

Critical aspects of health security of the Republic of Moldova compared to eastern European countries, in the context of the COVID-19 pandemic

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Abstract

In this paper we analyze the state's preparedness for the COVID-19 crisis, as well as argues the need for selective changes following the detection of critical aspects of health security in the Republic of Moldova. The main objective of this paper is to assess the situation in the field of health security in the Republic of Moldova, as well as its comparison with neighbouring countries in the regional framework of Eastern European countries, in order to identify gaps in health security indicators in the country. The novelty of the research consists in conducting for the first time the benchmarking analysis of health security in the Republic of Moldova based on the Global Health Security Index. In the benchmarking analysis, the average score calculated for Eastern European countries is considered as the reference value for each category. In the analysis performed the categories with lower than average ratings are considered critical. Research has shown that the most critical categories of health security for the Republic of Moldova are: Rapid response to and mitigation of the spread of an epidemic; Health system; Early detection and reporting for epidemics of potential international concern, and Overall risk environment. Study has found significant weaknesses in the state's ability to prevent, detect and respond to health emergencies; severe gaps in the health system; vulnerability to political, socio-economic risks that may undermine pandemic preparedness and response. The paper also identifies critical categories of health security in Eastern European countries, including: Poland, Hungary, Czech Republic, Bulgaria, Slovakia, Romania, Bulgaria, Ukraine, Belarus that can be used by decision makers in these countries in the process of adjusting state policies and drafting policy documents. At the end of the paper are formulated two groups of conclusions and proposals: in the regional context of Eastern European countries, as well as those directly addressed to decision makers in the Republic of Moldova.

Keywords: *COVID-19 crisis, gaps in health security indicators, infectious diseases, decision makers, Eastern European countries.*

1. Introduction

The etymology of the word crisis comes from the Greek noun "krisis" and the verb "krino", which have several related meanings: "to separate", "to decide" and "turning point".

In Chinese, the word crisis is composed of two characters: the character "wei", which means "danger" and the character "ji", which means "a time when things happen or change, chance".

Therefore, the crisis can be seen as a moment of truth: a turning point in which the conditions before and after the moment are much different.

The turning point is a challenge. It creates pressure to invent new methods of adaptation after the old methods prove incapable of solving the challenge. If a state creates newer and better methods of adaptation, then we can say that that crisis has been successfully overcome. Here the important moment is that countries under the pressure of a crisis must decide what exactly works and can work even in the new conditions, keeping these issues. On the other hand, the things to be changed must be identified.

With regard to COVID-19, there is a general consensus that this is a crisis that is not at the beginning, but at the moment there is still great uncertainty about the duration of the pandemic, especially given the development of new strains of the virus and its socio-economic impact

In the context of the COVID-19 crisis, a comparative analysis of health security in the Republic of Moldova with the systems of other countries will allow the detection of problems that cannot be identified by studying the situation in a single country.

As infectious diseases don't know borders, the comparison of the Republic of Moldova with the surrounding countries is relevant. With these countries, there are also intensive trade and flows of people. In addition, decision-makers should not only know where their own training gaps are, but also how they are prepared in comparison with neighbors to assess the likelihood of an outbreak spreading. The benchmarking analysis used in the paper is based on the *Global Health Security Index*.

The main purpose of this article is to assess the situation in the Republic of Moldova, as well as to compare it with neighboring countries, in the regional framework of Eastern European countries, in terms of health security. Achieving this goal allows us to identify gaps in health security indicators in the Republic of Moldova, as well as to trace directions for remedying them.

In addition to the introductory part, the paper has five sections, including theoretical and methodological approaches to research, then the critical categories of health security in the Republic of Moldova are identified in the regional aspect of Eastern European countries, further in each critical category are scored unfavorable indicators and, finally, some conclusions and proposals are formulated.

2. Scientific and decision-making approaches to infectious diseases up to the COVID-19 crisis

Previous studies of the COVID-19 pandemic have shown that some of these coronaviruses have the potential to infect humans [1,2]

In 2017, a study of all known gene sequences of coronaviruses found that 91 percent of them live in bats, making them the world leader in the evolution of

coronaviruses [3]. From bats came SARS (Severe Acute Respiratory Syndrome), MERS (Middle East Respiratory Syndrome), Ebola, Nipah, etc.

