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AMEE GUIDE

Building resilient health professions education in fragile contexts: AMEE guide No. 182

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ABSTRACT

Health Professions Education (HPE) cannot rely on assumptions of stability. Fragile contexts – wars, disasters, political upheaval, and systemic weakness – disrupt teaching and learning, assessment, accreditation, and the well-being of learners and faculty. This AMEE Guide provides a framework for building resilient HPE that survive crises and use them as opportunities for reform. The Guide identifies three types of fragility and explores their impact on institutions, human capital, clinical training, and social accountability. To boost resilience, the guide recommended adaptive strategies that include creating crisis management committees, implementing modular and competency-based curricula, allowing credit transfers for displaced learners, and incorporating tailored training programs. For curriculum delivery innovations range from hybrid and low-tech methods to peer-assisted approaches, diaspora involvement, and community-based services. A practical model for fair and feasible assessment in disrupted environments is suggested, with a focus on outcomes, flexibility, and cross-border recognition for rethinking accreditation and quality assurance. Systems thinking underpins the Guide, highlighting how destructive cycles such as brain drain can erode capacity, while virtuous cycles – driven by technology adoption, partnerships, and community integration – can foster recovery and growth. The guide also calls on educators, institutional leaders, and policymakers to move from reactive responses to proactive preparedness.

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1. Background

Health Professions Education (HPE) have long been built on the assumption of stability – continuous institutional operations, predictable curricular outcomes, reliable access to faculty, and structured clinical training environments. However, in fragile and complex situations, these foundational assumptions are often shattered. Fragility in HPE can be described as the chronic limitation or threat to the capacity to deliver consistent, safe, and comprehensive medical and health professions training [1]. These situations and weaknesses may include disasters, persistent conflict, political instability, socio-economic collapse, resource scarcity, and debilitated public health infrastructure. This disruption manifests across multiple dimensions: damage to infrastructure, displacement of learners and educators, collapse of regulatory systems, and interruption of teaching and clinical training – all of which pose a direct threat to the development of the health workforce and, ultimately, to population health [2–4].

The ongoing challenges faced by HPE in fragile settings require a shift in approach – from reactive methods to proactive, systems-based strategies that incorporate flexibility, inclusivity, and resilience as core features of educational institutions. Resilience should be viewed not just as an emergency response but as a fundamental design principle for 21st-century HPE.

In response, this AMEE Guide provides a comprehensive, evidence-informed framework for adapting and rebuilding resilient health professions education to thrive in fragile settings. This AMEE Guide can be used by a broad range of audiences, including educators, institutional leaders, policymakers, accreditation bodies, along with national and international stakeholders, and offers concrete guidance on upholding. Educational quality, equity, and relevance during crisis conditions. The guide synthesizes global literature, expert insights, and real-world case studies to distil practical strategies for curricular adaptation, alternative delivery methods, crisis-responsive assessment,

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Practice points

- Ensure continuity through flexible design and pre-planned emergency pathways to maintain learning in crises and align educational initiatives with community needs during instability to build responsive and resilient institutions.
- Address urgent local needs by prioritizing essential competencies and embed content like disaster medicine and conflict health directly into the curriculum and facilitate academic mobility by establishing credit-transfer systems and flexible sequencing so learners can pause and resume training without losing progress.
- Innovate delivery using available tech such as blend synchronous, asynchronous, and hybrid methods, including low-tech options and widely accessible platforms and adapt assessment for fairness and feasibility by modifying strategies to uphold standards in disrupted settings.
- Support student and faculty wellbeing by using robust communication systems to track displaced learners and offer mental-health resources, peer support, and mentorship.
- Apply systems thinking to anticipate ripple effects of fragility, identify leverage points, and design interconnected strategies that strengthen institutional resilience over time.

learner and faculty support, quality assurance, and community partnerships. Fundamentally, the Guide positions education not only as a system to be preserved, but as an instrument for health system recovery and societal healing through the application of social accountability principles and values in curriculum delivery, educational research and community services.

2. Understanding fragility in the context of health professions education

2.1. Typologies of fragility

Authors have started examining fragility, which is defined as 'the combination of exposure to risk and insufficient capacity of the state, system, and/or communities to manage, absorb, or mitigate those risks. Fragility can lead to negative outcomes, including violence, institutional breakdown, displacement, humanitarian crises, or other emergencies' [5]. In health professions education, there remains no established framework that categorizes its distinct forms. Existing literature highlights key challenges such as system breakdowns, resource shortages, and workforce instability, yet these are often described without a clear typology [6]. This limits the ability of educators and policymakers to plan targeted responses. To fill this gap, we introduce a structured typology adapted from global health and crisis response models (Figure 1). This three-part framework offers conceptual clarity and supports more responsive and resilient strategies in education systems.

2.1.1. Acute fragility

Acute fragility refers to sudden, short-term shocks that cause immediate and severe disruption to educational continuity. These include natural disasters (e.g. earthquakes, floods), pandemics, or sudden armed conflict. Such events can damage infrastructure, displace students and faculty, and sever essential communication channels. A recent example is what happened during the COVID-19 pandemic and the response made by almost all health professions education in terms of changing teaching and learning to online learning [3]. Another example is the earthquake that devastates a region, which may lead to the abrupt closure of health professions schools, forcing the establishment of temporary learning spaces or low-tech remote instruction [7]. A further example of acute fragility due to armed conflict is evident in Sudan, Ukraine, and Syria, where prolonged violence has led to the destruction of medical schools and teaching hospitals, large-scale displacement of students and faculty, interruption of clinical training, and reliance on cross-border education, emergency online platforms, and host-country institutions to sustain health professions education [8–10]. Similarly, the consequences of such acute events may manifest as delayed academic progression, gaps in clinical training, and long-term psychological impact; such results can persist for years.

