

Technological Dependency and Organisational Resilience of Outpatient Healthcare Facilities

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Abstract

The study analyses the organisational and decision-making preparedness of outpatient healthcare facilities in the Czech Republic for disruptions to the drinking water supply. A cross-sectional empirical investigation combining quantitative questionnaire data with a qualitative analysis of open-ended responses was conducted. The findings indicate a predominantly low to moderate level of preparedness, a lack of formalised procedures, limited operational continuity, and a strong reliance on improvisation and external actors. The preparedness of facilities is determined primarily by organisational and decision-making capacity rather than by technical self-sufficiency. The study establishes a basis for the development of decision-support tools and emphasises the importance of organisational resilience in managing infrastructure disruptions. It also contributes to a deeper understanding of the relationship between technological dependency and the governance of healthcare systems.

KEYWORDS: *critical infrastructure resilience; technological dependency; organisational resilience; outpatient healthcare; decision-making under uncertainty; continuity of care; national resilience, civil protection*

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1. Introduction

The contemporary security environment is characterised by the increasing interconnectedness of technical infrastructure, organisational arrangements, and societal processes, as a result of which the traditional separation between civil and security functions of the state is weakening. State resilience can therefore no longer be understood solely in relation to military defence, but also as the ability to maintain the functioning of essential services necessary for population protection, public health, and societal stability. The civil sector, including healthcare, thus becomes part of the broader architecture of national resilience and an important prerequisite for managing both crisis and conflict situations.

The transformation of this approach at the European level is evidenced by Directive (EU) 2022/2557 of the European Parliament and of the Council on the resilience of critical entities (CER), which strengthens the emphasis on the protection and continuity of operation of selected sectors, including healthcare [1]. The Czech legal framework responds to this development through the adoption of Act No. 266/2025 Coll., on the resilience of critical infrastructure entities [2]. At the time of this study, however, implementing regulations and designation criteria had not yet been issued that would enable the clear identification of entities falling under the critical infrastructure regime. Outpatient healthcare facilities therefore cannot be automatically considered elements of critical infrastructure in the legal sense; nevertheless, their significance must be assessed within the broader framework of the functioning of essential services.

In an environment characterised by hybrid threats and disruptions of critical infrastructure, the ability to maintain access to healthcare becomes a significant factor in system stability. Outpatient healthcare facilities represent the most extensive and most accessible segment of the healthcare system and constitute the first point of contact between patients and healthcare services. Their limitation or disruption may therefore have consequences extending beyond the healthcare sector itself, particularly in the form of secondary burden on hospital capacities, reduced accessibility of basic care, and deterioration of the population's health status [3].

Despite their systemic importance, outpatient healthcare facilities typically operate as small organisational units with limited personnel and material capacities. Their operation is based on the assumption of stable functioning of public infrastructure.

Unlike hospital facilities, they usually do not possess technical redundancy or formalised mechanisms of operational continuity. Moreover, the principles of business continuity management as defined by ISO 22301 are not systematically implemented in the environment of outpatient healthcare facilities [4].

One of the most significant infrastructural dependencies of the outpatient sector is the supply of safe drinking water. Without its availability, it is not possible to ensure hand hygiene, disinfection regimes, environmental sanitation, or routine operational activities necessary for the provision of healthcare [5, 6]. Documents of the World Health Organization have long linked the availability of water, sanitation, and hygiene to the fundamental conditions for safe healthcare and the prevention of infectious risks in healthcare facilities [5]. Under conditions of disruption of critical infrastructure, whether due to technical failures, natural disasters, or targeted hybrid actions, a disruption in the supply of drinking water represents a highly serious scenario, the consequences of which arise rapidly and whose immediate substitution is often limited in outpatient settings. Infrastructure disruption thus quickly transforms into a decision-making problem with a direct impact on the safety of provided care [6].

From the perspective of security studies, the outpatient healthcare sector can be understood as part of a broader system of essential services, the disruption of which may affect the functioning of the state as a whole. Although individual outpatient healthcare facilities are not subject to the critical infrastructure regime, their cumulative importance lies in ensuring the continuity of healthcare provision and absorbing the routine healthcare demand of the population. Limitations in their operation lead to the transfer of patients to other parts of the healthcare system, which may contribute to system overload and at the same time reduce the capacity to respond to further crisis situations.

The aim of the study is to empirically assess the level of preparedness of outpatient healthcare facilities for disruptions in the supply of drinking water in the Czech Republic, to analyse the key organisational and systemic factors that shape it, and to translate the obtained findings into a practically applicable decision-support tool. In this study, preparedness is understood as a manifestation of organisational resilience, that is, the ability of a healthcare facility to adaptively respond to disruptions of basic operational conditions in an environment of limited resources and high technological dependency.

