

Individual Threat Perception and Limits of Household Preparedness in Helsinki, Riga and German Cities

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Abstract

European security policy increasingly relies on comprehensive defence and responsabilisation, expecting households to follow contingency protocols and sustain themselves for at least 72 hours. Using 2025 urban survey data from Helsinki (Finland), Riga (Latvia) and the German cities of Berlin, Hamburg and Munich, this article shows that urban populations are underprepared. Further, we examine whether threat salience, identifying a hazard as a personal concern, translates into threat-appropriate preparedness. We assess both material and cognitive indicators. Findings show a persistent perception–action gap across all sites. Helsinki exhibits comparatively higher cognitive awareness but low material readiness; Riga and the German cities display even weaker alignment across cognitive and material domains. Among respondents worried about specific hazards, preparedness does not improve for recommended actions. We argue that responsabilisation is under-communicated and under-operationalised for urban realities even in high responsabilisation models like Finland. Meeting EU/NATO ambitions requires clear thresholds, local scaffolding and behaviourally savvy interventions that make preparedness feasible within the everyday constraints of city life.

Keywords: *comprehensive defence, civil preparedness, threat perception, total-defence, 72-hours, individual responsibility, crisis resilience, NATO Article 3, Baltic security, urban preparedness*

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Introduction

Across Europe, the security landscape has become increasingly volatile, shaped by overlapping geopolitical, environmental, technological and societal risks. Russia's full-scale invasion of Ukraine, escalating hybrid operations across the EU, intensifying climate-related disasters and the weaponisation of information ecosystems have collectively undermined long-standing assumptions about stability in the European neighbourhood. Scholars and policymakers alike argue that the complexity of contemporary crises demands whole-of-society resilience (Rhinar 2021; Wither 2020; Saxi, Bengt & Swaney 2020). Within this strategic environment, European governments have increasingly embraced models of comprehensive or total defence, where the capacities of individuals and households form a foundational layer of national security (Berzina 2020; Cimermanis 2025).

In 2025, the Commission's Preparedness Union Strategy (2025) set out a coordinated framework to strengthen societal resilience by improving foresight and anticipation, safeguarding vital societal functions and promoting population preparedness, including guidance to reach minimum 72-hour self-sufficiency for households during disruptions. Building on the Niinistö Report (2024), the Strategy positions citizens at the core of preparedness, emphasising public awareness, empowerment and concrete, guidance-based measures that households can enact in the first 72 hours of a crisis (Niinistö 2024). These developments reflect a consensus that Europe's security challenges cannot be met by institutional capacity alone, and that they require an active, informed and prepared population.

A parallel transformation has unfolded within NATO, where the civilian dimension of defence has been elevated to a strategic priority. Civil preparedness has been a foundational pillar of NATO's collective defence since the Alliance's inception. Article 3 of the Washington Treaty established each Ally's obligation to develop and maintain the capacity to resist armed attack beyond military means alone, an obligation that NATO operationalised as early as the 1950s through a network of civil wartime planning agencies covering shipping, transport, food, industry and refugee management (Jacuch 2024). After a post-Cold War contraction, this commitment was renewed at the 2016 Warsaw Summit, where Allies agreed on seven baseline requirements for national resilience, covering continuity of government and critical services, energy, population movements, food and water, mass casualties, civil communications, and transport, thus providing

a shared framework against which member states assess and strengthen their own preparedness (NATO 2016; Jacuch 2024). It is important to note that these baselines are directed at the national level: They define state-level capabilities and institutional continuity, not the behaviour of individual households. The Alliance is striving to develop a whole-of-society approach to resilience (Garriaud-Maylam 2021), and the EU's Preparedness Union Strategy (2025) complements NATO's national-level framework by explicitly extending preparedness obligations downward to the population level, incorporating the 72-hour household self-sufficiency standard as the operational expression of societal readiness (European Commission 2025; Niinistö 2024). It is therefore at this EU policy level, rather than directly through NATO's baseline requirements, that the expectation of household-level preparedness is formally anchored. For frontline and near-frontline states in the Baltic region, these expectations have accelerated reforms that assign clearer responsibilities to municipalities, social institutions and, increasingly, to individual citizens (Larsson 2021).

Yet despite these converging policy pressures, there is limited evidence that households across Europe possess the knowledge, resources or behavioural readiness envisioned by EU and NATO strategies. Research consistently finds that individual preparedness often lags behind official guidance due to psychological avoidance, information ambiguity, structural constraints and mismatches between perceived and official risk priorities (European Commission 2024; Eiser, Bostrom & Burton 2012; Kohler et al. 2020; Scolobig et al. 2015). As a result, a persistent implementation gap remains between the expectations embedded in comprehensive defence doctrines and the actual capacities of ordinary residents, particularly in dense and infrastructure-dependent urban settings.

This article examines that gap using original 2025 survey data from three key urban centres in the northern and central Baltic Sea region – Helsinki (Finland), Riga (Latvia) and the German cities of Berlin, Hamburg and Munich (Birka 2026). These countries represent distinct civil-protection traditions. Finland, with its long-standing total-defence model, embeds individual responsibility for preparedness in both constitutional expectations and practical guidance. Latvia, while historically focused on military defence, has recently incorporated Finnish-style civil preparedness expectations, including 72-hour self-sufficiency, into national doctrine and education policy. Germany's approach, rooted in its federalist system and less explicit emphasis on citizen responsibility, relies more on institutional protection and a whole-of-government framework. These differences provide a fertile basis for exploring how national strategies translate into individual perceptions and behaviours.

We first map threat perception and preparedness at the urban level. We then test country-anchored hypotheses derived from our theoretical discussion of responsabilisation and behavioural risk dynamics, examining whether the align-

ment between identifying a threat as personally salient and taking threat-appropriate actions varies systematically by national approach: stronger in Helsinki's high-responsibilisation model, moderate in Riga's transitional model and weak or absent in the German cities' institution-centred model.

Our findings highlight a persistent misalignment between policy ambition and public readiness. While several threats are widely recognised across the cities, actual preparedness actions remain limited regardless of the exposure and duration of civil-protection strategies. Further, this remains applicable even in instances when individuals rate a threat as personally salient. These insights contribute to ongoing debates on comprehensive defence, crisis governance, and the ethics and effectiveness of responsabilisation in European security policy, reinforcing the need to align household-level guidance with realistic behavioural pathways. Ultimately, we argue that EU and NATO expectations for household-level resilience will remain unmet without clearer, more operational communication; actionable, low-cost guidance; and supportive mechanisms that reflect the constraints of urban life.

Resilience, comprehensive defence and the expanding role of the individual

Resilience has become a central paradigm in contemporary security governance, reflecting a shift toward managing complex, interconnected risks through distributed rather than centralised capabilities. Originating in ecological systems theory (Holling 1973), resilience has since been adopted in disaster studies, critical infrastructure protection and national security as a framework for ensuring the continuity of essential functions under stress (Adger 2000; Comfort et al. 2010). In the European context, resilience is embedded in civil-protection cooperation (Widmalm, Parker & Persson 2019) and emerging models of whole-of-society security (Wigell et al. 2022).

Within comprehensive and total-defence models, resilience is operationalised across governmental, municipal, private-sector and societal actors. Northern European states have institutionalised a systemic approach in which preparedness responsibilities are dispersed across all sectors of society, including households (Bachmann & Gunneriusson 2015; Wither 2020). These frameworks emphasise both material readiness and cognitive readiness. As Rhinard (2021) argues, societal security increasingly hinges on fostering 'prepared subjectivities', in which individuals understand themselves as integral components of crisis management.

Yet research in disaster studies demonstrates that individual preparedness is highly uneven and influenced by emotional, structural and informational variables. Lindell and Perry (2012) show that household readiness depends not only on risk awareness but also on socio-economic capacity, prior experience and trust in authorities. Eiser et al. (2012) emphasise that risk interpretation is

shaped by cognitive filters, social norms and heuristics rather than objective probabilities. These insights suggest that the individual's role in comprehensive defence cannot be assumed; it must be understood within broader behavioural and institutional contexts.

Responsibilisation and neoliberal governmentality in crisis preparedness

The growing emphasis on individual preparedness aligns with a wider political shift toward responsibilisation, wherein states encourage or expect citizens to assume responsibility for managing risks previously handled by public institutions. This concept, rooted in Michel Foucault's work on governmentality (Foucault 1980; 1985), has been elaborated by scholars examining how contemporary governance increasingly seeks to shape autonomous, self-managing subjects (Rose 1999; 2000).

Responsibilisation operates through soft instruments, public awareness campaigns, guidance documents, preparedness booklets and discourses of civic duty rather than mandates or coercion (Rose & Miller 1992; Rose 1999). Löwenheim (2007) and Tsinovoi and Adler-Nissen (2018) illustrate how governments externalise elements of security provision to individuals through informational tools, reframing protection as a matter of personal choice and responsibility. In crisis management, this shift positions individuals as both beneficiaries and producers of security.

Critical scholarship has interrogated the normative implications of this trend. Rådestad and Larsson (2020) argue that Swedish crisis-preparedness discourse moralises individual responsibility, extending biopolitical governance by requiring citizens to anticipate and manage disruptions. Baker and Ludwig (2016) describe disaster preparedness as a form of social ordering that legitimises the retrenchment of state responsibility. Pyysiäinen, Halpin, and Guilfoyle (2017) similarly highlight how neoliberal governance frames vulnerability as an individual problem, thereby obscuring structural inequalities that constrain households' preparedness capacities.

These perspectives illuminate the tension between policy expectations and practical feasibility. While responsibilisation seeks to empower individuals, it may also produce unrealistic expectations. Research across behavioural public policy further shows that intention does not easily translate into action without clear, actionable guidance and supportive environmental cues (Sunstein 2021; Thaler & Sunstein 2008).

Threat perception, behavioural dynamics and the preparedness gap

A central theoretical puzzle concerns the relationship between threat perception and preparedness behaviour. Conventional models of risk assume that individuals who perceive risks as serious will act accordingly (Rosenstock 1974); however,

decades of empirical work suggest otherwise. Research in the psychology of risk shows that affective responses such as fear, avoidance and fatalism frequently override rational assessments and can inhibit protective action even when perceived severity is high (Slovic 1987). Disaster-preparedness studies similarly find that readiness is shaped by motivational factors, self-efficacy, prior experience, social networks and trust and not merely by assessments of hazard probability (Paton 2003; Tierney 2014).

Information ambiguity also plays a critical role in shaping whether concern becomes behaviour. When guidance is vague or generic, people struggle to evaluate what being prepared concretely entails, often over-estimating their own readiness (Boin et al. 2020; Kohler et al. 2020). Scolobig et al. (2015) further show that initiatives falter when they neglect how people process risk information by relying on abstract exhortations instead of translating recommendations into simple, actionable steps that fit everyday constraints.