Going into recent history, it should be noted that in 1972 MacFarlane Burnet, a Nobel Prize winner who was a world expert on human infections at the time, made a prediction about infectious diseases that they would be very monotonous because they are already defeated [4]. He considered that due to the vaccination process and the application of antibiotic treatment, there are no new infectious diseases have been appeared in the last fifty years. As a result, Harvard Medical School made staff reductions at the Department of Infectious Diseases in the 1970s [5]

In the contemporary world, after the infectious diseases were no longer a leading cause of death not only in developed countries, but increasingly in developing countries, diseases related to genes, environment and lifestyles, smoking and obesity complications are the main public health problems.

In this context, Deborah McKenzie mentions that these challenges "do not require investments in new vaccines or antimicrobial medicines, surveillance of pathogens or local agents and medical staff, who can monitor and limit epidemics" [5, p.67]. As a result, these capacities have declined significantly in many countries, as well as reduced investment in public health in countries everywhere. In particular, research funding ceased after 2005, when SARS was defeated. Currently, this explains the insufficient knowledge to stop the virus, as well as hinders efforts to combat COVID-19 and mitigate the negative impact on society. In the absence of the circulating virus, it was difficult to determine whether a medicine or a vaccine was effective, as there was no demand for them and the markets for medicines and vaccines did not develop, respectively. As it is known, since the 80's the creation of pharmaceutical products is done by large private companies, for which investments can be profitable only in the case of making medicines in large enough quantities. But the trade tools needed to overcome the situation have not been developed. At the same time, the companies producing vaccines and medicines are the financiers of many researches in this field.

It is now clear that Burnet's claims were premature and did not present a guide for the next fifty years, as he almost ruled out the emergence of a new infectious disease

It should be noted that at the beginning of the pandemic, most governments that had plans to combat a pandemic established these plans taking into account the flu pandemic. Many of them, in fact, have been titled "Pandemic Influenza Plan" [6]. But measures to combat COVID-19 (testing and isolation) do not coincide with those to combat the flu pandemic. So only few governments had plans on how to act when they were affected by a pandemic

Currently, the International Health Regulations (hereinafter the Regulations) set out the regulatory framework that obliges countries to save lives and jobs threatened by the international spread of infectious diseases [7]. Countries need to coordinate their monitoring and disease response with each other, and developed countries need to help developing and transition countries to implement appropriate surveillance measures to detect any danger. According to the pandemic plan drawn up by the Obama administration in the United States, one billion dollars

has been allocated for laboratories and training plans, stocks of protective equipment, etc. for developing countries in accordance with the Regulations. At the same time, according to Christopher Kirchhoff, all this was underfunded and / or abolished under the Trump administration[8]. Finally, although in the scientific work prior to the COVID-19 pandemic, researchers issued warnings that some of these coronaviruses have the potential to infect humans, the support of this knowledge has not been validated by decision makers

Currently, the discoveries of scientists against SARS (2003) have been rethought in the fight against COVID-19, which has allowed the development of vaccines in record time.

3. Research methodology

The analysis of health security in the Republic of Moldova, as well as the comparative analysis with the countries in the region are based on the methodology of the Global Health Security Index (GHSI). GHSI is a new tool, created in 2019 by the Global Alliance for Health Security and developed together with The Economist Intelligence Unit. GHSI can be used to assess global health security in one of the 195 signatory countries to the International Health Regulations, one of which is the Republic of Moldova. To assess a country's capacity to prevent and mitigate pandemics, the Global Health Security Index includes 34 indicators and 85 sub-indicators organized into the following 6 categories:

1. Prevention of the emergence or release of pathogens
2. Early detection and reporting for epidemics of potential international concern
3. Rapid response to and mitigation of the spread of an epidemic
4. Sufficient and robust health system to treat the sick and protect health workers
5. Commitments to improving national capacity, financing plans to address gaps, and adhering to global norms
6. Overall risk environment and country vulnerability to biological threats

From a methodological point of view, it is important to mention that The Economist Intelligence Unit has developed questions that, as far as possible, are classified as a binary choice (yes or no; or 1 or 0). For example, if a country meets a certain criterion, it is awarded a point; if not, it has a zero score. A binary approach limits the risk of subjectivity and increases the likelihood that the same scores will be obtained for a given indicator as a key measure of analytical objectivity and rigor [9, p. 63].

