The Academy of Medical Sciences

Strengthening clinical research career pathways

Exploring institutional- and individual-level perspectives about clinical research career pathway barriers and facilitators

Nadia Fazal and Imelda Bates
Liverpool School of Tropical Medicine, UK

In partnership with

LSTM — CENTRE FOR CAPACITY RESEARCH

acmedsci.ac.uk

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Executive summary

Background

This report examines the role of institutions in supporting clinical research career pathways (CRCPs) across low- and middle-income countries (LMICs) and identifies mechanisms to strengthen these pathways. Conducted by the Centre for Capacity Strengthening (CCR) at the Liverpool School of Tropical Medicine, this study aims to provide a systematic analysis of the barriers and facilitators of CRCPs, offering transferable insights to improve institutional support globally.

Methodology

A mixed-methods approach was employed, incorporating surveys and semi-structured interviews at both individual and institutional levels. The surveys captured quantitative and qualitative data on CRCP support mechanisms, while interviews provided in-depth perspectives from clinical researchers and institutional representatives. The study engaged 36 survey respondents and 14 interview participants, ensuring a broad representation of experiences from Africa, Asia and Latin America.

Key findings

Barriers to accessing, pursuing and maintaining CRCPs

- **Lack of institutional support:** a significant portion of respondents reported inadequate institutional funding and lack of formal CRCP structures.
- **Funding and resource constraints:** many researchers struggled to secure sustainable funding, with eligibility criteria often favouring PhD holders, limiting access for qualified clinicians.
- **Mentorship gaps:** while mentorship is crucial in guiding early-career researchers, formal mentorship programmes were largely absent, forcing researchers to rely on informal networks.
- **Workload imbalance:** the dual demands of clinical work and research created significant challenges, with institutions offering little to no protected research time.
- **Limited career progression pathways:** there was a lack of clear institutional career pathways for clinician-researchers, leading to uncertainty in professional development.

Facilitators supporting CRCPs

- **Collaborative research networks:** international and regional research collaborations provided essential mentorship, training and funding opportunities.

- **Institutional communication on external funding:** some institutions facilitated access to external grants by sharing funding opportunities and assisting with applications.
- **Strategic institutional support:** in certain cases, executive leadership recognised the value of clinical research and integrated CRCPs into strategic plans.
- **Structured training and development:** where available, interdisciplinary training programmes and research integrity workshops significantly enhanced research skills.
- **Personal advocacy and initiative:** many researchers overcame systemic barriers through personal efforts, seeking independent funding and leveraging professional relationships.

Institutional perspectives and policy implications

Institutions that actively support CRCPs benefit from improved research outputs, stronger academic–clinical partnerships and enhanced healthcare outcomes. However, institutional challenges such as fragmented policies, insufficient funding mechanisms and inconsistent leadership for CRCP support hinder CRCP development.

Key recommendations

Institutional mechanisms to strengthen CRCPs

To strengthen CRCPs, institutions should do the following:

1. **develop clear CRCP policies:** recognise CRCPs as formal career pathways with defined structures.
2. **enhance training and development:** implement structured mentorship programmes, interdisciplinary training opportunities, and flexible learning models.
3. **increase internal funding and resource availability:** reduce dependence on external grants by allocating institutional funds for research training and early-career support.
4. **improve career progression tracking:** develop institutional key performance indicators (KPIs) to monitor and evaluate researcher career development.

External support for institutional strengthening of CRCPs

- **Funding agencies and policy advocacy:** develop sustainable funding models that provide long-term support tailored to clinician-researchers.
- **Regional and international networks:** facilitate global collaborations to enhance mentorship and funding accessibility.

Enhancing academic and health sector integration

- **Formalise research within healthcare systems:** encourage hospitals to allocate protected research time for clinical researchers.
- **Encourage joint appointments:** enable clinical researchers to hold joint positions across academia and healthcare institutions.
- **Align policy frameworks across regions:** advocate for standardisation of licensing and research career structures across LMICs to facilitate mobility and career stability.
- **Strengthen institutional partnerships:** foster reciprocal collaborations between universities and healthcare institutions to enhance research integration within clinical practice.
- **Standardise policies across regions:** advocate for regional policies that standardise licensing and research career structures to facilitate mobility of clinical researchers globally.

Conclusion

Strengthening CRCPs is essential for advancing clinical research, improving healthcare outcomes and fostering sustainable development in LMICs. Institutions must take proactive measures to address systemic barriers while leveraging global partnerships and funding opportunities. Implementing the recommended strategies will create a more structured and supportive environment for clinical researchers, ensuring the long-term success of CRCPs.

Background

The purpose of this project was to enhance understanding about the role of institutions in supporting clinical research career pathways (CRCPs) across low- and middle-income countries (LMICs) and to help identify mechanisms to strengthen these pathways. This project underpins a larger Academy-led global report on strengthening locally embedded and sustainable CRCPs.

While some barriers to CRCPs have been identified through previous consultations – such as a lack of mentorship and protected time, and inability to absorb clinical academic postgraduates into the workforce – this study, conducted by the Centre for Capacity Strengthening (CCR) at the Liverpool School of Tropical Medicine (LSTM), dives into a deeper and more systematic analysis of the barriers and facilitators for CRCPs across different regions of the globe. Overall, this study aims to highlight examples of transferable learning and suggestions for improvements in the support for CRCPs.

Methodology

Overall, this study used a mixed-methods approach, gathering data through surveys (quantitative and qualitative) and semi-structured interviews (qualitative).

Data collection tools

Survey tool design

Two distinct web-based survey tools were designed for this study, one that focused on assessing CRCP support at the institutional level (designed for health and academic institutional representatives to complete) and one that focused on individual-level perceptions and experiences (designed for assessing the experiences of individual clinicians who are on a CRCP).

Survey designs were grounded in the CCR's experience of assessing research systems in LMIC institutions;[1] categorical themes and sub-themes were further informed by a practical guide developed by the Association of UK University Hospitals for advising healthcare organisations in developing and sustaining clinical academic roles.[2] Both surveys were created using Research Electronic Data Capture (REDCap), a secure online platform for building and managing web-based surveys and databases. Both surveys included quantitative and qualitative (free-text) assessment components.

[1] Pulford J et al. (2023). *How international research consortia can strengthen organisations' research systems and promote a conducive environment and culture*. BMJ Global Health **8**, e011419.

[2] Association of UK University Hospitals (AUKUH) (2016). *Transforming healthcare through clinical academic roles in nursing, midwifery and allied health professions: a practical resource for healthcare provider organisations*. https://cahpr.org.uk/wp-content/uploads/2024/02/Transforming-Healthcare-AUKUH-resource.pdf

For reference, both survey tools are included in Appendix A. Key topic areas covered in the surveys are highlighted in the table below.

Survey topic areas	
Individual level	**Institutional level**
1. Background information 2. Accessing a CRCP 3. Pursuing a CRCP 4. Maintaining a clinical academic role 5. Additional barriers and facilitators for CRCP development and additional comments	1. Background information 2. Institutional support for CRCP 3. Training and development opportunities 4. Resources and infrastructure for CRCP 5. Evaluation and impact measurements 6. Partnerships and collaborations 7. Additional barriers and facilitators for CRCP development and additional comments

Semi-structured interview guide design

Two distinct semi-structured interview guides (institutional-level focus and individual-level focus) were developed, informed by the thematic areas of the survey tool and emerging themes from the preliminary survey data analysis.

Interviews were conducted by a CCR senior researcher via Microsoft Teams, lasted 30–45 minutes, and were audio-recorded. All interviewees provided their oral consent for voluntary participation and oral recording. The majority of the interviews were conducted in English, although one involved an English/Spanish interpreter (the interviewee selected a colleague who they felt comfortable with to do this interpretation during the interview).

For reference, both interview guides are included in Appendix A. The topic areas that were included in the interview guides are highlighted in the table below.

Interview guide topic areas	
Individual level	**Institutional level**
1. Background information 2. Facilitators and barriers related to accessing a CRCP (initial institutional support and application process) 3. Facilitators and barriers related to pursuing a CRCP (ongoing access to funding and resources, partnerships and collaborations, training and development opportunities, mentorship and networking opportunities, perceptions of career value, and institutional policies and culture) 4. Maintaining a clinical academic role (support in wearing 'multiple hats', and retention and future growth) 5. Any additional barriers and facilitators for CRCP development (barriers and facilitators) and additional comments	1. Background information 2. Institutional support for CRCP (strategic planning for CRCP, and executive and leadership support) 3. Training and development opportunities (training pathways, access to continuing education, and mentorship and career progress tracking) 4. Resources and infrastructure for CRCP (research culture and leadership support, funding and resources, and research environment) 5. Evaluation and impact measurement (KPIs and institutional evaluation systems) 6. Partnerships and collaborations (external and internal partnerships) 7. Any additional barriers and facilitators for CRCP development (barriers and facilitators) and additional comments

Study participants

Survey participants (*n*=36)

Thirty-six participants for the online survey were recruited via e-mail through the Academy of Medical Sciences' (AMS) extensive global network.

Twenty-eight participants completed the individual-level survey; these were individual clinical research leaders from a range of health disciplines (including paediatrics, cardiology, neuroscience, microbiology, clinical nursing, oncology, intensive care, infectious disease, gynaecology, epidemiology, endocrinology and pharmacology). There was a relatively balanced gender distribution amongst survey participants, with 44.8% of participants identifying as female and 55.2% as male. The majority (64.3%) of survey participants had completed their professional qualifications more than 11 years prior to their interview participation. In terms of geographical spread, individual-level survey participants included 14 participants from Africa (countries represented were South Africa, Mali, Nigeria, Ghana, The Gambia, Zambia, Malawi, Kenya and Ethiopia), 4 participants from Asia (countries represented were Nepal and

India) and 10 from Latin America (countries represented included Honduras, Colombia, Dominican Republic, Costa Rica, Peru and Argentina).

Eight participants completed the institutional-level survey; these were representatives of academic training institutions (n=4), an academic consortium (n=1) and tertiary health institutions (n=3). There were five survey participants from Africa (countries represented were Malawi, Kenya, The Gambia, Rwanda and Zambia) and three participants from Latin America (Dominican Republic, Peru, and Honduras).

Interview participants (n=14)

Fourteen interview participants were identified through the surveys; those who had accepted additional follow-up were contacted for interview participation. Additional interview participant leads were contacted through the CCR and AMS global networks.

Ten participants completed the interview that focused on the individual level. This included representation from four individuals in Africa (Nigeria, The Gambia, Zambia and Mali), two individuals in Asia (Nepal) and four individuals in Latin America (Honduras, Brazil and Mexico)

Four participants completed the interview that focused on the institutional level. This included representation from two institutions in Africa (Kenya and Nigeria) and two institutions from Latin America (Peru and Mexico/Dominican Republic/Panama/Colombia/Chile/Paraguay/El Salvador).

Case study selection (n=5)

After the survey and interview data analyses were complete, five illustrative case studies were selected for inclusion in this report. With the goal of contextualising key findings and theme linkages, case study selection included three individual-level perspectives (perspectives from two females and one male, each from a different geographical region) and two institutional-level perspectives [perspectives from one regional network and one higher education institution (HEI), each from a different geographical region].

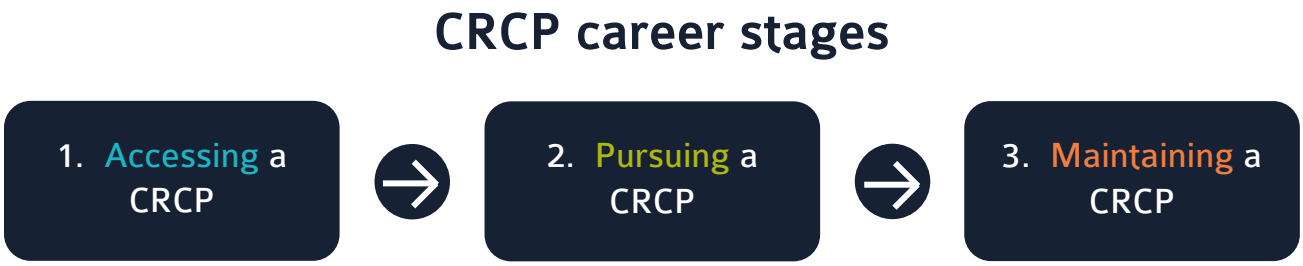
Findings

Please refer to Appendix B for a summary of the survey findings (individual and institutional levels), and to Appendix C for a summary of the interview findings (individual and institutional levels).

