



Healthcare Resilience after Crisis: What Makes a Health System Adaptive?

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Abstract

Health systems facing crisis exposure—whether from pandemics, armed conflict, or economic collapse—vary considerably in whether adaptive responses enacted during the acute phase translate into lasting institutional change or dissipate once conditions stabilize. This paper synthesizes conceptual and empirical literature on health system resilience to address a specific problem: what distinguishes health systems that convert crisis-period adaptation into durable transformation from those that revert to pre-crisis fragility. Drawing on five literature themes—definitional conceptualizations of resilience, structural vulnerabilities exposed by crisis, governance mechanisms of adaptive response, resource and workforce flexibility, and institutional learning—the paper develops an integrative framework, the Adaptive Conversion Pathway, comprising four stages: pre-crisis configuration, crisis-phase enactment, post-crisis conversion, and resulting trajectory. The synthesis indicates that enactment capacity, the ability to reconfigure governance and redeploy resources during acute crisis, is comparatively well documented and appears attainable across diverse settings, whereas conversion, the translation of that enactment into standing institutional capacity, is markedly less evidenced and appears to function as the pathway's principal bottleneck. A related proposition, termed the adaptive rigidity paradox, suggests that flexibility mechanisms adopted under crisis pressure carry an inherent tendency to harden into fixed arrangements once formalized. A typology distinguishing reversion, partial retention, and consolidation as post-crisis trajectories is proposed to organize this variation. The paper concludes that reversion, rather than transformation, constitutes the literature's modal finding, with implications for how governance design, workforce policy, and institutional monitoring should be oriented toward the comparatively neglected post-crisis period.

Keywords: *health system resilience; adaptive capacity; crisis response; health system governance; post-crisis recovery; institutional learning; healthcare workforce flexibility*

1. Introduction

Health systems are rarely tested by a single crisis in isolation. Over the past two decades, health-service infrastructures across income levels have absorbed pandemics, armed conflict, climate-related disasters, and acute financial shocks, often in overlapping succession rather than as discrete events. Each of these disruptions has exposed, in different ways, the same underlying question: why do some health systems bend and recover, reorganizing themselves to function under altered conditions, while others fracture, revert to prior fragilities once the acute phase has passed, or fail to restore essential services at all. The COVID-19 pandemic made this variation unusually visible. Systems with comparable baseline resources produced markedly different trajectories of service continuity, workforce retention, and post-crisis recovery, suggesting that resource endowment alone does not determine adaptive outcomes. This variation is the empirical puzzle motivating the present analysis, even though the analysis itself proceeds conceptually rather than through primary measurement.

The scholarly literature has responded to this puzzle unevenly. A substantial body of work treats resilience as a structural or systemic property, describing health systems as more or less resilient according to fixed characteristics such as financing structure, infrastructure density, or workforce ratios. A separate stream, drawing more heavily on organizational and management theory, treats resilience as a behavioral or process-based phenomenon: something enacted through decision-making, learning, and adaptation rather than something possessed in advance. A third

stream, oriented toward policy and governance, focuses on the institutional arrangements that either enable or constrain rapid reallocation of authority and resources during crisis. These three streams rarely engage one another directly. The result is a literature that is empirically rich but conceptually fragmented, offering multiple partial explanations of resilience without a shared account of how structural conditions, organizational behavior, and governance arrangements interact to produce adaptive outcomes once a crisis has already begun.

This fragmentation carries practical consequences. Health policymakers and system administrators seeking to strengthen resilience are often presented with checklists of desirable structural features—surge capacity, supply-chain diversification, digital infrastructure—without a clear conceptual account of the mechanisms that convert those features into actual adaptive behavior under stress. A system may possess redundant capacity and still fail to deploy it effectively if governance arrangements do not permit rapid reallocation, or if institutional learning from prior disruptions has not been retained. Conversely, systems with modest structural resources have sometimes achieved meaningful continuity of care through governance flexibility and workforce improvisation. This suggests that resilience is not reducible to what a health system has, but depends significantly on what a health system is able to do once conditions change—a distinction that existing frameworks acknowledge only partially and inconsistently.

The present paper addresses this gap by treating health system resilience not as a static attribute but as an emergent property arising from the interaction of governance flexibility, resource redundancy, workforce adaptability, and institutional learning as these are enacted during and after crisis exposure. This framing shifts the analytical question away from "how resilient is this system" toward "under what conditions does adaptive behavior actually occur," a reframing that has conceptual consequences for how resilience should be theorized, and practical consequences for how it might eventually be assessed. The paper synthesizes the conceptual and theoretical literature on health system resilience and post-crisis adaptive capacity, identifies the organizational and governance mechanisms through which adaptability is enacted in practice, and develops an integrative conceptual framework linking these mechanisms to observed post-crisis outcomes. From this framework, the paper derives implications for health system design, governance planning, and policy formulation aimed at strengthening adaptive capacity in advance of future disruption.

Health-system performance and continuity of care remain the central concerns throughout this analysis. Organizational and governance theory are engaged only insofar as they illuminate how health systems specifically behave under crisis conditions; the paper does not treat resilience as a generic organizational phenomenon transferable without qualification from other sectors. This distinction matters because much of the existing organizational-resilience literature originates in industrial, financial, or supply-chain contexts, where the stakes, actors, and institutional logics differ substantially from those governing healthcare delivery. Applying such frameworks to health systems without adaptation risks obscuring precisely the features—clinical workforce constraints, regulatory rigidity, the ethical weight of service interruption—that make health-system adaptation distinctive.

