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Strategic Crisis Management by Regional Authorities: Public Perceptions of Attica's Response to the COVID-19 Pandemic

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Abstract

The present research examines public perceptions regarding how the Region of Attica responded to the COVID-19 pandemic emergency. It emphasizes the Region's rapid adaptation to a dynamically changing environment and the implementation of strategies that included public health measures, collaboration with central government, and the use of technology and innovation to support citizens. To achieve the aim of the research, responses from 423 permanent residents of the Region of Attica to a questionnaire were statistically analyzed using descriptive and inferential methods. The data analysis highlighted the effective performance of the Region of Attica in managing the COVID-19 crisis. This research is multifaceted in its contributions: it not only reveals citizens' views on the COVID-19 crisis management by the Attica Region but also analyzes their perceptions concerning crisis management in general.

Keywords

Crisis Management, COVID-19, Public Perceptions, Regional Authorities, Region of Attica

1. Introduction

Combining the common features of the various definitions, a crisis can be defined as a sudden and often unpredictable situation that requires immediate intervention to prevent or mitigate the serious effects it may have (Rosenthal & Kouzmin, 1997). There are various distinctions of crises, which include, among others, natural disasters such as forest fires, earthquakes and floods, technological or industrial disasters such as fires and chemical spills, economic crises,

health crises which include pandemics and, social or political crises that, among others, include rebellions and wars (Diakakis et al., 2020; Lekkas et al., 2021; Mitsopoulos et al., 2022). The current environmental crisis is crucial as not only has an impact on global economy (Delegkos et al., 2022; Lampropoulos et al., 2024; Skordoulis et al., 2019, 2022; Skordoulis, Ntanos, & Arabatzis, 2020; Skordoulis et al., 2020) and peoples' lives, but also as it impacts public health systems globally, a link highlighted by the COVID-19 pandemic which has probably demonstrated how environmental degradation can accelerate the spread of diseases from wildlife to humans (Ross et al., 2015).

The effects that crises can have require their effective management. Effective crisis management requires careful preparation, immediate reaction and taking measures for the most immediate recovery possible (Pforr & Hosie, 2008).

Managing a crisis by regional authorities is important to ensure social welfare, protect citizens and prevent or limit the negative effects of the crisis. The first critical factor in the importance of managing a crisis by regional authorities has to do with the fact that regional authorities, due to their direct contact with the community and detailed knowledge of local conditions, can recognize and assess the potential threats with greater accuracy. This fact allows the development of more effective prevention and preparedness strategies that are adapted to the specific needs of each region. In addition, local government can ensure proper implementation of crisis response measures and provide immediate support to citizens (Drennan et al., 2014).

In addition, regional authorities can act as a bridge between the government and citizens, ensuring that the policies and initiatives taken by the government accurately respond to local needs. Immediate response and collaboration with local organizations and the community can bring significant benefits in preventing and responding to any type of crisis (Drennan et al., 2014).

For successful crisis management, regional authorities should develop several strategies. First, educating and preparing the population is essential to building community resilience. In addition, developing comprehensive emergency plans that include clear procedures, roles and responsibilities is also important. Finally, the continuous evaluation and revision of emergency plans, based on risk analysis and past experiences, is an important factor in dealing with the challenges arising from crises (Zhang & Zheng, 2024).

The COVID-19 pandemic began in late 2019 as an epidemic and quickly spread globally (Kumar et al., 2021). The rapid spread of the virus, the lack of knowledge about its characteristics, transmissibility, and treatment, as well as the insufficient preparation of health systems in many countries, led to an uncontrollable public health crisis. The pandemic caused by COVID-19 affected, all over the world, the daily life of citizens, economic activity, and social life, causing extensive socio-economic consequences (Christopoulos et al., 2021; Katsampoxakis et al., 2022).

The pandemic caused direct and indirect health impacts while also having se-

rious socio-economic ramifications in all dimensions of life, it also disproportionately affected vulnerable and marginalized populations, often exhausting their resilience and limits (Onyeaka et al., 2021).

COVID-19 pandemic management required immediate and extensive measures to limit the spread of the virus and protect public health. Around the world, social distancing measures were first implemented, including the banning of large gatherings and the restriction of movement, as well as measures that required the use of new technologies, such as the implementation of teleworking and distance education, in to a very large extent and on a global scale (Karaman et al., 2021).

The COVID-19 pandemic crisis coincided with Greece emerging from a long period of deep economic and social crisis with the public health care system on the verge of collapse (Drosos et al., 2018; Petrakis & Kostis, 2020). The first case of COVID-19 in Greece was registered on February 26. On March 1 the first measure taken by the Greek government, the cancellation of carnivals, was perceived by the public as excessive, given that at the time there were only three confirmed cases of COVID-19. On March 10, with 89 officially confirmed cases and no deaths, all schools and universities were closed. Since that day, new regulatory restrictions have been gradually implemented to mitigate the risk of exponential transmission of the virus. About 4 weeks into the pandemic, with 695 confirmed cases and 17 deaths recorded, on March 23 strict quarantine measures were imposed across the country (Bamias et al., 2020).

