

A Conceptual Framework for Health System Collapse: Linking External Stressors, Internal Vulnerabilities, and Cascading Risks

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Abstract

Health-system collapse is rarely attributable to a single shock or isolated system failure. Evidence generated across a sequential research program indicated that systemic deterioration emerges through the interaction of external pressures, internal vulnerabilities, cross-domain propagation, and declining system capacity. This study aimed to integrate these findings into a comprehensive conceptual and diagnostic framework for assessing the risk of health-system collapse.

An integrative conceptual framework-development approach was applied through cross-study synthesis of findings from ten preceding empirical and conceptual studies. The synthesis integrated evidence on external stressors, internal vulnerability domains, early-warning signals, vulnerability interactions, and functional deterioration. Findings were further interpreted in relation to the SEA dimensions of Stability, Efficiency, and Adaptability.

The synthesis identified eight categories of external stressors and six internal vulnerability domains and resulted in the WAVE Model, comprising four interconnected components: Wider Environmental Stressors (W), Activated Internal Vulnerabilities (A), Vulnerability Interactions and Cascades (V), and Escalating Systemic Risk (E). A structured WAVE Diagnostic Assessment Tool was subsequently developed to operationalize these components through domain-specific diagnostic items scored on a 10-point scale and hierarchically standardized to four 0–100 component scores. These scores can be retained as a diagnostic risk profile and provisionally integrated into an overall 0–100 collapse-risk score.

WAVE conceptualizes health-system collapse as a progressive systemic risk process rather than the consequence of a single failure. The framework provides a structured basis for detecting how external pressures activate vulnerabilities, how vulnerabilities interact and cascade, and when deterioration begins to threaten system-wide functioning. Empirical validation is required to establish item performance, differential weighting, risk thresholds, and predictive validity.

Keywords: Health-system collapse; WAVE Model; systemic risk; early-warning signals; health-system vulnerability; cascading risk; SEA framework; health-system resilience.

1. Introduction

Health systems are complex and interdependent structures whose functioning depends on the continuous coordination of governance, financing, workforce, infrastructure, information systems, service capacity, and relationships of trust. Contemporary health systems are simultaneously exposed to demographic transitions, changing disease burdens, workforce shortages, fiscal constraints, technological expansion, and recurrent public health and environmental pressures, creating conditions in which multiple sources of stress may accumulate rather than occur independently (Manafi, 2025, 2026; Gutowski et al., 2026; Hojabri & Manafi, 2026a, 2026b, 2026c, 2026d, 2026e, 2026g, 2026h). Comparative analysis of major health-system models further indicates that no institutional configuration is inherently protected from such pressures; rather, different models exhibit different combinations of structural strengths and vulnerabilities that influence their capacity to withstand increasing systemic stress (Manafi, 2025, 2026; Hojabri & Manafi, 2026f).

The distinction between temporary performance deterioration and progressive systemic decline is particularly important for understanding health-system collapse. The early-warning framework developed in the initial phase of this research program conceptualized collapse as a progressive process associated with deterioration across multiple internal domains rather than as the consequence of a single isolated failure (Hojabri & Manafi, 2026a). Governance failure, financial fragility, workforce burnout and attrition, infrastructure vulnerability, digital-system failure, and erosion of trust were identified as interconnected sources of vulnerability capable of progressively affecting system Stability, Efficiency, and Adaptability (Hojabri & Manafi, 2026a). These findings also suggested that continued optimization under pressure may become counterproductive when cost containment, workforce intensification, reduced redundancy, and highly optimized resource utilization progressively diminish flexibility and safety margins (Hojabri & Manafi, 2026a).

Subsequent studies examined these vulnerability domains in greater depth and demonstrated that each can generate measurable warning signals before overt system failure occurs. Workforce deterioration through sustained overload, burnout, attrition, and declining professional continuity can progressively undermine organizational stability and the capacity of the health system to respond to sustained pressure (Hojabri & Manafi, 2026h). Governance fragility may remain partially hidden within an apparently functioning system until weaknesses in strategic planning, accountability, coordination, implementation, information use, and crisis governance begin to impair effective system control (Hojabri & Manafi, 2026e). Economic and financial fragility similarly extends beyond isolated expenditure or budget indicators and may develop across interconnected levels ranging from the macroeconomic environment and health-market dynamics to financing mechanisms, provider sustainability, and household financial protection (Hojabri & Manafi, 2026d).

Other domains demonstrate comparable patterns of progressive vulnerability. Health-system infrastructure cannot be assessed solely through the physical presence of facilities and equipment because actual service continuity depends on functional capacity, critical infrastructure, supply chains, redundancy, reserves, alternative sources, and surge capacity (Hojabri & Manafi, 2026b). Digital transformation can improve coordination, access, and efficiency while simultaneously creating new dependencies; when highly interconnected digital systems operate with limited fallback capacity, technical failures, connectivity disruption, cyber incidents, and other digital failures may propagate beyond their point of origin and affect wider service continuity (Hojabri & Manafi, 2026c). A complementary digital-saturation assessment subsequently translated these vulnerabilities into a structured SEA-based assessment approach, emphasizing the importance of maintaining balance among Stability, Efficiency, and Adaptability rather than maximizing digital efficiency alone (Hojabri & Manafi, 2026c). Trust represents another system-level vulnerability: governance failures, workforce strain, declining service quality, misinformation, financial pressures, and reduced institutional legitimacy may progressively erode trust, with consequences for cooperation, public engagement, professional relationships, and adaptive capacity (Hojabri & Manafi, 2026g).

Taken together, these findings indicate that vulnerability to collapse is multidimensional and cannot be attributed to a single health-system component. They also reinforce the importance of examining the functional consequences of accumulated pressure. The SEA framework provides this functional perspective by considering deterioration in Stability, Efficiency, and Adaptability, while comparative analysis across major health-system models suggests that collapse risk depends less on institutional typology itself than on the ability of a system to maintain balance across these dimensions under increasing pressure (Hojabri & Manafi, 2026f). Different systems may therefore reach similar states of systemic vulnerability through different pathways: one may be predominantly affected by fiscal and capacity constraints, another by governance fragmentation, and another by financial inequality or institutional rigidity (Hojabri & Manafi, 2026f).

However, conventional performance assessment may not adequately reveal this progression. A comparative conceptual analysis of 32 performance evaluation and organizational excellence models found that dominant approaches tend to emphasize efficiency, quality, access, process optimization, and organizational performance while providing more limited representation of structural limits, cumulative saturation, systemic Stability, and Adaptability (Gutowski et al., 2026). Such imbalance may obscure

emerging conditions including workforce strain, declining responsiveness, policy rigidity, and other vulnerabilities that become important before visible system failure occurs (Gutowski et al., 2026). Consequently, a health system may continue to demonstrate acceptable performance on selected conventional indicators while simultaneously losing redundancy, adaptive reserve, compensatory capacity, or the ability to withstand additional pressure.

The domain-specific studies conducted across this research program addressed part of this limitation by identifying early-warning indicators and translating vulnerability into structured assessment approaches. Workforce deterioration, governance fragility, economic and financial vulnerability, infrastructure and capacity constraints, digital saturation, and trust erosion were progressively operationalized as conditions that could be monitored before complete functional failure became apparent (Hojabri & Manafi, 2026b, 2026c, 2026d, 2026e, 2026g, 2026h). Nevertheless, identifying individual vulnerabilities does not by itself explain how a health system moves from exposure to pressure toward systemic collapse. Multiple vulnerabilities may coexist without producing collapse if they remain contained or if sufficient reserves, redundancy, compensatory mechanisms, and adaptive capacity are retained. The critical analytical issue is therefore not only which vulnerabilities are present, but whether external pressures activate them, whether activated vulnerabilities begin to interact and reinforce one another, and whether those interactions propagate across the system and progressively impair its overall functioning.

This represents the central problem and research gap addressed by the present study. Although the preceding research program identified major internal vulnerability domains, external sources of pressure, domain-specific early-warning signals, and functional deterioration across Stability, Efficiency, and Adaptability, these elements remained distributed across separate analytical frameworks. A unified conceptual architecture explaining the progression from external stressor exposure to activation of internal vulnerabilities, cross-domain interaction and cascading deterioration, and ultimately escalating system-wide collapse risk has therefore remained absent. The present study addresses this gap by integrating findings from ten preceding empirical and conceptual studies to develop the WAVE Model, comprising Wider Environmental Stressors (W), Activated Internal Vulnerabilities (A), Vulnerability Interactions and Cascades (V), and Escalating Systemic Risk (E). The study further aims to operationalize this integrated architecture through a structured diagnostic assessment tool capable of profiling these four components and providing an overall estimate of health-system collapse risk.

2. Literature Review

Health systems differ substantially in their financing arrangements, governance structures, provider organization, and mechanisms of resource allocation. Classical comparative approaches commonly distinguish tax-funded Beveridge systems, social health insurance or Bismarck systems, National Health Insurance models, market-oriented arrangements, and various hybrid configurations. Comparative evidence has repeatedly shown that these models represent different institutional logics rather than a simple hierarchy in which one system is universally superior. In a comparison of National Health Service and social-security-based systems across European countries, van der Zee and Kroneman (2007) found differences in expenditure, satisfaction, and selected health outcomes, while also emphasizing that the indicators used could not capture every relevant dimension of health-system performance. This limitation is important because comparisons based primarily on outcomes, expenditure, or satisfaction describe how systems perform under observed conditions but provide less information about how they may behave when internal vulnerabilities accumulate or external pressures intensify.

The comparative SEA-based analysis conducted within the present research program similarly showed that different institutional models possess distinct combinations of strengths and vulnerabilities (Hojabri & Manafi, 2026h). Beveridge-type systems may benefit from centralized authority, unified financing, and relatively strong institutional coordination but may encounter capacity constraints and policy rigidity under sustained pressure. Bismarck systems may possess greater flexibility through negotiated and distributed governance but can become vulnerable to institutional fragmentation and coordination complexity. National Health Insurance systems may combine strong purchasing capacity and relatively stable financing with dependence on centralized fiscal resources. Market-oriented systems may encourage innovation and responsiveness while being more exposed to financial instability, access inequality, and

fragmented coverage. Hybrid systems combine characteristics of several arrangements and consequently display context-dependent vulnerability profiles. These differences imply that collapse risk is not associated with one particular model of health system; rather, each institutional structure contains specific points at which prolonged pressure may compromise Stability, Efficiency, or Adaptability (Hojabri & Manafi, 2026h). Broader comparative work has similarly demonstrated that institutional design can influence efficiency and resource use, while no single configuration consistently dominates across all dimensions of performance (Joumard et al., 2010).

This perspective is consistent with systems-thinking approaches, which conceptualize health systems as networks of interacting components rather than collections of independent organizational units. The World Health Organization (2009) emphasized that interventions in one component of a health system may produce effects elsewhere because financing, governance, workforce, information, technologies, and service delivery interact dynamically. Consequently, system deterioration may also propagate across domains. A workforce problem may therefore become a service-capacity problem; a financial constraint may develop into workforce attrition or deferred maintenance; and governance dysfunction may impair the system's ability to recognize and respond to emerging threats. This interconnectedness is fundamental to understanding why evaluation of isolated components cannot, by itself, provide a complete assessment of systemic vulnerability.

Performance measurement has become one of the principal mechanisms used to assess health systems and healthcare organizations. The World Health Report 2000 formalized a system-level approach connecting health-system functions with outcomes and broader objectives such as population health, responsiveness, and financial fairness (World Health Organization, 2000, 2003). Subsequent performance frameworks expanded the range of indicators available for policymakers and managers, and modern assessment increasingly combines measures of inputs, processes, outputs, quality, efficiency, access, and outcomes (World Health Organization, 2022).

At the organizational level, performance and excellence models have evolved from retrospective evaluation toward approaches intended to support strategic improvement and continuous organizational development. A comparative review of 32 performance evaluation and excellence models identified three broad orientations: performance- and process-based approaches, quality-management approaches, and strategic models (Hojabri et al., 2013). These models have contributed substantially to organizational management; however, they were primarily designed to determine whether organizations perform effectively, achieve strategic objectives, comply with expected processes, or improve quality. They were not originally developed as diagnostic systems for identifying pathways toward systemic saturation or collapse.

Several influential models illustrate this orientation. The Balanced Scorecard (BSC) translates organizational strategy into measures across financial performance, customers, internal processes, and learning and growth. Its major strength is the connection it creates between strategic objectives and organizational measurement, allowing management to assess whether activities are aligned with strategy (Hojabri et al., 2013). However, the measures are selected from the strategic priorities and operational objectives already recognized by the organization. Consequently, the BSC is highly useful for answering the question “Are we achieving our strategy?” but does not automatically answer a different question: “Are vulnerabilities developing outside the strategy that could eventually destabilize the system?”