Individual clinical researcher perspectives

The findings in this section draw on data generated through the surveys (mixed methods) and semi-structured interviews (qualitative) that were conducted with individual clinical researchers. It is worth noting that study participants were likely to be biased toward positive responses regarding CRCPs, as those who were included in the study are those who have successfully pursued CRCPs (not those who dropped out of this pathway because of challenges faced).

Findings are shared in relation to the following CRCP career stages:



Additional qualitative findings are also shared in relation to these three CRCP career stages, noting key themes, barriers and facilitators, and illustrative quotes.

Accessing a CRCP

Key CRCP themes and quantitative highlights

Key CRCP theme	Quantitative findings – highlights
i. Initial institutional support	The majority (58.6%) of respondents reported that they did not have adequate access to institutional funding opportunities and resources when they began their clinical research career.

ii. Funding application processes	Almost half (48.3%) of respondents reported that they did not receive any guidance or support from their institution when applying for research positions or fellowships, although 34.4% reported receiving some guidance or support (17.2% reported receiving guidance or support, 17.2% reported receiving some guidance or support). The remaining 17.2% had no opinion.
iii. Mentorship	The majority (58.6%) of survey respondents reported that they had access to adequate mentorship and/or supervision when they began their clinical research career.

Sub-theme key barriers and facilitators

1. Initial institutional support

Key barriers included limited and/or a lack of institutional funding and a lack of a clear institutional CRCP pathway.

> I came into the institution as a research clinician, and I haven't had any direct funding from the institution itself, because the institution doesn't fund research.
>
> Here, the career of clinical researcher, physician scientist, it's not here yet, it's not clear. This position does not exist. Here, you cannot go to a hospital, and be like, "oh, I want to be a clinical researcher, is there an opportunity for physician scientists". This does not exist.

Key facilitators included institutional communication about external funding opportunities for clinical researchers, supportive colleagues within the institution, and no institutional objection to CRCPs.

> The research support office sends out these weekly e-mails, which are e-mails that have funding opportunities, different categories of funding opportunities. I also had some particular opportunities shared directly

with me by my line manager, and those were the ones I eventually applied for.

Yeah, the colleagues working with me are very supportive, including the department, though the parent institution does not have clear support plans in terms of official documentation and other support for clinical researchers.

The most important is that there was no objection. Sometimes, institutions object to different responsibilities for doctors working here, but these kinds of indirect supports were there for me.

2. Funding application processes

Key barriers included language barriers, requirements of specific academic credentials (i.e. a PhD), country ineligibility, and local research interests not aligned with funder research interests for LMICs.

So, for health professionals we don't actually require a PhD to develop our research portfolio, so I never felt the need to do a PhD. But then when I applied for this project, there were multiple categories, and the criteria was having a PhD – the PI had to be a PhD holder. So, I was unable to apply.

Key facilitators included application guidance from within the institution, application guidance from outside of the institution, and securing external funding through individual efforts.

We have a Research Support Office, which is dedicated to helping with the whole application process and then managing the grants. In the case of an application, there's a team that supports you by sharing open calls, guiding you through the budgeting and planning, and even connecting you with someone who has previously won the same grant to do the heavy lifting—especially with budgeting, which can be challenging for me as a non-finance person.

So, I kind of addressed both the short-term as well as the long-term challenges of funding applications by connecting with colleagues who had gone through similar experiences and finding ways to secure small grants in the beginning.

3. Mentorship

Key facilitators included access to early mentorship during academic training, and engagement in international research networks.

Being an active member of research founders and recently established Research Foundation and collaboration with Critical Care Asia and

Africa Network, there were senior researchers and colleagues who continuously guided me, supporting my interest in research career, and then go into that pathway.

Pursuing a CRCP

Key CRCP themes and quantitative highlights

Key CRCP theme	Quantitative findings – highlights
i) Funding and resources	The majority (60.7%) of survey respondents noted that they have not had sufficient access to funding opportunities and resources for clinical research during the pursuit of their career. The majority (65.5%) of respondents noted that they sometimes (31%) or often (34.5%) have had difficulty in securing sustained grant funding or resources to continue their clinical research projects.
ii) Institutional partnerships and collaborations	Of the survey respondents, 81.5% highlighted that their institutions engage in partnerships or collaborations (i.e. between HEIs and healthcare institutions) and 69% noted that they have access to interdisciplinary collaborations in their clinical research.
iii) Training and development	No key quantitative highlights from the survey data.
iv) Balancing clinical and research work	The majority (74%) of survey respondents noted that clinical duties interfere with their ability to engage in research; 18.5% reported 'slightly', 25.9% reported 'moderately', 18.5% reported 'significantly' and 11.1% reported 'completely'.
v) Mentorship	The majority (78.6%) of survey respondents noted that they had a mentor during the pursuit of their clinical research career. Multiple benefits were reported from having a mentor. Out of the thematic options that were presented in the survey, 90.9% agreed that career guidance and networking opportunities were key benefits. Respondents also agreed that research skills development (81.1%), access to funding opportunities (54.5%), emotional support (31.8%) and improved work–life balance (18.2%) were additional benefits.

vi) Perceptions of career value	The majority (55.2%) of survey respondents reported that they felt valued in their institution as a clinical researcher (34.5% reported 'valued' and 20.7% reported 'very valued'). The majority (85.7%) of survey respondents noted that they believe their research has contributed to improving patient care or clinical practice/policies.
vii) Institutional policies and culture	The majority (82.8%) of survey respondents had not encountered any non-inclusive institutional policies or structures that had hindered their CRCP.

Sub-theme key barriers and facilitators

1. Funding and resources

Key barriers included lack of continuity of funding and lack of institutional funding.

> We have been able to get some grants, which have supported training related to research ethics and integrity. They were grants to host those training sessions, as well as certificate and diploma training. All of these types of training opportunities are dependent on external funding, so they are not consistent. One year there may be several training opportunities, and the next there may less or none […] If the short-term funding that we currently have expires, then these training opportunities will be stopped. So, the institution needs to have internal funding opportunities to establish research training opportunities for clinical researchers.
>
> While I have had multiple opportunities to learn about research funding and to apply for these opportunities, I think that securing long-term funding is an ongoing challenge for everybody in research. Currently, I am at the transition between one funding cycle and hopefully another, which means that my long-term research here largely depends on the outcomes of my applications.
>
> Every year, you have to resubmit your research to see if you're going to have further funding for the next year of your research. So, planning

your research is very difficult because you never knew if you're going to get the funding for the next stage.

Key facilitators included pursuing private funding opportunities, securing international funding, engaging in collaborative grants with international colleagues, and strong relationships between the institution and funder.

> The relationship between the university and the funder is very important. Like, putting together specific training and support to assist with scientists trying to secure grants. If everyone played a role, it would be easier to 'win the game'. But, if in the team of 11, about 7 people do not know where to play or even how to play, even if you still have 4 of the best players on your team, you might lose.

2. Institutional partnerships and collaborations

Key barriers included an overall lack of institutional partnerships.

> My parent institution itself doesn't have any partnerships or collaborations with higher education institutions.

Key facilitators included cross-country academic partnerships and/or networks, an integration of academic and clinical infrastructure, and individual agency in pursuing partnerships and collaborations.

> There are partnerships and collaborations that are ongoing, but they're not really at the institutional level – they tend to stem from individual connections. For example, several principal investigators in my unit work on projects with partners in different countries because they have established research relationships in the past. In my own research […] it's easy for me to leverage a relationship when needed, not because the institution has a formal relationship, but because my mentor already had that connection.

3. Training and development

A key barrier was language.

> We are a French-speaking country so there is a language barrier. You might see some good people who have bright ideas, but translating these ideas into English is challenging for them.

Key facilitators included training in research and clinical integrity, formal graduate training (Master's and PhD level), certificate and diploma training, grant writing training, leadership and management skills training, access to training grants and embedded workshops, pursuing training and development opportunities through individual links (not only institutional ones), and collaborative training opportunities through partner institutions.

> There have been some grants that myself and other people within the School of Medicine have received from the NIH [National Institutes of Health]. These are training grants, and embedded in those grants are workshops and training sessions for upcoming researchers and grant writing training. That has helped me, and going forward, I'm trying very hard to make sure that whoever comes after me doesn't go through the same challenges. However, these opportunities are very limited and are not funded by the institution itself but come from international partners.
>
> Yes, it was mainly through colleagues and individual links. In one of the local trainings, I was selected from my institutional department to participate, but the majority were dependent on personal contact and personal initiative.

5. Balancing clinical and research work

Key barriers included heavy clinical workload limiting research capacity, and a lack of structured clinical–research balance.

It has been hard since the clinical experience takes a lot longer. The clinical part of the work takes a lot of time, leaving little time to run research.

For doing investigation or research, you have to do extra work since your first job is the clinical job.

We do not have like division by effort or like we are always working, always working, and we do this a lot of research, but I would like to, I would like to be able to do research and have a clear path of what I'm doing.

Key facilitators included alignment of clinical practice with research interests, reducing clinical workload responsibilities, working extra hours, individual advocacy for protected research time, collaborative teamwork within a research team, and research improving clinical decision-making.

For me, I decided to do most of my clinical work related to gynaecology, which is the area of my interest, and most of my clinical research also revolves around patients with gynaecological cancers.

I quit my job at one of the hospitals, so that saved me at least around four or five hours a day and I dedicated that time to research.

Yeah, so in this part of the world, the payment or salary for the research job is very low. And the cost of living is, compared to earnings, is relatively higher. So, most of the clinicians need to work extra time to engage in research to earn their living.

The success of research projects at our institution is really grounded in teamwork and the ways that various team members pull together to fulfil their roles based on their individual strengths and skills.

Because of the research work, I have become a better clinical decision-maker.

6. Mentorships

A key barrier was a lack of formal mentorship.

> Right now, we do not have a structured mentorship programme, and it would be very helpful to have one so that different mentors could guide students properly.
>
> We believe that a mentorship programme is very critical for young researchers.

Key facilitators included mentorship from international research networks, strong mentorship from a single mentor, and informal mentorship opportunities.

> While working with this kind of research activities and contributing to ICU [intensive care unit] registry data collection, I had frequent virtual meetings with collaborators, which encouraged me to engage more into the research and develop my own research questions and build them up with the help of the colleagues in the network.
>
> I had an incredible mentor during my medical school […]. He's a physician whose training was conducted at NIH. He's a very, very productive researcher, and I have been mentored by him since medical school.
>
> While there isn't a formal mentor–mentee setup in the institution, but I have benefited immensely from people who have served as mentors. For example, the first grants I applied for were initially shared with me by mentors. They would send me opportunities that weren't public—more like hidden, institutional calls—and later, they would help me by reviewing my drafts and advising me on how to make my applications more competitive.
>
> I can't say I didn't have any mentors – there were many people who came on board for different supports that I needed throughout my career. But you know, I did not have one senior person to just go and rush to when I needed support.

7. Perceptions of career value

Key barriers included a lack of institutional recognition for research achievements of clinical researchers, and an institutional culture that does not value research.

> The second way my institution could support is by giving recognition for research. For instance, I went to [a European conference] and received first prize for my abstract – a really big achievement. But when I got back home, I expected at least my immediate supervisor to congratulate me. No one did. It's very demotivating. It makes it easier to just do private practice, where recognition is more visible.
>
> One of the main barriers is that the people who run the hospitals, the administrative persons, don't really care about research.

Key facilitators included institutional understanding of the importance of clinical researchers engaging in both clinical and research work, and institutional understanding regarding the importance of interdisciplinary research.

8. Institutional policies and culture

Key barriers included a lack of formal career pathway for clinical researchers, and a gap between institutional policy and practice.

> I was fortunate to work with very supportive line managers when I started as a research clinician. However, there isn't any incentive, per se, for a clinician to pursue their own research since one can easily remain on someone else's project. It was only through personal drive—and the support of a line manager who saw the potential for me to do my own research—that I transitioned into applying for my own grants and developing my research ideas.
>
> The people who branch off into a fully-fledged research career are those who, through personal interest and with support from their line managers, decide to push for more independent research opportunities. There isn't a structured pathway set out in a document or policy to guide you.