The argument proceeds by first establishing, through literature synthesis, the competing conceptualizations of resilience currently in circulation and the sources of health-system vulnerability that crisis exposure reveals. It then examines the governance and organizational mechanisms associated with adaptive capacity, together with the resource and workforce conditions that support or constrain their operation. The paper subsequently traces how institutional learning following crisis either consolidates or dissipates these adaptive gains over time. These strands are drawn together into an integrative conceptual framework intended to clarify the pathways through which adaptive capacity is generated, sustained, or lost—offering health-system stakeholders a more precise conceptual vocabulary for anticipating, rather than merely describing, resilience after crisis.

2. Review of Related Literature

2.1 Conceptualizing Health System Resilience

The literature on health system resilience has not converged on a single definition, and this ambiguity is treated by several authors as an obstacle to comparative analysis rather than a benign terminological variation (Asfoor et al., 2024; Rohova & Koeva, 2021; Okethwangu et al., 2026). Resilience has been used interchangeably to describe a capacity, a process, an ability, an outcome, a set of attributes, and a policy objective (Khalil et al., 2022; Mcdarby et al., 2023), and this conflation limits the field's ability to explain why resilience strategies appear to succeed in one setting and fail in another (Thu et al., 2024; Copeland et al., 2023). Three broad conceptual positions can be

distinguished. The first treats resilience as a structural attribute or end-state—a condition a system either has or lacks—and this framing retains a strong gravitational pull in the empirical literature despite growing theoretical discomfort with it (Thu et al., 2024; Rohova & Koeva, 2021). The second treats resilience as a dynamic process unfolding through phases of absorption, adaptation, and transformation (Khalil et al., 2022; Espmark et al., 2025; Topp, 2024). The third, currently the strongest point of consensus among more recent and theoretically oriented contributions, frames resilience as an emergent property of health systems understood as complex adaptive systems, arising from the interaction of resources and actors rather than residing in any single component (Rohova & Koeva, 2021; Witter et al., 2023; Copeland et al., 2023; Hou et al., 2026).

This unsettled conceptual terrain has practical consequences. Authors who favor outcome-based framings note that this approach draws attention toward visible, easily quantified "hardware" elements—beds, staff counts, stockpiles—while neglecting the intangible, relational "software" of coordination, trust, and improvisation that governs how those resources are actually mobilized (Thu et al., 2024). Some scholars respond by proposing that resilience be reframed explicitly as a learning process, precisely to resist the pull toward static measurement (Thu et al., 2024), while others argue for a sharper analytical separation between capacities (what enables a response), strategies (what actors choose to do), and outcomes (what results) (Topp, 2024). Empirical operationalizations have followed the capacity-based framing most consistently, defining resilience largely as the ability to absorb and adapt to shocks, while the learning and transformation dimensions remain comparatively under-operationalized (Hou et al., 2026).

A second definitional tension concerns the relationship between resilience and recovery. Recovery appears in most formal definitions of resilience, yet it is rarely examined or measured in its own right (McDarby et al., 2023); across a systematic review of resilience metrics, only 22 percent addressed recovery and learning, compared with 79 percent addressing the management stage of a shock (Fleming et al., 2022). Stakeholder accounts in some settings equate resilience almost entirely with "bouncing back," with transformative capacity the least articulated dimension of the concept (Okethwangu et al., 2026), and this pattern is echoed in scoping reviews that identify a shortage of recovery strategies and lessons-learned mechanisms as a persistent gap in the resilience-building literature (Forsgren et al., 2022; Espmark et al., 2025). Whether recovery constitutes a distinct construct or is better understood as a component of resilience itself—akin to robustness—remains theoretically contested and has not been resolved empirically (Grimm et al., 2021; McDarby et al., 2023).

For the purposes of the present analysis, this body of literature suggests that treating resilience as a fixed structural characteristic is difficult to sustain against the weight of more recent theoretical and empirical work, which favors a dynamic, interactional framing. This paper accordingly treats resilience as an emergent, process-based property—consistent with the complex-adaptive-systems position—while treating adaptive capacity specifically as the sub-dimension of resilience concerned with what happens after a shock has already occurred, addressing precisely the dimension the literature identifies as most persistently under-examined. At the individual level, resilience has also been operationalized as a professional capacity associated with adversity management and perceived effectiveness among helping professionals, underscoring why individual resilience should be distinguished from system-level resilience rather than treated as interchangeable (Adame, 2026). In an adjacent institutional domain, resilience has likewise been framed as emerging from the interaction of governance integrity, economic capacity, and strategic adaptability, offering a parallel systems-level logic without implying direct transferability to healthcare (Atento, 2025).

2.2 Crisis Exposure and Health System Vulnerability

If resilience is best understood as what a system does under stress, crisis exposure is analytically useful precisely because it reveals which pre-existing conditions constrain that capacity. Two structural vulnerabilities recur across strikingly different settings and crisis types: workforce shortage and supply-chain centralization.

Workforce shortage is associated with reduced crisis-response capacity in high-, middle-, and low-income contexts alike. In Africa, chronic shortages projected to reach 6.1 million workers by 2030 compound a region already carrying a disproportionate share of global disease burden (Okoroafor et al., 2022). The COVID-19 pandemic intensified workforce strain globally, contributing to an estimated 115,000 health-worker deaths and widespread burnout and psychological distress among survivors (Agyeman-Manu et al., 2023). Country-level accounts reinforce the pattern under different crisis conditions: economic collapse in Lebanon drove clinician migration and increased

the burden on remaining staff (Yamout et al., 2025), while shortages, inadequate training, and high turnover compounded Ethiopia's crisis response (Atnafu et al., 2025). A six-country European analysis similarly found that pandemic-era workforce responses concentrated additional staffing in hospitals at the expense of primary care, reflecting structural shortages that predated the crisis (Burau et al., 2023). Across these accounts, the consistent finding is that workforce flexibility—the ability to redeploy and reallocate staff rapidly—is a precondition for adaptive surge response, not merely a byproduct of having enough workers in the first place (Winkelmann et al., 2021).