The Region of Attica, according to its strategic planning, is always next to citizens, and is pioneer in social protection and solidarity in health and safety. The Region of Attica was on the front line to deal with the pandemic, providing medical equipment to all hospitals in Attica, providing medical advice and psychological support, placing particular emphasis on prevention, supporting the weak citizens with free distribution of protective equipment.

Based on the above, investigating the case of the Attica Region, as one of the central points of pandemic management in Greece, can offer valuable lessons for the future response to similar crises. The collection and analysis of data on the views of the residents of the Attica Region on the management strategy of the crisis caused by COVID-19, can therefore provide valuable conclusions regarding the following elements:

• Successes and failures of strategic crisis management: revealing the actions and policies that have been accepted by the population, providing opportunities for improvement.

• Communication management: understanding the effectiveness of informing citizens and communicating prevention and protection measures.

• Citizens' needs and expectations: understanding the needs and expectations of citizens from local government in times of crisis, allowing adaptation of response measures to the real needs of the population.

• Adapting strategies: providing feedback that will help adapt strategies, im-

proving the effectiveness of future crisis management.

All the above aspects are examined through a satisfaction survey of citizens who reside permanently in the Attica Region. Citizen satisfaction refers to the degree to which people feel that their needs, expectations, and desires are met by the services, policies and actions of the government or other public bodies (Skordoulis et al., 2017). It includes various aspects of social, economic, and political life, such as the quality of public services, safety, health, education, environmental protection and transparency of administration. Measuring citizen satisfaction is a critical factor in evaluating and improving the quality of public services and policies. This process is particularly important for regional authorities, as the decisions made at this level have a direct impact on the daily life of citizens (Skordoulis et al., 2017).

Citizen satisfaction with local regional authorities' handling of the pandemic can vary significantly depending on many factors, including the speed and effectiveness of responses, communication and transparency of actions, and the ability to adapt to changing circumstances. A sense of community and cooperation between citizens and local government has also been shown to be key factors in enhancing the resilience of communities (Diakakis et al., 2018, 2021, 2022; Liu et al., 2022). Moreover, citizens' knowledge of the pandemic, their personal experience of the disease, and whether they have taken protective measures can have a significant impact on their overall satisfaction (Adamy & Rani, 2022).

The contribution of this research is multifaceted: firstly, it reveals significant insights into the effectiveness of the implemented policies; secondly, it gauges citizens' satisfaction with the authorities' response; and thirdly, it identifies areas needing improvement. Moreover, the innovation of this research mainly focuses on the fact that it is the only research paper to analyze citizens' perceptions of COVID-19 crisis management in the Region of Attica.

The structure of the paper is organized as follows: the first section provides an introduction. Section two analyzes the research materials and methods. Section three presents the results of the research, and section four discusses these results, drawing conclusions and outlining their implications.

2. Materials and Methods

To achieve the aim of this study, primary research was conducted using a structured questionnaire. The questionnaire was completed by 423 permanent residents of the Attica Region, during the period from June 1, 2023, to August 31, 2023.

The timing of data collection, about one year after the end of the COVID-19 pandemic measures, was chosen based on several factors. Firstly, analyzing the views of citizens approximately a year post-measures allowed for an assessment of both the long-term effects of the pandemic and the evolution of public opinion. This interval was considered sufficient for citizens to have developed more stable views regarding the pandemic, the measures implemented, and their im-

pacts. Additionally, this timing aimed to yield more mature and stable results, as the research sought to capture citizens' opinions free from immediate influences that could have arisen during the active pandemic period. Finally, this approach enables comparisons with earlier surveys conducted during or shortly after the pandemic, thus highlighting how opinions have changed over time.

The research data were analyzed using descriptive and inductive statistical methods, to fully understand and interpret them. In the context of descriptive statistics, mean values, standard deviations, frequencies, and percentages were calculated. The results of these analyzes are essential for understanding the overall distribution of the opinions of the survey participants.

On the other hand, inductive statistical analysis contained more specialized analyses, such as the calculation of correlation coefficients. These analyses, helped to identify the factors associated with the research and to highlight possible relationships between the variables.

The above analyzes were based on a significance level set at 5%, in accordance with widely accepted practices in the scientific field to which this research belongs.

3. Research Results

3.1. Sample Demographics

Initially, respondents' profile was examined. Respondents' demographics are presented in Table 1.

Table 1. Respondents' demographics.

