
# DELTAS Africa Learning Research Programme:

# Learning Report No.3 (Apr 2018 – Mar 2019)

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## ABBREVIATIONS

| | |
|---|---|
| ACBI | Africa Capacity Building Initiative |
| AESA | Accelerating Excellence in Science in Africa |
| AFIDEP | African Institute for Development Policy |
| AMARI | African Mental Health Research Initiative |
| APHRC | Africa Population and Health Research Centre |
| CARTA+ | Consortium for Advanced Research Training in Africa+ |
| CCR | Centre for Capacity Research |
| CSO | Civil Society Organisations |
| DELGEME | Developing Excellence in Leadership and Genetic Training for Malaria Elimination in Sub-Saharan Africa |
| DELTAS | Developing Excellence in Leadership, Training and Science |
| DFID | Department for International Development |
| HEI | Higher Education Institute |
| HRCS | Health Research Capacity Strengthening |
| IDI | In-Depth Interview |
| IDeAL | Initiative to Develop African Research Leaders |
| IRCA | Institutional Research Capacity Assessment |
| KT | Knowledge Translation |
| KII | Key Informant Interview |
| KWTRP | KEMRI Wellcome Trust Research Programme |
| LMIC | Low- and Middle-Income Countries |
| LRP | Learning Research Programme |
| LSTM | Liverpool School of Tropical Medicine |
| MARCAD | Malaria Research Capacity Development in West and Central Africa |
| PI | Principal Investigator |
| RCS | Research Capacity Strengthening |
| RMS | Research Management & Support |
| SANTHE | Sub-Saharan African Network for TB/HIV Research Excellence |
| SOP | Standard Operating Procedure |
| SSA | Sub-Saharan Africa |
| ToC | Theory of Change |
| THRIVE2 | Training Health Researchers into Vocational Excellence 2 |
| TWAS | The World Academy of Sciences |
| WACCBIP | West African Centre for Cell Biology of Infectious Pathogens |

## EXECUTIVE SUMMARY

The DELTAS 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, in partnership with the Alliance for Accelerating Excellence in Science in Africa (AESA), the African Institute for Development Policy (AFIDEP) and the Institut Pasteur, Paris.

**This report presents key outcomes (learnings) from the DELTAS LRP for the period 1 April 2018 to 31 March 2019**, 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 a **'Learning Application'** discussion. We encourage DELTAS fellows 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 & support challenges in sub-Saharan Africa**
- **A framework for evaluating impact of research capacity strengthening initiatives**
- **Preliminary findings from a learning programme embedded in the 'Africa Capacity Building Initiative'**
- **A review of research capacity strengthening outcome and impact indicators**

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 Learning Research Programme (LRP)[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:

5. **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).

6. **Research training**
   Lead: Dr Pierre Abomo (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".

7. **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).

8. **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 2018 to 31 March 2019, 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 DELTAS LRP findings, each thematic sub-section concludes with a **'Learning Application'** heading. We encourage DELTAS fellows to consider this material (even if much of it remains preliminary) and its potential application within the context of their respective consortia.

[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

Ms Liani has completed a review paper titled **"Towards an integrated conceptual framework for understanding intersecting gender inequities in scientific career progression in higher education institutions in sub-Saharan Africa"**. This review paper is currently under submission in journal *International Journal of Gender, Science and Technology*. Preliminary findings from this review were presented in a previous version of this report (Learning report No. 2, 2018). An abstract is presented below. The Centre for Capacity Research (CCR) will circulate the paper, and supplementary file, across the DELTAS network once published.

**Literature Review Abstract**

The slow progression and under-representation of women in senior scientific career positions is a well-known and persistent global problem, especially among university-based academics, particularly in Sub-Saharan Africa (SSA). To inform action for change, we need to go beyond numerical evidence of inequalities to understanding the underlying social, cultural and institutional drivers and processes producing gender inequities in science careers. This requires a theoretically rigorous gender analysis framework that is relevant to SSA and sufficiently accounts for variations among both women and men. Since no such framework is available, we conducted a literature review of emerging theories and empirical evidence on the dimensions of and reasons for the prevailing gender inequities in higher education institutions in SSA. Based on this, we propose an integrated conceptual framework, which we have applied to the available empirical findings to test it for 'fit' and to develop a preliminary explanation of observed inequities. Our findings demonstrate that women's (lack of) progression in academic/scientific careers is shaped by intersections between gender roles and social power relations of gender within the family, wider society and academic institutions themselves. We argue that this integrated model provides implications for theory, practice at institutional and policy level, and future research.

Ms Liani has also completed 90% of data collection activities pertaining to her PhD study. The purpose, study design, and selected preliminary findings from interviews with DELTAS fellows and institutional staff are presented below:

***Purpose:*** This qualitative study seeks to examine the opportunities and challenges faced by female and male research fellows in their scientific career progression within the DELTAS funded African Research Institutions.

***Study design*:** The selected consortia involved in this research study include:

1. Initiative to Develop African Research Leaders (IDeAL), a capacity building initiative of KEMRI-Wellcome Trust Research Programme (KWTRP) based in Kenya.

2. Malaria Research Capacity Development in West and Central Africa (MARCAD), whose secretariat is based at the Université Cheikh Anta Diop, Senegal.

3. Sub-Saharan African Network for TB/HIV Research Excellence (SANTHE) - coordinated from the African Health Research Institute, based at the University of KwaZulu-Natal, South Africa.

In-depth interviews (IDIs) with DELTAS supported trainees and research scientists was/is the main method of data collection for this theme, along with key informant interviews (KIIs) with consortia research leaders/directors (DELTAS Principle Investigators [PIs]), programme managers/coordinators, monitoring and evaluation officers, human resources managers, and supervisors (co-PIs). Where possible, interviews were conducted in person, with Skype/telephone interviews carried out with fellows and staff located at the consortia's partner institutions. To date 58 IDIs with fellows (32 Female, 26 Male) and 22 KIIs have been conducted across the three selected case study consortia. The IDIs with DELTAS-supported trainees and research scientists was the main method of data collection, aimed at gathering qualitative data through provision of narratives about their lived-experiences in their science careers, as well as experiences with their current institutional environment (policies, practices, culture) in shaping their career progression. KIIs were conducted to corroborate information gathered from the IDIs and also to provide additional information on enabling factors/actions and policy processes that are currently or should be in place, to enhance career progression of female and male research scientists.

**Preliminary Findings**

Preliminary analysis shows that the career progression of female and male researchers to senior positions within the DELTAS supported institutions is influenced by many factors, including various individual, socio-cultural and institutional barriers and facilitators to scientific career progression set out below:

*Barriers to Scientific Career Progression*

1) **Negative influence from family members and peers on career path taken in science** with perception that scientific research is not a well-paid career path and there is no assurance of financial stability.
2) Some **women scientists are constrained by patriarchal norms**, that is, social norms and values exerting pressure on unmarried female scientists to get married and have children, at a time when peers are establishing their science career.
3) **Traditional unequal gender division of labour creates tension with balancing marriage, family and scientific research career especially for women researchers with young families**. This has had the following implications:
    a) Has led to a female fellow with a young family dropping out of the DELTAS fellowship programme, while others have forfeited applying for fellowships abroad or regularly attending conferences and trainings abroad because of family commitments.
    b) Some female participants who are married with young children expressed fear of undertaking long-term exchange programmes (over 3 months) as they perceived this could create disharmony in families which might result into separation or divorce.
    c) Respondents reported bias in recruiting female lab-based researchers by some supervisors given the urgency of projects because of the risk of maternity leave absence (3-6 months).

