DELTAS Africa Learning Research Programme:

Learning Report No.4 (April 2019 – March 2020)

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ABBREVIATIONS

AAS	African Academy of Sciences
ACBI	Africa Capacity Building Initiative
AESA	Accelerating Excellence in Science in Africa
AFIDEP	African Institute for Development Policy
ARC	Africa Research Consortia
CCR	Centre for Capacity Research
DELTAS	Developing Excellence in Leadership, Training and Science
IDIs	In-Depth Interviews
KIA	Knowledge and Intellectual Abilities
KIIs	Key Informant Interview
KT	Knowledge Translation
LRP	Learning Research Programme
LSTM	Liverpool School of Tropical Medicine
MRC	Medical Research Council
PI	Principal Investigator
RCS	Research Capacity Strengthening
RMS	Research Management and Support
ReMPro	Research Management Programme in Africa

EXECUTIVE SUMMARY

The DELTAS Africa Learning Research Programme (LRP), embedded within the DELTAS Africa initiative, aims to produce research-based learning about how to train and develop world-class researchers, foster their careers and collaborations, and promote research uptake. The LRP comprises four thematic research strands, three of which are completed within the frame of a PhD fellowship. The thematic strands include:

1. Equitable career pathways
2. Research training
3. Knowledge translation
4. Consortia management

The LRP is led by the Centre for Capacity Research (CCR), Liverpool School of Tropical Medicine (LSTM), in partnership with the Alliance for Accelerating Excellence in Science in Africa (AESA), the African Institute for Development Policy (AFIDEP), and the Institut Pasteur.

This report presents key outcomes (learnings) from the DELTAS LRP for the period 1 April 2019 to 31 March 2020, as well as additional material obtained from complementary (non-DELTAS) learning programmes or activities.

The report content is intended for use by DELTAS consortia and stakeholders. To guide uptake of the presented findings, each thematic sub-section concludes with **Good Practices and/or Recommendations for Improvement**. We encourage all DELTAS directors, programme managers, fellows, research support staff and wider stakeholders to consider this material and its potential application within the context of their respective consortia.

The presented findings may usefully inform decision-making in the following areas:

- **Enhancing gender equitable career advancement in academic and/or scientific institutions**
- **Enhancing the impact of training programmes for academic staff**
- **Enhancing researchers' and/or research institutions' knowledge translation capacity**
- **Enhancing consortia outcomes through effective programme management**

Key findings from four complementary (non-DELTAS) CCR-led projects are also presented, including:

- **Common research management and support challenges in sub-Saharan Africa**
- **Practical actions for fostering cross-disciplinary global health research**
- **Preliminary findings from a learning programme embedded in the Africa Capacity Building Initiative**

This complementary learning content may also be of use to DELTAS consortia and stakeholders.

CCR will continue to work in collaboration with AESA to support the dissemination and programme-level application of the presented findings.

1 INTRODUCTION

The DELTAS Africa Learning Research Programme[1], embedded within the DELTAS Africa initiative[2], aims to produce research-based learning about how to train and develop world-class researchers, foster their careers and collaborations, and promote research uptake. The LRP comprises four thematic research strands, three of which are completed within the frame of a PhD fellowship. The thematic strands and research leads include:

1. Equitable career pathways

Lead: Ms Millicent Liani (PhD fellow, LSTM)
PhD title: "Examining barriers and enablers to gender equitable scientific career pathways in African research institutions". Supervisors: Dr. Rachel Tolhurst (LSTM) and Prof. Isaac K. Nyamongo (The Co-operative University of Kenya).

2. Research training

Lead: Dr Abiola Aiyenigba (Research assistant, LSTM)
Projects (to date): "Developing a registry of postgraduate training programmes in Medical and Health Sciences provided by Higher Education Institutions in sub-Saharan Africa"; "An online survey of sub-Saharan African researchers' professional development opportunities, needs and barriers"; and "Enhancing researcher training in sub-Saharan Africa through consortia membership: Case studies from the DELTAS Africa network".

3. Knowledge translation

Lead: Ms Violet Murunga (PhD fellow, LSTM)
PhD title: "Exploring the research uptake strategies used by African researchers to promote evidence-informed decision making". Supervisors: Dr. Justin Pulford (LSTM), Prof. Imelda Bates (LSTM) and Dr. Rose Oronje (AFIDEP).

4. Consortia management

Lead: Ms Nadia Tagoe (PhD fellow, Open University)
PhD title: "Examining the process of establishing and managing health research capacity strengthening consortia". Supervisors: Prof. Sassy Molyneux (KEMRI-Wellcome Trust), Dr. Samson Kinyanjui (KEMRI-Wellcome Trust) and Dr. Justin Pulford (LSTM).

This report presents key outcomes (learnings) from the DELTAS LRP for the period 1 April 2019 to 31 March 2020, as well as additional material obtained from complementary (non-DELTAS) learning programmes or activities. The report content is intended for use by DELTAS consortia and stakeholders.

Key findings from the LRP are also continuously shared with DELTAS Africa stakeholders in succinct, two-page bulletins every month. Highlights from this report will be further shared via these bulletins alongside new findings as they emerge.

For more information about LRP research activities and to access LRP resources please visit our DELTAS LRP research page[1] or contact the DELTAS LRP research lead, Dr Justin Pulford, directly at: justin.pulford@lstmed.ac.uk

[1] https://www.lstmed.ac.uk/projects/deltas-%E2%80%93-learning-research-programme
[2] https://aasciences.ac.ke/aesa/en/programmes/deltas/

2 DELTAS LRP LEARNING

2.1 THEME 1: EQUITABLE CAREER PATHWAYS

Progress update and preliminary findings

Ms Millicent Liani is currently working on her dissertation and publications pertaining to a study titled "***An examination of barriers and enablers to gender equitable scientific career pathways in the DELTAS-funded African research institutions".*** This is a qualitative study which examines opportunities and challenges faced by female and male research fellows in their scientific career progression within the DELTAS funded African research institutions. Three purposively sampled DELTAS Africa research consortia (DELTAS ARC) participated in the study. In-depth interviews (IDIs) with trainees/fellows at various career stages supported and/or affiliated to the DELTAS ARC was the main method of data collection. Key informant interviews (KIIs) with consortia research leaders/directors, programme managers/coordinators, monitoring and evaluation officers, and supervisors (co-investigators) were also conducted to corroborate information from the IDIs and also provide additional information on enabling factors/actions that are currently or should be in place, to enhance equitable career progression of female and male research scientists. Fifty-eight IDIs (32 Female, 26 Male) and twenty (20) KIIs were conducted between May and December 2018.

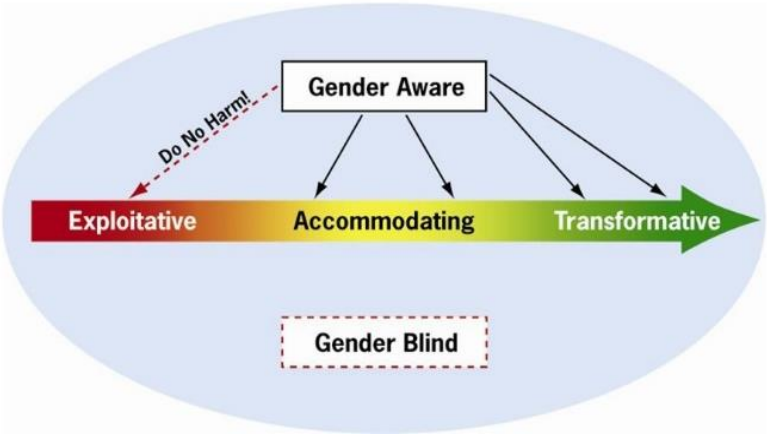
Member-checking exercise, which entailed confirming the accuracy and credibility of the data, as well as confidentiality checks based on the information provided in the transcripts by the individual study participants, took place from January to April 2019. A key suggestion from the member checking exercise by the majority of IDI participants was the request to present the finding as views and experiences of DELTAS Africa researchers as a whole as an additional strategy towards maintaining anonymity and confidentiality. Accordingly, we have modified the study design from initial case study approach towards an exploratory qualitative study within DELTAS Africa, with purposively selected DELTAS ARC without mention of the names in the final write up. Confidential feedback reports were provided in February 2020 to the respective research consortia that participated in this study.

