Supplementary File 1

Intervention and implementation manual for the Sierra Leone Advanced FETP pilot

Version 1.4 - 17 August 2026

Companion to: Implementing a competency-based Advanced Field Epidemiology Training Programme in Sierra Leone: protocol for a mixed-methods pilot evaluation

1. Purpose, users and status

This manual specifies what the pilot programme must deliver, who is accountable, what can be adapted and what evidence confirms fidelity. It serves programme leadership, residents, faculty, mentors, supervisors, assessors, field sites, the Independent Research and Evaluation Team (IRET), safeguarding personnel and governance committees. It is a prospective pilot specification rather than proof of feasibility, accreditation or effectiveness.

2. Non-negotiable design principles

- Field service organizes learning; classroom, virtual and simulated work support but do not replace authentic performance.
- Programme duration is 24 months, with no less than 21 months and 68 qualifying supervised field-practice weeks.
- Graduation requires demonstrated competence, complete critical evidence, resident ownership and an authorized panel decision.
- Outbreak investigation, research/thesis or dissertation, and manuscript development/publication are separate visible requirements.
- Critical technical, ethical, safety or integrity failures cannot pass through averaging across unrelated strengths.
- Country laws, systems, hazards, examples, software and language may change without removing universal outcomes or field-product standards.
- Research participation remains separate from academic assessment and employment.
- Every adaptation, exception, remediation and graduation decision leaves an auditable record.
- Programme workload, mentor capacity, publication demands and external disruption receive continuous monitoring. Corrective action protects core functions without lowering safety, integrity or competency standards.

3. Prelaunch gates

Gate	Required evidence before launch
G1 Ethics and authorization	Written SLESRC determination and NPHA authorization for the evaluation; defined approval routes for resident projects.
G2 Public registration	Prospective registration of the protocol and a version-controlled repository before resident enrolment.
G3 Financing	Committed core programme and evaluation resources for the first 12 months and an approved continuity plan.
G4 Governance	Approved terms of reference for steering, programme, assessment, research/thesis, independent research/evaluation and safeguarding functions; documented conflict rules and reporting lines.
G5 Field sites	Eight sites meet all critical readiness criteria and at least 80% of scored criteria.
G6 People and roles	Programme staff, mentors, supervisors, assessors, examiners and specialist referral pathways are assigned and prepared.
G7 Resident/host agreements	Protected time, deployment, data access, research, publication, supervision, safety and intellectual-contribution arrangements are signed.
G8 Systems	Learning, portfolio, independent fidelity measurement, research data, security, cost, safeguarding, appeals and low-bandwidth systems pass prelaunch testing.

4. Governance and decision rights

Body/role	Decision and accountability
NPHA executive sponsor	Institutional authority, alignment, resource escalation and final scale-up decision.
Steering committee	Quarterly strategic oversight, partner alignment, financing, sustainability and response to red risks.
Programme management team	Daily delivery, resident support, site coordination, schedules, records and corrective actions.
Assessment committee	Assessor calibration, progression, remediation, appeals and graduation recommendations.
Research/thesis committee	Supervisor assignment, proposal review, ethics/data-governance routing, examination and research quality.
Independent Research and Evaluation Team	Research consent; independent fidelity extraction, verification and adjudication; research data management and locking; quantitative, qualitative, mixed-methods and economic analysis; interpretation and dissemination. No teaching, mentoring, assessment, examination or progression vote.
Independent safeguarding function	Confidential reporting, immediate protection, independent safety and integrity review, non-retaliation checks and escalation to required authorities.

Body/role	Decision and accountability
Field-site leadership	Access, supervision, field opportunities, safety, management response and local corrective action.
Resident representatives	Structured feedback, equity and workload concerns; no access to confidential individual assessment or research records.

5. Participants and entry readiness

The planned cohort comprises 15 residents. National selection criteria should permit human, animal, environmental, laboratory, data, clinical and other relevant public health professionals. Entry requires relevant experience, baseline descriptive epidemiology and communication capability, employer support, protected time, deployment authorization, an eligible placement and access to secure computing. A diagnostic assessment guides bridging support in epidemiology, statistics, computing, scientific writing or language.

The 15 residents constitute the complete first implementation cohort. The pilot estimates large delivery successes or failures and tests the programme system across eight sites, mentors, supervisors, committees and support functions; it is not powered for modest effects or stable resident subgroup comparisons.