4) **Language barriers for fellows originally from francophone speaking countries** who expressed difficulties during training delivered in English, as well as challenges with preparing presentation slides in English. Fellows report that it takes them a long time to write scientific papers for publication in English. The process usually involves a first draft in French, and sometimes sending the document to someone to translate into English (who may not have a scientific background), followed by requesting supervisor/s or mentors to help with re-translation of the science. This approach works best if a supervisor has a smaller number of supervisees.
5) **Lack of appropriate mentoring and availability of (female) role models**. Some fellows complained that they barely meet with their mentors, who seem to be too busy; lack of involvement of mentees in selection of their mentors; concerns that the allocated mentors lack a one-on-one relationship with the fellows; shortage of female mentors and role models in successful marriages who female fellows could easily relate with.
6) **Fear of uncertainty with research funding characterized by lack of job security because of short-term contracts**. As a result, some fellows, both female and male, have considered quitting scientific research. The majority reported that without the collaboration with a well-known PI, it is difficult to win the research grants, upon which scientific career progression depends.
7) **Research funding allocation perceived as inequitable and racist.** There is a common perception that racial discrimination by funding agencies for African applicants exists to explain why it is hard to win a research grant as a lone African applicant without a White collaborator/co-applicant.
8) **Absence of institutional support for childcare** such as nursing-mother friendly rooms and crèches at the workplace.
9) Bureaucratic **delays in disbursement of research funding and procurement of laboratory resources** which is likely to create delays in timely completion of the fellowship in some sites.
10) **Delays** with getting **research ethical clearances** in some sites.
11) **Inadequate and sometimes abusive supervision**. A number of junior researchers reported that supervisors are unavailable to provide inadequate supervision, and some reported abusive or bullying behaviour, such as yelling at junior fellows in public spaces within the institutions (mainly reported by female fellows) and asking for a higher number of publications from fellows than required. This was felt to lead to attrition of fellows from the programme as well as weakening the aspirations of fellows to progress in their careers within the same institutions. Some sites reported difficulties with finding African science supervisors who are active in research. Both fellows and supervisors/co-PIs reported that there was a lack of supervisory training to supervisors by the DELTAS programme and identified this as a perceived gap.
12) **Negative stereotypical attitudes at workplace towards career women**. For example, formal meetings between women at the workplace are sometimes characterised by male colleagues as gossip time, and male junior staff look down upon young successful female research staff.
13) **Unconscious biases mainly directed towards female research fellows/scientists**. For instance, some male scientific managers caution female fellows/scientists to avoid pregnancy within the lifecycle of a research project; colleagues questioning 'why you aren't getting married' which makes the work space uncomfortable; experiences of subtle bullying from some senior researchers who seems threatened and uncomfortable by fast-track career progression of juniors to senior positions by stepping into a research area that is similar to that of the senior scientists.
14) **Limited research culture** characterised by: limited exposure to scientific research for undergraduate and postgraduate students; Lack of career advice from University supervisors about career progression for early researchers; Frequent lecturers' strikes in African Public

universities delays career progression/timely completion and graduation for postgraduate fellows.

15) **Marginalisation of social scientists in scientific research within their institutions**. There were complaints that most research centres are more inclined to basic sciences thus most social scientists see themselves as a minority. They feel that they cannot easily promote their science due to a lack of the 'right audience' that can offer intellectual stimulation, thus sometimes they feel they are not welcome. There is a lack of tailored social sciences trainings and courses offered to such fellows "*You just have to attend the trainings they propose even though you know quite well that they are irrelevant*".
16) **Lack of clear institutional policies and structures to address bullying, harassment and discrimination**. A lack of clear policies or procedures on how to report and effectively address sensitive issues such as sexual harassment, bullying and discrimination was commonly reported at both institutional and consortium levels.
17) **Lack of a clearly-defined and stable scientific and academic career pathways and opportunities for emerging scientific researchers in Africa**. There was expression of fear amongst doctoral and post-doctoral fellows about the lack of opportunities after completion of their fellowships. They highlighted that there are very few research institutions in Africa and that most African universities don't have many vacant positions or offer protected time for research.

*Facilitators of Scientific Career Progression*

1) **Family and spousal support** as critical for scientific career progression through provision of child care and emotional support.
2) **Good mentorship** was viewed as crucial for career progression, especially at early research career stage.
3) Support by PIs through **allocation of research assistants to help female fellows/researchers with data collection** where they have family demands because of young children.
4) **Support for childcare (subsidy for childcare) when traveling abroad**, as mainly reported by female mid-career and senior scientists.
5) **Flexible working arrangements** agreed upon with supervisors/line managers, who were consequently referred to as 'pro-family research leaders'.
6) **Work-life discussion panels** between junior research fellows and senior scientists within the workplace, which are helpful in understanding the career progression issues faced by juniors and seniors, who may be able to provide support - e.g. with time management skills.
7) Presence of **a well-being department that supports the work-life balance of researchers/staff** through encouraging them to undertake physical exercise and avoid working over the weekends. Some institutions have deployed occupational therapists and counsellors who help with the psychological issues experienced by researchers.
8) Encouraging fellows, as well as facilitating them financially, to **pursue English courses** at the British Councils in their respective countries.
9) Provision of **fellowships to researchers to visit their collaborators abroad** to enable them gain scientific and English speaking and writing skills. Some fellows (from Francophone countries) have applied for AESA's mobility fund to visit Anglophone countries during the analysis and writing phase to improve on their English language.

10) **Bridge funds by research institutions which support salaries for researchers** who are still struggling with research funding, as well as transition of PhD fellows upon their successful completion of fellowship. IDEAL programme, for instance, offers a one-year bridge fund to PhD fellows, commonly known as 'Career Development Year' which aids them to start thinking about their future career pathways through undertaking grant and paper writing and establishing research collaborations, although it is not guaranteed for all PhD fellows.
11) **Institutional support for networking and collaborations** i.e. through annual retreats for fellows where senior researchers and mentors are invited to share their career experience.
12) Some PIs are **providing supervisory opportunities to doctoral and post-doctoral fellows** to co-supervise their juniors which is useful for co-authorship in publications, and in gaining leadership, teaching and supervision skills early in their careers.

**Theme 1: Learning Application**

To enhance gender equitable scientific career progression within the DELTAS Africa Initiative, the following suggestions were put forward by the study participants, which we have categorized as institutional level approaches and programme-wide approaches as tabulated below:

*Institutional-Level Recommendations for Enhancing Scientific Career Progression:*

1) **Adopt a more structured approach to mentoring of fellows through:**
   a) Inquiring from fellows as part of the progress report and programme evaluation on how the mentorship is working for them.
   b) Consider involving the fellows during the selection of their mentors in future.
   c) Junior fellows should be allocated mentors separate from their supervisors to help them deal with any issues such as sexual harassment, bullying and supervisory challenges, they potentially experience within their work environment.
   d) Consider providing external female mentors to offer psychosocial support to female fellows.
2) Institutions should consider **deploying a career and psycho-social counsellor** within the workplace to guide staff and fellows on how to deal with challenges pertaining to their career progression.
3) **Improvement in allocation of supervisory roles to fellows** – post docs should also be considered as primary supervisors for MSc fellows
4) **Review the content of forms to evaluate fellows' DELTAS experiences** – consider widening the scope to cover issues pertaining to views about the work environment, personal development and general well-being, as opposed to focusing mainly on the science. Institutions should also **consider undertaking routine collection of gender and diversity data from fellows/researchers to aid in proper planning and targeted support for scientists with various career progression needs**. Such evidence can be useful when writing grant applications to support disadvantaged scientists.
5) **Consider providing training and coaching to scientists and faculty staff on how to identify and deal with unconscious bias** within the workplace. **Supervision training for supervisors** especially for those based in sampled African universities was suggested too.

*Programme-Level Recommendations for Enhancing Scientific Career Progression:*

1) Create supportive and gender sensitive work environment through:
    a) Establishment and implementation of formal standard operating procedures (SOPs) at consortium level on how to report and handle issues of discrimination, intimidation, bullying and sexual harassment at workplace.
    b) Improved communication of institutional policies such as maternity and paternity leave, sexual harassment and bullying at workplace to staff/fellows. Enhance communication through online campaigns i.e. by asking "what is your institution doing to address gender inequities in career progression".
    c) Launching spaces/forums where female researchers can hold conversations about matters affecting their career progression, and thus enhancing peer-to-peer mentoring.
    d) Provision of child care support at workplace (reported by both male and female fellows) e.g. have subsidies to childcare outside of the workplace, establish crèche facilities or subsidized childcare and nursing mother friendly rooms where they can express and store breast milk.
2) Explicit statement in the fellowship and job adverts that 'child care support for those with young children when on travels will be provided', in addition to declaring that 'female candidates are highly encouraged to apply'.
3) Support for language minorities at scientific gatherings such as conferences through provision of translation services. Consider extending the fellowship programme to Master's level so that Francophone speaking fellows can easily grasp English language as they progress to doctoral and post-doctoral levels (case of MARCAD).
4) Develop a more structured and well-defined scientific career pathway for African fellows. For instance, through creation of a DELTAS-wide career centre that can negotiate for Memoranda of Understanding with research and academic institutions in Africa to establish placement opportunities for fellows, as well as provision of information to fellows about the possible career pathways available for them in their specific countries/contexts.
5) Develop novel approaches to funding in Africa. For example, funders and institutional leaders could create a protected competitive funding for women in science in Africa, similar to 'Organization for Women in Science for the Developing World' Fellowship offered by The World Academy of Sciences (TWAS) given most women face similar challenge of balancing family and child care with scientific career.