Based on the previous DELTAS LRP annual reports[3], we appreciate the need for a more systematic approach for understanding efforts made by the three sampled consortia towards narrowing the gender inequity gap in scientific career progression. We draw on the usefulness of the continuum of approaches to gender integration (as illustrated in Figure 1), as developed by the Interagency Gender Working Group[4]. This is a commonly utilized tool to understand how organisations and programmes are addressing gender inequities (FHI 360, 2012; Rottach et al., 2009) and specifically, it classifies approaches/actions by how they address gender inequities in programming. This could help organisations or programme implementors to establish where they are positioned along the continuum, to facilitate self-reflection about next steps to be taken aimed towards achieving better equitable outcomes (USAID, 2007).

[3] Available at https://www.lstmed.ac.uk/research/centres-and-units/centre-for-capacity-research/resources site accessed on March 20, 2020.

[4] Interagency Gender Working Group. Accessed online at www.igwg.org , on March 20, 2020.

Figure 1: The Gender Integration Continuum



This tool categorises approaches made towards addressing gender inequities by placing each approach ("gender blind" and "gender aware") on a continuum ranging from "exploitative", "accommodating" and "transformative". The term ***"gender blind"*** refers to the programmes and policies that do not consider how gender norms and unequal power relations will affect the achievement of objectives, or how the programme or policy will affect gender norms and relations. In contrast, "***gender aware"*** refers to programmes and policies that deliberately examine and address the anticipated gender-related outcomes during design and implementation. The continuum itself classifies projects according to the way in which they respond to or address gender inequities: whether they seek to exploit, accommodate, or transform inequitable gender norms and roles (FHI 360, 2012). Specifically, ***"Gender exploitative approaches"*** take advantage of inequitable gender norms and existing imbalances in power to achieve programme objectives. ***"Gender accommodating approaches"*** acknowledges that inequities are embedded in gender norms and gender relations for which it does not actively attempt to address the underlying causes. Rather, it often works around accommodating gender differences to achieve project objectives. This approach may result in short term benefits which may only partially address the problem. The ***"Gender-transformative approaches"*** actively strive to examine, question, and challenge the rigid oppressive systems, gender norms and power imbalances as a means of achieving gender equity objectives. Gender transformative approaches encourage critical awareness among women and men of gender roles and norms, promote the position of women, challenge the distribution of resources and allocation of duties between men and women, and/or address the power relationships particularly in male dominated society and cultures (Kagesten & Chandra-Mouli, 2020; Rottach et al., 2009).

We have used this tool to demonstrate the collective efforts made by DELTAS Africa towards narrowing the gender inequity gaps in scientific research career progression based on key emergent findings from the in-depth interviews. In this report, we present the summarised main findings on five key challenges as well as existing good practices (GP) and participants' recommendations (R) that offer useful considerations towards narrowing the gender inequity gap in scientific career progression in Africa (Box 1). We have categorised the good practices and recommendations based on the continuum of approaches to gender integration as either gender accommodating (accommodating) or gender transformative (transformative), in recognition of the usefulness of this tool towards realisation of gender equity outcomes in programming.

Box 1: Good practices and/or recommendations for improvement

Key Challenge 1
Conflicts between the normative demands of family and scientific research career that call for long working hours and frequent mobility. This results in poor work-life balance, relationships and family suffering, and prejudice against women who prioritize establishing a career over marriage

Good practices and recommendations for improvement
For implementers
- Establish wellbeing initiatives within the programme that supports work-life balance e.g. work-life discussion panels at workplace for fellows (*GP - Accommodating*)
- Support by Principal Investigators through the allocation of research assistants to help female researchers who are constrained by family and caring demands (*GP - Accommodating*)
- Provide subsidies for child-care to fellows while on work-related travel (*GP - Accommodating*)

For research institutions
- Develop formal procedures on provision of flexitime to fellows (*R - Accommodating*)
- Make available occupational therapists and counsellors to help handle psychological issues experienced by researchers (*R - Accommodating*)
- Build and nurture a supportive research community through launching spaces and forums where female and male researchers can discuss and provide mutual support around career progression challenges, career decisions, and work-life balance issues (*R - Transformative*)
- Provide leadership training for fellows at all career stages to help build confidence, resilience, and support decision making around career progression (R - Transformative)

For funders
- Create community and public awareness on what research scientists do, particularly about the nature of science that requires long working hours and frequent scientific mobility, for which women researchers tend to be more disadvantaged based on their reproductive gender roles compared to the men (*R - Transformative*)

Key Challenge 2
Inequitable structures of gendered support systems within institutions characterised by insufficient mentoring and a dearth of female role models, inflexible working policies and culture, and lack of accommodation of women's needs

Good practices and recommendations for improvement
For implementers
- Establish and support researchers' needs through collection of monitoring data on gender and diversity. This requires a dedicated gender budget (*GP - Accommodating*)
- Develop virtual capacity building programmes (*R - Accommodating*)

For research institutions
- Develop a structured approach to career and psycho-social mentoring for fellows (which was viewed as crucial for career progression), especially at early research career stage (*R - Transformative*)
- Improve representation of women in science leadership and management positions to help enhance gender equitable decision-making on career progression matters affecting research fellows (*R - Accommodating & Transformative*)

- Improve fellowship adverts such as a disclaimer on anticipated support besides declaring that female candidates are highly encouraged to apply (*R - Accommodating*)
- Provide mother- and baby-friendly lactation rooms within institutions (*R - Accommodating*)

Key Challenge 3
Experiences of negative practices and culture at workplace characterized by gender stereotypes, unconscious biases, sexual harassment, bullying and intimidation

Good practices and recommendations for improvement
For implementers
- Establish and implement formal standard operating procedures at consortia level on how to report and handle sensitive malpractices experienced by fellows at workplace (*R - Accommodating*)
- Funders and consortia leaders to establish sanctions for grantees and researchers who portray negative behaviours at workplace (*R - Transformative*)

For research institutions
- Provide training and coaching to scientists and faculty staff on how to identify and deal with unconscious biases and gender stereotypes at workplace (*R - Transformative*)
- Conduct supervision training for supervisors (*R - Accommodating*)
- Confidential supervisory evaluation by fellows, as well as periodic review of fellows' experiences with their work environment, in addition to scientific quality (*R - Accommodating*)

For funders
- Funders and consortia leaders to establish sanctions for grantees and researchers who portray negative behaviours at workplace (*R - Transformative*)

Key Challenge 4
Francophone speaking fellows and social scientists face challenges as minorities in science research within DELTAS

Good practices and recommendations for improvement
For implementers & research institutions
- Encourage and financially support Francophone fellows to pursue English courses at the British Councils in their respective countries (*GP - Accommodating*)
- Establish an exchange programme for Francophone fellows to visit collaborating Anglophone countries to improve on English speaking and writing skills (*GP - Accommodating*)
- Provide tailored training courses for social scientists (*R - Accommodating*)

Key Challenge 5
Uncertainties with funding structure and career progression opportunities

Good practices and recommendations for improvement
For research institutions
- Actively support post-doctoral researchers in gaining relevant leadership experience, including allocating them primary supervisory roles for master's fellows (*R - Transformative*)
- Make efforts to create bridge/reserve research funds for salary support for researchers until they obtain research funding (*GP - Accommodating*)
- Organize mock interviews for fellows (*GP - Accommodating*)
- Efforts by some Principal Investigators on placement of fellows for permanent faculty positions (*GP - Accommodating*)

- Negotiate memorandums of understandings with research and academic institutions in Africa for career placement opportunities for fellows (*R - Accommodating*)
- Provide fellows with information about the possible career pathways available for them in their specific countries/contexts (*R - Accommodating*)

In conclusion, we acknowledge that the DELTAS Africa has progressively promoted approaches that are gender accommodating towards enhancing equitable career progression for women and men in scientific research career in sub-Saharan Africa. However, to maximize the impact of achieving equitable career progression outcomes for researchers, there is need to go beyond accommodating approaches towards embracing gender transformative approaches. Such approaches remain useful as they have the potential for shifting norms and may lead to more lasting outcomes, which is an important approach towards levelling the playing field to enhance gender equitable progression in science careers. However, such initiatives need to be carefully implemented so as not to reinforce male privileges created over the past decades.