Programme admission and research consent are separate. The programme must not deny academic support, field opportunity or employment benefit because a resident declines interviews or surveys.

6. Field-site accreditation

Criterion	Minimum evidence	Classification
Institutional mandate	Site performs surveillance, response, programme, laboratory, data or One Health functions relevant to Advanced field epidemiology.	Critical
Field opportunities	Site can provide routine surveillance work and access to authentic investigations, evaluations or rotations.	Critical
Named supervision	A qualified workplace supervisor accepts written responsibilities and protected contact time.	Critical
Data access and governance	Site can authorize resident access to appropriate data under approved privacy, security and sharing arrangements.	Critical
Decision-maker access	Residents can present findings and obtain documented management response or follow-up.	Critical
Safety and safeguarding	Risk assessment, field safety, incident reporting, non-retaliation and wellbeing procedures operate.	Critical
Research feasibility	Site supports research/thesis access, permissions and protected implementation time.	Scored
Laboratory and specialist linkage	Site can connect residents to necessary laboratory, GIS, informatics, One Health or other specialists.	Scored
Digital and physical infrastructure	Secure computing, data storage, connectivity or workable offline alternatives exist.	Scored
Equitable opportunity	Site allocates outbreak, leadership, publication and research opportunities transparently.	Critical
Operational support	Travel, communication, printing, specimen or field resources can be mobilized when required.	Scored
Quality participation	Site accepts monitoring, feedback, adaptation logging and accreditation renewal.	Critical

Decision rule: every critical criterion must pass. Scored criteria use 0 = absent, 1 = partial and 2 = ready; a site requires at least 80% of the available scored points. Conditional accreditation requires a dated corrective plan completed before placement. Accreditation is reviewed at months 12 and 24 and after a serious event.

7. Core intervention components

Component	Specification	Accountability	Timing	Fidelity evidence
Programme duration and field intensity	Twenty-four months; no less than 21 months and 68 weeks of qualifying supervised field practice; target approximately 75% field service.	Programme director; field-site supervisors	Month 0–24	Calendar, placement records and field-week log
Competency-based instruction	Seventeen modules, 102 terminal outcomes, 70 facilitated three-hour sessions, 36 practical exercises and low-bandwidth alternatives.	Core and specialist faculty	Month 1–22	Session register, learning-platform record and exercise archive
Mentorship and workplace supervision	Named technical mentor and workplace supervisor; mentor caseload normally no more than four residents; monthly technical contact and quarterly documented review.	Mentors; workplace supervisors; programme faculty	Month 0–24	Learning agreement, contact log and feedback record
Authentic portfolio assessment	Eight field-product categories, common four-point rubrics, direct observation, documented resident ownership, oral defence and non-compensatory critical criteria.	Calibrated assessors; assessment committee	Month 1–24	Portfolio system, rubric decisions and progression minutes

Component	Specification	Accountability	Timing	Fidelity evidence
Outbreak investigation deliverable	Two distinct authentic outbreak or urgent field investigations per resident; resident leads at least one analytic investigation through response action and after-action learning.	Resident; outbreak lead; mentor; assessor	Opportunity-dependent, Month 3–23	Role statement, protocols, analyses, reports, communication products and after-action review
Research and thesis/dissertation	Concept and supervision in year 1; approved protocol and governance route by Month 12; implementation, analysis, writing, examination and defence occupy most of year 2.	Resident; research supervisor; thesis committee	Month 5–24	Milestone register, protocol, data/code, thesis/dissertation, examination and corrections
Publication and dissemination	Two accepted or published internal or national-channel articles from distinct field products; one lead-author peer-reviewed manuscript; one policy brief; one scientific presentation.	Resident; publication mentor; editorial focal point	Month 8–24; follow-up to Month 30	Editorial correspondence, retrievable outputs, submission record and presentation evidence
Progression, remediation and graduation	Formal reviews at Months 6, 12, 18 and 24; documented recovery plans; final panel decision based on complete evidence, integrity and resident ownership.	Progression and graduation committee	Months 6, 12, 18 and 24	Review forms, remediation plans, appeal record and final decision

