BMJ Open

Rebalancing the research equation in Africa: principles and process

Cathryn M Edwards ,[1,2] Ahmed A A Suliman,[3] Simon Taylor-Robinson,[4] Tumani Corrah[5]

To cite: Edwards CM, Suliman AAA, Taylor-Robinson S, *et al*. Rebalancing the research equation in Africa: principles and process. *BMJ Open* 2022;**12**:e049781. doi:10.1136/bmjopen-2021-049781

► Prepublication history for this paper is available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2021-049781).

Received 01 February 2021
Accepted 30 January 2022

[1]Department of Gastroenterology and Hepatology, Torbay Hospital, Torquay, UK
[2]Department of Medicine, Plymouth University Peninsula School of Medicine, Plymouth, UK
[3]Faculty of Medicine, University of Khartoum, Khartoum, Sudan
[4]Department of Surgery and Cancer, Imperial College London, London, UK
[5]MRC Unit The Gambia at LSHTM, Banjul, Gambia

Correspondence to
Dr Cathryn M Edwards; drcathrynedwards@gmail.com

ABSTRACT

Background Many examples of research excellence in Africa have been driven by partnerships led by the global North and have involved localised infrastructure improvements to support the best of international research practice.

Objective In this article, we explore a possible mechanism by which local research networks, appropriately governed, could begin to support national African research programmes by allying research delivery to clinical service.

Summary This article explores the concept that sustainable research effort needs a well-trained and mentored workforce, working to common standards, but which is practically supported by a much developed information technology (IT) infrastructure throughout the continent.

Conclusions The balance of investment and ownership of such a research programme needs to be shared between local and international funding, with the emphasis on developing global South–South collaborations and research strategies which address the environmental impact of medical research activity and mitigate the impact of climate change on African populations. Healthcare must be embedded in the post-COVID-19 approach to research development.

INTRODUCTION

If the current pandemic teaches us anything, it is the value of global science applied for the common good. This has been achieved by international collaborative efforts of exceptional proportion with regard to SARS-CoV-2 vaccine development and it could be argued that this justifies the current research balance between the global North and South. Alternatively, it may be time to reappraise the balance of academic and industry partnerships, to create a new equilibrium of research governance, training, prioritisation and 'value creation' within Africa.

Mervyn King, speaking on value creation in business, challenges conventional tools of business audit and activity.[1] To create a new order of business sustainability in Africa, he states that values of 'inclusive capitalism' provide us with a radical means of sustainable transformation for the economy, society and environment.[1] Inclusive capitalist philosophy looks at the 'whole system' impact of business activity through the lens of measurable outcomes, such as 'ethical culture and effective leadership; and sustainable economic and environmental value creation with adequate and effective controls informing governance'.[1] All these confirm 'community confidence' and the legitimacy of business outcomes.[1]

Applying such principles to the research environment, we argue here for further development of regional and national networks of research in Africa, to prioritise, lead and empower research activity within institutions, working within a framework of enquiry aligned to specific and heterogenic African demographics. The 'corporate' value of such networks will be judged, not just by the quality and impact of their outputs, but by the wider contribution they make to sustainable development of African leaders and researchers themselves: research leadership through service, delivered through developmental mentorship support. This shift in balance towards a nationally supported and overseen network regulation will help transition the best exemplars of North–South equitable partnerships to a more extensive South–South axis. Although there have been many discussions on this topic, none has effectively identified practical vehicles to drive the required change.[2]

THE AFRICAN MEDICAL RESEARCH ENVIRONMENT

There are undoubtedly successful models of international partnership between the global North and South. These have delivered clinically relevant research progress, most notably around communicable diseases (HIV-AIDS, tuberculosis, malaria, and other parasitic and gastrointestinal communicable diseases).[3 4] There has been no shortage of recognition of the widespread challenges facing African-led research and health researchers.[5] Such is the time frame of progress that the overview written by Whitworth *et al* in 2008 still has relevance, enumerating the major obstacles to change. A primary recognition by African governments that research funding can be of economic benefit to countries is likely to gain more traction than altruistic

goals of improved patient outcomes through research-active clinicians. Nevertheless, fundamental acknowledgement of the principle of public good from research still needs wider political recognition and financial contributions, if practical progress is to be made.

Many of the international initiatives previously set up to move the African research agenda forward have resulted in successful pockets of research excellence, with and within African institutions, such as Medical Research Council The Gambia, Institut Pasteur in Dakar, Sénégal or KEMRI in Nairobi, Kenya. The danger is that without parallel support (including financial contributions) from national governments to drive nationally prioritised research through regional mechanisms, no sustainable support for quality local research can be assured (table 1).

The concept of local and regional networks is not new,[6] but building a compelling rationale and implementation plan for such networks, needs to be. Change is driven through crisis. Post-COVID-19, several generational cohorts of clinicians will need to be supported to find motivation and fulfilment in careers which have been impacted by effects of the pandemic. At its most basic, this will require redress of COVID-19's impact on the training and education of students and postgraduate clinicians. Training this workforce in research skills and supporting development of clinical leaders as clinician-scientists could be driven by early engagement of all doctors in facilitated mentored support, seizing the opportunity post-pandemic to combine need for clinical service expansion and the desire to develop regional research networks: in effect, providing a programme of integrated workforce development.