References

FHI 360 (2012). *Gender Integration Framework: How to integrate gender in every aspect of our work*. Available at https://www.fhi360.org/resource

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2.2 THEME 2: RESEARCH TRAINING

Progress update and preliminary findings

This is the only LRP that has not been completed within the frame of a PhD project. All activities are led by an LRP research assistant, under the supervision of Dr Justin Pulford. During the past 12-months, there has been a change in staffing on this theme: the original research assistant, Dr Pierre Abomo took up a postdoctoral position within LSTM and, as such, was replaced by Dr Abiola Aiyenigba. Dr Abomo remained available to assist Dr Aiyenigba in the early stages of her appointment, ensuring a smooth transition. Three core activities have been completed in support of this theme, the first two led by Dr Abomo and the third by Dr Aiyenigba. These activities include:

1. Development of a registry of health-related postgraduate training programmes provided by higher education institutes in sub-Saharan Africa, which is now available online. Key findings from this activity were presented in a previous version of this report (Learning report No. 2, 2018). A manuscript titled "*A mapping of academic health science centres in sub-Saharan Africa*" is currently in development.

2. An online survey of sub-Saharan African researchers' professional development opportunities, needs, and barriers. Selected findings are presented below. Detailed findings will be presented in a manuscript currently in development, provisionally titled: "*Researchers' professional development needs, opportunities and barriers in sub-Saharan Africa: Findings from an online survey*". This publication will be uploaded on the AAS Open Research Platform by June/July 2020.

3. A qualitative case study exploring the extent, and process by which, researcher training in sub-Saharan Africa may be enhanced through DELTAS consortia membership. Analysis is currently ongoing. Preliminary findings are presented below. A manuscript titled "*Strengthening research capacity through the provision of individual training in the context of health research consortia: a critical case study"* is currently in development.

Selected survey findings

The sample frame for the survey included all members with an active email address belonging to one or more of six research networks administered by the AAS, including the DELTAS Africa initiative. In addition, survey invitations were extended across the Institut Pasteur's African research network and to members of four African research capacity strengthening consortia involved in learning programmes headed by LSTM. Inclusion criteria included: must hold citizenship to a sub-Saharan Africa country; must have a primary affiliation to a university or research institution within a sub-Saharan Africa country; must be currently employed in a research-based position (excluding research support); and/or currently undertaking a post-graduate qualification with a substantial research component. The survey was open to all researchers irrespective of career stage and academic discipline. **A total of 520 surveys meeting all inclusion criteria were completed representing 29 sub-Saharan Africa countries and 117 sub-Saharan Africa universities or research institutions. Forty-seven percent (244/520) of this sample belonged to the DELTAS Africa network.**

Seventy-six percent (399/520) of respondents reported attending at least one training event in the 12 months prior to survey. Collectively, these 399 individuals reported attending a total of 716 training events over this period (mean 1.8, SD 1.0). Table 1 presents the training topic, format, duration and provider of these 716 events.

Eighty-eight percent (456/520) of respondents reported at least one priority training need that they would like to complete within the 12 months after the survey. The topic and preferred format, duration, and provider of the stated number one training priority for these 456 respondents is also presented in Table 1.

Twenty percent (92/456) of respondents reported that it was 'very likely' that they would access their priority training within the next 12 months, 24% (108/456) 'likely', 42% (191/456) 'unsure', 9% (43/456) 'unlikely' and 5% (22/456) 'very unlikely'.

Table 1. Characteristics of the reported training attended in the past 12 months and preferences for priority training in the next 12 months

Training Characteristics		**Training attended in past 12 months** (N=716)[a] n (%)	**Priority training in next 12 months** (N=456)[b] n (%)
Topic[c]	Knowledge and intellectual abilities	427 (60)	300 (66)
	Personal effectiveness	13 (2)	7 (2)
	Research governance and organisation	96 (13)	58 (13)
	Engagement, influence and impact	135 (19)	84 (18)
	Not stated	45 (6)	7 (2)
Format	In-person training	538 (75)	305 (67)
	Conference/seminar	78 (11)	32 (7)
	Online/distance	80 (11)	28 (6)
	Other	16 (2)	38 (8)
	Any	-	53 (12)

	Not stated	4 (<1)	0 (0)
Duration	Up to 1 day	86 (12)	10 (2)
	Up to 1 week	341 (48)	134 (29)
	Up to 4 weeks	183 (26)	227 (50)
	1 month+	103 (14)	85 (19)
	Not stated	3 (<1)	0 (0)
Provider	Own uni./institut./org.	219 (31)	38 (8)
	National uni./institute./org.	104 (15)	33 (7)
	International uni./institute./org.	349 (49)	245 (54)
	Other	41 (6)	22 (5)
	Any	-	118 (26)
	Not stated	3 (<1)	0 (0)

a. N refers to the total number of trainings reportedly attended by survey participants;
b. N refers to the total number of survey participants reporting a training priority;
c. Participant data pertaining to the subject/topic of either training attended in the past 12 months or priority training in the next 12 months were coded into one of four subject domains prior to analysis. The four domains were drawn from the Vitae researcher development framework: https://www.vitae.ac.uk/vitae-publications/rdf-related

Table 2 presents actual or perceived barriers to training as stated by the 121 respondents who reported not attending any training in the past 12 months and the 456 respondents who reported at least one priority training need in the next 12 months. The mean number of barriers reported by each group were 1.7 (SD 0.9) and 1.8 (SD 1.1), respectively.

Table 2. Reported/perceived barriers to training attendance

Barrier	**Reported in past 12 months[a]** (N=120)		**Perceived in next 12 months[b]** (N=456)	
	n (%)	Rank	n (%)	Rank
Lack of suitable training opportunities	47 (39)	2	173 (38)	2=
Lack of time to attend training	34 (28)	3	59 (13)	4
Lack of financial support to attend training	70 (58)	1	315 (69)	1
Lack of information about training opportunities available	29 (24)	4	173 (38)	2=
Lack of technical facilities to access training opportunities	6 (5)	6=	49 (11)	5
Lack of qualifications required to take part in the training	6 (5)	6=	13 (3)	7
Lack of encouragement to attend training	7 (6)	5	17 (4)	6
Other	6 (5)	6=	3 (<1)	8
No barriers	-	-	33 (7)	-

a. As reported by respondents who attended no training in the 12 months prior to survey;
b. As reported by respondents who reported that a priority training need in the next 12 months.

Preliminary case study findings

The aim of this case study was to inform good practice recommendations for initiatives that emphasise the provision of quality, intensive training for early career researchers as a primary research capacity strengthening (RCS) mechanism. The focus of the good practice recommendations would be on optimising both: A) the development of individual research capacity; and B) the contribution of 'individual-centric' RCS initiatives towards broader institutional- and systems-level research capacity strengthening.