2.1.2. Protracted fragility

Protracted fragility is marked by long-term or recurring crises that steadily degrade educational systems. This includes extended armed conflicts, political instability, or chronic humanitarian emergencies. Unlike acute fragility, these stressors evolve slowly and demand continuous adaptation rather than one-time emergency responses. In such settings, schools may operate under sustained threats to safety, unreliable infrastructure, and ongoing loss of faculty and resources. For instance, medical education in Sudan, Syria and Yemen has endured through years of war

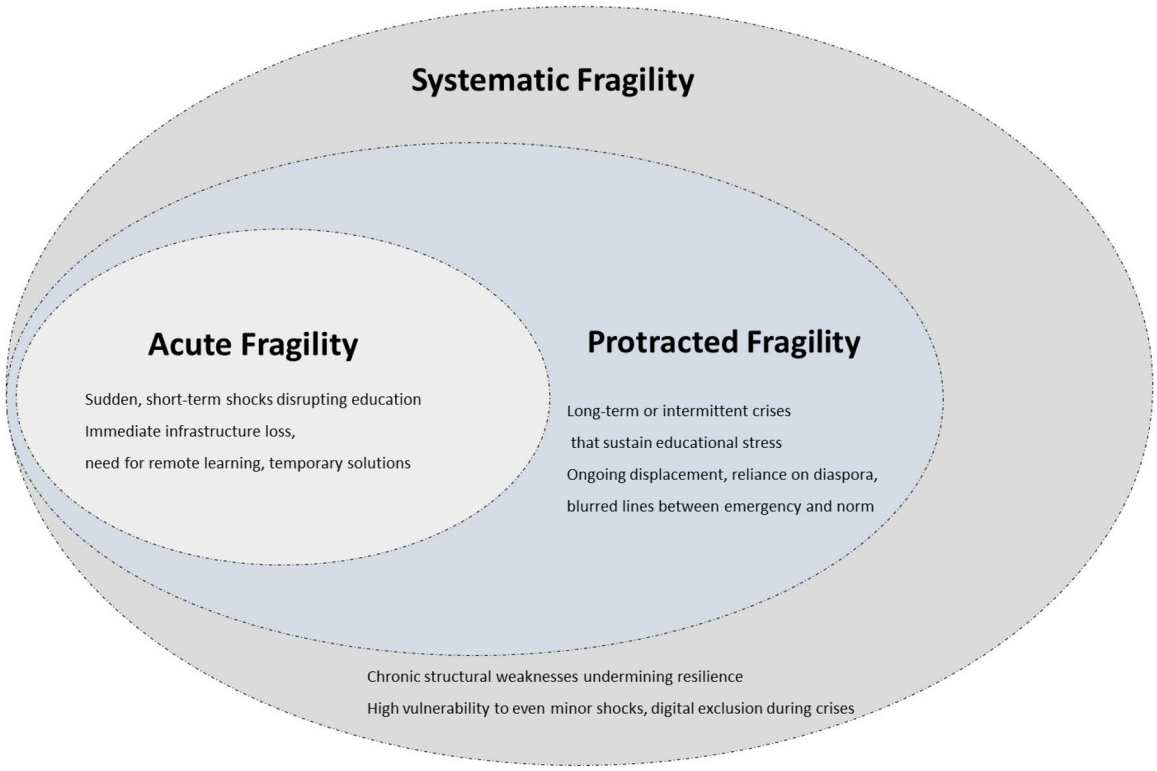

Figure 1. Typologies of fragility in health professions education.

by relying on strategies like relocating campuses, using informal learning networks, and support from diaspora educators [11–13]. The boundaries between emergency response and long-term educational planning become increasingly blurred in these environments.

2.1.3. Systemic fragility

Systemic fragility originates from deep-seated structural and cultural issues within the health professions education system. These problems include underfunding, inadequate infrastructure, poor governance, outdated curricula, and a lack of institutional readiness. In such environments, even minor external shocks can cause widespread failure. For instance, in some underdeveloped countries, medical schools without reliable electricity or internet can see all teaching activities halt during a pandemic that necessitates remote learning. Unlike sudden or prolonged fragility, systemic fragility can remain even during stable periods. Tackling it requires sustained investment in institutional capacity, faculty growth, and infrastructure improvements.

2.2. Intersections and overlaps. These forms of fragility often intersect Figure 1. In Liberia, for example, the health professions education system was already weakened by years of civil war – systemic fragility – [14] when the 2014–2015 Ebola outbreak struck – acute fragility – [18], deepening the crisis and delaying recovery. Recognizing these overlapping dynamics is essential for planning responsive and resilient educational strategies in fragile settings.

3. Understanding the impact of fragile contexts on health professions education

Crises profoundly disrupt all components of HPE – necessitating deliberate 'business continuity' strategies in fragile settings.

First, institutions may face abrupt closures, enforced relocations, or governance collapse. For example, in response to the February 2023 Türkiye–Syria earthquakes, universities in the affected regions halted in-person education, repurposed dormitories as shelters, and transitioned to remote instruction [15], while Ukrainian medical schools relocated westward or established partnerships abroad to preserve operations [9]. Governance systems are similarly stressed when administrative structures are fractured or competing authorities emerge, as occurred in Syria under parallel control zones.

Second, faculty and student displacement ('brain drain') erodes human capital. In Sudan, over 90 % of Khartoum-based students were displaced, many abroad, amid reports that approximately 60 % of students and 64 % of faculty members relocated during the conflict [16]. This exodus left profound gaps in instruction and mentorship and diminished in-country training capacity.

Third, clinical training, progression, and licensure are compromised as hospitals become overburdened, unsafe, or repurposed for emergency care.

Box 1. Summary of the impact of Fragile Contexts on HPE Systems

- **Institutional breakdown**: Conflict or disasters can cause abrupt closures, relocations, repurposing of facilities, and governance collapse – forcing remote teaching and straining accreditation (e.g. Türkiye earthquakes, Ukrainian relocations).
- **Brain drain**: Faculty and students flee instability, creating gaps in mentorship and human capital; displacement disrupts studies and often leads to permanent loss of future educators (documented during armed conflicts).
- **Clinical and licensure disruption**: Clinical rotations halted, exams postponed, and licensure delayed, undermining competency development and delaying entry into practice (documented during COVID-19 and conflict).
- **Psychological toll and community erosion**: High rates of anxiety, depression, and diminished peer support weaken student resilience and professional identity.
- **Social accountability weakens**: Disconnection from communities risks misaligned training unless institutions actively engage in emergency response again.

During COVID-19 and also in some conflicts, rotations were suspended, licensure examinations were delayed, and needed clinical exposure was reduced, raising concerns about competency and graduation delays [17,18].