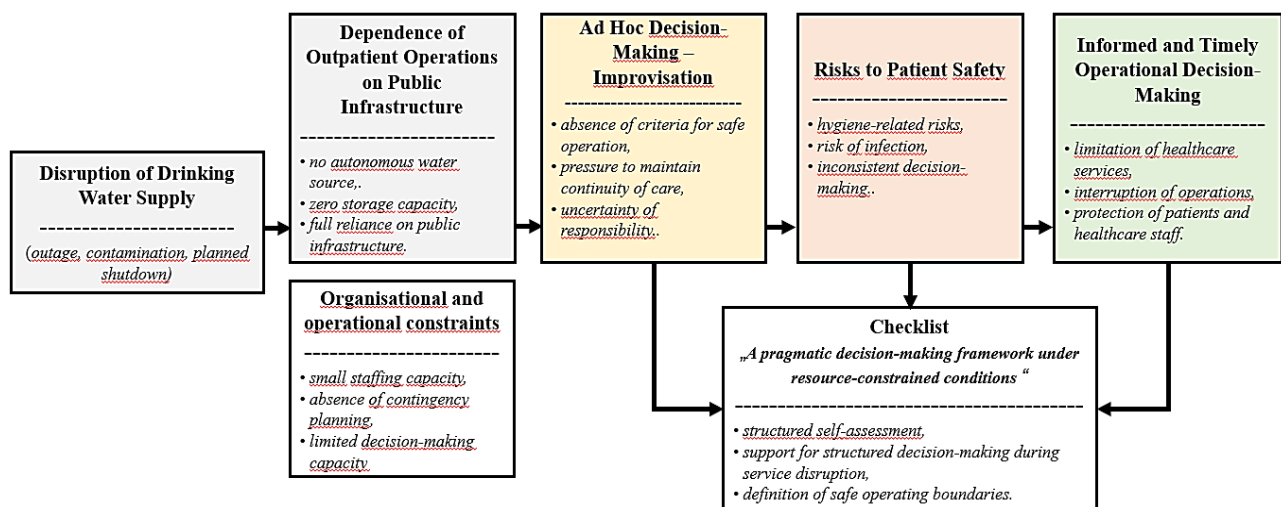


Fig. 1 Conceptual framework of preparedness of outpatient healthcare facilities for disruptions in the supply of drinking water. Source: elaborated by the authors

For the analytical conceptualisation of the relationship between technological dependency, organisational constraints, and the decision-making behaviour of outpatient healthcare facilities, a conceptual framework of the study was developed (Figure 1). The framework captures the relationships between disruption of the drinking water supply, the structural dependency of outpatient operations on public infrastructure, the emergence of ad hoc decision-making, and the associated risks to the safety of provided care. At the same time, it reflects the broader context of the resilience of essential services as part of the overall capacity of the state to withstand disruptions of critical infrastructure.

2. Materials and Methods

The methodological framework of the empirical investigation is focused on assessing the organisational and decision-making preparedness of outpatient healthcare facilities for disruptions in the supply of drinking water. The methodological approach is based on the conceptual framework of the study, which links the technological dependency of outpatient operations on public infrastructure, the organisational capacities of healthcare facilities, and decision-making processes under conditions of uncertainty.

Given the absence of standardised technical indicators of crisis preparedness in the outpatient sector, the methodology is primarily aimed at capturing the organisational and decision-making dimension of preparedness. It combines quantitative analysis of questionnaire data with qualitative interpretation of open-ended responses and with the analytical use of structured checklists as a methodological output.

2.1 Research Design

The research was designed as a cross-sectional exploratory empirical study combining quantitative and qualitative approaches. This design allows for capturing the current state of preparedness of outpatient healthcare facilities while simultaneously identifying contextual factors that influence preparedness.

The quantitative component of the research is based on a standardised questionnaire survey, which enables the structured capture of individual elements of preparedness. The qualitative component of the research is focused on the content analysis of open-ended responses from respondents, allowing for the identification of decision-making dilemmas, operational constraints, and experiences with disruptions in the supply of drinking water..

The chosen research design reflects the specific characteristics of the outpatient sector, in which preparedness cannot be assessed through technical parameters, but must be evaluated in the context of real organisational and operational conditions.

2.2 Research Sample and Data Collection

The research sample consisted of providers of outpatient healthcare services operating within the territory of the Czech Republic. The study included outpatient healthcare facilities, particularly general practitioner practices and specialised outpatient clinics, with the common characteristic being the absence of inpatient care and continuous operation.

The final research sample consisted of 30 respondents from thirty facilities (1 respondent/1 facility). The selection of respondents was purposive (purposive sampling) and focused on individuals with direct responsibility for the organisation of operations and decision-making in outpatient healthcare facilities.

