AFRICA PANDEMIC SCIENCES COLLABORATIVE

LEARNING VISIT REPORT

# Brown University Pandemic Center & BEACON Project

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## 1. Executive Summary

This learning visit to the Brown University Pandemic Center and the BEACON Project at Boston University aimed to distil transferable strategic lessons for strengthening pandemic science, research governance, and research-to-action pathways within the EPSILON hubs. The visit highlighted how well-designed institutional architecture, strong boundary-spanning roles, and deliberate investment in translation functions can significantly enhance preparedness, early warning, and policy relevance.

**Key takeaways**

(i) the importance of positioning pandemic centres as problem-solvers rather than discipline silos;
(ii) the centrality of research translation as a funded, professionalised function;
(iii) the value of hybrid AI-human workflows for epidemic intelligence; and
(iv) the need for continent-scale thinking for Africa, which fundamentally changes

Strategically, the visit underscores an opportunity for EPSILONs to pilot an Africa-adapted "pandemic intelligence layer" that links hubs, Africa CDC, and national systems, while simultaneously building a new cadre of professionals skilled in synthesis, translation, bio-security, and decision-support. Immediate next steps include piloting rapid translation units within EPSILONs, structured exchanges with Brown/BEACON, and co-developing a modular toolkit for epidemic intelligence and research management.

**Strategic implications for EPSILON Leadership:**

Based on the learning visit, EPSILON leadership should prioritise three immediate strategic decisions:

- whether to establish a centralised versus federated epidemic intelligence model;
- the level of investment required to institutionalise dedicated research translation functions; and
- the design of governance interfaces with Africa CDC and national public health systems.

## 2. Background & Strategic Purpose

The learning visit was designed to advance the goals of the African Pandemic Sciences Collaborative (the Collaborative) and the EPSILON programme by:

- Strengthening pandemic preparedness and response capacity through systems-level learning.
- Informing the Research Management and Research Translation workstreams.
- Exploring governance and sustainability models for new pandemic-facing institutions.
- Assessing BEACON as a practical example of translating fragmented signals and research outputs into operational intelligence.

Unlike traditional academic surveillance or modelling projects, BEACON explicitly addresses the persistent gap between data generation and actionable insight. Its real-time tracking of outbreaks (e.g. Lassa fever trends in Nigeria, including infections among health workers) illustrates how informal, event-based intelligence can complement formal surveillance systems and support prompt response.

The visit to Boston University and the demonstration of the resources available on the beaconbio.org website was an eye-opener in that this resource tracks outbreaks of diseases of public health importance in real time. For example, a member of the visiting team is currently tracking the increasing incidence of Lassa fever in Nigeria. Of concern is the increasing incidence of the disease among health workers.

EPSILON's comparative advantage lies not in replicating Northern pandemic centres, but in orchestrating distributed, multi-country intelligence and translation systems capable of operating effectively across fragmented institutional and policy environments in Africa.

## 3. Summary of engagements

**Brown University Pandemic Center.**
Strategic focus: Institutional design, governance, research - policy translation, and community engagement.
Relevance for EPSILONs: Demonstrates how a pandemic centre can operate as a convenor, translator, and trusted advisor to government while maintaining academic credibility.

**AWARE Project**.
Strategic focus: Cross-country synthesis and political uptake of evidence.
Relevance for EPSILONs: Illustrates how comparative, multi-country analysis can be packaged for policymakers.

**BEACON Project (Boston University CEID)**.
Strategic focus: Early outbreak detection using event-based surveillance, AI-assisted analysis, and human expert verification.
Relevance for EPSILONs: Offers a concrete, scalable model for epidemic intelligence and rapid synthesis suitable for adaptation in Africa.

**Ethics, Biosecurity, and Community Engagement Sessions.** Strategic focus: Research ethics, benefit sharing, biosecurity training, and town-Brown collaboration.
Relevance for EPSILONs: Provides tested approaches for embedding equity, trust, and community partnership into institutional practice.

***From Left:*** *Seydou Doumbia, MD, Ph.D. Director of the University Clinical Research Center (UCRC) and Honorary Dean of the Medical School and Dentistry at USTT of Bamako, Mali; Professor Ademola Ajuwon, faculty member of the Department of Health Promotion and Education, University of Ibadan; Allen Mukhwana Head of Programmes – Strengthening Science Ecosystems, SFA Foundation, and Prof. Sheetal Silal Professor Sheetal Silal, Director the Modelling and Simulation Hub, Africa (MASHA) at the University of Cape Town in South Africa and Honorary Visiting Research Fellow in Tropical Disease during the Learning Visit at Brown University Pandemic Center*

## 4. Key insights & strategic learnings

This section distils the most salient governance, operational, and translation lessons emerging from the learning visit, with a focus on what is strategically transferable to the EPSILON context. The insights highlight how institutional design, incentives, and translation capacity shape the ability of pandemic science to inform real-time decision-making.