Generally, on paper, the institution talks a lot about research. When I got employed, they said I would do 1/3 research, 1/3 teaching and 1/3 clinical work. But that's not true in practice. What you are expected to do practically is 100% clinical work, and the remaining time for research is left up to you to find. Also, although the official guidelines are very good, my job description doesn't even mention clinical work, even though most of what I do is clinical. This gap between policy and practice is a major challenge.

Key facilitators included established institutional guidelines for facilitating funding support, and regular institutional career monitoring processes.

We have been able to set some guideline policies. Guidelines about how to get funding, how to look for like for a sponsor, and about types of research to engage in (like operational research, observational research, or clinical trials), as well as about research responsibilities and integrity.

Maintaining a CRCP

Key CRCP themes and quantitative highlights

Key CRCP theme	Quantitative findings – highlights
Balancing clinical and research responsibilities	There were also mixed results relating to sufficiency of protected time that the institution provides to conduct research; 31% reported 'sufficient time', 20.7% reported 'somewhat sufficient time', 17.2% reported 'not sufficient time' and 31% reported 'no protected time provided'. Half (50%) of the respondents noted that work–life balance has been either 'very challenging' (21.4%) or 'somewhat challenging' (28.6%) in their clinical academic role. Some respondents were neutral (14.3%) and some reported the balance to be 'somewhat manageable' (35.7%), but no respondents reported that it was 'easily manageable' (0%).
Career progress opportunities	The majority (55.2%) noted that there was a lack of clarity or communication about their institution's policies regarding career progression in clinical research.
Financial incentive	No key quantitative highlights from the survey data.

Sub-theme key barriers and facilitators

1. Balancing clinical and research responsibilities

Key facilitators included the institution allowing clinical researchers to manage their own time, and personal agency in balancing clinical work and research.

> I don't think it's the institution that plays a major role in balancing my clinical and research work; rather, it's up to me as an individual. The institution doesn't preclude the option of private clinical practice, but it also allows me the opportunity to work in the clinical services department. Ultimately, I decide how much clinical work I take on—often cutting back on clinical work to devote more time to research.
>
> The demand for clinical work in my country is very high, so no one can give you a job just to do research. I have always had a full-time clinical job, and at the same time, I have had to balance that with doing research. This means I end up writing grants and articles after hours when I'm really tired from ward rounds. My mentor taught me to be

your own boss and to demand protected time for my research – even if it means making enemies with supervisors sometimes by saying, 'I have a paper to write, I've got a grant deadline; I won't come into the ward today'. This battle has helped me navigate my career pathway.

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2. Career progress opportunities

A key barrier included the lack of an institutionalised career pathway for clinical researchers.

There should be a career pathway defined within the university, which enhances or encourages students to go into a clinical research pathway because right now, there is no defined pathway.

Key facilitators included institutional monitoring and accountability, collaborative research teams, and institutional increased recognition of the value of clinical researchers.

The hospital, at the beginning, was looking at the investment in research – in clinical research training – as a waste of time. But now that they are seeing how some of us are applying such knowledge to improve patient care and outcomes, they now appreciate why they should support such endeavours.

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3. Financial incentive

Key barriers included a lack of security in continued funding support, and institutional fixed remuneration that does not incentivise increased clinical work.

It is hard to earn a living. People cannot go into a research career out of their interest if they do not have any financial support or institutional support.

In my setting, the remuneration doesn't really change whether I do more clinical work or more research work—it's kind of fixed. So, there isn't an added incentive to do more clinical work, which makes it easier for me to allocate more time to research, especially since clinical work is more mentally demanding.

Individual clinical researcher illustrative case studies

Individual case study from the Africa region

A female clinical researcher explained that her CRCP has been shaped by institutional support, mentorship and funding constraints.

In accessing her clinical research career, mentorship played a crucial role in guiding early research activities and helping her to balance clinical and research responsibilities. However, securing funding was difficult due to limited local opportunities and restrictive eligibility criteria in international funding applications, making long-term financial support unpredictable.

In pursuing her clinical research career, she encountered significant barriers related to funding priorities, as many international funders focused on infectious diseases, while her work on non-communicable diseases received less recognition. Institutional policies allowed for research time in theory but did not implement it in practice, leading to an overwhelming clinical workload that left little space for research activities. Despite these challenges, external collaborations provided essential research opportunities, and she actively supported early-career researchers through mentorship.

In maintaining her clinical research career, balancing clinical and research responsibilities remains difficult, as research roles are not fully institutionalised. Career progression is hindered by a lack of formal recognition for research contributions, and financial incentives favour clinical practice over research. Despite these structural barriers, she continues to secure international funding and sustain research collaborations with the goal of advancing clinical research in her field.

Individual case study from the Asia region

A female clinical researcher shared how she has navigated a complex CRCP shaped by institutional structures, mentorship, funding opportunities and systemic challenges.

When accessing her clinical research career, early mentorship was limited, with no single senior mentor providing structured guidance. However, she actively sought learning opportunities from multiple sources, including colleagues and assistants. Institutional support for research existed, but it was not systematically structured, requiring her personal effort to build research expertise. Funding opportunities were initially available but restricted.

In pursuing her clinical research career, challenges included balancing clinical, teaching and research responsibilities, as there was no clear institutional structure defining time allocation for each role. Institutional funding policies favoured research as a requirement for academic promotion but did not provide the necessary support to conduct meaningful studies. International collaborations played a crucial role in sustaining research activities, but many institutional partnerships were unilateral, benefiting visiting researchers rather than local staff. Training and development opportunities were

initially robust but declined due to shifting institutional priorities, impacting long-term research capacity building. Despite these challenges, she actively contributed to mentorship programmes, supporting the next generation of clinical researchers.

In maintaining her clinical research career, systemic barriers are still persistent, including unclear institutional policies on research responsibilities and a lack of structured career progression pathways for clinician-researchers. The absence of protected research time still makes it difficult to sustain long-term projects, and financial incentives heavily favour clinical work over research. Leadership changes further influence institutional priorities, with a growing emphasis on hospital management rather than academic and research development. Despite these obstacles, she remains committed to advancing clinical research, being a mentor for early-career clinical researchers, leveraging international collaborations, and advocating for stronger institutional support mechanisms.

Individual case study from the Latin America region

A male clinical researcher described that his CRCP has been shaped by institutional structures, mentorship and funding challenges.

When initially accessing his clinical research career, early mentorship played a crucial role in guiding career decisions, with a long-term mentor providing continuous support from medical school through to a PhD. However, institutional funding opportunities were limited, particularly during medical training, requiring a reliance on internationally funded opportunities. The lack of structured funding mechanisms made it difficult to establish an early research career, with national funding bodies offering only selective fellowships.

In pursuing a research career, he faced challenges in securing sustainable financial support, as many national funding opportunities diminished with the country's economic transition. The absence of a clear CRCP within institutions further complicated career development, as clinical research roles were not formally recognised within hospitals, limiting opportunities for protected research time. Institutional partnerships were also weak, with international collaborations providing the primary source of funding and research support. Balancing clinical and research responsibilities was a persistent issue, as financial pressures required maintaining a separate clinical job to sustain a research career. His home institution functioned more like a startup, without formal structures to support career progression, requiring a heavy reliance on self-teaching and informal learning opportunities.

In maintaining his clinical research career, his greatest challenges are centred around financial stability and opportunities for career progression. National funding models prioritise project-based funding rather than direct researcher salaries, making it difficult for independent researchers to establish long-term careers. The lack of available research positions means that formal employment opportunities in research institutions are highly competitive and infrequent, limiting his opportunities for career progression. Despite these barriers, he remains committed to securing international grants and advocating for clearer research career pathways to strengthen clinical research in the region.

Institutional perspectives: key findings

The findings in this section draw on data generated through the surveys (mixed methods) and semi-structured interviews (qualitative) that were conducted with representatives from either HEIs or tertiary health institutions.

Findings are shared in relation to five key CRCP institutional support themes:

Findings are shared in relation to these key themes, noting sub-themes, barriers and facilitators, and illustrative quotes.

Institutional policy support

Key CRCP institutional-support sub-themes and quantitative highlights

Key CRCP institutional-support sub-theme	Quantitative findings – highlights
Strategic planning for CRCPs	The majority of survey respondents (75%) noted that their institution recognises the importance of clinical research roles (37.5% 'strongly agreed' and 37.5% 'agreed'). The large majority of survey respondents (87.5%) noted that their institution has plans to expand CRCP capacity in the next 3 years. Half of survey respondents (50%) noted that their institution does not have institutional policies in place for funding clinicians on a CRCP.
Executive leadership support	Half of the respondents (50%) noted that the human resources (HR) department at their institution is supportive of clinical research roles (37.5% 'agreed' and 12.5% 'strongly agreed'), whereas the other half were either neutral (12.5%), 'disagreed' (25%) or 'strongly disagreed' (12.5%).

Sub-theme key barriers and facilitators

1) Strategic planning for CRCPs

Key barriers included a lack of distinct CRCP and university research policies that do not apply to affiliated teaching hospitals.

> I was even wondering if a 'clinical researcher pathway' exists as an entity in itself, or people just sort of arrive there? I know that probably in the US it's an established career path, and maybe in the UK, but in my country, we just have people who end up as academics and are also doing clinical research, it doesn't exist as a distinct career path.
>
> The pressing need that I see in the region, and I've been doing this for over 15 years, I see the need to professionalise the exercise of the profession of being a clinical researcher. In other words, it's not a recognised profession yet, as it is close to being recognised in the United States and Europe.
>
> So, we have a medical school in the university, as well as a teaching hospital. Teaching hospitals are where you have the training resident

doctors who are conducting clinical research, but this is actually separate from the main university and the other research that is going on at the university. So, actually the research policies we have developed for the university have not been applied to the teaching hospital.

A key facilitator was formal inclusion of CRCPs in strategic planning.

By integrating these objectives into our strategic planning framework, this means that there are a number of deliverables that career scientists need to complete to be members, including engagement in a formal mentorship program, which links senior to early researchers who are in the same field (so, in clinical research, for example).

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2) Executive leadership support

Key barriers included a lack of awareness and formal recognition of clinical research roles, and policies that impact clinical researchers that are standardised across geographic regions.

It is informally recognised, unfortunately, and this is across Latin America; there is no awareness, from professionals like doctors. Very few people know that the hospital has a clinical research site.

If you take licensing as an example, currently you might find that in Kenya and Uganda someone may be able to practise as a clinician, but when they go to a country like the DRC they cannot practise because there are different regulations. So, what we are doing at the institutional level is bringing these African countries together in forums […] to try to standardise these types of policies across Africa.

A key facilitator included institutional recognition of clinical research roles.

> Every year we have a recognition award for all the researchers in my institution, and most often they go to clinical researchers. They are the top, both in terms of productivity and outputs in papers and all that.

Training and development opportunities

Key CRCP institutional-support sub-themes and quantitative highlights

Key CRCP institutional-support sub-theme	Quantitative findings – highlights
Access to continuing education	Of the survey respondents, 57.1% noted that their institution provides workshops as part of continuing education opportunities for clinicians on a CRCP, and 42.9% of respondents noted that their institution provides short courses as part of continuing education opportunities for clinicians on a CRCP.
Mentorship and career progress tracking	The majority (62.5%) of survey respondents noted that the existence of role models and mentors is a 'very significant' facilitator for CRCPs.

Sub-theme key barriers and facilitators

1) Access to continuing education

A key barrier was limited funding for training.

> Training clinicians is resource-intensive. Even a short 2–3-day programme requires significant funding, and we often struggle to secure enough support.

Key facilitators included practical industrial-based training, grant-writing and research skills training, clinical trial research training, online and hybrid training models as a cost-effective alternative, international collaborations for training opportunities, and interdisciplinary training opportunities.

Okay, so in terms of training, we believe in industrial training and not just teaching in a classroom environment. The classroom, we've left that for universities and all that; for us, we are looking at how these early-career scientists will bring in reports or recommendations that drive policy. So, what we do is we involve early-career scientists in responding to calls for proposals, and we write proposals together with them (while giving feedback along the way). These are proposals that we end up submitting to the relevant health organisations.

