Review Article

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Beyond Flooded Homes: Household Financial Resilience, Healthcare Access, and Economic Recovery After Disasters—Lessons from the 2025 Hat Yai Flood

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Abstract:

Flood disasters can affect household welfare through simultaneous losses of income and assets, disruption of healthcare, and increased expenditure required for recovery. These pressures are commonly examined in separate literatures on disaster economics, household coping, financial protection, and health-system resilience. This paper brings them together around a household-level problem: competing claims on limited resources after a disaster.

We propose a conceptual framework in which disaster-related economic losses and healthcare disruption converge on household financial-buffer capacity. When resources are insufficient, households may continue to obtain healthcare and experience financial hardship, delay or forgo care and experience unmet need, or move between these responses as disruption persists. Continuity-dependent healthcare can amplify this constraint by reducing the flexibility to postpone healthcare use or expenditure.

The 2025 Hat Yai flood in Southern Thailand illustrates the upstream conditions represented in the framework. Available evidence documents widespread livelihood and productive-asset losses alongside disruption of essential healthcare services, including dialysis. Household-level evidence is not yet available to determine the extent of catastrophic health expenditure, forgone care, or longer-term welfare loss following the flood.

The framework suggests three policy priorities: protecting the continuity of essential and non-deferrable care, providing rapid and flexible household liquidity, and linking health protection with livelihood recovery and social protection. Disaster resilience depends not only on restoring services, but also on whether households retain the economic capacity to use them while rebuilding their lives and livelihoods.

This paper is part of the “Hat Yai Flooding 2025” collection

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Introduction

Flood disasters are often described in terms of damaged homes, infrastructure, and other physical assets. For households, however, the economic consequences extend beyond what is destroyed. Employment may stop, businesses may remain closed after floodwaters recede, productive assets may need to be replaced, and ordinary expenditure on food, housing, transport, and healthcare continues while income is disrupted. A major flood can therefore create several demands on household resources at the same time.

How households manage these demands depends partly on the resources available before the disaster and on their ability to draw on savings, insurance, credit, social protection, or informal support. The literature on household risk and livelihoods has long examined how families respond to income and asset shocks through consumption smoothing and coping strategies[1–3]. Disaster economics has extended this perspective by showing that similar asset losses can produce very different welfare consequences according to households' capacity to absorb and recover from shocks[4].

Healthcare introduces an additional constraint. Financial-protection research has traditionally examined the burden of out-of-pocket expenditure, including catastrophic health expenditure and medical impoverishment[5,6]. Yet expenditure records only what households actually spend. A household unable to afford or reach care may incur little healthcare expenditure precisely because treatment was delayed or forgone. Financial hardship and unmet healthcare need are therefore related but distinct consequences of constrained access to care[7].

These concerns remain relevant in Thailand despite universal health coverage. Studies of chronic kidney disease and lung cancer have documented residual household financial burden under routine conditions, including the non-medical costs associated with obtaining care[8,9]. During a disaster, these existing healthcare demands may coincide with income interruption, damaged assets, transport problems, and expenditures required for household and livelihood recovery.

Several established frameworks address parts of this problem, but from different starting points. Livelihood and household-risk frameworks focus primarily on assets, income shocks, coping, and consumption[2,3]. Financial-protection research examines the economic consequences of paying for healthcare[5,6], while work on unmet need and forgone care addresses barriers that prevent needed healthcare from being obtained[7]. Health-system resilience frameworks generally focus on the capacity of services and institutions to maintain or restore essential functions during shocks[10]. Less attention has been given to their intersection at the household level: what happens when recovery needs, basic consumption, and healthcare simultaneously compete for resources that have themselves been reduced by a disaster.

This article develops a household-centred framework for examining that intersection. The 2025 Hat Yai flood in Southern Thailand is used not as evidence that every downstream consequence in the framework occurred, but as a documented case in which livelihood and productive-asset losses coincided with the disruption of essential healthcare. The aim is to clarify the economic pathways connecting these shocks, identify where continuity-dependent healthcare may amplify vulnerability, and derive a more focused set of implications for disaster and health policy.

