

Submitted: 17 June 2025
Accepted: 20 November 2025
Published online: 7 July, TAPS 2026, 11(3), 52-55
<https://doi.org/10.29060/TAPS.2026-11-3/II3790>

A Malaysia-centric proposal to integrate wilderness and remote medicine into undergraduate education

Mohamad Hamim Mohamad Hanifah¹, Jubaida Paraja², Zhen Zhen Lo¹ & Fairrul Kadir¹

¹Department of Emergency Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Malaysia;

²Department of Pathology and Microbiology, Universiti Malaysia Sabah, Malaysia

I. INTRODUCTION

Wilderness and remote medicine have evolved into a recognised subspecialty addressing healthcare in resource-limited, austere, and geographically isolated settings. Globally, its relevance is growing due to environmental emergencies, adventure travel incidents, and humanitarian missions (Wilderness Medical Society, 2024). Training in this field cultivates competencies beyond conventional hospital-based education - such as trauma care in low-resource environments, environmental physiology, medical improvisation, and decision-making under delayed access to definitive care.

In Malaysia, the need is acute. The country's diverse geography - from Mount Kinabalu's high-altitude terrain to Sarawak's remote riverine communities and Peninsular Malaysia's marine zones - poses unique challenges (Wilderness and Austere Medicine Society Malaysia, 2024). Clinicians often face floods, forest injuries, marine envenomation, and logistical barriers in rural healthcare.

Despite this, undergraduate medical education remains urban-centric and hospital-focused, leaving future doctors underprepared for remote and disaster-prone environments (Malaysian Qualifications Agency, 2024). Addressing this gap through a structured wilderness and remote medicine curriculum is essential to develop a

resilient, adaptable, and globally relevant healthcare workforce capable of serving all Malaysians.

II. RATIONALE FOR INTEGRATION

Malaysia's healthcare system spans advanced urban centres to remote rainforests and coastal communities. Delivering care in rural clinics, flood zones, and mountainous terrain demands specific competencies often absent from hospital-centric undergraduate curricula. This gap leaves future doctors underprepared for real-world challenges in low-resource and disaster-prone settings.

Integrating wilderness and remote medicine directly addresses this gap. It aligns with national priorities in the Malaysian Education Blueprint and disaster risk reduction strategies, emphasising community-based care, emergency responsiveness, and public health preparedness (Malaysian Qualifications Agency, 2024). It also supports Malaysia's commitment to global and planetary health frameworks by equipping students with skills in tropical medicine, improvisational care, and disaster response.

Beyond clinical skills, the module fosters resilience, adaptability, cultural humility, and leadership - attributes essential for modern medical practice. It also opens pathways to international recognition through

certifications like Fellowship in the Academy of Wilderness Medicine (FAWM) and the National Outdoor Leadership School (NOLS) (National Outdoor Leadership School, 2024).

Importantly, wilderness medicine is inherently interprofessional. Effective care in remote settings requires collaboration among physicians, nurses, paramedics, public health officials, and rescue personnel. Early exposure to this teamwork culture prepares students for integrated healthcare systems, especially in outreach and disaster scenarios where coordination is critical.

III. GLOBAL AND REGIONAL PRECEDENTS

Wilderness medicine has matured into an established academic discipline globally, with robust training frameworks informing this proposal. The FAWM by the Wilderness Medical Society offers a modular, competency-based pathway covering essential topics including altitude illness, environmental exposure, and expedition medicine. Similarly, the United Kingdom's Royal College of Surgeons of Edinburgh has integrated these competencies through its Faculty of Remote, Rural and Humanitarian Healthcare (FRRHH), while organisations like World Extreme Medicine (WEM) (2024) and the NOLS provide additional field-based training standards recognised worldwide.

Regionally, Malaysia demonstrates growing leadership through the Wilderness and Austere Medicine Society Malaysia (WAMS Malaysia), which has successfully developed workshops and certifications tailored to local environmental challenges. This established local expertise, combined with adaptable global frameworks, provides a solid foundation for curriculum integration. The proposed model specifically emphasises interdisciplinary collaboration, engaging emergency medicine, public health, family medicine, and allied health professionals from its inception. This ensures graduates are prepared for the team-based care essential in remote settings, while the framework's modular design allows for future adaptation across Southeast Asia, where neighbouring nations face comparable geographical and healthcare challenges.