Fourth, the psychological toll and erosion of the community threaten well-being and professional identity. In Sudan, many students reported anxiety, depression, or distractibility, while similar mental health burdens were observed in Syria and Ukraine [12, 19,20]. Campus closures and displacement weaken peer support and diminish engagement with healthcare communities, undermining social accountability.

In sum, fragile contexts compromise infrastructure, institutional integrity, human capital, training quality, and community cohesion. Recognizing this multidimensional impact is essential for developing curricula, teaching methods, and governance reforms that fortify HPE systems in emergencies. Subsequent sections provide tailored adaptation strategies in curriculum and pedagogy

4. Systems thinking approach

For a better understanding of the impact of the fragility context in HPE and how to better respond to each, it is essential to underscore the importance of utilising systems thinking as a framework for understanding and addressing the challenges of fragile contexts. Health professions education in these settings is characterized by complexity, interdependence, and unpredictability, where disruptions in one domain frequently cascade into others. Conventional responses, often limited to isolated problems and short-term remedies, are insufficient to capture or respond to these dynamics. Systems thinking provides a comprehensive perspective that enables educators, policymakers, and institutions to recognize interconnections, anticipate ripple effects, and identify leverage points that strengthen resilience. Beyond its analytical value, systems thinking offers a strategic orientation through which fragility can be reframed not only as a barrier but also as a catalyst for innovation, adaptation, and transformative change in health professions education.

4.1. Applying systems thinking to health professions education in fragile contexts

Systems thinking is a way of analyzing the relationships among the parts of a system in order to understand the system as a whole. One influential framework, developed by Peter Checkland [21], is particularly relevant to health professions education (HPE) in fragile contexts. It identifies five types of systems: natural systems, designed physical systems, designed abstract systems, human activity systems, and transcendental systems. Crises usually disturb all of these dimensions simultaneously.

To have a proper systems thinking approach, it is important to identify the external shocks such as crisis intensity, resource scarcity, and displacement, the response variables such as institutional adaptations, including technology adoption, partnership formation, curriculum flexibility, capacity building, community integration, and financial innovation and The outcome variables such as educational continuity, institutional resilience, graduate competency, and community health impact. The systems thinking approach necessitates the development of interconnections between those variables and the detection of the loops that works as feedback mechanisms that connect these elements over time. The final shape will be a diagram that uses different arrow styles to help policy makers interpret the system's dynamics [22].

4.2. Response to fragile context in health professions education

HPE programs should incorporate a systems-thinking approach, which recognizes fragility as a predictable situation rather than an exception. This involves designing crisis preparedness through emergency curricula, inter-institutional agreements for student relocation, and cloud backups of learning materials. Creating redundancies, such as enabling faculty to teach *via* multiple modalities, maintaining both high- and low-tech teaching tools, and diversifying clinical placements, ensures students can be redeployed if sites are affected. Preparedness also requires collaboration beyond the institution, including coordination with health systems, telecommunications, government, and communities to integrate students effectively into emergency responses, maintain

continuity during infrastructure failures, and build resilient HPE systems. A resilient HPE is robust, adaptable, and interconnected across sectors to withstand and respond to shocks.

4.3. Responses to crisis at the institutional level

In fragile settings, HPE systems face fragmentation, resource shortages, and governance breakdowns that disrupt training continuity and threaten learner and faculty safety. Establishing a dedicated Crisis Management Committee (CMC) within medical and health sciences schools supports rapid decision-making, maintains educational operations and clinical missions, and safeguards stakeholders [23]. In a scoping review, Nijokoo et al. [24] examined leading universities worldwide to explore how they maintained educational activities during situational crises. The study emphasized the critical importance of structured crisis management programs and identified their key functions, including developing planning and response frameworks, ensuring the continuity of educational operations, maintaining effective communication, and providing essential supplies and ongoing training. The review concluded that the formation of a comprehensive crisis management program is one of the most crucial elements for sustaining higher education during emergencies. The Crisis Management committee has core responsibilities outlined in Box 2. This approach parallels university crisis programs and the WHO toolkit for health-system emergency preparedness [24].

Box 2. Crisis Management Committee ToR in fragile HPE settings.

Rationale
- Resilience requires adaptive governance, multi-stakeholder coordination

Role
- Maintain educational and clinical missions
- Protect learners, faculty, and patients

Core duties
- Plan multi-scenario crisis response with activation triggers
- Coordinate internally and externally under crises
- Mobilize and reassign resources as needed
- Document activity and monitor using concrete metrics
- Debrief post-crisis and review plans annually

Structure
- Dean-led committee with academics, student-support, safety, IT, communications, and external representation

Authority
- Adjust calendars, teaching formats, and personnel deployment
- Direct reporting to academic leadership

Process
- Activate within 24 hrs; weekly meetings in crisis; monthly otherwise
- Maintain minutes, action logs, and crisis dashboards

Monitoring
- KPIs (Key performance indicators): response time, communications, attendance, qualitative feedback
- Annual reviews guided by international frameworks, including WHO

The ToR (Terms of Reference) of CMC embeds resilience-building through adaptive governance, iterative learning, and alignment with global frameworks. It draws on global examples, such as Syria's hybrid model, where local coordination units strengthened internal governance under fragmentation. Performance is tracked *via* KPIs – response time, communication frequency, student engagement, and qualitative feedback – and informs annual reviews. Institutional resilience is enhanced through training in crisis management and partnerships across stakeholders [23,24].

4.4. Social accountability of health professions schools in fragile contexts

Social accountability in health professions education refers to the obligation of institutions to orient their education, research, and service activities toward addressing the priority health needs of the communities they serve, particularly the most vulnerable [25]. In contexts of fragility, this responsibility becomes not only a moral commitment but a strategic necessity for health system survival. When healthcare infrastructure is damaged, populations are displaced, and health inequities widen, socially accountable institutions play a critical role in protecting access to care, sustaining the local health workforce, and advocating for medical neutrality and human rights. Rather than suspending their social mission during crises, health professions education institutions are called to intensify it – aligning their resources, policies, and partnerships with the urgent health needs created by conflict. Institutions must leverage their human and physical capital to support public health in times of instability, while using their influence to advocate for the protection of healthcare infrastructure and population health. This means deploying faculty, clinic facilities, and medical trainee groups to assist overstretched health systems – for example, by running free clinics or disease surveillance programs in hard-hit areas – and speaking out when hospitals and aid convoys are under threat [23,24]. This is an example of a socially accountable institute responding to community health needs. In conflict zones, attacks on medical facilities and staff are tragically common. Therefore, academic leaders have a duty to champion medical neutrality by lobbying governments and international organizations to protect access to healthcare [26]. Service and advocacy often extend beyond national borders as well. During crises in neighboring countries, health professions schools in more stable areas have sent volunteer teams to support refugee camps and underserved populations across borders. For example, when South Sudan's civil war drove refugees into Uganda, faculty and students from Ugandan medical schools

helped run mobile clinics and vaccination campaigns in border settlements – an example of cross-border social accountability in action [27].