Data collection was conducted from 10 November 2025 to 31 January 2026 in the form of an anonymous questionnaire survey distributed electronically via the Survio platform. The questionnaire was intended for managers or persons responsible for the organisation of operations.

2.3 Research Instrument

The questionnaire was designed as a semi-structured research instrument combining closed and open-ended questions. Its construction was based on the aim of operationalising the organisational and decision-making preparedness of outpatient healthcare facilities while simultaneously capturing real operational practice under conditions of disruption in the supply of drinking water.

The structure of the questionnaire was designed to allow the parallel capture of both formally declared measures and the actual decision-making behaviour of respondents. The questionnaire was thematically divided into the following areas:

- characteristics of the outpatient healthcare facility,
- the degree of operational dependence on the supply of drinking water,
- experience with disruptions in water supply (outages, contamination),
- the existence of formal and informal measures and procedures,
- the perception of responsibility and decision-making competences in crisis situations.

Closed-ended questions enabled the standardised capture of individual elements of preparedness and their subsequent quantitative evaluation. Open-ended questions were included in order to identify contextual factors, individual decision-making procedures, and practical constraints of outpatient operations that cannot be adequately captured through structured items.

The combination of both types of questions made it possible to link the quantitative description of the state of preparedness with qualitative insight into decision-making practice and contributed to a deeper interpretation of the collected data.

2.4 Construction of the Preparedness Index

Selected questionnaire items were systematically assigned to individual domains of preparedness on the basis of the theoretical and analytical framework of the study and subsequently transformed into a scoring system according to predefined mapping rules. Each item was assigned a value on a three-level ordinal scale of 0–2 points, where a value of 0 indicated non-fulfilment of the assessed element, a value of 1 its partial fulfilment, and a value of 2 fulfilment in full. This procedure made it possible to convert qualitatively and quantitatively heterogeneous responses into a unified evaluation framework and to establish a basis for a synthetic expression of preparedness.

The construction of the index is based on the assumption that the preparedness of an outpatient healthcare facility cannot be adequately captured by a single variable, but must be understood as an emergent property arising at the intersection of multiple interrelated organisational, hygienic, material, and decision-making factors. Based on the aggregation of the point values of individual items, a composite preparedness index was constructed for each respondent, representing a synthetic indicator of the organisational and decision-making preparedness of an outpatient healthcare facility for disruptions in the supply of drinking water.

The total raw score was calculated as the sum of the point values of all included items. All items were weighted equally, reflecting the exploratory nature of the study and the effort to maintain methodological transparency. The raw score was subsequently normalised into a percentage form to enable comparison between individual facilities and to identify distribution patterns of preparedness within the research sample. For analytical purposes, the resulting values were divided into three categories: low preparedness, medium preparedness, and high preparedness. Low preparedness corresponded to index values below 50 %, medium preparedness to values in the range of 50–79 %, and high preparedness to values of 80 % and above.

The process of constructing the preparedness index, including the mapping of questionnaire items into domains, scoring, aggregation, and final categorisation, is schematically illustrated in Figure 2.