Approach to the literature

This article uses a targeted narrative approach to support conceptual synthesis rather than an exhaustive systematic review. Literature was selected to represent four bodies of work needed to construct and interrogate the framework: household risk and livelihood coping; healthcare financial protection and unmet need; health-system resilience during disasters; and continuity-dependent care. Priority was given to foundational conceptual work, systematic reviews where available, Thai evidence on household financial burden, and directly documented evidence from the 2025 Hat Yai flood. The purpose of this approach is to make the intellectual sources of the framework explicit while distinguishing established concepts from the synthesis proposed here.

The Hat Yai case is treated conservatively. Contemporary institutional reports are used to document the economic and livelihood disruption, while peer-reviewed evidence is used where available for healthcare disruption. The case is not used to infer household-level catastrophic health expenditure, forgone care, or impoverishment in the absence of direct measurement. These remain downstream hypotheses generated by the framework and targets for subsequent empirical investigation.

From disaster losses to competing household needs

A flood affects household welfare through several mechanisms that can occur together. Damage to housing and household assets creates immediate replacement and repair costs. Loss of equipment, vehicles, inventories, or business premises can also affect the ability to generate income. Even when physical access to an area is restored, employment and business activity may take longer to recover. The welfare consequences of the disaster therefore depend on both the value of assets lost and the household's capacity to maintain consumption and rebuild its livelihood[3,4].

Households can draw on several mechanisms to absorb a temporary shock: savings provide immediate liquidity, insurance and transfers shift part of the loss elsewhere, borrowing moves expenditure into the future, and informal support may redistribute resources across family or community networks. When these mechanisms are insufficient, households adjust expenditure directly. The options available, however, are not equivalent. Borrowing creates future repayment obligations, selling productive assets may weaken subsequent earning capacity, and reductions in essential consumption can have consequences that persist after the initial shock[1,2].

Healthcare enters this allocation problem in two ways. First, access itself may become more costly as transport routes, usual providers, pharmacies, or referral systems are disrupted. Second, healthcare needs do not necessarily fall when household resources do. Routine treatment, medications, and management of acute illness continue to require money and time while households are also paying for food, temporary accommodation, home repair, and livelihood recovery.

The central economic problem is therefore not simply that disasters create additional healthcare expenditure. They create simultaneous claims on a resource base that may already have contracted. How these competing needs are managed depends on the household's financial buffer and on whether healthcare can safely be postponed.

A household framework for financial resilience during disasters

Figure 1 summarizes this process. A flood produces two upstream pressures: household economic losses and healthcare disruption. Economic losses include both asset and wealth losses and disruption of livelihoods and income. Healthcare disruption may require additional resources to obtain or maintain care. These pressures converge at the household level, where basic needs, home and livelihood recovery, and healthcare compete for limited resources.

Financial-buffer capacity influences how much of this combined shock can be absorbed. Buffers may include savings, insurance, access to credit, and social protection[1,2]. A sufficient buffer does not eliminate the consequences of the disaster or guarantee access to functioning health services, but it provides greater capacity to meet simultaneous demands without immediately sacrificing essential consumption or care.

When buffers are insufficient, healthcare-related consequences may take different forms. Some households continue to obtain care despite its cost, potentially reallocating consumption, borrowing, or drawing down assets. In these households, the economic burden may become visible as financial hardship associated with healthcare spending. Others delay or forgo care; their measured healthcare expenditure may be lower even though unmet need has increased[7,11]. Financial protection therefore cannot be assessed solely from the amount households spend on healthcare.

Continuity-dependent healthcare is shown as an amplifier rather than a separate causal pathway. Where treatment can be postponed, households have some flexibility in the timing of expenditure. Dialysis, time-sensitive cancer treatment, essential chronic medications, and other non-deferrable care reduce that flexibility. The same economic shock may consequently create a tighter household constraint when the interruption of healthcare carries an immediate or substantial clinical risk.

