

Building capacity in evidence-based medicine in low- and middle-income countries: problems and potential solutions

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Introduction

The early era of evidence-based medicine (EBM) saw the emergence of a cohort of leaders who applied the concepts of clinical expertise, best available evidence and patient preferences to healthcare. Yet, with time, these core components of EBM have become distorted, misinterpreted and hijacked.[1] The EBM Manifesto provided a roadmap for tackling the core issues related to the practice and application of EBM.[2] One of the important items in the manifesto is to “*Encourage the next generation of leaders in evidence-based medicine.*”[2] Achieving improvements in healthcare globally requires building and sustaining early- and mid-career researchers (EMCRs).[3] Yet, there are big gaps in both critical appraisal and research capacity, particularly in low- and middle-income countries (LMICs), and this hinders development in these regions.[4]

At the 2019 EBMLive conference (see Box 1), we wanted to better understand the problems and challenges that EMCRs encounter. In particular, we focused on EMCRs in those LMICs undergoing major health system transformations, such as Brazil and India. We asked the six recipients of the Building Capacity Bursaries (all co-authors of this Commentary) to describe the challenges that they have encountered individually and among their peers, along with potential solutions (see Box 2). Their responses reflect healthcare professionals who practise in South America, Africa, the Middle East and Asia. While some challenges are specific to certain settings, we tried to identify, highlight and describe broad overarching themes.

Problem 1: Limited career and funding opportunities

There are major disparities in financial investment in science as a means to drive local development.[5] This is especially true in LMICs where scientific productivity is dramatically different from high-income settings.[5,6] In lower resourced settings, low scientific productivity may result from an unsupportive

environment for research, combined with cyclic tides of political and economic instability.[7,8] As a result, many EMCRs face significant job insecurity. The poorly funded environment for science either dissuades those considering a career in science or leads others to look for opportunities abroad. By neglecting science, the cycle of poor education, poverty, and unequal distribution of wealth is perpetuated.[9] Ultimately, these countries are missing opportunities to use local expertise to produce innovative solutions tailored to their healthcare needs.

To close this gap, sustainable regional capacity building is needed through targeted mentorship for EMCRs. Networked models[10] and linkage systems could connect EMCRs in LMICs with suitable mentors locally and in high-income countries through online mentoring to support the development of critical appraisal and research capacity in evidence-based healthcare.[11] While certain initiatives to build research capacity in LMIC have been established (e.g. the World Health Organization Special Programme for Research and Training in Tropical Diseases and the Fulbright Scholarship), expansion of existing programmes and development of new programmes are needed. Lastly, it is important to raise awareness of EMCRs as future leaders, and the role they can play in fostering innovation and development.[11]

Problem 2: Lack of training in evidence-based medicine

The lack of emphasis on EBM in training limits the uptake of evidence-based practices in LMICs, and limits investment in EMCRs.[12] Many healthcare professionals thus lack the core competencies of critical appraisal, question formulation, study design, and the skills to translate evidence into practice.[13,14] International collaborations may help to foster advances in developing an EBM curriculum, tailored to each unique setting and context.[15]

The Oxford-Brazil EBM Alliance is a recently established initiative that seeks to promote teaching, learning, practice, and evaluation of EBM throughout Brazil, the fifth largest country in the world. This mutually collaborative approach combines a well-structured curriculum and resources from the Centre for Evidence-Based Medicine at the University of Oxford with engaged local colleagues in Brazil. While it is important to train healthcare professionals, educating teachers and primary school children about critical thinking can also have an impact.[16] Long-term, this may raise public health literacy. For LMICs in which the primary language is not English, identifying specific resources in primary languages or partnering with translation services such as Pan American Health Organization may further reduce barriers to implementing evidence-based healthcare.[17]

Problem 3: Insufficient use of multi-disciplinary teams

Given the complexity of modern health problems, multidisciplinary teamwork in healthcare (i.e. nurses, pharmacists, physicians, psychologists, physiotherapists, social workers, etc.) is important in improving patient outcomes.[18] For example, multidisciplinary care in oncology has led to improved survival, and for specific types of cancer (e.g. breast cancer), it has led to greater implementation of evidence-based recommendations.[19] Yet, in LMICs, patient care is often primarily driven by physicians, with few multidisciplinary teams, and little involvement of patients in decision making.[20] This is partly due to training (see above), but also due to fewer allied healthcare professionals seeking research careers. LMICs need to provide opportunities for allied healthcare professionals to become familiar with ways of critically appraising evidence, and, for a minority, mentoring in embarking on research careers. For example, the Canadian Child Health Clinician Scientist Program (CCHCSP) is a transdisciplinary training programme that trains clinician-scientists in child health, including nurses, dieticians and physiotherapists. Similar programs are needed in LMICs, particularly in emerging economies with rapidly changing health systems.

Conclusion

Early- and mid-career researchers seeking a career in EBM face numerous challenges, particularly in LMICs. The issues we have outlined are not exhaustive, but they can foster important conversations about steps that may help to improve circumstances. For EBM to continue to thrive in the next decade, it is important that future leaders are supported. Now more than ever, we need novel and creative solutions to help those that work and practise in LMICs to lead meaningful healthcare transformation.

Box 1

The EBMLive Conference (www.ebmlive.org), a joint partnership between the Centre for Evidence-Based Medicine (CEBM) and the *BMJ*, is designed to “*develop, disseminate, and implement better evidence for better healthcare.*” Since its inception, EBMLive has endeavoured to include the voice of students and early career researchers. Manifestations of this policy have included creation of leadership scholarships to enable attendance at the conference; soliciting submissions on pertinent questions; creating sessions focused on early career researchers; and by publishing the best submissions in the *Student BMJ* and *BMJ Evidence-Based Medicine Journal*.