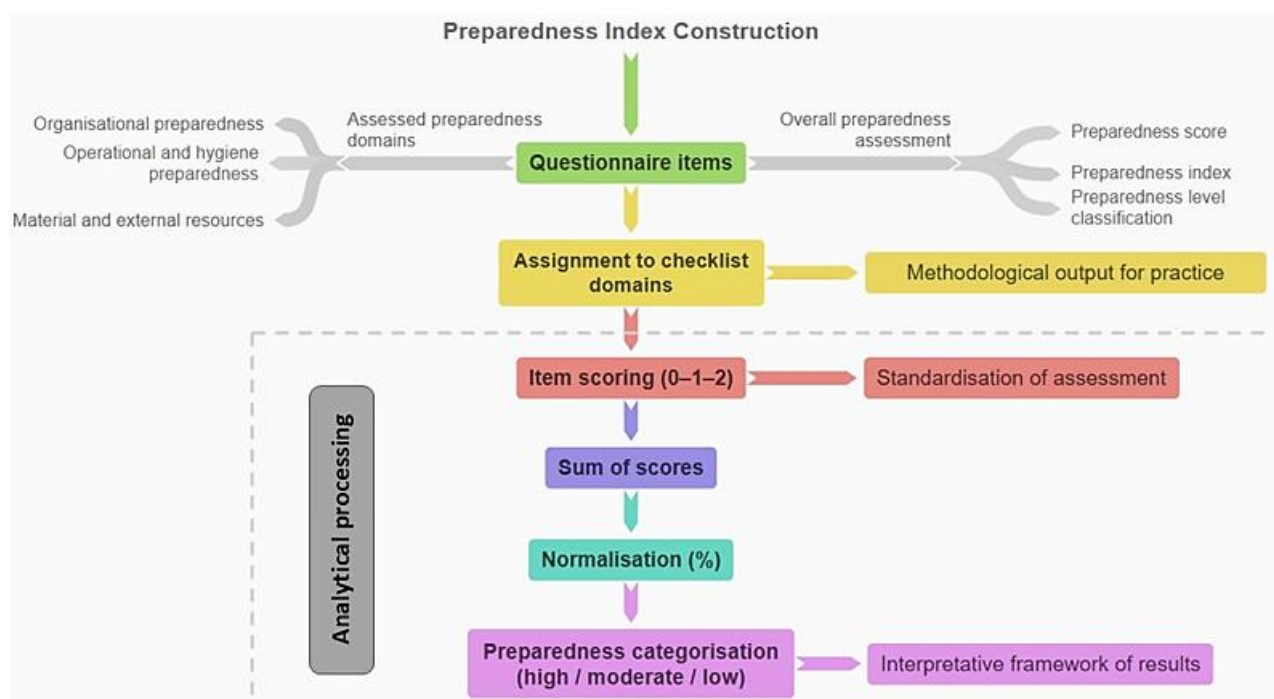


Fig. 2. Scheme of the construction of the preparedness index of outpatient healthcare facilities
Source: elaborated by the authors

The preparedness index is not conceived as a measure of technical security nor as a normative indicator of compliance with external standards. Its function is the analytical operationalisation of preparedness in the conditions of the outpatient sector and the capture of organisational and operational differences between individual facilities. The constructed index enables not only a quantitative evaluation of the level of preparedness, but also the identification of structural weaknesses and recurring behavioural patterns that are relevant for interpreting the results in the context of healthcare system resilience.

An important methodological aspect is that the scoring was assigned algorithmically on the basis of predefined rules, thereby reducing inter-rater variability and strengthening the internal consistency of the results. The preparedness index therefore does not represent a subjective assessment, but a standardised output based on a uniform transformation procedure. In addition to the composite index, basic descriptive statistical indicators were also used in the analysis of questionnaire data, in particular absolute and relative frequencies of responses within individual categories.

2.5 Checklists as a Methodological Output

Based on a synthesis of the relevant scientific literature, an analysis of the applicable legal framework, and the interpretation of empirical data obtained through the questionnaire survey, structured checklists were developed as a key methodological output of the study [7,8,11]. The checklists were not used as a data collection tool, but as an analytical and application-oriented instrument intended to translate identified empirical findings into a practically applicable form for the outpatient healthcare environment. Their purpose is not audit or compliance control with normative requirements, but decision support, enabling healthcare professionals to make informed, timely, and safe decisions in the event of

disruptions in the supply of drinking water. This logic is consistent with recently developed risk-based preparedness tools designed for healthcare facilities [11]. An overview of the identified domains, their content specification, and the associated risks is presented in Table 1.

Table 1. Domains of preparedness of outpatient healthcare facilities and their risk interpretation

Domain	Assessed Aspect	Example Item	Risk in Case of Non-Compliance
Information and communication	decision-making competence	Is a responsible person designated for decisions on the operational regime?	chaos, delay in decision-making
Hand hygiene	alternative hygiene procedures	Is there a safe alternative for hand hygiene in the absence of drinking water?	increased risk of infection
Environmental hygiene	disinfection regime	Is an alternative regime for disinfection of work surfaces defined?	environmental contamination
Care provision regime	limitation of services	Are limits for the safe scope of care predefined?	clinical risk
Material minimum	basic supplies	Is a minimum amount of water secured for the first hours of disruption?	critical operational delay
External coordination	interdependencies	Are contacts for the facility manager or water supplier known?	ineffective cooperation
Learning from the incident	documentation and reflection	Is the emergency event recorded and evaluated?	recurrence of errors

Source: elaborated by the authors

The checklists were not used as a data collection tool, but as an analytical and application-oriented instrument intended to translate identified empirical findings into a practically applicable form for the outpatient healthcare environment. Their purpose is not audit or compliance control with normative requirements, but decision support, enabling healthcare professionals to make informed, timely, and safe decisions in the event of disruptions in the supply of drinking water. They are intended for independent application directly within outpatient operations and serve as a supporting decision-making tool in situations of limited or disrupted water supply. Their benefit lies in enabling rapid orientation in critical areas of operation, identifying potential weaknesses, and providing a structured assessment of the minimum conditions for safe healthcare delivery under non-standard conditions. The objective is not to maximise technical self-sufficiency, but to support adaptive operational management in an environment of limited resources.

The structure of the checklists is thematically organised into key domains of preparedness derived from recurring weaknesses, decision-making dilemmas, and operational constraints identified in the empirical investigation. These domains represent operationalised areas of risk in which critical points influencing the ability of outpatient healthcare facilities to respond to infrastructural disruption are concentrated. Their definition was designed to capture decision-making nodes in outpatient operations during outages or contamination of drinking water supply, while simultaneously encompassing organisational, hygienic, material, and coordination aspects of preparedness.