A parallel vulnerability appears in supply-chain design. Health systems that adopted lean, cost-minimizing, just-in-time procurement models before a crisis were more exposed to disruption once demand surged and international logistics were interrupted, as occurred extensively during COVID-19 (Götz et al., 2024; Spieske et al., 2022). Pre-pandemic procurement models that prioritized efficiency over redundancy left clinical staff without adequate protective equipment when global shortages emerged (Hobbs, 2026). In contrast, diversification of suppliers is identified as a critical resilience factor in the majority of reviewed pharmaceutical supply-chain studies (Jamil et al., 2025), and long-term buyer–supplier relationships have proven more effective at securing critical supplies than stockpiling alone (Spieske et al., 2022). Notably, procurement resilience appears to depend more on managerial flexibility and inter-institutional collaboration than on digital tools or technical sophistication (De Souza Lima et al., 2026), and redundancy, collaboration, and robustness—rather than sophisticated supply-chain design—emerge as the strongest indicators of a resilient supply chain under crisis conditions (Zamiela et al., 2021).

Read together, these two vulnerabilities point to a common underlying pattern rather than two unrelated weaknesses: pre-crisis organizational choices oriented toward efficiency and cost minimization—in staffing models as much as in procurement—appear to reduce the very flexibility that crisis conditions demand (Wright et al., 2023). This suggests that vulnerability is not simply a matter of insufficient resources, but of resource configurations optimized for stability rather than for adaptability, a distinction that becomes central to the framework developed later in this paper. Philippine health-workforce analysis similarly identifies migration pressure, pipeline fragility, maldistribution, and competency mismatch as interacting constraints on domestic service capacity, reinforcing the view that nominal workforce supply can coexist with structural vulnerability (Atento, Quinto, & Espelita, 2025). At the community-health interface, evidence from flood-prone Marikina shows that awareness does not automatically translate into preventive practice and that enabling conditions such as protective resources, sanitation services, and access to care shape behavioral response (Temporada et al., 2025).

2.3 Governance and Organizational Mechanisms of Adaptive Capacity

Governance arrangements determine whether the resources and personnel discussed above can actually be redeployed when conditions change, and the literature offers a more nuanced account of this relationship than a simple preference for either centralization or decentralization would suggest. Decentralized decision-making is broadly associated with faster organizational adaptation: it enables ad hoc problem-solving at the frontline, supports the formation of auxiliary decision-making bodies, and allows flatter organizational structures to respond more quickly to emerging requirements (Johnson et al., 2022; Jovanović et al., 2023; Rosenbäck & Eriksson, 2024). Countries combining decentralized authority with an enhanced frontline role achieved more effective crisis suppression in comparative accounts of the COVID-19 response (Jovanović et al., 2023).

This relationship is moderated, however, by crisis intensity and phase. Evidence from Italian hospital leadership shows a deliberate shift toward centralization during the acute phase of a crisis, with decision-making concentrated in time and space even in systems that favored decentralization under normal conditions (Romiti et al., 2025). A comparable pattern appears in British Columbia, where a centralized command structure was layered onto an otherwise decentralized health system, producing an effective response despite underlying structural fragmentation (Berman et al., 2024). Decentralization alone is also not sufficient: in Uganda, greater facility-level decision space improved essential drug availability but showed no association with broader performance management or quality improvement, indicating that autonomy without accompanying capacity or accountability does not translate uniformly into better outcomes (Chen et al., 2021).

Beyond the centralization–decentralization axis, governance flexibility more broadly is consistently associated with the continuity of essential health services. Adaptive leadership grounded in self-correction and data-driven decision-making sustained service continuity during Uganda's drought and food-insecurity emergencies (Njuguna et al., 2024), and a WHO African Region review identifies flexible leadership and governance as essential to continuous

service delivery across the region (Chamla et al., 2024). Cross-country analysis spanning Asia, Sub-Saharan Africa, and Latin America similarly found that multisectoral collaboration and coordinated decision-making enabled the maintenance of essential services during COVID-19 (Guha et al., 2023). Where governance mechanisms are weak or fragmented, the consequences are consistent across settings: delayed responses and inefficient resource allocation in Ethiopia (Atnafu et al., 2025), inefficiency and service duplication in Lebanon stemming from the failure to integrate informal health actors into formal governance structures (Yamout et al., 2025), and informal leadership networks emerging within Portuguese hospitals specifically to bypass strained formal hierarchies (De Almeida Marques, 2026). A multidimensional framework synthesizing this evidence identifies governance, financing, and information as the three most influential dimensions of resilience, with governance functioning as the mechanism that converts information into coordinated strategic action (Erol et al., 2026); structural financing gaps combined with weak subnational authority are identified as the primary bottleneck limiting effective local governance during crises (Vasco et al., 2025).

Taken together, this literature does not support a single "correct" governance structure for resilience. Instead, it supports the interpretation that adaptive capacity depends on a system's ability to shift its governance mode—toward centralization or decentralization—in response to the specific intensity and phase of a crisis, and to sustain coordination across formal and informal actors regardless of which mode is in use. This finding reinforces the process-based conceptualization of resilience established in Theme 1: adaptive governance is a capability to reconfigure, not a fixed organizational design. Related healthcare analytics work proposes that data integration improves outcomes only when analytics capability and organizational alignment convert information into decision quality, a mechanism consistent with governance as an enacted rather than merely structural variable (Atento, Quinto, Espelita, & Castaneda, 2025). Hospital accreditation evidence from the Philippines also shows that middle-management engagement can coexist with documentation burden and resource constraints, illustrating how formal quality structures depend on local implementation capacity (Garcia & Atento, 2026).