We are continuously building capacity, training people to apply for grants and manage the grants—we're doing that all the time. When we do not have the expertise, we meet our collaborators to try and develop that capacity.

Many physicians in Latin America have become social science researchers, and they might be interested in social epidemiology for example. So, I would say medical training in Latin America, being an undergrad enterprise, is very useful to conduct an interdisciplinary career.

---

2) Mentorship and career progress tracking

A key barrier was a lack of formal mentorship programmes.

The word mentorship in Latin America is not widely used, to be honest with you, it's not a thing that people talk about in organisations, unfortunately. So, it's something that needs to be promoted a lot more in the region.

Key facilitators included structured mentorship programmes with embedded career tracking mechanisms, and career development support for early-career researchers.

For tracking, mostly what we do is when we attach a student to a certain healthcare institution, we also include a periodic monitoring and evaluation report that needs to be filled out by the early-career clinician and approved by their senior mentor. So, we follow up. If it's 3 months, we have a template that we give the clinician to give to the health institution, and it needs to be completed every week. It will be the senior supervisor signing against what the early-career clinician has

done every week. The early-career clinician also needs to come up with a full report on what they were doing during the placement with the senior mentor.

Resources and infrastructure

Key CRCP institutional-support sub-themes and quantitative highlights

Key CRCP institutional-support sub-theme	Quantitative findings – highlights
Research culture and leadership support	There were mixed results from survey respondents relating to the research culture in their institution and its support for CRCPs. Half (50%) of respondents noted that this culture supports CRCPs 'to a moderate extent', 12.5% of respondents noted that the culture supports CRCPs 'to a small extent', 25% noted that the culture supports CRCPs 'to a great extent' and 12.5% noted this culture supports CRCPs 'completely'. There were mixed results from respondents relating to the extent to which their institution encourages research-driven practice; 25% replied 'to a small extent', 25% replied 'to a moderate extent', 25% replied 'to a great extent' and the final 25% replied 'completely'.
Funding and resources	The majority of respondents (62.5%) noted that limited funding opportunities are a 'very significant' barrier in CRCPs, and that there are not adequate internal funding opportunities for clinicians on a CRCP at their institution. Half of respondents (50%) noted that there are not adequate external funding opportunities for clinicians on a CRCP at their institution; 12.5% replied 'to a small extent', 12.5% replied 'to a moderate extent' and 25% replied 'to a great extent'. No respondents replied 'completely'.
Research environment	The majority (75%) of respondents noted that a key barrier for CRCPs is the difficulty that clinical researchers have in balancing their clinical and academic workloads. There were mixed results from respondents relating to the significance of the research culture within the institution as a facilitator for CRCPs; 37.5% of respondents noted that this was a 'very significant' facilitator, 25% noted that this was a 'somewhat significant' facilitator, an additional 25% noted that this was neither a 'very significant' or 'not a significant' facilitator, and 12.5% of respondents noted that this was a 'somewhat significant' facilitator for CRCPs.

Sub-theme key barriers and facilitators

1) Research culture and leadership support

Key barriers included a lack of dedicated research support staff, and hiring for clinical research roles based on prior research experience (rather than educational training).

> I think the greatest barrier to effectively doing this is that we do not have significant research support […]. We've just tried to build a business case for the university to have dedicated research professionals who really support us to do this better.
>
> It is very hard to enter into a research project without prior research experience. But usually that individual is either a nurse or like a microbiologist. There are some medical doctors who stumble upon a research project, and they become principal investigators, and they start working in that pathway, but it's rare.
>
> A key facilitator was institutional support in balancing work and research commitments.
>
> So, what we've done is we've actually allowed them to go to the labs to engage in clinical research and they need to work a certain percentage of time, and then they need to engage in research as well. These details have been included in our HR manual.

2) Funding and resources

Key barriers included limited funding for training and mentorship, and research focus being shaped by international funding priorities.

> I mean, the only two sources of external funding are usually government or industry. And government is project by project. If there is a project and there is a government grant that has some money allocated for training, sure, but that happens once every 5 years.
>
> Since we don't have a lot of local funding, we don't have a way of prioritising our research needs, and people end up working on what is

probably set by international priorities, because that's where they get their money from.

A key facilitator was international funding as a source of research support.

The largest amounts of internal funding for research usually come from international sources.

3) Research environment

A key facilitator was institutional tracking of research outputs.

We rely on institutions to share KPIs with us so we can track skill development and report back on training gaps that can be addressed.

Evaluation and impact measurement

Key CRCP institutional-support sub-themes and quantitative highlights

Key CRCP institutional-support sub-theme	Quantitative findings – highlights
Key performance indicators (KPIs)	The majority (75%) of survey respondents noted that their institution tracks and measures research outputs (publications, grants); this includes 50% who responded 'completely', 12.5% who responded 'to a great extent' and 12.5% who responded 'to a moderate extent'; 25% of respondents replied 'not at all'.
Institutional evaluation systems	Of the survey respondents, 37.5% noted that their institution does not track and measure the career progression of clinical academics; a further 25% noted that this was only done 'to a small extent', 12.5% of respondents noted that this happens 'to a moderate extent' and 25% of respondents noted that this happens 'to a great extent'. No respondents noted that this happens 'completely'. The results were mixed relating to the extent to which the respondents' institution tracks and measures the impact of clinical research; 25% of respondents noted 'not at all', an additional 25% of respondents noted 'to a small extent', 12.5% of respondents noted 'to a moderate extent', 25% of respondents noted 'to a great extent' and 12.5% of respondents noted 'completely'.

Sub-theme key barriers and facilitators

1) KPIs

A key barrier included a lack of structured KPIs for clinical research career progression.

Key facilitators included the use of KPIs for skill development tracking, and research outputs as a determinant of career progression.

> The way it's tracked is automatically, as whether you're progressing in your career or not… If you're due for assessment to the next level, and your outputs do not match, you will not go forward.

2) Institutional evaluation systems

A key facilitator was report-based monitoring and evaluation.

Partnerships and collaborations

Key CRCP institutional-support sub-themes and quantitative highlights

Key CRCP institutional-support sub-theme	Quantitative findings – highlights
Internal and external partnerships	No key quantitative highlights from the survey data.

Sub-theme key barriers and facilitators

1) Internal and external partnerships

A key barrier was a lack of reciprocal partnerships between hospitals and universities.

> So, hospital institutions that I that I deal with, they have partnerships with universities, but it doesn't happen the other way around. It's usually university students who come to the hospital institutions to get trained, not the other way around. So, it's a one-way street. It's usually not a two-way street.

Key facilitators included collaborations facilitated by regional networks, interdisciplinary research collaborations, and industry partnership as a funding source.

> We are doing this not only within my institution but across the network that I lead. I have a number of research projects, which have site leads from different teaching hospitals. Some of them are paediatricians, some of them are haematologists, and we spent the last 6 years just doing skills development for research, with respect to database development, clinical research itself, and also multidisciplinary disease-specific management of specific diseases.
>
> I will emphasise the need to partner with industry to obtain more funding. If you, as an institution, rely on government grants or grants from non-profit organisations […] it's going to be very difficult to have economic, financial sustainability in your institution.

Industry sponsorship of clinical trials feeds the research that is created within this institution; that's something that needs to be pushed more in the region.

Institution illustrative case studies

Institutional (regional network) case study from the Africa region

This regional network provides various forms of support for early-career scientists, including clinical researchers, but also faces significant challenges in sustaining and expanding these efforts.

Institutional policy support within the network exists through strategic planning, with early-career researchers benefiting from mentorship programmes, quarterly meetings and funding application support. Clinical research is formally recognised within the network's strategic framework, and leadership acknowledges its importance. However, there is no structured CRCP, which can make it difficult for clinician-researchers to transition smoothly into research roles. Additionally, funding limitations pose a major barrier to expanding support, with most resources dependent on external partnerships.

Training and development opportunities are available, primarily through industrial training rather than traditional classroom-based learning. The network organises grant-writing workshops and facilitates mentorship by linking early-career scientists with senior researchers. These mentorship opportunities play a key role in skill-building and professional development, though the availability of such programmes depends on institutional partnerships and funding.

Resources and infrastructure remain a challenge, particularly in balancing clinical and research responsibilities. Clinical work is often prioritised over research, limiting the time clinician-researchers can dedicate to advancing their research careers. While research engagement is encouraged, there are no dedicated institutional mechanisms to ensure that clinicians can effectively divide their time between clinical practice and research. Funding constraints further exacerbate this issue, with only limited financial support available for training and career development. Some funding is secured through external partnerships, which has enabled key training initiatives, but the lack of sustained institutional funding means that these opportunities are not consistently available.

Evaluation and impact measurement is conducted **through a structured reporting system** within the network. Clinicians on a research career pathway must complete periodic monitoring and evaluation reports, which are reviewed and approved by senior mentors. These reports document skills development, research activities and overall career progression. In addition to this internal system, the network also draws on KPIs from universities to assess broader trends, identify gaps in training, and ensure alignment with institutional benchmarks. This combination of internal tracking and university data allows the network to monitor impact and make informed decisions about future support initiatives.

Partnerships and collaborations with universities, health institutions, and international academies serve as key facilitators in strengthening training and research opportunities. However, there is still a need for stronger partnerships to help universities align their curriculums with industry needs, and address gaps in clinical research training. Additionally, institutional barriers related to licensing and regulatory policies create obstacles for clinician-researchers who wish to work across different countries. The network is actively advocating for policies that enable cross-border clinical research careers, including efforts to standardise clinician licensing across multiple countries. Overall, this regional network continues to seek new opportunities for funding, mentorship and policy development to strengthen CRCPs.

Institutional (HEI) case study from the Latin America region

This research-intensive HEI specialises in health and life sciences. It has a structured research ecosystem, with multiple directorates overseeing research promotion, innovation and regulatory aspects, including ethics, biosecurity and clinical trials.

Despite its strong research orientation, **institutional policy support** for clinical research career pathways is not explicitly outlined as a strategic priority, and executive leadership backing for clinician-researchers is variable. While research is encouraged, there is no clear institutional framework to guide clinicians in balancing research with their medical careers.

Opportunities for **training and development** exist, particularly for undergraduate students who are encouraged to engage in research groups early on. Internal grants provide some financial support, allowing students to explore research interests alongside their studies. However, structured career progression for clinician-researchers is less defined, and many of the most research-oriented individuals seek opportunities abroad where career pathways are clearer and better supported. Mentorship is present in an informal capacity, but there are limited structured mechanisms to track career development or provide long-term guidance for those attempting to integrate clinical practice and research.

The university benefits from strong **resources and infrastructure**, including access to a hospital and a private clinic, which provide spaces for conducting research. However, the challenge remains in balancing clinical responsibilities with research demands. While the university fosters a research culture and recognises the prestige associated with being an active researcher, there are social and institutional tensions. Researchers who gain significant visibility may encounter internal resistance, and faculty members must navigate the balance between institutional expectations and personal career growth.

Evaluation and impact measurement at the university emphasise research output, largely in response to international ranking systems. This creates an environment where research productivity is valued, yet there is little institutional focus on tracking the career progression of clinician-researchers or developing systems to support them in navigating dual roles.

Strong **partnerships and collaborations** play a crucial role in supporting research at the university. The institution is well connected to international research networks and frequently collaborates with hospitals, non-governmental organisations (NGOs) and governmental agencies. These partnerships provide opportunities for securing larger grants and engaging in fieldwork. However, while these external collaborations offer valuable research opportunities, they do not directly address the institutional challenges clinicians face in balancing research with their medical practice.

Overall, the university has cultivated a strong research culture, yet the path for clinician-researchers remains uncertain. Without targeted institutional mechanisms—such as dedicated funding streams, structured mentorship programmes and formal career progression frameworks—clinicians who wish to integrate research into their careers must navigate these challenges largely on their own.

Strengthening CRCPs: key recommendations and conclusion

By drawing on the findings from this study, this final section shares these key recommendations for:

1. institutional mechanisms to strengthen CRCPs
2. external support for institutional strengthening of CRCPs; and
3. strategies to strengthen links between academic and tertiary health institutions.