## 2.2 Theme 2: Research Training

Three core activities have been completed, or commenced, in support of this theme to date. The three activities include:

1. Development of a registry of health-related postgraduate training programmes provided by higher education institutes (HEIs) 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).

2. An online survey of sub-Saharan African researchers' professional development opportunities, needs, and barriers. This is a brief (5-10 minute) survey, available in both English and French, that will be administered to all DELTAS Africa fellows as well as members of other African Academy of

Sciences-administered research networks. Launch of this survey has been delayed due to an unexpectedly lengthy ethical review process; however, it is anticipated that the survey will be formally launched in late April 2019 with final results available for reporting at the 2019 DELTAS AGM.

3. A qualitative case study exploring the extent, and process by which, researcher training in sub-Saharan Africa may be enhanced through consortia membership. The purpose of these case studies is to learn and understand to what extent membership of the DELTAS Africa network influences the research training programmes designed and implemented by research institutions across the DELTAS-sponsored consortia. The case studies are carried out among purposively selected consortia including: Consortium for Advanced Research Training in Africa+ (CARTA+); Malaria Research Capacity Development in West and Central Africa (MARCAD); and (pending final approval) Developing Excellence in Leadership and Genetic Training for Malaria Elimination in Sub-Saharan Africa (DELGEME). To date, data have been collected from the African Population Health Research Centre and the National University of Rwanda (CARTA+) and University Cheikh Anta Diop and University of Yaounde I (MARCAD). The data were collected through semi-structured interviews, site observations and document review.

**Preliminary Findings**

The data collection and analysis for study 3 are still ongoing. However, preliminary findings emerging from the first case study with CARTA+ show that:

- The research training programme developed by CARTA+ is highly regarded and well perceived by research fellows and their supervisors. The features of the CARTA+ research training approach are praised both by fellows and host institutions because they help to improve both the quality and quantity of research and academic support staff to provide a better research training environment, equipment and curricula;

- The issue of sustaining the intervention approach of CARTA+ and having it embedded within partner institutions seems to be crucial in CARTA+'s theory of change. This objective is starting to take shape in some partner institutions such as the University of Rwanda where processes for reviewing research training policies at the post-graduate level and adapting them to the research training model promoted by CARTA+ are ongoing. Another critical finding to note regarding the institutionalisation goal, is that at the University of Rwanda for instance, this institutional change is led and driven by former and current CARTA+ fellows (albeit supported by the management, as well as senior academic and administrative staffs of the university);

- In terms of impact, CARTA+ fellows reported feeling more confident and conversant with research methods than before they joined the CARTA+ fellowship. They testify to be better equipped and trained when it comes to critical research skills such as research methods, multidisciplinary research, grant writing, scientific publications and community engagement as compared to their institutional peers who are not part of the CARTA+ programme. Many of the CARTA fellows have been successful in grant applications and in using their research findings to inform policymaking in their home institution and country;

- Nevertheless, research collaboration appears to be the area wherein opportunities offered by vast research networks like CARTA+ and DELTAS are not fully harnessed by CARTA+ fellows. The minimal research collaboration among fellows across the consortia could be explained by the insufficient communication around the DELTAS Africa initiative among its grantees and its strategic vision. Also, the lack of venues convening all CARTA+ or DELTAS fellows together, beyond the DELTAS annual grantees meetings, could add to these limitations to build and solidify the growing new generations of African scientists.

**Theme 2: Learning Application**

Regarding good practices, the case study on CARTA+ showcase the following examples that could inspire other DELTAS consortia:

- The targeting of research training programmes towards staff already part of the workforce of the institution. This strategy strengthens the capacities of people who are already tasked with conducting high-level research activity. It also enhances the capabilities of the research institution by providing opportunities to augment and retain the numbers of staff with high-quality research skills, allowing them to become scientific leaders and contribute to the development of a conducive research environment;

- Before and during the Doctoral training: well-structured and intensive research-focused training seminars for both PhD students and their supervisors help to create better conditions for PhD research work and supervision; the stipend for PhD students and financial incentives for supervisors also contribute to this same objective;

- After the PhD graduation: the follow up of graduates and opportunities to develop their research career through postdoctoral opportunities and re-entry grants.

## 2.3 THEME 3: RESEARCH UPTAKE

Ms Murunga has completed a review paper titled **"Knowledge translation capacity, practice and support among researchers in low- and middle-income countries: A structured review of the published literature"**. This review paper is about to be submitted to the journal *Implementation Science*. Preliminary findings from this review were presented in a previous version of this report (Learning report No. 2, 2018). An abstract is presented below. CCR will circulate the paper, and supplementary file, across the DELTAS network once published.

Ms Murunga has also (nearly) completed data collection for the first phase of the empirical component of her PhD. Employing a sequential exploratory mixed methods design, Ms Murunga will collect data in two discrete phases. Phase one is a qualitative case study entailing in-depth interviews with representative research and research support staff from three purposively selected DELTAS Africa consortia including: African Mental Health Research Initiative (AMARI); Training Health Researchers into Vocational Excellence in East Africa-2 (THRiVE-2); and West African Centre for Cell Biology of Infectious Pathogens (WACCBIP). The qualitative study findings will then inform a survey to be administered to all DELTAS Africa fellows and research support staff in late 2019/early 2020 (Phase two).

**Literature Review Abstract**

**Objectives** Knowledge translation (KT) is defined as 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 literature review focusing on researchers' KT capacity and practice or interventions for improving their KT capacity and practice in low- and middle- income (LMIC) contexts. **Methods** An electronic search for peer reviewed journals focusing on LMIC researchers' KT capacity, practice and support, 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 and a narrative synthesis used to summarise emergent themes. **Results** The search resulted in 334 screened articles of which 68 met the inclusion criteria. Most (45) of the articles presented original research findings, 22 were commentaries and 1 was a systematic review. 49 articles reported on researchers' KT practice, 10 assessed research institutional KT capacity and 9 reported on KT support for researchers. More than half (59%) of the articles focused on sub-Saharan Africa and majority (93%) on health research. The findings suggest that LMIC researchers rarely conduct KT mainly due to limited capacity at individual and institutional levels including limited KT knowledge and skills, funding, and institutional guidelines, structures and incentives promoting KT practice. Furthermore, the evidence-base on effective interventions or supports for enhancing KT among LMIC researchers is limited and largely of weak quality. **Conclusions** More research on initiatives aimed at strengthening researchers' and research institutions' KT capacity is needed. Intervention studies should employ more robust evaluation designs preferably using mixed methods and assessing context, process and outcome indicators in the short-, medium- and long-term.

**Preliminary Findings**

Ms Murunga has completed a total of 25 in-depth interviews across the three consortia, with a small number still scheduled for completion. Detailed analyses of the data are expected to be completed by August 2019. Preliminary findings from early stage analyses of one consortium are presented below

*KT knowledge*

Respondents' conceptualisation of what knowledge translation is and entails was mixed. Respondents who have either read extensively on the topic or received prior KT training provided more comprehensive definitions of knowledge translation and descriptions of what it entails in relation to existing theories. More than half of respondents believed that researchers have a role to play in KT to ensure that the research evidence they produce is beneficial to society. A number of specific ways in which researchers can promote KT were mentioned. They ranged from involvement of research participants/communities in the identification of research priorities, to involvement of policymakers throughout the research process as co-investigators, to providing regular communication to research participants throughout the research process including dissemination of research findings. The role of communications experts in supporting researchers to undertake KT activities was also cited as important by some respondents. Although, the conceptualisation of what the communications support for KT entails varied among the respondents. Some respondents viewed communications

experts' role primarily as facilitating mass media engagement. While some respondents had a broader view of their role, which includes media and policy engagement as well as simplifying research results into key messages that can be understood by non-scientific audiences.