8. Twenty-four-month resident pathway

Period	Planned emphasis
Months 0-3	Orientation, diagnostic bridging, foundations, systems, surveillance, data workflows, field-site learning agreement and first assignment.
Months 4-6	Outbreak and study methods, initial authentic investigation opportunity, concept note, supervision agreement and progression review 1.
Months 7-12	Advanced methods, laboratory/GIS/informatics, evidence synthesis, full research protocol, ethics/data-governance authorization, protocol defence and progression review 2.
Months 13-16	Protected research implementation, surveillance/response service, programme evaluation, One Health/preparedness work and internal publication development.
Months 17-19	Primary analysis, results seminar, second investigation opportunity, leadership and policy translation, and progression review 3.
Months 20-22	Thesis/dissertation drafting, peer-reviewed manuscript, two internal/national articles, policy brief, presentation and portfolio completion.
Months 23-24	Independent examination, oral defence, corrections, final products, graduation review, repository deposit and editorial follow-up agreement.
Months 25-30	Peer-review and publication follow-up, recommendation uptake verification, graduate deployment and sustainability assessment.

9. Field-product requirements

Code	Product	Minimum evidence
FP1	Surveillance or public health intelligence product	Evaluation, redesign or integration of a real surveillance/intelligence system, with analysis, stakeholder consultation, management response and an implementation plan.
FP2	Led outbreak investigation and response	Evidence from two distinct authentic outbreak or urgent field investigations; the resident leads at least one analytic investigation through recommendations, communication and after-action learning.
FP3	Applied study or programme evaluation	Approved protocol, ethics/data-governance determination, field implementation, analysis and decision-oriented report for an applied study, programme evaluation or implementation study.
FP4	Reproducible analytics and spatial portfolio	Documented data workflow, data dictionary, code, outputs and at least one advanced statistical, temporal, spatial or modelling application with an oral defence.
FP5	Informatics and responsible artificial-intelligence appraisal	Information-system assessment or requirements specification plus an algorithmic impact, local validation, procurement or governance appraisal when relevant.
FP6	Preparedness, One Health or improvement project	Preparedness assessment or exercise, One Health/environmental project, implementation improvement or quality-improvement work with follow-up.
FP7	Manuscript development, publication and dissemination	Two accepted or published internal/national-channel articles from distinct field products; one lead-author peer-reviewed manuscript; one policy/decision brief; and one scientific presentation.
FP8	Teaching, mentorship and leadership portfolio	Observed teaching, documented mentorship, project/leadership evidence, multi-source feedback and a reflective improvement plan.

A single complex project may contribute to more than one category only when assessors record separate decisions and the evidence meets each category. Every submitted product must include a resident-contribution statement, source-data/code location where relevant, ethics/data-governance evidence, stakeholder feedback and a version history.

10. FP2 outbreak investigation operating rule

- The programme tracks outbreak opportunity, not only completed reports. A resident must receive two distinct authentic investigation opportunities or a programme-led corrective placement.

- At least one investigation must permit resident analytic leadership. Leadership evidence includes role assignment, team coordination, methods, interpretation, control advice, communication and after-action learning.
- The two investigations may differ in agent or setting, but each must involve an authentic signal, event or urgent field problem and a real decision pathway.
- Required evidence includes verification or trigger record, objectives/protocol, case definition or analytic frame, data-management and analysis evidence, recommendations, communication product, final report or outbreak manuscript, stakeholder verification and reflection.
- A simulation, classroom case or retrospective reanalysis cannot satisfy the authentic-investigation count. It may support remediation of a specific skill.
- When national outbreak incidence is insufficient, the programme may use a documented regional deployment, urgent cluster investigation, vaccine-safety event, environmental/occupational event, humanitarian assessment or another qualifying public health event.

11. Research, thesis/dissertation and publication pathway

Code	Target	Milestone	Minimum evidence
R1	Month 5	Priority problem and concept note	Question, public health value, feasibility, initial design and named institutional user.
R2	Month 6	Supervision and field agreement	Research supervisor, field mentor, access plan, protected time, conflict and initial authorship discussion.
R3	Month 8	Evidence synthesis and framework	Reproducible search record, critical synthesis, gap statement and conceptual or causal framework.
R4	Month 10	Full protocol and statistical analysis plan	Objectives, design, variables, sampling, bias control, analysis, dissemination, timeline and budget.
R5	Month 12	Ethics and data-governance authorization	Written approval, waiver or classification; data-access, security, sharing, retention and incident plan.
R6	Month 12	Protocol defence	Multidisciplinary panel approval before field implementation.
R7	Month 15	Implementation and data-quality review	Progress, deviations, quality indicators, safety, corrective action and continued feasibility.
R8	Month 18	Reproducible primary analysis review	Locked dictionary, code, planned analyses, diagnostics, sensitivity work and interpretation log.
R9	Month 19	Results and interpretation seminar	Findings, limitations, equity, stakeholder interpretation and decision implications.
R10	Month 21	Complete thesis/dissertation draft	Full monograph, publication-based dissertation or integrated field-epidemiology thesis.
R11	Month 22	Peer-reviewed manuscript and policy package	Lead-author manuscript, reporting checklist, journal screen, policy brief and submission plan.
R12	Month 23	Independent examination and oral defence	Examiner reports, defence decision and corrections list.
R13	Month 24	Final approval, repository and publication handover	Corrections completed, final deposit, authorship confirmation and post-graduation editorial follow-up.