2.6 Qualitative Analysis

The qualitative analysis was based on open-ended responses obtained from the questionnaire survey and was conducted using the method of content analysis. Its purpose was to identify recurring thematic patterns, decision-making dilemmas, and operational constraints that cannot be fully captured through quantitative scoring.

The analytical procedure consisted of the systematic categorisation of responses into thematic areas reflecting key dimensions of preparedness, particularly decision-making, organisational arrangements, and responses to disruptions in the supply of drinking water. The identified categories were subsequently interpreted within the context of the conceptual framework of the study and used to complement and refine the quantitative findings.

The significance of the qualitative analysis was particularly evident in the interpretation of situations in which a low or medium level of preparedness did not result from the passivity of healthcare providers, but from objective legal, technical, or organisational constraints of outpatient operations. The analysis of open-ended responses thus made it possible to distinguish between an actual absence of preparedness and situations in which the limitation or interruption of operations represented a deliberate and safety-justified decision.

The qualitative component of the research contributed to a deeper understanding of the relationship between technological dependency and organisational behaviour and made it possible to interpret preparedness as a dynamic, context-dependent decision-making capability rather than a static state.

2.7 Ethical Aspects

The research was conducted in accordance with generally accepted ethical principles of research in the field of healthcare management and crisis preparedness. Prior to the commencement of the survey, respondents were informed

about the purpose of the study, the voluntary nature of participation, and the manner in which the collected data would be processed.

Participation in the research was entirely voluntary and was not associated with any form of pressure or any form of compensation. Respondents could refuse to participate or withdraw from the study at any time without any negative consequences.

The collected data did not relate to patients or clinical health data, but exclusively to organisational and operational aspects of healthcare provision. All data were anonymised and processed in aggregated form so that individual healthcare facilities or specific respondents could not be identified.

The chosen research design minimised ethical risks and complied with standards of personal data protection as well as principles of responsible research in the field of healthcare services.

3. Results

The empirical findings provide a comprehensive picture of the organisational and decision-making preparedness of outpatient healthcare facilities for disruptions in the supply of drinking water in the conditions of the Czech Republic. The analysis is based on the evaluation of questionnaire data through a composite preparedness index and on the qualitative interpretation of open-ended responses from respondents, with the results framed within the context of technological dependency and organisational resilience.

Attention is focused on the identification of recurring behavioural patterns, structural constraints, and decision-making mechanisms that influence the ability of healthcare facilities to respond to infrastructural disruptions. The results are therefore not understood solely as descriptive outputs of the questionnaire survey, but also as indicators of systemic characteristics of the outpatient sector.

3.1 Nature and Context of the Findings

The empirical data indicate that disruptions in the supply of drinking water are not systematically perceived in the outpatient sector as a managed operational risk, but rather as an extraordinary event addressed in an ad hoc manner [7]. This perception is reflected in the absence of formalised continuity mechanisms and in the predominance of reactive decision-making [8]. At the same time, the structure of the research sample confirms that the outpatient sector is predominantly composed of small organisational units with limited personnel capacities. The typical model of one physician and one nurse, or a small team, represents not only an organisational characteristic but also a structural constraint that significantly reduces the ability to simultaneously ensure clinical operations and crisis management.

The size and organisational simplicity of outpatient healthcare facilities thus emerge as significant determinants of vulnerability. Under conditions of disruption in the supply of drinking water, these characteristics directly translate into a limited capacity to respond during the time-critical initial phase of the first hours, when external support is usually not yet available.

3.2 Formal and Practical Preparedness

The analysis of the data clearly demonstrates a deficit of formalised preparedness across the examined sample. The majority of outpatient healthcare facilities do not have internal procedures or crisis plans in place for situations involving disruption or contamination of the drinking water supply. Where certain measures are implemented, they tend to be fragmentary in nature and lack a clearly defined decision-making framework.

A significant finding is the asymmetry between external and internal preparedness. Outpatient healthcare facilities show a strong orientation towards external actors, particularly water suppliers, facility managers, or public administration authorities, while internal measures supporting operational autonomy remain limited. This imbalance indicates a high degree of both technological and organisational dependency on the surrounding infrastructural environment [3].

The initial phase of disruption can be considered particularly critical, as some facilities have no immediately deployable measures available. The absence of preparedness within this time window significantly limits the ability to make safe decisions regarding the continuation, limitation, or suspension of healthcare provision.