*KT practice*

Despite the recognition of researchers' role in KT, some respondents noted that researchers are not playing this role largely because they prioritise their role as research producers. Some respondents reported having experience doing some aspects of KT including working with communications experts and intermediary actors such as experts from Civil Society Organisations (CSOs) and journalists, prior to the DELTAS Africa programme, which has explicit KT objectives. However, their experience centered around involving policymakers, practitioners and community members in the research process from identification of research questions through dissemination of the research findings. Few respondents had experience doing other KT activities such as simplifying and packaging their research findings for non-scientific audiences.

A primary motivation to participate in KT was an inherent desire to find and implement workable solutions to known problems. No respondent referred to host institutional KT policies, strategies and mechanisms as motivators of their KT efforts. When specifically asked if their host institutions were supportive of KT only two respondents specifically highlighted their institutions aspirations to impact policy and practice. One of the two respondents reported that this is operationalised through the use of a national research agenda by all research ethics committees to assess the extent to which researchers and students research topics align to national priorities and a requirement to discuss dissemination of research plans. Indeed, the referenced host institutions research strategy states that researchers would be encouraged to 'incorporate in their project proposals the dissemination of results to end-users' and this was reflected in the research proposal guidelines. However, the guidelines do not provide specific activities and/or products expected in relation to research dissemination. The second respondent reported that KT is part of the tenure and promotion assessment. Indeed, the performance appraisal guidelines outline KT as a critical component of performance assessment. The guideline recognizes (as articulated by the respondent) that 'some disciplines lend themselves more easily to social responsiveness activities than others, and that these activities vary widely, and do not align in any simple way to academic seniority or rank' and uses a weighting system to account for these differences. Most respondents also did not refer to country policies and mechanisms promoting evidence informed decision making as motivators of their KT practice. Yet, review of national documents reveal that all host countries have national research councils that coordinate national research and facilitate application of evidence in decision making processes including leading development of research agendas.

The DELTAS Africa initiative has a KT objective, 'Scientific Citizenship', which mandates DELTAS grantees to carry out policy, public and community engagement activities. Therefore, the DELTAS Africa initiative has influenced more active implementation of KT activities by researchers. However, descriptions of the granting process reveal that limited guidance was provided to grantees in relation to the KT component and that KT was not a critical determinant of winning proposals. AESA has since then tried to rectify this by organizing sensitization meetings with grantees. However, respondents'

articulations of expectations in relation to KT were inconsistent and reveal confusion in relation to this.

*Barriers and facilitators of KT*

Factors that influence researchers' KT practice fall in three categories, those related to the researchers' knowledge, attitudes and skills, those related to institutional support and those related to the broader context. In relation to the **researchers' knowledge and skills** including skills for networking, writing and packaging evidence for non-scientific audiences (e.g. policy briefs), and media engagement were cited as a barrier to their KT practice. Being a lab-based scientist was also linked to no or limited KT practice relative to other scientists who interact more with policymakers, practitioners and communities in their research process. Only two respondents mentioned KT trainings that they have been involved in prior to the DELTAS programme. However, a number of respondents reported attending KT training events organised by DELTAS Africa, either through AAS or through their specific consortium.

Among respondents who had experience working with communications experts, there was a mix of views about communications experts' KT capacity. While some viewed them as having limited knowledge and skills and need training, some viewed them as being effective at facilitating KT. Respondents that had a more comprehensive understanding of KT and what it entails tended to think communications experts had limited KT understanding and skills and could benefit from training. The limited KT capacity is likely as a result of how communications departments' role in academic institutions is defined. Most respondents noted the existence of communication departments within their host institutions but most criticised them as focusing on public relations. Most respondents revealed that it is uncommon for academic institutions to have communications staff with explicit KT roles. Only one respondent cited a growing emphasis on the communications department and a research support centre supporting researchers with KT activities. A review of the institution's documents found this to be true but also revealed that among the other respondents, there were some existing KT structures within host institutions that they are unaware of. For instance, one institution's research support center organizes annual research dissemination conferences, a platform for students and researchers to disseminate their research, share knowledge and build partnerships and collaborations that is also open to policymakers and the public. However, policymakers and the public appear to be a secondary audience in these forums; the primary audience are researchers.

**At the institutional level**, the most cited factors that hinder researchers' KT practice were institutional performance standards that favour research and publishing in peer reviewed scientific journals, and limited budgets allocated for KT. Most respondents cited that funders rarely make allocations or enough allocations for KT. Some respondents noted that funding is typically focused on short term activities e.g. one-off dissemination meetings and no follow-up beyond the research completion. The DELTAS programme is an example of a project that expected grantees to hire communications/public engagement officers and budget for KT activities to meet the programme's KT objective.

**At the context level**, funding, the dynamic nature of the policy making context, political interest and national values and laws were cited as key factors influencing KT. Inadequate funding for KT was a commonly cited barrier to researchers' KT practice. National documents reviewed did not specifically

mention provision of funding for KT although there are investments made to structures such as national research councils that aim to play this role. Only two respondents reported that funders they had dealt with, other than the DELTAS, have either mandated grantees to do KT or have made recent changes in their funding requirements mandating grantees to do KT. Wellcome Trust was explicitly cited as a funder that has a KT focused grant. Only one respondent referred to government funding for KT, citing it as underutilized. Research ethics committees were also cited to have little focus on uptake of findings in policy and practice. In relation to the dynamic nature of the policy making context, election cycles and related changes in government were reported to negatively affect KT often resulting in loss of issue champions and changes in political interest. The political interest in an issue was also cited as critical to the success of KT. Involving community leaders in the research process and integrating neglected issues with issues of high political interest such as HIV were reported approaches used to circumvent noted challenges. In addition, tailoring KT activities to align with national values and laws was noted as critical to their success. Researchers' knowledge of the issue, health system and context and being know to the policymakers were highlighted as valuable attributes among policymakers. A few respondents noted that communities are amenable to taking up new practices. However, this is hindered lack of sustained investments beyond the research period. Investment in building and sustaining relationships with policymakers and influential individuals at community level was highlighted as a key enabler of KT.

**Theme 3: Learning Application**

Respondent data from the in-depth interviews will be assessed against the Lavis at al (2006) framework for linking research to action[3]. The Lavis framework has four elements. The first element assesses the general climate, which is concerned with research funders', universities', researchers' and users' support or value KT. The second element addresses the production of research including priority setting to identify users' needs and use of scoping reviews, systematic reviews and single studies to address these needs. The third element addresses the mix of four clusters of KT activities including: push efforts that involve strategies are used to support action based on the messages arising from research; facilitate "user pull" involving repositories of optimally packaged high-quality reviews either alone or as part of a national electronic library for health, how these reviews are profiled during "teachable moments" such as intense media coverage, and the use of rapid-response units to meet users' needs for the best research; "user pull" efforts undertaken by those who use research, for example, assess their capacity to use research and change their structures and processes to support the use of research; exchange efforts which involve forging meaningful partnerships between researchers and users to jointly ask and answer relevant questions. The fourth element addresses support for and approaches to evaluation of KT activities and their impact, emphasising robust evaluation.

IDI data from across the three case studies have yet to be analysed in full. However, presented below is a further preliminary analysis from one case consortia against the second, third and fourth elements

[3] Lavis J, Lomas J, Hamid M, Sewankambo N. Assessing country-level efforts to link research to action. Bulletin of the World Health Organization. 2006;84(8):620-8.

in the Lavis et al framework. These data further highlight KT strengths and weaknesses in one DELTAS consortium case example and illustrate the potential of the Lavis et al framework as a tool to assess existing KT capacities and opportunities. We would encourage DELTAS Directors, programme managers and communications officers to consider their own KT activities against this case example.