Crises also deepen internal inequities, risking the exclusion of marginalized learners just when local health workforce is most needed. Institutional leadership entails ensuring the school itself remains inclusive and operational. Schools should adjust admissions policies to favor local applicants and underrepresented groups from affected communities (often those who are more likely to stay and serve) and provide extra support – such as stipends, housing, or devices for online learning – to help vulnerable students continue their training during disruptions. Equitable curriculum design is another key strategy: integrating case studies on displaced populations, refugee health, or epidemic ethics into teaching can sensitize all students to pressing health disparities [28,29]. By proactively maintaining opportunities for disadvantaged students and by embedding service learning into the curriculum, institutions affirm that their social mission does not stop in a crisis. Instead, their commitment to both their students and society strengthens the health system's resilience when it's needed most.

Fragility should catalyze – not derail – social accountability efforts. In other words, a crisis is precisely when a school's social mission should be most visible. This approach builds resilience in both students and the health system they serve. In Northwest Syria for example, a new medical institute responded to the crisis by prioritizing admissions for displaced students from the most affected areas [12, 30].

This targeted flexibility, aligned with social justice goals, meant that those communities would eventually have homegrown health workers. It exemplifies how social accountability principles can guide admissions and training policies during conflict. Similarly, some schools under siege have adapted by collaborating with NGOs to let students participate in delivering aid, turning learning experiences into lifelines for the community. Such measures, rooted in social accountability, ensure that even in dire circumstances, the school remains an agent of equity. The message is that every life matters, and the HPE institution stands firmly with the poorest and most vulnerable. By formally weaving these values into their crisis response (through community-engaged research, protected spots for disadvantaged students, etc.), schools uphold their end of the social contract.

Box 3. Summary: Social Contract for Health Professions Schools in Fragile Contexts

- **Responsive Curricula**: Adapt programs to include conflict medicine, outbreak response, and student-led needs assessments for real-time community impact (e.g. Haiti, Liberia).
- **Institutional Advocacy**: Use school leadership and infrastructure for health service delivery and public advocacy (e.g. Syrian deans, Turkish universities).
- **Equity in Access**: Modify admissions and provide support (devices, stipends) to include marginalized students; integrate content on vulnerable groups.
- **Impact Monitoring**: Track community engagement and outcomes using surveys or student service logs.
- **Justice Commitment**: Align admissions, activities, and partnerships with social justice frameworks to reinforce resilience and equity.

4.5. Curriculum adaptation and delivery during fragile contexts

In fragile and conflict-affected settings, medical curricula must be flexible and responsive to the context to ensure the continuity of training. Figure 2 illustrates how the curriculum could be adapted and delivered. Key adaptations include modular and competency-based structures that enable students to pause and resume their studies as conditions allow. Additionally, the inclusion of content-specific topics and context-specific modules or courses (Figure 2). Regarding curriculum delivery during fragility, it could be conducted using low-tech or non-tech methods, synchronously or asynchronously, employing social media and collaboration with regional support.

4.5.1. Curricula structural adaptation

Curricula structural adaptation offers the flexibility and resilience needed in fragile and conflict-affected settings [23]. By allowing learners to progress based on demonstrated competencies rather than rigid timelines, this model supports non-linear educational pathways – essential when students may be displaced or face intermittent access to instruction. During the Ukrainian crisis, many health professions education institutions adopted modular curricula and negotiated credit-transfer agreements, allowing students to resume their education in neighbouring countries without repeating prior learning [31]. Competency-Based Medical Education (CBME) supports adaptive progression, especially when traditional assessments or clinical placements are disrupted [32]. Such structures could enable recognition of supervised community-based service, which became a critical substitute for hospital rotations. Institutions that had already adopted modular design found it easier to recalibrate schedules or compress modules without compromising learning outcomes. In fragile contexts, modularity, flexibility, and recognition of prior learning are not only efficient – they are ethically essential [23].

4.5.2. Curricula content adaptations

Curricula content adjustments prioritise lifesaving skills – emergency care, infection control, and mental