The Baldrige Performance Excellence Framework similarly adopts a broad strategic perspective incorporating leadership, strategy, customer orientation, measurement and analysis, knowledge management, workforce, operations or process management, and organizational results. Its breadth makes it considerably more comprehensive than simple output measurement and has supported its application in healthcare and other service organizations (Hojabri et al., 2013). Nevertheless, its logic remains predominantly one of organizational excellence and performance improvement. Assessment therefore concentrates on the quality and effectiveness of recognized organizational systems and processes. The framework does not explicitly begin with the possibility that a system may appear operationally successful while hidden financial, workforce, infrastructural, digital, governance, or relational vulnerabilities are accumulating.

The EFQM Excellence Model provides another important example. EFQM-based approaches integrate organizational enablers and results and have been applied within healthcare as mechanisms for organizational self-assessment, quality improvement, and governance. The model has also been considered suitable for supporting clinical governance and baseline organizational assessment within healthcare institutions (Jackson, 1999; Hojabri et al., 2013). As with Baldrige, its strength lies in providing a structured and comprehensive view of organizational performance, leadership, processes, stakeholders, and results. However, the structure of excellence assessment remains anchored in determining how well organizational processes and enabling mechanisms support desired outcomes.

Clinical governance extends this quality-oriented logic specifically into healthcare. Halligan and Donaldson (2001) described clinical governance as an institutional framework through which healthcare organizations maintain accountability for continuous improvement in quality and safeguard standards of care. In practice, clinical governance encompasses domains such as clinical effectiveness, patient safety, risk management, audit, professional development, evidence-based practice, and accountability. Accreditation and external quality-assurance mechanisms likewise evaluate whether predefined standards, processes, and safety requirements have been implemented (Shaw, 2000; World Health Organization, 2003). Such approaches are indispensable for evaluating quality and reducing preventable harm, but their analytical starting point is predominantly the delivery process and its compliance with defined standards.

The comparative analysis of performance models supports this interpretation. Although major models cover many aspects of leadership, strategy, quality, processes, staff, customers, and results, their coverage is uneven, and dimensions related to external pressures, structural limits, systemic Stability, and Adaptability receive substantially less attention than process efficiency and organizational performance (Hojabri et al., 2013; Gutowski et al., 2026). The SEA reinterpretation of 32 models further showed that conventional performance frameworks disproportionately emphasize Efficiency while providing weaker visibility into declining Stability and adaptive capacity (Gutowski et al., 2026). Therefore, the problem is not that conventional models are ineffective for their intended purpose; rather, their intended purpose is different from collapse-risk diagnosis.

This distinction is particularly clear in efficiency-based approaches such as Data Envelopment Analysis, in which organizational units are compared using combinations of inputs and outputs to determine relative efficiency (Hojabri et al., 2013). Such analysis may demonstrate that an organization converts its available inputs into outputs efficiently, but high efficiency does not necessarily indicate low systemic vulnerability. An organization operating with minimal staffing, minimal inventory, limited redundancy, and high utilization may appear efficient while simultaneously possessing very little reserve capacity. Under normal operating conditions, these characteristics may improve conventional performance ratios; under a major external shock, the same characteristics may accelerate saturation.

Thus, performance and vulnerability are related but not interchangeable concepts. Good performance does not necessarily imply high resilience, and poor performance does not necessarily indicate proximity to collapse. The crucial issue is whether the system retains sufficient institutional coherence, workforce capacity, financial reserve, infrastructure redundancy, digital fallback, trust, and adaptive capability to withstand additional pressure.

The domain-specific studies within the present research program were designed to investigate precisely these less visible sources of vulnerability. Governance fragility was shown to develop through failures in planning, coordination, accountability, implementation, information use, and adaptive governance (Hojabri & Manafi, 2026g). Economic and financial fragility was conceptualized as a multilevel process extending from the macroeconomic environment through health markets and financing institutions to providers and household financial protection (Hojabri & Manafi, 2026e). Workforce analysis identified progressive overload, burnout, attrition, depletion, and loss of adaptive capacity as early-warning conditions that may precede visible service failure (Hojabri & Manafi, 2026i).

Other studies identified comparable vulnerabilities. Infrastructure and capacity assessment demonstrated that the presence of physical infrastructure alone does not establish functional capacity; effective operation depends on electricity, water, supply chains, logistics, maintenance, reserve capacity, alternative suppliers, and other upstream dependencies (Hojabri & Manafi, 2026b). Digital-system research showed that technologies that initially increase efficiency may also create systemic dependence when manual fallback, interoperability, recovery mechanisms, or cybersecurity become inadequate (Hojabri & Manafi, 2026c, 2026d). Trust research further demonstrated that declining institutional legitimacy, workforce stress, misinformation, perceived unfairness, service failure, and governance dysfunction can progressively weaken cooperation and adaptive capacity even before conventional indicators register widespread operational failure (Hojabri & Manafi, 2026f).

Taken together, these findings suggest that health-system collapse cannot be adequately assessed by replacing one conventional performance model with another. Rather, collapse-oriented assessment requires a complementary diagnostic layer capable of identifying conditions that existing performance, quality, accreditation, and process-assessment systems were not designed to detect. SEA contributes to this requirement by distinguishing whether Stability, Efficiency, or Adaptability is deteriorating, while the domain-specific studies provide measurable evidence of the vulnerabilities underlying that deterioration.

The remaining conceptual problem concerns the relationship among these vulnerabilities and the external environment. Conventional assessment tends to evaluate components separately, while the evidence from systems thinking and the preceding studies indicates that systemic risk depends increasingly on interaction and propagation. External pressures may activate previously manageable vulnerabilities; vulnerabilities may reinforce one another; and deterioration may spread across financing, workforce, infrastructure, digital systems, governance, and trust. The unresolved requirement is therefore a framework capable of connecting external stressors, activated internal vulnerabilities, vulnerability interactions and cascades, and escalating systemic risk. This requirement provides the conceptual basis for the WAVE framework developed in the present study.

3. Methodology

This study employed an integrative conceptual framework-development approach as the synthesis phase of a sequential research program on health-system saturation and collapse. The framework was developed by integrating findings generated through previous qualitative studies, expert interviews, literature reviews, and domain-specific analyses conducted across the research program. No new interviews were undertaken for the present study.

Findings from the preceding studies were reviewed through cross-study conceptual synthesis. The synthesis focused on three categories of evidence: external conditions capable of placing health systems under substantial pressure, internal factors associated with vulnerability to saturation and collapse, and system-level patterns indicating interaction, propagation, and escalation of risk.

External pressures were consolidated into eight major stressor categories: wars and armed conflict; changes in disease burden and outbreaks; economic changes and crises; political changes and instability; social, cultural, and demographic changes; natural disasters; climate-related changes; and cross-border and regional crisis spillover. Internal vulnerability findings were consolidated into six domains: governance fragmentation and failure, financial and economic vulnerability, workforce vulnerability, digital saturation, infrastructure and capacity vulnerability, and trust erosion. The functional consequences of deterioration were interpreted in relation to the previously developed SEA framework of Stability, Efficiency, and Adaptability.

Integration of these findings resulted in the WAVE Model, representing four interconnected components of the pathway toward health-system collapse: Wider Environmental Stressors (W), Activated Internal Vulnerabilities (A), Vulnerability Interactions and Cascades (V), and Escalating

Systemic Risk (E). The model conceptualizes collapse as a progressive risk process rather than an inevitable consequence of any single stressor or vulnerability.

To operationalize the conceptual model, a structured diagnostic assessment tool was developed around the four WAVE components. Each component was decomposed hierarchically into domains, subdomains, and detailed diagnostic items. The W component assesses the nature, intensity, duration, geographic and population exposure, trajectory, and other relevant characteristics of external stressors. The A component assesses the extent to which internal vulnerabilities are present, activated, or intensified. The V component assesses concurrency, interaction, mutual reinforcement, propagation, cascading effects, and feedback among vulnerabilities. The E component assesses evidence that deterioration has progressed from individual domains toward system-wide risk, including deterioration in stability, efficiency, adaptability, service continuity, reserve capacity, shock absorption, and recovery capacity.

Items are structured using a 10-point response scale, consistently oriented so that higher values indicate greater pressure, vulnerability, interaction, or systemic deterioration. Wherever possible, response levels are anchored to explicit quantitative ranges, time intervals, population or geographic proportions, or clearly defined qualitative conditions. This approach allows complex qualitative and contextual conditions to be translated into standardized numerical assessments while retaining their diagnostic meaning.

Item scores are aggregated hierarchically, first into subdomain and domain scores and subsequently into four standardized WAVE component scores:

$$0 \leq W, A, V, E \leq 100$$

where values approaching 100 represent progressively greater concern within the respective component. The WAVE framework expresses the overall Risk of Health-System Collapse as:

$$R_{HSC} = w_W W + w_A A + w_V V + w_E E$$

where W , A , V , and E represent the standardized component scores and w_W , w_A , w_V , and w_E represent their relative weights. Because empirical evidence for differential weighting of the four components is not yet available, the initial framework does not claim empirically validated component weights. Equal weighting may be used for preliminary application:

$$R_{HSC} = \frac{W + A + V + E}{4}$$

producing an overall score ranging from 0 to 100, with higher values representing greater estimated risk of health-system collapse. Component scores are retained alongside the overall score to identify the principal sources and stages of risk rather than relying solely on the aggregate value.

The WAVE Model and its diagnostic assessment tool should therefore be regarded as a conceptually derived assessment framework rather than a validated predictive instrument. Subsequent research will be required to test item performance, internal consistency, construct validity, component weighting, risk thresholds, and predictive validity using empirical data across different health-system contexts.

4. Results

Cross-study synthesis of the preceding research program demonstrated that health-system collapse could not be adequately explained by the presence of a single external shock, an isolated organizational weakness, or deterioration within one functional domain. Across the studies, a recurrent pattern emerged in which external pressures confronted pre-existing or developing internal vulnerabilities, activated or intensified these vulnerabilities, and created conditions in which deterioration could propagate across interconnected parts of the health system. When such interactions persisted or intensified, the resulting effects extended beyond individual domains and progressively threatened system-wide functioning.

The synthesis generated four analytical pillars. The first identified the major external stressors capable of imposing substantial pressure on health systems. The second consolidated the principal internal vulnerability domains through which these pressures could affect system functioning. The third drew on the previously developed SEA framework to characterize deterioration in Stability, Efficiency, and Adaptability. The fourth integrated these findings into the WAVE Model, providing a conceptual architecture for describing how external pressure may progress toward systemic risk.

The external-stressor synthesis identified eight major categories: wars and armed conflict; changes in disease burden and outbreaks; economic changes and crises; political changes and instability; social, cultural, and demographic changes; natural disasters; climate-related changes; and cross-border and regional crisis spillover. These stressors differed substantially in origin and manifestation but shared the capacity to impose additional demands, disrupt essential resource flows, alter population needs, or constrain the operating environment of the health system.

The internal-vulnerability synthesis identified six principal domains: governance fragmentation and failure, financial and economic vulnerability, workforce vulnerability, digital saturation, infrastructure and capacity vulnerability, and trust erosion. These domains represented different mechanisms through which a health system could become increasingly susceptible to external pressure. Importantly, their presence did not itself indicate collapse. Rather, the synthesis suggested that their significance increased when vulnerabilities became activated, deteriorated concurrently, or began to affect other domains.

The preceding studies also generated domain-specific early-warning indicators reflecting progressive deterioration within these vulnerabilities. Because these indicators and their operational characteristics were developed and reported within the respective domain studies, they were not reproduced individually in the present synthesis. Instead, they provided part of the conceptual and operational basis for developing the integrated diagnostic framework.

A further finding of the cross-study synthesis was the importance of distinguishing the severity of individual vulnerabilities from the relationships developing among them. Financial deterioration, workforce pressure, infrastructure constraints, governance fragmentation, digital disruption, or declining trust may initially occur as distinguishable problems. However, their systemic significance increases when deterioration in one domain contributes to deterioration in another, when multiple vulnerabilities reinforce each other, or when sequential effects form cascading pathways. This distinction provided the basis for separating activated vulnerabilities from vulnerability interactions and cascades within the integrated model.

The synthesis also distinguished such interactions from a subsequent stage in which deterioration becomes increasingly systemic. At this stage, the principal concern is no longer only the number or severity of affected domains, but whether the health system is losing its ability to maintain essential functions, compensate for local failures, absorb additional shocks, mobilize remaining reserves, and recover from disruption. The SEA framework provided the functional lens for interpreting this progression through deterioration in Stability, Efficiency, and Adaptability.

The WAVE Model

Integration of these findings resulted in the WAVE Model, comprising four interconnected components: Wider Environmental Stressors (W), Activated Internal Vulnerabilities (A), Vulnerability Interactions and Cascades (V), and Escalating Systemic Risk (E).