The 2025 Hat Yai flood: a documented case of compound disruption

The November 2025 flood in Hat Yai provides a recent example of several upstream components of the framework occurring together. Hat Yai is an important commercial, transport, and tourism centre in Southern Thailand. A post-flood field assessment by the Bank of Thailand reported that approximately 170,000 households were affected and described extensive losses to homes, businesses, and income-generating assets, including vehicles, machinery, and equipment used by local enterprises. The Bank estimated an income loss of approximately 15.7 billion baht to the southern economy and reported that recovery in parts of the trade and tourism sectors could take several months[12].

Recovery remained incomplete several weeks after the flood. As of 15 December 2025, 64 of 203 hotels and accommodation establishments in Hat Yai had reopened, representing 4,483 of 12,689 available rooms. The provincial tourism assessment also reported extensive damage among tour operators, including more than 200 passenger vans and 20 tour buses that could no longer be used[13]. These observations are consistent with the Bank of Thailand's assessment that recovery in trade and tourism would extend beyond the immediate post-flood period[12].

Healthcare disruption occurred alongside these economic losses. A province-wide assessment of all 20 dialysis centres in Songkhla found that 11 centres ceased operation during the peak flood period; all 11 were located in Hat Yai. The median interruption was four days. Loss of municipal water, physical inaccessibility, electricity failure, and telecommunications disruption contributed to service suspension. The study estimated that 347 haemodialysis and 91 peritoneal dialysis patients were affected, although these were centre-reported aggregate estimates rather than individually verified patient-level observations[14].

Dialysis makes the interaction between service disruption and household resources particularly visible because treatment is recurrent and cannot safely be deferred for long. The broader economic issue is not specific to kidney disease. The Hat Yai evidence shows that disruption of healthcare occurred in the same disaster setting as widespread damage to homes, businesses, and productive assets. It does not, however, establish how these pressures were distributed within individual households.