Variable		% Percent
Age	18 - 35	17.0%
	36 - 45	26.4%
	46 - 55	37.7%
	56 - 65	18.9%
Gender	Male	48.08%
	Female	51.92%
Level of current studies	High school	7.55%
	Associate's degree	3.77%
	Bachelor's degree	37.74%
	Master's degree	43.40%
	PhD	7.55%
Family status	Unmarried	26.92%
	Married	21.15%
	Unmarried with children	11.54%
	Married with children	40.38%

Firstly, as shown in Table 1, 51.92% of participants are women and 48.08% are men. The age group with the highest representation in this study is from 46 to 55 years, accounting for 37.70%, followed by the 36 - 45 years old age group with a rate of 26.40%. The age groups with the lowest participation rates are those aged 56 to 65 years (18.90%) and 18 to 35 years (17%). Regarding education levels, the largest proportion of respondents (43.40%) holds a master's degree. Lastly, concerning family status, the most common category in the sample is married with children, comprising 40.38% (Figure 1).

Finally, regarding illness during the pandemic, 88.46% of the respondents reported that they fell ill due to COVID-19, while 3.84% of them required hospitalization at the same time. The remaining 11.54% of the respondents did not fell ill due to COVID-19.

3.2. Descriptive Analysis

Initially, the study analyzed the perceptions and satisfaction of citizens regarding the strategies employed by the Region Attica for managing the crisis resulting from the COVID-19 pandemic, utilizing descriptive statistics (Table 2).

From the table above, there is strong agreement with all propositions. The level of preparedness of the Region of Attica to handle various pandemic scenarios and its response to managing the pandemic both received a high percentage of positive responses (86.80%). This is followed by a slightly lower percentage of agreement (86.60%) regarding the Attica Region's ability to respond promptly to necessary decisions and measures during the pandemic. In all cases, the standard deviations are low, indicating that the responses are closely clustered around the mean.

The variables in the following table explore the degree of agreement or disagreement among the sample on issues related to the effectiveness of risk management and planning by the Attica Region for managing the COVID-19 pandemic (Table 3).
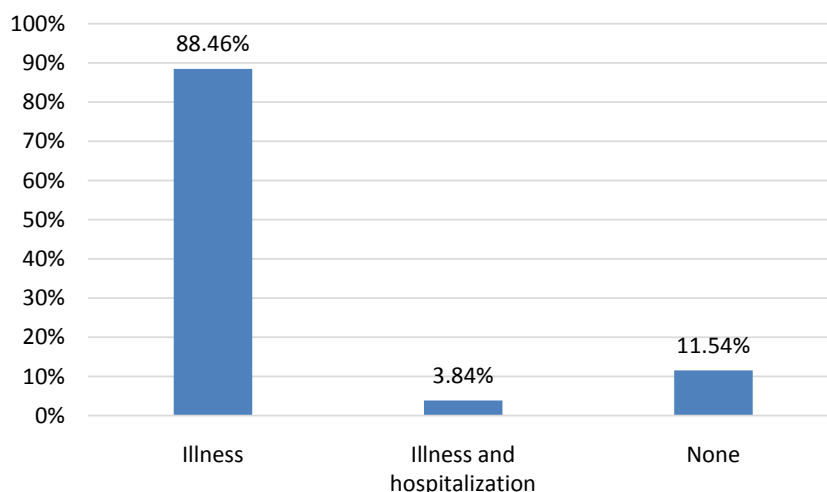

Figure 1. Illness during the COVID-19 pandemic.

Table 2. Descriptive statistics satisfaction data, assessing the risk management and planning efforts of the Region of Attica in handling the COVID-19 pandemic.

Variable	% Responses			Mean	Standard deviation
	Negative	Neutral	Positive		
Ability of the Region of Attica to respond in a timely manner to the decisions and measures that had to be taken during the pandemic	11.40	0	86.60	4.11	1.01
Level of readiness of the Region of Attica to face different scenarios around the pandemic	13.20	0	86.80	3.96	1.05
Response of the Region of Attica to the need to manage the pandemic	13.20	0	86.80	4.07	1.10

Table 3. Descriptive statistics of risk management and planning effectiveness of the Region of Attica, for the management of the COVID-19 pandemic.

Variable	% Responses			Mean	Standard deviation
	Negative	Neutral	Positive		
The Region of Attica strategic management plan to manage health risks from the pandemic has been effective	13.20	11.40	75.40	3.96	1.15
The public health measures implemented by the Region of Attica were effective	13.20	9.40	77.40	4.05	1.13
Establishing mechanisms for early detection of cases has been effective	13.20	11.30	75.50	4.01	1.13
The Region of Attica can respond effectively to a possible future pandemic, or other crises given how it responded to the COVID-19 pandemic	15.10	13.20	71.70	3.98	1.23

From the table above, there is strong agreement with all propositions. The effectiveness of the public health measures implemented by the Region of Attica received the highest percentage of positive responses (77.40%). The lowest percentage of agreement is observed in the variable regarding the ability of the Region of Attica to respond effectively to a possible future pandemic or other crises, given how it responded to the COVID-19 pandemic (71.70%). In all cases, the standard deviations are low, which means that the responses do not have a large spread.