Wider Environmental Stressors (W) represent pressures originating primarily outside the health system. Their relevance is determined not simply by their presence but by characteristics such as intensity, duration, geographic reach, population exposure, trajectory, persistence, and concurrence with other pressures.

Activated Internal Vulnerabilities (A) represent weaknesses within the health system that are present or have become sufficiently intensified to affect its capacity to withstand external pressure. The concept of activation distinguishes the existence of a structural weakness from a vulnerability that has become functionally consequential under prevailing conditions.

Vulnerability Interactions and Cascades (V) represent the transition from isolated or concurrent vulnerabilities toward interconnected deterioration. This component captures transmission between domains, mutual reinforcement, cascading effects, feedback processes, and dependencies through which deterioration may propagate across the system.

Escalating Systemic Risk (E) represents evidence that deterioration is extending beyond individual vulnerabilities and their interactions toward system-wide functional consequences. This includes progressive loss of reserve and compensatory capacity, impaired continuity of essential services, declining shock-absorption and recovery capacity, and deterioration in Stability, Efficiency, and Adaptability. The resulting conceptual pathway is therefore expressed as:

$$W \rightarrow A \rightarrow V \rightarrow E \rightarrow \text{Risk of Health-System Collapse}$$

This pathway should not be interpreted as an inevitable or strictly linear sequence. A major external stressor does not necessarily produce substantial internal vulnerability, and the presence of several vulnerabilities does not necessarily result in cascading deterioration. Similarly, systems may interrupt the progression through reserve capacity, effective governance, redundancy, adaptation, or recovery. The WAVE components therefore represent analytically distinct but interconnected dimensions of an escalating risk process. See Figure 1.

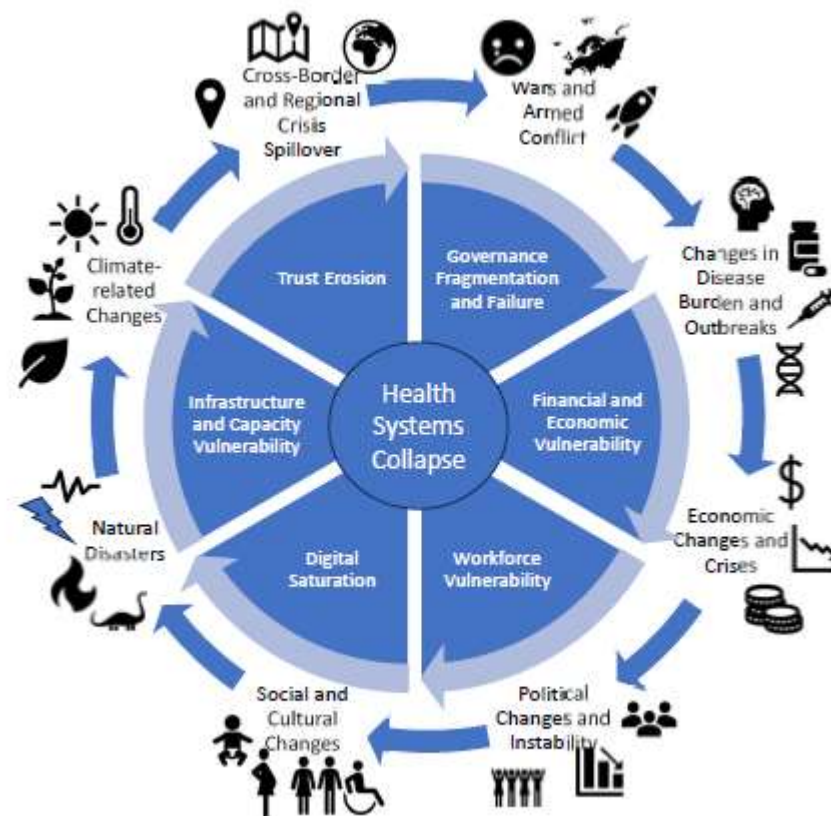


Figure 1: WAVE Model developed by this study

Development of the WAVE Diagnostic Assessment Tool

The conceptual model was operationalized through the WAVE Diagnostic Assessment Tool. The instrument follows a hierarchical structure in which the four WAVE components are decomposed into domains, subdomains, and detailed diagnostic items. This structure enables the assessment to retain information about the origin and progression of risk rather than reducing complex system conditions directly to a single global judgment.

All diagnostic items use a 10-point response scale, consistently oriented so that higher scores represent greater external pressure, activated vulnerability, interaction or cascading risk, or systemic deterioration. Quantitative response anchors are used where measurable ranges can reasonably be specified, while ordered descriptive anchors are used for conditions that cannot be represented adequately by a single quantitative measure. Unknown or insufficient information is treated as missing information rather than being assigned a low-risk score.

To minimize conceptual overlap and double counting, each component assesses a different aspect of the risk pathway. W evaluates the characteristics of external pressures; A evaluates the internal vulnerabilities activated under prevailing conditions; V evaluates interactions and propagation among vulnerabilities; and E evaluates evidence that deterioration is becoming systemic. The complete diagnostic instrument, including the detailed items and their corresponding 10-point response anchors, is provided in Appendix 1.

Scoring follows the hierarchical structure of the instrument rather than pooling all individual items directly. Item scores are first aggregated within their respective subdomains and domains and are subsequently used to derive the four WAVE component scores. This prevents components or domains containing larger numbers of diagnostic items from acquiring unintended influence solely because of questionnaire length. For each applicable group of items, the mean 1–10 score is standardized to a 0–100 scale as follows:

$$S = \frac{\bar{x} - 1}{9} \times 100$$

where $\bar{x}$ represents the mean score of the applicable items at the relevant aggregation level. The same transformation is applied hierarchically to generate standardized domain and component scores, resulting in:

$$0 \leq W, A, V, E \leq 100$$

Higher component scores consistently indicate greater concern. Importantly, the four scores are retained as a diagnostic profile because systems with the same overall risk score may have substantially different underlying configurations of external pressure, internal vulnerability, cascading interaction, and systemic deterioration.

Estimation of Health-System Collapse Risk

After standardization, the four WAVE component scores are combined to provide an overall estimate of health-system collapse risk. Because empirically derived differential weights are not yet available, the preliminary application assigns equal weight to W, A, V, and E:

$$R_{HSC} = \frac{W + A + V + E}{4}$$

where R_{HSC} represents the overall Risk of Health-System Collapse score. The resulting value ranges from 0 to 100, with higher values indicating greater estimated risk. The framework nevertheless allows differential component weights to be introduced when sufficient empirical evidence becomes available. Its generalized formulation is therefore:

$$R_{HSC} = w_W W + w_A A + w_V V + w_E E$$

where:

$$w_W + w_A + w_V + w_E = 1$$

and w_W , w_A , w_V , and w_E represent the relative contribution assigned to each component. The overall score is not intended to replace interpretation of the four component scores. Rather, R_{HSC} provides an integrated summary while the WAVE profile [W·A·V·E] identifies where risk is concentrated and how far deterioration appears to have progressed through the conceptual pathway. Two health systems may therefore receive similar overall scores while requiring substantially different interpretations and responses.

At this stage, the WAVE score should be interpreted as a standardized estimate of collapse risk rather than a validated probability of collapse. Empirically validated cut-off values separating discrete risk categories have not yet been established for the integrated WAVE score. Establishing such thresholds, together with evaluating item performance, reliability, construct validity, differential component weighting, and predictive validity, constitutes the subsequent empirical validation phase of the research program.

5. Discussion

The principal contribution of this study is the integration of previously identified external stressors, internal vulnerabilities, functional deterioration, and cross-domain interactions into a single conceptual architecture for understanding the progression toward health-system collapse. Previous studies within the research program examined these elements separately, allowing detailed investigation of specific vulnerability domains and their early-warning indicators. The present synthesis extends those findings by shifting the analytical focus from individual sources of vulnerability to the process through which multiple sources of pressure may converge, interact, propagate, and ultimately generate systemic risk.

A central implication of the WAVE Model is that exposure to a major stressor should not be equated with proximity to collapse. Health systems may face wars, disease outbreaks, economic crises, political instability, demographic and social pressures, natural disasters, climate-related changes, or regional spillover without necessarily progressing toward systemic failure. The consequences of these pressures depend partly on the vulnerabilities that are present within the system and the extent to which they become activated under stress. This distinction is important because it separates the magnitude of the external challenge from the condition of the system exposed to it. Two health systems facing comparable external pressures may therefore follow substantially different trajectories.

The second important contribution of WAVE is the distinction between activated vulnerability and vulnerability interaction. The simultaneous presence of financial strain, workforce shortages, infrastructure constraints, governance problems, digital saturation, and trust erosion does not necessarily mean that these vulnerabilities have formed a systemic cascade. The V component specifically addresses whether deterioration is being transmitted across domains, whether vulnerabilities are mutually reinforcing, and whether feedback processes are emerging. This provides an analytical distinction between a system experiencing several concurrent problems and one in which those problems have begun to behave as an interconnected deterioration process.

This distinction also changes the interpretation of early-warning signals. Domain-specific indicators remain important because they can reveal deterioration before widespread functional failure becomes visible. However, the WAVE framework suggests that their significance may increase when warning signals appear simultaneously across domains or when changes in one domain are associated with deterioration in others. Early warning should therefore involve not only monitoring individual indicators but also examining their configuration, concurrence, direction of change, and potential propagation across the system.

The E component adds a further distinction by separating cascading vulnerability from systemic escalation. A cascade indicates that deterioration is spreading between interconnected domains, whereas escalating systemic risk indicates that these processes are beginning to affect the health system's overall ability to function. At this stage, declining reserve capacity, impaired continuity of essential services, reduced compensatory capacity, diminished shock absorption, and weakened recovery become increasingly important. This distinction prevents systemic risk from being inferred merely from the number of vulnerabilities present.

The relationship between WAVE and the SEA framework is particularly important in this regard. The two frameworks address different analytical questions. WAVE describes the architecture through which risk develops and propagates, whereas SEA provides a functional perspective on what is being lost as systemic deterioration progresses. Stability reflects the ability to maintain

essential functions under pressure; Efficiency concerns the ability to sustain acceptable performance without progressively exhausting available resources; and Adaptability concerns the ability to adjust, reorganize, compensate, and recover when existing arrangements are no longer sufficient. Within WAVE, deterioration across these dimensions therefore contributes particularly to the interpretation of escalating systemic risk rather than constituting an additional stage outside the WAVE pathway.

Another implication concerns conventional health-system assessment. A system may continue to demonstrate acceptable performance on selected routine indicators while simultaneously accumulating vulnerabilities that reduce its capacity to withstand additional pressure. Conversely, temporary deterioration in performance during a major shock does not necessarily indicate movement toward collapse if the system retains sufficient reserve, compensatory mechanisms, adaptability, and recovery capacity. The analytical objective is therefore not simply to determine whether performance has deteriorated, but to determine whether the underlying configuration of pressure and vulnerability is becoming progressively more difficult to contain or reverse.

The WAVE Diagnostic Assessment Tool translates this conceptual distinction into a structured assessment process. Rather than asking assessors to make a direct subjective judgment about whether a health system is approaching collapse, the instrument decomposes that judgment into observable characteristics of external stressors, activated vulnerabilities, interactions and cascades, and systemic deterioration. Retaining the four component scores alongside the overall risk score is consequently important. A single aggregate value cannot distinguish a system experiencing extreme external pressure but retaining substantial internal resilience from another experiencing moderate external pressure alongside severe internal vulnerability and advanced cascading deterioration.

The framework may therefore have practical value not only for identifying elevated risk but also for locating the dominant configuration of that risk. A high W score primarily indicates an adverse external environment; a high A score identifies substantial activated internal vulnerabilities; increasing V indicates that vulnerabilities are becoming interconnected and mutually consequential; and increasing E indicates that deterioration is approaching a system-wide functional problem. This diagnostic profile may be more informative for decision-making than an aggregate score considered in isolation because interventions appropriate to each configuration may differ substantially.

The present framework nevertheless represents a conceptual and diagnostic development rather than a validated predictive model. The 0–100 component scores provide standardized measures that enable the four dimensions to be compared and integrated, but they should not currently be interpreted as probabilities of collapse. Similarly, the preliminary equal weighting of W, A, V, and E is an operational starting point rather than evidence that the four components exert identical effects. Empirical testing across different health-system contexts will be required to examine item performance, reliability, construct validity, relationships among components, differential weighting, and the ability of WAVE scores and trajectories to anticipate subsequent systemic deterioration.

Future validation should also determine whether the trajectory and configuration of WAVE scores provide greater early-warning value than a single cross-sectional total score. Longitudinal application would make it possible to examine whether particular sequences for example, increasing external pressure followed by activation of multiple vulnerabilities and subsequent growth in cross-domain interactions consistently precede deterioration in system-wide functioning. Such evidence could ultimately support empirically derived thresholds and context-

sensitive weighting while preserving the conceptual distinction among the four WAVE components.