The rating scale ranges from 0 to 100, where 100 corresponds to the best health security conditions

Aggregate scores are divided into three levels, countries with scores between 0 and 33.3 are ranked at the lower level (also called "low scores"), countries with scores between 33.4 and 66.6 are at the middle level (also called "Moderate scores") and countries that are scored between 66.7 and 100 are at the top level (also called "high scores"). [9, p. 41]

Analytical rigor is also ensured by using information from open sources to government institutions and international organizations, as well as national legislation and regulations, academic resources and scientific publications.

It is important that GHSI assess not only the existence of countries' capabilities, but also whether these capabilities are tested regularly (annually), and prove to be functional in real-world exercises or events.

GHSI serves as a tool for national governments to prioritize resources more systematically to fill in the most critical gaps for prevention, detection, and rapid response to biological events before they spread or lead to cascading and destabilizing effects [9, p. 38].

4. The place of the Republic of Moldova in the health security of some Eastern European countries



Six categories of the Global Health Security Index, selected for nine Eastern European countries, including: Moldova, Poland, Hungary, Czech Republic, Bulgaria, Slovakia, Romania, Bulgaria, Ukraine, Belarus are presented in Table 1.

All countries, according to the overall score obtained are ranked in the middle level of health security. At the same time, the comparative analysis of health security in Eastern European countries shows persistent differences between them. According to the overall score obtained the countries are ranked: Poland (55.4) and Hungary (54) at the upper end to Ukraine (38) and Belarus (35.3) at the lower end (Table 1).

Table 1. The scores of the health security categories of some Eastern European countries

Country	Prevent	Detect	Respond	Health	Norms	Risk	Over all
Poland	50.9	61.7	47.5	48.9	58.9	67.9	55.4
Hungary	56.4	55.5	52.2	36.6	58.9	68.2	54.0
Czech Republic	51.1	50.7	46.6	37.4	58.9	74.0	52.0
Slovakia	53.5	46.0	34.1	37.9	52.8	71.5	47.9
Romania	48.9	42.8	35.3	36.7	52.4	65.7	45.8
Bulgaria	37.6	53.3	21.7	41.0	61.5	66.3	45.6
Moldova	46.5	42.9	31.1	36.4	56.7	47.1	42.9
Ukraine	38.1	36.5	34.8	23.0	55.1	43.3	38.0
Belarus	19.4	28.9	46.6	40.6	25.8	53.0	35.3
Country with the best score	Hungary 56.4	Poland 61.7	Hungary 52.2	Poland 48.9	Bulgaria 61.5	Czech Republic 74.0	-
Average score Eastern Europe	44.7	46.5	38.9	37.6	53.4	61.9	46.3
Number of countries with critical categories	3	5	5	5	3	3	-

Source: Developed by the author using the Global Health Security Index

Note: Categories with below average score 
 Categories with above average score 

The Republic of Moldova according to the overall score of health security - 42.9 is at the bottom of the list of Eastern European countries, after Romania (45.8) and Bulgaria (45.6)

The analysis also shows that Hungary gets the best score in two categories (*Prevention; Quick Response*), Poland in two categories (*Detection and Reporting; Health System*), Bulgaria in one category (*Compliance with International Norms*) and

the Czech Republic in the category (*Environmental Risk*). Romania and Slovakia, as well as three countries from the former Soviet Union, do not have the categories with the best result.

In the following analysis, the most critical categories of health security in Moldova will be identified by comparing the scores of the categories between Eastern European countries. For this, the average score for each category is calculated. In our analysis, categories with a lower than average rating are considered critical.

Analysis shows that Ukraine is the country with the highest number of critical categories (five), followed by Belarus, Moldova and Romania with four each. It is also noted that Poland is a country without critical categories.

The analysis shows that in most Eastern European countries (five of them) the score is below average in the following categories: *Detection and Reporting*; *Quick Response and Mitigation of the Spread of an Epidemic*; *Health System*. These categories, as well as the *Environmental Risk* category are considered the most critical for the Republic of Moldova.