This situation is confirmed by the respondents' self-assessment. The predominance of ratings at the level of rather insufficient or completely insufficient preparedness corresponds with the empirically identified absence of systematic measures. The consistency between self-assessment and other findings strengthens the validity of the results and suggests that healthcare providers are aware of their limitations. The identified shortcomings should therefore not be interpreted as individual failure, but as a manifestation of the structural characteristics of the outpatient sector, which is not configured for the autonomous management of infrastructural disruptions.

3.3 Qualitative Dimension of Preparedness

The qualitative analysis shows that the deficit in preparedness is not primarily associated by respondents with a lack of technical resources, but rather with the absence of decision-making support. Open-ended responses repeatedly

point to the need for simple, comprehensible, and immediately applicable procedures that would enable rapid orientation in situations involving disruption of the drinking water supply.

The requirement is not directed towards extensive crisis plans, but towards reduced, step-structured tools corresponding to the real capacities of outpatient operations. The emphasis on the operationalisation of decision-making confirms that a key dimension of preparedness is the ability to translate an uncertain situation into a structured decision-making process [8]. An important role is also played by the need for clearly defined responsibilities and a basic level of staff preparedness. Without the institutional anchoring of roles and without minimal training, even available measures lose their practical usability. In addition, there is a recurring demand for minimal material self-sufficiency, particularly in relation to hygiene procedures and short-term operational continuity. However, this element does not represent the central finding, but rather complements the fundamental need for a decision-making structure.

The qualitative findings indicate that, alongside material measures, respondents primarily lack a clearly structured procedure for decision-making in non-standard situations.

3.4 Resulting Distribution of the Preparedness Index

The evaluation of the composite preparedness index shows that the majority of outpatient healthcare facilities fall into the category of low to medium preparedness, while a high level of preparedness is represented only marginally.

The distribution of the resulting values corresponds both to the declared measures and to the subjective assessments of respondents, which supports the internal consistency of the chosen analytical approach. Low index values are associated in particular with the absence of formalised procedures, limited operational autonomy, and a pronounced dependence on external actors.

In this sense, the composite preparedness index proves to be an appropriate tool for the synthetic capture of the organisational and decision-making dimension of preparedness. Its contribution does not lie in predicting the future behaviour of healthcare facilities, but in identifying structural patterns that characterise the outpatient sector as a whole.

3.5 Implication-Based Interpretation of the Results

The results of the study show that the level of preparedness of outpatient healthcare facilities is significantly influenced by the existence or absence of an organisationally embedded decision-making framework. A lower level of preparedness was associated primarily with a lack of formalised continuity mechanisms, unclear definition of responsibilities, and limited availability of pre-prepared alternatives [8].

At the same time, the empirical data confirm the existence of a systemic gap between the requirements of crisis management and the actual capacities of outpatient healthcare facilities. This gap is manifested in the predominance of improvised approaches, the absence of standardised measures, and dependence on external support in the event of disruption to the drinking water supply [7].

The results further indicate that differences in the level of preparedness are not determined solely by the presence of individual measures, but also by the ability to translate a non-standard situation into a structured decision-making process. The findings also demonstrate a relationship between the level of preparedness, limited internal reserves, and dependence on the external environment [3].

4. Discussion

The obtained results show that the preparedness of outpatient healthcare facilities for disruptions in the supply of drinking water cannot be interpreted merely as a set of individual measures, but rather as a manifestation of a broader relationship between technological dependency, organisational constraints, and decision-making capacity. The interconnection between infrastructural conditions and decision-making processes proves to be a key factor influencing the safety of provided care.

The empirical findings thus do not only indicate the level of preparedness of individual facilities, but also reveal the structural characteristics of the outpatient sector, whose functioning is long-term based on the stability of external infrastructure and a limited level of internal reserves.

4.1 The Outpatient Sector as a Specific Zone of Vulnerability

In this context, outpatient healthcare facilities emerge as a segment of the healthcare system whose systemic importance is not accompanied by a corresponding level of formal operational resilience. The outpatient sector provides a significant portion of everyday healthcare; however, it operates within a regime based on the implicit assumption of stable functioning of public infrastructure. When this stability is disrupted, the ability to continue providing care safely is significantly limited.

The nature of this vulnerability is neither incidental nor marginal. It does not arise solely from the absence of individual technical measures, but from the broader structural configuration of outpatient operations. A limited number of staff, constrained spatial and material resources, the absence of technical redundancy, and a high dependence on external suppliers create a set of factors that weaken both absorption and adaptation capacities in the event of disruption

of essential services. Outpatient healthcare facilities therefore cannot be understood merely as a smaller-scale operational variant of hospital facilities, but rather as a qualitatively distinct type of healthcare operation whose vulnerability becomes fully apparent when it is necessary to move beyond the framework of standard functioning [3, 9].