We employed a qualitative, comparative case study design utilising semi-structured interviews and document review collected from three out of the 11 DELTAS consortia. Case study consortia were purposively selected to reflect a balance in geographical location across sub-Saharan Africa, language, and models of training provision in order to ensure a variety of research training consortia contexts. Following selection, purposive sampling was further employed to select focal institutions belonging to each consortium (i.e. data were only collected from a sub-sample of consortia member institutions as opposed to all member institutions) and to recruit participants from each focal institution. **A total of 69 participants took part in semi-structured interviews from across the three cases.**

Analysis is currently ongoing, however, preliminary findings suggest that there are both benefits and challenges to consortia membership at the individual level (i.e. fellows who belong to the respective DELTAS consortia) and at the institutional level (i.e. the institutions of fellows who belong to each consortia), and that many of these, but not all, are shared. A summary of the shared and unique benefits and challenges of consortia membership across all three cases studied, with respect to achieving both individual- and institutional-research capacity strengthening, are shown in Tables 3 and 4.

Table 3: Reported benefits of consortia membership at individual and institutional levels

	Benefits - Individual level	Benefits – Institutional level
Case A	Research co-creation: fellows develop own research topics.	Trainees are recruited from existing university staff.
	Structured training events for personal, interpersonal development – Hard and soft skill training.	Global research collaboration- west, east and southern Africa institutions, north- south, within and across other consortia.
	Gender awareness policies- deliberate quota for female applicants, childcare support for fellows with young children.	Supervision & mentoring training opportunities for academic staff.
	Specific career development policies.	Strengthening of institutional policies regarding training e.g. supervision contract & MoU, recruitment policies.
	Strong focus on multidisciplinary.	Institutional high publication turn-out and securing grants.
	Opportunities for shared experiences amongst peers and collaborative research.	Procurement of training infrastructure.
Case B	Specialised training with pre-determined topics.	Institutions seen as “centre of excellence” through expert knowledge on subject.
	Tailored research specific training personal, interpersonal development – Hard and soft skill training.	Policies influencing strong leadership and accountability at host institutions.
	‘Centre of excellence’ approach to training.	Global research collaboration- west and central African institutions, north- south, and strengthened links between anglophone & francophone institutions.
	Opportunities for shared experiences amongst peers and collaborative research.	Development of local champions which influenced good institutional practice and performance.
	PhD and post doc fellows’ mentor and/or supervise junior peers at undergraduate and master level.	Procurement of training infrastructure.
	RCS focus on training individuals to trickle to their various institutions.	
Case C	Specialised training within specific themes.	Institutions seen as “centre of excellence” through expert knowledge on specific research themes.
	Structured training events plus tailored research specific training- hard and soft skills.	Global research collaboration- west and east Africa institutions, north- south, within and across other consortia, etc.
	Gender awareness policies- support for fellows with young children, female fellows mentoring and supporting junior peers, recruitment adverts encouraging female applicants.	Influenced policy change of stakeholders at district, national and regional levels.
	PhD and Post-doc fellows’ mentor and/or supervise junior peers at undergraduate and masters' level.	Strengthening of institutional policies to influence strong leadership and accountability at host institutions e.g. supervision MoU, PCE activities, etc.
	Fellows trained to become trainers.	Post doc and post docs involved in training & supervision increasing institutional resources.
	Special focus on community & public engagement activities for interacting with stakeholders.	Job creation at host institutions.
		Procurement of training infrastructure.

Table 4: Reported challenges of consortia membership at individual and institutional levels

	Challenges - Individual level	Challenges - Institutional level
Case A	Trainees experience bureaucratic delays in registration, ethical approval, and supervision agreements.	Bureaucracy in administrative tasks at host institutions.
	Supervision problems- apathetic behaviour hindering fellow progress, conflict of opinion within supervision team.	Delayed progress report by fellows leading to delay in disbursement of funds.
	Work life balance for trainees and research support staff compromised due to workload.	Lack of creativity with other streams of income generation.
	Lack of clarity relating to focal persons at host institutions.	Commitment of focal persons under threat if funding is withdrawn.
	Timeline conflicts between consortia and host institution timetables.	
	Communication challenges- too many requests for reports distracting for trainees.	
	Experience of toxic hierarchy by fellows at host institutions, stifled creativity.	
	Sustained career progression threatened if funder support or consortia affiliation is withdrawn.	
Case B	Trainees experience negative experiences and undue delays from poor management and execution of training activities.	Weak administrative co-ordination of training and research activities and accountability problems.
	Supervision- apathetic behaviour of supervisors at host institution hinders fellow progress.	Limited engagement of local stakeholders leading to reduced impact.
	Training for research support staff ad-hoc and inconsistent.	Bureaucratic barriers due to multi-level approvals & signatures at various levels at consortium level.
	Language barrier limiting learning, collaborations, publications turnout and visibility	Communication delays- leading to delay in disbursement of funds.
	Experience of toxic hierarchy by fellows at host institutions, stifled creativity.	Lack of creativity with other streams of income generation.
	Sustained career progression threatened if funder support or consortia affiliation is withdrawn.	Commitment of focal persons under threat if funding is withdrawn.
		No policy guideline on supervision (varies according to host institution).
Case C	Trainees support dependent on experience and expertise available in the partner institutions.	Institutional & regional politics affecting consortia processes and working relationships.
	Undue delays from poor management and execution of training and research activities.	Proximity to main institution affects the level of research support received.
	Politics at partner institution led to reduced access to learning spaces for fellows.	Leadership problem due to lack of experience of PI.
	Supervision- apathetic behaviour of supervisors hindering fellow progress.	Communication delays- leading to delay in funds disbursement.
	Delays from conflict of opinion within supervision team.	Lack of creativity with other streams of income generation.
	Financial delays -funds transfer and stipend value in real terms.	Commitment of focal persons under threat if funding is withdrawn.
	Timeline conflicts between consortia and host institution timetables.	Training resources- majority of training activities are delivered or organised by PDTF; suitability of PDTF delivering certain courses.
	Sustained career progression threatened if funder support or consortia affiliation is withdrawn.	Challenge of balancing research themes to match with regional health needs.
	Work-life balance- long field trips for researchers.	Work life balance- research field trips, long working hours (research support staff / finance team to meet deadlines).
	Language barriers limiting learning, collaborations, publications turnout and visibility, and training quality.	
	Communication problems- too many reports, email behaviour, etc.	

Good practices and/or recommendations for improvement

For implementers

- Consortia research plans and training activities relied heavily on existing funders with limited creativity in terms of income generation. The findings show that sustainability of training initiatives at partner institutions remains under threat if funder support is withdrawn.
- Irrespective of consortia identity, experiences, or challenges, DELTAS fellows perceived themselves as better off in terms of quality of training received in comparison to non-DELTAS fellows.
- The implementation of consortia training activities improves over time through experience.
- All three consortia emphasised the importance of a strong research capacity strengthening ethos. A shared commitment towards the strategic vision of achieving a critical mass of researchers and well-trained fellows were viewed as a powerful agent of change to promote research culture and leadership.

For research institutions

- Achieving institutional change in terms of enhanced training provision was usefully facilitated by: funding to support a dedicated training provider/support staff embedded in the partner institutions; committed, senior representation from partner institutions in higher-level consortia governance/decision-making; and provision of infrastructure and training support budgets to partner institutions.
- The importance of providing adequate support and fair compensation to academic supervisors appointed from partner institutions and ensuring the level and quality of their supervisory engagement is monitored.
- Lead institutions often reported challenges engaging with partner institutions which can lead to delays in training timelines and difficulties in trainee experiences.