In the case of Belarus, the above-mentioned trends are not fully observed: the score of the categories *Quick Response and Mitigation of the Spread of an Epidemic* and *Health System* is higher than the average for Eastern Europe. Belarus also scored the lowest in the *Prevention and Compliance with International Norms* categories

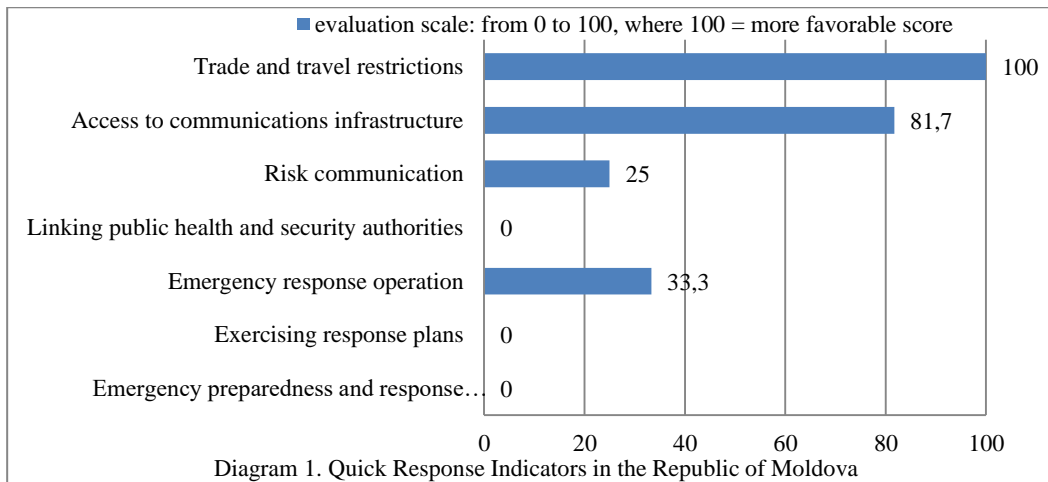
5. Gaps in health security indicators in the Republic of Moldova

The previous analysis shows that in the regional context of Eastern European countries the most critical categories of health security for the Republic of Moldova are: *Quick Response and Mitigation of the Spread of an Epidemic*; *Health System*; *Detection and Reporting* and *Environmental Risk*. In each critical category, it is important to identify indicators that have contributed to the state's insufficient preparedness for the pandemic, and that can later be used as benchmarks in the process of adjusting state policies and developing policy documents. In the analysis below, the critical categories are studied in detail, in the order of increasing the accumulated score.

5.1. Quick response and mitigation of the spread of an epidemic

In the Republic of Moldova the lowest category is *Quick Response and Mitigation of the Spread of an Epidemic* (score 31.1). The result obtained is largely due to the accumulation of the score "0" on the indicators: *Emergency preparedness and response planning*; *Exercising response plans* as well as *Linking public health with security authorities* [Diagram 1].

The analysis of the results indicates that the Republic of Moldova does not have a national plan in place for public health emergencies, which will address the planning of the response to several communicable diseases with pandemic potential. Those provisions were not included in the "National Public Health Strategy for 2014-2020", approved by Government Decision No. 1032 of 20.12.2013 [10]. At the same time, the state does not have a specific mechanism for interaction with the private sector in order to contributing to the preparation of the emergency response.



Source: Developed by the author using the Global Health Security Index

The analysis of the data also shows that the Republic of Moldova has not undergone in

recent years an exercise to identify the list of gaps and best practices recommended by the World Health Organization (WHO) or another exercise focused on biological threats.

The list of gaps in health security indicators also includes the non-implementation of at least one joint exercise by the authorities in the field of public health and national security in the Republic of Moldova in order to respond to a potentially deliberate biological event. In addition, no standard operating procedures or other agreements have been drawn up between public health authorities and national security

Although there is evidence that nuclear chemical, biological and radiological hazard training and drills are conducted by national authorities responsible for the management of public health events, these training and drills are not conducted regularly to institutionalize knowledge and practice.

The low value of the Risk Communication indicator is explained by the lack of a risk communication plan specifically for use during a public health emergency in Moldova, as well as how the messages will reach citizens and sectors with different needs in communication. The respective provisions are not found in the "National Strategy for Public Health for the years 2014-2020", approved by Government Decision No. 1032 of 20.12.2013 [10]. At the same time, the "National Communication Strategy for Public Health Emergencies in the Republic of Moldova" is being developed in collaboration with WHO.