2.4 Resource Flexibility, Redundancy, and Workforce Adaptation

Governance flexibility alone does not generate adaptive capacity; it must be paired with resource and workforce mechanisms capable of being redeployed. Surge capacity planning is one such mechanism, and the evidence associates it consistently with improved performance under acute demand. During the H1N1 pandemic, surge plans that modified staffing, resources, and systems improved patient safety, reduced wait times, and increased patient satisfaction (Dhamanti et al., 2024). More recent modeling work shows that forecast-informed allocation enables earlier surge activation and reduces occupancy saturation relative to conventional reactive approaches (Alkhayrat, 2024), and optimized models for allocating dedicated capacity and transferring patients reduced surge capacity needs by nearly 90 percent during COVID-19 (Parker et al., 2024). Importantly, surge preparedness is characterized in this literature not as a matter of physical capacity alone but as the intersection of predictive capability, workforce sustainability, and adaptive governance (Petanidis et al., 2025)—directly linking this theme back to the governance mechanisms discussed above.

Workforce adaptation through cross-training and task-shifting operates as a second resource-flexibility mechanism. During COVID-19, task-shifting filled workforce gaps and expanded access to diagnostic and medication services across multiple clinical areas (Das & Grant, 2023), and cross-training curricula enabled the rapid redeployment of social workers and hospitalists into psychiatric emergency and intensive care settings (Curry & Simpson, 2021; Keniston et al., 2022). Comprehensive training packages were associated with greater worker confidence in extended roles, in contrast to informal task-shifting arrangements offering only brief on-the-job instruction (Coales et al., 2023).

This mechanism, however, carries documented sustainability risks that qualify its value as a resilience strategy. Shifting staff between programs produced unintended service disruptions in some settings, underscoring that redeployment is not costless (Das et al., 2023). More fundamentally, task-shifting risks functioning as a temporary workaround rather than a transformative strategy if it is not embedded in comprehensive workforce planning with fair remuneration and clear regulatory structures, and it does not address the underlying causes of workforce scarcity identified in Theme 2, such as poor working conditions and inadequate compensation (Anwar, 2025). A further complication is what has been termed the "professionalisation paradox": where task-shifting initiatives succeed, they often prompt the professionalization of the workers involved, which can paradoxically restrict the flexibility that made the initial task-shifting effective (Das et al., 2026).

This theme therefore indicates that resource and workforce flexibility mechanisms are genuinely adaptive in the short term but are not self-sustaining. Their contribution to resilience depends on whether they are absorbed into durable workforce and financing structures—a question that leads directly into the institutional-learning literature examined next. Adjacent evidence from health professions education similarly links workforce capacity to interacting constraints in leadership, faculty workload, clinical placement availability, and resource access, suggesting that adaptive workforce mechanisms cannot be separated from the institutional conditions that sustain them (Bermido et al., 2025). Outside healthcare, a Philippine organizational study found work-environment support to be the strongest predictor among self-efficacy dimensions associated with employee productivity, offering a cautious parallel for the role of enabling context in translating individual capacity into performance (Espelita & Atento, 2026).

2.5 Institutional Learning and Post-Crisis System Transformation

The final theme addresses whether the adaptive gains documented in Themes 3 and 4 persist once acute crisis pressure subsides, and the literature offers a more pessimistic answer here than for the preceding themes. On the question of learning itself, the evidence is comparatively encouraging: post-crisis institutional learning is associated with improved preparedness for subsequent shocks when lessons are converted into structured mechanisms such as dashboards, after-action reviews, and learning collaboratives tied explicitly to budgeting and service delivery (Majdzadeh & Sajadi, 2026). Institutional flexibility and prior learning appear to be preconditions for the comparatively rare cases of genuinely transformative response in later crises (Diaconu et al., 2026; Truppa et al., 2024). Learning is not unambiguously beneficial, however: systems that prepare narrowly for the "last shock" can develop path dependencies that reduce their adaptability to novel and dissimilar threats (Thomas et al., 2022; Karreinen et al., 2023), and recovery and learning remain the least measured phase of the resilience cycle across the literature, which limits how well preparedness legacies can even be documented (Fleming et al., 2022; Forsgren et al., 2022).

The evidence on reform sustainability is considerably weaker. Across highly varied settings—Yemen's protracted conflict, Lebanon's multi-crisis economic collapse, Greece's fiscal retrenchment, and cross-national European analysis—crisis-era adaptations are repeatedly characterized as ad hoc, fragmented, or reversed once emergency conditions ease (Hyzam et al., 2026; Yamout et al., 2025; Kyriopoulos et al., 2025; Berardi et al., 2024). In Yemen, formal governance structures persisted on paper while actual resilience capacity did not, undermined by weak institutional memory, high turnover, and an absence of accountability mechanisms (Hyzam et al., 2026). In Greece, reforms have been enacted repeatedly but consistently undermined by weak monitoring and fragmented implementation (Kyriopoulos et al., 2025). Transformative change—as opposed to mere recovery—is consistently the least documented resilience outcome, particularly in fragile and conflict-affected settings (Truppa et al., 2024).

Where sustained transformation has occurred, it is associated with a specific and recurring set of conditions: sustained political commitment, protected financing, durable institutional capacity, documentation and memory systems, and accountability mechanisms linking evidence to decisions (Hyzam et al., 2026; Kyriopoulos et al., 2025). Conversely, reform is undermined by donor dependence, fragmented coordination, political volatility, and institutional pressure to move past a crisis rather than formally evaluate and consolidate what was learned from it (Yamout et al., 2025; Khalife et al., 2026; Turner & Guevara Maldonado, 2025; Ankomah et al., 2026). Temporary collaborations formed during crisis tend to dissolve once the crisis passes unless they are anchored in legal mandates and formal governance structures (Ankomah et al., 2026), and systems that fail to learn adequately from one shock risk entering a state of recurring, unresolved vulnerability—sometimes described as "permacrisis"—carrying the same weaknesses into the next emergency (Farsaci et al., 2024).