For implementers & research institutions

- The majority of reported trainings attended in the past 12 months related to 'Knowledge and Intellectual Abilities' (KIA). Participants further prioritised training of this type, suggesting a match between the type of training most commonly attended and the type of training most commonly wanted. A similar match was evident in terms of training format, duration, and provider. However, this does not in itself imply that more of the same is the best professional development strategy. The survey findings suggest a shift in the overall balance in training provision across the four core domains may be required (although this is not to suggest that training provision should be provided in equal proportion across domains).
- Survey participants expressed preference for KIA training, suggesting the softer, more transferable skills promoted in contemporary models of researcher development are yet to be fully embraced by sub-Saharan African researchers. A slow embrace of soft skills training may be a sensible strategy if competency in these softer skills does not translate into greater career advancement opportunities; however, it may also suggest that the connection between greater competency in soft skills and greater (or more diverse) career prospects has not been sufficiently reinforced in sub-Saharan African researcher training to date.
- The preference for international training providers may suggest a lack of confidence in local training provision and/or recognition that the expertise in desired training subjects is not available locally. The latter possibility is exacerbated by the prioritisation of KIA-related training which is often highly discipline-specific unlike trainings from other domains which may be relevant to a

much broader audience and are, therefore, more likely to be available through local providers or more sustainable if investment in quality local training provision is made.

- The notion of investing in local training providers to deliver transferable skills training speaks to potential interventions to overcome barriers to professional development for sub-Saharan African researchers. 'Lack of suitable training opportunities' was consistently identified as a common barrier to training attendance, so developing local training expertise in core, transferable researcher development competencies presents a potential solution, albeit with the caveat that the value of such training may need to be reinforced in the local context (for reasons described above).

- 'Lack of information about training opportunities' also presented as a common barrier, further suggesting that more effective communication of the training opportunities currently available to sub-Saharan African researchers (as well as future training opportunities), inclusive of high-quality online training resources, may be required.

- Insufficient funding to cover training attendance costs (inclusive of all costs such as registration, travel, accommodation etc.) was the most frequently reported barrier to attending training. Increasing the availability of quality local provision would work towards reducing the costs of training attendance, but the primacy of this issue suggests that despite its relative unpopularity, investment in quality online or blended training provision models remains essential. However, online training provision was a relatively unpopular mode of delivery suggesting greater effort to ensure the acceptability of online training provision, inclusive of style and delivery of content, as well as the legitimacy of online training instruction may be warranted.

2.3 THEME 3: RESEARCH UPTAKE

Progress update and preliminary findings

Ms Violet Murunga is currently working on her dissertation and publications pertaining to a study titled ***"Exploring the research uptake strategies used by African researchers to promote evidence-informed decision making".*** Ms Murunga's PhD employs a qualitative case study design, centred on three purposively selected DELTAS Africa consortia. Data collection has been completed, including 26 semi-structured interviews exploring knowledge translation (KT) knowledge, attitudes and practices among research and research support staff (N= 26) and the identification and retrieval of a wide range of documents for formal review. Since the last learning report (Learning report No. 3, 2018-2019), Ms Murunga has published a paper titled ***"Review of published evidence on knowledge translation capacity, practice and support among researchers and research institutions in low- and middle-income countries"*** in the Journal ***"Health Research Policy and Systems"***. The abstract is presented below, followed by a link to the open access publication.

Background: Knowledge translation (KT) is a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to yield beneficial outcomes for society. Effective KT requires researchers to play an active role in promoting evidence uptake. This paper presents a systematised review of evidence on low- and middle-income country (LMIC) researchers' KT capacity, practice and interventions for enhancing their KT practice (support) with the aim of identifying gaps and informing future research and interventions.
Methods: An electronic search for peer-reviewed publications focusing on LMIC researchers' KT capacity, practice and support across all academic fields, authored in English and from the earliest records available to February 2019, was conducted using PubMed and Scopus. Selected studies were appraised using the Mixed Methods Appraisal Tool, data pertaining to publication characteristics and study design extracted, and an a priori thematic analysis of reported research findings completed.
Results: The search resulted in 334 screened articles, of which 66 met the inclusion criteria. Most (n =

43) of the articles presented original research findings, 22 were commentaries and 1 was a structured review; 47 articles reported on researchers' KT practice, 12 assessed the KT capacity of researchers or academic/research institutions and 9 reported on KT support for researchers. More than half (59%) of the articles focused on sub-Saharan Africa and the majority (91%) on health research. Most of the primary studies used the case study design (41%). The findings suggest that LMIC researchers rarely conduct KT and face a range of barriers at individual and institutional levels that limit their KT practice, including inadequate KT knowledge and skills, particularly for communicating research and interacting with research end-users, insufficient funding, and inadequate institutional guidelines, structures and incentives promoting KT practice. Furthermore, the evidence-base on effective interventions for enhancing LMIC researchers' KT practice is insufficient and largely of weak quality.
Conclusions: More high-quality research on researchers' KT capacity, practice and effective KT capacity strengthening interventions is needed. Study designs that extend beyond case studies and descriptive studies are recommended, including better designed evaluation studies, e.g. use of realist approaches, pragmatic trials, impact evaluations, implementation research and participatory action research.
Keywords: Knowledge translation, Evidence, Research, Uptake, Researchers, Academic, Institution, Capacity, Evaluation, Interventions, LMIC
https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-019-0524-0

Ms Murunga is currently in an advanced stage of data analysis. Between September and December 2019 she completed a first-round analysis of her interview data. Over the past three months (January 2020 to present), Violet has focused on finalising her review of institutional documents across her case consortia consisting of nine research/academic institutions. This data will then be triangulated with her interview data.

Document review preliminary findings

Based on reviews of vision and mission statements as well as strategic plans, a majority of the nine study research/academic institutions making up the three consortia cases aspire to generate research evidence that is responsive to societal needs and to actively promote its application in public and private sectors. However, reviews of institutional research policy documents, structures and process reveal that the institutions vary in the extent to which they are fulfilling these aspirations and are generally falling short:

- While the majority of institutions have research policy documents that emphasize generation of research that is relevant for addressing national priorities and of high quality, most of the institutional research priorities do not indicate their alignment to national research priorities.
- It is uncommon for institutions to have a KT strategy or guidelines and few of the nine institutions have this or outline specific or comprehensive KT strategies within their research policy.
- There appears to be more emphasis on commercialization of research innovations compared to promoting uptake of evidence in policy making processes and service delivery settings.
- When undertaking research, relevant accountability mechanisms also do not emphasize KT e.g. research ethics committees, particularly those dealing with applied research protocols, ask for dissemination plans and among a few, dissemination, and utilization plans. However, no further guidance on expected kinds of activities is provided.
- Most of the nine institutions have tenure and promotion processes that assess KT. However, only one institution clearly outlines a comprehensive inclusion and exclusion criteria for assessing KT. The rest of the institutions provide vague descriptions that could be interpreted variously and result in exclusion or inclusion of activities that do or do not pass as KT. Only one institution outlines an incentive (blocked-out time) for promoting KT practice among academics.

- Structural arrangements further illustrate the noted gaps. Most institutions are better resourced for their public relations function than for their KT and technology transfer function. The KT function is the least well developed in most of the institutions in terms of how the function is articulated and the staff allocated to this function. In many of the institutions, this function is integrated into the research support function with no staff allocated to focus specifically on this. Often, the description of the function is limited to having an open access institutional research repository, holding research conferences and public lectures and publishing a regular newsletter. Only one institution provided a comprehensive description of its KT function including KT activities undertaken, spanning the push, facilitate pull and exchange types of activities, and related research outputs.

Good practices and/or recommendations for improvement

For research institutions

- More investments are needed towards strengthening the KT functions of research/academic institutions including hiring specialized staff who can establish and implement KT best practices within the institutions.

- KT functions should be strengthened to offer services that span a range of activities including KT push (e.g. dissemination through email, newsletters, blogs, newspapers, TV etc.), facilitate pull (e.g. having in place repositories that clearly indicate actionable recommendations from the research, training research users on how to access and use research, having reserve funds to rapidly respond to evidence needs of target audiences etc.) and exchange activities (forging partnerships with target audiences to do research and promote its uptake).