Institutional mechanisms to strengthen CRCPs

To improve support for CRCPs, institutions should consider the following mechanisms:

Develop clear CRCP policies

Institutions should establish formal policies recognising CRCPs as distinct career pathways, and ensure integration within strategic plans. This includes defining career progression structures and leadership support mechanisms.

Enhance training and development

Institutions should implement structured mentorship programmes, offer interdisciplinary research training and develop hybrid or online learning models to expand accessibility.

Increase internal funding and resource availability

Institutions should reduce reliance on external grants by allocating institutional funds for research training, small research grants and professional development support for early-career clinical researchers.

Improve career progression tracking

Institutions should establish institutional KPIs for CRCPs, track career development of clinician-researchers and create structured evaluation mechanisms to assess research impact and contributions.

External support for institutional strengthening of CRCPs

Institutions require targeted external support to effectively enhance CRCPs. Recommended strategies include:

Funding agencies and policy advocacy

Advocate for funding models that provide long-term, sustainable support for CRCPs, including flexible grants tailored to the dual roles of clinician-researchers.

Regional and international networks

Institutions should implement structured mentorship programmes, offer interdisciplinary research training and develop hybrid or online learning models to expand accessibility.

Strategies to strengthen links between academic and tertiary health institutions

To improve integration between academic and tertiary health institutions globally, the following actions are recommended:

Formalise research within health systems

Tertiary health institutions should integrate research roles into clinical job descriptions, ensuring protected time for research activities.

Encourage joint appointments

Dual roles across HEIs and tertiary health institutions should be encouraged, ensuring clinician-researchers can maintain active research engagement alongside clinical duties.

Strengthen institutional partnerships across sectors

Strengthen partnerships between HEIs and tertiary health institutions through co-funded research initiatives, shared infrastructure and collaborative training programmes.

Standardise policies across regions

Advocate for regional policies that standardise licensing and research career structures to facilitate mobility of clinical researchers globally.

Conclusion

Strengthening CRCPs is essential for advancing clinical research, improving healthcare outcomes and fostering sustainable development in LMICs. Institutions must take proactive measures to address systemic barriers while leveraging global partnerships and funding opportunities. Implementing the recommended strategies will create a more structured and supportive environment for clinical researchers, ensuring the long-term success of CRCPs.

Appendices

Appendix A: Data collection tools

AI. Individual-level survey tool

Survey participants: Clinicians on a Clinical Research Career Pathway

Introduction:

We are interested in understanding your experiences and perceptions regarding the facilitators and barriers you have encountered during your clinical research career pathway (CRCP). Your responses will help us identify mechanisms to strengthen these pathways.

This survey includes 5 sections: 1) Background Information; three main sections that focus on facilitators and barriers related to 2) Accessing a CRCP; 3) Pursuing a CRCP; and 4) Maintaining a clinical academic role; and 5) Additional comments.

Thank you for your time and for participating in this survey.

Section I: Background information

Institution name and country

(Free text)

Your clinical role and area of clinical specialisation

(Free text)

Number of years since receiving your professional qualification?

- 0-2 years
- 3-5 years
- 6-10 years
- 11+ years

Your academic role and area of research

(Free text)

Number of years since receiving your academic qualification?

- 0-2 years
- 3-5 years
- 6-10 years
- 11+ years

Which of the following degrees do you hold?
(Select all that apply)

- Bachelor's Degree (e.g., BSc, BA)

- Master's Degree (e.g., MSc, MA)
- Doctor of Medicine (MD)
- Doctor of Philosophy (PhD)
- Doctorate in Clinical Practice (e.g., DClinP, DNP)
- Other Clinical Doctorate (please specify)
- Professional Degree (e.g., MBBS, JD)
- Diploma (please specify)
- Other (please specify)

(Text fields for "please specify" options)

Which of the following best describes your gender?"

- Woman
- Man
- Non-binary
- Prefer to self-describe: [_____]
- Prefer not to say

Please share any other details about your role as a clinical researcher that you think may be relevant as background information.

(*Free text)*

Section II: Facilitators and barriers related to accessing a Clinical Research Career Pathway

II-a) Initial institutional support

To what extent do you agree with the following statement: I had adequate access to funding opportunities and resources when I began my clinical research career.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Please describe the types of funding opportunities and resources that were available to you at the start of your clinical research career, and how these impacted your clinical research career pathway.

(Free text)

To what extent do you agree with the following statement: I had adequate mentorship and supervision when I began my clinical research career.

- Strongly Disagree
- Disagree

- Neutral
- Agree
- Strongly Agree

Please describe the type of mentorship and supervision you were offered at the start of your clinical research career, and how this impacted your clinical research career pathway.

(Free text)

To what extent do you agree with the following statement: When seeking out a clinical researcher career, my institution was open to adjusting my clinical workload to balance my roles and responsibilities as both a clinician and a researcher

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Please describe the ways in which your institution was flexible or inflexible in this way, and how this impacted the start of your clinical research career pathway.

(Free text)

II-b) Application process

Did you find the application process for research positions or fellowships within your institution clear and easy to navigate?

- Yes, it was clear
- It was somewhat clear
- No, it was unclear
- No opinion

Did you receive any guidance or support from your institution when applying for research positions or fellowships?

- Yes, I received guidance or support
- I received some guidance or support
- No, I did not receive any guidance or support
- No opinion

To what extent do you agree with the following statement: The application process for research positions or fellowships within my institution is equitable across all healthcare professions.

- Strongly Disagree
- Disagree
- Neutral

- Agree
- Strongly Agree

To what extent do you agree with the following statement: The application process for research positions or fellowships within my institution is equitable across all genders.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

To what extent do you agree with the following statement: The application process for research positions or fellowships within my institution is equitable across all ethnic groups.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Please describe any challenges you faced during the application process.

(Free text)

Section III: Facilitators and barriers related to pursuing a Clinical Research Career Pathway

III-a) Ongoing access to funding and resources

To what extent do you agree with the following statement: "I have sufficient access to funding opportunities and resources for clinical research."

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

How often have you experienced difficulty in securing sustained grant funding or resources to continue your clinical research projects?

- Never
- Rarely
- Sometimes
- Often

- Always

What specific challenges have you encountered when trying to secure long-term funding or resources for your research?

(Free text)

What resources or processes at your institution have facilitated your CRCP?

(Free text)

III-b) Institutional partnerships and collaborations

Does your institution engage in any clinical/academic partnerships or collaborations (i.e. between higher education institutions and healthcare institutions)?

(Yes/No)

[If yes, please describe and note how this has shaped your career path (if at all)]

To what extent do you agree with the following statement: "I have access to opportunities for interdisciplinary collaboration in my clinical research work."

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

How often do you collaborate with professionals from other disciplines on research projects?

- Never
- Rarely
- Sometimes
- Often
- Always

What barriers and facilitators have impacted your engagement in interdisciplinary collaboration for your research?

(Free text)

III-c) Training and development opportunities

Please describe any specific training and/or development opportunities that have helped you develop essential research skills.

(Free text)

Please describe any specific training and/or development opportunities that have helped you develop leadership and management skills.

(Free text)

III-d) Mentorship opportunities

Have you had a mentor during your clinical research career?

- Yes
- No

If yes:

32a. How often do you meet or communicate with your mentor?

- Daily
- Weekly
- Biweekly
- Monthly
- Quarterly
- Annually
- Other (please specify)

32b. What benefits have you experienced from having a mentor? (Select all that apply)

- Career guidance
- Emotional support
- Research skills development
- Networking opportunities
- Access to funding opportunities
- Improved work-life balance
- Other (please specify)

32c. What challenges have you experienced in your mentoring relationship? (Select all that apply)

- Lack of time for meetings
- Misalignment of expectations
- Difficulty accessing the mentor
- Differences in communication styles
- Lack of mentorship support for specific areas (e.g., research, career development)
- Other (please specify)

III-e) Perceptions of career value

How valued do you feel in your institution, as clinical researcher?

- Very unvalued
- Unvalued
- Neutral

- Valued
- Very valued

Do you believe your research has contributed to improving patient care or clinical practice/policies?

- Yes (if so, please provide some examples)
- No
- Unsure

How satisfied are you with the long-term career opportunities available for you as a clinical researcher?

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very satisfied

III-f) Institutional policies and culture

To what extent do your clinical duties interfere with your ability to engage in research?

- Not at all
- Slightly
- Moderately
- Significantly
- Completely

How flexible is your institution in allowing you to adjust your clinical schedule to make time for research?

- Very inflexible
- Somewhat inflexible
- Neutral
- Somewhat flexible
- Very flexible

Please describe any difficulties you've encountered in balancing clinical and research responsibilities.

(Free text)

How would you rate the equity across diverse backgrounds (e.g., gender, ethnicity) in your research career pathway?

- 1 = Not inclusive
- 2 = Slightly inclusive
- 3 = Neutral
- 4 = Somewhat inclusive

- 5 = Very inclusive

Have you personally faced any barriers related to diversity (e.g., gender, race, language) during your clinical research career pathway?

(Free text)

40. Have you encountered any non-inclusive institutional policies or structures that have hindered your clinical research career pathway?

(Yes/No)

(If yes, please describe)

41. How embedded is research culture within your clinical practice environment?

- 1 = Not embedded
- 2 = Slightly embedded
- 3 = Neutral
- 4 = Somewhat embedded
- 5 = Very embedded

Section IV: Facilitators and barriers related to maintaining a Clinical Academic role

IV-a) Support in wearing 'multiple hats'

42. Does your institution provide you with sufficient protected time to conduct your research?

- Yes, sufficient time
- Somewhat sufficient
- Not sufficient
- No protected time provided

43. How clear are the institutional expectations regarding your research and clinical roles?

- Very unclear
- Somewhat unclear
- Neutral
- Somewhat clear
- Very clear

44, How challenging have you found balancing clinical duties with your research responsibilities?

- 1 = Very challenging
- 2 = Somewhat challenging
- 3 = Neutral
- 4 = Somewhat manageable
- 5 = Easily manageable

45. Please describe how you address these types of challenges (re: balance of clinical duties with research responsibilities)

(Free text)

46, How challenging have you found work-life balance to be in your clinical academic role?

- 1 = Very challenging
- 2 = Somewhat challenging
- 3 = Neutral
- 4 = Somewhat manageable
- 5 = Easily manageable

47. Please describe how you address these types of challenges (re: work-life balance in your clinical academic role)

(Free text)

IV-b) Retention and progress

48. What specific challenges have you encountered with regards to career progression as a clinical researcher at your institution, and how have you navigated these?

(Free text)

49. To what extent do you agree with the following statement: "My institution has clear and well-communicated policies regarding career progression in clinical research."

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

50. How do you hope to grow and progress as a clinical researcher in the future

(Free text)

Section V: Additional comments

51. Please provide any additional comments about facilitators and/or barriers you have encountered during your clinical research career pathway (CRCP) that were not captured in this survey.

(Free text)

AII. Institutional-level survey tool

Survey participants: Academic Training Institutions and Tertiary Health Institutions

Introduction:

We are interested in learning more about clinical research career pathways (CRCP) across different global contexts. Your responses will help us identify and explore the successes and challenges faced by institutions in supporting clinicians on these pathways.

This survey includes 8 sections: 1) Background information; 2) Institutional support for CRCP; 3) Training and development opportunities; 4) Resources and infrastructure for CRCP; 5) Evaluation and impact measurements; 6) Partnerships and collaborations; 7) Barriers and facilitators for CRCP development; and 8) Additional comments.

Thank you for your time and for participating in this survey.

Section I: Background information

Institution name, location and country

(Free text)

Type of institution

Drop down menu:

- Academic Training Institution
- Tertiary Health Institution
- Other (please specify)

Your role in this institution

(Free text)

Section II: Institutional support for CRCP

II-a) Strategic planning for CRCP

Does your institution have a written strategic plan for supporting clinical research career pathways (CRCP)?

- No plan
- A draft plan
- A finalised plan
- A finalised plan that is accessible to all staff (e.g. on intranet)

If the finalised plan is publicly available, please provide weblink here:

Does your institution have plans to expand CRCP capacity in the next 3 years?

- ☐ Yes
- ☐ No

(Free Text: If yes, please describe these plans.)