Overall, WAVE reframes health-system collapse as an evolving systemic risk process rather than a discrete event produced by a single cause. Its contribution lies in connecting the external environment, internal system condition, cross-domain propagation, and systemic functional deterioration within one analytical framework. In this formulation, the critical early-warning question is not simply whether a health system is under pressure, but whether that pressure is activating vulnerabilities, whether those vulnerabilities are beginning to reinforce and propagate one another, and whether the system is progressively losing its capacity to contain, absorb, and recover from their combined effects.

6. Conclusion

Health-system collapse is unlikely to result from a single external shock or isolated internal failure. Rather, the findings of this research program suggest that collapse should be understood as a progressive systemic process in which external pressures encounter internal vulnerabilities, activate or intensify those vulnerabilities, generate interactions and cascading effects across interconnected domains, and may ultimately progress toward system-wide deterioration.

The WAVE Model integrates this process through four interconnected components: Wider Environmental Stressors, Activated Internal Vulnerabilities, Vulnerability Interactions and Cascades, and Escalating Systemic Risk. By distinguishing external pressure from internal vulnerability, and individual vulnerability from cross-domain propagation and systemic escalation, the framework provides a structured approach for examining not only whether a health system is under pressure, but also how that pressure may progress toward collapse. Integration with the SEA framework further enables systemic deterioration to be interpreted through changes in Stability, Efficiency, and Adaptability.

The accompanying WAVE Diagnostic Assessment Tool operationalizes this conceptual architecture through structured diagnostic items and standardized component scores. Its principal value lies in preserving the WAVE risk profile alongside the overall risk estimate, allowing different pathways and concentrations of risk to remain visible rather than being obscured within a single aggregate measure.

At its current stage, WAVE should be regarded as a conceptually derived diagnostic framework rather than a validated predictive instrument. The proposed scoring system and preliminary equal weighting provide a basis for initial application, while empirical validation is required to establish item performance, component relationships, differential weights, risk thresholds, and predictive validity across different health-system contexts. Such validation may ultimately enable WAVE to support systematic early-warning assessment by identifying not only the accumulation of health-system vulnerabilities, but also the point at which those vulnerabilities begin to interact, propagate, and threaten the capacity of the system to absorb, adapt to, and recover from sustained pressure.