This theme establishes an important asymmetry that the present paper's framework must address directly: the mechanisms of adaptive capacity identified in the literature—governance flexibility, resource redundancy, workforce adaptation—appear reliably capable of producing short-term adaptive behavior, but the evidence does not support the assumption that these gains convert automatically into durable system transformation. Whether they do so depends on a distinct and only partially overlapping set of institutional conditions. Complementary work on narrative health analytics frames healthcare improvement as a learning system in which patient-derived information feeds back into quality-improvement processes under explicit governance safeguards, reinforcing the importance of institutionalized feedback rather than episodic data collection (Atento, Quinto, Espelita, & San Juan, 2025). Post-rehabilitation environmental-health monitoring in the Pasig River system likewise illustrates, in an adjacent setting, the value of

testing whether intervention gains persist after formal rehabilitation rather than assuming that institutional action automatically produces durable improvement (Ylagan et al., 2025).

2.6 Synthesis of Literature

Across the five themes, the literature converges on a position that a decade ago would have been more contested: health system resilience is better understood as an emergent, process-based property than as a fixed structural characteristic, even though empirical measurement continues to lag behind this theoretical shift. This convergence carries an important corollary that structures the remainder of the present analysis. If resilience is a process, then its constituent mechanisms—governance flexibility, resource and workforce redundancy, and institutional learning—should be expected to interact rather than operate independently, and the literature bears this out. Governance flexibility determines whether resource and workforce mechanisms can actually be redeployed once a crisis begins; resource and workforce flexibility, in turn, only translates into meaningful continuity of care when governance permits rapid reallocation; and institutional learning determines whether the adaptive behaviors enacted through governance and resource flexibility are retained or lost once the acute phase passes.

The literature also converges, more surprisingly, on the location of the weakest evidentiary ground. Vulnerability, governance mechanisms, and resource/workforce adaptation are all comparatively well evidenced, with reasonably consistent findings across very different settings—high-income and low-income, conflict-affected and stable, pandemic and non-pandemic. Recovery, learning, and long-term transformation are, by contrast, the least measured and least theorized dimensions across nearly every theme examined, a gap that recurs so consistently across independent literatures (conceptual reviews, metrics reviews, governance studies, and reform-sustainability studies) that it cannot be dismissed as an artifact of any single research tradition. A second point of convergence concerns the absence of a universal governance prescription: rather than decentralization or centralization being uniformly superior, the evidence supports a contingent, phase-dependent model in which effective systems appear to shift governance mode according to crisis intensity, and where the frontier of failure lies not in initial resource endowment but in the durability of adaptive gains once achieved. A Philippine pharmacy case similarly frames adaptation to universal healthcare reform and digital disruption as a dynamic-capabilities problem in which legacy strengths must be deliberately reconfigured, providing an adjacent illustration of the distinction between possessing resources and converting them into adaptive capability (Atento & Atento, 2025). At a broader systems level, ASEAN evidence linking macroeconomic conditions, labor-market dynamics, and child nutrition shows that strong aggregate resources do not translate uniformly into health-related outcomes, reinforcing the synthesis here that capacity effects are contingent on the pathways through which resources are mobilized (Quinto & Atento, 2025).

2.7 Gaps in the Literature

The most consistent and heavily corroborated gap concerns the recovery, learning, and transformation phase of the resilience cycle. Multiple independent lines of evidence—conceptual reviews, systematic metrics reviews, and reform-sustainability studies—converge on the finding that this phase is simultaneously the least measured, the least theorized, and the least likely to produce durable outcomes, yet it receives markedly less analytical attention than the acute-response phase. This imbalance leaves the field with a comparatively strong account of how systems respond during crisis and a comparatively weak account of what happens afterward, which is precisely the period in which adaptive capacity either consolidates into lasting system change or dissipates.

A second gap concerns the mechanisms linking short-term adaptive behavior to long-term transformation. The literature documents each in isolation—governance shifts during acute crisis, and separately, the institutional conditions associated with sustained reform—but rarely specifies the pathway connecting the two. It remains unclear, for instance, whether the same governance flexibility that enables rapid adaptation during a crisis is a precondition for institutional learning afterward, or whether these represent distinct capacities that happen to co-occur in resilient systems.

A third gap concerns the professionalisation paradox identified within workforce adaptation: the finding that successful task-shifting arrangements tend to generate pressure toward professionalization, which then constrains the very flexibility that made the arrangement effective, has not been examined for its broader implications across other resource-flexibility mechanisms, such as supply-chain diversification or surge staffing models, where an analogous dynamic (short-term flexibility generating longer-term rigidity) may also operate but has not been tested.

Finally, the literature offers limited theoretical integration across levels of analysis. Governance studies, workforce studies, and reform-sustainability studies each employ their own conceptual vocabulary and are rarely brought into a single explanatory account of how a crisis-exposed health system moves from vulnerability, through adaptive response, to either consolidation or reversion. This fragmentation is consistent with the definitional ambiguity identified in Theme 1 and suggests that the field currently lacks an integrative framework connecting its own most robust findings.

2.8 Contribution of the Present Paper

The present paper responds directly to this fragmentation by proposing an integrative conceptual framework that connects the mechanisms established across Themes 2 through 5—vulnerability exposure, governance adaptation, resource and workforce flexibility, and institutional learning—into a single account of the conditions under which post-crisis adaptive behavior converts into durable system transformation rather than reversion to pre-crisis fragility. Rather than treating recovery and transformation as an unmeasured residual category, as much of the existing literature implicitly does, the framework developed in Section 4 positions the transition from short-term adaptation to long-term consolidation as its central analytical problem, addressing the gap identified as most consistent across independent literatures. In doing so, the paper also offers a disciplined response to the professionalisation-paradox gap by treating the tension between short-term flexibility and long-term rigidity as a general feature of adaptive mechanisms rather than a peculiarity of task-shifting alone. The paper's contribution is therefore conceptual rather than empirical: it does not resolve these open questions through new data, but provides a structured account of the mechanisms through which they could be investigated, and specifies the institutional conditions under which adaptive capacity, once demonstrated, is more or less likely to be retained.