II-b) Executive and leadership support

To what extent do you agree with the following statements:

My institution recognises the importance of clinical research roles

- Strongly Disagree
- Disagree
- Neutral
- Agree (please provide an example)
- Strongly Agree (please provide an example)

The executive leadership in my institution is engaged in supporting clinical research roles

- Strongly Disagree
- Disagree
- Neutral
- Agree (please provide an example)
- Strongly Agree (please provide an example)

The HR department at my institution is supportive of clinical research roles

- Strongly Disagree
- Disagree
- Neutral
- Agree (please provide an example)
- Strongly Agree (please provide an example)

Section III: Training and development opportunities

III-a) Access to continuing education

What continuing education opportunities does your institution offer for clinicians on a CRCP?

- ☐ Workshops (please describe):
- ☐ Short courses (please describe):
- ☐ Advanced degrees (please describe):
- ☐ Other continuing professional development opportunities (please describe):

III-b) Mentorship and career progress tracking

Please describe any formal or informal mentorship opportunities your institution offers for clinicians on a CRCP.

(Free text)

Please describe any processes that your institution has for evaluating and tracking the career progress of clinicians on a CRCP.

(Free text)

Please describe any support that your institution offers for helping clinicians transition into engaging in research training and/or activities.

(Free text)

Section IV: Resources and infrastructure for CRCP

IV-a) Research culture and leadership support

Does your institution foster a research culture that supports CRCPs?

- ☐ Not at all
- ☐ To a small extent
- ☐ To a moderate extent
- ☐ To a great extent
- ☐ Completely

Please provide clear examples of how the research culture in your institution supports and/or does not support clinical research career pathways.

(Free text)

Does your institution encourage research-driven practice?

- ☐ Not at all
- ☐ To a small extent
- ☐ To a moderate extent
- ☐ To a great extent
- ☐ Completely

Please provide clear examples of how the leadership in your institution supports and/or does not support clinical research career pathways.

(Free text)

IV-b) Funding and resources

Are there adequate internal funding opportunities for clinicians on CRCPs in my institution?

- ☐ Not at all
- ☐ To a small extent (please expand):
- ☐ To a moderate extent (please expand):
- ☐ To a great extent (please expand):
- ☐ Completely (please expand):

Are there adequate external funding opportunities for clinicians on CRCPs in my institution.

- ☐ Not at all
- ☐ To a small extent (please expand):

- ☐ To a moderate extent (please expand):
- ☐ To a great extent (please expand):
- ☐ Completely (please expand):

Does your institution have institutional policies in place for funding clinicians on a CRCP?

- ☐ Not at all
- ☐ To a small extent (please include the policy details here):
- ☐ To a moderate extent (please include the policy details here):
- ☐ To a great extent (please include the policy details here):
- ☐ Completely (please include the policy details here):

IV-c) Research environment

In what ways, if any, does your institution collaborate with healthcare providers to conduct clinical research?

(Free text)

To what extent does your institution integrate clinical practice with research activities?

- ☐ Not at all
- ☐ To a small extent (please explain):
- ☐ To a moderate extent (please explain):
- ☐ To a great extent (please explain):
- ☐ Completely (please explain)

Section V: Evaluation and impact measurement

V-a) Key performance indicators (KPIs)

In relation to clinical research career pathways, does your institution track and measure the following.

(Rate from 1 - Not at all to 5 - completely)

- Research output (publications, grants): [1] [2] [3] [4] [5]
- Career progression of clinical academics: [1] [2] [3] [4] [5]
- Impact of clinical research produced by your institution: [1] [2] [3] [4] [5]

V-b) Institutional evaluation systems

Is clinical research recognised in performance evaluations at your institution?

- Not at all
- To a small extent
- To a moderate extent
- To a great extent
- Completely

How frequently does your institution review the career progression of clinical researchers?

- ☐ Never
- ☐ Every 2 years
- ☐ Annually
- ☐ Bi-annually
- ☐ Other (specify here):

Free Text: Describe the performance review process for clinical researchers.

Section VI: Partnerships and collaborations

VI-a) External and internal partnerships

For academic institutions: Describe any external research partnerships that your institution has with tertiary health institutions, and how these contribute to supporting CRCPs.

[Free text]

For health institutions: Describe any external research partnerships that your institution has with academic training institutions and/or research centres, and how these contribute to supporting CRCPs.

[Free text]

Describe any additional external partnerships or collaborations that your institution has that support CRCPs.

[Free text]

Describe any internal collaborations within your institution that support CRCPs (i.e. collaboration across departments/units)

[Free text]

Section VII: Barriers and enablers for CRCP development

VII-a) Barriers

How significant are the following barriers to CRCPs at your institution?

(Rate from 1 - Not significant to 5 - Very significant)

- Limited funding opportunities: [1] [2] [3] [4] [5]
- Organisational resistance to change: [1] [2] [3] [4] [5]
- Lack of career structure for clinical academics: [1] [2] [3] [4] [5]
- Difficulty for clinical researchers in balancing their clinical and academic workloads: [1] [2] [3] [4] [5]

Free Text: Please describe any additional barriers.

VII-b) Facilitators

How strong are the following facilitators in supporting clinical research career pathways at your institution?

(Rate from 1 - Not strong to 5 - Very strong)

- National and institutional policies supporting research: [1] [2] [3] [4] [5]
- Existence of role models and mentors: [1] [2] [3] [4] [5]
- Research culture within the institution: [1] [2] [3] [4] [5]

Free Text: Please describe any additional facilitators that support CRCP.

Section VIII: Additional comments

Please provide any additional comments or suggestions on how to improve support for clinical research career pathways at your institution.

(Free text)

If you have any leads about any specific case studies that would showcase an interesting clinical career pathway (successful or unsuccessful), please share the details here (including contact details so that we can follow up).

(Free text)

AIII. Individual-level interview guide

Interview participants: Clinicians on a Clinical Research Career Pathway

Introduction:

Thank you for agreeing to participate in this interview.

As you know this interview is a follow-on from the survey that you recently participated in, led by the Centre for Capacity Research, which was part of a global study led by the Academy of Medical Sciences (AMS).

This study is about the role of institutions in supporting clinical research career pathways across the globe. The intention of this interview is to build upon learnings from the survey and dig deeper into thematic areas about the career pathways of clinical research leaders (not just those in supporting research roles) from any health discipline (e.g. doctors, nurses, pharmacy, laboratory, physiotherapy, etc.). The goal is to help identify mechanisms to strengthen these types of clinical research career pathways.

In relation to confidentiality and data protection, please note that:

- Your participation in this interview is voluntary and questions relating to your personal data are optional.
- Interview data will be shared with the small research team who are leading this study at the Liverpool School of Tropical Medicine, but any published results will be anonymous and aggregated, and no individuals will be identifiable.
- You may withdraw at any time without consequence
- The interview will take approximately 1 hour, and with your permission, I would like to audio record the conversation to ensure accuracy. These recordings will only be accessible to the research team.

Is it okay with you for me to start this audio recording? *[Interviewee must reply 'yes' in order to proceed with the interview]*

Do you have any questions about the interview before we proceed? *[Respond to any questions]*

Thank you again for your willingness to participate in this interview, your perspectives are invaluable to this study.

SECTION A: Background information

1. Can you please introduce yourself, including your current institutional roles and affiliations?

- *What degrees do you hold?*
- *What is your current area of research?*
- *What is your clinical specialisation?*

SECTION B: Facilitators and barriers related to <u>accessing</u> a Clinical Research Career Pathway

Initial institutional support

2. Can you please describe the ways in which you had, or did not have, adequate access to funding opportunities and resources when you began your clinical research career?

- *If you did not have adequate access, how did you navigate this challenge?*
- *How did this impact your career pathway?*

3. Can you please describe the ways in which you had, or did not have, adequate access to mentorship and supervision when you began your clinical research career?

- *If you were able to have access to mentorship, what were the key areas in your CRCP that this mentorship facilitated?*
- *What challenges have you had in accessing mentorship, and how have you addressed these?*
- *How did this impact your career pathway?*

4. Can you please describe the ways in which your institution was flexible or inflexible in relation to allowing you to readjust your clinical workload to balance roles and responsibilities as both a clinician and researcher?

- *How did this impact your career pathway?*

Application process

5. Did you receive any guidance or support from your institution when applying for research positions or fellowships?

- *Did you face any challenges during these application processes?*
- *Do you feel that these application processes are equitable across*
    - *all healthcare positions?*
    - *all genders?*
    - *all ethnic groups?*

SECTION C: Facilitators and barriers related to <u>pursuing</u> a Clinical Research Career Pathway

Ongoing access to funding and resources

6. Can you please describe the access that you have to ongoing funding and resources?

- *What challenges have you faced when trying to secure long-term funding or researchers for your research?*

- *In what ways have resources or processes at your institution facilitated (or not facilitated) this access?*

Institutional partnerships and collaborations

7. Can you please describe any institutional partnerships and/or collaborations that your institution engages in, between higher education institutions and healthcare institutions?

- *How has this facilitated any opportunities for interdisciplinary collaborations for you in your work?*
- *How has this shaped your career path?*
- *What additional types of institutional partnerships or collaborations do you think would benefit you in your career?*

Training and development opportunities

8. Can you share about any specific training or development opportunities that you have had that have helped you develop your research skills?

- *What additional training would have been helpful for you?*

9. Can you share about any specific training and/or development opportunities that have helped you develop leadership and management skills?

- *What additional training would have been helpful for you?*

Mentorship opportunities

10. Can you please share about any mentorship you have received throughout your career?

- *How long has this been in place?*
- *How has this shaped your career pathway?*
- *Have you faced any challenges in accessing mentorship?*

Perceptions of career value

11. Can you please share about the ways you feel your role as a clinical researcher is valued or not valued at your institution?

12. In what ways do you feel your research has contributed to improving patient care or clinical practice and policies?

13. Can describe how you envision your long-term career opportunities as a clinical researcher?

Institutional policies and culture

14. In what ways does your institution allow or not allow you to adjust your clinical schedule to make time for research?

- *What challenges have you faced with respect to balancing your clinical and research role within your institution?*

15. Have you personally faced any barriers related to diversity (gender, race, language), during your clinical research career pathway?

- *Are there any non-inclusive institutional policies or structures that have hindered your clinical research career pathway?*

- *What aspects of your institutional policies or cultures would you change to allow for a more supportive environment for you throughout your clinical research career pathway?*

SECTION D: Facilitators and barriers related to <u>maintaining</u> a Clinical Academic Role

Support in wearing 'multiple hats"

16. Can you please share about the ways in which your institution allows, or does not allow, you to have sufficient time to conduct your research?

- *Are there clear institutional expectations regarding your research and clinical roles?*
- *What challenges do you face in balancing these two roles with respect to the expectations of your institution?*

17. Can you please share about any challenges your face in relation to work-life balance in your clinical academic role, and how you have navigated these challenges?

Retention and progress

18. Can you share any challenges you have encountered regarding career progression as a clinical researcher in your institution?

- *How have you navigated these challenges?*
- *How could your institution support you better?*

SECTION E: Additional comments

19. Do you have any additional thoughts or feedback to share about facilitators or barriers that you have faced within your institution during your clinical research career pathway that you were not asked about during this interview?

Wrapping up

We have now reached the end of the discussion. Thank you again so much for your time and for your participation in this interview, your insights and perspectives shared are invaluable to this study.

AIV. Institutional-level interview guide

Interview participants: Representatives of Academic Training Institutions and Tertiary Health Institutions

Introduction:

Thank you for agreeing to participate in this interview.

As you know this interview is a follow-on from the survey that you recently participated in, led by the Centre for Capacity Research, which was part of a global study led by the Academy of Medical Sciences (AMS).

This study is about the role of institutions in supporting clinical research career pathways across the globe. The intention of this interview is to build upon learnings from the survey and dig deeper into thematic areas about the career pathways of clinical research leaders (not just those in supporting research roles) from any health discipline (e.g. doctors, nurses, pharmacy, laboratory, physiotherapy, etc.). The goal is to help identify mechanisms to strengthen these types of clinical research career pathways.