These dynamics carry weight in comprehensive or total-defence systems, which presume that households will autonomously internalise preparedness responsibilities. Empirical studies, however, indicate that preparedness behaviour is moderated by institutional trust, contextual threat histories and cultural narratives about state protection versus self-reliance (Adger et al. 2009; Tierney 2014). As a result, perceiving a threat as severe does not reliably produce proportionate action, especially when protective tasks are complex or aversive, when instructions are ambiguous, or when individuals lack confidence or knowledge (Slovic 1987; Paton 2003; Eiser et al. 2012).

At the same time, there are well-specified conditions under which identifying a threat as personally salient can trigger preparedness. First, when risk appraisal is paired with clear, concrete guidance, individuals are more likely to translate concern into behaviour because ambiguity and perceived complexity are reduced (Boin et al. 2020; Kohler et al. 2020). Second, coping appraisal matters. Recommendations that are simple, affordable and demonstrably effective increase self-efficacy and dampen avoidance (Paton 2003; Tierney 2014). Third, social and institutional cues such as school curricula, municipal drills, workplace routines and trusted messengers convert abstract fear into procedural knowledge, narrowing the intention–action gap (Scolobig et al. 2015; Adger et al. 2009). In short, personally salient threats induce action when communication is specific rather than generic, when households believe the steps will work and are within reach, and when local institutions scaffold learning (Slovic 1987; Paton 2003).

Resilience in urban conditions

Urban resilience must be theorised with the distinct material and behavioural constraints of cities in view. Dense, service-intensive urban environments foster just-in-time household routines rather than stockpiling, while interdependent infrastructures mean that cascading failures can occur when one system falters.

Accordingly, urban risk-governance scholarship emphasises localised warning, early-action protocols and design measures that reduce ambiguity for residents facing rapid-onset events (Siliézar et al. 2023; Sáenz de Tejada et al. 2024; Miner et al. 2013). Cities also impose physical constraints – notably limited domestic storage in apartments – that shape the feasibility of holding bulky essentials and of maintaining equipment for outages, which implies that guidance must be operationalised into space-efficient thresholds and routines rather than generic exhortations (Kong et al. 2022; Rezvani et al. 2023). Reviews of urban planning health-centred resilience further argue for institutional innovation, risk communication tuned to local conditions and micro-scale design choices, because residents cannot be assumed to enact preparedness without concrete cues in dense settings (Sáenz de Tejada et al. 2024; IFRC 2010).

Behavioural research consistently shows that perceived risk alone seldom yields preparedness where ambiguous instructions, low self-efficacy and response costs are high (Zamboni & Martin 2020; Levac, Toal-Sullivan & O’Sullivan 2012). Urban households are especially sensitive to these costs given everyday constraints and competing demands. Comparative public-health and household-preparedness syntheses therefore recommend tailored, actionable interventions that reduce ambiguity and build efficacy (Lindell 2019). This is directly relevant for cities where limited storage and high opportunity costs make stockpiling atypical even when concern is high. In addition, the diffusion of cashless transactions in metropolitan areas increases dependency on digital payment systems, making offline contingencies both behaviourally uncommon and insufficiently specified in policy. Scholarship on cashless transitions and emergency communications thus highlights the value of low-tech redundancies to maintain autonomy and situational awareness during communications or power outages (Kitamura 2022; Carreras-Coch et al. 2022; Douvinet et al. 2019; Siliézar et al. 2023). These requirements that are especially salient in dense urban cores where network load and physical masking can degrade alerts.

The urban resilience literature therefore implies that responsabilisation must be paired with operational support, or scaffolding, adapted to city life, such as specific thresholds for supplies, mapped and marked shelters, standardised siren instructions, community or building-level micro-drills, and redundant communication modes that remain audible and interpretable amidst urban noise and complexity. If these elements are absent, city households face structural and cognitive barriers that render preparedness difficult to enact, even when perceived severity is high (Miner et al. 2013; Douvinet et al. 2019).

Taken together, this literature implies that the alignment between perceived threat and threat-appropriate preparedness is not automatic but conditional, varying with the clarity of guidance, the ease and cost of recommended behaviours, and the strength of institutional and social supports.

Finland, Latvia and Germany

This conditionality underpins our subsequent case selection. Finland, Latvia and Germany offer a compelling lens through which to examine how responsabilisation and comprehensive-defence logics are interpreted, institutionalised and communicated. While all three countries share commitments to NATO's Article 3, which obliges Allies to maintain the capacity to 'resist armed attack' through resilient civilian structures (NATO 1949; NATO 2016), and all operate within the EU's deepening civil-protection framework (Niinistö 2024; European Commission 2025), their approaches to the role of the individual differ in historically and institutionally meaningful ways.

Finland: A mature total-defence system built on individual responsibility

Finland represents one of Europe's most developed models of total defence, with roots in Cold War mobilisation doctrine and a long tradition of societal resilience (Raitasalo 2023). Comprehensive security represents an inclusive, cooperation-based preparedness model where the essential functions of society are safeguarded through joint efforts by government authorities, private sector actors, civil society organisations and individual citizens (Government of Finland 2017). Its Security Strategy for Society defines preparedness as an integrated, multi-level responsibility shared by government, municipalities, businesses, NGOs and citizens (Government of Finland 2025). Crucially, individuals are positioned as active security actors responsible for maintaining emergency supplies, participating in training and supporting household continuity during crises (Finland Ministry of Defence 2025). The state provides clear, detailed and highly operationalised guidance, including the well-known 72-hour rule, concrete household checklists and survival-skills education (Finnish National Rescue Association, 2025).

This clarity reflects Finland's broader political culture of high institutional trust, clear communication and consensus-based security governance. Scholars note that Finland represents the 'archetype' of a societal-security regime in which individual responsibility is embedded in national identity and civic norms (Berzina 2020; Rhinard 2021; Wither 2020). Finland thus serves in the comparative design as the high-responsibilisation benchmark: a context where state expectations for household preparedness are explicit, institutionalised and socially legitimate. To test the penetration of the responsabilisation strategies, we chose to look at the urban centre of Helsinki.

Latvia: An emerging hybrid

Latvia's civil-protection model has historically emphasised military defence, reflecting its geopolitical exposure, historical memory of occupation and proximity to Russia. However, since 2022–2024, national strategy documents demonstrate

a clear shift toward a comprehensive-defence model, with Finland's example as an important reference point (Latvia Ministry of Defence 2023; 2024; 2025).

Latvia now expects individuals to ensure 72-hour self-sufficiency, maintain basic emergency supplies and learn survival skills (Latvia, Ministry of Defence 2022). Preparedness has been incorporated into school curricula, and municipalities are increasingly tasked with local information responsibilities (Latvia, Ministry of Defence 2023). This 'Finnicisation' of Latvian civil preparedness has been noted in emerging research (Friede 2025; Cimermanis 2025).

Yet Latvia remains institutionally distinct. Its communication ecosystem is more fragmented, levels of institutional trust lower and societal inequalities more pronounced (Pan et al. 2025). As a result, responsabilisation is emerging in a context where the state's expectations may exceed citizens perceived capacity or resources, a dynamic that we propose to test in Riga. Latvia thus functions as the intermediate case: adopting comprehensive-defence responsibilities but still transitioning from a militarised security paradigm toward a truly societal one.

Germany: A federalist, institutionally-centred model

Germany contrasts sharply with Finland and Latvia. While the German defence and civil-protection strategies acknowledge the importance of civilian readiness and the need for a whole-of-society approach, the role of the individual remains comparatively weakly defined. The federal structure places responsibility for disaster response primarily on states (Länder) and municipalities, with the Federal Office of Civil Protection and Disaster Assistance coordinating guidance and public information (German Federal Government 2022; German Ministry of Defence 2023; German Federal Office of Civil Protection and Disaster Assistance 2025).

Preparedness recommendations have recently been updated to acknowledge that the potential of military conflict exist (German Federal Office of Civil Protection and Disaster Assistance 2025), but communication tends to be less prescriptive, less centralised and less embedded in national identity than in Finland. Public debates following BBK's guidance reforms show frequent scepticism about state messaging, and Germany's risk landscape has tended to prioritise natural disasters, infrastructure resilience and terrorism over societal mobilisation (Deutschland in English 2025). Germany therefore represents the low-responsibilisation case: a model where individuals are encouraged, but not strongly expected, to prepare. Because of the federal structures, to test the assumptions we chose to look at a sample drawn from three urban centres in Germany: Berlin, Hamburg and Munich.

This combination of shared structural context and diverse governance logics creates an ideal basis for comparing how households interpret and act upon preparedness expectations. The three cases collectively form a structured comparative triad, from high to low responsabilisation, allowing us to examine how

institutional, cultural and behavioural dynamics shape individual preparedness within Europe's evolving resilience agenda.

The theoretical debates outlined above concerning the limits of responsabilisation, the behavioural and cognitive dynamics of preparedness, especially in urban environments, and the distinct national civil-protection models in Finland, Latvia and Germany lead to the formulation of the following hypothesis to be evaluated using the 2025 survey data:

H1. (Finland – High Responsibilisation)

Individuals in Helsinki who identify a threat as 'major' will demonstrate higher material and cognitive preparedness for that threat.

H2. (Latvia – Transitional Responsibilisation)

Individuals in Riga who identify a threat as 'major' will demonstrate moderate material and cognitive preparedness for that threat.

H3. (Germany – Low Responsibilisation / Institutional Emphasis)

Individuals in German cities who identify a threat as 'major' will demonstrate weak or no association with material and cognitive preparedness for that threat.

2025 Survey Data

The analysis draws on an original survey conducted in May 2025 among urban residents aged 18–74 in Helsinki, Riga, Berlin, Hamburg and Munich using the Computer-Assisted Web Interviewing (CAWI) method (Birka 2026). The instrument included items on threat perception, material and cognitive preparedness, and perceived obstacles to readiness. Sampling and recruitment were carried out by Norstat, a professional panel provider operating under ESOMAR/ICC standards and an ISO 9001:2008-certified quality management system, ensuring rigorous identity verification, controlled recruitment and high data integrity. Norstat employs quality controls such as single-IP protections, duplicate checks and the removal of respondents showing unusually rapid completion patterns.

The 2025 samples comprised approximately 1,000 respondents per country and were balanced to reflect the demographic structure of each country's urban population. While not nationally representative, the focus on cities is analytically appropriate given the study's interest in urban resilience, infrastructure dependence and exposure to crisis communication environments. The questionnaire captured perceptions of eleven potential threats and measured preparedness via indicators such as the availability of supplies and knowledge of emergency procedures.

Threat perception

Using the 2025 urban survey, we first map the overall threat landscape as perceived by residents in Helsinki (Finland), Riga (Latvia) and the German cities of Berlin, Hamburg and Munich. In the survey, the question used to analyse individual

threat perception was phrased in the following way: ‘Personally, how significant do you think each of these threats is?’ Respondents had the option to rate eleven suggested potential threats as either a ‘major threat’, ‘minor threat’, ‘not a threat’ or select the ‘prefer not to say’ option. Table 1 below illustrates the top five threats.