- Strengthen the KT and technology transfer components of tenure and promotion processes including clearly articulating expectations and providing incentives such as time and awards to promote involvement in these. The assessment can be differentiated by research career stage and research type i.e. applied researchers are more likely to generate research applicable in policy and practice. Likewise, basic scientists are more likely to generate research innovations. In all cases, researchers more advanced in their careers have more time to be involved in KT activities.

2.4 THEME 4: CONSORTIA MANAGEMENT

Progress update and preliminary findings

Ms Nadia Tagoe is currently working on her dissertation and publications pertaining to a study titled "***Examining the process of establishing and managing health research capacity strengthening consortia*".** This is a qualitative study and consists of three phases of data collection:

1. Key informant interviews focused on identifying management processes adopted by the DELTAS consortia and the experiences of consortium leaders in implementing these processes. A total of 23 KIIs were conducted with DELTAS consortium directors, programme managers, and monitoring and evaluation staff from 10 consortia as well as representatives of the AAS. Preliminary findings from this first phase of data collection were presented in Learning report No. 3, 2018-2019.

2. Case studies to understand the factors that influenced management decisions and the role of consortium management in the research capacity strengthening (RCS) process. Three consortia were purposively selected as cases in order to capture a variation of consortium characteristics and contexts. For each case consortium, participants were selected from the lead institution and three partner institutions. Forty-four (44) in-depth interviews were conducted across the three

consortia with participants drawn from eleven (11) institutions in eight (8) countries. Participants included consortium directors, programme managers, monitoring and evaluation officers, finance officers, and other institutional stakeholders.

3. Ms Tagoe will generate and share summaries of findings for each case consortium with the respective consortia directors as a way of sharing her findings with participants and validating her data. This phase has yet to be commence.

Case study findings

The case studies in phase 2 examined the management strategies adopted by consortia, tensions encountered when deciding on strategies, factors that influenced their decisions, and how these strategies played out during implementation.

Tensions in management decisions

- Making management decisions is more complex than usually reported. Leaders constantly encountered tensions between compelling options each with its own capacity development consequences.
- Careful decision-making was required for key consortium management processes including partner selection, development of goals and activities, governance, assignment of roles and responsibilities, resource allocation, partner management, and coordination and monitoring.
- When deciding on strategies for these processes, leaders faced a decision between:
    - Selecting stronger partners to ensure consortium competitiveness for funding and programme performance and selecting less-strong partners so as to strengthen the research capacity of those who need it most.
    - Representative governance to ensure inclusive leadership and the need for executive control to ensure a high level of programme accountability to funders.
    - Allocating training resources based on excellence which prescribed awarding fellowships to the most competitive applicants or based on equitable distribution among partners.
    - Prioritising more efficient delivery of programme outputs and promoting more effective capacity development processes in managing partners e.g. allowing for learning-by-doing approaches even if it meant less efficiency.
- Decisions on management strategies are influenced by factors such as programme evaluation requirements and competitiveness for future funding as well as adherence to collaborative principles such as equity and inclusion. These factors determined whether consortia used merit or equity for trainee selection, whether they prioritized highly efficient project delivery or slower-paced partner learning, or whether they focused on short-term outputs or longer-term outcomes.
- Consortia made efforts to attain a balance between diverse strategy options, placing themselves along a spectrum rather than at one extreme or the other. However, consortia generally appeared to be driven more by the need to be competitive in the research and funding arena and to meet funder expectations, sometimes at the expense of more effective capacity strengthening approaches.

Research capacity strengthening vs research

- Consortia actors' interpretation of RCS was a major influence in decisions on management strategies and prioritisation of programme components. For example, while some consortia chose to focus on individual researcher training, others had a wider focus of training both researchers and administrators as well as strengthening institutional systems.
- The perceptions of RCS was at individual, institutional and consortia levels. Due to the interaction of these levels, consortia needed to reconcile and align these interpretations to incorporate them into their activities and management decisions.

- The way different consortium actors conceptualised RCS and the components prioritised were influenced by their level of research capacity, funder perceptions, and evaluation requirements. For instance, actors from institutions with a lower level of research capacity appeared to have a narrower interpretation.
- Both consortia actors and funders appeared to cast RCS programmes in the same mould as research programmes. For example, the evaluation indicators used in assessing consortia performance such as number of publications were more research-oriented than RCS-oriented. This appeared to be a major contributor to consortia's emphasis on the delivery of programme outputs such as publications. Also, the difficulty of measuring research capacity strengthened, and the lack of appropriate metrics resulted in the reliance on research-oriented metrics.

Role of management in research capacity strengthening

- Management processes are seen as means to an end and not perceived as capacity strengthening mechanisms in their own right. More emphasis is placed on technical research training of individuals as a key approach to RCS.
- There is rarely any assessment of the management capacity of consortium leaders, what their management role entails and what is required to fill the capacity gaps.
- There have been numerous gains for consortium actors at both individual and institutional levels resulting from participation in consortia. These include strengthened grant management capacity (human, processes, systems) as well as technical and managerial skills transferable to other programmes.
- In addition to gains resulting from the general participation in the consortium, there have been specific gains resulting from participation in consortium management processes. Capacity strengthening occurred through experiential learning as a result of the execution of management responsibilities by both lead and partner institutions, training sessions and mentoring.

Good practices and/or recommendations for improvement

For implementers

- Consortium leaders acknowledge limited management training and 'managing by experience'. It will be valuable to provide leadership and consortium and programme management training/support for consortia leaders and managers. Attention and emphasis should be placed on strengthening capacity in both operational and relational aspects of consortia management.
- Managing RCS consortia involves considerable effort including identification of partner contexts, strengths and gaps, relationship building, participatory decision-making, and peer mentoring at both individual- and institutional-levels. These are essential for achieving capacity strengthening aims and hence should be incorporated into programme planning, budgeting and monitoring.
- Consortium management processes and experiences are capacity strengthening opportunities in their own right. Deliberately tracking, reflecting and reporting on consortium management elements including capacity gains will provide evidence for enhancing the effectiveness of consortia and contribute to research capacity strengthening.

For implementers & funders

- There are varying interpretations of "research capacity strengthening". Funders and consortia actors need to explicitly discuss the RCS aim of DELTAS across both consortia (possibly funder-driven) and within consortia. The importance of the technical and management aspects at both individual- and institutional-levels in attaining more holistic and sustainable research capacity needs to be particularly emphasized.
- It is essential to develop and use more appropriate metrics for RCS beyond those for research. This can be done through engagement of multiple stakeholders including consortia actors, capacity

researchers, monitoring and evaluation specialists and funders. Evaluation indicators significantly influence consortia's interpretation of RCS and what they prioritise.

- Consortia often encounter dilemmas when determining management strategies. Consortium actors and funders need to work together ensure a balance between producing programme deliverables and achieving sustainable capacity outcomes.

- The requirements of effective health research capacity strengthening consortium management call for dedicated resources (including time and funds) both on the parts of funders and consortium leaders.

3 COMPLEMENTARY LEARNING

CCR works across several research capacity strengthening programmes and projects and is therefore uniquely positioned to be able to learn, disseminate and use lessons among those implementing, managing and funding these projects. This provides substantial added value for the DELTAS LRP. Relevant learnings and updates from selected other CCR activities are presented below

3.1 RESEARCH MANAGEMENT AND SUPPORT SERVICES (RMS) CHALLENGES IN SUB-SAHARAN AFRICA

CCR recently completed a synthesis of 28 RMS capacity assessments completed in 25 universities/research institutions from across 15 sub-Saharan African countries between 2014 and 2018. All assessments were completed by CCR, in collaboration with the host institution, according to a standardised methodology. In brief, each assessment focused in full or part on RMS capacity and consisted of semi-structured interviews conducted with research and research support staff at the respective institution as well as document reviews and observation of onsite facilities. The assessments were designed to assess existing RMS capacity against an international benchmark. The benchmark was determined based on a review of the RMS literature and in consultation with various stakeholders and focused on six core domains: institutional research strategy; institutional support services; research facilities; human resource management for research; training activities for research and external promotion of research. All assessments were qualitative, with no attempt made to rank, score, or measure existing capacities. A full report describing the identified capacity gaps and recommended capacity strengthening actions was completed at the conclusion of each on-site assessment.