In relation to confidentiality and data protection, please note that:

- Your participation in this interview is voluntary and questions relating to your personal data are optional.
- Interview data will be shared with the small research team who are leading this study at the Liverpool School of Tropical Medicine, but any published results will be anonymous and aggregated, and no individuals will be identifiable.
- You may withdraw at any time without consequence
- The interview will take approximately 1 hour, and with your permission, I would like to audio record the conversation to ensure accuracy. These recordings will only be accessible to the research team.

Is it okay with you for me to start this audio recording? *[Interviewee must reply 'yes' in order to proceed with the interview]*

Do you have any questions about the interview before we proceed? *[Respond to any questions]*

Thank you again for your willingness to participate in this interview, your perspectives are invaluable.

SECTION A: Background information

1. Can you please introduce yourself, including your institution and current role within it?

SECTION B: Institutional support for CRCP

Strategic planning for CRCP

2. Can you please describe any written strategic plans that your institution has for supporting clinical research career pathways?

- *Are there any plans for these plans to be expanded in the future?*

Executive and leadership support

5. In what ways does your institution recognise, or not recognise, the importance of clinical research roles?

- Is the executive leadership engaged in supporting clinical research roles?
- Does the HR department support clinical research roles?

SECTION C: Training and development opportunities

Access to continuing education

6. Can you please describe any continuing education opportunities that your institution offers for clinicians on a CRCP?

Mentorship and career progress tracking

7. Can you please describe any formal or informal mentorship opportunities that your institution offers for clinicians on a CRCP?

8. Can you please describe any processes that your institution has for evaluating and tracking the career progress of clinicians on a CRCP?

9. Can you please describe any support that your institution offers for helping clinicians transition into engaging in research training and/or activities?

SECTION D: Resources and infrastructure for CRCP

Research culture and leadership support

10. In what ways does your institution foster, or not foster, a research culture that supports CRCPs?

- Can you provide any examples?
- Do you have any examples about how the institutional leadership supports or does not support CRCPs?

11. In what ways does your institution encourage research-driven practice?

Funding and resources

12. Can you please describe any funding opportunities that your institution offers for clinicians on CRCPs?

- Internal funding opportunities?
- External funding opportunities?
- Any institutional policies in place for funding clinicians on a CRCP?

Research environment

13. Can you please describe the ways in which your institution collaborates with healthcare providers to conduct clinical research?

- Does your institution integrate clinical practice with research activities?

SECTION E: Evaluation and impact measurement

Key Performance Indicators (KPIs)

14. In what ways does your institution track and monitor clinical research career pathways?

- Research outputs (publications, grants)?
- Career progression of clinical academics?

- Impact of clinical research produced by your institution?

Institutional evaluation systems

15. Can you please describe the performance review process for clinical researchers?

- Is clinical research is recognised, or not recognised, in performance evaluations at your institution?
- How frequently is the career progression of clinical researchers reviewed?

SECTION F: Partnerships and collaborations

External and internal partnerships

16. Can you please describe any research partnerships that your institution has with *[tertiary health institutions/academic training institutions or research centres]*, and how these contribute to supporting CRCPs.

- Internal partnerships?
- External partnerships?

SECTION G: Barriers and facilitators for CRCP development

Barriers and facilitators

17. From your perspective, can you please describe the key barriers for clinical research career pathways at your institution?

18. From your perspective, can you please describe the key facilitators for clinical research career pathways at your institution?

SECTION H: Additional comments

19. Do you have any additional comments, suggestions, or insights related to institutional support for clinical research career pathways that you have not had a chance to share within this interview?

Wrapping up

We have now reached the end of the discussion. Thank you again so much for your time and for your participation in this interview, your insights and perspectives shared are invaluable to this study.

Appendix B: Survey data-finding summary tables (quantitative and qualitative)

BI. Individual-level survey data summary table

Theme category	Theme	Sub-theme	Quantitative descriptive analysis	Qualitative analysis (survey free text)
Facilitators and barriers related to accessing a CRCP	Initial institutional support	Availability of funding and resources	The majority (58.6%) of respondents reported that they did not have adequate access to funding opportunities and resources when they began their clinical research career.	When asked to describe the types of funding opportunities and resources that were available to them at the start of their clinical research career, the respondents' descriptions centred around the following themes: (1) self-funded (no institutional support); (2) international research grant funding; (3) international fellowships and scholarships; (4) institutional research grant funding; (5) institutional fellowships and scholarships; and (6) national research funding.
		Access to mentorship and supervision	The majority (58.6%) of respondents reported that they had adequate mentorship and/or supervision when they began their clinical research career.	When asked to describe the type of mentorships and supervision that was offered at the start of their clinical research career, the respondents' descriptions centred around the following themes: (1) informal mentorship (organically developed through an institutional degree programme, an institutional clinical training programme or a clinical research work placement); (2) formal mentorship and/or supervision (through an institutional research degree programme, or an institutional fellowship opportunity); (3) very little mentorship; and (4) no mentorship.
		Flexibility in clinical and academic roles	There were mixed responses in relation to institutional openness to adjusting individual clinical/researcher workloads; 39.3% noted that their institution was not flexible with these workload adjustments, 25% of participants were neutral	When asked to describe the ways in which their institution was flexible or inflexible in allowing a balance between clinical and academic roles, and how this impacted the start of their CRCP, the respondents' descriptions centred around the following themes: (1) not flexible – institutional focus is on clinical work only (this was a common theme); (2) not flexible – institutional focus is on research only; (3) some balance/flexibility (often dependent on seniority and/or an individual's negotiating their particular case with their institution; (4) flexible (framed as a personal choice and/or

			and 35.7% of participants noted that their institution was flexible with these workload adjustments.	the institution's understanding of the intricate link between their research and clinical roles); (5) institution allowed reduced clinical work hours during the pursuit of a PhD and/or postdoc; and (6) institution allowed reduced research work hours during a clinical work placement.
	Application process	Complexity and transparency of the application process	There were mixed responses in relation to the clarity and ease of navigating application processes for research positions or fellowships within institutions, with the majority noting that they were either 'somewhat clear' (41.4%) or 'unclear' (31%).	When asked to describe any challenges faced during the application process, respondents' descriptions centred around the following themes: (1) lack of inclusivity of the process (for various healthcare professions, gender, race); (2) research positions unavailable within their clinical institutions; (3) lack of writing support within their institution; (4) language as a barrier for application writing (English as the dominant language that is required); (5) challenges related to work–life balance; and (6) academic qualifications as a barrier.
		Availability of guidance and support	Almost half (48.3%) of respondents reported that they did not receive any guidance or support from their institution when applying for research positions or fellowships, although 34.4% reported receiving some guidance or support (17.2% reported receiving guidance or support, 17.2% reported receiving some guidance or support). The remaining 17.2% had no opinion.	

		Inclusivity of the process (for various healthcare professions, gender, race)	*Healthcare professions*: Almost half (46.4%) of respondents reported that the application process for research positions or fellowships within their institution was not equitable across all healthcare professions. Only 25% noted that the application process was equitable across healthcare positions; 28.6% were neutral. *Gender:* The majority (57.2%) of respondents reported that the application process for research positions or fellowships within their institution was equitable across all genders. *Race:* Half (50%) of respondents reported that the application process for research positions or fellowships within their institution was equitable across all ethnic groups; 25% noted that it was not equitable across all ethnic groups and 25% were neutral.	
Facilitators and barriers related to <u>pursuing</u> a CRCP	Ongoing access of funding and resources	Access to funding or financial support	The majority (60.7%) of respondents noted that they did not have sufficient access to funding opportunities and resources for clinical research.	When asked to describe any specific challenges encountered when trying to secure long-term funding or resources for their research, the respondents' descriptions centred around the following themes: (1) lack of institutional, national or regional funding; (2) country ineligibility for several of the international funders (based in the Global North); (3) lack

		Securing sustained grants or resources	The majority (65.5%) of respondents noted that they sometimes (31%) or often (34.5%) had difficulty in securing sustained grant funding or resources to continue their clinical research projects.	of research topic-specific funding opportunities; (4) lack of protected time within the institution to apply for funding opportunities; (5) lack of institutional administrative support; (6) competition too high within the institution for external funding application submission; (7) lack of long-term funding opportunities (required for cohort studies and other long-term research); (8) lack of funding opportunities for early-career clinical researchers; (9) language barriers (English as the dominant language for grant applications); and (10) some funding opportunities require an international research team (including collaborators from the Global North). When asked about what resources or process at their institution have facilitated their CRCP, respondents' replies centred around the following themes: (1) no resources or processes; (2) mentoring; (3) institutional support during temporary study leave; (4) training programmes (although typically more suited toward laboratory-based researchers); (5) working in multidisciplinary research teams; (6) global institutional collaborations and partnerships; (7) institutional administrative and logistical support (research support office, communications about grant opportunities through weekly newsletters, administrative support for funding applications, office space, institutional permission to appoint a research coordinator); (8) access to information and patients; (9) limited interest in respondent's research topic area so institutional competition was low; and (10) individual motivation (not related to institutional support).

	Partnerships and collaborations	Partnerships between healthcare institutions and HEIs	The majority (81.5%) of respondents noted that their institution engages in clinical/academic partnerships or collaborations (i.e. between HEIs and healthcare institutions).	When asked about any additional comments about facilitators and/or barriers encountered during their CRCP, respondents noted that a CRCP is not typically seen as a 'formal' career pathway, and thus pursuing this type of career requires a lot of motivation and/or dedication at the individual level. Additional barriers that were highlighted by respondents related to inequity (gender, ethnicity), academic institutional focus on teaching (rather than research) and limited career-tracking systems within HEIs (for clearer career progression opportunities for clinical researchers).	When asked if their institution engages in any clinical/academic partnerships or collaborations (i.e. between HEIs and healthcare institutions) and the ways in which these have shaped their career path, respondents' responses centred around the following themes: (1) a general positive impact on CRCPs; (2) new research networks opened up; (3) strengthened local team capacity; (4) additional collaborative research project opportunities opened up; (5) additional access to patient resources and materials for research; and (6) additional funding opportunities. There were also some respondents who noted that they had (7) no experiences of these kinds of clinical/academic institutional partnerships/collaborations; and others who highlighted that (8) these types of collaborations/partnerships had been self-driven, not institutionally founded.
		Interdisciplinary collaboration opportunities	The majority (69%) of respondents noted that they have access to opportunities for interdisciplinary collaboration in their clinical research work. The majority (82.8%) of respondents noted that they sometimes (34.5%) or often (48.3%) collaborate with professionals from other disciplines on research projects.		When asked about the barriers and facilitators that have impacted their engagement in interdisciplinary collaboration for their research, respondents' noted that barriers included: (1) clinical researchers' lack of willingness to engage due to lack of knowledge in other disciplines; (2) risk of other researchers stealing ideas/projects; (3) lack of institutional interest/support; (4) difficulty in finding the 'right' research partner; (5) limited time for collaborative work; (6) limited institutional logistical oversight; and (7) lack of awareness

					within the institution about what research is taking place in other disciplines. Facilitators included: (1) strong national and international networks; (2) a research culture that supports interdisciplinary collaboration; (3) long-term relationships; (4) funding opportunities for interdisciplinary research; and (5) individual-level relationships (i.e. developed through previous co-authorships) rather than institutional-level relationships.
	Training and development opportunities	Availability of essential research skills training			When asked to describe any specific training and/or development opportunities that have helped to develop essential research skills, respondents' responses centred around the following themes: (1) clinical training opportunities (clinical practice, bioethics); (2) research training opportunities (project planning, implementation science, research ethics, research methodology, statistics, data sciences); (3) institutional research degree training programmes (Master's and PhD levels); and (4) additional career development opportunities (grant writing as a major theme, as well as manuscript writing, clinical writing, and mentorship and leadership programmes).