IV. CURRICULUM FRAMEWORK OVERVIEW

The proposed Wilderness and Remote Medicine module follows a three-phase structure integrated across five years of undergraduate training. It combines classroom instruction, simulation-based learning, certified practical skills, rural postings, and immersive field experiences - anchored in global standards and Malaysian realities.

A. Phase 1: Foundational Knowledge (Years 1–2)

Students are introduced to environmental physiology, jungle medicine, marine envenomation, diving emergencies, and tropical diseases. Ethics, risk management, and medicolegal aspects of remote care are taught via lectures, e-learning, and tutorials.

The assessment methods are:

- MCQs and short-answer questions embedded in pre-clinical subjects
- Group presentations and case-based discussions
- Online quizzes and reflective writing assignments

B. Phase 2: Applied Skills and Certification (Years 3–4)

Students acquire certifications in Wilderness Basic Life Support (WBLS) and Wilderness First Aid (WFA). They learn improvisational trauma care, survival skills, and point-of-care ultrasound (POCUS) applications. Training is delivered through hybrid workshops and supervised field exercises.

The assessment methods are:

- Skills checklists during workshops
- Simulation-based OSCEs (e.g., trauma improvisation, POCUS scenarios)
- Peer and instructor evaluations during team-based exercises
- Certification exams (WBLS, WFA)

C. Phase 3: Immersive Application (Year 5)

This capstone phase transitions students into real-world practice. They undertake rural health postings, humanitarian field attachments (e.g., MERCY Malaysia, WAMS Malaysia), and participate in complex field simulations.

Phase	Year	Key Components
Phase 1: Foundational Knowledge	Years 1–2	Environmental physiology, jungle medicine, marine envenomation, diving-related emergencies, tropical medicine topics, ethics and medicolegal considerations.
Phase 2: Applied Skills and Certification	Years 3–4	Certifications (WBLS, WFA), POCUS applications, survival and rescue skills, syndromic management of tropical diseases.
Phase 3: Immersive Application	Year 5	Rural health postings, humanitarian field attachments (e.g., MERCY Malaysia, WAMS Malaysia), capstone field simulations and team-based learning.

Table 1. Three-Phase Framework for Wilderness and Remote Medicine Integration

The capstone Phase 3 is designed to transition students from simulated environments to real-world application. This phase would be conducted through structured partnerships with existing rural health clinics (e.g., Klinik Kesihatan in rural Sabah and Sarawak), humanitarian organisations (MERCY Malaysia, WAMS Malaysia), and national agencies (e.g., the Fire and Rescue Department of Malaysia (BOMBA) and the Department of Orang Asli Development (JAKOA)).

Vital resources for Phase 3 include:

- Partnership Agreements: Formal MoUs with rural clinics and NGOs to define supervision and roles.
- Trained Field Preceptors: Oriented via a dedicated ‘train-the-trainer’ program.
- Reflective Learning Framework: Guided debriefings and structured logbooks to foster resilience.
- Safety Infrastructure: SOPs, risk assessments, satellite communication tools, and insurance coverage.

The assessment methods are:

- Remote-context OSCEs (e.g., managing envenomation, altitude illness)
- Structured logbooks reviewed by field preceptors
- Reflective portfolios on ethical dilemmas and team dynamics
- Capstone simulation evaluations (disaster response, rescue missions)
- Preceptor feedback and peer review using standardised rubrics

V. ANTICIPATED CHALLENGES AND SOLUTIONS

Integrating wilderness and remote medicine into Malaysia’s undergraduate curriculum presents several challenges: curriculum overload, limited faculty expertise, logistical complexities of field components, and the need for valid assessment tools.

To mitigate curriculum overload, a modular and elective-based approach can be adopted initially. Phase 1 topics may be embedded into existing pre-clinical subjects, while Phases 2 and 3 can begin as selective postings or Special Study Modules (SSMs), allowing gradual scaling.