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Appendix 1

WAVE Checklist

Code	Component	Domain	Subdomain	Diagnostic question	Anchor type	1→10 response anchors
W001	W	W1. Wars and Armed Conflict	Conflict type and intensity	To what extent has armed violence progressed from isolated incidents toward sustained organized conflict?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W002	W	W1. Wars and Armed Conflict	Conflict type and intensity	How intense are current hostilities in terms of frequency and operational scale?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
W003	W	W1. Wars and Armed Conflict	Conflict type and intensity	To what extent are multiple fronts or conflict zones active simultaneously?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W004	W	W1. Wars and Armed Conflict	Geographic exposure	What proportion of national territory is directly affected by armed conflict?	geography	1: <1% of territory 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80% of territory
W005	W	W1. Wars and Armed Conflict	Geographic exposure	To what extent are major population centers exposed to direct or recurrent hostilities?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W006	W	W1. Wars and Armed Conflict	Population exposure	What proportion of the national population lives in areas directly affected by conflict?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W007	W	W1. Wars and Armed Conflict	Population exposure	What proportion of the population is indirectly affected through access, supply, displacement, or insecurity?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W008	W	W1. Wars and Armed Conflict	Duration	How long has the current conflict-related pressure persisted?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W009	W	W1. Wars and Armed Conflict	Onset	How rapidly did the conflict move from detectable tension to material pressure on the health system?	onset	1: >5 y 2: 3-5 y 3: 2-3 y 4: 1-2 y 5: 6-12 mo 6: 3-6 mo 7: 1-3 mo 8: 1-4 wk 9: 1-7 d 10: <24 h
W010	W	W1. Wars and Armed Conflict	Escalation	How rapidly has conflict intensity worsened during the current assessment period?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W011	W	W1. Wars and Armed Conflict	Displacement	What proportion of the population has been internally displaced or forced to relocate because of conflict?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W012	W	W1. Wars and Armed Conflict	Displacement	To what extent has population displacement created sudden geographic mismatch between health-service demand and capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W013	W	W1. Wars and Armed Conflict	Siege/access restriction	To what extent are populations or regions subject to siege, blockade, encirclement, or severe movement restriction?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W014	W	W1. Wars and Armed Conflict	Humanitarian access	To what extent is humanitarian and medical access restricted by insecurity, checkpoints, closure, or denial?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W015	W	W1. Wars and Armed Conflict	Critical infrastructure	To what extent has conflict disrupted electricity, water, sanitation, transport, or communications required by health services?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W016	W	W1. Wars and Armed Conflict	Health infrastructure exposure	What proportion of health facilities in affected areas are damaged, inaccessible, occupied, evacuated, or non-functional because of conflict?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
W017	W	W1. Wars and Armed Conflict	Supply routes	To what extent have conflict conditions disrupted routes for medicines, equipment, fuel, oxygen, food, or other essential supplies?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W018	W	W1. Wars and Armed Conflict	Governance environment	To what extent has conflict fragmented territorial control or public administrative authority?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W019	W	W1. Wars and Armed Conflict	Workforce mobility	To what extent does insecurity restrict safe movement of health workers to and from workplaces?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W020	W	W1. Wars and Armed Conflict	Civilian harm pressure	To what extent has conflict generated additional acute-care, trauma, rehabilitation, mental-health, or public-health demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W021	W	W1. Wars and Armed Conflict	Preparedness time	To what extent did the system lack sufficient warning time to mobilize contingency capacity before conflict-related demand increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W022	W	W1. Wars and Armed Conflict	Persistence	To what extent are conflict-related pressures expected to persist under current conditions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W023	W	W1. Wars and Armed Conflict	Trend	Compared with the preceding equivalent period, how has overall conflict-related pressure changed?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W024	W	W1. Wars and Armed Conflict	Concurrency	To what extent is armed conflict occurring concurrently with other major W stressors?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W025	W	W2. Changes in Disease Burden and Outbreaks	Burden shift	To what extent has disease burden increased beyond the recent expected baseline?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W026	W	W2. Changes in Disease Burden and Outbreaks	Incidence	To what extent has incidence of the principal pressure-generating condition increased relative to baseline?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W027	W	W2. Changes in Disease Burden and Outbreaks	Prevalence	To what extent has prevalence increased relative to the system's usual planning assumptions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W028	W	W2. Changes in Disease Burden and Outbreaks	Transmission/growth	How rapidly are new cases or service-relevant disease events increasing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W029	W	W2. Changes in Disease Burden and Outbreaks	Population exposure	What proportion of the population is currently exposed to the increased disease burden?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W030	W	W2. Changes in Disease Burden and Outbreaks	Geographic spread	What proportion of the country is experiencing materially increased disease-related demand?	geography	1: <1% of territory 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80% of territory
W031	W	W2. Changes in Disease Burden and Outbreaks	Clinical severity	To what extent has the proportion of cases requiring complex, urgent, or resource-intensive care increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W032	W	W2. Changes in Disease Burden and Outbreaks	Hospital demand	To what extent has disease-related inpatient demand exceeded expected baseline levels?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W033	W	W2. Changes in Disease Burden and Outbreaks	Critical-care demand	To what extent has demand for critical care, oxygen, ventilation, or high-dependency care increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W034	W	W2. Changes in Disease Burden and Outbreaks	Primary-care demand	To what extent has demand for primary, ambulatory, or community care increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W035	W	W2. Changes in Disease Burden and Outbreaks	Diagnostic demand	To what extent has demand for laboratory, imaging, screening, or surveillance capacity increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W036	W	W2. Changes in Disease Burden and Outbreaks	Pharmaceutical demand	To what extent has disease change increased demand for medicines, vaccines, blood products, or consumables?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W037	W	W2. Changes in Disease Burden and Outbreaks	Duration	How long has the elevated disease-related pressure persisted?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W038	W	W2. Changes in Disease Burden and Outbreaks	Onset	How rapidly did disease-related demand rise from baseline to a level requiring system response?	onset	1: >5 y 2: 3-5 y 3: 2-3 y 4: 1-2 y 5: 6-12 mo 6: 3-6 mo 7: 1-3 mo 8: 1-4 wk 9: 1-7 d 10: <24 h
W039	W	W2. Changes in Disease Burden and Outbreaks	Predictability	To what extent was the timing or magnitude of the disease-burden change unexpected?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W040	W	W2. Changes in Disease Burden and Outbreaks	Multiple burdens	To what extent are multiple communicable and/or non-communicable disease pressures occurring simultaneously?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W041	W	W2. Changes in Disease Burden and Outbreaks	Chronicity	To what extent is the increased burden expected to require prolonged or repeated care?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W042	W	W2. Changes in Disease Burden and Outbreaks	Vulnerable populations	To what extent is the burden concentrated in populations requiring disproportionate resources or specialized care?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W043	W	W2. Changes in Disease Burden and Outbreaks	Trend	Compared with the preceding equivalent period, how is disease-related pressure changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W044	W	W2. Changes in Disease Burden and Outbreaks	Seasonal deviation	To what extent does current demand exceed the normal seasonal pattern?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W045	W	W2. Changes in Disease Burden and Outbreaks	Mortality pressure	To what extent has mortality or severe outcome burden increased beyond expected levels?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W046	W	W2. Changes in Disease Burden and Outbreaks	Workforce exposure	To what extent does the disease burden directly reduce available health workforce through illness, quarantine, or occupational exposure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W047	W	W2. Changes in Disease Burden and Outbreaks	Concurrency	To what extent is the disease-burden change occurring concurrently with other major W stressors?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W048	W	W3. Economic Changes and Crises	Economic contraction	To what extent is the economy experiencing recession or sustained contraction?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W049	W	W3. Economic Changes and Crises	Inflation	To what extent is general inflation eroding the real purchasing power of public institutions and households?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W050	W	W3. Economic Changes and Crises	Stagflation	To what extent are weak/negative growth and high inflation occurring simultaneously?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W051	W	W3. Economic Changes and Crises	Currency depreciation	To what extent has national-currency depreciation increased the cost of imported health-related inputs?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W052	W	W3. Economic Changes and Crises	Exchange-rate volatility	To what extent does exchange-rate volatility impair predictable procurement and budgeting?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W053	W	W3. Economic Changes and Crises	Fiscal space	To what extent has government fiscal space deteriorated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W054	W	W3. Economic Changes and Crises	Public revenue	To what extent have real public revenues declined relative to recent baseline?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W055	W	W3. Economic Changes and Crises	Public debt	To what extent is increasing public debt constraining fiscal flexibility?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W056	W	W3. Economic Changes and Crises	Debt service	To what extent are debt-service obligations crowding out discretionary public spending?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W057	W	W3. Economic Changes and Crises	Unemployment	To what extent has unemployment or underemployment increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W058	W	W3. Economic Changes and Crises	Household income	To what extent have real household incomes deteriorated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W059	W	W3. Economic Changes and Crises	Poverty	To what extent has poverty or severe material deprivation increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W060	W	W3. Economic Changes and Crises	Financial-sector stress	To what extent are banking or financial-system disruptions affecting normal economic transactions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W061	W	W3. Economic Changes and Crises	Capital controls/payment restrictions	To what extent do payment, foreign-exchange, or capital restrictions impede essential transactions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W062	W	W3. Economic Changes and Crises	Economic sanctions	To what extent are economic sanctions restricting trade, finance, logistics, technology, or essential imports?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W063	W	W3. Economic Changes and Crises	Trade restrictions	To what extent are import/export restrictions disrupting access to essential goods?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W064	W	W3. Economic Changes and Crises	Supply-chain prices	To what extent have international or domestic input prices risen beyond routine budget assumptions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W065	W	W3. Economic Changes and Crises	Energy shock	To what extent are energy price or supply shocks increasing system-wide operating costs?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W066	W	W3. Economic Changes and Crises	Food shock	To what extent are food-price or food-supply shocks increasing population health and service pressures?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W067	W	W3. Economic Changes and Crises	Commodity dependence	To what extent does dependence on a narrow export/revenue base amplify current fiscal vulnerability?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
W068	W	W3. Economic Changes and Crises	External financing	To what extent has access to external financing, credit, aid, or foreign currency deteriorated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W069	W	W3. Economic Changes and Crises	Duration	How long has the current material economic pressure persisted?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W070	W	W3. Economic Changes and Crises	Onset	How rapidly did the economic deterioration become material for public-sector planning?	onset	1: >5 y 2: 3-5 y 3: 2-3 y 4: 1-2 y 5: 6-12 mo 6: 3-6 mo 7: 1-3 mo 8: 1-4 wk 9: 1-7 d 10: <24 h
W071	W	W3. Economic Changes and Crises	Escalation	How rapidly is the economic pressure worsening?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W072	W	W3. Economic Changes and Crises	Trend	Compared with the preceding equivalent period, how has overall economic pressure changed?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W073	W	W3. Economic Changes and Crises	Population reach	What proportion of the population is materially affected by the economic deterioration?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W074	W	W3. Economic Changes and Crises	Regional inequality	To what extent is economic deterioration concentrated in regions already vulnerable in health access?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W075	W	W3. Economic Changes and Crises	Multiple economic shocks	To what extent are several economic disturbances occurring concurrently?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W076	W	W3. Economic Changes and Crises	Policy room	To what extent has the government's room for counter-cyclical or protective action narrowed?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W077	W	W3. Economic Changes and Crises	Concurrency	To what extent is the economic crisis occurring concurrently with other major W stressors?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W078	W	W4. Political Changes and Instability	Government stability	To what extent is instability in national or subnational government disrupting continuity of public administration?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W079	W	W4. Political Changes and Instability	Leadership turnover	To what extent is frequent leadership turnover disrupting continuity of policy and implementation?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
W080	W	W4. Political Changes and Instability	Policy volatility	To what extent are major policies changing unpredictably or repeatedly?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W081	W	W4. Political Changes and Instability	Legislative instability	To what extent are rapid or contested legal changes creating uncertainty for public institutions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W082	W	W4. Political Changes and Instability	Administrative disruption	To what extent are routine public administrative functions disrupted by political instability?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W083	W	W4. Political Changes and Instability	Decision paralysis	To what extent are political disputes delaying or blocking necessary decisions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W084	W	W4. Political Changes and Instability	Institutional legitimacy	To what extent has contested legitimacy weakened compliance with public decisions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W085	W	W4. Political Changes and Instability	Civil unrest	To what extent are protests, strikes, riots, or civil disturbances disrupting normal activity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W086	W	W4. Political Changes and Instability	Geographic spread	What proportion of the country is materially affected by political instability or civil unrest?	geography	1: <1% of territory 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80% of territory
W087	W	W4. Political Changes and Instability	Population exposure	What proportion of the population is materially exposed to political-instability-related disruption?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W088	W	W4. Political Changes and Instability	Public-sector strikes	To what extent are politically linked public-sector strikes or work stoppages disrupting essential functions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W089	W	W4. Political Changes and Instability	Intergovernmental conflict	To what extent do conflicts between levels of government impede coordinated action?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W090	W	W4. Political Changes and Instability	Duration	How long has material political instability persisted?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W091	W	W4. Political Changes and Instability	Onset	How rapidly did political instability develop into material public-sector disruption?	onset	1: >5 y 2: 3-5 y 3: 2-3 y 4: 1-2 y 5: 6-12 mo 6: 3-6 mo 7: 1-3 mo 8: 1-4 wk 9: 1-7 d 10: <24 h
W092	W	W4. Political Changes and Instability	Trend	Compared with the preceding equivalent period, how is political-instability pressure changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W093	W	W4. Political Changes and Instability	Predictability	To what extent are political developments difficult to anticipate for operational planning?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W094	W	W4. Political Changes and Instability	Concurrency	To what extent is political instability occurring concurrently with other major W stressors?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W095	W	W5. Social, Cultural, and Demographic Changes	Population aging	To what extent is population aging increasing demand for chronic, complex, long-term, or geriatric care beyond current capacity growth?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W096	W	W5. Social, Cultural, and Demographic Changes	Rapid population growth	To what extent is population growth outpacing expansion of health-system capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W097	W	W5. Social, Cultural, and Demographic Changes	Population decline	To what extent is population decline undermining workforce availability or sustainable service distribution?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W098	W	W5. Social, Cultural, and Demographic Changes	Urbanization	To what extent is rapid urbanization creating demand-capacity mismatch in receiving areas?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W099	W	W5. Social, Cultural, and Demographic Changes	Internal migration	To what extent is internal migration changing geographic demand faster than capacity can adjust?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W100	W	W5. Social, Cultural, and Demographic Changes	International migration	To what extent is migration materially altering population health needs or service demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W101	W	W5. Social, Cultural, and Demographic Changes	Age-structure shift	To what extent are changes in age structure altering the type and intensity of health-service demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W102	W	W5. Social, Cultural, and Demographic Changes	Household structure	To what extent are changes in household/family structure reducing informal care capacity or increasing formal-care demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W103	W	W5. Social, Cultural, and Demographic Changes	Poverty/deprivation	To what extent is social deprivation increasing unmet need or dependence on publicly financed services?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W104	W	W5. Social, Cultural, and Demographic Changes	Inequality	To what extent are widening socioeconomic inequalities producing uneven health needs and access pressures?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W105	W	W5. Social, Cultural, and Demographic Changes	Social cohesion	To what extent has declining social cohesion increased difficulty in collective health action?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W106	W	W5. Social, Cultural, and Demographic Changes	Health behavior change	To what extent are changing health behaviors increasing preventable demand or complexity of care?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W107	W	W5. Social, Cultural, and Demographic Changes	Care-seeking change	To what extent are changes in care-seeking patterns creating sudden demand shifts between service levels?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W108	W	W5. Social, Cultural, and Demographic Changes	Cultural barriers	To what extent do changing cultural or linguistic needs exceed current service adaptation capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W109	W	W5. Social, Cultural, and Demographic Changes	Population concentration	To what extent is population concentration creating localized overload despite adequate national averages?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W110	W	W5. Social, Cultural, and Demographic Changes	Duration	How long has the relevant social/demographic pressure been materially affecting planning needs?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W111	W	W5. Social, Cultural, and Demographic Changes	Rate of change	How rapidly is the relevant social/demographic condition changing relative to planning cycles?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W112	W	W5. Social, Cultural, and Demographic Changes	Geographic concentration	To what extent is the change concentrated in areas with limited existing capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W113	W	W5. Social, Cultural, and Demographic Changes	Population reach	What proportion of the population is materially affected by the relevant social/demographic change?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W114	W	W5. Social, Cultural, and Demographic Changes	Concurrency	To what extent are several social, cultural, or demographic pressures occurring concurrently?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W115	W	W6. Natural Disasters	Hazard intensity	How severe is the physical intensity of the current natural hazard relative to locally expected events?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W116	W	W6. Natural Disasters	Geographic exposure	What proportion of national territory is materially affected?	geography	1: <1% of territory 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80% of territory
W117	W	W6. Natural Disasters	Population exposure	What proportion of the population is materially affected?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W118	W	W6. Natural Disasters	Casualty burden	To what extent has the event generated deaths, injuries, or urgent health needs beyond routine emergency capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W119	W	W6. Natural Disasters	Displacement	What proportion of the population has been displaced or evacuated?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W120	W	W6. Natural Disasters	Housing damage	To what extent has housing loss created shelter-related health demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W121	W	W6. Natural Disasters	Transport disruption	To what extent are roads, bridges, ports, airports, or transport routes disrupted?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W122	W	W6. Natural Disasters	Electricity disruption	To what extent has electricity availability been disrupted in affected areas?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W123	W	W6. Natural Disasters	Water/sanitation disruption	To what extent have water and sanitation systems been disrupted?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W124	W	W6. Natural Disasters	Communications disruption	To what extent are communications systems impaired?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W125	W	W6. Natural Disasters	Health-facility damage	What proportion of health-service capacity in affected areas is unavailable because of physical damage or inaccessibility?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
W126	W	W6. Natural Disasters	Supply access	To what extent has the event disrupted delivery of medicines, blood, oxygen, fuel, food, or other essentials?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W127	W	W6. Natural Disasters	Onset	How rapidly did the event create material health-system pressure?	onset	1: >5 y 2: 3-5 y 3: 2-3 y 4: 1-2 y 5: 6-12 mo 6: 3-6 mo 7: 1-3 mo 8: 1-4 wk 9: 1-7 d 10: <24 h
W128	W	W6. Natural Disasters	Impact duration	How long are material health-system consequences expected to persist?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W129	W	W6. Natural Disasters	Secondary hazards	To what extent are aftershocks, floods, landslides, fires, contamination, or other secondary hazards continuing?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W130	W	W6. Natural Disasters	Recurrence	How frequently have major natural hazards affected the same system during the current planning period?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
W131	W	W6. Natural Disasters	Seasonal clustering	To what extent is the event occurring during a period of other predictable seasonal pressures?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W132	W	W6. Natural Disasters	External assistance access	To what extent is access to external emergency assistance constrained?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W133	W	W6. Natural Disasters	Trend	Compared with the immediately preceding assessment, how is disaster-related pressure changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W134	W	W6. Natural Disasters	Concurrency	To what extent is the disaster occurring concurrently with other major W stressors?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W135	W	W7. Climate-related Changes	Heat	To what extent are sustained temperature increases or heatwaves creating additional health demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W136	W	W7. Climate-related Changes	Drought	To what extent is drought affecting water availability, livelihoods, nutrition, or disease risk?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W137	W	W7. Climate-related Changes	Water scarcity	To what extent is chronic water scarcity constraining population health or health-service operation?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W138	W	W7. Climate-related Changes	Rainfall variability	To what extent are abnormal rainfall patterns increasing health or infrastructure pressure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W139	W	W7. Climate-related Changes	Wildfire conditions	To what extent are climate-related wildfire conditions affecting health demand, air quality, or access?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W140	W	W7. Climate-related Changes	Air-quality deterioration	To what extent are climate-linked air-quality conditions increasing respiratory or cardiovascular demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W141	W	W7. Climate-related Changes	Food security	To what extent are climate conditions worsening food insecurity or malnutrition risk?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W142	W	W7. Climate-related Changes	Vector ecology	To what extent are climate shifts expanding vector-borne disease risk or season length?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W143	W	W7. Climate-related Changes	Population displacement	To what extent is climate-related displacement changing geographic health-service demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W144	W	W7. Climate-related Changes	Geographic exposure	What proportion of national territory is materially exposed to the relevant climate pressure?	geography	1: <1% of territory 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80% of territory
W145	W	W7. Climate-related Changes	Population exposure	What proportion of the population is materially exposed?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
W146	W	W7. Climate-related Changes	Duration	How long has the relevant climate-related pressure persisted?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W147	W	W7. Climate-related Changes	Rate of change	How rapidly is the climate-related pressure worsening relative to adaptation capacity?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W148	W	W7. Climate-related Changes	Reversibility	To what extent is the relevant environmental change difficult to reverse within normal planning horizons?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W149	W	W7. Climate-related Changes	Infrastructure exposure	To what extent are health-supporting infrastructures vulnerable to the climate pressure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W150	W	W7. Climate-related Changes	Seasonal extension	To what extent are hazardous seasons becoming longer or less predictable?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W151	W	W7. Climate-related Changes	Adaptation gap	To what extent does the rate of climate pressure exceed implemented adaptation measures?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W152	W	W7. Climate-related Changes	Concurrency	To what extent are multiple climate-related pressures or other W stressors occurring concurrently?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W153	W	W8. Cross-Border and Regional Crisis Spillover	Neighboring conflict	To what extent are conflicts in neighboring or closely connected countries generating pressure on the national health environment?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W154	W	W8. Cross-Border and Regional Crisis Spillover	Refugee inflow	To what extent has sudden refugee or displaced-population inflow increased health-service demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W155	W	W8. Cross-Border and Regional Crisis Spillover	Cross-border migration	To what extent are abrupt migration flows changing service demand in border or receiving regions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W156	W	W8. Cross-Border and Regional Crisis Spillover	Cross-border disease	To what extent is disease transmission from neighboring regions increasing national surveillance or service pressure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W157	W	W8. Cross-Border and Regional Crisis Spillover	Trade-route disruption	To what extent are regional crises disrupting trade routes used for health-related supplies?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W158	W	W8. Cross-Border and Regional Crisis Spillover	Energy spillover	To what extent are regional energy disruptions affecting domestic availability or cost?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W159	W	W8. Cross-Border and Regional Crisis Spillover	Food spillover	To what extent are regional food disruptions increasing domestic health or nutrition pressure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W160	W	W8. Cross-Border and Regional Crisis Spillover	Medical supply spillover	To what extent are regional crises reducing access to medicines, equipment, oxygen, or consumables?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W161	W	W8. Cross-Border and Regional Crisis Spillover	Border insecurity	To what extent is border insecurity restricting movement of patients, staff, goods, or assistance?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W162	W	W8. Cross-Border and Regional Crisis Spillover	Border-region overload	To what extent are health services in border regions operating above usual capacity because of external spillover?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