Table 1: Top 5 Major Threats Identified by Urban Residents (2025)

Rank	Riga (Latvia)	German Cities (<i>Berlin, Hamburg, Munich</i>)	Helsinki (Finland)
1	Latvia’s economic situation (58%)	Organised crime (56%)	Spread of false information (50%)
2	Disrupted critical supplies (57%)	Spread of false information (55%)	Disrupted digital services (45%)
3	Military attack (56%)	Impact of climate change (52%)	Impact of climate change (44%)
4	Spread of false information (54%)	Terrorism (51%)	Organised crime (38%)
5	Use of chemical, biological or nuclear substances (49%)	Disrupted digital services (48%)	Finland’s economic situation (37%)

Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data.

Urban residents in Riga, the German cities and Helsinki converge on a risk landscape dominated by informational/digital vulnerabilities and hard-security or basic-needs concerns, but the top-five hierarchies are distinctly national. In Riga, respondents worry about Latvia’s economic situation, disrupted critical supplies and military attack, followed by the spread of false or misleading information, and the use of chemical, biological or nuclear substances. This is a profile that blends geopolitical anxiety with worries about infrastructure continuity and household welfare. In the German cities, the list centres on organised crime, false/misleading information, the impact of climate change, terrorism and disrupted digital services, reflecting an internal-security and climate-resilience framing alongside sustained concern about information disorder and cyber risk. In Helsinki, informational and digital threats are most salient for respondents, false/misleading information and disrupted digital services lead, with climate change, organised crime and Finland’s economic situation rounding out the top five issues respondents worry about.

Taken together, the 2025 results indicate shared exposure to hybrid threat domains, mis/disinformation and cyber disruption, while national contexts also influence common worries such as supply continuity and defence in Riga, internal

security and climate related weather events in the German cities, and information/cyber paired with weather worries in Helsinki.

Individual preparedness

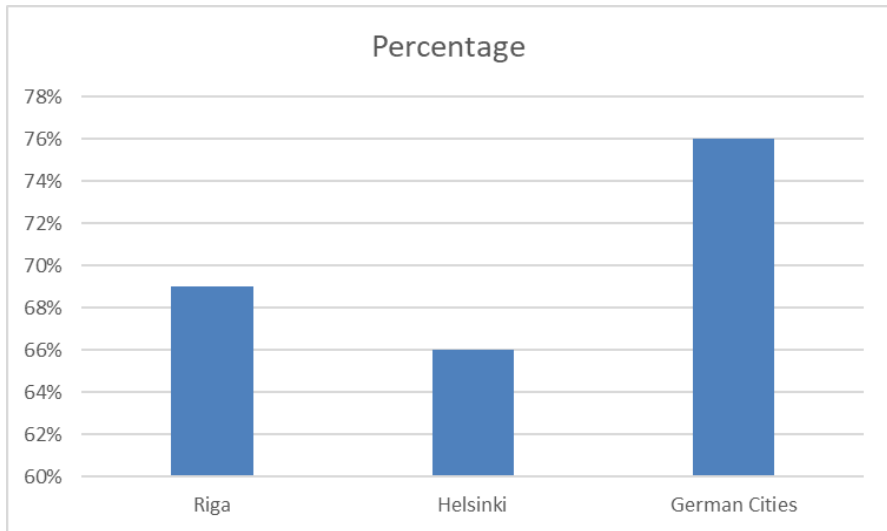
The three countries have issued official guidance to civilians on how to prepare for crisis scenarios (Finland Finnish National Rescue Association 2025; Latvia Ministry of Defence 2022; German Federal Office of Civil Protection and Disaster Assistance 2025). To assess the extent of individual preparedness, we formulated survey questions based on the content of national civil-protection booklets and public information campaigns, aiming to evaluate the degree to which this guidance has been internalised by the population. Finland and Latvia emphasise the importance of being self-sufficient for 72 hours (Finland Finnish National Rescue Association 2025; Latvia Ministry of Defence 2022), while Germany's guidance recommends stockpiling supplies sufficient for up to ten days (German Federal Office of Civil Protection and Disaster Assistance 2025). These recommendations typically include necessities such as water, food, medicine and cash reserves. Additionally, all three countries advise households to possess a battery-powered AM/FM radio to receive emergency information in the event of power outages. Beyond material provisions, preparedness also encompasses cognitive dimensions, such as awareness of appropriate actions during a crisis, knowledge of shelter locations and prearranged communication and meeting strategies with family members. Taken together, these indicators offer a comprehensive picture of individual readiness to respond effectively in emergency situations.

As the first indicator of preparedness, we asked respondents whether they had reserves of essential supplies such as food, water and medicine. Respondents were given multiple-choice options ranging from 'no supplies' to 'more than a week'. When asked in this general manner, most respondents across all three countries reported having at least some supplies. Image 1 below illustrates the percentage of individuals who claimed to have essential supplies sufficient for at least 72 hours.

Although these figures indicate what appears to be a relatively high level of basic preparedness, they likely overstate respondents' actual readiness. When preparedness is assessed through a general, broadly framed question, respondents often overestimate their level of supplies, answering based on assumptions or impressions rather than concrete details. Moreover, having some supplies does not necessarily equate to having sufficient resources to sustain a household for 72 hours or longer, particularly in the absence of electricity or access to external support. This highlights the importance of clear preparedness communication and indicators of supplies.

However, when the survey probes further, asking respondents to specify quantities and duration of use, it becomes clear that many households are less prepared than they initially believed. We delved deeper into respondents' understanding

Image 1: Essential supplies 72 hours self-estimate



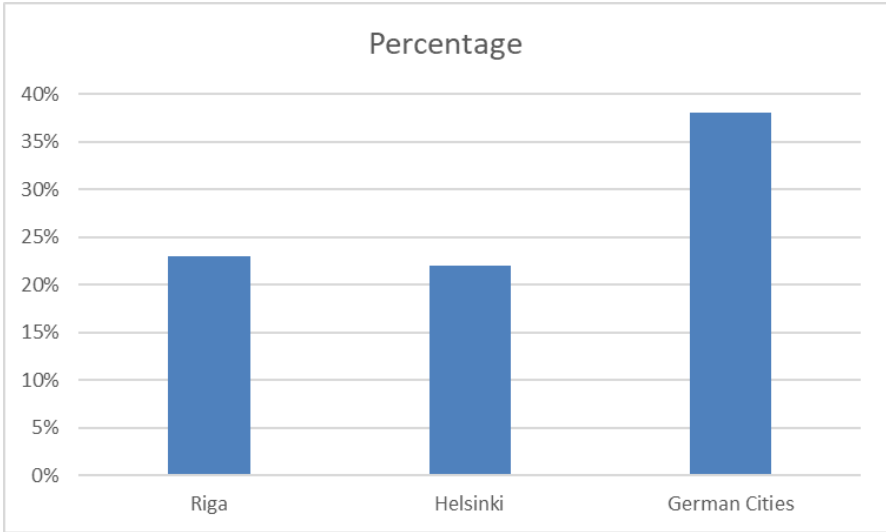
Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

of essential supplies by asking a more specific question: ‘How long would water supplies in your home last (3 litres of water per household member per day)?’ This more precise framing revealed a significantly more pessimistic picture of actual preparedness. Only 38 percent of respondents in the German cities reported having sufficient water for at least 72 hours, while the figures for Riga and Helsinki were markedly lower – just 23 percent and 22 percent, respectively. See the illustration below in Image 2.

Furthermore, a substantial portion of the population reported having no water reserves whatsoever: 27 percent in Riga, 30 percent in Helsinki and 20 percent in the German cities. This indicator is particularly concerning given the German preparedness booklet’s warning that ‘a person can manage for three weeks without food, but only for four days without liquid’ (Germany 2018: 11). The discrepancy between general claims of preparedness and specific resource availability suggests that many individuals may overestimate their readiness. Water, being the most critical resource in any emergency, is a fundamental benchmark of crisis resilience. The data underscores the need for clearer public communication and education on what constitutes adequate supply levels, especially in urban environments where access to clean water may be disrupted during crises.

The national crisis preparedness booklets in Finland, Latvia and Germany all emphasise the importance of maintaining cash reserves for essential purchases if electronic payment systems or ATMs become unavailable. However, none of the booklets specify the exact amount of cash individuals should keep on hand,

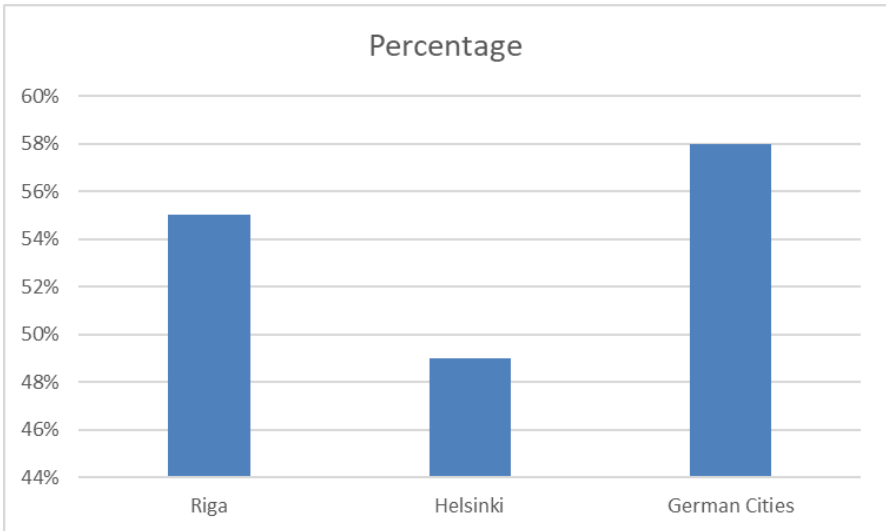
Image 2: Water supplies 72 hours



Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

leaving room for interpretation and variability in preparedness. To gauge actual readiness, we asked respondents to estimate how long their cash reserves would last for essential purchases. Image 3 below shows the percentage of individuals who reported having enough cash for at least 72 hours.