A robust Faculty Development (FD) programmed is essential to build teaching capacity:

- Train-the-Trainer Certification: Conducted with WMS, NOLS, and WAMS Malaysia to certify instructors in wilderness-specific pedagogy, simulation facilitation, and field safety.
- Interprofessional Engagement: Involving educators from emergency medicine, family medicine, public health, surgery, and allied health to reflect the collaborative nature of wilderness medicine.
- Curriculum Co-Creation: FD workshops serve as platforms to adapt global content to Malaysian contexts, ensuring cultural and environmental relevance.
- Simulation and Field Instruction Training: Faculty are trained in designing high-fidelity simulations and supervising immersive field activities.
- Continuous Professional Development (CPD): Supported through annual retreats, online modules, and inter-institutional teaching exchanges.

Nationwide implementation may be phased. Initial pilots can be launched in institutions with strong emergency or rural health programs, community partnerships, or proximity to relevant environments (e.g., East Malaysia). A national consortium of medical schools can facilitate resource sharing, simulation scenarios, and faculty expertise, ensuring standardisation and reducing institutional burden.

Strategic engagement with stakeholders - Ministry of Higher Education (MOHE), MQA, and medical school deans - is essential to formally recognise wilderness

medicine as a core competency. This structured rollout ensures feasibility, sustainability, and alignment with national health and education goals.

VI. CONCLUSION

Integrating wilderness and remote medicine into Malaysia's undergraduate curriculum is timely and aligned with national health priorities, educational reforms, and global best practices. As Malaysia faces increasing public health challenges in remote and disaster-prone areas, equipping future doctors with relevant competencies is essential for national health resilience.

The proposed three-phase framework responds to Malaysia's unique healthcare needs while aligning with international standards from FAWM, WEM, and NOLS. It also leverages local expertise through WAMS Malaysia, ensuring contextual relevance.

Importantly, the framework promotes interdisciplinary collaboration - engaging emergency medicine, family medicine, public health, and allied health professionals. This prepares students for integrated, team-based care essential in remote and austere environments.

While Malaysia is the primary focus, the framework is scalable to other Southeast Asian nations with similar geographic and healthcare challenges, such as Indonesia, the Philippines, and Thailand. Its modular design and emphasis on local adaptation make it a viable blueprint for regional implementation.

Long-term sustainability is achievable through embedding foundational knowledge into core curricula and leveraging partnerships with national agencies and humanitarian organisations. By pioneering this integration, Malaysia is poised not only to enhance its own healthcare resilience but also to emerge as a definitive regional leader in wilderness and austere medicine education.

Notes on Contributors

Mohamad Hamim Mohamad Hanifah conceptualised the curriculum framework, integrated global and local elements, and drafted the manuscript. He ensured alignment with national and international standards in wilderness medicine education.

Jubaida Paraja critically reviewed the manuscript and provided expertise on tropical medicine.

Zhen Zhen Lo critically reviewed the manuscript, contributed to refining the final structure, and provided expertise on POCUS module.

Fairrul Kadir critically reviewed the manuscript, contributed to refining the final structure, and provided expertise on field-based applications relevant to Malaysian contexts.

Ethical Approval

This article does not involve human subjects or identifiable data requiring ethical approval.

Acknowledgement

The authors would like to thank colleagues and mentors who have provided valuable feedback and support in refining this manuscript.

Funding

No external funding was received for the preparation of this manuscript.

Declaration of Interest

The authors declare no conflicts of interest related to this work.

References

-
- Malaysian Qualifications Agency. (2024). *Programme standards: Medical and health sciences*. Malaysian Qualifications Agency. <https://www.mqa.gov.my>
- National Outdoor Leadership School. (2024). *Wilderness medicine courses*. NOLS. <https://www.nols.edu/en/courses/wilderness-medicine>
- Wilderness and Austere Medicine Society Malaysia. (2024). *Wilderness medicine programs in Malaysia*. WAMS Malaysia. <https://www.wamsmalaysia.com/>
- Wilderness Medical Society. (2024). *Fellowship in the Academy of Wilderness Medicine (FAWM)*. Wilderness Medical Society. <https://wms.org/fawm>
- World Extreme Medicine. (2024). *Extreme medicine conferences and training*. World Extreme Medicine. <https://worldextrememedicine.com>
-

*Assoc. Prof. Dr. Mohamad Hamim Mohamad Hanifah
Faculty of Medicine and Health Sciences,
Universiti Malaysia Sabah,
88400 Kota Kinabalu, Sabah, Malaysia
+60128951525
Email: hamim@ums.edu.my