W163	W	W8. Cross-Border and Regional Crisis Spillover	Regional simultaneity	To what extent are crises occurring simultaneously in multiple neighboring or connected countries?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W164	W	W8. Cross-Border and Regional Crisis Spillover	Connectivity dependence	To what extent does national health-system functioning depend on affected regional routes, markets, or services?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
W165	W	W8. Cross-Border and Regional Crisis Spillover	Duration	How long has material regional spillover pressure persisted?	duration_long	1: <1 mo 2: 1-3 mo 3: 3-6 mo 4: 6-12 mo 5: 1-2 y 6: 2-3 y 7: 3-5 y 8: 5-7 y 9: 7-10 y 10: >10 y
W166	W	W8. Cross-Border and Regional Crisis Spillover	Onset	How rapidly did the regional crisis translate into domestic health-system pressure?	onset	1: >5 y 2: 3-5 y 3: 2-3 y 4: 1-2 y 5: 6-12 mo 6: 3-6 mo 7: 1-3 mo 8: 1-4 wk 9: 1-7 d 10: <24 h
W167	W	W8. Cross-Border and Regional Crisis Spillover	Trend	Compared with the preceding equivalent period, how is regional spillover pressure changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
W168	W	W8. Cross-Border and Regional Crisis Spillover	External support competition	To what extent does simultaneous regional need reduce access to international assistance or supplies?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
W169	W	W8. Cross-Border and Regional Crisis Spillover	Concurrency	To what extent is regional spillover occurring concurrently with other major domestic W stressors?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A001	A	A1. Governance Fragmentation and Failure	Strategic planning	To what extent are national health priorities unclear, inconsistent, or frequently reversed?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A002	A	A1. Governance Fragmentation and Failure	Strategic planning	To what extent do approved health plans lack feasible resources, timelines, or implementation capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A003	A	A1. Governance Fragmentation and Failure	Strategic planning	To what extent are major strategic targets repeatedly missed without corrective action?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A004	A	A1. Governance Fragmentation and Failure	Policy continuity	To what extent does leadership turnover interrupt policy continuity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A005	A	A1. Governance Fragmentation and Failure	Policy coherence	To what extent do major health policies conflict across institutions or levels of government?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A006	A	A1. Governance Fragmentation and Failure	Role clarity	To what extent are mandates and responsibilities unclear or overlapping?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A007	A	A1. Governance Fragmentation and Failure	Regulatory capacity	To what extent are regulators unable to enforce essential standards?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A008	A	A1. Governance Fragmentation and Failure	Regulatory consistency	To what extent is regulation applied inconsistently across providers or regions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A009	A	A1. Governance Fragmentation and Failure	Accountability	To what extent are failures not followed by timely review, responsibility, or corrective action?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A010	A	A1. Governance Fragmentation and Failure	Transparency	To what extent is material performance or resource information unavailable or unreliable?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A011	A	A1. Governance Fragmentation and Failure	Integrity	To what extent do conflicts of interest, corruption risks, or informal influence distort decisions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A012	A	A1. Governance Fragmentation and Failure	Coordination	To what extent is coordination among ministries, payers, providers, regulators, and emergency actors impaired?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A013	A	A1. Governance Fragmentation and Failure	Implementation	To what extent are formally approved policies not implemented as intended?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A014	A	A1. Governance Fragmentation and Failure	Implementation delay	How frequently are critical implementation actions delayed beyond operationally useful timeframes?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
A015	A	A1. Governance Fragmentation and Failure	Information governance	To what extent do decision-makers lack timely, complete, or credible information?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A016	A	A1. Governance Fragmentation and Failure	Evidence use	To what extent are major decisions made without adequate use of available evidence?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A017	A	A1. Governance Fragmentation and Failure	Warning-to-action	To what extent are recognized warning signals not translated into timely action?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A018	A	A1. Governance Fragmentation and Failure	Crisis governance	To what extent are emergency command, authority, and escalation procedures unclear or ineffective?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A019	A	A1. Governance Fragmentation and Failure	Adaptive governance	To what extent is governance unable to modify rules, resources, or structures when conditions change?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A020	A	A1. Governance Fragmentation and Failure	Essential-service governance	To what extent have governance failures directly contributed to disruption of essential services?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A021	A	A1. Governance Fragmentation and Failure	Subnational variation	To what extent is governance capacity uneven across regions in ways that create systemic vulnerability?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A022	A	A1. Governance Fragmentation and Failure	Stakeholder participation	To what extent are key implementers or affected groups excluded from decisions that require their cooperation?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A023	A	A1. Governance Fragmentation and Failure	Decision speed	To what extent are necessary decisions delayed relative to the speed of system deterioration?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A024	A	A1. Governance Fragmentation and Failure	Recovery governance	To what extent are lessons from previous crises not incorporated into current preparedness or recovery?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A025	A	A1. Governance Fragmentation and Failure	Governance reserve	To what extent is effective governance dependent on a small number of individuals with limited succession or backup?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A026	A	A2. Financial and Economic Vulnerability	Health financing adequacy	To what extent are available health-sector revenues insufficient for essential obligations?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A027	A	A2. Financial and Economic Vulnerability	Funding predictability	To what extent is the timing or amount of health funding unpredictable?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A028	A	A2. Financial and Economic Vulnerability	Real health spending	To what extent is real per-capita public health spending declining?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A029	A	A2. Financial and Economic Vulnerability	Budget execution	To what extent are approved health budgets not released or executed on time?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A030	A	A2. Financial and Economic Vulnerability	Insurance deficits	To what extent are health insurance funds operating with persistent deficits?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A031	A	A2. Financial and Economic Vulnerability	Insurance reserves	To what extent have health insurance reserves been depleted?	reserve	1: >12 mo reserve 2: 9-12 mo 3: 6-9 mo 4: 4-6 mo 5: 3-4 mo 6: 2-3 mo 7: 1-2 mo 8: 2-4 wk 9: <2 wk 10: No effective reserve
A032	A	A2. Financial and Economic Vulnerability	Reimbursement delay	How severe are delays in reimbursement to healthcare providers?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A033	A	A2. Financial and Economic Vulnerability	Payment arrears	To what extent are payer arrears accumulating across the system?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A034	A	A2. Financial and Economic Vulnerability	Provider debt	To what extent is healthcare-provider debt increasing beyond sustainable operating levels?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A035	A	A2. Financial and Economic Vulnerability	Provider liquidity	To what extent do providers lack cash to meet routine operating expenditure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A036	A	A2. Financial and Economic Vulnerability	Salary delay	How frequently are health-worker salaries or contracted payments delayed?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
A037	A	A2. Financial and Economic Vulnerability	Supplier delay	How frequently are suppliers paid later than agreed terms?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
A038	A	A2. Financial and Economic Vulnerability	Capital investment	To what extent has necessary capital investment been postponed or cancelled?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A039	A	A2. Financial and Economic Vulnerability	Maintenance finance	To what extent is maintenance deferred because of financial constraints?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A040	A	A2. Financial and Economic Vulnerability	Healthcare inflation	To what extent are healthcare prices rising faster than available health revenues?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A041	A	A2. Financial and Economic Vulnerability	Medicine prices	To what extent are medicine-price increases reducing affordability or procurement capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A042	A	A2. Financial and Economic Vulnerability	Procurement affordability	To what extent do financial constraints prevent procurement of required inputs?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A043	A	A2. Financial and Economic Vulnerability	Purchasing efficiency	To what extent do purchasing mechanisms fail to allocate resources toward priority or effective services?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A044	A	A2. Financial and Economic Vulnerability	Budget reallocation	How frequently are emergency reallocations required to sustain routine essential services?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
A045	A	A2. Financial and Economic Vulnerability	Out-of-pocket burden	To what extent are households increasingly financing care directly because pooled financing is inadequate?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A046	A	A2. Financial and Economic Vulnerability	Catastrophic expenditure	To what extent is catastrophic health expenditure increasing?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A047	A	A2. Financial and Economic Vulnerability	Delayed care	To what extent are households delaying necessary care for financial reasons?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A048	A	A2. Financial and Economic Vulnerability	Treatment discontinuation	To what extent are patients discontinuing necessary treatment because of cost?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A049	A	A2. Financial and Economic Vulnerability	Insurance affordability	To what extent is health-insurance coverage becoming unaffordable for households or employers?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A050	A	A2. Financial and Economic Vulnerability	Financial reserve	How much effective financial reserve remains for maintaining essential operations under continued pressure?	reserve	1: >12 mo reserve 2: 9-12 mo 3: 6-9 mo 4: 4-6 mo 5: 3-4 mo 6: 2-3 mo 7: 1-2 mo 8: 2-4 wk 9: <2 wk 10: No effective reserve
A051	A	A2. Financial and Economic Vulnerability	Trend	Compared with the preceding equivalent period, how is overall financial vulnerability changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
A052	A	A2. Financial and Economic Vulnerability	Cross-level spread	To what extent are macroeconomic pressures simultaneously visible in financing, providers, and households?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A053	A	A2. Financial and Economic Vulnerability	Service consequence	To what extent have financial constraints already reduced service volume, scope, or availability?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A054	A	A2. Financial and Economic Vulnerability	Recovery capacity	To what extent could the financing system restore normal operation without extraordinary external support?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A055	A	A2. Financial and Economic Vulnerability	Contingency capacity	To what extent are contingency financing mechanisms inadequate for an additional shock?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A056	A	A3. Workforce Vulnerability	Staffing sufficiency	To what extent are essential services operating below required staffing levels?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
A057	A	A3. Workforce Vulnerability	Vacancy burden	To what extent are critical positions persistently vacant?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A058	A	A3. Workforce Vulnerability	Workload	To what extent does workload exceed sustainable staffing capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A059	A	A3. Workforce Vulnerability	Overtime	How frequently is excessive overtime required to maintain essential services?	frequency	1: Never 2: Exceptional 3: Very rare 4: Rare 5: Occasional 6: Recurring 7: Frequent 8: Very frequent 9: Near-continuous 10: Continuous
A060	A	A3. Workforce Vulnerability	Burnout	To what extent are burnout symptoms affecting workforce functioning or retention?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A061	A	A3. Workforce Vulnerability	Absenteeism	To what extent is absenteeism disrupting planned service delivery?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A062	A	A3. Workforce Vulnerability	Turnover	To what extent has voluntary or involuntary turnover increased?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A063	A	A3. Workforce Vulnerability	Attrition	To what extent is loss of experienced personnel reducing service capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A064	A	A3. Workforce Vulnerability	Migration	To what extent is health-worker migration reducing availability of required skills?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A065	A	A3. Workforce Vulnerability	Retirement	To what extent are retirement waves creating replacement gaps?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A066	A	A3. Workforce Vulnerability	Skill mix	To what extent is the available skill mix inadequate for current service needs?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A067	A	A3. Workforce Vulnerability	Geographic maldistribution	To what extent are workforce shortages concentrated in underserved regions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A068	A	A3. Workforce Vulnerability	Specialty maldistribution	To what extent are shortages concentrated in critical specialties?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A069	A	A3. Workforce Vulnerability	Shift coverage	To what extent are essential shifts difficult to fill without unsafe or exceptional measures?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A070	A	A3. Workforce Vulnerability	Agency/temporary dependence	To what extent is continuity dependent on temporary, agency, volunteer, or emergency staff?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A071	A	A3. Workforce Vulnerability	Training pipeline	To what extent is the training pipeline insufficient to replace losses or meet demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A072	A	A3. Workforce Vulnerability	Retraining	To what extent is the workforce unable to rapidly retrain or redeploy for changing needs?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A073	A	A3. Workforce Vulnerability	Surge capacity	To what extent is additional workforce unavailable for sudden demand increases?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
A074	A	A3. Workforce Vulnerability	Leadership capacity	To what extent are clinical or operational leadership shortages impairing coordination?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A075	A	A3. Workforce Vulnerability	Administrative burden	To what extent are administrative tasks reducing time available for clinical or public-health work?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A076	A	A3. Workforce Vulnerability	Digital burden	To what extent are digital systems increasing cognitive or documentation workload?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A077	A	A3. Workforce Vulnerability	Moral distress	To what extent is inability to provide appropriate care contributing to workforce distress or withdrawal?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A078	A	A3. Workforce Vulnerability	Safety	To what extent do unsafe working conditions reduce attendance, retention, or performance?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A079	A	A3. Workforce Vulnerability	Well-being support	To what extent are workforce support and recovery mechanisms inadequate?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A080	A	A3. Workforce Vulnerability	Replacement time	To what extent does replacement of lost critical staff require time beyond the system's current tolerance?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A081	A	A3. Workforce Vulnerability	Single-person dependency	To what extent do essential functions depend on a small number of irreplaceable individuals?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A082	A	A3. Workforce Vulnerability	Team cohesion	To what extent has workforce strain impaired teamwork and coordination?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A083	A	A3. Workforce Vulnerability	Productivity deterioration	To what extent has effective output per available worker declined because of strain?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A084	A	A3. Workforce Vulnerability	Trend	Compared with the preceding equivalent period, how is workforce vulnerability changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
A085	A	A3. Workforce Vulnerability	Service consequence	To what extent has workforce vulnerability already reduced essential service availability or quality?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A086	A	A4. Digital Saturation	System availability	To what extent are critical digital systems unavailable or unstable during required operating periods?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A087	A	A4. Digital Saturation	Performance	To what extent are slow or degraded digital systems delaying care or operations?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A088	A	A4. Digital Saturation	Interoperability	To what extent do interoperability failures create duplication, delay, or information loss?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A089	A	A4. Digital Saturation	Data quality	To what extent are incomplete, inaccurate, or inconsistent data affecting decisions or care?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A090	A	A4. Digital Saturation	Information overload	To what extent does excessive digital information impair prioritization or decision-making?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A091	A	A4. Digital Saturation	Alert fatigue	To what extent does alert volume reduce attention to clinically or operationally important warnings?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A092	A	A4. Digital Saturation	Workflow over-integration	To what extent does failure of one digital component disrupt multiple dependent workflows?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A093	A	A4. Digital Saturation	Single point of failure	To what extent do essential services depend on digital components without effective redundancy?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A094	A	A4. Digital Saturation	Manual fallback	To what extent are safe manual fallback procedures unavailable, untested, or impractical?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A095	A	A4. Digital Saturation	Reversibility	To what extent is temporary return to non-digital operation difficult or impossible?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A096	A	A4. Digital Saturation	Cybersecurity exposure	To what extent are cyber threats disrupting or threatening essential digital functions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A097	A	A4. Digital Saturation	Cyber recovery	To what extent is recovery from a major cyber incident likely to exceed operational tolerance?	recovery	1: <24 h 2: 1-3 d 3: 4-7 d 4: 1-2 wk 5: 2-4 wk 6: 1-3 mo 7: 3-6 mo 8: 6-12 mo 9: >12 mo 10: Recovery not achievable with current capacity
A098	A	A4. Digital Saturation	Infrastructure dependency	To what extent do digital services depend on fragile electricity, connectivity, cloud, or vendor infrastructure?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A099	A	A4. Digital Saturation	Vendor dependency	To what extent are essential functions dependent on a single vendor or external platform?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A100	A	A4. Digital Saturation	AI dependence	To what extent are critical decisions or workflows dependent on AI systems without adequate human fallback?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A101	A	A4. Digital Saturation	AI reliability	To what extent are AI limitations, drift, bias, or error creating operational risk?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A102	A	A4. Digital Saturation	User burden	To what extent does digital complexity increase workload, cognitive burden, or error risk?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A103	A	A4. Digital Saturation	Downtime preparedness	To what extent are downtime plans incomplete, outdated, or untested?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A104	A	A4. Digital Saturation	Data access	To what extent are required data unavailable to authorized users at the point of need?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A105	A	A4. Digital Saturation	Data fragmentation	To what extent are records fragmented across systems in ways that impair continuity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A106	A	A4. Digital Saturation	Capacity saturation	To what extent are digital infrastructure or support teams operating near technical capacity?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
A107	A	A4. Digital Saturation	Change overload	To what extent are frequent digital changes exceeding user or organizational adaptation capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A108	A	A4. Digital Saturation	Support capacity	To what extent is technical support insufficient to resolve critical incidents promptly?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A109	A	A4. Digital Saturation	Trend	Compared with the preceding equivalent period, how is digital vulnerability changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
A110	A	A4. Digital Saturation	Service consequence	To what extent have digital failures already reduced essential service continuity or safety?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A111	A	A5. Infrastructure and Capacity Vulnerability	Facility availability	To what extent is required facility capacity unavailable relative to demand?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
A112	A	A5. Infrastructure and Capacity Vulnerability	Functional capacity	To what extent is nominal capacity non-functional because of staffing, equipment, utilities, or supplies?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
A113	A	A5. Infrastructure and Capacity Vulnerability	Accessible capacity	To what extent is functional capacity inaccessible to the populations that need it?	coverage_gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
A114	A	A5. Infrastructure and Capacity Vulnerability	Effective capacity	To what extent does available capacity fail to translate into timely effective care?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A115	A	A5. Infrastructure and Capacity Vulnerability	Bed capacity	To what extent are inpatient beds persistently saturated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A116	A	A5. Infrastructure and Capacity Vulnerability	Critical-care capacity	To what extent is ICU/high-dependency capacity persistently saturated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A117	A	A5. Infrastructure and Capacity Vulnerability	Emergency capacity	To what extent is emergency-care capacity unable to absorb routine peaks?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A118	A	A5. Infrastructure and Capacity Vulnerability	Diagnostic capacity	To what extent are laboratory or imaging services operating beyond sustainable capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A119	A	A5. Infrastructure and Capacity Vulnerability	Operating capacity	To what extent are surgical/procedural services constrained by capacity deficits?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A120	A	A5. Infrastructure and Capacity Vulnerability	Primary-care capacity	To what extent is primary/community-care capacity insufficient for current demand?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A121	A	A5. Infrastructure and Capacity Vulnerability	Electricity	To what extent is reliable electricity unavailable for essential health operations?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A122	A	A5. Infrastructure and Capacity Vulnerability	Water	To what extent is reliable safe water unavailable for essential health operations?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A123	A	A5. Infrastructure and Capacity Vulnerability	Sanitation	To what extent are sanitation or waste systems inadequate for safe operation?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A124	A	A5. Infrastructure and Capacity Vulnerability	Transport	To what extent are patient, staff, or supply transport systems inadequate?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A125	A	A5. Infrastructure and Capacity Vulnerability	Communications	To what extent are communications systems unreliable for essential coordination?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A126	A	A5. Infrastructure and Capacity Vulnerability	Equipment functionality	To what extent is essential equipment unavailable because of failure, maintenance, or parts shortages?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
A127	A	A5. Infrastructure and Capacity Vulnerability	Maintenance backlog	To what extent has deferred maintenance accumulated across facilities or equipment?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A128	A	A5. Infrastructure and Capacity Vulnerability	Medicine availability	To what extent are essential/tracer medicines unavailable at point of care?	coverage_gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
A129	A	A5. Infrastructure and Capacity Vulnerability	Consumables	To what extent are essential consumables unavailable at point of care?	coverage_gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
A130	A	A5. Infrastructure and Capacity Vulnerability	Oxygen/blood	To what extent are oxygen, blood, or other critical clinical inputs insufficient?	coverage_gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
A131	A	A5. Infrastructure and Capacity Vulnerability	Supply-chain continuity	To what extent are supply chains unable to maintain reliable replenishment?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A132	A	A5. Infrastructure and Capacity Vulnerability	Supplier concentration	To what extent are critical supplies dependent on a small number of suppliers?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A133	A	A5. Infrastructure and Capacity Vulnerability	Route redundancy	To what extent are critical supply routes lacking alternatives?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A134	A	A5. Infrastructure and Capacity Vulnerability	Inventory reserve	How much effective inventory reserve remains for critical supplies under continued disruption?	reserve	1: >12 mo reserve 2: 9-12 mo 3: 6-9 mo 4: 4-6 mo 5: 3-4 mo 6: 2-3 mo 7: 1-2 mo 8: 2-4 wk 9: <2 wk 10: No effective reserve
A135	A	A5. Infrastructure and Capacity Vulnerability	Surge capacity	To what extent is additional physical/service capacity unavailable for sudden demand increases?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
A136	A	A5. Infrastructure and Capacity Vulnerability	Geographic distribution	To what extent is capacity maldistributed relative to population need?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A137	A	A5. Infrastructure and Capacity Vulnerability	Referral network	To what extent are referral pathways unable to redistribute demand between facilities or regions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A138	A	A5. Infrastructure and Capacity Vulnerability	Upstream dependency	To what extent do health services depend on fragile non-health critical infrastructure?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
A139	A	A5. Infrastructure and Capacity Vulnerability	Trend	Compared with the preceding equivalent period, how is infrastructure/capacity vulnerability changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
A140	A	A5. Infrastructure and Capacity Vulnerability	Service consequence	To what extent has infrastructure/capacity vulnerability already disrupted essential services?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A141	A	A6. Trust Erosion	Public confidence	To what extent has public confidence in the health system declined?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A142	A	A6. Trust Erosion	Patient-clinician trust	To what extent has trust between patients and clinicians deteriorated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A143	A	A6. Trust Erosion	Workforce-management trust	To what extent has trust between health workers and organizational management deteriorated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A144	A	A6. Trust Erosion	Workforce-policy trust	To what extent has health-worker trust in health authorities or policymakers deteriorated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A145	A	A6. Trust Erosion	Interprofessional trust	To what extent has trust among professional groups deteriorated?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