Image 3: Cash reserves 72 hours

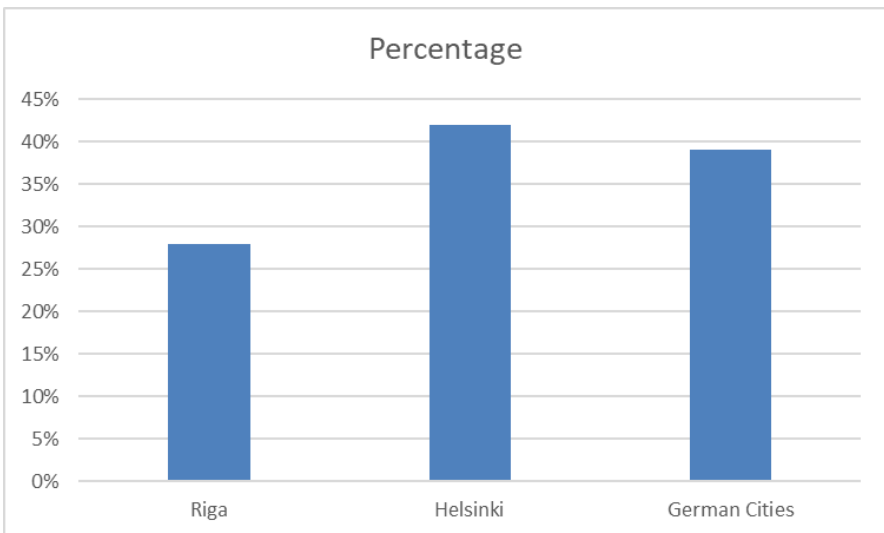


Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

The situation is particularly concerning in Helsinki, where fewer than half of the respondents reported having sufficient cash reserves. This trend reflects the broader societal shift toward cashless transactions and appears especially pronounced in Finland. While digital payment systems offer convenience, their vulnerability during crises, such as power outages or cyber-attacks, makes physical cash a critical component of individual resilience. The data suggests that public awareness of this risk remains limited, and that current guidance may not be sufficiently emphasised or internalised. Strengthening communication around the importance of cash reserves, and clarifying recommended amounts, could help bridge this preparedness gap.

All three national preparedness booklets stress the importance of including battery-powered AM/FM radio in emergency kits. Radios are highlighted as one of the most reliable means of receiving information during a crisis, particularly in situations where electricity and internet services are disrupted. To assess public adherence to this recommendation, the survey asked respondents: 'Do you have a battery-powered AM/FM radio at home?' The results, illustrated in Image 4 below, show that fewer than half of the households in Helsinki and the surveyed German cities possess such radios, while in Riga, only about a quarter of respondents reported having one.

Image 4: Battery-powered AM/FM radio ownership

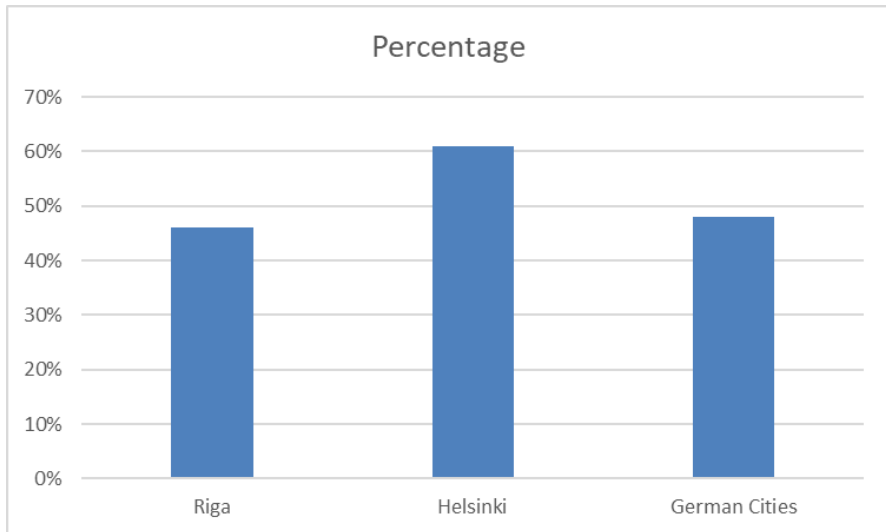


Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

These figures suggest that despite clear guidance, the penetration of this basic preparedness item remains low. The data indicates that many urban households lack access to critical communication tools during emergencies. This gap could severely limit the effectiveness of public warning systems and hinder coordinated crisis response efforts.

In addition to assessing material preparedness, the survey also examined individual awareness of necessary actions during a crisis or cognitive preparedness. Respondents were asked whether they knew what to do upon hearing emergency public sirens, the location of their closest emergency shelter and whether they had an agreed meeting place with close ones in case communications were disrupted.

Image 5: Knowledge of sirens



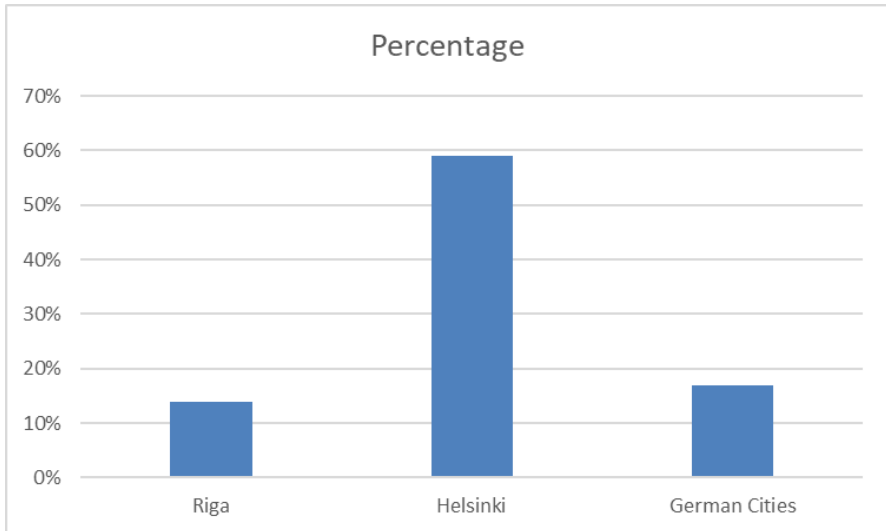
Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

These results, illustrated above in Image 5, paint a concerning picture of civilian awareness of preparedness measures. The data reveal a clear cognitive preparedness deficit across all three urban settings. In Helsinki, 61 percent of respondents reported knowing what action to take when public sirens sound, reflecting the long-standing investment in civil-defence communication and the routine integration of preparedness messaging into Finnish public life. Yet even in this high-responsibilisation context, awareness is far from universal, suggesting that familiarity with guidance does not automatically translate into internalised procedural knowledge. In Riga, fewer than half of respondents reported knowing how to respond to sirens. The German cities show a comparable pattern, with siren knowledge also falling below the majority threshold. Across all three

contexts, the data underscore a structural weakness: urban residents who lack procedural knowledge of siren response are, in effect, unreachable by the very alert mechanisms designed to protect them.

Image 6, below, illustrates the percentage of respondents who self-reported knowing where the closest emergency shelter is located. Knowledge of the nearest emergency shelter represents perhaps the most operationally consequential form of cognitive preparedness, as it determines whether individuals can physically act on a public alert rather than simply recognise that one has been issued. The figures here are markedly lower than those for siren awareness across all three cities, pointing to a secondary cognitive gap that compounds the first. Helsinki again shows the comparatively strongest performance, with 59 percent of respondents reporting knowledge of their nearest shelter. In Riga, however, only 14 percent of respondents could identify the location of the nearest emergency shelter. Similarly low rates in the German cities reinforce the pattern observed elsewhere. In dense urban environments, where built infrastructure and population mobility can rapidly disorient residents during disruptions, not knowing the location of the nearest shelter is not a minor gap, it is a foundational obstacle to any coordinated protective response.

Image 6: Knowledge of closest emergency shelter

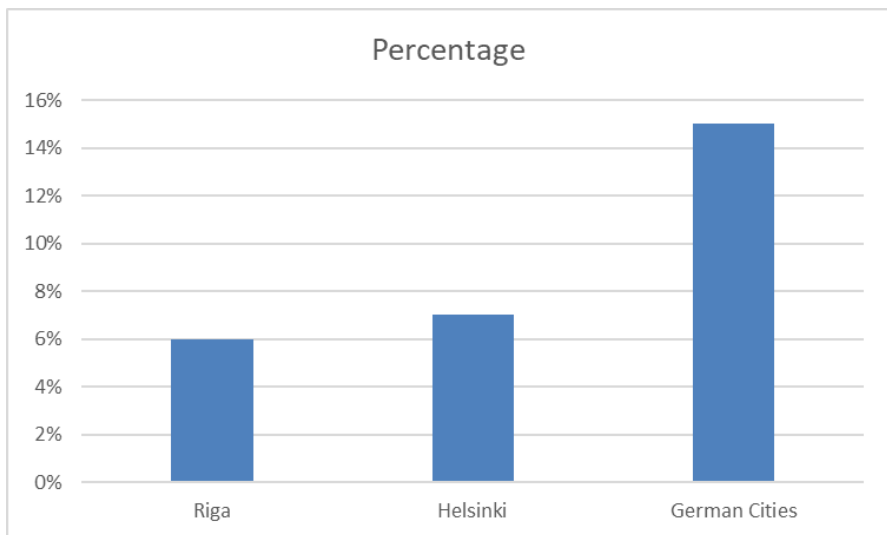


Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

Further, Image 7, below, illustrates the extremely low percentages of individuals with agreed family meeting points. Of all the cognitive preparedness indicators assessed, agreed family meeting points record the lowest rates across all three

urban settings. This measure is particularly significant because it represents a form of preparedness that requires no financial investment, no physical storage and no specialist knowledge, only prior coordination among household members. Yet even this low-barrier action appears to have been neglected by the majority of urban residents surveyed. The failure to agree on a meeting point in advance is especially consequential in scenarios involving communication disruptions, precisely those situations most likely to accompany the threats such as military attack, cyber-attack and severe weather events, that respondents across all three cities rate as most personally salient. The contrast with the theoretical expectation embedded in comprehensive-defence doctrine is stark: national guidance in all three countries assumes that citizens will be capable of acting autonomously and maintaining household coordination during the first critical hours of a crisis. The data suggest that this assumption is largely unwarranted. Without clear knowledge of procedures and safe locations, the assumption that citizens can effectively respond during the first 72 hours of a crisis becomes highly questionable.

Image 7: Agreed meeting point



Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

Obstacles to individual action

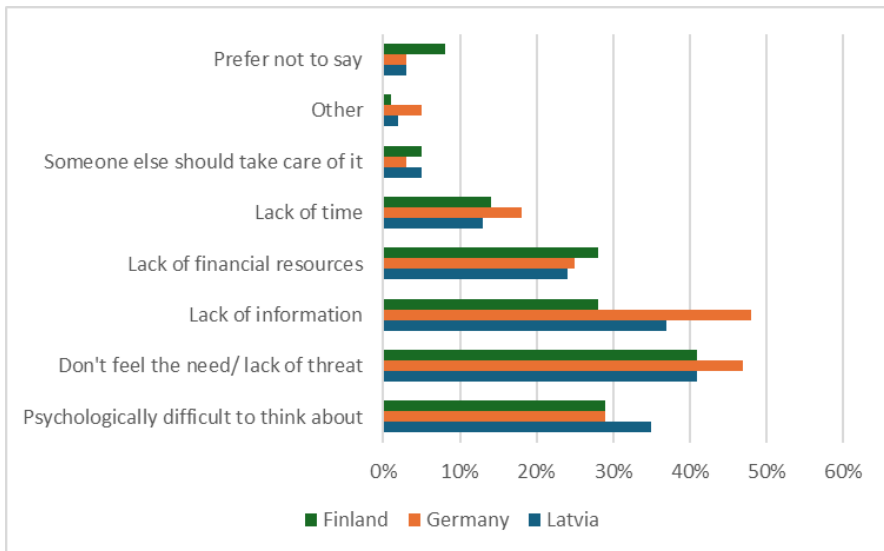
The 2025 results indicate that national responsabilisation strategies have not, in practice, produced commensurate household readiness in the surveyed cities. Despite extensive guidance and explicit expectations for 72-hour self-sufficiency, most urban residents still lack basic supplies and procedural knowledge. The notable exception is Helsinki's comparatively higher awareness of siren responses

and shelter locations, suggesting that long-standing, operationalised messaging and local institutional scaffolding can improve cognitive, though not necessarily material, preparedness. In Riga and the German cities, awareness and supplies remain consistently low across the same indicators.