Clinicians and laboratory scientists could be supported to engage in research either through active academic or clinical service roles. Research-active clinicians and scientists would then create, de facto, responsive 'functional research units'. This need for responsiveness cannot be overemphasised and there are obvious parallels here with the requisite global preparedness for the next pandemic.[7] Successful delivery of this strategy will require national leadership which champions personal/professional development and considers 'leadership through mentorship' as valid. Additionally, there needs to be clear separation between development of an engaged clinician-researcher workforce and professional regulation (professional standards, research accreditation and practice) through line management, legal framework and oversight. Most significantly, re-engagement with doctors and researchers at all levels needs to demonstrate genuine care for and professional investment in a workforce which is under extreme pressure. By adopting developmental mentorship strategies, including peer-to-peer, or reverse mentorship partnerships, such a framework for professional and personal reinvestment can be created.

Engagement of all clinicians in elements of research activity, as well as the provision of defined career pathways for clinician-researchers, should embed research culture in clinical practice and improve patient mortality outcomes.[8] Supported transition to ground-up models of local and regional research networks will require rapid development of an infrastructure for training support, without creating a burden of destructive bureaucracy.[9] Use of e-portfolios to track educational milestones and identify future training needs would support the annual appraisal and regular revalidation of all research-active individuals. The model set out by the Royal College of Physicians (London) and taken up by the East, Central and Southern African College of Physicians is an exemplar in the clinical context which could be transferred to a research environment.

Local networks have potential to deliver much needed standardisation of research practice through skills teaching: study design, grant writing, good laboratory practice, new technologies and research governance. Laboratory accreditation and regulation would need oversight in parallel with people development. Much of this can be delivered online. The validation and assessment of people and processes will be vital for any transition to self-reliance and all of this will require a robust and 'fit for purpose' digital infrastructure.

THE CHALLENGES OF CYBER-INFRASTRUCTURE AND CLIMATE CHANGE

Adequate digital speed and bandwidth across the continent is fundamental to digital learning, research support and monitoring. While public opinion surveys have confirmed the acceptability of e-health strategies in several African countries, improving access, connectivity and uptake to a reliable digital infrastructure is a prerequisite, if research and clinical services are to be equitably accessed. The South African Research and Education Network acknowledges this principle, although the delivery of its goals remains patchy.[10] If existing partners and sponsors in Africa are serious about transitioning to models in which local research networks lead high-quality African-centric research, collaborative funding strategies need to deliver a sustainable cyber-infrastructure for the continent.

The next most important consideration is that of global warming. Establishing a research infrastructure requires a sustainable 'green' framework, as well as developing a medical research focus which mitigates the effects of climate change, including efforts to recycle waste and to reduce use of scare resources such as water. The global South will incur the health impacts of planetary warming disproportionately.[11 12] These two strategic approaches—cyber and climate—will be transformative for Africa.

NATIONAL–INTERNATIONAL COORDINATION

Local autonomy and research innovation need to be balanced by independent national prioritisation and oversight. The auspices of the African Union could be used to develop and monitor national and regional research centres of excellence providing top-down oversight of governance and research ethics. Other bodies are well placed to encourage and monitor training programmes from the ground-up. The Africa Research Excellence Fund was created to develop the next generation of research leaders through education, mentorship, training and protected research fellowships to

Table 1 Summary of exemplar international partnerships working as part of healthcare research in Africa