3. Methodology

This paper is a conceptual, integrative literature synthesis. It does not report primary or secondary empirical data, and no claims made in the subsequent sections should be read as findings derived from original measurement, survey administration, interviews, or statistical analysis. The paper's method is analytical and interpretive: it draws together an existing body of peer-reviewed literature on health system resilience and reorganizes it around a specific conceptual problem—the conditions under which adaptive behavior enacted during crisis converts into durable system transformation rather than reversion to pre-crisis fragility.

The literature underlying this synthesis was identified through targeted, question-driven searches rather than a formal systematic-review protocol. Five guiding themes were established prior to the literature search, each anchored to a specific dimension of the paper's central problem: the conceptualization of resilience itself, the structural vulnerabilities that crisis exposure reveals, the governance mechanisms associated with adaptive response, the resource and workforce mechanisms that enable that response, and the institutional conditions associated with post-crisis learning and reform sustainability. For each theme, two guide questions were formulated in a yes/no evidence-retrieval format and used to search the academic literature via an AI-assisted evidence-synthesis search tool that surfaces peer-reviewed sources and reports an associated evidence-strength assessment for key claims. This approach is best described as a structured, theme-driven literature synthesis rather than a systematic or scoping review in the formal methodological sense: no predefined database protocol, screening criteria, or reviewer-agreement procedure was applied, and no claim of exhaustive coverage of the literature is made.

Source inclusion followed a relevance-based logic rather than a fixed inclusion/exclusion checklist. Sources returned by the guide-question searches were retained where they addressed the substantive content of the corresponding theme and reported findings traceable to an identifiable peer-reviewed publication. The resulting literature spans health systems across a deliberately broad range of settings—including high-income, low-income, conflict-affected, and disaster-affected contexts, and crisis types including pandemics, economic collapse, and armed conflict—reflecting the paper's conceptual rather than context-specific ambit. No literature was excluded on the basis of contradicting an anticipated conclusion; where sources reported divergent or contingent findings, as occurred notably around the question of decentralization and crisis intensity, that divergence is preserved and discussed rather than resolved by selective omission.

Thematically, the literature was organized according to the five guide themes and analyzed within each theme for patterns of agreement, disagreement, and evidentiary strength. The analytical procedure used in Section 4 involves

a further, cross-thematic step: rather than treating the five themes as parallel or independent bodies of evidence, the paper examines the connective relationships between them—for instance, whether the governance mechanisms identified in Theme 3 are preconditions for the institutional-learning outcomes identified in Theme 5—in order to construct an integrative conceptual framework. This step constitutes conceptual synthesis rather than empirical modeling: the relationships proposed are theoretical propositions derived from patterns across the reviewed literature, not statistically estimated relationships.

Several limitations follow from this design. First, because the literature search was theme-driven rather than exhaustive, the synthesis may not capture every relevant contribution to each theme, particularly literature published outside the sources indexed by the search tool used. Second, the evidence base itself is uneven across themes: as documented in Section 2, the recovery, learning, and transformation dimensions of resilience are less extensively studied than the acute-response dimensions, which constrains how confidently conclusions can be drawn about the paper's central problem—the conversion of short-term adaptation into durable transformation. Third, because the underlying studies employ varied definitions of resilience, as documented in Theme 1, cross-study synthesis necessarily involves a degree of interpretive judgment in aligning terminology; this judgment is made explicit throughout Section 2 rather than concealed behind uniform terminology. Finally, the framework proposed in Section 4 is a conceptual proposition intended to organize existing evidence and generate testable relationships for future empirical inquiry; it has not itself been empirically validated, and it should be read as a contribution to theory-building rather than as a confirmed model of health system behavior.

4. Analytical Synthesis / Conceptual Analysis and Discussion

The literature reviewed in Section 2 establishes four well-evidenced but loosely connected findings: crisis exposure reveals specific structural vulnerabilities concentrated in workforce and supply configurations optimized for efficiency rather than flexibility; governance systems that shift mode according to crisis intensity are associated with faster adaptive response; resource and workforce flexibility mechanisms produce genuine short-term adaptive gains but carry embedded sustainability risks; and institutional learning is associated with improved preparedness, while reform sustainability is not. What the literature does not offer is an account of how these four findings relate to one another as stages of a single process. This section develops that account, proposing an integrative framework—here termed the Adaptive Conversion Pathway—that traces how a health system's pre-crisis configuration shapes its capacity not merely to respond during crisis, but to convert that response into durable transformation.

4.1 The Adaptive Conversion Pathway

The pathway comprises four analytically distinct stages, each grounded in a theme established in Section 2. The first stage, configuration, refers to the pre-crisis structural condition of the system—the workforce distribution, supply-chain design, and governance defaults documented in Themes 2 and 3. Configuration determines the vulnerability profile a crisis will expose, but the literature does not support treating configuration as determinative of outcome; systems with modest resource endowments have achieved meaningful continuity of care through governance and workforce flexibility, while resource-adequate systems have nonetheless fragmented where governance rigidity prevented reallocation (Guha et al., 2023; Berman et al., 2024). Configuration is therefore best understood as setting the initial conditions for adaptive response rather than fixing its outcome.