Data were extracted from the 28 reports according to a framework synthesis approach. The framework, constructed in Microsoft Excel, consisted of eight column headings including the institution name, the six core RMS domains and an 'other' column. Two independent reviewers read the full text of each report and recorded any listed or implied capacity gap relating to RMS within the corresponding column (e.g. 'unreliable power supply' would be listed under the 'research facilities/infrastructure' column against the respective report). A third reviewer subsequently compared the entries from the two independent reviews for each domain within each report. When the same or similar capacity gap was reported by both the initial reviewers, a single representative label or description was applied to describe it. When a capacity gap was only identified by one of the first two reviewers, the third reviewer consulted the full text of the corresponding report and made a final decision as to its inclusion.

Results

Thirteen distinct categories of capacity gap emerged from across the 28 RMS capacity assessment reports. Each of the 13 categories, along with specific examples of capacity gaps common to each category, are presented in Box 2.

Box 2. Common RMS capacity gaps

1. **Physical Infrastructure**
   Unreliable power supply; insufficient laboratory-, office-, study-, meeting or physical storage-space.
2. **Information and Communication Technologies (ICT) Infrastructure**
   Insufficient ICT hardware; nil/limited access to specialist software; limited internet access or bandwidth capacity.
3. **Operating Equipment**
   Absence or critical shortage of essential laboratory-, field- and office equipment; vehicle shortage.
4. **Laboratory Services and Support**
   Poorly maintained laboratory equipment; limited funding to support laboratory maintenance; limited/nil laboratory Quality Control (QC) systems or accreditation; insufficient biosecurity/laboratory safety protocols and resources; nil/sub-optimal revenue generation from provision of laboratory services.
5. **Research Funding**
   Limited/nil availability of national and/or institutional research funding; limited funding to support post-graduate research required for attainment of award.
6. **Workforce**
   Excessive workloads for research and research support staff; prolonged staffing vacancies due to hire freezes and/or absence of suitably qualified candidates; aging workforce; under-qualified and/or unexperienced workforce; insufficient laboratory technicians and/or research support staff.
7. **Remuneration**
   Uncompetitive and/or insufficient salary relative to living costs; inequitable salary 'top-up' system applied to externally funded research grants (e.g. academics costed in, but support staff not).
8. **Professional Development**
   Limited/nil access to training/professional development activities for research and research support staff (technicians and support staff having lowest levels of access); limited/nil institutional structures/services to support professional development; limited/nil staff mentorship schemes; limited/nil staff appraisal and performance mechanisms.
9. **Career Progression**
   Limited promotion opportunities (especially for technicians and research support staff); job-insecurity; poor staff retention (primarily support staff); limited opportunities for junior academics to enter faculty positions (exacerbated by aging workforce remaining in post).
10. **Institutional Support Services**
    Inefficient/inadequate financial management-, procurement-, data management-, human resource support services; limited access to research literature/e-resources; limited/nil functionality of institutional review boards.
11. **Research Support and Project Management**
    Limited/nil pre- and post-award support services, quality assurance and monitoring; limited research cost recovery policies/expertise; limited/nil institutional research strategy.
12. **Internal Communication and Collaboration**
    Limited internal (inter-departmental) communication and collaboration mechanisms; limited access to and/or awareness of institutional polices and/or available support services.
13. **External Communication and Networking**
    Limited/nil institutional communications strategy; limited/nil institutional funds and/or staff incentives to support knowledge translation activities; limited/nil research output repository; limited support or oversight of institutional website (content and maintenance).

Almost all assessed institutions faced significant gaps in RMS capacity within and across each of these 13 categories suggesting multi-focal interventions/strategies may be necessary to 'shift' current RMS capacity to a significantly stronger position within sub-Saharan African universities and research institutions. The type and scope of intervention required to address the diverse capacity gaps would also vary considerably. Addressing some of the identified capacity gaps would primarily necessitate financial support to purchase required resources such as the operating equipment examples described above, high cost investment in infrastructure development and research funding. However, in other cases the provision of training or technical assistance would be more appropriate (e.g. to support professional development, laboratory maintenance or the development of publication/data depositories) and in others support to strengthen institutional policies, practices and systems would be most appropriate (e.g. to streamline and strengthen financial management practice, staff induction and accountability processes or establish institutional review boards). Some interventions would almost certainly require external input (e.g. to support specialised training or procurement of otherwise unaffordable equipment) whilst others could be driven by the respective institutions themselves (possibly with some degree of external support) such as the development of remuneration policies or more effective internal communication and collaboration mechanisms.

Typologies were also not independent of each other, but rather often closely inter-connected. For example, financial management and/or human resource systems (i.e. institutional support services) were often constrained, in part, by limited/nil access to computing hardware and specialised software (ICT infrastructure), limited training (professional development) and promotion (career progression) opportunities and perceived low pay (remuneration). Thus, effective intervention in many cases would require multiple actions (i.e. all three of financial expenditure, training and systems strengthening) designed to address multiple capacity gaps.

Underlying 'threads' were also evident across multiple typologies, the two most obvious of which were the severe fiscal constraints and often complex bureaucracy of the institutional operating environment. Many challenges were directly attributable or exacerbated by these two threads. Neither are necessarily easily resolved in a sub-Saharan Africa context, but RCS interventions that address these common constraints may be especially valuable across typologies (and, therefore, more impactful).

A full manuscript presenting these findings is currently under development. Provisional title is:
Common challenges to the effective provision of research management and support in sub-Saharan Africa and proposed conceptual tools for informing the capacity strengthening response. Pulford J, Crossman S.J, Begg S, Amegee J, Abomo P, El Hajj T, Bates I.

3.2 Practical actions for fostering cross-disciplinary global health research

The CCR multi-disciplinary capacity development research project has undertaken a literature review with the abstract presented below to determine the practical actions for fostering cross-disciplinary global health research.

Global health research involves disciplines within and beyond the health sciences. A cross-disciplinary collaborative research approach enables an interchange of knowledge and experience and stimulates innovative responses to complex health challenges. However, there is little robust evidence to guide the design and implementation of cross-disciplinary research in global health, hampering effective collective action. This review synthesized evidence on practical actions for fostering cross-disciplinary research to provide guidance on the design and implementation of research in global health.

We searched five electronic databases using key words. The search included original research and research notes articles in English. We used a framework adapted from the socio-ecological model and thematic synthesis for data analysis.

Thirty-six original research and 27 research notes articles were included in the review. These were predominantly from high-income countries and indicated that practical actions on fostering cross-disciplinary research are closely linked to leadership and teamwork which should be planned and implemented at research team and institutional levels. The publications also indicated that individual qualities such as being receptive to new ideas and funders' power and influence have practical implications for conducting cross-disciplinary research. Practical actions that individuals, research team leaders, academic institution and funders can undertake to foster cross-disciplinary research were identified.

The review found that the existing published evidence on fostering cross-disciplinary research in practice is mainly from high-income countries and that practical actions for fostering cross-disciplinary global health research are closely linked to leadership, management, collaboration, and teamwork. As shown in Box 3, recommendations are provided at the individual-, research team leadership-, academic-, and research funder-level and all have practical implications for conducting cross-disciplinary research. Across all levels these findings can be applied to improve cross-disciplinary research in global health.