Accepted thesis formats are a conventional monograph, a publication-based dissertation or an integrated field-epidemiology thesis. The academic partner determines formatting and examination rules, but the pilot preserves the milestones, reproducible analysis, independent examination, oral defence and correction requirement.

Internal or national publication means an output accepted through a named editorial process and retrievable through a ministry, NPHA, programme, surveillance, epidemiology or institutional channel. Two items must arise from distinct field products. A slide deck, unreviewed memo, social-media post or conference abstract alone does not count. The peer-reviewed journal must pass legitimacy screening. Predatory or deceptive journals do not satisfy FP7.

The editorial-delay safeguard applies only after the resident produces a complete lead-author manuscript, passes independent technical and reporting-checklist review, submits to a legitimate journal and records editorial correspondence. The graduation committee may accept this evidence when journal processing sits outside the resident's control. The resident remains responsible for revisions or resubmission through month 30.

Workload and continuity safeguards

Protected time, a usual mentor caseload of no more than four residents, quarterly workload review, Year-2 research and writing time, specialist referral and substitute mentor cover are part of programme delivery. When public health emergencies, security events, connectivity failures, financing interruption or site loss disrupt delivery, the programme may use safe alternative placement, offline materials, deferred secure upload, temporary interruption or an approved completion window. Every action enters the continuity and adaptation record.

12. Mentorship, supervision and specialist support

Role	Minimum function
Technical mentor	Monthly technical contact, reasoning and product feedback, learning plan, career development and escalation. Usual caseload no more than four residents.
Workplace supervisor	Operational access, service priorities, safety, daily performance, protected time and verification of resident contribution.

Role	Minimum function
Research supervisor	Question, design, ethics route, analysis, thesis writing, examination preparation and publication quality.
Publication mentor/editorial focal point	Internal channels, journal screen, authorship, reporting checklist, submission, revision and output tracking.
Faculty/specialist	Targeted teaching and consultation in methods, GIS, informatics, laboratory/genomics, One Health, economics, ethics, communication or other need.
Assessor/examiner	Independent judgment against rubrics; no use of mentoring relationship to lower standards; conflict declaration and calibration.

13. Progression, remediation and graduation

Formal reviews occur at months 6, 12, 18 and 24. Each review considers field weeks, opportunity, outcomes, products, research milestones, publication, professional practice, safety, integrity and resident support. Decisions are progress, progress with actions, remediation, interruption or exit. Remediation states the gap, support, evidence required, responsible person, due date, reassessment method and appeal route.

- Month 6: orientation complete, field agreement active, first products underway, research concept and supervision confirmed.
- Month 12: required year-1 outcomes assessed, research protocol defended and ethics/data-governance route complete or an approved recovery deadline exists.
- Month 18: year-2 field exposure and research implementation are viable, primary analysis is near completion, outbreak and publication pathways remain recoverable.
- Month 24: programme duration and field weeks complete, all eight product categories pass, thesis/dissertation passes after corrections, FP7 evidence is complete, critical integrity/safety requirements are met and the final panel approves graduation.