These patterns suggest that the national approach to civil defence alone is not a reliable driver of household action, specifically in urban settings. In Finland, a mature total-defence model and concrete checklists have helped translate salience into procedural knowledge, but material benchmarks are still missed by large shares of Helsinki residents. In Riga, where 72-hour guidance is newer and communication ecosystems are more fragmented, threat salience does not manifest in either procedural knowledge or supplies. In the German cities, an institution-centred, less prescriptive model coincides with weak individual readiness despite high concern for digital and information risks. Taken together, the country models (high/transitional/low responsabilisation) do not map cleanly onto higher material or cognitive preparedness, with the partial Helsinki exception limited to awareness.

In the survey, we asked the respondents about the obstacles that prevent them from preparing for crisis situations. The question read ‘What hinders you from adequately preparing for crisis/emergency situations?’ The illustrated results in Image 8 below provide critical insight into why individuals are not taking the necessary steps to prepare. Across all three countries, the most frequently cited barriers include psychological considerations, threat perception and lack of information.

Image 8: Obstacles to preparedness



Source: Compiled by authors from 2025 Baltic Individual Crisis Preparedness Barometer data

The highest percentage of respondents, across the sample, with 1 percent difference in Germany, indicate that the main reason they have not taken the necessary steps to prepare for a crisis is because they 'don't feel the need/lack of threat'. This pervasive absence of perceived threat, shared across urban contexts, thus represents a profound behavioural and political hurdle, underscoring how future preparedness strategies will need not only to build capacities but to confront the deeper motivational gap that inhibits societal engagement in the first place.

Data analysis

Given that a substantial share of individuals across countries report no felt need to prepare, reflecting the broader behavioural gap identified above, we therefore focus our hypothesis-testing specifically on those respondents for whom the threat registers as personally salient. Specifically, we assess whether the alignment between identifying a threat as personally salient ('major') will result in respondents taking the necessary steps to prepare. Further, we want to establish whether taking threat-appropriate actions varies systematically by national approach: specifically, whether Finland's long-standing comprehensive defence tradition, with its deep community-level embeddedness and decades of normalised preparedness practices, translates into higher levels of action among those who perceive a threat as personally salient in Helsinki; whether Riga's more recent but increasingly coordinated attempts to promote whole-of-society readiness have begun to shape behaviour in a measurable, intermediate way; and whether, in contrast, the institution-centred model prevailing in Germany continues to yield weaker or negligible behavioural effects even among individuals who recognise a threat as major. We operationalise threat-appropriate actions by pairing each salient threat with its relevant preparedness indicator, gathered from the crisis booklets of Finland, Latvia and Germany. The threat to action Table 2 is presented below.

We used the 2025 CAWI survey to test pre-specified 'logic pairs' that link specific perceived threats to matched household preparedness actions, as illustrated in Table 2 below. Threat perception was measured for eleven hazards on a three-point ordinal scale (1 = not a personal threat; 2 = minor; 3 = major), with 'don't know/prefer not to say' coded as missing. For hypothesis tests contrasting 'major' versus 'non-major', we created a binary indicator (major = 1; otherwise = 0). Preparedness outcomes comprised binary indicators of cognitive and material readiness, knowledge of what to do when public sirens sound, ownership of a battery-powered AM/FM radio and whether the household has a pre-agreed family meeting point (each coded 1/0), and capacity measures derived from categorical durations, namely water and cash 'days of coverage'. For policy-relevant interpretation and cross-country comparability, we harmonised sufficiency cut-offs at ≥ 72 -hours to form binary outcomes for water (≥ 3 litres per person per day for three days) and cash (ability to cover essential purchases for at least 72-hours during electronic

Table 2: Threat to action mapping

Threat (survey item)	Preparedness action(s) (survey indicator)	Rationale (policy and operational)
Disrupted digital services/ cyber-attack	1) Cash reserves 2) Battery-powered AM/FM radio 3) Agreed meeting point	Payments/ATMs may fail; cash needed for essentials. Internet/mobile networks may be down; radio is the resilient broadcast channel. Comms outages impede coordination; pre-agreed meeting point reduces separation risk.
Severe weather (e.g., floods, storms)	1) Siren knowledge 2) Water supplies	Sirens and public alerts guide rapid action (shelter-in-place/evacuate). Outages and contamination disrupt water.
Disrupted critical supplies	1) Water supplies 2) Cash reserves	Supply chains and retail availability can fail; water is most time-critical resource. Cash enables purchases when POS/ATMs are down or card systems fail.
Military attack	1) Siren knowledge 2) Battery AM/FM radio 3) Water supplies 4) Agreed family meeting point	Sirens and public alerts guide rapid action (shelter-in-place/evacuate). Radio remains a primary channel under power/telecom disruption. Water continuity at risk, most time-critical resource. Comms outages impede coordination; pre-agreed meeting point reduces separation risk.

Source: Authors' own elaboration (2026)

payment/ATM disruption). The threat to action pairs followed national guidance and operational logic.

Primary models were selected according to outcome type. For binary outcomes, siren knowledge, radio ownership and pre-agreed meeting point, we used logistic regression, reporting odds ratios with 95 percent confidence intervals, a standard approach for modelling dichotomous dependent variables (Hosmer, Lemeshow & Sturdivant 2013). For capacity outcomes, days of water and cash coverage, we used ordinary least squares regression with robust, heteroscedasticity-consistent, standard errors to accommodate potential violations of homoscedasticity (Long & Ervin 2000). Spearman rank correlations were computed as a complementary, distribution-free measure of monotonic association between the ordinal threat scale and preparedness indicators, appropriate given the ordinal nature of the threat perception measure (Myers, Well & Lorch 2010). Given the number of threat-action tests conducted, we controlled familywise error rates using the Holm-Bonferroni sequential correction procedure, which offers greater statistical power than the standard Bonferroni adjustment while maintaining control of the familywise error rate (Holm 1979). Finally, because the design is cross-sectional, results should not be interpreted causally; negative associations may reflect reverse

causation or unmeasured factors such as low self-efficacy. Future longitudinal or experimental designs are needed to identify mechanisms linking threat perception to preparedness behaviour.

To test the hypothesis *H1*, *Individuals in Helsinki who identify a threat as ‘major’ will demonstrate higher material and cognitive preparedness for that threat*, we took the two major threats identified by the respondents that can be prepared for in the traditional sense, according to the guidance issued by the Finnish crisis booklet. First, we looked at the 450 respondents who identified disrupted digital services due to a cyber-attack as a major personal threat. As threat appropriate actions, we identified having cash reserves in instances when electronic payment systems or ATMs become unavailable, agreed meeting place with family members in case communications networks are compromised, and having a radio as a means of receiving information during a crisis when communication channels and internet services are disrupted.

Table 3: Helsinki major threat disrupted digital services/cyber-attack (n=450)

Action	Correlation	P-value	Regression Coef. (controls: age, gender)	Regression p-value	Result
Cash Reserves	-0.078	0.042	-0.040	0.086	Marginally significant (Negative)
Meeting Place	0.006	0.855	0.007	0.596	Not Significant
Radio	0.034	0.294	-0.014	0.590	Not Significant

Source: Authors' calculations based on Baltic Individual Crisis Preparedness Barometer 2025 data

As shown in Table 3 above, the relationship between perceiving cyber-attacks as a major personal threat and keeping cash reserves was marginally significant and negative in both the correlation and regression models, suggesting that even among those who worry about cyber-induced service disruptions, higher expressed threat does not correspond to greater material preparedness – in fact, it trends slightly in the opposite direction. By contrast, no significant associations emerged for having an agreed meeting place with family or owning a radio, indicating that increased concern about cyber threats did not predict higher cognitive or material preparedness for these actions.

Next, we conducted a separate analysis focusing on the 410 respondents who identified climate change related severe weather, such as floods or storms, as a major personal threat. Consistent with preparedness guidance in the Finnish crisis booklet, two key actions were selected as appropriate responses to this hazard: knowing what to do when emergency sirens function and maintaining adequate water supplies. As shown in Table 4 below, neither preparedness behav-

our demonstrated a statistically meaningful relationship with perceiving severe weather as a major threat. Taken together, these findings offer no support for H1: Even among individuals who consider severe weather a major threat, there is no observed increase in either material or cognitive preparedness behaviours recommended for this scenario. Overall, these findings provide no evidence in support of H1 and instead highlight a disconnect between threat awareness and the recommended preparedness behaviours.

Table 4: Helsinki major threat climate change weather (n=410)

Action	Correlation	P-value	Regression Coef. (controls: age, gender)	Regression p-value	Result
Sirens	-0.044	0.163	-0.007	0.750	Not Significant
Water	-0.037	0.271	-0.010	0.352	Not Significant

Source: Authors' calculations based on Baltic Individual Crisis Preparedness Barometer 2025 data

To assess hypothesis H2, *Individuals in Riga who perceive a given hazard as a major threat will demonstrate moderate material and cognitive preparedness for that threat*, we examined the 573 respondents who identified disruption to critical supplies as a major personal concern. Guided by the recommendations in the Latvian national crisis preparedness booklet, two preparedness actions were considered relevant for this scenario: maintaining adequate water supplies and having cash reserves available if access to essential goods or electronic payment systems becomes limited. As shown in Table 5, the analysis revealed no significant association between perceiving disrupted supplies as a major threat and having sufficient water storage. In contrast, the relationship between threat perception and maintaining cash reserves was marginally significant and negative. This pattern mirrors the trends observed in Helsinki and indicates that even among those who consider disruptions to essential supplies a major personal threat, higher perceived threat is not associated with greater preparedness and may even correspond to slightly lower levels of readiness.