However, it is found that communication takes place with the affected communities and

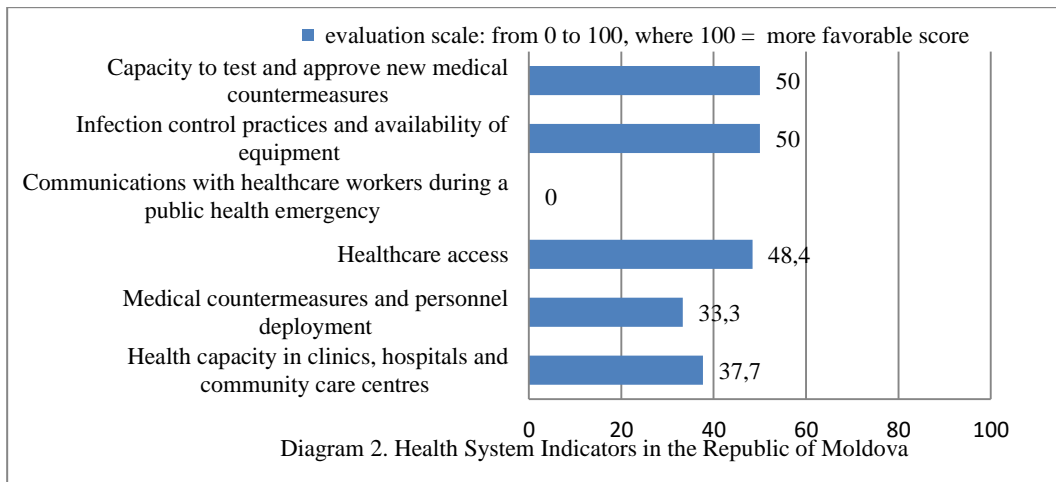
that the messages are adapted according to age, place of residence, language spoken, etc. [9].

Finally, the low value of the *Emergency Response Operation* indicator was reached, among other things, due to the lack of evidence that the *Public Health*

Emergency Coordination Operational Center within the National Agency for Public Health can carry out or have conducted a coordinated emergency response exercise in the last year within 120 minutes of identifying the public health emergency.

5.2. Adequate and robust health system for treating the sick and protecting health workers

The Republic of Moldova does not have the fundamental capabilities of the health system, which are vital for responding to the epidemic or pandemic. There are no indicators in the Health System category that exceed the score of 50 points [Diagram 2].



Source: Developed by the author using the Global Health Security Index

The score "0" obtained on the indicator *Communications with healthcare workers during a public health emergency* indicates the lack of a communication system in place between public health authorities and health workers in the public and private sectors during a health emergency. The normative acts regarding the elaboration and implementation of the policies in the field of public health do not contain the respective provisions [10, 11,12].

The low value of the *Medical countermeasures and personal deployment* indicator is explained by the lack of an agreement to purchase medical countermeasures (diagnosis and therapy, etc.) for national use during a health emergency with the manufacturing companies. There is also no national plan or program for the development of medical countermeasures.

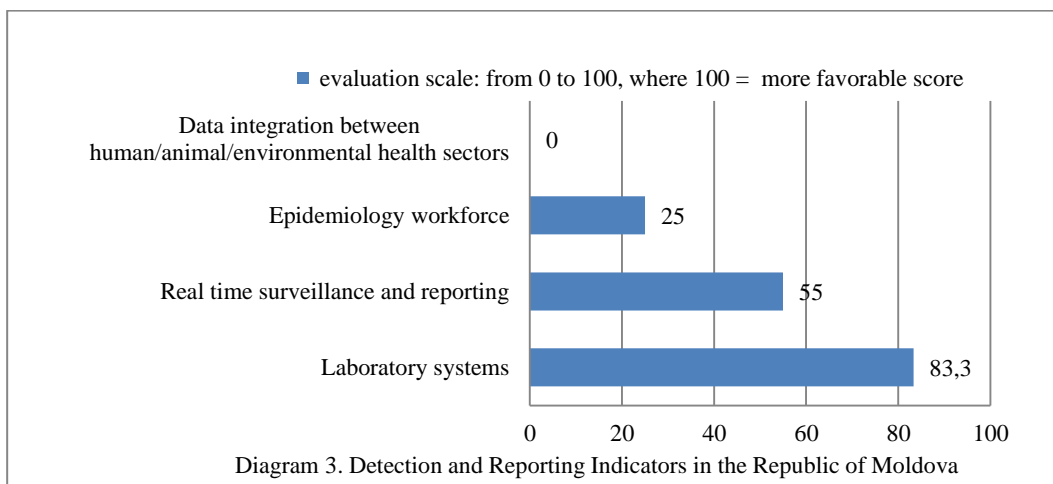
Gaps in the indicator *Health capacity in clinics, hospitals and medical centers* is manifested by the lack of isolation facilities for patients with highly communicable diseases in an isolation unit at the time of the pandemic, including in prominent hospitals in Moldova: Medpark International Hospital and Institute of Emergency Medicine.