At the same time, empirical data indicate that healthcare providers are aware of this vulnerability and perceive their own limitations relatively realistically. This leads to an important interpretative conclusion: the problem does not lie in a lack of awareness of risk, but in the absence of structures, tools, and decision-making support that would enable effective risk management. The discussion on the preparedness of the outpatient sector therefore cannot remain limited to the level of technical requirements, but must also encompass issues of organisational arrangement, methodological support, and decision-making capacity.

4.2 Disruption of Drinking Water Supply as Both an Operational Incident and a Systemic Test of Resilience

One of the significant contributions of the study is a shift in the interpretation of outages or contamination of the drinking water supply. In routine operational thinking, such a situation is often understood as a technical incident, the resolution of which lies largely outside the healthcare facility itself. However, the empirical findings show that in the outpatient care environment, disruption of the drinking water supply has an immediate impact on hygiene standards, decision-making regarding the scope of provided care, the safety of patients and staff, and the actual continuity of operations. It is therefore not merely a technical infrastructure problem, but an event that tests the functional limits of the outpatient sector as part of essential services.

This interpretation is also important in relation to broader frameworks of resilience of critical entities and infrastructure. Although individual outpatient healthcare facilities cannot be automatically classified as elements of critical infrastructure, their aggregate importance for the functioning of the healthcare system is undeniable. In this context, a disruption of drinking water supply does not manifest in isolation, but as a disruption of a condition on which outpatient care is existentially dependent. Such an understanding corresponds to a broader concept of resilience that emphasises not only the protection of formally designated critical elements, but also the ability to maintain the provision of essential services when their infrastructural preconditions are disrupted.

The study therefore supports the interpretation of drinking water supply as an infrastructural dependency with significant operational implications. It is precisely in outpatient practice that the interconnection between technical conditions, hygienic requirements, organisational constraints, and decision-making responsibility becomes evident. A disruption of drinking water supply thus becomes not only an extraordinary event, but also an analytical lens through which the actual level of resilience of the outpatient sector can be observed.

From this perspective, disruption of the drinking water supply in the outpatient sector can be understood not only as an operational problem, but also as a test of the functionality of a part of civil infrastructure essential for maintaining the stability of the healthcare system and, in a broader sense, societal resilience.

4.3 Preparedness as Decision-Making Capacity Rather than Technical Autonomy

A key interpretative conclusion of the study is that, in this context, the preparedness of outpatient healthcare facilities cannot be equated with technical self-sufficiency. Such an understanding would be both methodologically misleading and practically inappropriate. The outpatient sector is not designed as a technically autonomous infrastructure. Real resilience is therefore not manifested in the ability to fully replace external infrastructure, but in the ability to recognise emerging risks in a timely manner, assess the limits of safe operation, and make responsible decisions regarding the limitation, modification, or suspension of care provision.

This logic corresponds to the contemporary understanding of resilience in healthcare systems. In this sense, resilience does not mean the ability to continue under all circumstances, but the ability to respond adaptively while maintaining the safety of essential functions [3, 9]. In the outpatient environment, resilience thus takes on primarily an organisational and decision-making character. What is decisive is not the existence of technological dependency itself, but whether it is accompanied by mechanisms that enable safe, consistent, and timely decision-making.

In this respect, the study results reveal a significant deficit. The lack of formalised procedures, unclear delineation of responsibilities, and the limited availability of pre-prepared alternatives reinforce improvisation as the dominant mode of response. Improvisation in itself does not necessarily represent a negative phenomenon; in certain situations, it constitutes a necessary component of adaptation. However, a problem arises when it does not build upon an existing structure, but rather replaces it. The empirical findings show that in the outpatient sector, improvisation often does not function as an exceptional supplement to response, but rather as a routine element of managing situations.

4.4 Decision-Making Deficit as the Core of the Problem

The qualitative part of the research showed that respondents do not require complex crisis documentation or extensive technical modernisation. The most frequently articulated need is for a simple, comprehensible, and rapidly applicable decision-making framework. This finding is significant, as it shifts the focus of the discussion towards the conditions for safe and timely decision-making.

Decisions on whether care provision can continue, to what extent, and under what hygienic conditions are, in many cases, left to the individual without sufficient support from a pre-established structure. This creates space for variability in decisions, uncertainty, as well as delayed or safety-compromising responses.

In this context, the importance of the proposed checklists comes to the forefront. Their contribution does not lie in replacing comprehensive crisis management, but in providing a reduced yet functional framework for decision-making under conditions of limited resources. In this sense, they correspond to the principle of “good enough governance”, that is, an approach that does not strive for an ideal state, but for a sufficiently robust, practically applicable, and safety-oriented mode of action under constrained conditions [8]. For the outpatient sector, such an approach is particularly appropriate, as it respects its operational reality rather than imposing disproportionate standards upon it.