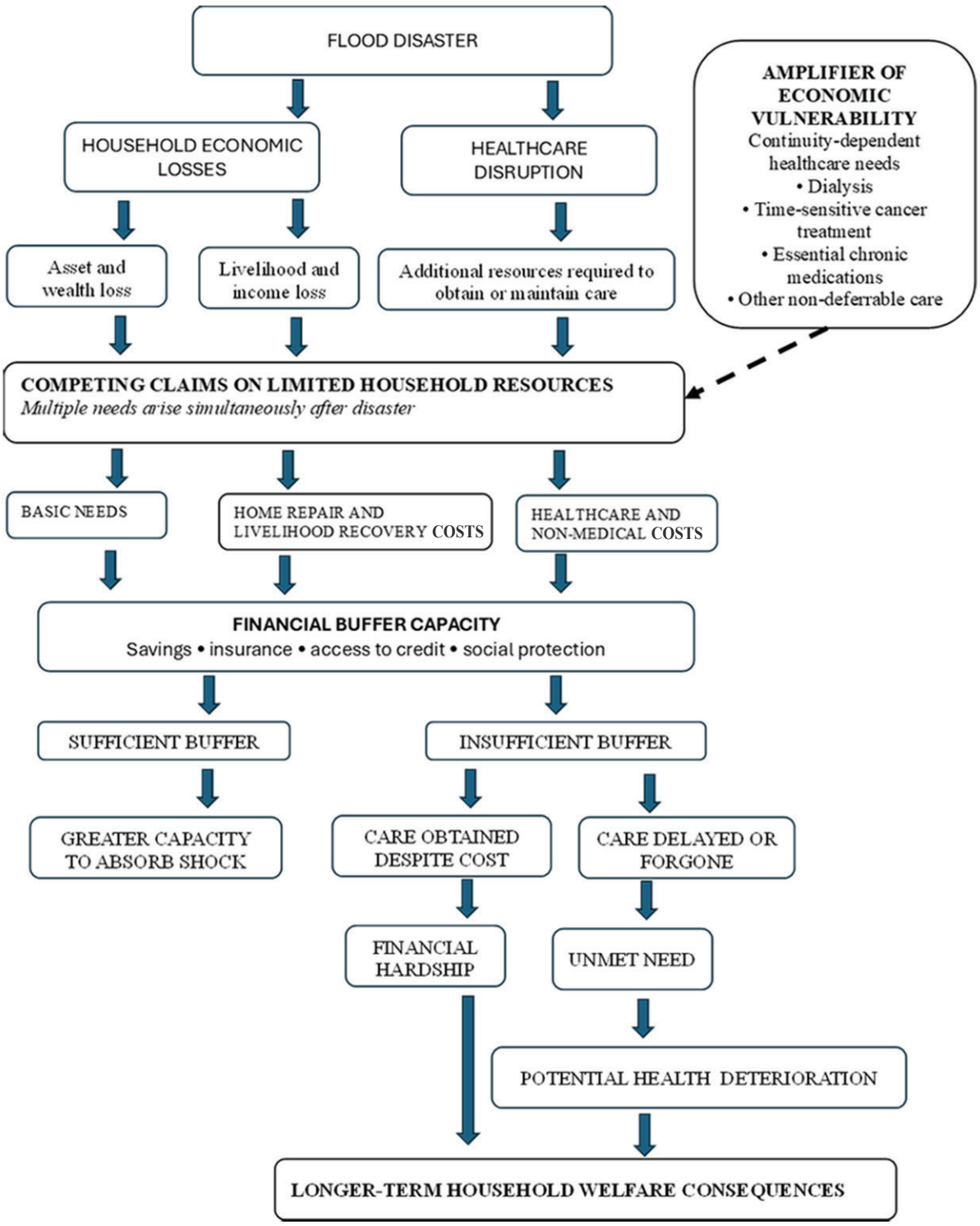

Figure 1 Household financial resilience and healthcare access following a flood disaster

The available evidence does not establish that the Hat Yai flood caused catastrophic health expenditure, impoverishment, or forgone care at household level. These outcomes have not yet been systematically measured in the affected population. Hat Yai is therefore used here to document the upstream conditions represented in Figure 1—economic and livelihood loss occurring alongside healthcare disruption—rather than as empirical validation of every downstream pathway.

Financial hardship and forgone care: two consequences of constrained household resources

Catastrophic health expenditure is widely used to identify households whose out-of-pocket healthcare payments consume a substantial share of the resources available for other needs[5,6]. Expenditure-based measures, however, necessarily describe households that incur healthcare spending. A household facing simultaneous demands for food, housing recovery, livelihood restoration, and healthcare may continue to obtain care and absorb the associated cost, or it may delay or forgo care because the resources or access required to obtain it are no longer available. Over time, the household consequences of this constraint may therefore appear as financial hardship, unmet healthcare needs, or both[7].

Thailand provides a useful baseline because substantial financial burden has been documented under universal health coverage even outside disaster settings. In a nationwide study of 1,224 patients with chronic kidney disease, catastrophic health expenditure under the Universal Coverage Scheme increased with treatment intensity, reaching 19.5% among patients receiving peritoneal dialysis and 50.0% among those receiving haemodialysis. Medical impoverishment occurred in 11.5% and 31.6%, respectively. Non-medical expenditure was also important; travel accounted for a substantial share of out-of-pocket expenditure among haemodialysis patients across the major public health schemes[8].

Financial burden has also been documented among Thai patients with lung cancer. A single-centre cross-sectional study identified catastrophic health expenditure and medical impoverishment among patients covered by the major public payment schemes.9 These findings, like the CKD estimates above, were obtained under routine healthcare conditions and should not be interpreted as estimates of the flood-related financial burden. Rather, they show that some households requiring prolonged or intensive treatment already face healthcare-related financial pressure before the additional loss of income, assets, transport access, or other resources that may accompany a disaster.

This exposes an important limitation of relying on catastrophic health expenditure alone after a disaster. A household that misses a clinic visit, cannot replace medication, or postpones necessary treatment may spend less on healthcare than one that succeeds in maintaining care. Lower observed expenditure in such circumstances is not evidence of greater financial resilience; it may instead reflect unmet healthcare needs. Financial hardship indicators should therefore be interpreted alongside measures of unmet need and forgone care[7,11].