The second stage, enactment, corresponds to the governance mode-shifting and resource/workforce redeployment documented in Themes 3 and 4. This is the stage most extensively evidenced in the existing literature, and the evidence supports a specific interpretive claim: enactment capacity is contingent rather than structural. Systems do not possess a fixed level of adaptive capacity; they exhibit an ability to reconfigure governance mode and resource allocation in response to the phase and intensity of the crisis at hand, as illustrated by the shift toward centralized decision-making during the acute phase in otherwise decentralized systems (Romiti et al., 2025; Berman et al., 2024). This reframes "adaptive capacity" away from a system attribute and toward what might be called an enactment capability—the demonstrated ability to reconfigure, rather than a stored reserve of flexibility.

The third stage, conversion, is the paper's central analytical contribution and the stage least developed in the existing literature. Conversion refers to the process by which adaptive behaviors enacted during the acute phase either become embedded in routine governance, financing, and workforce structures, or dissipate once acute pressure eases. The evidence reviewed in Theme 5 indicates that conversion is not automatic: temporary collaborations, decentralized

decision authority, and redeployed staffing arrangements adopted during crisis have repeatedly reverted once emergency conditions lifted, even where the crisis-era arrangement was judged effective while active (Hyzam et al., 2026; Yamout et al., 2025; Kyriopoulos et al., 2025). Conversion, in other words, is the pathway's bottleneck: enactment capacity appears comparatively common across the reviewed literature, while successful conversion into lasting transformation appears comparatively rare.

The fourth stage, outcome, describes the resulting trajectory: reversion to pre-crisis configuration, partial retention of isolated adaptive elements, or consolidation into transformed institutional arrangements. The literature associates consolidation with a specific and recurring cluster of conditions—sustained political commitment, protected financing, documentation and institutional memory, and accountability mechanisms linking evidence to decisions (Hyzam et al., 2026; Kyriopoulos et al., 2025)—and associates reversion with their absence, particularly donor dependence, fragmented coordination, and institutional pressure to move past the crisis rather than formally evaluate it (Turner & Guevara Maldonado, 2025; Ankomah et al., 2026).

4.2 The Adaptive Rigidity Paradox

A second contribution of this synthesis is to generalize a pattern that the reviewed literature documents only within a single mechanism. The professionalisation paradox identified in workforce task-shifting—where successful flexibility arrangements generate pressure toward formalization that subsequently constrains the flexibility that made them effective (Das et al., 2026)—is structurally similar to dynamics observable elsewhere in the reviewed evidence, though this parallel is proposed here as a conceptual extension rather than as an established empirical finding. Supply-chain diversification adopted reactively during crisis, for instance, risks becoming a new fixed configuration rather than a standing flexible capability once the crisis passes, potentially reproducing the same efficiency-over-redundancy logic identified as a source of vulnerability in Theme 2. Termed here the adaptive rigidity paradox, this pattern proposes that mechanisms deployed specifically for their flexibility during acute crisis carry an inherent tendency to harden into fixed structures once institutionalized, unless conversion processes are deliberately designed to preserve rather than freeze the flexibility itself. This is offered as a testable proposition rather than a demonstrated regularity: it is consistent with the workforce evidence reviewed but has not been examined directly for governance or supply-chain mechanisms in the literature synthesized here.

4.3 A Typology of Post-Crisis Trajectories

Building on the conversion stage, three post-crisis trajectories can be distinguished analytically, differentiated by whether adaptive enactment during crisis translates into altered institutional arrangements afterward. Reversion describes systems in which crisis-era adaptations are dismantled once acute pressure lifts, restoring pre-crisis configuration and, with it, pre-crisis vulnerability; the Yemeni case, in which formal governance structures persisted while underlying resilience capacity did not, is illustrative of this trajectory in its most severe form (Hyzam et al., 2026). Partial retention describes systems in which isolated adaptive elements persist—a redeployment protocol, a supplier relationship—without broader institutional consolidation, plausibly the modal outcome given the literature's general finding that transformation is the least documented resilience response (Truppa et al., 2024). Consolidation describes systems in which crisis-era adaptations are formalized into routine governance, financing, and accountability structures, converting temporary enactment into standing institutional capacity. This typology is proposed as an organizing device for future comparative or empirical work rather than as a claim that these categories have been measured or validated in the present synthesis.

4.4 Boundary Conditions

The framework's applicability is bounded in ways the literature suggests but does not fully resolve. First, the relationship between governance mode-shifting and adaptive outcome appears sensitive to crisis intensity and phase (Romiti et al., 2025), suggesting the pathway may operate differently for acute, time-limited shocks than for protracted or recurring crises such as prolonged conflict or sustained economic sanction, where the boundary between "acute" and "chronic" phases is less distinct (Majdzadeh & Sajadi, 2026). Second, the framework assumes a baseline institutional capacity sufficient to formalize learning; in settings where this capacity is itself severely constrained, the conversion stage may be structurally foreclosed regardless of enactment quality, a possibility consistent with fragile and conflict-affected settings documented in Theme 5 (Truppa et al., 2024). These boundary conditions are noted as limits on the framework's generalizability rather than as gaps to be resolved within a conceptual paper.

5. Discussion and Implications

The Adaptive Conversion Pathway developed in Section 4 carries implications that extend beyond the literature synthesis itself, principally by reframing what "building resilience" should mean in practice. If enactment capacity is comparatively common while conversion is the pathway's genuine bottleneck, then interventions aimed narrowly at strengthening crisis-phase response—surge staffing protocols, emergency governance structures, supplier diversification—address a stage of the pathway the existing literature already evidences reasonably well, while leaving the stage most associated with reversion largely untouched. This suggests that health-system strengthening efforts oriented primarily toward acute-response readiness may be addressing the more tractable half of the resilience problem while leaving the harder, less visible half—whether that readiness outlives the crisis that produced it—comparatively unaddressed.