At the same time, Moldova is facing the insufficiency of certain categories of medical staff, especially in rural areas, where there is a shortage of epidemiologists, doctors of certain specialties, laboratory staff and family doctors.

The Republic of Moldova does not have a public commitment to give priority to health care services for workers who become ill as a result of participating in a public health response.

5.3. Early detection and reporting of epidemics of potential international interest

Data analysis indicates the lack of a functional mechanism for data exchange between ministries that provide human, animal and environmental surveillance in the Republic of Moldova [Diagram3].



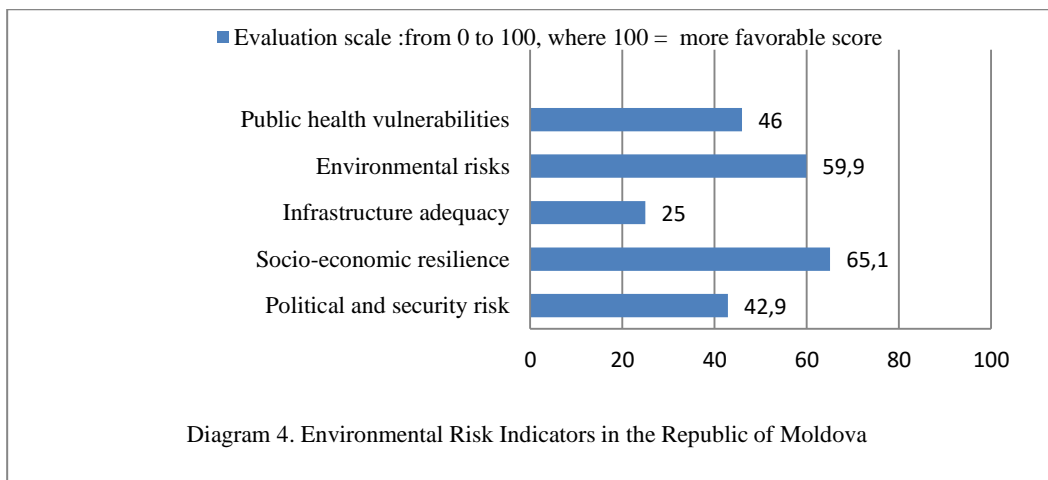
Source: Developed by the author using the Global Health Security Index

The low value of the *Epidemiology Workforce* indicator is explained by the fact that the Republic of Moldova does not have at least one trained field epidemiologist per 200,000 population, which reduces the probability of a rapid response during a public health emergency.

5.4. The general environmental risk and the country's vulnerability to biological threats

The *Environmental Risk* category covers quite broad areas and is composed of indicators: *Infrastructure Compliance, Political and Security Risks, Public Health Vulnerabilities, Environmental Risks and Socio-Economic Resilience*.

Although the scores obtained by the *Environmental Risk* category indicators are among the highest compared to other health security indicators in the Republic of Moldova [Diagram 4], this category is critical not only in the regional context of Eastern European countries but also internationally - out of 195 signatory countries to the International Health Regulations.



Source: Developed by the author using the Global Health Security Index

The respective situation within the category *Environmental Risk* is explained by the higher average level reached in the countries of the Eastern European region and in the world in general, than in the Republic of Moldova.

At the same time, the places obtained by the category indicators are the lowest compared to the rest of the health security indicators in the Republic of Moldova.

From a regional point of view, the indicators within the *Environmental Risk* category, with the exception of the indicators of *Socio-economic Resilience*, accumulate the score below the average of Eastern European countries.

From a global point of view, the Republic of Moldova ranks 78th in terms of the overall average calculated, being in the first part of the ranking of 195 countries. But, according to most indicators of the *Environmental Risk* category, the state occupies the positions in the second part of the ranking: *Political and security risks* (153th place), *Infrastructure compliance* (152th), *Public health vulnerabilities* (118th) and *Socio-resilience economic* (116th).