The next section to be analyzed refers to the communication management of the Attica Region. The variables in the following table refer to the degree of agreement or disagreement of the sample, regarding propositions concerning the information provided by the Region of Attica, regarding the COVID-19 pandemic (Table 4).

From the table above, there is strong agreement with all propositions. The clarity of information from the Region of Attica received the highest percentage of positive responses (84.90%). On the contrary, the lowest percentage of positive responses is observed in the variable regarding the appropriate timing of information (71.70%). In all cases, the standard deviations are low, which means that the responses do not have a large spread.

Table 4. Descriptive statistics of the information provided by the Region of Attica on the COVID-19 pandemic.

Variable	% Responses			Mean	Standard deviation
	Negative	Neutral	Positive		
Were always clear	11.40	3.70	84.90	4.07	1.08
Were always adequate	11.40	15.00	73.60	3.96	1.14
Always corresponded to reality	13.20	13.30	73.50	3.90	1.14
Were always scheduled at the right time	13.20	15.10	71.70	3.90	1.16
Did not create confusion among the population	16.90	9.60	73.50	3.84	1.23
Were more valid compared to information from other sources	13.20	11.30	75.50	4.01	1.18
Didn't create panic	13.20	9.40	77.40	4.07	1.14

The next section to be analyzed focuses on the health services in terms of availability, access, and utilization of resources by the Region of Attica. Table 5 measures the sample's level of agreement with various statements concerning health services and resource utilization by the Region of Attica during the COVID-19 pandemic.

According to the above table, there is strong agreement with all statements. The statement regarding the cooperation of the Region of Attica with companies and organizations to secure essential resources (such as rapid tests and masks) to combat the pandemic received the highest percentage of positive responses, at 83.00%. Conversely, the statement about efforts to enhance health services by the Attica Region (including the provision of medical equipment and staff) received the lowest percentage of positive responses, at 77.40%. In all instances, the standard deviations are low, indicating a tight clustering of responses around the mean.

In the following table, the level of citizens' satisfaction is expressed regarding the elements of local coordination and planning of the Region of Attica, during the COVID-19 pandemic (Table 6).

From the table above, there is strong agreement with all the above positions. The propositions about the ability of the Region of Attica region attract external support and expertise and the level of coordination of the Region of Attica, with different local authorities (municipalities, hospitals, private doctors, etc.), gathered the highest percentage of positive responses (94.30 %). On the contrary, the lowest percentage of positive responses was received by the proposal regarding the level of coordination and cooperation between different departments and services with the Region of Attica, to develop and implement a pandemic management plan (90.50%). In all cases, the standard deviations are low, which means that the responses do not have a large dispersion.

Table 5. Descriptive statistics, for the degree of satisfaction regarding health services and the utilization of resources from the Region of Attica, during the COVID-19 pandemic.

Variable	% Responses			Mean	Standard deviation
	Negative	Neutral	Positive		
The actions of the Region of Attica strengthened the health system (provision of medical equipment, medical staff, etc.)	9.50	13.10	77.40	4.07	1.07
The Region of Attica moved in time to ensure the basic means to deal with the pandemic (rapid test, masks, etc.)	5.70	13.20	81.10	4.20	1.06
The Region of Attica correctly cooperated with companies and organizations to secure basic resources (rapid test, masks, etc.) to deal with the pandemic	7.60	9.40	83.00	4.16	1.06

Table 6. Descriptive statistics for the elements of local coordination and planning of the Region of Attica, during the COVID-19 pandemic.

Variable	% Responses			Mean	Standard deviation
	Negative	Neutral	Positive		
Coordination efforts and collaborations with partners (health services, etc.)	9.40	0	90.60	4.09	0.94
Ability of the Region of Attica to attract external support and expertise	5.70	0	94.30	4.20	0.86
Level of coordination of the Region of Attica with different local authorities (municipalities, hospitals, private doctors, etc.)	5.70	0	94.30	4.24	0.87
Level of coordination and cooperation between different departments and services with the Region of Attica to develop and implement a pandemic management plan	9.50	0	90.50	4.16	0.97

3.3. Correlation Analysis

In this section, the results of the correlation analyses conducted to fulfill the objectives of the research are presented. Given the nature of the variables, the Pearson Chi-Square test of independence was utilized.

The first correlation that was examined is that between the variables concerning the opinion of citizens about the main person responsible for dealing with the consequences of disasters and the taking of protection measures by citizens (Table 7).

Based on the results of the table above, it appears that there is no independence between the opinion of the citizens about the main person responsible for dealing with disasters and taking measures regarding the supply of relevant equipment and the availability of the phone of a person who will help. In these two cases, the P-value of the test is less than the established 5% significance level of the research, resulting in insufficient evidence to accept the hypothesis H_0, which refers to the independence of the variables.