Country	Institution	Collaborators	Sphere of interest
USA	Centers for Disease Control and Prevention: https://www.cdc.gov/Globalhealth/	32 African countries	Global health security, global health protection, HIV-AIDS, TB, malaria, parasitic diseases, among others
USA	Harvard Medical School-School of Public Health: https://www.hsph.harvard.edu/africa-health-partnership/	12 African countries	Variety of public health issues (chiefly in communicable diseases)
USA	Yale University-Africa Initiative: https://world.yale.edu/africa	Links with 43 African countries but research and educational programmes in 8 countries	Clinical medicine, palliative care, education and training, among others
USA	Johns Hopkins Center for Global Health: https://hopkinsglobalhealth.org/faculty-research/project-map/	15 African countries	Both communicable and non-communicable diseases including HIV, TB and malaria
France	Institut Pasteur: https://www.pasteur.fr/en/institut-pasteur/institut-pasteur-throughout-world/institut-pasteur-international-network	Institutes in 7 African countries	Communicable diseases: biomedical research, public health activities, education, innovation and technology transfer
Switzerland	Swiss Institute for Tropical and Public Health: https://www.swisstph.ch/fr/research-we-do/	Collaborations throughout Africa with focus on Cameroon, Ghana, Kenya and Uganda	Infectious and non-communicable diseases, society and health; environment; health systems and innovation
UK	Wellcome Trust: https://wellcome.org/what-we-do/our-work/programmes-and-initiatives-africa-and-asia	Projects throughout Africa, but institutes in Kenya, Malawi and South Africa	TB, HIV, malaria, respiratory diseases, leadership, training among others
UK	Medical Research Council: https://mrc.ukri.org/about/institutes-units-centres/list-of-institutes-units-centres/?filtersSubmitted=true&textSearch=Search+centres%E2%80%A6&centreLocation=The+Gambia&centreLocation=Uganda	Projects throughout Africa with dedicated research units in Gambia and Uganda	All aspects of communicable and non-communicable diseases including vaccinology
European Union	European Union: https://ec.europa.eu/info/research-and-innovation/strategy/international-cooperation/africa_en	Supports potential research projects throughout Africa through specific funding calls	All aspects of medical research, innovation and education including new calls for COVID-19 work
Germany	Federal Ministry of Education and Research: https://www.bmbf.de/en/africa-strategy-of-the-federal-ministry-of-education-and-research-2280.html	Collaborations in 14 African countries	Both communicable and non-communicable diseases
Global Alliance for Vaccines and Immunization (international organisation based in Geneva, Switzerland)	https://www.gavi.org	Projects in 43 African countries Associated with WHO, UNICEF, Bill and Melinda Gates Foundation and World Bank	Established work with HIV and 12 vaccine programmes but work on COVID-19 underway now
USA	Bill and Melinda Gates Foundation: https://www.gatesfoundation.org/Where-We-Work/Africa-Office/Focus-Countries	45 countries in Africa eligible for help but focus on 10 countries: Ethiopia, Nigeria, South Africa, Burkina Faso, Democratic Republic of Congo, Ghana, Kenya, Senegal, Tanzania and Zambia	Multiple areas including TB, HIV, malaria, neglected tropical diseases, maternal and child health; current attention on COVID-19

Oxford and Cambridge Universities and the London School of Hygiene and Tropical Medicine, UK support a variety of international partnerships usually through indirect resourcing, for example, via Wellcome and other outside sources. They are therefore not included as direct resource providers in this table.
TB, tuberculosis.

Table 2 Exemplars of South–South network collaboration in Africa

Study	Synopsis	Countries involved
THESUS-HF[14] Sub-Saharan African Survey of Heart Failure: A prospective, multicenter, observational survey of patients with acute heart failure (AHF)	Of 1006 enrolled African patients, AHF was predominantly non-ischaemic in cause: most commonly hypertension.	12 centres in 9 countries: Mozambique, South Africa, Nigeria, Sudan, Kenya, Uganda, Cameroon, Sénégal, Ethiopia
CREOLE[15] Comparison of Dual Therapies for Lowering Blood Pressure in Black Africans: single-blind, three-group trial	Of 728 black patients enrolled with uncontrolled hypertension, amlodipine plus either hydrochlorothiazide or perindopril was more effective than perindopril plus hydrochlorothiazide at lowering blood pressure at 6 months.	University Hospital Centres in 6 countries: Uganda, Cameroon, Mozambique, Kenya, South Africa, Nigeria

promote skills development, including, where necessary, time in the global North.[13] Successful examples of existing South–South research collaborations are given in table 2.[14 15]

SUMMARY

The importance of shared research learning and scientific rigour in publication has been highlighted during the recent pandemic. Acquisition and sharing of knowledge pertinent to local and national health priorities has been a way in which positive steps towards 'normality' have been taken. The opportunity to re-engage the clinical workforce in a reinvigorated research approach for the African continent, transitioning from partnership-centric to nationally prioritised agendas, is obvious. If delivered through local and regional networks, research can be newly supported and directed for the benefit of the workforce and for patient outcomes.

Well mentored and led, this will allow a transition from current pockets of research excellence to functional regional research units which penetrate the wider clinical community. At a national level, care will need to be taken to avoid inequity in South–South alliances, while ensuring that the global South continues as an active partner with the global North. This should involve African centres in multinational collaborative partnerships, which particularly emphasise sustainable and digital infrastructure growth.

Acknowledgements ST-R is grateful to the UK National Institute for Healthcare Research (NIHR) Biomedical Facility at Imperial College London for infrastructure support and to the Wellcome Institutional Strategic Support Fund at Imperial College for fostering research collaborations. CME and ST-R are members of the Africa Research Excellence Fund (AREF) College of Mentors and are grateful for the support of AREF. We thank Professor C Wendy Spearman from the University of Cape Town, South Africa, for useful discussions; Professor Peter Olupot-Olupot from Busitema University, Uganda, for philosophical comments on the manuscript; and Professor Babatunde L Salako, Director General of the Nigerian Institute of Medical Research (NIMR), Lagos, Nigeria, for expert guidance.

Contributors AAAS and CME developed the original idea together and then planned the work with ST-R and TC. CME and AAAS conducted a literature search with input from ST-R and TC. CME reported the results and wrote the manuscript with help from AAAS, ST-R and TC. All authors contributed to and approved the final document. TC stands as guarantor for the work.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval This study does not involve human participants.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD

Cathryn M Edwards http://orcid.org/0000-0002-5550-9184

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