### *4.1 Governance & Institutional Arrangements*

The Brown Pandemic Center is structured as a university-wide platform rather than a single-department unit. Authority is distributed through academic leadership with strong peer-review norms, while accountability is anchored in transparency, external engagement, and reputational risk. Decision-making prioritises problem orientation (e.g. H5N1, measles, FIFA World Cup preparedness) over disciplinary ownership. A defining feature is the protection of credibility through:

- Separation of synthesis/translation from advocacy.
- Explicit peer review and internal challenge before external briefing.
- Clear norms around uncertainty of communication.

For EPSILONs, this underscores that legitimacy comes less from formal mandate and more from trusted performance under pressure.

### *4.2 Scope and Operating Model of Pandemic Centres*

The Brown Pandemic Center coordinates a wide portfolio of research, with individuals embedded in diverse projects rather than a single monolithic programme. However, much of its responsive work remains sub-national (state-level), with limited coordination at national or continental scale.

The African context fundamentally differs: EPSILONs must be designed from the outset as continental entities. This precludes reliance on a single host university workforce and requires distributed staffing, innovative funding models, and explicit coordination mechanisms across countries.

A viable EPSILON pandemic intelligence architecture would require:

(i) hub-level embedded translation and synthesis units;
(ii) a central coordination layer responsible for aggregation, quality assurance, and dissemination of intelligence outputs; and
(iii) formalised interfaces with Africa CDC and national public health institutes to ensure uptake and operational relevance.

### *4.3 Research Management & Infrastructure Models*

Brown illustrates the value of professional research management embedded alongside science. Systems and workflows are explicitly designed to support:

- Rapid evidence generation and synthesis.
- Cross-school collaboration supported by shared governance structures.
- Career pathways that reward translation and public engagement, not only publications.

A notable innovation is formal agreements with state authorities that allow academic time-buyouts, enabling faculty to act as quasi-embedded analysts for government. The deeper implication is that science becomes operational without becoming political.

**Strategic implication for EPSILONs:**
This arrangement demonstrates how pandemic science can be made operational without eroding academic independence. For EPSILONs, it points to the need for formal mechanisms (e.g. funded fellowships, secondments, or time-buyout agreements) that protect dedicated translation time while keeping experts institutionally anchored in universities. Such models enable continuity, trust, and rapid response during crises, reduce reliance on ad-hoc consultancy, and create a professional cadre of boundary-spanners who consistently translate evidence into decision-ready intelligence for national and continental health authorities.

Capacity strengthening efforts should therefore focus on three distinct professional tracks:
(i) epidemic intelligence analysts;
(ii) research translation and synthesis specialists; and
(iii) research management professionals with crisis-response and rapid coordination capabilities.

This arrangement turns universities into reliable components of the preparedness system, not just knowledge producers.

### *4.4 Translation of Research into Operational and Policy Intelligence*

BEACON Project is the strongest example of end-to-end translation:

- Hundreds of daily informal signals are triaged using a large language model trained on public health-specific corpora.
- AI outputs prioritise severity, urgency, and relevance, but humans remain essential for verification, contextual judgement, and credibility.
- Outputs are standardised, open-access, and designed for diverse users (ministries, clinicians, global agencies).

Critically, BEACON succeeds because it treats translation as a core product, not an add-on. Dedicated editorial teams, verification protocols, and funding lines protect speed without sacrificing trust.

### *4.5 Incentives, Collaboration Models & Sustainability*

Both Brown Pandemic Center and BEACON Project rely on diversified funding (philanthropy, government, foundations) that incentivises collaboration rather than competition. Informal partnerships are common and often as important as formal MoUs.

Sustainability remains an open challenge. BEACON is exploring API-based access and platform-style models to generate resources while keeping outputs open.

Implication: Even high-impact, open epidemic intelligence platforms struggle to sustain core operations without dedicated revenue streams, making long-term viability a strategic risk rather than a technical one.

**What EPSILONs can learn:** Build sustainability into the model from the outset, by separating open core outputs from value-added services (e.g. APIs, analytics, tailored briefings) and treating platforms as shared infrastructure that can attract diversified, recurring funding rather than relying solely on grants.

### *4.6 Equity, Ethics, and Community Engagement (For SHARPER and ethics-focused learning)*

The SHARPER's plan to develop strategies of shifting from individual to community sharing of research benefits was well-received. However, the anticipated opportunity of learning from the experience in Brown University was limited because the institution has not done much in this area.