4.5 Checklist as a Bridge Between Empirical Findings and Operational Practice

The proposed checklists A and B (Appendix 1, Appendix 2) represent an application-oriented output that elevates the value of the study beyond the level of purely descriptive research. They are not an add-on to the article, but a direct response to the identified empirical gap. Their construction is based on recurring weaknesses identified in the questionnaire survey and translates them into a practically applicable decision-making tool, in line with other risk-based preparedness instruments developed for healthcare facilities [11].

From a methodological perspective, it is important that the checklist is not intended as a compliance control instrument, but as a tool supporting operational orientation, self-assessment, and the rapid activation of decision-making processes. This distinguishes it from conventional audit mechanisms. Its purpose is not to determine whether a facility is “formally prepared”, but to help practitioners verify whether the minimum conditions for safe decision-making are met. Such an approach is fully consistent with the findings of the qualitative component of the research, which do not indicate a need for further formalisation, but rather for usability.

In a broader context, the checklist can be understood as a tool of micro-governance at the level of frontline healthcare services. It enhances the predictability of decision-making, reduces dependence on purely individual judgement, and creates a minimal shared structure for action under conditions of uncertainty. In doing so, it contributes to organisational resilience without the need for extensive technical investments. This represents an important conclusion not only for healthcare practice, but also for health policy, as it demonstrates that strengthening the resilience of the outpatient sector does not have to be primarily a matter of capital expenditure, but rather of well-designed methodological and decision-support tools.

4.6 Limitations of the Study and Implications for Further Research

Despite its analytical and application value, the study has several limitations. The questionnaire survey is based on respondents’ self-assessment and therefore subjective bias cannot be entirely excluded. The research sample is relatively small and purposively constructed, which does not allow for statistical generalisation of the findings to the entire outpatient sector in the Czech Republic. Moreover, the composite preparedness index does not represent a tool for predicting the future behaviour of healthcare facilities in real emergency situations, but rather an analytical framework intended to capture patterns of organisational and decision-making preparedness.

However, these limitations do not diminish the significance of the findings, but rather define the framework for their interpretation. The study does not provide a representative statistical picture of the entire sector, but an analytically grounded insight into the structural mechanisms of vulnerability and preparedness. Its contribution therefore lies not in the extent of generalisability, but in the quality of conceptualisation and in its ability to link empirical findings with a practically applicable methodological output.

Further research should focus on verifying the applicability of the proposed checklists in real operational settings, or on their differentiation according to the type of outpatient healthcare facility. It would also be beneficial to extend the research to other infrastructural dependencies, particularly electricity supply, communication systems, and the availability of digital services. In a broader European context, a comparative analysis with healthcare systems characterised by different regulatory and organisational arrangements of outpatient care would also be valuable.

5. Conclusions

The study contributes to understanding the preparedness of outpatient healthcare facilities for disruptions in the supply of drinking water in the conditions of the Czech Republic and demonstrates that the resilience of the outpatient sector must be understood primarily in organisational and decision-making terms. The significance of the findings lies not only in the identification of partial deficiencies, but above all in highlighting the structural conditioning of vulnerability in outpatient care, whose operation is long-term based on the stability of public infrastructure and a limited level of internal reserves.

A key implication of the study is that the preparedness of the outpatient sector cannot be reduced to the level of technical security. In the context of outpatient care, the decisive factor is the ability to make timely, informed, and safety-oriented decisions under conditions of limited resources and high technological dependency. Organisational and decision-making capacity thus represent the key determinants of resilience, while technical autonomy remains a secondary and only partially attainable factor.

The significance of the composite preparedness index lies primarily in its analytical grasp of an otherwise difficult-to-operationalise concept of preparedness in the outpatient sector. Its contribution is not predictive, but interpretative: it enables the identification of recurring patterns of organisational behaviour and structural weaknesses that are relevant for expert reflection and further research.

A practical output of the study is the proposal of structured checklists (Appendices 1 and 2), which can support orientation and decision-making of outpatient healthcare facilities in critical situations. In this sense, they represent a realistic approach to strengthening resilience under conditions of limited capacities and correspond to the principle of “good enough governance”.

From a broader perspective, the study shows that the infrastructural security of the outpatient sector cannot be strengthened solely through technical measures. It requires the development of decision-making structures, methodological support, and a realistic setting of requirements for crisis preparedness. Strengthening the resilience of outpatient care therefore represents not only a matter of healthcare practice, but also a component of enhancing national resilience to disruptions of critical infrastructural functions.

At the same time, space is opened for further research, particularly in the area of verifying the proposed tools in real operational settings and under other types of infrastructural disruptions. The findings already provide a relevant basis for professional discussion as well as for the formulation of measures at the level of healthcare practice and health policy, which should take into account the specific characteristics of the outpatient sector as an integral part of the system for the protection of population health.

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