Box 2

Problems faced by early- and mid-career researchers in low- and middle-income countries and their potential solutions

1: Limited career and funding opportunities

- Enable mentorship for early- and mid-career researchers through network models and linkage systems for research projects and grant funding
- Allocate a proportion of funding for early- and mid-career researchers in pre-existing grant schemes
- Encourage institutions to create a budget item (from annual allocation or locally revolving funds) to support research, which could be nested within quality improvement initiatives
- Support institutions to accurately capture routine clinical data that could be used for observational studies aimed at generating context specific evidence
- Raise awareness of the role that early- and mid-career researchers play in the future of evidence-based medicine
- Encourage local philanthropy and support from Government and Ministries of Health for early- and mid-career researchers

2: Lack of training in evidence-based health care

- Establish international collaborations to develop and tailor a curriculum for evidence-based health care
- Identify and use resources in local languages (e.g. multilingual resources such as www.testingtreatments.org).
- Translate external resources (e.g. Cochrane systematic reviews) into local languages
- Ensure that medical school and postgraduate programs curricula include training on critical appraisal skills.
- Teach critical appraisal to teachers and primary school aged children

3: Insufficient use of multi-disciplinary teams

- Create critical appraisal and research opportunities for allied healthcare professionals

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References

- 1 Greenhalgh T, Howick J, Maskrey N, *et al.* Evidence based medicine: a movement in crisis? *BMJ* 2014;**348**:g3725.
- 2 Heneghan C, Mahtani KR, Goldacre B, *et al.* Evidence based medicine manifesto for better healthcare. *BMJ* 2017;**357**:j2973.
- 3 Richards GC, Macdonald H, Gill PJ. A scholarship to foster future leaders in evidence based medicine. *BMJ* 2019;**364**:l775.
- 4 Käser M, Maure C, Halpaap BMM, *et al.* Research Capacity Strengthening in Low and Middle Income Countries - An Evaluation of the WHO/TDR Career Development Fellowship Programme. *PLoS Negl Trop Dis* 2016;**10**:e0004631.
- 5 Estenssoro E, Friedman G, Hernández G. Research in Latin America: opportunities and challenges. *Intensive Care Med* 2016;**42**:1045–7.
- 6 Ciocca DR, Delgado G. The reality of scientific research in Latin America; an insider's perspective. *Cell Stress Chaperones* 2017;**22**:847–52.
- 7 Rodrigues ML, Morel CM. The Brazilian Dilemma: Increased Scientific Production and High Publication Costs during a Global Health Crisis and Major Economic Downturn. *MBio* 2016;**7**. doi:10.1128/mBio.00907-16
- 8 Moura EG de, Camargo KR de Junior. The crisis in funding for research and graduate studies in Brazil. *Cad Saude Publica* 2017;**33**:e00052917.
- 9 Massuda A, Hone T, Leles FAG, *et al.* The Brazilian health system at crossroads: progress, crisis and resilience. *BMJ Glob Health* 2018;**3**:e000829.
- 10 Marjanovic S, Hanlin R, Diepeveen S, *et al.* RESEARCH CAPACITY-BUILDING IN AFRICA: NETWORKS, INSTITUTIONS AND LOCAL OWNERSHIP. *J Int Dev* 2013;**25**:936–46.
- 11 Geffers, J., Beaudry, C., Yang HC, *et al.* Global State of Young Scientists (GloSYS) in ASEAN – Creativity and Innovation of Young Scientists in ASEAN. 2017. https://globalyoungacademy.net/wp-content/uploads/2017/01/GloSYS-in-ASEAN_webversion.pdf
- 12 Puchalski Ritchie LM, Khan S, Moore JE, *et al.* Low- and middle-income countries face many common barriers to implementation of maternal health evidence products. *J Clin Epidemiol* 2016;**76**:229–37.
- 13 Dawes M, Summerskill W, Glasziou P, *et al.* Sicily statement on evidence-based practice. *BMC Med Educ* 2005;**5**:1.
- 14 Zhang Q, Zeng T, Chen Y, *et al.* Assisting undergraduate nursing students to learn evidence-based practice through self-directed learning and workshop strategies during clinical practicum. *Nurse Educ Today* 2012;**32**:570–5.
- 15 Elessi K, Albarqouni L, Glasziou P, *et al.* Promoting critical appraisal skills. *Lancet* 2019;**393**:2589–90.

- 16 Nsangi A, Semakula D, Oxman AD, *et al.* Effects of the Informed Health Choices primary school intervention on the ability of children in Uganda to assess the reliability of claims about treatment effects: a cluster-randomised controlled trial. *Lancet* 2017;**390**:374–88.
- 17 Calderón C, Sola I, Rotaecche R, *et al.* EBM in primary care: a qualitative multicenter study in Spain. *BMC Fam Pract* 2011;**12**:84.
- 18 Reeves S, Lewin S, Espin S, *et al.* *Interprofessional teamwork for health and social care*. Chichester, U.K.: : Wiley-Blackwell 2010.
- 19 Taylor C, Munro AJ, Glynne-Jones R, *et al.* Multidisciplinary team working in cancer: what is the evidence? *BMJ* 2010;**340**:c951.
- 20 Taylor K. Paternalism, participation and partnership - the evolution of patient centeredness in the consultation. *Patient Educ Couns* 2009;**74**:150–5.