Furthermore, in the table above, the phi column refers to the φ coefficient which is a special case of the Pearson coefficient used for correlation matrices and measures the strength of the correlation between the two variables. Values of ϕ range from −1 to 1, where 0 indicates no correlation, while values close to −1 or 1 indicate strong negative or positive correlation respectively.

Table 7. Citizens' views of the main person responsible for dealing with the consequences of disasters (state/citizens) and the protection measures by citizens.

Variable	Pearson chi-square	P-value	Phi (φ)
I have relevant equipment	8.885	0.003	0.162
I have emergency phone numbers handy or know of	1.502	0.220	−0.067
I have the phone number of someone who will help me	6.885	0.009	0.143
I have been informed by a special organization	1.203	0.253	0.059

From the above results, it can be referred that those who believe that citizens are responsible for dealing with disasters, have procured relevant equipment and have available the phone number of someone who will help them.

This result suggests that the perception of role and responsibility may play an important role in how people prepare for potential disasters. Those who believe that personal preparation and protection are crucial tend to take more steps to enhance their ability to cope with such situations.

This behavior is important for public policy and risk management, as it indicates the need to educate and inform the public about how to prepare for and respond to disasters. Enhancing and promoting a sense of personal responsibility can improve community resilience to disasters while reducing reliance on government or other organized actions, which may not be readily available or sufficient during emergencies.

The next relationship to be examined has to do with citizens' self-assessment of their level of knowledge about crises and disasters and taking protective measures (Table 8).

From the results included in the table above, it emerges the fact that there is a relationship between the self-assessments of knowledge about crises and disasters and the taking of all protection measures by the citizens. Based on the values of φ as well as the values of the variables, the relationship is characterized as positive, which means that the higher the citizens self-assess their level of knowledge about crises and disasters, the more likely they are to take actions to protect themselves.

From the above results, it is evident that when citizens assess their knowledge about crises and disasters as high, they are more likely to feel capable of responding effectively to such situations. This heightened sense of competence and preparedness may motivate them to undertake preventive actions, such as enrolling in first aid courses, acquiring emergency supplies, or participating in disaster preparedness workshops.

Moreover, recognizing the significance of personal knowledge may serve as a catalyst for actively educating and informing others. Thus, individuals who consider themselves well-informed about crises and disasters may act as advocates for prevention and preparedness within their communities, enhancing societal resilience.

Table 8. Self-assessment of knowledge on crisis and disaster management, and citizen actions for protection.

Variable	Pearson chi-square	P-value	Phi (φ)
I have relevant equipment	37.588	0.000	0.334
I have emergency phone numbers handy or know of	22.181	0.000	0.257
I have the phone number of someone who will help me	25.014	0.000	0.272
I have been informed by a special organization	42.564	0.000	0.355

This acknowledgment underscores the potential need for educational programs and public awareness campaigns aimed at enhancing knowledge about risk management and disaster response strategies. Such initiatives could play a pivotal role in boosting both personal and community safety.

Furthermore, it will be examined whether and to what extent the illness and/or hospitalization during the COVID-19 pandemic affected the lifestyle of the residents of the Attica region, in terms of taking voluntary protective measures (Table 9).

From the table above, it appears that the only statistically significant relationship that exists is between the illness during COVID-19 and voluntary distancing from social gatherings.

It is possible that the above result reflects citizens' effort to protect themselves from further exposure to the virus or their desire to limit its spread to others, especially if they have experienced the severity of the disease personally.

Here, it is evident that the information campaigns of the Region of Attica contributed to the promotion of voluntary distancing by informing and educating the public about the risks of the disease and the importance of reducing contacts to limit the spread of the virus. This includes providing clear instructions and recommendations for safety, adopting protective measures, and encouraging citizens to make responsible personal choices for their individual interest and public health.

The next analysis concerns the illness and hospitalization during COVID-19 and the adoption of optional protective measures (Table 10).

As in the previous case, from the table above, it is referred that the only statistically significant relationship that exists is between hospitalization during COVID-19 and voluntary distancing from social gatherings, since the p-value for this case is lower than the level of significance of the research.

Consequently, a similar criticism can be made regarding the information campaign from the Region of Attica.

The results of both cases above highlight that a successful information campaign should be clear, comprehensive, and widely accessible, promoting the safety and health of the population, and encouraging responsible behaviors, thus confirming, to a certain extent, the effectiveness of the respective campaign on the part of the Region of Attica.

Table 9. Illness during the COVID-19 pandemic and citizen participation in voluntary measures.

Variable	Pearson chi-square	*P*-value	Phi (φ)
Use of a mask	2.694	0.101	0.089
Vaccination	2.086	0.149	−0.079
Distancing from social gatherings	8.697	0.003	0.161
Teleworking	0.015	0.903	−0.007

Table 10. Illness and hospitalization during the COVID-19 pandemic and citizen participation in voluntary measures.