Table 5: Riga major threat disrupted critical supplies (n=573)

Action	Correlation	P-value	Regression Coef. (controls: age, gender)	Regression p-value	Result
Water	0.009	0.772	-0.004	0.723	Not Significant
Cash Reserves	-0.061	0.104	-0.036	0.088	Marginally Significant (Negative)

Source: Authors' calculations based on Baltic Individual Crisis Preparedness Barometer 2025 data

To continue evaluating hypothesis H2 for Riga, we next examined the 563 respondents who identified a military attack as a major personal threat. In line with the preparedness guidance outlined in the Latvian crisis booklet, four actions were considered relevant indicators of material and cognitive readiness: understanding what to do if sirens operate, having a radio for receiving emergency information, maintaining adequate water supplies and designating a meeting place to reconnect with family members should communication channels fail. As shown in Table 6 below, three of the four actions – sirens, radio and meeting place – showed no significant association with perceiving a military attack as a major threat. All factors displayed negligible and statistically non-significant relationships, indicating that greater perceived threat does not predict higher cognitive or material preparedness for these actions. In contrast, the analysis revealed a significant negative association between perceiving a military attack as a major threat and maintaining water supplies. Taken together, these findings provide no support for H2 within either of the scenarios analysed in Riga. Even among respondents who view the threat of a military attack as major, preparedness behaviours do not increase and, in the case of water reserves, appear to decrease slightly, underscoring a persistent disconnect between perceived threat severity and recommended preparedness actions in the Riga context.

Table 6: Riga major threat military attack (n=563)

Action	Correlation	P-value	Regression Coef. (controls: age, gender)	Regression p-value	Result
Sirens	-0.005	0.868	0.003	0.902	Not Significant
Radio	-0.028	0.387	-0.004	0.839	Not Significant
Water	-0.069	0.034	-0.020	0.031	Significant (Negative)
Meeting Place	-0.035	0.282	-0.008	0.444	Not Significant

Source: Authors' calculations based on Baltic Individual Crisis Preparedness Barometer 2025 data

To evaluate hypothesis H3, *Individuals in German cities who perceive a threat as 'major' will exhibit only weak or no association with material and cognitive preparedness*, we analysed respondents who identified either climate change related severe weather or disrupted digital services from a cyber-attack as major personal threats. For the severe weather scenario, we looked at 524 respondents, and two preparedness actions recommended in the German crisis preparedness guidelines: understanding sirens and maintaining adequate water supplies. As shown in Table 7 below, both actions demonstrated negative associations with perceived threat. Knowledge of sirens showed a significant negative correlation and regression coefficient, indicating that greater perceived threat was associated with lower, not higher, cognitive preparedness. Water supplies also showed a marginally

significant negative relationship, again suggesting that heightened concern did not translate into increased material readiness.

Table 7: German cities – major threat climate change weather (n=524)

Action	Correlation	P-value	Regression Coef. (controls: age, gender)	Regression p-value	Result
Sirens	-0.101	0.001	-0.063	0.004	Significant (Negative)
Water	-0.074	0.021	-0.023	0.065	Marginally Significant (Negative)

Source: Authors' calculations based on Baltic Individual Crisis Preparedness Barometer 2025 data

A similar pattern emerged for the cyber-attack scenario of 483 respondents, illustrated in Table 8 below. Among the three preparedness actions assessed, maintaining cash reserves, designating a family meeting place, and owning a radio, two exhibited no statistical relationship with threat perception. Only one action, agreeing on a meeting place with family, showed a significant negative association, indicating again that higher perceived threat corresponds to lower preparedness.

Table 8: German cities major threat disrupted digital services/cyber-attack (n=483)

Action	Correlation	P-value	Regression Coef. (controls: age, gender)	Regression p-value	Result
Cash	-0.029	0.421	-0.020	0.314	Not Significant
Meeting Place	-0.066	0.038	-0.036	0.046	Significant (Negative)
Radio	-0.008	0.805	-0.018	0.474	Not Significant

Source: Authors' calculations based on Baltic Individual Crisis Preparedness Barometer 2025 data

Taken together, these results are partially consistent for H3. Across both German city scenarios, preparedness behaviours show either no relationship or a significant negative association with perceived threat. Rather than displaying moderate or high preparedness, individuals who view these hazards as major threats tend to be no better prepared, and in some cases, slightly less prepared, reinforcing the broader pattern observed across the three countries.

Discussion of findings

Across the 2025 urban samples, we find that threat perception varies across the Baltic Sea region's urban centres, with Riga prioritising economic volatility, supply disruption and defence; the German cities emphasising organised crime, climate risk and information/cyber threats; and Helsinki highlighting disinformation and cyber disruption alongside climate concerns. Despite these differences, general preparedness is low across all three settings. The data shows that supplies are

limited, and procedural knowledge on sirens, shelters and family action plans remains uneven, with Helsinki's siren and shelter awareness a partial exception.

Even in our country-specific hypothesis, when we concentrate on evaluating threats that are personally salient to the respondents, we find no evidence that threat salience improves preparedness; in several cases, higher salience is associated with slightly lower preparedness. This is clearest where preparedness requires material provisioning – that is, even in the cities where specific threats dominate public concern, household supplies remain modest. By contrast, cognitive preparedness shows somewhat stronger, but still uneven, uptake, suggesting that information and routines are easier to acquire than supplies that demand time, money and storage. These patterns are consistent with the theoretical literature outlined earlier, which predicts that affect, ambiguity and structural frictions dampen translation from risk salience to behaviour (Paton 2003; Tierney 2014; Eiser et al. 2012). This broad result is consistent with public-health and household-preparedness syntheses showing that households more readily complete action-based items than resource-based ones and that tailored, actionable guidance is needed to bridge the intention–action gap (Zamboni & Martin 2020; Levac, Toal-Sullivan & O'Sullivan 2012).

Helsinki's comprehensive-security model is associated with comparatively higher cognitive awareness as a clear majority know what to do when sirens sound, and 59 percent of respondents' report knowing the nearest shelter. At the same time, material preparedness remains limited with only 22 percent reporting supplies of drinking water for 72 hours, 42 percent owning a battery AM/FM radio, and cash sufficiency for outages remaining mixed, reflecting the city's cash-light routines. When we tested perception to preparedness alignment for the city's most salient actionable threat (cyber disruption), we found no significant association with radio ownership or agreed meeting points, and a small, non-robust negative relationship with cash once age and gender are controlled. The inference is that Finland's long-standing guidance and municipal scaffolding have succeeded in procedural learning but have not overcome the logistical and psychological costs of provisioning in dense urban life. These findings reinforce the theoretical claim that salience translates more readily into procedural knowledge than into stockpiling, especially in urban environments where storage, cost and habit frictions are pronounced (Zamboni & Martin 2020; Levac et al. 2012).

Riga's threat profile does not translate into procedural knowledge or supplies commensurate with concern. Only 14 percent report knowing the nearest shelter, less than 50 percent know what to do if sirens sound and only 23 percent meet the 72-hour water benchmark. The obstacle structure, 'don't feel the need', 'lack of information', 'psychologically difficult', maps onto well-documented behavioural barriers that highlight ambiguity about what counts as 'enough', avoidance in the face of aversive tasks and low perceived efficacy, all of which depress uptake in the absence of concrete thresholds and locally scaffolded routines (Zamboni & Martin

2020; Levac et al. 2012). In theoretical terms, Riga exemplifies the conditionality of responsabilisation where elevating expectations without operational supports is insufficient to move households from salience to action.

Berlin, Hamburg and Munich show pronounced concern for climate change severe weather and cyber-attacks, but household-level preparedness remains modest. A radio is owned by 39 percent of urban respondents, siren knowledge is below 50 percent and water reserves for 72 hours are held by 38 percent. The most frequently reported barrier, 'lack of information', is consistent with a decentralised, less prescriptive guidance environment, in which responsibilities are distributed across states, and municipalities and household-level expectations are comparatively under-specified. This is the low-responsibilisation end of the triad where institutional continuity is emphasised, but perception to preparedness alignment at the household level is weak or absent. The risk-communication literature argues that in such settings, multi-motive, localised approaches and redundant channels are needed to convert awareness into practiced action (Eriksson 2024; Carreras-Coch et al. 2022; Douvinet et al. 2019). Our results therefore fit the theory's prediction that institution-centred continuity without clear household thresholds yields weak perception to preparedness alignment.

Our results corroborate the theoretical expectation that risk salience alone rarely induces proportionate action when the recommended tasks are aversive or complex, the guidance is generic rather than specific, and households lack self-efficacy and local cues that make action feel doable. Helsinki's cognitive advantage reflects specific long-term instructions and routine municipal engagement; yet the same advantage fades for material tasks because costs and frictions are higher. Riga and German cities exhibit both instructional ambiguity and lower scaffolding, which alongside strong psychological obstacles dampens both cognitive and material uptake. This is precisely the conditional pathway the theory anticipates that clear, concrete communication plus coping appraisal and local cues convert salience into action; if these are absent then avoidance and fatalism dominate.

The urban environment magnifies the costs of material preparedness. Cities are service-intensive and infrastructure-dependent and they cultivate just-in-time household routines rather than stockpiling. Urban dwellings also impose limited storage capacity and normal-time digital payment habits make offline contingencies behaviourally atypical. Radios look obsolete in normal times. These everyday logics underpin why urban respondents, despite high concern, remain under-provisioned for disruptions. Without concrete thresholds and local cues that reduce ambiguity and boost coping appraisal, responsabilisation under-delivers in dense settings (Sáenz de Tejada et al. 2024; Miner et al. 2013; Kitamura 2022; Carreras-Coch et al. 2022; Douvinet et al. 2019; Siliézar et al. 2023). The Helsinki case shows that even within a high-responsibilisation model, urban frictions are powerful enough to cap material uptake.

The evidence suggests that even if worried residents remain underprepared, then messaging must move from general exhortations to concrete thresholds, such as specifying recommended quantities and providing clear checklists. The evidence aligns with risk-communication theory that emphasises that when guidance is generic rather than operational, individuals struggle to translate salience into behaviour, often over-estimating their readiness or deferring action (Boin et al. 2020; Kohler et al. 2020). Specificity reduces ambiguity and strengthens individuals' sense of efficacy. Operationalisation also requires localising access to preparedness information and resources, including mapping nearby emergency shelters, reviewing instructions for responding to sirens, and lowering the practical barriers to acquiring recommended supplies, such as offering community-level radio kits or subsidies. In addition, preparedness can be reinforced by embedding low-effort routines into everyday life, encouraging households to agree on family meeting points, promoting annual micro-drills in residential buildings or workplaces, and organising neighbourhood briefings that turn abstract guidance into practiced behaviour in urban settings (Sáenz de Tejada et al. 2024; Carreras-Coch et al. 2022; Douvinet et al. 2019). These interventions follow directly from the theory's core claim that salience alone seldom yields preparedness. Instead, clarity, efficacy and local cues are the necessary conditions for responsabilisation to work in urban Europe.

Our 2025 results point to a clear conclusion, that responsabilisation for self-sufficiency in crisis situations has not been adequately communicated or operationalised in the surveyed urban contexts. The consequence is a security gap between policy ambition and household capacity. Even in Helsinki, where Finland is often presented as the flag-bearer of comprehensive defence, most residents would be unable to meet 72-hour self-sufficiency if an unexpected crisis struck. Comparable shortfalls are visible in Riga and the German cities, confirming that the expectation of 72-hour independence is unrealistic under current urban conditions.

