with the program. The service package created within the HTP has made it more attractive for providers to provide more services to patients as well. Implementing the HTP has created a coalition of many people interested in being involved in the brucellosis-related agenda setting.

WINDOW OF OPPORTUNITY AND POLICY ENTREPRENEURS

According to the MSF, if all the three streams are effectively and properly merged, a window of opportunity can be created and policy entrepreneurs can use this opportunity to run their own programs to solve health-related issues [17, 20].

The findings of this study showed that due to the presence of different problems and obstacles at the level of all the three streams, the window of opportunity has not been created. Policy entrepreneurs have not been able to take actions and steps to change policy programs and adequately tackle Brucellosis. This disease is not perceived as a policy priority by all stakeholders and actors and one of the most important reasons is that only the MoHME and the medical university are paying attention to the complications of this disease,

and other organizations do not have a specific program for managing Brucellosis. Based on interviews and documents, decision- and policy-makers in Lorestan province are interested in controlling Brucellosis, but there is no serious commitment to developing prevention and implementation plans. Execution of programs requires the support of all groups, but since this is lacking, the window of opportunity has not been created in these years.

The study showed that there are several indications and reasons why Brucellosis should be considered as a health concern for the population of Lorestan. Lack of proper awareness, lack of sufficient financial resources for other actors to implement their organizational plans, lack of inter-sectoral cooperation and inadequate support have prevented Brucellosis from being included in the agenda of policy- and decision-makers in the province. Paying attention to these obstacles and challenges can be a great help to solve them and put Brucellosis as a priority. Prevention and control programs with the support of all actors can open the window of opportunity.

Despite its novelty and methodological rigor, this study has some limitations. The sample of interviewed stakeholders may not represent all the cultural, economic, and social aspects of the Lorestan province. Furthermore, some participants were reluctant to provide all the information requested.

Conclusions

This study examined the brucellosis-related agenda setting in Lorestan province, which is characterized by a high prevalence rate of this zoonotic disorder. If different issues related to the disease are taken into consideration, this disease can be perceived as a priority and put on the agenda. The findings of this study can be useful for countries with similar conditions: it is expected that health decision- and policy-makers will play an important role in preventing and controlling the disease by planning and implementing appropriate programs.

List of abbreviations

MSF: Multiple streams framework.
COREQ: Consolidated criteria for reporting qualitative research.
HTTP: Health Transformation Plan.
MoHME: Ministry of Health and Medical Education.
WHO: World Health Organization.
EMRO: Eastern Mediterranean Region Organization.

Ethics approval

This study was supported by the Lorestan University of Medical Sciences, Iran (No: A-10-1289-4).

Availability of data and materials

Not applicable.

Acknowledgements

Funding sources: this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

MB, SS, MZ, MKG and MM conceptualized the study and also analysed the data as a team. MB, NLB, MM and MZ wrote up the manuscript. SS, MZ, NLB, and MM reviewed the manuscript. All authors have thoroughly read this manuscript and approved it for submission.

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Supplementary Material

Interview guide

1. Please describe your activities related to the brucellosis.
2. Explain the information on the epidemiology of the disease, its transmission routes in the province.
3. What are the problems and challenges in relation to the brucellosis in Lorestan province?
4. What are the solutions to control and manage the brucellosis in Lorestan province by individuals, groups and organizations?
5. What political factors can affect the control and management of brucellosis in Lorestan province?

Received on February 23, 2021. Accepted on May 3, 2021.

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How to cite this article: Behzadifar M, Shahabi S, Zeinali M, Ghanbari MK, Martini M, Bragazzi NL. A policy analysis of agenda-setting of Brucellosis in Iran using a multiple-stream framework: health policy and historical implications. *J Prev Med Hyg* 2021;62:E584-E551. <https://doi.org/10.15167/2421-4248/jpmh2021.62.2.2041>

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