Variable	Pearson chi-square	*P*-value	Phi (φ)
Use of a mask	1.040	0.308	0.056
Vaccination	3.623	0.157	−0.057
Distancing from social gatherings	7.454	0.028	0.166
Teleworking	0.226	0.635	−0.026

4. Discussion and Conclusion

The aim of this research was to analyze citizens' perceptions regarding the response to the crisis of the COVID-19 pandemic by the Region of Attica.

From the results of the statistical analysis carried out, the Region of Attica had a high performance in terms of the evaluation by the citizens.

From the analysis of the research data, important results emerged referring to the behavior of citizens in terms of crisis and disaster management, on COVID-19 pandemic. Thus, from the results of the research, it became clear that there is a relationship between citizens' perceptions on who is responsible for managing the consequences of crises and disasters and the corresponding self-protection measures taken. The education and knowledge of the citizens, it appeared, are still important factors for their attitudes towards dealing with crises and disasters.

The main conclusion of the research is that the Region of Attica managed to implement a series of crisis management strategies that contributed to minimizing the negative effects of the pandemic. These included the early activation of emergency mechanisms, the strengthening of the health system, the adoption of new technological solutions to support teleworking and education, as well as the implementation of targeted programs to strengthen the economy and social cohesion.

The research findings highlight the need for an integrated approach to crisis management, which combines technological innovation, socio-economic support, and strong public health, with the aim of protecting citizens and ensuring the well-being of society. The experience of managing the COVID-19 pandemic offers unique lessons for strengthening the resilience and preparedness of the

Region of Attica in the face of future crises, while at the same time provoking important political and social revisions on how we collectively face the challenges posed by global health crises.

After all, local government's success in managing the COVID-19 pandemic has depended heavily on its ability to function as a dynamic, adaptive and responsive organization that is fully committed to protecting the public health and well-being of its citizens. This commitment, combined with active citizen participation and mutual trust between local government and community, will continue to be a critical pillar in addressing the pandemic and other future challenges.

5. Implications

Summarizing the above observations, the research results lead to both policy and social applications.

The first of the policy implications of the research results has to do with the need to strengthen local preparedness and response. Strengthening local crisis preparedness and response is a critical pillar of emergency management (Khan et al., 2018).

The second strategic implication of the research has to do with ensuring health preparedness. For this purpose, measures such as recruitment of specialized personnel, training of existing personnel in collaboration with specialized bodies such as universities, the purchase of specialized equipment as well as the upgrading of the existing one, the creation of stocks of medicines and other necessary health materials, as well as ensuring the continuation of the operation of health infrastructure under conditions of crises and disasters.

Finally, the development of appropriate technological solutions plays an important role in strategies (Drosos et al., 2017). Consequently, it is proposed to adopt and implement new technologies to improve communication, information management and telecommuting, to ensure the continuity of critical operations.

Regarding the social implications of the results of this research, initially actions are proposed to ensure social cohesion in cases of crises. Strengthening social cohesion is essential for coping with crises and maintaining social well-being, especially for the most vulnerable groups. The implementation of targeted programs and initiatives can significantly contribute to strengthening the resilience of citizens and societies in general. In this context, social protection programs can contribute decisively, the strengthening of services that provide psychological support and counseling to people who have faced the adverse effects of crises, the development and encouragement of the creation of solidarity and support networks, such as mutual aid groups and voluntary groups, the encouragement of volunteerism, as well as the development of platforms and applications that promote social information, interaction and mutual assistance among citizens.

In addition, securing financial support is a critical element of social applica-

tions to address the impact of a crisis, especially on businesses and financially vulnerable households. Tools such as the provision of grants to businesses and households severely affected by the crisis, to cover their operating costs as well as the temporary suspension or reduction of financial obligations to the Region of Attica, are particularly important.

Finally, measures to strengthen social resilience such as crisis management training, psychological support, and social support as well as measures that contribute to the promotion of volunteerism such as encouraging citizen participation in volunteering processes, as a means of empowerment, are deemed important of communities and crisis response.

6. Future Research Directions

The research findings also pave the way for future studies. Exploring the psychological reactions of citizens to the crisis and the implemented policies by analyzing the psychological impacts of the pandemic, levels of anxiety and fear among citizens, and the influence of demographic characteristics could inform strategies to enhance population psychological resilience.

Additionally, it would be beneficial to capture and analyze expert attitudes, complementing the typically predominant citizen perspectives in such studies. Therefore, a thorough analysis and evaluation of existing crisis management strategies are recommended to develop more effective methods and approaches for the future, incorporating insights from those tasked with implementing these strategies in the Attica Region during the COVID-19 crisis management.