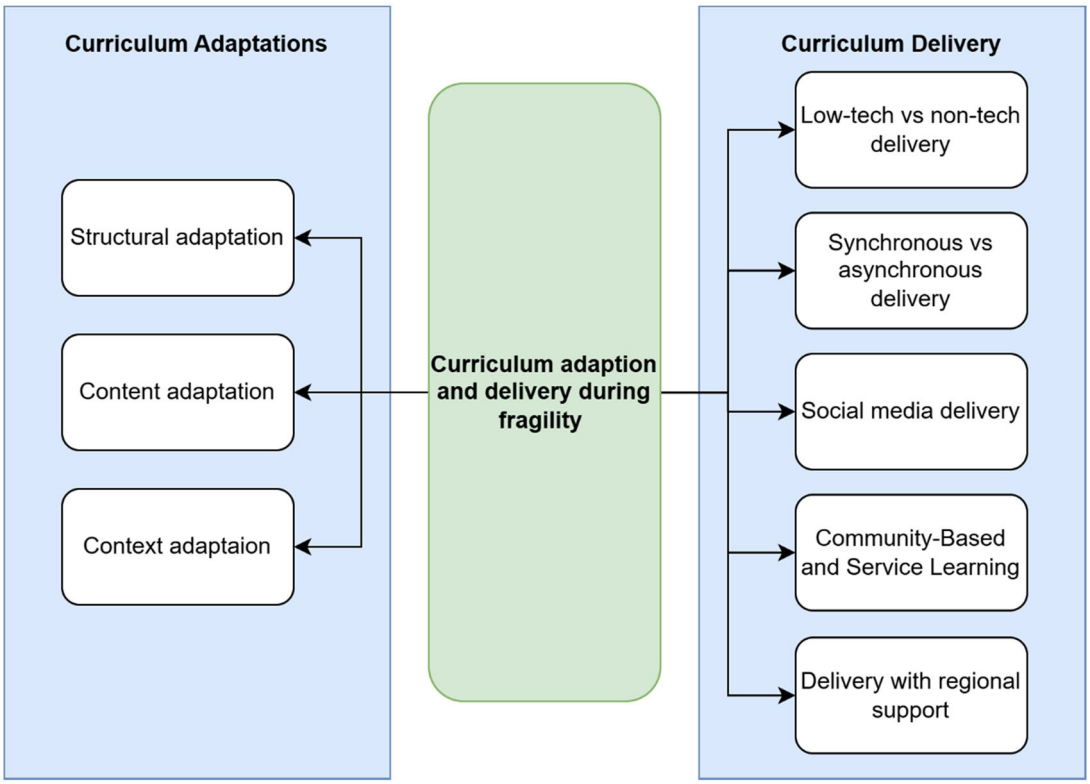

Figure 2. Curriculum adaptation and delivery during fragile context.

health first aid – while postponing less urgent content [33]. During the 2014–2016 Ebola outbreak in West Africa, several medical schools pivoted quickly to provide condensed modules on infection control through remote or small-group sessions, using WHO and MSF materials [34]. Similarly, COVID-19 forced global institutions to defer elective rotations and shift toward virtual delivery of urgent clinical content [35], such as triage protocols and respiratory care [36]. In fragile settings, repurposing research methods modules or integrating public health surveillance into the curriculum can sustain educational momentum when clinical sites are inaccessible. These adaptations align with core social accountability principles by focusing learning on population and system needs during emergencies. Though empirical evidence is limited, the positive outcomes of such shifts during COVID-19 and Ebola suggest that agile, needs-based curricular adjustments are effective and feasible under pressure.

4.5.3. Curricula context-relevant modules

Integrating modules that reflect the lived realities of learners in fragile settings enhances both educational relevance and learner motivation. Courses in Disaster Medicine, Conflict Health, or Community Engagement in Crisis equip future professionals with knowledge and skills to respond to immediate population needs. In Liberia, following the Ebola crisis, medical education reform included targeted training in outbreak preparedness and health system resilience [37]. Similarly, during Syria's war, NGOs and universities collaborated to offer crash courses in emergency surgical care, infectious disease control, and trauma management [38]. These context-relevant modules are not merely reactive – they also support long-term system transformation by anchoring medical education in local realities. This trend reflects a shift from 'curriculum importation' to 'curriculum indigenization', ensuring alignment with the social accountability agenda [29]. Where institutional capacity is limited, NGOs and regional partners can assist in content development, training, and evaluation of these targeted learning packages.

In regions affected by chronic or recurrent conflicts, the inclusion of conflict medicine in undergraduate and postgraduate curricula is increasingly recognized as a necessity rather than a luxury Fares et al. [39] argue for systematic inclusion of conflict medicine, noting that traditional medical curricula fail to prepare students for managing blast trauma, chemical injuries, and psychological trauma under austere conditions [39]. Their proposal for a structured module includes the epidemiology of war injuries, wound ballistics, mass-casualty triage, ethical issues in conflict zones, and basic surgical skills. This has been implemented at the Lebanese University in partnership with the ICRC through a 33-topic weekend course combining theoretical, operational, and practical learning. Notably, real-world clinical experience is embedded through community hospital placements treating war casualties, supporting the development of procedural and decision-making

competencies. This model stands as a replicable template for medical schools in fragile settings (see Appendix 1)

4.5.4. Low-tech and no-tech modalities. In fragile contexts, low- and no-tech solutions are often prioritized due to their inherent reliability and broad accessibility. For instance, the OxPal Medlink initiative effectively demonstrates a low-tech approach, leveraging online classroom technology and mentorship with low-bandwidth internet to facilitate remote distance-learning collaborations [40]. Similarly, medical education podcasts Cho et al. [41] offer a flexible, accessible tool that doesn't demand high-bandwidth internet. Another alternative that doesn't need internet but requires a device is the use of offline learning systems, or offline computer-based eLearning Kyaw et al. [42] delivered *via* media like CD-ROMs or USB sticks, providing presentations, videos, and educational software programs. Research even suggests that offline computer-based eLearning can be as effective as traditional methods for knowledge acquisition, and potentially better for skill development. Conversely, no-tech modalities operate entirely independent of digital infrastructure, making them crucial in the most resource-limited settings. Radio and television broadcasting, for example, are long-standing educational methods that can be the only viable option when internet access is absent [43]. Ultimately, these diverse approaches are essential for promoting equitable access to education for students in challenging environments.

4.5.4.1. Synchronous and asynchronous curricula delivery. The shift to online education is often a vital strategy for maintaining educational continuity during times of conflict and disaster. However, the selection between synchronous and asynchronous delivery modalities is heavily influenced by critical infrastructural factors, notably internet access and technological accessibility. For instance, the conflicts in Sudan and Ukraine, and the Kahramanmara earthquake in Turkey, led to the adoption of hybrid instructional methods (both synchronous and asynchronous elements). This approach offered flexibility to the students to attend live online sessions when feasible, while also providing access to recorded content for later viewing, dependent on their internet availability and personal ability [23,44]. An asynchronous e-learning program was used to sustain the healthcare educational process developed by the University of Parma in Myanmar following the instability resulting from the 2021 military coup [45]. Conversely, in regions with more stable and robust infrastructures, synchronous education has proven effective. For example, a Pediatric Advanced Life Support (PALS) course was delivered in Iraq *via* interactive teleconference, allowing real-time interaction between instructors in Florida and participants in Baghdad [40,46]. Ultimately, the choice between asynchronous and synchronous approaches, should be guided by a thorough assessment of local conditions.