Brown's University approach to community engagement is unique and interesting. Brown requests for application which is jointly developed by faculty and professionals working in relevant agencies in the county and state. What is unique is that both applicants take the role of co-principal investigators and funding is allocated equally for activities planned. This approach encourages collaboration between the Brown and the town in the spirit of equality. The second interesting approach is the fact that the university has created a department to manage issues relating to community engagement. This is commendable because it demonstrates the university's commitment to not only to fund but also to encourage community engagement.

Equity consideration and inclusion in LMIC-focused research.

Brown has a flagship program on biosecurity where candidates are recruited to undergo training in this area of pandemic prevention.

Brown's model of community engagement stands out for its institutionalisation:

- A dedicated office with staffing and budget.
- Joint applications where community partners and faculty are co-PIs with equal funding.
- Explicit recognition that engagement is neither charity nor participant recruitment, but co-creation.

For SHARPER and EPSILON ethics workstreams, this offers a practical template, even though Brown has limited experience with LMIC-style community benefit-sharing at scale.

## 5. Opportunities for the EPSILONs

### *5.1 Capacity Strengthening & Skills Transfer*

The learning visit highlights a clear opportunity to establish structured, bidirectional capacity strengthening mechanisms between EPSILON hubs, Brown University, and the BEACON initiative. These should be designed not as ad hoc exchanges but as deliberate capability-building pathways aligned to epidemic intelligence, research translation, and distributed system coordination at scale.

In parallel, there is strong scope for joint mentorship of early-career researchers and professionals across modelling, genomics, ethics, research management, and epidemic intelligence. EPSILON hubs bring valuable experience in working across low-resource, multi-country environments, community engagement, and real-time policy interfaces, which can usefully inform and challenge Global North models. Targeted training and co-learning activities focused on AI-assisted synthesis, uncertainty communication, and decision-support would further strengthen shared practice across institutions.

### *5.2 Potential Collaborations & Partnerships*

Priority collaborations should move beyond one-directional support towards genuine co-development. A central opportunity is the joint design and piloting of an Africa-adapted BEACON-like epidemic intelligence capability, developed with Africa CDC and embedded within EPSILON hubs. This would allow BEACON's technical and editorial approaches to be stress-tested and adapted for continental-scale, LMIC contexts, while leveraging EPSILONs' convening power and regional networks.

Additional partnership opportunities include collaborative work on components of the Africa Health Security Index, shared analysis of surveillance gaps, and comparative learning across regions. Engagements with Brown faculty on biosecurity, ethics, and community engagement could likewise be structured as exchanges, drawing on EPSILON and SHARPER experience in participatory research, benefit-sharing, and working with historically underserved communities.

### *5.3 Institutional Models to Adapt for Africa*

There are also opportunities for structured experience sharing around institutional models that support trust, legitimacy, and impact. In particular, Brown's community engagement approach offers a useful reference point for dialogue and adaptation. Members of the SHARPER workstream have encouraged Professor Ademola to explore inviting the Director of Brown's Community Engagement Unit to present on relevant topics of mutual interest, creating space for critical reflection on how such models translate into African research, ethics, and partnership contexts and national systems. This should be accompanied by deliberate professionalisation of research management and translation roles across hubs, including clearer career pathways, shared standards, and sustained funding lines for these functions.


Others are:

- Adopt directly: Translation workflows, standardised outputs, AI-human hybrid pipelines.
- Adapt: Governance structures to fit continental mandates and distributed staffing.
- Pilot: Rapid synthesis and epidemic intelligence units within select EPSILON hubs.

## 6. Recommendations for EPSILON Network Strengthening

In the short term, EPSILONs could pilot a small, focused translation and epidemic intelligence function in one to two hubs to test workflows, staffing models, and demand. These pilots could be complemented by formalised learning exchanges with Brown University and the BEACON team, enabling hands-on exposure to mature translation and intelligence practices. In parallel, EPSILONs should co-develop a shared, practical toolkit on research translation and intelligence workflows to support consistency and rapid uptake across hubs.

Over the medium term, EPSILONs should move towards establishing a centralised research intelligence layer that is explicitly linked to Africa CDC and national systems. This should be accompanied by deliberate professionalisation of research management and translation roles across hubs, including clearer career pathways, shared standards, and sustained funding lines for these functions.

In the long term, EPSILONs should aim to build a continental-scale pandemic intelligence and synthesis platform that connects hub-level capacities into a coherent system. Achieving this will require securing sustainable core funding that is structurally separate from short-term project grants, ensuring continuity, credibility, and the ability to respond rapidly during crises.