*Production of research*

Only two respondents mentioned the existence of mechanisms for identifying national research priorities at the national level. Respondents cited a combination of information sources to identify research questions including national research agendas, clinical practice, participation on government technical working groups and reviews of literature. One respondent did not reference the national research agenda as a source of research questions. Among all respondents, there was no reference about how their approaches align to institution level frameworks. Review of host institution strategic plans and/or research policies or strategies espouse commitment to producing research that is informed by national and global priorities. However, how these aspirations are operationalized is not clear in all except one institution. Further exploration of this was beyond the scope of this research.

Much of the research undertaken by respondents are intervention and service evaluation studies, multi-disciplinary and largely using randomised controlled study designs. Most respondents who are researchers or have a research background highlighted a trend towards multi-disciplinary research in their institutions and among funders. Nearly all institutional research policies or strategies also recognize the importance of multi-, inter- and trans- disciplinary research in relation to research that is relevant for informing policy and practice and therefore espouse goals of promoting cross disciplinary collaborations. Although, for all except one institution, mechanisms in place to ensure this happens is not clearly articulated. For two institutions, co-supervision is one strategy being used to promote this. Interview responses also illustrates some efforts towards this at college, school, faculty and department levels but also some gaps in some disciplines e.g. social scientists.

Some respondents reported having either conducted a systematic review or been involved in a decision-making process that used a systematic review of evidence. However, respondents who reported having ever conducted a systematic review had done it primarily to inform their research focus rather than as an input into a decision-making process. A notable gap in research in all institutions as well as at programme level is the generation of systematic reviews, which are critical as an input in decision making processes. None of the host institution documents highlighted the generation of systematic reviews as a priority given their aspirations to input into policy and practice. As noted earlier, systematic reviews are mainly viewed as part of the research process to identify research gaps. Their value as an input into policy and practice decisions is not recognised. Although, given the strong focus on KT in the DELTAS programme, the systematic review training has been adapted to incorporate information on its importance and uses in policy and practice decisions beyond just identification of research gaps.

*Push efforts*

Most respondents reported a range of KT push activities most of which were tailored for the public including citizens, communities, and local and international policymakers and practitioners, funders

and researchers. The most commonly undertaken KT push activities were publishing non-technical articles/opinion editorials in print media, doing radio interviews, podcasts, and public talks such as TED talk and Aspen Ideas. Respondents also commonly cited interacting with a wide range of audiences including local and global policymakers, practitioners, communities and funders to either disseminate research findings or inform the research design and process. Reported platforms where interactions happened include: 1) presentations and participation on panel discussions at national, regional and global meetings/conferences; 2) Theory of Change workshops organised by the respondent; 3) respondent's participation in a technical working group and policy formulation task forces; and 4) during clinical practice. Theory of Change workshops largely aimed to identify policymakers', practitioners' and service users' needs and priorities to inform the focus, design and approaches of research projects. It is worth noting that there were disproportionately more reported interactions at global level than national or local levels. Policy dialogues organised by respondents bringing together policymakers, practitioners and researchers to discuss policy issues were also rarely reported. Respondents also rarely reported developing and using policy briefs as an input in policy-making processes.

Respondents activities may be influenced by broader institutional cultures. Review of institutional documents found that KT push efforts being undertaken and documented in all host institutions mainly take the form of scientific conferences open to policymakers and the public and public forums/dialogues on specific issues. Only one institution systematically documents its KT activities and in its latest (2017-18) annual report found that organising conferences for non-academic audiences were the second most common types of KT activities (27%) behind collaborative research related activities (43%) e.g. conducting strategic, government-funded and/or applied/action research. However, academic products e.g. books, articles and conference posters were the main outputs (59%) of KT activities, followed by applied products (22%) e.g. policies, research briefs and technical assistant, and community products (19%) e.g. newsletters, blogs, social media and digital media.

More recently, as a result of the DELTAS programme, respondents reported more diverse and creative KT push activities including integrating use of documentaries, performing arts including well known artists, music and road shows and public transportation as mediums for disseminating key evidence-based health messages to the public. Still, majority of the KT activities center around presenting research findings at scientific conferences organised by the programme or other groups to which policymakers are invited and sometimes part of the programme. Use of mass media and social media are also main KT push activities.

*Efforts to facilitate pull*

All host institutions included in this case have databases or lists of researchers and their research interests and ongoing and past projects. Although in one institution, this was not easy to locate. All institutions also have research repositories of research produced by the institution. In some institutions, the information provided in the databases/list of researchers was incomplete. Whether or not these are updated on a regular basis and the process of gathering this information was not explored in the interviews. Furthermore, while all institutions had a research repository, they lacked summaries of the research, which is critical for interested researchers to get a short comprehensive synopsis of the research to inform whether they should get the full article.

Having in place a rapid response service is one way that an institution could get research users, particularly policymakers, to seek and use research more in their decision-making processes. However, such services were not reported or identified in any of the host institutions. At programme level, this strategy is also not being used by this consortium.

*User pull efforts*

Given the emphasis of this study on researchers and research institutions, not much information in this area is expected. Some respondents reported some experience working with government health authorities to test or scale up interventions. These activities entailed undertaking needs assessments to identify skills and resource gaps and address them through training and allocation of funding. However, none of the respondents reported experiences of enhancing evidence-informed practice at other stages of the policy process life cycle including agenda setting, policy formulation and policy evaluation. From the documents reviewed, no explicit strategies in relation to enhancing the capacity of research end-users individual and institutional capacity to use research was mentioned.

*Exchange efforts*

All research respondents reported doing collaborative research with government health authorities, patients and communities. Largely because most of the research they are or have been undertaking involves testing, evaluating and scaling up health interventions within public health facilities or communities. Investments in time to nurture relationships and involvement of research end-users throughout the research process were noted as critical for successful KT exchange efforts. Respondents also reported having forged a number of partnerships with CSOs working on similar issues to promote better access to care and health outcomes. As noted earlier, an institutional framework for guiding KT activities was identified in only one host institution, which is systematically assessed on an annual basis. In its latest report collaborative research was the most common type of KT undertaken by the institution. At programme level, the consortium approach, which largely stems from the research culture of the institutional leadership and also the type of research undertaken, is to engage research end-users including community, policymakers and practitioners in the research process. As noted earlier, the Theory of Change workshop was cited as a critical platform used in every research to get input into the research process from all actors. Health authorities and practitioners are typically research co-investigators.

*Evaluation*

None of the respondents reported past systematic efforts to assess the impact of their efforts to influence policy and practice or the impact of their research in general. One respondent highlighted monitoring and evaluation as being weak in general typically not paying attention to understanding underlying factors influencing research uptake and not having a long-term view, though from the community perspective. At host institution level, only one institution assessed its KT activities on an annual basis for the past decade (since 2010) and reports progress in its 5-year strategic plan. This is done using an annual voluntary survey of all faculties of the institution. At the programme level, The DELTAS programme has a reporting requirement for policy and public engagement activities. DELTAS

fellows are required to submit progress on quarterly basis to the consortium Monitoring and Evaluation (M&E) Officer who compiles quarterly reports to the consortium Steering Committee and annual reports to the AESA M&E office. The DELTAS programme annual reporting tool does not define specific targets expected. Rather, broad guidelines of what is expected are provided and DELTAS grantees are expected to report the KT activities and milestones that they defined at the proposal development stage. Although, at a later stage, in a bid to support DELTAS grantees that were struggling with defining public engagement activities, AESA suggested that fellows from each DELTAS grantee could adopt a school and organize periodic educational activities with students from the school as one way of meeting the programme's public engagement objective. This in a way introduces some standard targets for the public engagement component.

As noted earlier, the consortium has a Community Engagement Strategy, which outlines specific KT activities to be undertaken by the consortium and hence what is reported to AESA. However, the strategy is biased to public engagement activities, which may mean that policy engagement activities are not being systematically tracked and assessed. Related to this, respondents did not report any M&E plan and tools for tracking and assessing their policy and public engagement activities e.g. tracking feedback to radio and TV interviews and documenting processes of policy and public engagement activities such as meetings held, challenges, strategies to overcome challenges and evidence use outcomes in relation to the research use continuum theory. Furthermore, the consortium and DELTAS programme quarterly and annual reporting tools, respectively, focus on activities and outcomes. It does not explicitly emphasise reporting of context factors critical to understanding the policy process and learning about factors and strategies that influence (either hinder or facilitate) KT.