4.5.4.2. Social media as learning platforms. The widespread adoption and documented use of social media platforms like YouTube, Facebook, X (formerly Twitter), WhatsApp, Telegram and WeChat make them increasingly relevant as learning tools [41,47]. Their feasibility and low-cost position them as valuable educational modalities, particularly in fragile context. In Sudan, for instance, Telegram has been effectively utilized for distributing educational materials to undergraduate students [48]. This same platform also underpinned the Sudan Emergency ECHO program, providing rapid education in emergency medicine and trauma care to healthcare workers [23]. Similarly, in Ukraine, Viber facilitated information exchange among medical students at Dnipro State Medical University [49]. Beyond crisis response, social media platforms proved instrumental during the COVID-19 pandemic, enabling the exchange of protocols and guidelines among healthcare workers [50].

Beside social media curriculum delivery, peer assisted learning fit with this context. Peer-assisted learning (PAL) offers a vital and adaptable educational strategy in fragile settings, by leveraging existing student capabilities and fostering increased student ownership of their education. Its effectiveness is illustrated by two case studies from Syrian universities: an online, peer-taught Evidence-Based Medicine course at Damascus University [51], and peer-led Basic Life Support training at Syrian Private University. Both initiatives were effective in improving students' knowledge and skills. Another example is the Aqoon program, which facilitates peer-to-peer e-learning between medical students at King's College London in the UK and students at Hargeisa and Amoud Universities in Somaliland [52]. These examples collectively underscore that PAL can deliver substantial educational improvements in challenging environments, proving to be a cost-effective and highly effective alternative to traditional methods.

4.5.4.3. Community-based education and service learning. Community-based education and service-learning approaches are crucial for preparing students to address real-world health needs, developing practical skills, and making a tangible community impact. Historically, the University of North Carolina (UNC) School of Medicine exemplified this in 1999. Following Hurricane Floyd's devastation in eastern

North Carolina, UNC medical students provided aid to affected communities. They undertook various tasks, like cleaning damaged homes, distributing essentials, and caring for stranded animals, all while meeting their learning outcomes [50,53]. More recently, Damascus University's 'Syrian Smiles' program offered dental undergraduates' outreach in Dental Public Health (DPH). This involved delivering preventive care to disadvantaged children, educating their social networks, and advocating for health promotion policies [53]. Similarly, in Ukraine, surgery residents volunteered as frontline surgeons. This not only prepared future surgeons for combat-related trauma but also provided invaluable experience for their professional development [54]. These examples demonstrate how such programs equip students with vital skills, address pressing health challenges, and crucially, foster a deep sense of social accountability in future healthcare professionals.

4.5.4.4. Regional and diaspora teaching support. Diaspora and regional academic networks are instrumental in sustaining education when local systems are disrupted [55]. Syrian, Sudanese, and Turkish academic communities have organized coordinated online lecture series aligned with national curricula, often supported by NGOs and global academic partners. These networks not only provide continuity but also help bridge capacity gaps in staffing and infrastructure. Diaspora-led teaching initiatives, offer models for scalable and sustainable external academic support in fragile contexts [23].

5. Assessment in fragile contexts

Managing students' assessment during periods of fragility is not simply important – it is essential. Assessment is the mechanism through which we safeguard our credibility as educators and ensure that our graduates are genuinely prepared to take on their responsibilities. Unlike teaching, which can often continue through online facilitation or asynchronous delivery, assessment becomes significantly more complex during fragility as there are inevitably disruptions to the stable conditions and meticulous standards we usually rely on during normal situations [56]. As a result, some degree of compromise becomes unavoidable.

Even so, compromise should not be arbitrary. It must be guided by a clear understanding of which assessment aspects can be adjusted without undermining the overall integrity of the system. To make such decisions responsibly, we turn to van der Vleuten's utility formula [57], which continues to offer one of the most practical and insightful lenses for navigating complex assessment landscapes. This formula highlights five interdependent components – validity, reliability, educational impact, cost, and acceptability – and reminds us that the relative weight of each element shifts depending on the assessment's purpose and stakes [57].

High-stakes assessments, such as graduation examinations or assessments that determine progression, demand a strong emphasis on validity and reliability. The consequences of these decisions are significant, and therefore, the evidence supporting them must be robust. In contrast, formative and low-stakes assessments prioritise educational impact. Their primary purpose is to guide learners, promote growth, and offer feedback; therefore, the strictness of validity and reliability can be moderated.

Cost and acceptability sit at the heart of implementation. When resources are plentiful, institutions can pursue sophisticated assessment methods with confidence. However, when resources are limited, decisions must be grounded in pragmatism: What can we implement well with what we have? Acceptability plays a similarly powerful role. Even the most advanced assessment tools may remain unused if assessors or learners feel unprepared or unconvinced – for instance, incorporating highly technical simulation equipment into a final OSCE may be theoretically ideal but practically unfeasible without adequate training and buy-in.

During fragile periods, these five principles become even more crucial [58] conceptualised them through the 'assessment clock', (Figure 3) placing educational impact on both vertical and horizontal axes to emphasise its centrality across all assessment approaches. Surrounding this core, the remaining principles are arranged in a clockwise sequence, allowing educators to see how their emphasis can shift as circumstances change [58].

Along the outer rim of the clock, the two levels of assessment stakes (low and high) are displayed vertically, while the two assessment conditions (normal and fragile) appear horizontally. Together, they form four quadrants: on the right, low- and high-stakes assessments in normal conditions; on the left, the same two levels of stakes under fragile conditions.

In the upper-right quadrant (normal, low-stakes), educators may lean more toward cost and acceptability considerations. Under stable conditions, they can afford to try high-cost assessment methods that offer added value. For example, advanced technologies or sophisticated simulation tools may be introduced when the purpose is assessment for learning in a formative context or when the assessment carries low stakes.