Lastly, at a macro-economic level, it is suggested to assess the impact of health crisis measures on the economy. This could involve research examining the economic effects of public health measures implemented during the pandemic. The goal would be to better understand the trade-off between protecting public health and minimizing economic damage.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

Adamy, A., & Rani, H. A. (2022). An Evaluation of Community Satisfaction with the Government's COVID-19 Pandemic Response in Aceh, Indonesia. *International Journal of Disaster Risk Reduction, 69,* Article ID: 102723. https://doi.org/10.1016/j.ijdrr.2021.102723

Bamias, G., Lagou, S., Gizis, M., Karampekos, G., Kyriakoulis, K. G., Pontas, C., & Mantzaris, G. J. (2020). The Greek Response to COVID-19: A True Success Story from an IBD Perspective. *Inflammatory Bowel Diseases, 26,* 1144-1148. https://doi.org/10.1093/ibd/izaa143

Christopoulos, A. G., Kalantonis, P., Katsampoxakis, I., & Vergos, K. (2021). COVID-19 and the Energy Price Volatility. *Energies, 14,* Article No. 20.

https://doi.org/10.3390/en14206496

Delegkos, A. E., Skordoulis, M., Kalantonis, P., & Xanthopoulou, A. (2022). Integrated Reporting and Value Relevance in the Energy Sector: The Case of European Listed Firms. *Energies, 15,* Article No. 22. https://doi.org/10.3390/en15228435

Diakakis, M., Boufidis, N., Salanova Grau, J. M., Andreadakis, E., & Stamos, I. (2020). A Systematic Assessment of the Effects of Extreme Flash Floods on Transportation Infrastructure and Circulation: The Example of the 2017 Mandra Flood. *International Journal of Disaster Risk Reduction, 47,* Article ID: 101542. https://doi.org/10.1016/j.ijdrr.2020.101542

Diakakis, M., Priskos, G., & Skordoulis, M. (2018). Public Perception of Flood Risk in Flash Flood Prone Areas of Eastern Mediterranean: The Case of Attica Region in Greece. *International Journal of Disaster Risk Reduction, 28,* 404-413. https://doi.org/10.1016/j.ijdrr.2018.03.018

Diakakis, M., Skordoulis, M., & Kyriakopoulos, P. (2022). Public Perceptions of Flood and Extreme Weather Early Warnings in Greece. *Sustainability, 14,* Article No. 16. https://doi.org/10.3390/su141610199

Diakakis, M., Skordoulis, M., & Savvidou, E. (2021). The Relationships between Public Risk Perceptions of Climate Change, Environmental Sensitivity and Experience of Extreme Weather-Related Disasters: Evidence from Greece. *Water, 13,* Article No. 20. https://doi.org/10.3390/w13202842

Drennan, L. T., McConnell, A., Stark, A., & Drennan, L. T. (2014). *Risk and Crisis Management in the Public Sector* (2nd ed.). Routledge. https://doi.org/10.4324/9781315816456

Drosos, D., Chalikias, M., Skordoulis, M., Kalantonis, P., & Papagrigoriou, A. (2017). The Strategic Role of Information Technology in Tourism: The Case of Global Distribution Systems. In V. Katsoni, A. Upadhya, & A. Stratigea (Eds.), *Tourism, Culture and Heritage in a Smart Economy* (pp. 207-219). Springer International Publishing. https://doi.org/10.1007/978-3-319-47732-9_15

Drosos, D., Tsotsolas, N., Skordoulis, M., & Chalikias, M. (2018). Patient Satisfaction Analysis Using a Multi-Criteria Analysis Method: The Case of the NHS in Greece. *International Journal of Productivity and Quality Management, 25,* 491-505. https://doi.org/10.1504/IJPQM.2018.096091

Karaman, A. S., Orazalin, N., Uyar, A., & Shahbaz, M. (2021). CSR Achievement, Reporting, and Assurance in the Energy Sector: Does Economic Development Matter? *Energy Policy, 149,* Article ID: 112007. https://doi.org/10.1016/j.enpol.2020.112007

Katsampoxakis, I., Christopoulos, A., Kalantonis, P., & Nastas, V. (2022). Crude Oil Price Shocks and European Stock Markets during the COVID-19 Period. *Energies, 15,* Article No. 11. https://doi.org/10.3390/en15114090

Khan, Y., O'Sullivan, T., Brown, A., Tracey, S., Gibson, J., Généreux, M., Bonnie, H., & Schwartz, B. (2018). Public Health Emergency Preparedness: A Framework to Promote Resilience. *BMC Public Health, 18,* 1-16. https://doi.org/10.1186/s12889-018-6250-7

Kumar, A., Singh, R., Kaur, J., Pandey, S., Sharma, V., Thakur, L., Sati, S., Mani, S., Asthana, S., Sharma, T. K., Chaudhuri, S., Bhattacharyya, S., & Kumar, N. (2021). Wuhan to World: The COVID-19 Pandemic. *Frontiers in Cellular and Infection Microbiology, 11,* Article ID: 596201. https://doi.org/10.3389/fcimb.2021.596201