This has a direct implication for health-system governance design. Because governance mode-shifting appears to be a genuine capability rather than a fixed structural feature, governance arrangements might usefully be evaluated not only on their steady-state configuration but on their demonstrated capacity to reconfigure and then deliberately revert or consolidate as conditions require. This reframes the choice between centralized and decentralized governance, long treated in parts of the literature as a design decision to be settled once, as a question of institutional dexterity: whether a system possesses the mechanisms—documentation, review processes, formal mandate structures—to decide, after a crisis, which adaptations merit institutionalization and which do not. The evidence on temporary collaborations dissolving without legal or governance anchoring (Ankomah et al., 2026; Hyzam et al., 2026) suggests that consolidation is unlikely to occur by default; it appears to require deliberate institutional design rather than emerging automatically from the fact that an adaptation worked during the crisis itself.

The adaptive rigidity paradox proposed in Section 4.2 carries a related implication for workforce and supply-chain policy specifically. If flexibility mechanisms adopted under crisis pressure tend toward institutional hardening once formalized, then policy attention directed solely at expanding flexible capacity—more cross-trained staff, more diversified suppliers—may be insufficient without parallel attention to how that capacity is governed once the crisis passes. The professionalisation paradox documented in task-shifting arrangements (Das et al., 2026) illustrates a specific version of a more general design problem: mechanisms intended to preserve flexibility require structures that protect their flexibility as a standing property, rather than structures that simply formalize the arrangement as it existed at the moment of crisis.

For health-system performance more broadly, the typology of post-crisis trajectories proposed in Section 4.3 suggests that reversion and partial retention should be treated as the expected default outcomes rather than as failures of implementation, given how consistently the reviewed literature documents transformation as the rarest response across highly varied settings (Truppa et al., 2024). This has a practical corollary: institutional actors evaluating post-crisis system performance may be better served by monitoring the presence or absence of the specific conditions associated with consolidation—protected financing, documentation and memory systems, accountability linking evidence to decisions (Hyzam et al., 2026; Kyriopoulos et al., 2025)—than by assuming that a system's crisis-era performance is itself a reliable predictor of its longer-term trajectory.

Several boundaries qualify these implications. The framework proposed here is a conceptual proposition assembled from patterns across an unevenly distributed evidence base, not a validated causal model; its stages, particularly conversion, are the least empirically documented in the underlying literature and are correspondingly the least certain components of the pathway. The boundary conditions noted in Section 4.4—crisis intensity and duration, and baseline institutional capacity—mean the pathway should not be assumed to generalize uniformly across acute versus protracted crises, or across settings with markedly different baseline institutional strength. Finally, because the literature underlying this synthesis skews toward documented cases of both notable success and notable failure, the pathway may understate the prevalence of more ambiguous or slow-moving trajectories that are less likely to be written up as distinct case studies in the first place.

6. Conclusions and Recommendations

This paper set out to address a specific conceptual problem: what distinguishes health systems that adapt successfully after crisis from those that fail to adapt or revert to pre-crisis fragility. The synthesis developed across the preceding sections suggests that this question has been answered only partially by the existing literature, and that

the partial answer it provides is itself informative. The literature offers a reasonably well-evidenced account of how health systems respond during the acute phase of a crisis—through governance mode-shifting, workforce redeployment, and resource reallocation—but a comparatively thin account of what happens afterward, when the acute pressure lifts and systems either consolidate what they learned or quietly revert to prior configurations. The Adaptive Conversion Pathway proposed in Section 4 reorganizes this asymmetry into an explicit claim: adaptive capacity, understood as the ability to enact governance and resource flexibility under crisis conditions, is not the same capability as conversion capacity, understood as the ability to translate that enactment into durable institutional change. Health systems that appear highly adaptive during a crisis are not thereby guaranteed to emerge transformed by it.

The strongest and most consistently supported insight from this synthesis is that reversion, not transformation, is the literature's modal finding across settings as different as conflict-affected Yemen, economically collapsed Lebanon, and fiscally constrained Greece. This is not a minor caveat to an otherwise optimistic resilience literature; it is arguably the literature's central empirical regularity, and one that existing conceptual frameworks have not placed at their center. A secondary insight, developed as the adaptive rigidity paradox, proposes that the flexibility mechanisms most associated with successful crisis response—task-shifting, decentralized authority, diversified procurement—carry an embedded tendency to harden into fixed arrangements once formalized, unless conversion processes are deliberately designed to protect flexibility as an ongoing property rather than a one-time adaptation.

These insights should be read with proportionate caution. The framework offered here is a conceptual proposition built from patterns identified across an unevenly distributed evidence base; it has not been operationalized or empirically tested, and its central mechanism—conversion—rests on the thinnest layer of existing evidence precisely because recovery and transformation are the least studied phase of the resilience cycle across the literature reviewed. The typology of post-crisis trajectories and the adaptive rigidity paradox are accordingly best understood as organizing propositions intended to generate testable questions, not as findings that have themselves been validated.

Several recommendations follow, calibrated to this conceptual status. For research, the most immediate priority is the development of measurement approaches capable of tracking the conversion stage specifically—whether crisis-era governance and workforce adaptations are retained, formalized, or reversed over defined post-crisis intervals—since the absence of such measurement is what currently prevents the framework's central proposition from being tested. Comparative case-based research designed explicitly around the reversion, partial-retention, and consolidation typology proposed here would allow the conditions associated with each trajectory to be examined more systematically than the largely single-case literature currently permits. For institutional practice, the analysis suggests that resilience-strengthening efforts should extend deliberate attention beyond acute-response readiness to the institutional mechanisms—documentation, financing protection, accountability structures—that the literature associates with consolidation, rather than assuming that effective crisis-phase performance will translate automatically into lasting system improvement.

The central limitation of this paper is the one it shares with much of the literature it synthesizes: it can describe the conditions under which adaptive gains appear more or less likely to endure, but it cannot, as a conceptual synthesis, demonstrate that these conditions are sufficient, or establish their relative weight against one another. That remains an empirical task for future research building on the propositions advanced here.

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