Despite the identified gaps in assessing impact of research, there were some examples of instances when respondents' past research has contributed to evidence-informed policy and practice. A few respondents have been involved in policy or guideline formulation processes. A few have also been involved in scaling up (nationally and globally) of effective interventions that they had designed, tested and evaluated and in one case the formal adoption of an intervention as a national programme. At the time of the data collection, the DELTAS programme impact on policy and practice was not yet evident because the respondents' research projects were in the early stages and had not generated any evidence. However, respondents' accounts pointed to improved KT capacity and practice among fellows in the DELTAS programme relative to baseline levels as a result of the expectation to undertake policy and public engagement activities.

## 2.4 THEME 4: CONSORTIA MANAGEMENT

Ms Tagoe has completed a literature review which aimed to ascertain the evidence base for health research capacity strengthening (HRCS) consortium management and its role in the capacity strengthening agenda. The review determined the scope and quality of published literature on HRCS consortium management processes, management-related factors influencing consortium operations and outcomes, and the knowledge gaps. The results reveal that though there are increasing efforts being made in the HRCS field in reporting consortia outcomes, the published literature on consortium management is thin both in terms of quantity and quality, demonstrating the need to expand research efforts to inform HRCS policy and practice. Her manuscript titled **"Managing health research capacity**

**strengthening consortia: A systematized review of the published literature"** has been accepted for publication in the *BMJ Global Health* journal and can be accessed here: https://gh.bmj.com/content/bmjgh/4/2/e001318.full.pdf. The abstract is presented below:

**Literature Review Abstract**

**Background** Locally relevant research is considered critical for advancing health and development in low and middle-income countries. Accordingly, HRCS efforts have intensified, increasingly through consortia. Yet the knowledge base for managing such consortia is not well-defined. This review aimed to ascertain the scope and quality of published literature on HRCS consortium management processes, management-related factors influencing consortium operations and outcomes, and the knowledge gaps. **Methods** Given the paucity of published HRCS literature, a 'systematized review' as outlined by Grant and Booth was conducted, modelling the systematic review process without restriction to research-based publications. A systematic search in PubMed and Scopus was carried out coupled with a manual search for papers using reference checking and citation searching. A quality appraisal of eligible articles using the Mixed Method Appraisal Tool was undertaken. Thematic synthesis was used to analyse the extracted data. **Results** The search identified 55 papers, made up of 18 empirical papers and 37 commentaries focusing on consortium-based HRCS initiatives involving low- and middle-income countries and reporting management-related data. The review indicates increasing efforts being made in the HRCS field in reporting consortia outcomes. However, it highlights the dearth of high-quality empirical research on HRCS consortium management and the nascent nature of the field with most papers published after 2010. The available literature highlights the importance of relational management factors such as equity and power relations in influencing consortium success, though these factors were not explored in depth. Operational management processes and their role in the capacity strengthening pathway were rarely examined. **Conclusion** Findings indicate a weak evidence base for HRCS consortium management both in terms of quantity and conceptual depth, demonstrating the need for an expanded research effort to inform HRCS practice.

Ms Tagoe has further completed the first phase of the empirical component of her study which focuses on identifying management processes adopted by the DELTAS consortia and the experiences of consortium leaders in implementing these processes. She conducted a total of 23 key informant interviews with DELTAS consortium directors, programme managers, and monitoring and evaluation staff from 10 consortia as well as representatives of the AAS. A preliminary analysis of the data formed the basis for further focusing her study and conducting more in-depth case studies in the second phase of her work. Nadia selected three consortia for the case studies, aiming to include a wide variation of consortium characteristics and contexts. The consortia involved are CARTA+, THRiVE 2 consortium, and the DELGEME consortium. Nadia has conducted 32 in-depth interviews with key members of selected consortia to date, drawing participants from both lead and partner institutions.

Next steps:
Nadia will complete data collection for the second phase by the end of April and undertake data analysis in the subsequent months. The preliminary findings will inform a final phase of the study in

which Nadia will explore if emerging findings are applicable across the wider group of DELTAS consortia as well as in other LMIC-led HRCS consortia.

**Preliminary Findings**

The first phase (key informant interviews with DELTAS consortia directors, managers and monitoring and evaluation staff as described above) identified the management processes adopted by consortia and the experiences of consortium leaders in implementing these processes. Selected preliminary findings from this phase are presented below.

- Factors that motivated the establishment of the DELTAS consortia included the recognition of having common health challenges as well as the opportunity to pool resources, share learning and experiences, and consolidate efforts in tackling these challenges. The formation of consortia was also seen as a means of strengthening regional capacity and south-south collaborations.

- Criteria used by consortia leaders in selecting partners included previous working relationships, common research interests, and the expertise and capacity of potential individual and institutional partners. Many consortia considered geographical factors such as the aspiration for a sub-regional or continent-wide spread, while others sought to improve anglophone-francophone relations.

- All consortia had a two-tiered structure with some members having an 'institutional partner' or 'co-applicant' status and others, a 'collaborating partner' status. However, the responsibilities and opportunities available for partners in the various tiers varied across consortia. Participation in consortium governance and eligibility for a sub-award or for trainee support, for example, were the preserve of institutional partners in some consortia and open to both tiers in others.

- A commonality among consortia was the governance and management structures. Four levels of governance similar to what was identified in the literature, were used by most consortia. These were advisory bodies made up of independent experts mainly ensuring scientific quality; steering bodies made up of partner representatives determining strategic direction; executive teams operating at the secretariat and driving the day-to-day management of the consortia; and technical sub-teams focusing on the implementation of activities by research sub-specialties or operational areas such as training, monitoring and evaluation or finance.

- Approaches to sharing consortium resources varied. As majority of consortium funds went into trainee support across all consortia, strategies for awarding training fellowships gives an indication of how consortium resources were shared among partners. These were either merit-driven or quota-driven. There were nuances in how these two strategies were implemented across some consortia. For example, some merit-driven consortia capped the number of awards a partner or region could get, and quota-driven consortia still based their selection within the quotas on merit.

- Consortia adopted diverse strategies for financial management. Some consortia are implementing a primarily centralised management of funds where financial transactions for most activities at both lead and partner institutions were handled by the secretariat, while others have awarded sub-grants to partners who are managing and reporting on these awards. Others still are

implementing a part centralised and part decentralised fund management system. It will be worth exploring the thinking behind these choices and the implementation experiences of consortia.

- Factors identified as enablers for successful collaboration underscored the importance of soft skills in consortium management. These include managing communication and relationships among partners, ensuring inclusive decision-making and equality, having cultural awareness, and paying attention to partner differences and needs. This reinforces the emphasis on the importance of the relational aspects of consortium management in the literature and the need for consortia to give attention to it. Operational factors such as the use of established policies and guidelines and an efficient secretariat were also cited as enablers for consortium success.

- Funder influences contributed to some of the management decisions such as the size and structure (two-tier) of the consortium and governance levels such as having independent advisory boards. These influences are affected through funder requirements, recommendations and recognition.

- There appears to be a narrow interpretation of "research capacity strengthening" (RCS) with a huge focus on individual research training and less attention given to management-related capacities, with the metrics for RCS undifferentiated from those for research.

- Consortia leaders encounter tensions in the selecting and implementing management strategies. For example, many consortia had to and continue to work through tensions between merit and equity in awarding trainee support. Though many found a way of incorporating features of one on the other, each consortium had to decide on which on is the primary driver of their trainee resource allocation strategy. Consortia leaders needed to either implicitly or explicitly deal with this and other tensions at the different stages of the consortium process including when selecting partners, assigning responsibilities and allocating resources. It will be valuable to determine which factors influenced decisions taken when such tensions are encountered.

- Across consortia, it appears that partner institutions with higher capacities are often prioritised in partner selection and assignment of responsibilities. They consequently receive more resources and are more engaged in consortia activities. Less-capacitated partners tend to have fewer responsibilities and receive less resources, which in some cases result in less motivation, engagement, commitment. This raises the question of whether the tensions encountered, and decisions taken, result in a vicious circle with the strong getting stronger.