The slow progress calculated in the prevention of political and security risks is explained by the accumulation of insufficient score in the areas: *Government effectiveness*, *Clarity of established and acceptable constitutional mechanisms for the orderly transfer of power from one government to another*, and absence the score regarding the *Extermination of government authority throughout the country*. The analysis shows that Moldova faces major political and security risks, which could undermine the national capacity to counter biological threats.

The analysis of the data also shows that non-compliances in infrastructure such as the road network, air transport are proving to be inadequate the needs. Failure to deliver electricity can also cause damage.

The high vulnerabilities of public health are due to very low general public health expenditures per capita (234.4 according to the Purchasing Power Parity indicator), as well as the lack of access to at least basic sanitary conditions for almost 22% of households in the Republic of Moldova.

Low place of the indicator Socio-economic resilience is influenced by factors: public confidence in government (0 points), robust media coverage through the existence of open and free discussions of public issues, with a reasonable diversity of opinions (accumulation of a low level of points).

Low public confidence in the government could affect its ability to convey effective messages during pandemic crises.

The analysis shows that the abilities of the Republic of Moldova to effectively prevent, detect and respond to outbreaks of diseases can be significantly affected by the broad national risk environment.

6. Conclusions and proposals

Based on the research, two groups of conclusions and proposals can be formulated: in the regional context of Eastern European countries, as well as those directly addressed to decision-makers in the Republic of Moldova.

1. In the regional context of Eastern European countries:

- The overall average of Eastern European countries is quite low reaching the score of 46.3 out of 100 possible. In each critical category, it is important to identify the indicators that have contributed to the countries' insufficient preparedness for the pandemic. Decision-makers in Eastern European countries could use them in the future as benchmarks in the process of improving public policy documents.
- National health authorities should develop epidemic and pandemic-specific preparedness and response strategies as part of wider regional and national security planning efforts.
- In the regional context of Eastern European countries, the most critical categories of health security for the Republic of Moldova are: *Detection and reporting; Rapid response and mitigation of the spread of an epidemic; Health system and environmental risk.*
- Given that the first three categories of the above are considered critical for most Eastern European countries, national governments should give more systematic priority and resources to strengthen health systems, as well as detection and rapid response to biological events before they spread or lead to cascading and regionally destabilizing effects.

2. In the national context, in addition to those mentioned above, the following conclusions and proposals are relevant for the Republic of Moldova:

- Inclusion in the new National Health Strategy 2030 of the provisions on the national preparedness and response plan for public health emergencies, including planning, training, management, preparing, etc. in assessing the risks and vulnerability in cases of pathogens. It is also necessary to create a mechanism dedicated to interaction with the private sector, to help prepare for and respond to outbreaks.

- Responsible national authorities should ensure the integration of data into the human, animal and environmental sectors, by incorporating a "single health" approach as part of emergency response planning and national outbreak preparedness and response efforts. Decision makers should consider the risks of infectious diseases when developing policies and plans related to climate change, land use and urban planning.
- In three of the four critical categories, communication indicators were identified with an insufficient rating or "0" ("Health system" category) indicating the need for a better understanding and measurement - on a transparent basis of the state of national capacities regarding prevention, detection and rapid response to epidemic and pandemic threats.
- Decision-makers should take steps to build and maintain a robust public health workforce, which includes, but is not limited to, physicians, nurses, health care workers, epidemiologists, and other health care professionals that could play a major role in preventing, detecting, and responding to biological crises.
- The analysis also finds that knowledge of the risks is not enough. Political will is needed to protect people from the consequences of epidemics, to take measures to save lives and build a safer world. In this context, the capacity of the Republic of Moldova to effectively prevent, detect and respond to outbreaks of infectious diseases is significantly limited by a fairly broad national risk environment.
- Overall, the Global Health Security Index finds essential weaknesses in the state's ability to prevent, detect and respond to health emergencies; severe gaps in the health system; vulnerabilities to political, socio-economic risks that may undermine pandemic preparedness and response.
- Currently, there have already been selective changes in the health security system of the Republic of Moldova, especially regarding the creation of facilities for the isolation of patients with communicable diseases in a special unit, which were missing at the time of the COVID-19 pandemic. The changes also influenced the increase in the number of daily tests performed, the decrease in the number of infected medical staff, the development of the vaccination process, the choice of vaccine for the population, etc.

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