Conclusion

Over the past decade, EU and NATO policy have converged on a comprehensive, whole-of-society model of security and crisis management. NATO has long recognised civil preparedness as an enabler of collective defence under Article 3 of the Washington Treaty, a commitment dating to the Alliance's founding and renewed with fresh urgency at the 2016 Warsaw Summit through the seven baseline requirements for national resilience (NATO 2016; Jacuch 2024). It is important to note that these requirements operate at the national level, defining state and institutional capabilities rather than prescribing behaviour for individual households. The EU's Preparedness Union Strategy (2025) bridges this gap, explicitly embedding an all-hazards, whole-of-government and whole-of-society approach

that extends preparedness obligations downward to the population level, including guidance to reach minimum 72-hour household self-sufficiency as a core pillar of European resilience (European Commission 2025; Niinistö 2024). It is therefore primarily at this EU policy level that the expectation of household-level preparedness is formally anchored.

That strategic shift, manifesting in responsabilisation, places a new burden on individuals and households, expecting them to hold supplies, adopt contingency routines and convert risk awareness into practical, threat-appropriate action. Yet our 2025 urban evidence reveals a structural gap between these policy expectations and household realities. Across Helsinki, Riga and the German cities, both material and cognitive preparedness remain uneven and consistently fall short of official guidance thresholds. Crucially, even among those who say they are personally worried about the very threats they are advised to prepare for, preparedness remains inadequate, the classic perception–action gap anticipated in the risk-behaviour literature.

These findings speak directly to the theoretical debates outlined at the outset and yield a clear pattern of confirmation alongside one result that warrants closer scrutiny. The core finding that threat salience does not improve preparedness, and in several instances is associated with slightly lower readiness, is consistent with the central claims of the risk-behaviour literature. Slovic (1987), Paton (2003) and Eiser et al. (2012) all anticipate that affective responses to threat, including avoidance and fatalism, can suppress protective action even when perceived severity is high, and our data fit this prediction across all three national contexts. The confirmation that cognitive preparedness, such as siren knowledge and shelter awareness, proves more accessible than material preparedness, such as water stocks and cash reserves. This also aligns with prior synthesis work on household emergency readiness, which consistently finds that action-based items are completed more readily than resource-based ones (Levac, Toal-Sullivan & O’Sullivan 2012; Zamboni & Martin 2020). Similarly, the finding that Helsinki’s long-standing, operationalised guidance produces a cognitive advantage but not a commensurate material one is consistent with theoretical expectations. Boin et al. (2020) and Kohler et al. (2020) predict that specificity reduces ambiguity and improves procedural learning but cannot on its own overcome the logistical and financial costs of stockpiling in dense urban environments.

The result that demands closer attention is the direction of significant associations where they do emerge. In several cases, including cash reserves in Helsinki and Riga, siren knowledge in the German cities, and water supplies among those perceiving military attack as a major threat in Riga, higher threat salience is associated with lower preparedness rather than simply a null relationship. This negative direction sits in some tension with protection motivation theory (Rosenstock 1974), which predicts at minimum a neutral rather than inverse relationship. Two

explanations are plausible. First, reverse causation: individuals who have not prepared may experience higher residual anxiety that expresses itself as elevated perceived threat, while those who have taken steps feel a degree of reassurance that moderates rated salience. Second, the avoidance pathway described by Slovic (1987) and Paton (2003) may be operating more forcefully than anticipated: In the absence of clear, actionable guidance and coping self-efficacy, high salience may intensify paralysis rather than motivate action. The cross-sectional design does not allow us to distinguish between these mechanisms, and future longitudinal or experimental work is needed to establish whether these negative associations reflect genuine psychological inhibition or statistical artefacts of reverse causation.

Finland, which is often held up as the flag-bearer of comprehensive defence, illustrates both the promise and the limits of responsabilisation in urban settings. Helsinki residents exhibit comparatively higher cognitive awareness, but not proportional material readiness. Even among Helsinki respondents who rate cyber disruption as a major personal threat, we find no improvement in radio ownership or family meeting-point planning, and a small, negative association with cash reserves once age and gender are controlled. This pattern is consistent with the theoretical claim that Finland's long-standing guidance and municipal scaffolding have succeeded in procedural learning but have not overcome the logistical and psychological costs of provisioning in dense, service-intensive city environments (Zamboni & Martin 2020; Levac et al. 2012). In Riga and the German cities, where institutional communication is more fragmented and guidance less prescriptive, both cognitive and material uptake remain consistently weak, fitting the conditionality argument that responsabilisation without operational supports is insufficient to move households from salience to action (Scolobig et al. 2015; Boin et al. 2020).

The urban environment magnifies these challenges throughout. Cities cultivate just-in-time household routines rather than stockpiling, impose limited domestic storage, and normalise cashless and digitally dependent habits that make offline contingencies behaviourally atypical. These everyday logics explain why urban residents, despite expressing genuine concern, remain under-provisioned for the very disruptions they fear. Without concrete thresholds, locally mapped resources and scaffolded routines that reduce ambiguity and strengthen coping appraisal, responsabilisation systematically under-delivers in dense settings (Sáenz de Tejada et al. 2024; Miner et al. 2013; Douvinet et al. 2019).

For EU and NATO goals on household-level resilience, the implication is clear: Responsibilisation without urban-specific operational supports will continue to fall short. Closing the gap requires moving from general exhortations to concrete thresholds, specified quantities, mapped shelters and standardised siren instructions paired with local scaffolding such as building-level micro-drills, neighbourhood briefings and community-level access to recommended supplies.

These are not optional refinements; they are the necessary conditions for the EU's whole-of-society ambitions and NATO's Article 3 resilience commitments to succeed at the household level in Europe's cities. Until preparedness guidance is operationalised for the realities of urban life, the security gap between policy expectation and household capacity will persist, even in the countries that have worked hardest to close it.



Author contributions

The authors contributed equally to all stages of the research and writing.

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Conflict of interest statement

No conflict of interest was reported.

Data availability statement

The data that support the findings of this study are openly available in DataverseLV at <https://doi.org/10.71782/DATA/HQANMQ>, title Baltic Individual Crisis Preparedness Barometer 2025 (Urban Preparedness for Emerging Risks in the Baltic Sea Region).



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References

- Adger, W. N. (2000): Social and Ecological Resilience: Are They Related? *Progress in Human Geography*, 24(3), 347–364.
- Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R. & Wreford, A. (2009): Are there social limits to adaptation to climate change? *Climatic Change*, 93(3), 335–354.
- Bachmann, S.-D., & Gunneriusson, H. (2015): Hybrid wars: The 21st-century's new threats to global peace and security. *Scientia Militaria - South African Journal of Military Studies*, 43(1), 77–98.
- Baker, N. D. & Ludwig, L.G. (2016): Disaster preparedness as social control. *Critical Policy Studies*, 12(1), 24–43.
- Berzina, I. (2020): From 'total' to 'comprehensive' national defense: the development of the concept in Europe. *Journal on Baltic Security*, 6(2), 1–9.
- Birka, I. (2026): Baltic Individual Crisis Preparedness Barometer 2025 (Urban Preparedness for Emerging Risks in the Baltic Sea Region), DataverseLV. <accessed online: <https://dv.dataverse.lv/dataset.xhtml?persistentId=doi:10.71782/DATA/HQANMQ>>.
- Boin, A., Ekengren, M. & Rhinard, M. (2020): Hiding in plain sight: conceptualizing the creeping crisis. *Risk Hazards Crisis Public Policy*, 11(2), 116–138.
- Carreras-Coch, A., Navarro, J. Sans, C. & Zaballos, A. (2022): Communication technologies in emergency situations. *Electronics*, 11, 1155, 1–31.
- Cimermanis, A. (2025): Integrating total defense and military sustainment in the new northern security paradigm, *Foreign Policy Research Institute*, 8 April, <accessed online: <https://www.fpri.org/article/2025/04/integrating-total-defense-and-military-sustainment-in-the-new-northern-security-paradigm/>>.
- Comfort, L. K., Boin, A. & Demchak, C.C. (2010): *Designing Resilience: Preparing for Extreme Events*. Pittsburgh: University of Pittsburgh Press.

- Deutschland in English (2025): Germany issues new war preparedness guide amid rising security threats. *Deutschland in English*, 17 October, <accessed online: <https://deutschlandinenglish.com/p/germany-issues-new-war-preparedness-guide-amid-rising-security-threats/>>.
- Douvinet, J., Bopp, E. & Serre, D. (2019): Sorting the good from the bad smart-phone applications to alert residents facing disasters - Experiments in France. Geospatial Technologies and Geographic Information Science for Crisis Management (GIS) Proceedings of the 16th ISCRAM Conference - València, Spain May 2019.
- Eiser, J., Bostrom, A. & Burton, I. (2012): Risk interpretation and action: A conceptual framework for responses to natural hazards. *International Journal of Disaster Risk Reduction*, 1(1), 5-16.
- Eriksson, M. (2024): A Multi-motive risk communication model for 'making' crisis preparedness. In: Diers-Lawson, A. et al. (eds) *Risk and Crisis Communication in Europe: Towards Integrating Theory and Practice in Unstable and Turbulent Times*. New York: Routledge, 13-27.
- European Commission (2025): Joint Communication on the European Preparedness Union Strategy. JOIN(2025) 130 final. *European Commission*, 26 March, <accessed online: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52025JC0130>>.
- European Commission (2024): Disaster risk awareness and preparedness of the EU population.
- Eurobarometer Special 547 Report. *European Commission*, Publications Office of the European Union, <accessed online: <https://doi.org/10.2795/9235147>>.
- Finland Finnish National Rescue Association (2025): Home preparedness. Useful tips for disruptions and emergencies. Finnish National Rescue Association, 21 January, <accessed online: https://72tuntia.fi/wp-content/uploads/2025/01/spek_72_hours_home_preparedness_2025_01_21_vo1.pdf>.
- Finland Government (2025): Security Strategy for Society. *Finland Government*, 16 January, <accessed online: <https://julkaisut.valtioneuvosto.fi/items/0126122a-1e8a-4ffa-9868-6286292efc01>>.
- Finland Government (2025): Preparing for incidents and crises. *Finland Government*, <accessed online: <https://www.suomi.fi/guides/preparedness>>.
- Finland Government. The Security Committee. (2017): The Security Strategy for Society: Government Resolution. *Finland Government*, 2 November, <accessed online: https://turvallisuuksomitea.fi/wp-content/uploads/2018/04/YTS_2017_english.pdf>.
- Finland Ministry of Defence (2025): Comprehensive security. *Finland Government*, <accessed online: <https://turvallisuuksomitea.fi/en/comprehensive-security/#:~:text=Comprehensive%20security%20is%20the%20cooperation,International%20and%20EU%20activities>>.
- Foucault, M. (1985): An Exchange. *Political Theory*, 13(3), 363-365.
- Foucault, M. (1980): *Power/Knowledge: Selected Interviews and Other Writings, 1972-79*. New York: Pantheon.