**Theme 4: Learning Application**

Consortia have the opportunity to contribute to the nascent HRCS and consortium management evidence base by deliberately reflecting on and documenting the processes, contexts, deliberations, influences and decisions taken during their establishment and implementation phases. Consortia can consider the inclusion of specialist management team members from the outset who will focus on the science of implementation, management, and capacity strengthening.

There are multiple options when selecting strategies for various management decision areas such as partner selection, resource allocation or financial management even though in many cases, the selection process appears to be implicit. Consortium leaders should actively draw out management strategy options and explicitly consider the implication of each to ensure that tensions are continuously managed, and decisions taken contribute to the capacity strengthening aim of the consortium.

Provide leadership, research management and soft skills training for consortium leaders and managers, not only to strengthen capacity in this area but to ensure that attention is continuously drawn to both operational and relational aspects of managing consortia. Funders should consider the incorporation of this aspect in monitoring and evaluation tools to ensure routine reflection on both operational and relational efforts and progress by consortia. Ensure trainees undertake soft skills training as part of their fellowship to strengthen their development as research leaders.

Explicitly discuss the "research capacity strengthening" aim of DELTAS both across (possibly funder-driven) and within consortia, emphasizing the importance of both the technical and management aspects in attaining more holistic and sustainable individual and institutional research capacity.

Develop and use more appropriate metrics for research capacity strengthening occurring at various levels and through various mechanisms. This can be done through engagement of multiple stakeholders including consortia actors, monitoring and evaluation specialists and funders.

Consider the development of deliberate strategies for strengthening the capacity of both capacitated and less-capacitated research actors on the continent. These can be adopted by consortium leaders in the constitution and management of consortia, and funders in their programme design, requirements and support.

# 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 Common Research Management & Support (RMS) Challenges in Sub-Saharan Africa

Since 2014, CCR have conducted institutional research capacity assessments (IRCAs) in 23 sub-Saharan African Universities across 15 countries. Each IRCA has been conducted according to the same methodology, although within the context of 9 separate projects. Whilst the focal elements of each IRCA have varied, all have included at least a partial focus on research management and support (RMS). All RMS assessments were completed against defined 'optimal' RMS capacities, informed through desk review and expert consultation. The assessments themselves were largely qualitative exercises, with data collected from key informants through semi-structured interviews, document review and observations of facilities. As far as possible, all information was obtained from at least two independent sources to enhance validity. CCR are currently synthesising the collective IRCA data to

identify the most commonly reported RMS challenges across institutions as well as potential solutions to these challenges. This synthesis is being prepared for publication in a peer-reviewed journal (anticipated submission date mid 2019). Presented below are a selection of RMSS challenges emerging from preliminary analysis that were common to most institutions assessed. A suggested response is presented under each challenge (although it is recognised that a wide range of alternative responses may be equally/more appropriate in any one context):

1. **Research activity primarily driven by interests of international funders/partners.**

Ensure research priorities, cascaded from Institute/College/School/Department, designed to address relevant local/national/regional challenges are clearly defined. Once completed, a needs assessment of laboratory and field equipment/resources as well as specific professional development needs relevant to the identified priority research areas should be conducted. Decisions to partner with international collaborators may then be informed according to the extent to which they: a) align with identified research priorities; and b) address identified equipment, resource or training needs.

2. **Limited pre-award checks to ensure maximum cost recovery/full economic benefit is obtained from partnering in international research collaborations.**

Develop clear research costing and overhead payment guidelines for PIs to draw upon when developing research budgets. Where institutional policies allow the inclusion of supplementary allowances or salary 'top ups' within research budget submissions, PIs should ensure appropriate allocation to both academic and non-academic staff.

3. **Awareness of international research funding opportunities is often reliant on notification from existing research collaborators.**

Develop institution/college/school/department research grant information systems that routinely alert academic staff to potential funding opportunities. A simple system could be based on the circulation of grant alerts obtained from prominent research funders/research networks.

4. **Grant submissions are often prepared and submitted without formal peer-review.**

Develop formal/in-formal internal peer-review processes designed to support the preparation of high-quality research grant submissions. Peer-review support from existing international partners could be considered where needed/appropriate.

5. **Institutional research outputs are not readily accessible.**

Embed externally-accessible repositories for institutional research outputs (e.g. publications) within institutional websites or other readily accessible platforms. Develop clear internal processes designed to motivate institutional staff to submit appropriate research outputs to the depository in a timely manner.

6. **Postgraduate students and academics have limited access to academic journals and resources.**

Include links to research-supportive open access resources, such as academic journals, software and tutorials, in a single location on accessible, institutional e-platforms (e.g. on an institutional webpage). Once developed, ensure the availability of the online resources is widely and continuously advertised to postgraduate students and academic staff.

7. **Research data are rarely secured on institutional servers.**

Develop SOPs to support good research data management practice, inclusive of data storage and security, appropriate to the local context.

8. **Sub-optimal management of biosecurity risk in research laboratories.**

Support the training and resourcing of laboratory biosecurity committees, including the provision of appropriate protective equipment for staff.

**9. Research implementation is often delayed due to lengthy ethical review processes.**
Develop expedited ethical review processes for low-risk research.

**10. Professional development opportunities for research staff are limited and/or ad hoc.**
Support the development and institutionalisation of a generic 'core skills' researcher training programme, inclusive of the provision of necessary resources and 'train the trainer' support to ensure sustainable institution-led provision. Programme components could be informed by the Vitae researcher development framework https://www.vitae.ac.uk/vitae-publications/rdf-related/researcher-development-framework-rdf-vitae.pdf

**11. Supervision and mentorship arrangements can be sub-optimal.**
Strengthen academic supervision and mentorship arrangements, inclusive of academic staff at junior-, mid- and late-career stage. Accessing support from external supervisors/mentees, inclusive of international partners may often be necessary and/or beneficial.

## 3.2 DFID Strategic Evaluation Fund Project

The aim of this project was to develop guidance on improving RCS evaluation practice to better direct current and future RCS investments. The project was funded by DFID and conducted by CCR in partnership with the Africa Population and Health Research Centre (APHRC). The objectives of this project, and the methodological approach for each objective, were:

1. Conduct a rapid review of literature on RCS evaluation practice, with a focus on indicators used for evaluating RCS impact in SSA
   *Methods: Desk-based, literature review and synthesis of existing evidence to identify RCS evaluation indicators and to develop an initial framework against which to map programme-derived RCS indicators.*

2. Review theories of change (ToC) from DFID's, and other, RCS programmes; identify commonalities and differences between the RCS activities and evaluation indicators in ToCs, and map indicators onto a revised, draft framework that could be used for evaluating RCS in SSA.
   *Methods: Desk-based analysis of relevant documentation to extract common outcome/impact indicators and explore the range of indicators; adapt the draft RCS evaluation framework to incorporate these indicators.*

3. Validate the framework and generic indicators in consultation with stakeholders
   *Methods: Conduct validation through workshops with key stakeholders, one with Nairobi-based senior programme managers and funders, and one with a broader international range of stakeholders, and through key informant interviews.*

4. Provide guidance on ways to improve RCS evaluation practice to build evidence of impact, including the implementation of the overarching framework and the testing and validation of indicators.
   *Methods: Synthesise information from Objectives 1, 2 and 3 to provide practical guidance on how to approach and implement RCS evaluations and indicators in relation to (meta) programme-level and project level evaluations.*

The results of activities under objectives 1-3 have led to two main project outputs and associated recommendations for actions that can contribute to improved evaluations to demonstrate the impact of RCS investments:

- An evidence-informed and validated over-arching **framework for evaluating RCS initiatives**, with a suggested list of **generic indicators** under each item in the framework. The framework and indicators could be used to harmonise RCS evaluations across a range of projects or programmes but will need to be tested and validated in practice in diverse contexts to assess their feasibility and usefulness, and to confirm that they can provide a mechanism for enabling comparisons of RCS achievements across projects and programmes
- Novel initial concepts for better design, tracking and evaluation of the impact of RCS investments across programmes with guidance about what will be required to implement these in practice
- Recommended actions comprise a re-design of the way that RCS initiatives are designed so that projects are aligned to, and measured against, an overarching scheme-level ToC, and shorter-term prioritised actions around developing and testing metrics for essential RCS indicators

Outputs from this project are currently under review by DFID and will be disseminated in due course.