In the lower-right quadrant (normal, high-stakes), the stability of the environment enables educators to focus on maximising reliability and validity. This

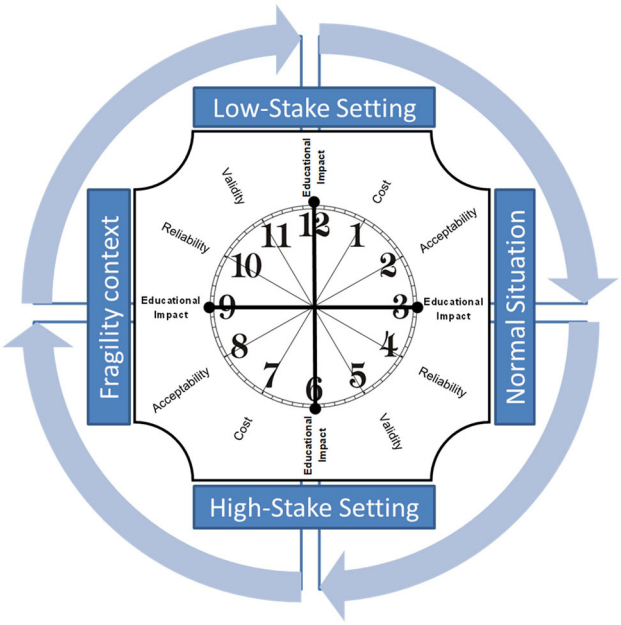

Figure 3. Assessment clock a model to prioritize students' Assessment during fragile context.

requires a rigorous assessment process involving detailed blueprinting, careful item development, examiner training, and robust standard-setting procedures to ensure fair and defensible decisions.

When the context shifts leftward into emergency conditions, priorities inevitably recalibrate. In fragile settings with low-stakes assessment, designers should emphasise formative approaches that rely on existing methods already known to have strong validity and reliability. Using well-established, high-quality tools helps generate rich, meaningful feedback that supports learning while maintaining alignment with the intended outcomes. Common strategies include open-book or take-home exams that emphasise knowledge application and reasoning over recall, written assignments and projects – portfolios, reflective essays, research tasks – that allow asynchronous progression [56].

In the fragile, high-stakes quadrant, acceptability and cost serve as immediate anchors, as feasibility takes precedence. Ensuring that the process remains safe, fair, and practically manageable becomes the central focus. Under such constraints, methods such as remote OSCEs or online structured viva voce examinations may be the most viable options for sustaining defensible decision-making [59,60].

It is worth discussing some challenges that arise when assessment takes place in fragile context. Online examinations demand robust digital infrastructure, proctoring arrangements, and technical support. However, digital divides remain a persistent challenge [61]. Universities have responded by lending laptops and Wi-Fi hotspots, offering asynchronous options, or even distributing paper-based assignments in low-resource settings [56]. In extreme circumstances, students have completed assessments while sheltering in conflict zones [12].

Remote proctoring, although widely adopted, has been controversial. Although AI-based and live-monitoring systems can mimic aspects of traditional exam hall supervision, they raise substantial concerns related to privacy, technical instability, and unequal access [62].

Alongside these logistical issues, well-being becomes a central consideration. Students and faculty often face elevated levels of stress, anxiety, and workload, prompting in some cases the need to adjust expectations or standards to maintain fairness and safeguard mental health [63]. Given the heightened importance of well-being in fragile settings – especially in relation to assessment – Wadi et al. [64] introduced the Systematic Assessment for Resilience (SAR) framework. Although designed to embed resilience within assessment during normal conditions, SAR offers practical and actionable guidance that remains highly relevant during periods of disruption [64,65]. Taken together, these approaches help buffer stress, protect equity, and uphold academic standards when educational systems are most vulnerable [58].

6. Case studies about responses to fragile contexts in health professions education

Below are case studies illustrating the resilience of Health Professions Education (HPE) in overcoming challenges posed by fragile settings.

6.1. Case Study 1: Re-building graduate medical education in Haiti Post-Earthquake

After the 2010 earthquake devastated Haiti's health infrastructure, the country faced an acute shortage of medical personnel and training opportunities. In response, a bold initiative led by the Haitian Ministry of Health and Partners In Health (PIH) established the *Hôpital Universitaire de Mirebalais* (HUM) – a 300-bed, solar-powered teaching hospital [66]. Opened in April 2013, it became the largest public health reconstruction project in Haiti and a cornerstone for rebuilding graduate medical education [4]. HUM addressed Haiti's urgent need for trained professionals by launching residency programs in five specialties. The programs followed international standards (ACGME-I), prioritized local leadership, and integrated social medicine into the curriculum. Transparent recruitment, faculty development, and a strong governance structure (HUMAD) ensured quality and sustainability [4]. By 2019, 67 physicians had graduated from HUM; nearly all remained in Haiti, with over half working

in rural communities. The hospital also served as a teaching and research site for Haitian and Harvard faculty. Its solar energy system – the largest of any hospital globally – showcased sustainable infrastructure supporting local resilience. This model shows how disaster recovery, when centered on equity, education, and local leadership, can build stronger health systems. It offers a replicable path for global settings facing similar fragility.

6.2. Case Study 2: Resilience of the faculty of Medicine, University of Gezira (FMUG), during armed conflict in Sudan

When armed conflict erupted in Sudan in April 2023, the Faculty of Medicine at the University of Gezira (FMUG) faced massive disruptions: the main campus was occupied, students and staff were displaced, and clinical training was suspended [67]. Despite these challenges, FMUG rapidly implemented adaptive strategies to sustain its educational and social accountability mission. A crisis management committee coordinated evacuations and ensured continued communication with students scattered across the country Teaching shifted to online platforms, using tools like Telegram and asynchronous modules to reach learners in unstable areas. The curriculum was reorganized into longitudinal formats and supplemented with a specialized 'War and Health' module focused on trauma care and infectious disease management [23]. FMUG also deployed mobile clinics in partnership with the Ministry of Health, providing essential care and practical training in underserved communities. Alumni and diaspora contributed by supporting telemedicine and capacity-building initiatives [23]. The institution's leadership transformed adversity into innovation, creating a flexible, resilient learning model. This experience demonstrates that medical education can not only survive war but remain responsive to societal needs – if driven by strong values, strategic planning, and community commitment. FMUG's case sets a precedent for socially accountable education in fragile settings.