14. Implementation strategies

ID	Strategy	Actor	Action	Dose/timing	Evidence
IS01	Assess readiness and barriers	Programme implementation team	Governance, finance, faculty, field sites, data access, safety, digital access and resident support	Pre-launch Months −3 to 0; repeat Month 12	Completed readiness matrix and action plan
IS02	Establish governance and coalitions	NPHA and programme director	National steering, assessment, research/thesis, independent research/evaluation and safeguarding structures, plus resident representation	Pre-launch; quarterly	Terms of reference, attendance and decision log
IS03	Accredit and prepare field sites	Programme faculty and quality team	Eight field sites assessed against critical and scored eligibility criteria; gaps corrected before placement	Pre-launch; annual renewal	Site accreditation decision and corrective-action record
IS04	Prepare mentors, supervisors, faculty and assessors	Programme faculty leads	Role-specific training, calibration cases, feedback skills, learner support, ethics, equity and escalation procedures	Before cohort; refresh Months 6, 12 and 18	Completion register and calibration results
IS05	Create protected-time and access agreements	Programme director and host institutions	Resident field time, data permissions, outbreak deployment, research access, publication rights and supervisor responsibilities	Before enrolment; reviewed Month 6 and 12	Signed agreements and exception log
IS06	Provide central technical assistance	Programme hub and specialist network	Epidemiology, statistics, GIS, informatics, laboratory/genomics, One Health, ethics, communication, economics and writing consultation	Throughout; request-based and scheduled	Consultation log and response time
IS07	Use blended and low-bandwidth delivery	Faculty and digital-learning coordinator	In-person blocks, synchronous virtual sessions, self-paced preparation, ECHO case discussions, printed/offline packs and deferred secure upload	Throughout	Dose delivered, connection failures and alternative used
IS08	Audit and provide feedback	Independent Research and Evaluation Team	Extract and independently verify fidelity evidence; lock quarterly datasets; issue dashboards covering fidelity, field exposure, mentorship, products, research, publication, equity, cost and risks	Quarterly	I07 fidelity package, signed data lock, dashboard, programme factual response and closed-action record
IS09	Facilitate remediation and learner support	Programme director, mentors and safeguarding focal point	Early identification, written recovery plan, additional coaching, reassessment, wellbeing support and appeal route	Triggered; reviewed monthly until closure	Remediation record and outcome
IS10	Track and govern adaptations	Programme adaptation focal point; IRET verifier	Programme records each change; IRET verifies timing, rationale, level, core-function preservation and observed consequence	At each change; quarterly synthesis	FRAME/FRAME-IS adaptation log
IS11	Track resources and costs	Finance officer and IRET health economist	Time-driven activity-based costing of implementation strategies and programme delivery; research-only costs separated	Monthly; quarterly reconciliation	Resource-use log and cost ledger
IS12	Plan sustainability and scale-up	Steering committee and NPHA leadership	Domestic financing, local faculty, mentor pipeline, institutional placement, curriculum maintenance, data systems and graduate deployment	From Month 12; formal Month 24 and 30	Sustainability plan and scale-up decision

15. Resource requirements

Resource area	Minimum requirement
Governance	Programme steering committee; assessment committee; research/thesis committee; independent research/evaluation team; independent safeguarding function; resident representation; documented conflicts, appeals and version control.
Core staffing for 15 residents	Programme director (approximately 0.5 full-time equivalent), programme coordinator (1.0), monitoring/data officer (0.5), research/thesis coordinator (0.4), publication/editorial support (0.2), digital-learning support (0.3), and combined core epidemiology faculty capacity of at least 1.5 full-time equivalents. Final staffing follows workload analysis.
Mentorship and supervision	At least four prepared technical mentors for a usual maximum caseload of four residents, plus contingency cover; one accountable workplace supervisor at each of eight sites; access to substitute mentors and escalation support.
Specialist access	Biostatistics, GIS, informatics, laboratory/genomics, One Health/environment, emergency management, implementation/evaluation, economics, ethics, communication and qualitative research.
Assessment	At least six calibrated assessors; two independent examiners for each thesis/dissertation; secure portfolio platform; rubrics, calibration cases, appeals and double-rating plan.
Digital and analytic infrastructure	Secure laptops, encrypted storage, power backup, internet and offline alternatives; R or another auditable analytic environment; QGIS or equivalent; secure survey/database platform; learning and ECHO platform.
Field and laboratory operations	Travel, accommodation, communications, personal protective equipment, specimen and laboratory pathways, printing, field allowances under national policy and emergency-deployment arrangements.
Research and publication	Library and literature access, ethics and data-governance support, transcription/translation where approved, thesis examination, internal editorial channels, legitimate-journal screening and publication/dissemination resources.
Research systems and costing	Secure survey and fidelity database, source-evidence register, two-reviewer verification and adjudication logs, data-quality audits, qualitative capacity, transcription, version-controlled analysis, cost tracking and dissemination resources.
Learner protection	Orientation, reasonable accommodation, wellbeing referral, confidential reporting, non-retaliation, workload monitoring, remediation, grievance and appeal procedures.
Independent research and evaluation	A conflict-screened research lead, fidelity/quantitative analyst, qualitative lead and interviewers, data manager and health economist. No member teaches, mentors, supervises, assesses, examines or votes on progression. The team controls consent, research collection, fidelity scoring, source verification, data locks, analysis and reporting.
Financial continuity	Committed first-year core resources before launch; second-year financing plan; contingency reserve; separation of programme delivery from research-only costs; domestic financing and sustainability plan.