		Leadership and management training programmes			When asked to describe any specific training and/or development opportunities that have helped leadership and management skills, respondents' responses centred around the following themes: (1) research fellowships and training opportunities (training in research project planning, research implementation, research evaluation and research administration, research graduate degree training programmes); (2) clinical training opportunities (clinical trials training); (3) leadership and management training and awards; (4) manuscript-writing training; (5) grant management training; (6) clinical-writing training; and (7) career pathway development courses. Some respondents also highlighted the lack of training opportunities that they have had to help promote their leadership and/or management skills.
	Mentorship and networking opportunities	Access to mentors and research networks	The majority (78.6%) of respondents noted that they had a mentor during their clinical research career. The frequency of communication with mentors varied; 14.3% reported weekly communication, 14.3% reported biweekly communication, 14.3% reported monthly communication, 33.3% reported quarterly communication, 4.8%		*These data were collected in the section related to interdisciplinary collaboration in the first section of the survey (re: accessing a CRCP) and thus were not repeated here. The data from the first section of the survey can be assumed to also apply here.*

			reported annual communication and 19% reported 'other'. Multiple benefits were reported from having a mentor. Out of the thematic options that were presented in the survey, 90.9% agreed that career guidance and networking opportunities were key benefits. Respondents also agreed that research skills development (81.1%), access to funding opportunities (54.5%), emotional support (31.8%) and improved work–life balance (18.2%) were additional benefits. When asked about challenges that have been experienced in the mentoring relationship, the majority (62.5%) of respondents highlighted a lack of time for meetings. Other challenges included misalignment of expectations (37.5%), difficulty accessing the mentor (12.5%), differences in communication styles (18.8%) and lack of mentorship support for specific areas (e.g. research		

			career development; 18.8%).		
		Opportunities for interdisciplinary collaboration	*These data were collected in the section related to interdisciplinary collaboration in the first section of the survey (re: accessing a CRCP) and thus were not repeated here. The data from the first section of the survey can be assumed to also apply here.*		*These data were collected in the section related to interdisciplinary collaboration in the first section of the survey (re: accessing a CRCP) and thus were not repeated here. The data from the first section of the survey can be assumed to also apply here.*
	Perceptions of career value	Career satisfaction from clinical research roles	The majority (55.2%) of respondents reported that they felt valued in their institution as a clinical researcher (34.5% reported 'valued' and 20.7% reported 'very valued').		
		Contribution of research to clinical practice and patient outcomes	The majority (85.7%) of respondents noted that they believe their research has contributed to improving patient care or clinical practice/policies.		When asked if they believed that their research has contributed to improving patient care or clinical practice/policies, respondents' descriptions centred around improvements in: (1) current clinical practice; (2) patient care guidelines; (3) patient follow-up care; (4) patient referral systems; (5) reproductive technology processes; (6) patient treatments; (7) patient treatments; (8) science technology; (9) disease outbreaks: (10) World Health Organization (WHO) treatment guidelines; (11) policies on diagnostics; (12) knowledge about disease incidence and prevalence; (13) intensive care unit (ICU) quality of care; (14) public health policy changes; and (15) patient access to vaccines.

		Perceptions of long-term career opportunities	The majority (57.2%) of respondents reported that they are satisfied with the long-term career opportunities available for them as a clinical researcher (42.9% reported 'satisfied' and 14.3% reported 'very satisfied').		
	Institutional policies and culture	Institutional policies and expectations regarding clinical workload	The majority (74%) of respondents noted that clinical duties interfere with their ability to engage in research (18.5% reported 'slightly', 25.9% reported 'moderately', 18.5% reported 'significantly' and 11.1% reported 'completely'.		
		Diversity and inclusion (related to opportunities for funding and career progression)	The majority (58.6%) of respondents reported that the equity across diverse backgrounds (e.g. gender, ethnicity) in their research career pathway was inclusive (34.5% reported 'somewhat inclusive' and 24.1% reported 'very inclusive'). The majority (82.8%) of participants had not encountered any non-inclusive institutional policies or structures that had hindered their clinical research career pathway.		When asked if respondents had encountered any non-inclusive institutional policies or structures that have hindered their CRCP, few respondents had anything to share. Amongst those who shared, their (1) political stance; and (2) country of citizenship had played a role.

		Organisational research culture	There were mixed results relating to the degree to which research culture is embedded within the clinical practice environment; 21.4% of respondents reported 'not embedded', 17.9% reported 'slightly embedded', 17.9% were neutral, 35.7% reported 'somewhat embedded' and 7.1% reported 'very embedded'.		
		Impact of research on institutional change and progress	There were also mixed results relating to institutional expectations regarding research and clinical roles; 29.6% of respondents noted that these expectations were 'very unclear', 7.4% noted 'somewhat unclear', 18.5% were neutral, 25.9% reported 'somewhat clear' and 18.5% reported 'very clear'.		
Maintaining a clinical academic role	Support in wearing 'multiple hats'	Ability to balance clinical and research duties	There were also mixed results relating to sufficiency of protected time that the institution provides to conduct research; 31% reported 'sufficient time', 20.7% reported 'somewhat sufficient time', 17.2% reported 'not sufficient time' and 31% reported 'no protected time provided'.	When asked to describe any difficulties encountered in relation to balancing clinical and research responsibilities, and how they have navigated these challenges, the respondents' responses noted that: (1) there is a lack of institutional resources for research projects; and (2) patient load for clinical work is too high. To address clinical/research workload challenges, respondents noted their efforts to: (1) maintain good time management in their work; (2) intentionally engage in self-care activities; and (3) collaborate with colleagues to balance out workloads. In order to move forward with their careers, respondents typically fell into four camps: (1) the workload is too much to balance, and individual choice was made to abandon clinical practice; (2) the workload is too much to	

				balance, and individual choice was made to abandon research work; (3) unable to balance workload well, although they continue to try (clinical work typically takes preference); and (4) unable to balance workload well, so any research conducted is done in additional full-time practice (while working overtime).
		Work–life balance during research engagement	Half (50%) of the respondents noted that work–life balance has been either 'very challenging' (21.4%) or 'somewhat challenging' (28.6%) in their clinical academic role. Some respondents were neutral (14.3%) and some reported the balance to be 'somewhat manageable' (35.7%), but no respondents reported that it was 'easily manageable' (0%).	When asked about how respondents navigate work–life balance challenges in their clinical academic role, their responses centred around the following themes: (1) seeking external support and advice from mentors; (2) engaging in self-care activities and/or pursuing a hobby; (3) effectively managing their time according to their personal/professional priorities; (4) acting as a mentor; (5) contributing to a positive work culture; (6) working outside of work hours; and (7) working with colleagues to balance out workloads.
	Retention and future growth	Career progression policies	The majority (55.2%) noted that there was a lack of clarity or communication about their institution's policies regarding career progression in clinical research.	When asked about any specific challenges encountered with regard to career progression as a clinical researcher at their institution, and how they have navigated these challenges, respondents' replies centred around the following themes: (1) limited funding opportunities; (2) lack of clarity of a career progression pathway; (3) unsupportive institutional policies; (4) language as a barrier (English as the main language); (5) too many commitments to juggle; (6) research interests not always a topical focus of funders and/or the institution; (7) lack of time; (8) lack of resources; and (9) slow ethics review board processes.
		Opportunities for retention		When asked about hopes to grow and progress as a clinical researcher in the future, the respondents' replies centred around the following themes: (1) pursue a PhD; (2) pursue

		and future growth		a clinical fellowship abroad; (3) publish more; (4) engage in more collaborative research; (5) pursue more training opportunities; (6) perform more clinical trials; (7) secure more research funding; (8) engage in more interdisciplinary research; (9) pursue global networking and partnership opportunities; (10) increase awareness amongst local authorities about the importance of research; and (11) engage in more research to inform clinical practice.

Appendix C: Interview data thematic summary tables

CI. Individual-level interview summary table

	Key CRCP theme	Key barriers	Key facilitators
Accessing a CRCP	Initial institutional support	• limited and/or lack of institutional funding • lack of a clear institutional CRCP pathway	• institutional communication about external funding opportunities for clinical researchers • supportive colleagues within the institution • no institutional objection to CRCPs
	Funding application processes	• language barriers • requirements of specific academic credentials (i.e. a PhD) • country ineligibility • local research interests not aligned with funder research interests for LMICs	• application guidance from within the institution • application guidance from outside of the institution • securing external funding through individual efforts
	Mentorship		• access to early mentorship during academic training • engagement in international research networks
Pursuing a CRCP	Funding and resources	• lack of continuity of funding • lack of institutional funding	• pursuing private funding opportunities • securing international funding, engaging in collaborative grants with international colleagues • strong relationships between the institution and funder

	Institutional partnerships and collaborations	• an overall lack of institutional partnerships	• cross-country academic partnerships and/or networks • integration of academic and clinical infrastructure • individual agency in pursuing partnerships and collaborations
	Training and development	• language	• training in research and clinical integrity • formal graduate training (Master's and PhD level) • certificate and diploma training • grant-writing training • leadership and management skills training • access to training grants and embedded workshops • pursuing training and development opportunities through individual links (not only institutional ones) • collaborative training opportunities through partner institutions
	Balancing clinical and research work	• heavy clinical workload limiting research capacity • lack of structured clinical–research balance	• alignment of clinical practice with research interests • reducing clinical workload responsibilities • working extra hours • individual advocacy for protected research time • collaborative teamwork within a research team • research improving clinical decision-making
	Mentorship	• lack of formal mentorship	• mentorship from international research networks

			• strong mentorship from a single mentor • informal mentorship opportunities
	Perceptions of career value	• lack of institutional recognition for research achievements of clinical researchers • an institutional culture that does not value research	• institutional understanding of the importance of clinical researchers engaging in both clinical and research work • institutional understanding regarding the importance of interdisciplinary research
	Institutional policies and culture	• lack of a formal career pathway for clinical researchers • a gap between institutional policy and practice	• established institutional guidelines for facilitating funding support, and regular institutional career monitoring processes
Maintaining a CRCP	Balancing clinical and research responsibilities		• institution allowing clinical researchers to manage their own time • personal agency in balancing clinical work and research
	Career progress opportunities	• lack of an institutionalised career pathway for clinical researchers	• institutional monitoring and accountability • collaborative research teams • institutional increased recognition of the value of clinical researchers
	Financial incentive	• lack of security in continued funding support • institutional fixed remuneration that does not incentivise	

		increased clinical work	

CI. Institutional-level interview summary table

Key CRCP institutional support			
Key theme	**Key sub-theme**	**Key barriers**	**Key facilitators**
Institutional policy support	Strategic planning for CRCPs	• lack of distinct CRCP and university research policies that do not apply to affiliated teaching hospitals	• formal inclusion of CRCPs in strategic planning
	Executive leadership support	• lack of awareness and formal recognition of clinical research roles • policies that impact clinical researchers that are standardised across geographic regions	• institutional recognition of clinical research roles
Training and development opportunities	Access to continuing education	• limited funding for training	• practical industrial-based training • grant-writing and research skills training • clinical trial research training • online and hybrid training models as a cost-effective alternative • international collaborations for training opportunities • interdisciplinary training opportunities
	Mentorship and career progress tracking	• lack of formal mentorship programmes	• structured mentorship programmes with embedded career-tracking mechanisms

			• career development support for early-career researchers
Resources and infrastructure	Research culture and leadership support	• lack of dedicated research support staff • hiring for clinical research roles based on prior research experience (rather than educational training)	• institutional support in balancing work and research commitments
	Funding and resources	• limited funding for training and mentorship • research focus being shaped by international funding priorities	• international funding as a source of research support
	Research environment	• institutional tracking of research outputs	
Evaluation and impact measurement	KPIs	• lack of structured KPIs for clinical research career progression	• the use of KPIs for skill development tracking • research outputs as a determinant of career progression
	Institutional evaluation systems	• report-based monitoring and evaluation	
Partnerships and collaborations	Internal and external partnerships	• lack of reciprocal partnerships between hospitals and universities	• collaborations facilitated by regional networks • interdisciplinary research collaborations • industry partnership as a funding source

Glossary of abbreviations

AMS	Academy of Medical Sciences
CCR	Centre for Capacity Strengthening
CRCP	Clinical Research Career Pathway
HEI	Higher education institution
HR	Human resources
ICU	Intensive care unit
KPI	Key performance indicator
LMIC	Low- and middle-income country
LSTM	Liverpool School of Tropical Medicine
MOU	Memorandum of understanding
NGO	Non-governmental organisation
NIH	National Institutes of Health
PhD	Doctor of Philosophy
PI	Principal investigator
REDCap	Research Electronic Data Capture
WHO	World Health Organization

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Academy of Medical Sciences
41 Portland Place
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