Lampropoulos, I., Astara, O.-E., Skordoulis, M., Panagiotakopoulou, K., & Papagrigoriou, A. (2024). The Contribution of Education and ICT Knowledge in Sustainable Development Perceptions: The Case of Higher Education Students in Greece. *Journal of*

Human Resource and Sustainability Studies, 12, 15-31.
https://doi.org/10.4236/jhrss.2024.121002

Lekkas, E., Andreadakis, E., Diakakis, M., Mavroulis, S., & Antoniou, V. (2021). Natural Disasters: Mapping and Evaluating Incidents. In E. Pikoulis, & J. Doucet (Eds.), *Emergency Medicine, Trauma and Disaster Management: From Prehospital to Hospital Care and beyond* (pp. 451-462). Springer International Publishing.
https://doi.org/10.1007/978-3-030-34116-9_34

Liu, J., Shahab, Y., & Hoque, H. (2022). Government Response Measures and Public Trust during the COVID-19 Pandemic: Evidence from around the World. *British Journal of Management, 33,* 571-602. https://doi.org/10.1111/1467-8551.12577

Mitsopoulos, G., Diakakis, M., Panagiotatou, E., Sant, V., Bloutsos, A., Lekkas, E., Baltas, E., & Stamou, A. I. (2022). "How Would an Extreme Flood Have Behaved If Flood Protection Works Were Built?" The Case of the Disastrous Flash Flood of November 2017 in Mandra, Attica, Greece. *Urban Water Journal, 19,* 911-921.
https://doi.org/10.1080/1573062X.2022.2103002

Onyeaka, H., Anumudu, C., TAl-Sharify, Z., Egele-Godswill, E., & Mbaegbu, P. (2021). COVID-19 Pandemic: A Review of the Global Lockdown and Its Far-Reaching Effects. *Science Progress, 104,* 1-18.

Petrakis, P. E., & Kostis, P. C. (2020). *The Evolution of the Greek Economy: Past Challenges and Future Approaches.* Springer Nature.

Pforr, C., & Hosie, P. J. (2008). Crisis Management in Tourism: Preparing for Recovery. *Journal of Travel & Tourism Marketing, 23,* 249-264.
https://doi.org/10.1300/J073v23n02_19

Rosenthal, U., & Kouzmin, A. (1997). Crises and Crisis Management: Toward Comprehensive Government Decision Making. *Journal of Public Administration Research and Theory, 7,* 277-304. https://doi.org/10.1093/oxfordjournals.jpart.a024349

Ross, A. G. P., Crowe, S. M., & Tyndall, M. W. (2015). Planning for the Next Global Pandemic. *International Journal of Infectious Diseases, 38,* 89-94.
https://doi.org/10.1016/j.ijid.2015.07.016

Skordoulis, M., Alasonas, P., & Pekka-Economou, V. (2017). E-government Services Quality and Citizens' Satisfaction: A Multi-Criteria Satisfaction Analysis of TAXISnet Information System in Greece. *International Journal of Productivity and Quality Management, 22,* 82-100. https://doi.org/10.1504/IJPQM.2017.085848

Skordoulis, M., Chalikias, M., Galatsidas, S., & Arabatzis, G. (2019). Competitive Advantage Establishment through Sustainable Environmental Management and Green Entrepreneurship: A Proposed Differential Equations Framework. In A. Theodoridis, A. Ragkos, & M. Salampasis (Eds.), *Innovative Approaches and Applications for Sustainable Rural Development* (pp. 205-219). Springer International Publishing.
https://doi.org/10.1007/978-3-030-02312-6_12

Skordoulis, M., Kyriakopoulos, G., Ntanos, S., Galatsidas, S., Arabatzis, G., Chalikias, M., & Kalantonis, P. (2022). The Mediating Role of Firm Strategy in the Relationship between Green Entrepreneurship, Green Innovation, and Competitive Advantage: The Case of Medium and Large-Sized Firms in Greece. *Sustainability, 14,* Article No. 6.
https://doi.org/10.3390/su14063286

Skordoulis, M., Ntanos, S., & Arabatzis, G. (2020). Socioeconomic Evaluation of Green Energy Investments: Analyzing Citizens' Willingness to Invest in Photovoltaics in Greece. *International Journal of Energy Sector Management, 14,* 871-890.
https://doi.org/10.1108/IJESM-12-2019-0015

Skordoulis, M., Ntanos, S., Kyriakopoulos, G., Arabatzis, G., Galatsidas, S., & Chalikias,

M. (2020). Environmental Innovation, Open Innovation Dynamics and Competitive Advantage of Medium and Large-Sized Firms. *Journal of Open Innovation: Technology, Market, and Complexity, 6,* 195. https://doi.org/10.3390/joitmc6040195

Zhang, M., & Zheng, W. (2024). Building Disaster Resilience through Emergency Plan Updates: A Case Study of Ya'an, China. *International Journal of Disaster Risk Reduction, 100,* Article ID: 104173. https://doi.org/10.1016/j.ijdrr.2023.104173