Staffing fractions are planning assumptions for a 15-resident cohort and require workload validation. The programme cannot launch when financing, supervision, site safety or research governance falls below a critical gate.

16. Fidelity framework

Definition and dimensions

Implementation fidelity is the extent to which the Advanced FETP intervention and its implementation strategies are delivered, received and documented as specified in the version-controlled protocol while approved adaptations preserve core functions [33,43]. The framework examines adherence to content and core functions, dose and timeliness, reach and coverage, quality of delivery, participant responsiveness, programme differentiation and fidelity-preserving adaptation. Not every component contributes to every dimension; Supplementary File 2 and the workbook map each component to its relevant dimension, unit, numerator, denominator, evidence and timing.

Independent measurement procedure

1. 1. Programme record owners submit the prespecified source documents or secure system extracts to the IRET within ten working days after each quarter.
2. 2. The IRET data manager registers each source with a unique evidence identifier and checks completeness, dates, version and access restrictions.
3. 3. A trained fidelity reviewer uses Instrument I07 to record whether each component is due and applicable, its numerator and denominator, evidence identifiers, adaptation link, data-quality issue and provisional status.
4. 4. A second IRET reviewer independently verifies every component. Critical components require an official primary source and, when available, corroborating evidence; self-report alone cannot establish a critical component.
5. 5. Reviewers resolve differences through source review. A third IRET adjudicator decides unresolved cases and records the rationale. Programme staff may correct factual extraction errors during a five-working-day query period but do not score components.

6. 6. The IRET classifies each component as met, partial, not met, unknown, not due or not applicable. Partial and unknown count as not met in the primary score. Not-due items are excluded; not-applicable status requires written IRET approval and rationale.
7. 7. The IRET lead signs and locks the quarterly dataset. Later corrections create a new version and preserve the prior value, reason, approver and date. Dashboards report component status, critical failures, adaptations and corrective actions without changing the locked score.

ID	Component	Operational standard	Class
F01	Governance active	Steering, programme, assessment, research/thesis, independent research/evaluation and safeguarding functions have approved terms of reference; governance bodies meet at least quarterly and IRET conflicts remain resolved.	Critical
F02	Ethics and institutional authorization	Written SLESRC determination, NPHA authorization and approved amendments precede IRET research data collection.	Critical
F03	Financing and operational readiness	Core programme and independent evaluation costs for the first 12 months are committed before cohort launch, with a documented continuity plan.	Critical
F04	Field sites accredited	All eight placement sites meet every critical criterion and at least 80% of scored readiness criteria before resident placement.	Critical
F05	Resident and host agreements	Every resident and host institution completes protected-time, data-access, deployment, supervision and publication agreements.	Core
F06	Faculty and mentor preparation	At least 90% of assigned faculty, mentors, supervisors and assessors complete required preparation before role assumption.	Core
F07	Modules delivered	All 17 modules receive the planned facilitated, practice and field-transfer components or approved fidelity-preserving adaptations.	Core
F08	Sessions delivered	At least 85% of 70 planned sessions are delivered within the permitted schedule.	Core
F09	Exercises delivered	At least 85% of 36 planned practical exercises are completed with feedback.	Core
F10	Field-practice opportunity and supervision delivered	Every active resident receives an accredited placement, protected field time, qualifying assignments, named supervision and a verified field-week recording system throughout the planned period; gaps trigger documented programme corrective action.	Critical
F11	Named mentorship and supervision	Every active resident has a named technical mentor and workplace supervisor throughout placement.	Critical
F12	Mentor contacts	At least 80% of planned monthly mentor contacts and quarterly formal reviews are documented.	Core
F13	Progression reviews	At least 90% of due progression reviews occur within four weeks of the planned month and record evidence, decision and actions.	Core
F14	Portfolio assessment	Every resident receives rubric-based assessment for all products due by each progression point; critical failures trigger remediation.	Critical
F15	Outbreak opportunity and evidence	Every resident receives two authentic investigation opportunities or a documented programme-led corrective placement; at least one investigation permits resident analytic leadership.	Critical
F16	Research governance by Month 12	At least 80% of active residents receive protocol-defence approval and ethics/data-governance authorization by Month 12 or an approved recovery deadline.	Core
F17	Year-2 research protection	Residents receive planned protected time and access for implementation, analysis and writing during Months 13–23.	Core
F18	Publication pathway	Each resident receives publication mentorship, approved internal channels, journal-legitimacy screening and editorial tracking.	Core
F19	Assessment calibration	All high-stakes assessors complete calibration; every thesis/dissertation and at least 25% of other products receive independent double rating.	Core
F20	Adaptation, cost and quality tracking	Quarterly adaptation logs, cost ledgers, data-quality audits, independently verified fidelity datasets, signed data locks and programme feedback cycles are complete.	Core