- Friede, A. M. (2025): Security, first of all, begins at home: How Finland, Latvia, and Germany prepare ordinary people for crises. *European Policy Analysis*, 11(1), 114–137.
- Garriaud-Maylam, J. (2021): *Enhancing the Resilience of Allied Societies through Civil Preparedness*. NATO Parliamentary Assembly General Report, 011 CDS 21 E rev. 1.
- German Federal Government (2022): German Strategy for Strengthening Resilience to Disasters 2022-2030. *Federal Government*, <accessed online: https://www.bbk.bund.de/SharedDocs/Downloads/DE/Mediathek/Publikationen/Sendai-Katrima/deutsche-strategie-resilienz-kurz-eng_download.pdf?__blob=publicationFile&v=5>.
- German Federal Ministry of Defence (2023): Defence Policy Guidelines 2023. *Federal Ministry of Defence*, <accessed online: <https://www.bmvg.de/resource/blob/5702190/edabed114d7856c8aa71ad666cbce8b3/download-defence-policy-guidelines-2023-data.pdf>>.
- German Federal Office of Civil Protection and Disaster Assistance (2025): Vorsorgen für Krisen und Katastrophen [Preparations for crises and disasters]. *Federal Office of Civil Protection and Disaster Assistance*, <accessed online: https://www.bbk.bund.de/DE/Warnung-Vorsorge/Vorsorge/vorsorge_node.html>.
- German Federal Office of Civil Protection and Disaster Assistance (2018): Guide for emergency preparedness and correct action in emergency situations. *Federal Office of Civil Protection and Disaster Assistance*, <accessed online: https://www.ernaehrungsvorsorge.de/fileadmin/SITE_MASTER/content/Dokumente/ratgeber-englisch-disasters-alarm-3.pdf>.
- Holling, C. S. (1973): Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics* 4, 1–23.
- Holm, S. (1979): A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics*, 6(2), 65–70.
- Hosmer, D.W., Lemeshow, S. & Sturdivant, R.X. (2013): *Applied Logistic Regression*, 3rd ed. Hoboken, NJ: Wiley.
- International Federation of Red Cross and Red Crescent Societies (IFRC) (2010): *World Disasters Report 2010: Focus on Urban Risk*. Geneva: IFRC.
- Jacuch, A. (2024): Defending Europe: Strengthening resilience through civil preparedness. *Politeja*, 21(6/93), 245–265.
- Kitamura, Y. (2022): A cashless society: facts and issues. In: *Quest for Good Money*, Hitotsubashi University IER Economic Research Series 48, 125–139.
- Kohler, K., Hauri, A., Roth, F. & Scharte, B. (2020): *Measuring Individual Disaster Preparedness*. Risk and Resilience Report. Center for Security Studies (CSS), ETH Zurich.
- Kohler, M. D., Smith, D. E., Andrews, J., Chung, A. I., Hartog, R., Henson, I. & Guivits, S. (2020): Earthquake early warning ShakeAlert 2.0: Public rollout. *Seismological Research Letters*, 91(3), 1763–1775.

- Kong, L., Mu, Z., Hu, G. & Zhang, Z. (2022): The application of resilience theory in urban development: a literature review. *Environmental Science and Pollution Research*, 29, 49651–49671.
- Larsson, O. L. (2021): The connection between crisis and war preparedness in Sweden. *Security Dialogue*, 52(4), 306–324.
- Latvia Ministry of Defence (2025): Civil protection. *Ministry of Defence*, <accessed online: <https://www.mod.gov.lv/en/nozares-politika/comprehensive-state-defence/civil-protection> >.
- Latvia Ministry of Defence (2024): Comprehensive state defence. *Ministry of Defence*, <accessed online: <https://www.mod.gov.lv/en/nozares-politika/comprehensive-state-defence> >.
- Latvia Ministry of Defence (2023): The State Defence Concept. *Ministry of Defence*, <accessed online: <https://www.mod.gov.lv/sites/mod/files/document/The%20State%20Defence%20Concept%202023-2027.pdf> >.
- Latvia Ministry of Defence (2022): What to do in case of a crisis. *Ministry of Defence*, <accessed online: <https://www.sargs.lv/lv/brochure-what-to-do-in-case-of-crisis> >.
- Levac, J., Toal-Sullivan D. & O'Sullivan, T. L. (2012): Household emergency preparedness: a literature review. *Journal of Community Health*, 37(3), 725–733.
- Lindell, M. (2019): *The Routledge handbook of urban disaster resilience: Integrating mitigation, preparedness, and recovery planning*. New York: Routledge.
- Lindell, M. K. & Perry, R. W. (2012): The protective action decision model: Theoretical Modifications and Additional Evidence. *Risk Analysis*, 32(4), 616–627.
- Long, J. S. & Ervin, L. H. (2000): Using heteroscedasticity consistent standard errors in the linear regression model. *The American Statistician*, 54(3), 217–224.
- Löwenheim, O. (2007): The responsibility to responsibilize: Foreign offices and the issuing of travel warnings. *International Political Sociology*, 1(3), 203–221.
- Miner, T. W., Jha, A. K. & Stanton-Geddes, Z. (2013): *Building Urban Resilience: Principles, Tools, and Practice*. Washington, DC: World Bank.
- Myers, J. L., Well, A. D. & Lorch, R. F. (2010): *Research Design and Statistical Analysis* (3rd ed.). New York: Routledge.
- NATO (2024): Resilience, civil preparedness and Article 3. *NATO*, 13 November, <accessed online: https://www.nato.int/cps/en/natohq/topics_132722.htm >.
- NATO (2016): *Commitment to enhance resilience*. Press release Nr. 118. *NATO*, 18 July, <accessed online: https://www.nato.int/cps/en/natohq/official_texts_133180.htm>.
- NATO (1949): The North Atlantic Treaty. *NATO*, 4 April, <accessed online: https://www.nato.int/cps/en/natolive/official_texts_17120.htm >.
- NATO ACT (2025): Strengthening Civil-Military Cooperation: The Role of NATO's Civil-Military Cooperation Centre of Excellence. *NATO ACT*, 6 August, <accessed online: <https://www.act.nato.int/article/cimic-coe-2025/>>.
- Niinistö, S. (2024): Safer Together – Strengthening Europe's Civilian and Military Preparedness and Readiness. *European Commission*, 20 March. <accessed

- online: https://commission.europa.eu/document/download/5bb2881f-9e29-42f2-8b77-8739b19do47c_en?filename=2024_Niinisto-report_Book_VF.pdf >.
- Pan Y., Čižo E., Ruža O. & Ignatjevs S. (2025): Strategic communication for open governance in Latvia: from theory to practice. *Sociālo Zinātņu Vēstnesis / Social Sciences Bulletin*, 40(1), 33–51.
- Paton, D. (2003): Disaster preparedness: a social-cognitive perspective. *Disaster Prevention and Management*, 12(3), 210–216.
- Pyysiäinen, J., Halpin, D. & Guilfoyle, A. (2017): Neoliberal governance and ‘responsibilization’ of agents: reassessing the mechanisms of responsibility-shift in neoliberal discursive environments. *Journal of Social Theory*, 18(2), 215–235.
- Rådestad, C. & Larsson, O. (2020): Responsibilization in contemporary Swedish crisis management: expanding ‘bare life’ biopolitics through exceptionalism and neoliberal governmentality. *Critical Policy Studies*, 14(1), 86–105.
- Raitasalo, J. (2023): Finnish defense ‘left of bang’. *PRISM*, 10(2). National Defense University Press.
- Rezvani, S. M. H. S., Falcão, M. J., Komljenovic, D. & Marques de Almeida, N. (2023): A systematic literature review on urban resilience enabled with asset and disaster risk management approaches and GIS-based decision support tools. *Applied Sciences*, 13(4), 1–41.
- Rhinard, M. (2021): Societal security in theory and practice. In: Larsson, S. & Rhinard, M. (eds.): *Nordic societal security: convergence and divergence*. London: Routledge, 22–42.
- Rose, N. (2000): Government and Control. *British Journal of Criminology*, 40(2), 321–339.
- Rose, N. (1999): *Powers of Freedom: Reframing Political Thought*. Cambridge: Cambridge University Press.
- Rose, N. & Miller, P. (1992): Political Power beyond the State: Problematics of Government. *British Journal of Sociology*, 43(2), 173–205.
- Rosenstock, I. M. (1974): The health belief model and preventive health behavior. *Health Education Monographs*, 2(4), 354–386.
- Sáenz de Tejada, C., Daher, C., Hidalgo, L., Netanyahu, S., Nieuwenhuijsen, M. & Braubach, M. (2024): Urban planning, design and management approaches to building urban resilience: a rapid review of the evidence. *Cities & Health*, 8(5), 932–955.
- Saxi, H.L., Bengt, S. & Swaney, B. (2020): Baltics left of bang: Nordic total defense and implications for the Baltic Sea region. *Strategic Forum*, 304, 1–19.
- Scolobig, A., Prior, T., Schröter, D., Jörina, J. & Patta, A. (2015): Towards people-centred approaches for effective disaster risk management: Balancing rhetoric with reality. *International Journal Disaster Risk Reduction*, 12, 202–212.
- Siliézar, J. P. A., Can, A., Chapron, P. & Péroche, M. (2023): Case study on the audibility of siren-driven alert systems. *Noise Mapping*, 10(1), 1–16.
- Slovic, P. (1987): Perception of risk. *Science*, 236 (4799), 280–285.

- Sunstein, C. R. (2021): Better off, as judged by themselves: Bounded rationality and nudging. In: Viale, R. (ed.): *Routledge Handbook of Bounded Rationality*. New York: Routledge/Taylor & Francis Group Press, 563–569.
- Thaler, R. H. & Sunstein, C. R. (2008): *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Yale: Yale University Press.
- Tierney, K. (2014): *The Social Roots of Risk: Producing Disasters, Promoting Resilience*. Stanford: Stanford University Press.
- Tsinovoi, A. & Adler-Nissen, R. (2018): Inversion of the “Duty of Care”: Diplomacy and the Protection of Citizens Abroad, from Pastoral Care to Neoliberal Governmentality. *The Hague Journal of Diplomacy*, 13(2), 211–232.
- Widmalm, S., Parker, C. & Persson, T. (2019): *Civil Protection Cooperation in the European Union*. Cham: Palgrave Macmillan.
- Wigell, M., Hägglund, M., Fjäder, C., Hakala, E., Ketola, J. & Mikkola, H. (2022): Nordic resilience: strengthening cooperation on security of supply and crisis preparedness. *Finnish Institute of International Affairs, Report Nr. 70.*, September, <accessed online: <https://www.fia.fi/en/publication/nordic-resilience>>.
- Wither, J. K. (2020): Back to the future? Nordic total defence concepts. *Defence Studies*, 20(1), 61–81.
- Zamboni, L. M. & Martin E.G. (2020): Association of US households’ disaster preparedness with socioeconomic characteristics, composition, and region. *JAMA Network Open*, 3(4), e206881.