6.3. Case Study 3: Curriculum delivery in medical education during an emergency (COVID-19) – University of Sharjah, United Arab Emirates

During the COVID-19 pandemic, the University of Sharjah College of Medicine implemented a structured, institution-wide response to sustain curriculum delivery and assessment. A central task force was established to oversee planning, faculty development, and the online transition. Faculty were trained in using Blackboard, Zoom, and Microsoft Teams. Teaching activities were redesigned to include e-lectures, e-PBL, virtual patient encounters, and simulation-based sessions. Weekly coordination meetings ensured curriculum consistency and quality assurance [35]. To enhance engagement in theoretical components, the college introduced online Team-Based Learning (TBL) using Blackboard Lockdown Browser, breakout rooms, and Microsoft Forms. A study conducted by [68] reported increased student confidence, motivation, and active participation through similar online TBL strategies during the pandemic [68]. Additionally, the university modeled its high-stakes summative assessment structure after the comprehensive, multi-format online exams implemented for final-year dental students at another institution [69]. These exams included MEQs, MCQs, OSCEs, and oral exams, conducted using Blackboard and MS Teams. Stakeholder feedback indicated successful execution with minimal issues and positive satisfaction levels [69]. For clinical assessment, the college launched electronic OSCEs (e-OSCEs) using Microsoft Teams. Students remained in assigned virtual rooms while faculty rotated across cases – an approach adapted from Shorbagi et al. who demonstrated high acceptance and perceived validity among both students and faculty for evaluating communication, reasoning, and history-taking skills [70]. The Medical Education Center developed and disseminated targeted manuals to guide faculty during this transition. These included a Faculty Orientation Manual for Online Teaching, an e-PBL Facilitation Guide, an Online TBL Implementation Manual [68], an e-OSCE Examiner and Simulated Patient Handbook [70], and an Assessment Quality Assurance Manual [69]. Each manual was accompanied by training sessions, video tutorials, and ongoing support to ensure consistent implementation.

7. Accreditation and quality assurance in fragile settings

7.1. Regulatory adaptations and hybrid evaluations

During crises, accreditation and quality assurance must transition from strict procedures to adaptable, context-aware methods while protecting fundamental educational goals. Accrediting bodies should prioritize outcome-based standards rather than just input metrics like facilities or patient numbers. While meeting accreditation standards may add challenges for schools in delicate situations, it remains vital to uphold standards to maintain stakeholder confidence in the educational process's integrity. Agencies should implement flexible frameworks that allow institutions to meet core requirements through

Box 4. Key strategies for maintaining accreditation and quality assurance in fragile contexts include

Relevant Regulatory Standards: Introduce temporary adjustments to input-based and process criteria while ensuring learning outcomes are validated through alternative pathways such as simulations or inter-institutional partnerships.
Hybrid Evaluation Methods: Employ virtual site visits, recorded teaching sessions, and remote interviews to sustain accreditation reviews and quality assurance during disruptions
Outcome-Focused Accreditation: Prioritize competency-based outcomes over structural metrics; apply conditional accreditation and deploy targeted OSCEs to address specific clinical training gaps.
Regional and Global Coordination: Collaborate with WFME and similar international bodies to strengthen cross-border recognition, ensuring continuity and legitimacy of qualifications during crises.
Peer QA Networks: Promote 'accreditation solidarity' through inter-institutional cooperation, including mentoring, joint audits, and shared quality improvement initiatives.

innovative solutions. Box (4) summarizes key strategies for sustaining accreditation and quality assurance in fragile settings, emphasizing the importance of understanding contextual realities, ensuring fairness, and supporting institutions with adaptable processes that sustain credibility without sacrificing educational quality.

This adaptive approach ensures that accreditation systems remain credible and trusted, while also being resilient and responsive to the realities of education in fragile and conflict-affected contexts.

8. Conclusion

Fragility in health professions education is now common in many regions worldwide. Conflicts, disasters, political upheaval, and systemic issues repeatedly threaten teaching, assessments, accreditation, and the wellbeing of learners and staff. This AMEE Guide redefines fragility not just as a challenge but as an opportunity to incorporate resilience, equity, and social accountability into HPE design. It details types of fragility and their effects on institutions, personnel, and clinical training, offering practical adaptation strategies. These include modular, competency-based curricula, low- and no-tech teaching methods, diaspora engagement, the Assessment Clock for crisis-responsive evaluation, and outcome-driven accreditation. Case studies from Haiti, Sudan, and the UAE show that even in severe disruptions, innovation and dedication can sustain educational missions. The guide stresses that resilience requires systemic action, integrating flexible curricula, blended teaching, adaptive assessment, wellbeing support, quality assurance, and stakeholder collaboration to enable HPE systems to flourish amid instability. Fragility-informed accreditation, crisis governance, and resilience metrics support sustainable development. Systems thinking reminds educators that HPE is a dynamic system with feedback loops. Unchecked, issues like brain drain can accelerate decline, but deliberate partnerships, community engagement, and adaptable curricula can foster resilience and growth. The AMEE Guide urges institutions and global communities to shift from reactive to proactive strategies. By embedding resilience, equity, accountability, and systems thinking into design, health education can produce competent, socially accountable professionals, ready to serve their communities – even in fragile, uncertain settings.

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Glossary

Assessment clock

A conceptual model that guides decision-making about assessment during crises. It prioritizes feasibility and fairness while balancing validity, reliability, acceptability, and cost.

Brain drain

The migration or displacement of skilled faculty, students, or health workers from fragile settings, which reduces institutional capacity and sustainability.

CBME (competency-based medical education)

An approach to education that emphasizes achievement of defined competencies rather than time-based progression, offering flexibility in disrupted contexts.

CMC (Crisis management Committee)

A dedicated institutional body that coordinates planning, decision-making, and continuity of education during emergencies such as conflict, disaster, or epidemics.

Diaspora engagement

The involvement of professionals living outside their country of origin in teaching, mentoring, or supporting institutions in fragile settings.

Fragility

A condition where health professions education systems are vulnerable to disruption from acute shocks (e.g. earthquakes), protracted crises (e.g. war), or systemic weaknesses (e.g. poor governance).

Low- and No-tech solutions

Educational delivery methods that require minimal or no digital infrastructure, such as radio, television, offline e-learning, or community-based teaching.

Resilience

The capacity of HPE systems to anticipate, absorb, adapt, and transform in response to crises while maintaining core functions.

Social accountability

The obligation of health professions schools to align their education, research, and service with the priority health needs of the communities they serve.

Systems thinking

An approach that examines the interconnections and feedback loops within educational systems to identify leverage points and design adaptive, resilient strategies.

ToR (Terms of Reference)

A formal description of the role, responsibilities, and processes of a committee or working group, such as a Crisis Management Committee.

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