## 7. Resources, Risks, and Mitigation

| Dimension | Key Requirements / Risks | Implications for Implementation | Mitigation / Enablers |
|---|---|---|---|
| **Human Resources** | Analysts, editors, research managers, fellows | Insufficient professional capacity could slow translation, synthesis, and response functions | Phased recruitment, secondee and fellowship models, bi-directional placements with partners |
| **Technical Infrastructure** | Surveillance platforms, AI tools, data and analytics infrastructure | Gaps in interoperability, reliability, or scalability may limit effectiveness of epidemic intelligence | Modular platforms, shared standards, and incremental deployment through pilots |
| **Financial Resources** | Funding for pilots, exchanges, and core functions | Over-reliance on short-term project funding threatens continuity and institutional credibility | Diversified funding portfolios, ring-fenced core support, and platform-style financing models |
| **Institutional & Governance** | SFA Foundation–level coordination and formal partnership agreements | Weak coordination or unclear mandates could fragment efforts across hubs and partners | Clear governance arrangements, formal agreements, and defined roles across the network |
| **Sustainability Risk** | Dependence on time-bound grants and individual champions | Loss of capability once pilots or grants end | Early sustainability planning and separation of core functions from projects |
| **Data Governance & Ethics** | Data sharing, ownership, privacy, and responsible AI use | Reputational and operational risks if governance frameworks are weak | Clear ethical frameworks, data-sharing agreements, and alignment with Africa CDC norms |

## 8. Next steps & implementation timeline

Initial implementation should begin immediately with structured follow-up engagements with Brown University and the BEACON team within the next one to two months. These discussions should focus on translating learning into concrete collaboration opportunities, including exchange modalities and pilot activities.

In parallel, EPSILONs should launch an internal seminar series to disseminate insights from the learning visit across hubs, Programme teams, and partners. This will help build a shared understanding of emerging models for pandemic intelligence, research translation, and institutional design.

Over the subsequent six to nine months, EPSILONs should prioritise the co-development of a practical research translation and intelligence toolkit, drawing directly on lessons from Brown and BEACON and adapting them for African institutional contexts. This period should culminate in a structured presentation of findings and proposed next steps to all EPSILON Principal Investigators and Programme teams, providing a basis for alignment and collective

## 9. Annexes

- Visit agenda
- BEACON briefing note
- Concept note for the learning visit

### Co-developers' Profiles:

**Allen Mukhwana is Head of Programmes – Strengthening Science Ecosystems at SFA Foundation**, providing executive oversight of a multi-country portfolio advancing research management, institutional capacity, and science systems across Africa. She has over 15 years' experience designing and delivering large-scale programmes that strengthen research and innovation ecosystems. Her work spans institutional transformation, governance reform, and professionalisation of research management, with a strong track record translating strategy into operational systems that improve performance, sustainability, and policy impact. She has led complex organisational transitions, including establishing independent entities and restructuring multi-million-dollar portfolios, and has shaped continental approaches to research and capacity strengthening in collaboration with governments, funders, and global partners. Recognised for expertise in governance and organisational design, she builds collaborative platforms linking researchers, institutions, and policymakers. She holds an MSc from Portsmouth, an MBA from ESAMI, and postgraduate qualifications in global health leadership, clinical trials, and applied clinical research.

**Professor Ademola Ajuwon is a faculty member of the Department of Health Promotion and Education, University of Ibadan, Nigeria.** He has supervised 120 Master of Public Health dissertations and 7 PhD theses. He was a Visiting Scholar at the Center for AIDS Prevention Studies, University of California, San Francisco, USA, a post-doctoral research fellow at the Bloomberg School of Public Health, Johns Hopkins University, Baltimore, USA, DAAD Staff Exchange Fellow at the University of Kwa-Zulu Natal, Durban South Africa, CARTA Senior Staff Exchange Fellow, University of Malawi, and Visiting Professor at the School of Public Health, University of Witwatersrand, South Africa.

**Seydou Doumbia, MD, Ph.D. Director of the University Clinical Research Center (UCRC) and Honorary Dean of the Medical School and Dentistry at USTT of Bamako, Mali.**
For more than 25 years, Dr. Doumbia has been engaged in translational research and capacity building for research on infectious diseases, including malaria, HIV/TB, emerging infectious diseases, and neglected tropical diseases. Dr. Doumbia is Chair of the West African Consortium for Clinical Research on Emerging Pathogens (WAC-CREP), a network including Mali, Guinea Conakry, Liberia, and Sierra Leone, aimed to harmonize clinical research for multi-center studies and sub-regional preparedness for response to epidemics pathogens.

**Professor Sheetal Silal is the Director the Modelling and Simulation Hub, Africa (MASHA) at the University of Cape Town in South Africa** and Honorary Visiting Research Fellow in Tropical Disease Modelling at Oxford University. Her primary research area is the development and application of mathematical transmission models of vector-borne diseases and vaccine preventable diseases in South Africa, sub-Saharan Africa and globally, with a focus on supporting policy development and implementation. She is the Chair of the WHO Immunization and Vaccine Implementation Research Advisory Committee and a member of the WHO Collaboratory Technical Advisory Group.