A146	A	A6. Trust Erosion	Institutional legitimacy	To what extent do health institutions lack perceived legitimacy?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A147	A	A6. Trust Erosion	Information trust	To what extent do populations distrust official health information?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A148	A	A6. Trust Erosion	Communication credibility	To what extent are health-system communications perceived as inconsistent, delayed, or non-credible?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A149	A	A6. Trust Erosion	Misinformation vulnerability	To what extent is misinformation displacing trusted health information?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A150	A	A6. Trust Erosion	Care seeking	To what extent is distrust delaying or reducing appropriate care seeking?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A151	A	A6. Trust Erosion	Treatment adherence	To what extent is distrust reducing adherence to recommended treatment or guidance?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A152	A	A6. Trust Erosion	Vaccination confidence	To what extent has confidence in recommended vaccination declined?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A153	A	A6. Trust Erosion	Public cooperation	To what extent is declining trust reducing cooperation with public-health measures?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A154	A	A6. Trust Erosion	Complaints	To what extent are complaints, disputes, or adversarial interactions increasing because of perceived system failure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A155	A	A6. Trust Erosion	Perceived quality	To what extent has perceived quality deteriorated enough to affect confidence or utilization?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A156	A	A6. Trust Erosion	Waiting-time trust effect	To what extent are waiting times or access barriers eroding trust?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A157	A	A6. Trust Erosion	Financial trust effect	To what extent are unexpected costs or financial barriers eroding trust?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A158	A	A6. Trust Erosion	Equity/fairness	To what extent do perceived inequities or unfair treatment erode trust?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A159	A	A6. Trust Erosion	Transparency	To what extent does perceived lack of transparency erode trust?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A160	A	A6. Trust Erosion	Crisis communication	To what extent has crisis communication failed to maintain confidence under uncertainty?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A161	A	A6. Trust Erosion	Organizational cooperation	To what extent is trust erosion increasing internal operational friction?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A162	A	A6. Trust Erosion	Community engagement	To what extent has community engagement weakened because of distrust?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A163	A	A6. Trust Erosion	Trend	Compared with the preceding equivalent period, how is trust erosion changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
A164	A	A6. Trust Erosion	Recovery difficulty	To what extent would rebuilding trust require prolonged or extraordinary intervention?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
A165	A	A6. Trust Erosion	Service consequence	To what extent has trust erosion already disrupted demand, adherence, cooperation, or service delivery?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