Nor are these pathways mutually exclusive over time. A family may initially use savings or borrow to maintain treatment, later reduce other consumption, and eventually postpone care if disruption persists. The observed outcome depends on the cost and urgency of healthcare, the duration of income loss, the financial resources available before the disaster, and the pace at which those resources can be restored.

Continuity-dependent care as an amplifier of economic vulnerability

Not all healthcare needs impose the same constraint after a disaster. Some consultations, investigations, or elective procedures can be postponed with relatively limited immediate consequences, whereas other forms of care allow much less flexibility. Dialysis, essential medications, and some time-sensitive cancer treatments depend on repeated or scheduled contact with the health system. For households relying on such care, postponement may carry greater clinical consequences and is therefore a more limited coping option.

This lack of flexibility has an economic consequence. Postponement is one way households can adjust expenditure when resources become scarce. Continuity-dependent care narrows that option. Maintaining treatment may require additional money, time, transport, or travel to an alternative provider. Delaying treatment may reduce immediate expenditure, but at the cost of greater unmet healthcare needs and potentially poorer health.

Dialysis illustrates this constraint clearly. Haemodialysis depends on functioning facilities, trained personnel, electricity, clean water, supplies, and regular patient access. Experience from previous disasters has shown that the failure of these components can interrupt treatment, close dialysis facilities, or require patients to obtain care elsewhere[15,16]. The 2025 Hat Yai flood provides a local example of these dependencies occurring together, with service suspension associated with the loss of water, electricity, telecommunications, and physical access[14].

The principle extends beyond dialysis, although the degree of time sensitivity differs across conditions. Some cancer treatments require scheduled contact with the health system, while many people with chronic disease depend on uninterrupted access to medication and monitoring. Disaster studies have repeatedly identified medication continuity as a practical problem when usual healthcare facilities, pharmacies, transport, or supply arrangements are disrupted[17]. These conditions do not require separate pathways in the framework. What they share is reduced flexibility when economic and healthcare disruption occur together.

In the proposed framework, continuity-dependent healthcare therefore acts as an amplifier rather than another stage in the main pathway. Two households may experience similar income interruption and physical damage but face different economic choices if one must also maintain frequent or non-deferrable treatment. The difference lies not simply in the cost of healthcare, but in how much flexibility the household has to postpone that expenditure when resources are constrained.

From short-term coping to longer-term household welfare loss

The economic consequences of coping may extend well beyond the acute phase of a disaster. Savings can help maintain consumption or healthcare in the short term but leave less protection against subsequent shocks. Borrowing creates future repayment obligations, while the sale or delayed replacement of productive assets may weaken earning capacity during recovery. Short-term coping can therefore preserve immediate consumption while shifting part of the economic burden into the future[1,2,4].

The longer-term consequences also depend on how recovery is financed. Drawing on accumulated savings differs from selling an income-generating asset, just as grant support differs from taking on debt that must later be repaid. Household consumption or expenditure measured during the immediate post-disaster period may therefore provide an incomplete picture of the economic adjustment that follows.

Healthcare adds another intertemporal trade-off. A household may maintain treatment during a flood by drawing on savings or borrowing and experience no

immediate interruption of care. Those resources are then less available for housing repair, livelihood restoration, or subsequent healthcare. Conversely, postponing treatment may conserve resources in the short term while increasing unmet need and, for some conditions, the risk of later clinical consequences. A single measure of healthcare expenditure or utilization cannot capture all of these adjustments.

Catastrophic health expenditure and medical impoverishment remain important indicators of healthcare-related financial burden[5,6]. They do not, however, capture every form of household welfare loss relevant after a disaster. Debt accumulation, depletion of savings, loss of productive assets, reductions in essential consumption, and forgone healthcare may matter even when a household does not cross a conventional catastrophic-expenditure threshold.