Overall fidelity at each quarter equals the number of due and applicable components independently verified as met divided by the number due and applicable. The Month-24 score is the primary estimand. Components receive no numerical weight. Every component and its evidence are reported, while critical components receive separate non-compensatory decisions. The secure I07 record stores quarter, component, dimension, level, numerator, denominator, status, evidence IDs, source quality, reviewer decisions, adjudication, adaptation ID, data-quality issue, programme factual response, corrective action, lock date and IRET sign-off.

17. Adaptation and version control

Permitted adaptations include local laws, institutions, hazards, language, examples, software, calendars, academic format, field-site sequence and delivery modality. Core duration, field-practice minimum, terminal outcomes, authentic outbreak requirement, eight product categories, research governance, independent assessment, critical safety/integrity standards and documented graduation decisions cannot be removed during the pilot without formal protocol amendment.

Every change records: date; component or strategy; planned or reactive status; decision-maker; rationale; level; context; content, dose or delivery change; relation to core function; intended equity effect; cost; and observed consequence. Major changes enter the public protocol amendment log.

18. Scale-up decision

Criterion	Green	Amber	Red
Overall implementation fidelity	≥80% components meet standard and all critical components met	60–79% or one remediable critical component missed	<60% or unresolved failure of a critical component
Resident retention at Month 24	≥80%	60–79%	<60%
Field-practice attainment	≥80% complete ≥68 weeks	60–79% complete ≥68 weeks	<60% complete ≥68 weeks
Portfolio and graduation requirements	≥80% complete all critical requirements within three months of scheduled end	60–79% or delays judged recoverable	<60% or widespread non-recoverable gaps
Mentorship dose	≥80% of planned contacts completed	60–79%	<60%
Acceptability, appropriateness and feasibility	Each stakeholder group mean ≥4.0/5 and no major unaddressed qualitative concern	Mean 3.0–3.9 or remediable concerns	Mean <3.0 or persistent major concern
Primary-data completeness	≥90%	75–89%	<75%
Safety, safeguarding and integrity	No unresolved serious event; corrective systems function	Serious event resolved with verified corrective action	Unresolved serious event, coercion, retaliation, material privacy breach or assessment/scientific-integrity failure

A red result on safety, safeguarding, integrity, field-practice attainment or another critical component blocks scale-up until the failure and system cause are resolved. The final decision considers quantitative criteria, qualitative concerns, cost, equity, sustainability and the feasibility of corrective action.

Threshold basis: the 68-week requirement follows Advanced FETP accreditation. The 80% fidelity, retention, field-practice and mentorship thresholds require delivery to most of the complete first cohort while permitting a limited recoverable interruption. A mean of 4/5 indicates affirmative stakeholder agreement. Ninety-percent completeness supports dependable progression decisions. Safety, safeguarding and integrity remain non-compensatory. These are prospective pilot decision rules, not universal validated cut-offs.

Version record

1.1 - 21 July 2026: initial prospective protocol package. 1.2 - 17 August 2026: reviewer-responsive clarification of national rationale, workload, continuity, fidelity scoring, threshold basis and publication/outbreak contingencies. 1.3 - 17 August 2026: defined implementation fidelity, established an independent research and evaluation team, and specified source collection, two-reviewer verification, adjudication, data locking, recording and reporting. The corresponding author will reconfirm study status before upload. 1.4 - 17 August 2026: final coordinated audit aligned the two-figure manuscript, key-secondary outcome hierarchy, field-practice delivery component, independent scoring, analysis plan and dissemination controls.

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