## 3.3 Africa Capacity Building Initiative (ACBI)

The overall aim of the Royal Society-DFID Africa Capacity Building Initiative (ACBI) is to close the capacity gaps in critical areas of science and research in SSA by developing sustainable scientific networks that undertake high quality research and offer long- term research training. ACBI seeks to do this through the development of strong postgraduate training with an emphasis on strengthening institutional/departmental PhD programmes and research conducive environments.

CCR is conducting research into the capacity strengthening process of ACBI, supporting the research consortia to achieve the initiative's research capacity strengthening objectives and generating new knowledge and recommendations to guide this and future research capacity strengthening programmes. During phase 1 (2012-17), CCR conducted baseline studies of research institutions in SSA. The baseline studies gathered information on partners' current strengths and challenges in postgraduate training and the research environment more generally and made recommendations for improving the programme which were acted on by the Royal Society. These baseline studies revealed significant differences in PhD programmes and laboratory systems across the institutions. Since effective PhD programmes and laboratory capacity are crucial for the success of the ACBI, it was agreed between the Royal Society, DFID and CCR that these would be the focal areas for CCR's research during phase 2 (2017-21).

**Phase One Findings**

Drawing on Phase one findings from the ACBI programme, CCR have prepared a manuscript titled **"Strengthening capacity for science research: a qualitative assessment to identify good practices, capacity gaps and investment priorities in African institutions'"**. This original research paper is currently under peer review in the journal *PLoS One*. Highlights from the paper are noted in the manuscript abstract presented below. CCR will circulate the paper, and supplementary file, across the DELTAS network once published.

**Abstract**

**Background** Strengthening research capacity in low-and-middle-income countries is essential to drive socioeconomic development and to achieve the Sustainable Development Goals. Understanding strengths and weaknesses in institutions' research capacity can guide effective targeting of investments and resources. This study assessed the capacity of institutions undertaking research in science topics in Africa to identify priority capacity gaps for future investment. **Methods** Assessments were conducted in eight African institutions that were partners in a UK-Africa programme to strengthen research capacity in renewable energy, soil-related science, and water and sanitation. Assessments involved 86 interviews and three focus group discussions to identify institutions' research capacity strengths and gaps against an evidence-informed benchmark. Use of the same interview guides and data collection processes across all institutions meant that findings could be compared. **Results** Common research capacity gaps were: lack of, or poorly maintained, equipment; unreliable, slow procurement systems; insufficient opportunities for developing the skills of research support staff such as administrators and technicians; dysfunctional institutional email communication systems; insufficient focus on the development of 'soft' researcher skills such as ethics, academic writing and, in non-Anglophone countries, English language. Programme strengths were the South-South and South-North partnerships for sharing and cascading expertise and resources, joint writing of proposals and publications, and improved individual and institutional visibility. **Conclusion** There were many similarities in research capacity gaps irrespective of the institutions' science research focus, and these were similar to those reported in the health sector. Common capacity needs are improving the skills of technicians and administrators to support research activities, soft skills training for researchers, and more effective pan-institutional e-communication systems. These could be strategic investment targets for the joint efforts of national governments and international organisations that fund programmes for strengthening research capacity in low- and middle-income countries.

**Phase Two Findings (Preliminary)**

Phase two data collection is currently ongoing; however, early evidence of the impact of ACBI on the development of individual researchers at both doctoral and leadership level, as well as on institutional improvements, is already emerging from preliminary analyses. Examples of these 'good news' and success stories are provided below:

Examples provided during interviews of how 'prestigious' international grants such as Royal Society-DFID ACBI and others (for example Royal Society-Leverhulme) have made an impact on strengthening research capacity are:

- Such grants **strengthen some of the infrastructural facilities** essential to supporting and enhancing research **and therefore enable PIs and PhD students to carry out high quality research** within their institution (or department).

- Programmes like ACBI **foster regional and international partnerships** (both south-north and south-south partnerships), opening new doors for collaborations (including exchange visits, equipment sharing, collaborative grant writing proposals, collaborative publications)
- The production of high-quality research along with the enhanced partnerships and networking opportunities **increases the visibility of the research group (or department)** both locally (within the institution) and internationally. **As a result, it increases their opportunity for obtaining further 'prestigious' grants.**
- When PIs start developing a track record in attracting such reputable research grants, **their authority becomes more influential particularly at the institutional level. Their ability to demand changes at the departmental and institutional level becomes stronger.** The grants they are attracting are perceived as important for the research institution itself. It builds up the institution's reputation, hence they can push for more positive changes (and sometimes additional funds) within the institution itself.

One of the PIs explained that as a result of ACBI and the improvements it brought to the department, he had seen a change in mentality and willingness to improve the research programmes within the institution.

ACBI-affiliated PhD students perceived themselves as lucky and privileged to be part of the ACBI programme. To many, it is a life-changing opportunity. They have highlighted numerous benefits and positive changes since they have started their PhD programme such as:

- Excellent opportunity for networking and meeting other PhD students from different institutions and/or countries as well as meeting a number of experts in their field, and acquiring feedback from the them which is useful for their research work and progress
- Improvements in the laboratory equipment and instrumentation. In some cases, students no longer need to travel or seek other laboratories to conduct their basic experiments.
- A sense of solidarity at the south-south collaboration level
- Availability of new advanced equipment or computational software
- Attending conferences and advancing their knowledge and skills through the various training opportunities (offered by ACBI consortia)
- Receiving the right guidance and progressing quickly with their research work (compared to non-ACBI PhD students) due to the opportunities they have in terms of exchange visits, collaborations, and procedures which facilitates their research progress.
- They do not have to worry about money or funding which helps them progress quickly with their work
- Having their work and publications reviewed by experts which is motivating for them.

## 3.4 Review of Research Capacity Strengthening Outcome & Impact Indicators

CCR have completed a structured literature review titled **"Measuring the outcome and impact of research capacity strengthening initiatives: A review of indicators used or described in the published and grey literature"**. This review paper, along with a supplementary Excel file listing 668 retrieved indicators, is currently under peer review in the *Journal of International Development*. Highlights from the review are noted in the manuscript abstract presented below. CCR will circulate the paper, and supplementary file, across the DELTAS network once published.

**Literature Review Abstract**

**Background** Development partners and research councils are increasingly investing in RCS initiatives in LMICs. There are few reported evaluations of RCS initiatives and no agreed evaluation metrics despite the large sums of public money invested. This paper aims to advance progress towards the establishment of a standardised set of outcome and impact indicators for use across RCS initiatives in LMIC contexts. **Method** A review of RCS indicators described in the published and grey literatures was undertaken. A systematic search in PubMed, Global Health, CINAHL Complete, IBSS, Google Advanced, BASE, Grey Literature and OpenGrey was completed along with a manual search for papers using reference checking and citation searching. RCS indicator descriptions were extracted from each publication/report, recorded in an Excel spreadsheet and sorted according to type (output, outcome or impact). All outcome and impact indicators were quality appraised and thematically analysed. **Results** We identified a total of 668 RCS indicators from across 32 publications/reports. Of these, 40% (265/668) were output indicators, 59.5% (400/668) outcome indicators and 0.5% (3/668) impact indicators. Thirty-four percent (225/668) measured individual research capacity, 38% (265/668) institutional research capacity and 21% (178/668) systemic research capacity. The 400 outcome indicators were coded into nine thematic categories, the most common of which were 'research management and support' (n=97), 'skills/knowledge' (n=62) and 'collaboration activities' (n=53). The three impact indicators were all systemic-level indicators and were all coded to a 'health and wellbeing' theme. Only 1% (6/403) of outcome and impact indicators met all four quality criteria. **Conclusion** Numerous RCS outcome indicators are present in the public and grey literature, although across a relatively limited range suggesting common interest in key focal areas. Very few impact indicators have been described and the quality of commonly described indicators, both outcome and impact, is poor.

**END**