Box 3. Practical actions for fostering cross-disciplinary research

Individual
- Identify your own motives and believe in the value of cross-disciplinary research
- Be receptive to new ideas, deal with the unknown, tolerate ambiguity
- Gain cross-disciplinary research experience through networking and mentorship/menteeship
- Take time to understand other disciplines and team members
- Foster teamwork through good communication, negotiation, interpersonal relationships, time management, and leadership skills

Research team leader
- Define research problems collaboratively to produce a common theoretical framework, a shared understanding and a common language
- Develop a clear vision with an explicit goal of knowledge integration across disciplines
- Establish a cross-disciplinary team that includes clearly defined roles, rules and boundaries
- Engage local stakeholders and develop working relationships through transparency, trustworthiness, fair recognition and realistic goals
- Build trust and minimize academic and discipline hierarchy
- Encourage team-level reflection on both the process and outcomes of cross-disciplinary research

Academic institution
- Implement incentives that value cross disciplinary research
- Provide administrative support and tools for good cross-disciplinary research management and coordination
- Provide seed money, and identify external funds, for cross-disciplinary research and its dissemination
- Facilitate spaces for researchers from multiple disciplines to work and meet

Research funder
- Commission research on cross-disciplinary communication and coordination
- Recognise that cross-disciplinary research projects may need their own metrics
- Ensure the process for reviewing cross disciplinary proposals is fit for purpose
- Encourage academic institutions and publishers to recognise and promote cross-disciplinary research

Further detail about this study can be found in the publication:
Ding Y, Pulford J, Bates I Practical actions for fostering cross-disciplinary global health research: lessons from a narrative literature review BMJ Global Health 2020;5:e002293.

See also the IMPALA MUDI bulletin, December 2019

3.3 AFRICA CAPACITY BUILDING INITIATIVE (ACBI)

Through extensive interviews and focus group discussions, the CCR-ACBI programme have listed the factors that positively and negatively influence the progress of PhD students in the form of barriers and enablers either at the individual-, institutional-, or consortia/systems-level. It also considers some of the benefits that PhD students acquired from belonging to a consortium. As presented in Box 4, preliminary findings suggest that the major challenges PhD students are facing are mostly occurring at the institutional-level.

Box 4. Barriers to conducting PhD research

Individual

Family responsibilities/maternity: A key challenge for married students and particularly for female students. Women reported difficulties juggling between family and work responsibilities with maternity delaying work progress.

Financial: Particularly reported by married male students who are expected to be the major breadwinners for the family. Some reported leaving their jobs to do their PhD and struggling to support their families on their stipend.

Institutional

Poor supervision quality and power relations: Supervisor's lack of appropriate research expertise; lack of timely response and feedback; lack of technical and professional support; poor communication and lack of transparency; irregular follow-up to students.

Lack of supportive working and learning environments: The importance of having a supportive and encouraging research environment that goes beyond the physical facilities, equipment and infrastructure to encompass supportive experts and lead researchers who care about the professional progress and advancement of the doctoral students and early career researchers.

Poor facilities/infrastructure: Poorly equipped laboratories and lack of fundamental research tools (e.g. functional laboratory or field equipment, adequate consumables, advanced software and hardware for computational research); poor wi-fi or internet connection; major power cuts; poor access to scientific journals and research articles.

Institutional bureaucracy and delays: Bureaucracy influenced processing students' stipend on a regular basis as well as procurement of equipment. Institutional delays in procurement meant that students and principle investigators had to sometimes find alternative ways of obtaining the necessary equipment to keep the research moving.

Lack of personal and professional development opportunities: Often absent or very limited due to the lack of funding but ACBI-affiliated students received opportunities including training for PhD students; engaging PhD students in research projects; participating in scientific conferences or meetings; attending external technical courses; supervising master students; and teaching.

Other: Relating to the security and infrastructure of field sites or geographical areas where the research is taking place, and an overall lack of funding for research at their institutions, particularly for theoretical research or research that is not perceived as a priority by the local government.

Consortia/system

Competition between PhD students: Little collaboration and minimal communication between the students created a feeling of isolation and discomfort.

Too many supervisors: Having several supervisors could sometimes slow down work progress.

Listed in Box 5 are the benefits and enablers that foster progress of PhD students which are mostly found at the consortia/systems level. In the absence of institutional support, RCS programmes are crucial not only to the progress of PhD students but also to the production of quality research work.

Box 5. Enablers to conducting PhD research

Individual

Personal motivation: Friends and families are proud of their successes and achievements.

Family support: Supportive family and partners helped female students balance family life and research work.

Enhanced financial revenue in the future: A motivation to complete PhD studies was attaining an enhanced financial revenue in the future through occupying higher positions and having better jobs bringing a higher-quality standard of living.

Institutional

Quality supervision and good monitoring processes of research progress: A pivotal factor with students who had positive supervision experiences reported better motivation and better overall progress with their work.

Good infrastructure and a supportive working and learning environment: Good facilities and overall infrastructure at institutions meant less challenges in terms of research support. Having a supportive working environment is considered an enabling factor for work progression.

Consortia/system

Networking and establishing professional long-term relationships: For future academic collaborations within and beyond the programme.

Opportunities for personal and professional development: Advancing knowledge and skills (e.g. training in technical and research skills as well as in life/generic/management skills; participating and presenting in national, regional and international conferences and meetings). Colleagues, students and technicians outside of the grant have benefited from the ACBI-funding training programmes held at their institutions.

Exchange visits to other research/academic institutions within Africa and the UK: Opportunities to learn about new techniques, use state-of-art technologies unavailable in their home country and access advanced equipment and laboratory facilities, and offered some a fresh view on their own working environment through working in other institutions.

Receiving academic and professional support and advice: Interacting and acquiring feedback from regional and international experts improved students' experiences and inspired them to generate new ideas.

Receiving new equipment and instrumentation: In some cases, students no longer need to travel or seek other laboratories to conduct their basic experiments. The purchase of new laboratory equipment and computer software/hardware for ACBI-affiliated students also benefited the local institution/department.

Increased self-confidence: PhD students have strengthened their communication skills and confidence through networking and presenting research findings and francophone students reported improved English language skills.

Fostering research outputs: Publications were perceived to improve the reputation of the students, researchers, and the institution.

Building a sense of solidarity through South-South collaboration: Manifested through the exchange visits and collaborations within and amongst the African institutions; students' interactions with friends and fellow PhD students from all over Africa, particularly during consortium meetings and annual meetings.

An additional element of the ACBI findings has been suggestions for consortia to operate more effectively which are presented in Box 6 below.

Box 6. Suggestions for improving consortia working

- More transparency with regard to the project's budget lines and reporting, particularly in terms of how much budget is allocated for students' stipend, travel, research work, and fieldwork
- Allocate a budget for monitoring and maintaining field equipment to be set by the research team
- Plan strategically so that future research work could build on the currently funded work
- Limit the number of supervisors for each PhD student
- Assign an external mentor for every PhD student, independent of the principle investigator (e.g. outside the department or consortium/consortia)
- Enable young researchers to emerge and flourish through building healthy and constructive relationships, as well as ensuring a supportive working environment at the institutional level
- Establish training needs assessment for the students at the institutional and consortium level at the start of the programme
- Maximise opportunities to gain leadership skills such as supervising junior students or managing people in the field
- Allow 3-month placements in well-equipped institutions
- Consider multidisciplinary research collaborations and implementation

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The cross-learning generated through the ACBI initiative and DELTAS LRP was recently noted in the UKCDR report[5]:

> "*ACBI and DELTAS benefit from and contribute to cross-learning through the Centre for Capacity Research (CCR) at the Liverpool School of Tropical Medicine (LSTM) involvement in research and monitoring & evaluation (M&E) for both programmes."*

END

[5] Yaso Kunaratnam, Jeff Waage, Adrian Bucher, Callum Boyd (2020). A mapping analysis of UK-funded fellowships and scholarships for Africa