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V031	V	V2. Concurrency	Number of activated domains	To what extent are multiple A domains simultaneously at materially elevated risk?	concurrency	1: No concurrent domain 2: 2 weakly concurrent 3: 2 clearly concurrent 4: 3 limited 5: 3 moderate 6: 3-4 substantial 7: 4 high 8: 5 very high 9: All 6 involved 10: All 6 strongly coupled
V032	V	V2. Concurrency	Temporal overlap	To what extent do periods of deterioration in different A domains overlap in time?	concurrency	1: No concurrent domain 2: 2 weakly concurrent 3: 2 clearly concurrent 4: 3 limited 5: 3 moderate 6: 3-4 substantial 7: 4 high 8: 5 very high 9: All 6 involved 10: All 6 strongly coupled
V033	V	V2. Concurrency	Geographic overlap	To what extent do multiple vulnerabilities affect the same geographic areas simultaneously?	concurrency	1: No concurrent domain 2: 2 weakly concurrent 3: 2 clearly concurrent 4: 3 limited 5: 3 moderate 6: 3-4 substantial 7: 4 high 8: 5 very high 9: All 6 involved 10: All 6 strongly coupled
V034	V	V2. Concurrency	Service overlap	To what extent do multiple vulnerabilities affect the same essential services simultaneously?	concurrency	1: No concurrent domain 2: 2 weakly concurrent 3: 2 clearly concurrent 4: 3 limited 5: 3 moderate 6: 3-4 substantial 7: 4 high 8: 5 very high 9: All 6 involved 10: All 6 strongly coupled
V035	V	V2. Concurrency	Population overlap	To what extent are the same vulnerable populations exposed to multiple internal failures simultaneously?	concurrency	1: No concurrent domain 2: 2 weakly concurrent 3: 2 clearly concurrent 4: 3 limited 5: 3 moderate 6: 3-4 substantial 7: 4 high 8: 5 very high 9: All 6 involved 10: All 6 strongly coupled
V036	V	V3. Mutual Reinforcement	Bidirectionality	To what extent are two or more vulnerability domains worsening each other bidirectionally?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V037	V	V3. Mutual Reinforcement	Amplification	To what extent does interaction produce effects greater than the apparent sum of isolated domain problems?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V038	V	V3. Mutual Reinforcement	Acceleration	To what extent do interacting vulnerabilities accelerate the rate of deterioration?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V039	V	V3. Mutual Reinforcement	Compensation loss	To what extent does deterioration in one domain remove compensatory capacity normally supplied by another?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V040	V	V3. Mutual Reinforcement	Resource competition	To what extent are vulnerable domains competing for the same scarce resources in ways that worsen each other?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V041	V	V4. Cascading Sequences	Two-step cascade	To what extent is there evidence of a clear two-domain failure sequence?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V042	V	V4. Cascading Sequences	Three-step cascade	To what extent is there evidence of a three-domain failure sequence?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V043	V	V4. Cascading Sequences	Four-plus cascade	To what extent is deterioration propagating through four or more vulnerability domains?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V044	V	V4. Cascading Sequences	Cross-level cascade	To what extent does deterioration propagate from national to regional, organizational, and point-of-care levels?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V045	V	V4. Cascading Sequences	Cross-service cascade	To what extent does disruption in one service line propagate to other essential services?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade

V046	V	V4. Cascading Sequences	Cross-region cascade	To what extent does overload or failure in one region transfer pressure to other regions?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V047	V	V4. Cascading Sequences	Upstream-downstream cascade	To what extent do upstream failures propagate through financing, supply, workforce, and service delivery?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V048	V	V4. Cascading Sequences	Containment failure	To what extent are existing barriers unable to contain propagation between domains?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V049	V	V5. Feedback Loops	Financial-workforce loop	To what extent has a self-reinforcing financial–workforce deterioration loop developed?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V050	V	V5. Feedback Loops	Workforce-capacity loop	To what extent has a self-reinforcing workforce–capacity deterioration loop developed?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V051	V	V5. Feedback Loops	Capacity-trust loop	To what extent has a self-reinforcing capacity–trust deterioration loop developed?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V052	V	V5. Feedback Loops	Governance-trust loop	To what extent has a self-reinforcing governance–trust deterioration loop developed?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V053	V	V5. Feedback Loops	Digital-workforce loop	To what extent has a self-reinforcing digital–workforce deterioration loop developed?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V054	V	V5. Feedback Loops	Governance-financial loop	To what extent has a self-reinforcing governance–financial deterioration loop developed?	cascade	1: No transmission 2: Possible isolated link 3: One weak link 4: One clear link 5: Two-domain propagation 6: Three-domain propagation 7: Multi-domain propagation 8: Long cascade 9: Self-reinforcing cascade 10: System-wide cascade
V055	V	V6. System Interdependence	Shared dependencies	To what extent do several vulnerability domains depend on the same fragile resource, institution, platform, or infrastructure?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
V056	V	V6. System Interdependence	Single points of failure	To what extent can failure of one node simultaneously impair several vulnerability domains?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
V057	V	V6. System Interdependence	Redundancy	To what extent is cross-domain redundancy insufficient to prevent propagation?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
V058	V	V6. System Interdependence	Substitutability	To what extent are alternative resources, providers, routes, or processes unavailable when one domain fails?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
V059	V	V6. System Interdependence	Network centrality	To what extent is system functioning concentrated in highly connected nodes whose failure would propagate widely?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
V060	V	V7. Propagation Dynamics	Propagation speed	How rapidly is deterioration moving from one domain to another?	onset	1: >5 y 2: 3-5 y 3: 2-3 y 4: 1-2 y 5: 6-12 mo 6: 3-6 mo 7: 1-3 mo 8: 1-4 wk 9: 1-7 d 10: <24 h
V061	V	V7. Propagation Dynamics	Propagation breadth	To what extent has deterioration spread across the six A domains?	concurrency	1: No concurrent domain 2: 2 weakly concurrent 3: 2 clearly concurrent 4: 3 limited 5: 3 moderate 6: 3-4 substantial 7: 4

						high 8: 5 very high 9: All 6 involved 10: All 6 strongly coupled
V062	V	V7. Propagation Dynamics	Propagation persistence	To what extent does cross-domain deterioration persist despite corrective actions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
V063	V	V7. Propagation Dynamics	Propagation trend	Compared with the preceding equivalent period, how is cross-domain propagation changing?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
V064	V	V7. Propagation Dynamics	Recovery coupling	To what extent does recovery in one domain depend on recovery in several other impaired domains?	dependency	1: Independent/fully buffered 2: Minimal dependency 3: Low dependency 4: Limited dependency 5: Moderate dependency 6: Moderate-high dependency 7: High dependency 8: Very high dependency 9: Critical dependency 10: Single-point dependency/no fallback
E001	E	E1. System-wide Spread	Functional spread	To what extent is deterioration affecting multiple core health-system functions simultaneously?	concurrency	1: No concurrent domain 2: 2 weakly concurrent 3: 2 clearly concurrent 4: 3 limited 5: 3 moderate 6: 3-4 substantial 7: 4 high 8: 5 very high 9: All 6 involved 10: All 6 strongly coupled
E002	E	E1. System-wide Spread	Organizational spread	To what extent is deterioration affecting multiple major organizations or provider networks?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E003	E	E1. System-wide Spread	Geographic spread	What proportion of the country is experiencing material health-system deterioration?	geography	1: <1% of territory 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80% of territory
E004	E	E1. System-wide Spread	Population reach	What proportion of the population is exposed to materially deteriorated health-system functioning?	population	1: <1% 2: 1-<2% 3: 2-<5% 4: 5-<10% 5: 10-<20% 6: 20-<30% 7: 30-<40% 8: 40-<60% 9: 60-<80% 10: ≥80%
E005	E	E1. System-wide Spread	Cross-level spread	To what extent is deterioration visible from national governance/financing through regional and point-of-care levels?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E006	E	E2. Essential Service Continuity	Essential services	To what extent are essential health services intermittently or persistently unavailable?	coverage gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
E007	E	E2. Essential Service Continuity	Emergency care	To what extent is timely emergency care unavailable to those who need it?	coverage gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
E008	E	E2. Essential Service Continuity	Maternal/newborn care	To what extent is essential maternal and newborn care disrupted?	coverage gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
E009	E	E2. Essential Service Continuity	Chronic care	To what extent is continuity of essential chronic-disease care disrupted?	coverage gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
E010	E	E2. Essential Service Continuity	Public health functions	To what extent are surveillance, prevention, vaccination, or outbreak-control functions disrupted?	coverage gap	1: <1% unmet 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% unmet
E011	E	E3. Reserve Depletion	Financial reserve	How much effective financial reserve remains to sustain essential functions under continued pressure?	reserve	1: >12 mo reserve 2: 9-12 mo 3: 6-9 mo 4: 4-6 mo 5: 3-4 mo 6: 2-3 mo 7: 1-2 mo 8: 2-4 wk 9: <2 wk 10: No effective reserve
E012	E	E3. Reserve Depletion	Workforce reserve	To what extent is additional workforce reserve unavailable?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
E013	E	E3. Reserve Depletion	Bed/service reserve	To what extent is spare service capacity unavailable?	capacity_loss	1: <1% loss 2: 1-<5% 3: 5-<10% 4: 10-<15% 5: 15-<25% 6: 25-<35% 7: 35-<50% 8: 50-<65% 9: 65-<80% 10: ≥80% loss
E014	E	E3. Reserve Depletion	Supply reserve	How much effective reserve of critical supplies remains?	reserve	1: >12 mo reserve 2: 9-12 mo 3: 6-9 mo 4: 4-6 mo 5: 3-4 mo 6: 2-3 mo 7: 1-2 mo 8: 2-4 wk 9: <2 wk 10: No effective reserve
E015	E	E3. Reserve Depletion	Management reserve	To what extent is managerial attention and crisis-management capacity exhausted?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

E016	E	E4. Shock Absorption	Additional demand	To what extent would a moderate additional demand shock exceed current capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E017	E	E4. Shock Absorption	Additional supply shock	To what extent would a moderate additional supply disruption exceed current coping capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E018	E	E4. Shock Absorption	Additional workforce shock	To what extent would a moderate additional workforce loss disrupt essential services?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E019	E	E4. Shock Absorption	Additional digital/infrastructure shock	To what extent would another major digital or infrastructure failure exceed current coping capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E020	E	E4. Shock Absorption	Multiple-shock tolerance	To what extent is the system unable to absorb two concurrent additional shocks?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E021	E	E5. Recovery Capacity	Time to restore routine operation	How long would the system require to restore routine essential functions after the current disruption?	recovery	1: <24 h 2: 1-3 d 3: 4-7 d 4: 1-2 wk 5: 2-4 wk 6: 1-3 mo 7: 3-6 mo 8: 6-12 mo 9: >12 mo 10: Recovery not achievable with current capacity
E022	E	E5. Recovery Capacity	Backlog recovery	To what extent is the system unable to clear accumulated waiting lists or deferred care?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E023	E	E5. Recovery Capacity	Workforce recovery	To what extent is restoration of adequate workforce capacity difficult within current resources?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E024	E	E5. Recovery Capacity	Financial recovery	To what extent is restoration of sustainable financing difficult without extraordinary support?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E025	E	E5. Recovery Capacity	Infrastructure recovery	To what extent is restoration of damaged/depleted infrastructure and supplies difficult within current capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E026	E	E6. Stability Deterioration	Continuity	To what extent has continuity of essential functions become unreliable?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E027	E	E6. Stability Deterioration	Predictability	To what extent has system performance become unpredictable across time or regions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E028	E	E6. Stability Deterioration	Institutional continuity	To what extent are institutions unable to maintain routine responsibilities under pressure?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E029	E	E6. Stability Deterioration	Resource continuity	To what extent are critical resource flows unstable or repeatedly interrupted?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E030	E	E6. Stability Deterioration	Service reliability	To what extent can patients no longer rely on essential services being available when needed?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E031	E	E7. Efficiency Saturation	Demand-capacity mismatch	To what extent does demand persistently exceed effective capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E032	E	E7. Efficiency Saturation	Backlogs	To what extent are waiting lists, queues, or deferred services accumulating faster than they can be cleared?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E033	E	E7. Efficiency Saturation	Resource substitution	To what extent are increasingly costly or inefficient emergency substitutions required to maintain output?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E034	E	E7. Efficiency Saturation	Operational friction	To what extent do coordination, delay, rework, duplication, or bottlenecks consume scarce capacity?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E035	E	E7. Efficiency Saturation	Marginal output	To what extent does additional resource input fail to produce proportional service recovery?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

E036	E	E8. Adaptability Deterioration	Reallocation	To what extent is the system unable to rapidly reallocate resources toward emerging priorities?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E037	E	E8. Adaptability Deterioration	Reconfiguration	To what extent is the system unable to redesign services or workflows in response to changing conditions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E038	E	E8. Adaptability Deterioration	Learning	To what extent are lessons from current deterioration not translated into effective adaptation?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E039	E	E8. Adaptability Deterioration	Alternative pathways	To what extent are alternative providers, routes, technologies, or processes unavailable?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E040	E	E8. Adaptability Deterioration	Adaptive exhaustion	To what extent have previously effective coping measures become exhausted or unsustainable?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E041	E	E9. Systemic Escalation	Exceptional measures	To what extent does routine operation depend on prolonged emergency or exceptional measures?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E042	E	E9. Systemic Escalation	Failure containment	To what extent can the system no longer contain failures within individual services, organizations, or regions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E043	E	E9. Systemic Escalation	Acceleration	Compared with the preceding equivalent period, how rapidly is system-wide deterioration worsening?	trend	1: Strong improvement 2: Clear improvement 3: Moderate improvement 4: Slight improvement 5: Stable-improving 6: Stable-worsening 7: Slight worsening 8: Moderate worsening 9: Marked worsening 10: Rapid/critical worsening
E044	E	E9. Systemic Escalation	Persistence	To what extent does system-wide deterioration persist despite major corrective interventions?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide
E045	E	E9. Systemic Escalation	Proximity to functional breakdown	To what extent are essential functions approaching a state in which they cannot be sustained with available resources and current arrangements?	extent	1: Absent/negligible 2: Very limited 3: Limited 4: Low-moderate 5: Moderate 6: Moderate-high 7: High 8: Very high 9: Severe 10: Extreme/system-wide