For these reasons, longer-term household welfare consequences are broader than impoverishment alone. They may include depleted assets, greater indebtedness, slower livelihood recovery, unmet healthcare needs, and reduced capacity to absorb a subsequent shock. Whether these outcomes occurred, and how they were distributed among households affected by the 2025 Hat Yai flood, remains an empirical question. Household-level longitudinal data would be particularly valuable for distinguishing temporary coping from persistent welfare loss.

Policy priorities for household and health-system resilience

The framework suggests that disaster policy should address both sides of the household constraint: the need to maintain access to essential healthcare and the need to preserve sufficient resources for households to use that care while recovering their livelihoods. This leads to three priorities, ordered by their position in the pathway: first, protect the continuity of essential care; second, provide rapid, flexible household liquidity; and third, connect health protection with livelihood recovery and social protection.

Protect continuity of essential and non-deferrable care

The first priority is to reduce healthcare disruption before it becomes an additional household economic burden. Preparedness should identify services for which even short interruptions carry substantial consequences and establish workable alternatives before a disaster occurs. This is particularly relevant for dialysis, essential medicines, and other care that depends on repeated or time-sensitive contact with the health system[15–17].

The Hat Yai experience also shows why continuity planning cannot be reduced to backup electricity. Dialysis services were disrupted by failures involving municipal water, physical access, telecommunications, and power[14]. Planning should therefore consider the set of dependencies required to deliver and reach essential care, rather than the resilience of individual facilities alone.

Provide rapid and flexible household liquidity

The second priority is to protect household liquidity during the period when income and assets have been disrupted, but essential expenditure continues. Timely financial support can increase the capacity to meet basic needs, maintain healthcare access, and begin restoring livelihoods without immediately resorting to more damaging coping strategies such as distress borrowing or the sale of productive assets[2,4].

The appropriate instrument will depend on the affected population and institutional setting. Grants, insurance payments, temporary income support, concessional credit, and debt restructuring differ in timing, eligibility, and the obligations they create for households. The relevant policy objective is therefore not simply to make finance available,

but to provide usable resources early enough to preserve household choices during recovery.

Following the 2025 Southern Thailand floods, financial-sector measures were introduced to assist borrowers affected by the disaster, while local businesses identified access to liquidity and debt relief as important needs during recovery[12]. These responses and expressed needs illustrate the importance of timely access to financial resources, although the present analysis does not assess the effectiveness of specific instruments.

Link health protection with livelihood recovery and social protection

The third priority is to connect healthcare continuity with the economic support required to make that continuity usable. Households experience a disaster as a combined shock even when institutional responses are divided among health services, social protection, employment, finance, and disaster-management systems. A patient who requires regular treatment may simultaneously face interrupted income, damaged productive assets, transport difficulties, and continuing debt or household expenditure.

This creates a practical case for linking information on continuity-dependent healthcare needs with emergency social protection and livelihood-support mechanisms, subject to appropriate safeguards for privacy and eligibility. The purpose is not to create a separate assistance system for each disease, but to recognize that households with limited flexibility in healthcare use may require different forms or timing of support.

Under this approach, health-system resilience is not measured only by whether facilities reopen or service volumes recover. For continuity-dependent care, an additional question is whether the affected households can still reach and use essential services without severe financial hardship or having to forgo care.

Conclusion

Flood disasters can affect household welfare through economic loss and healthcare disruption at the same time. When income and assets are reduced while basic needs, recovery costs, and healthcare continue to compete for limited resources, the consequences depend not only on the size of the loss but also on the household's capacity to absorb it. Continuity-dependent healthcare can further narrow the choices available by making the postponement of care a less viable coping option.

The 2025 Hat Yai flood illustrates these overlapping upstream pressures. Available evidence documents substantial disruption to livelihoods and productive assets alongside the interruption of essential healthcare services, but does not yet establish the extent of catastrophic health expenditure, forgone care, or longer-term welfare loss among affected households. These downstream consequences require household-level empirical study.

Disaster resilience therefore depends on more than restoring infrastructure and reopening health services. It also depends on whether households retain sufficient economic capacity to meet essential needs, recover their livelihoods, and continue using the necessary healthcare. Protecting that capacity should be considered part of both disaster recovery and health-system resilience.

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