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Insights

Confronting the Challenge of Attracting and Retaining African Scientists to the Continent

African biomedical scientists weigh in on the barriers and solutions

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Africa is ripe for increasing biomedical research and development; however, many African diaspora scientists have gone abroad for other opportunities. Many who do want to return face several major barriers in increasing their research links to the continent. To better understand these impediments, Egon Zehnder partnered with the UK Medical Research Council (MRC) to interview 15 African biomedical scientists from around the world to explore the following questions:

- What is preventing African biomedical scientists based abroad from increasing their involvement with African research institutes and local African scientific talent?
- What are potential solutions to overcome these barriers?
- What role can MRC and other funders play in removing these barriers?

Across the conversations, we heard diverse stories from African scientists and their experiences engaging, or re-engaging, with their home continent. In most cases, participants had attempted to return, successfully returned or were volunteering their time to build capacity on the continent. The areas explored were not only related to making returning to the continent more appealing but also developing African scientific research excellence more broadly. Experiences were strikingly consistent, with subtle differences in emphasis stemming from scientists' personal and professional journeys, as well across the diversity of the African nations they had collectively worked in.

The barriers for diaspora scientists to increase their links to Africa span personal, institutional, national and international levels

Building on the thinking conducted and shared by Professor Solomon F. Ofori-Acquah, we broadly categorized the barriers to entry or development of stronger scientific links to Africa as "hard" or "soft." These barriers occurred at various levels, from personal to cross-country. Although the below matrix details discrete cross sections, many of these experiences transcend categorization.

Barriers to Diaspora Scientists Increasing Links to Africa

	Hard *(objective, structural or systemic)*	**Soft** *(subjective, historical or cultural)*
International *(above country)*	Limitations of international funder flexibility	Historical precedents and funder biases
National *(country and governmental level)*	Laws, regulations and physical infrastructure	Limited political attention or recognition of the value of research
Institutional *(university, research institute, business)*	Institutional infrastructure and competing institutional priorities	Culture and distribution of power
Personal *(direct impact on the person and their relations, individual choices)*	Quality of life and personal growth /career opportunities	Cultural integration

International funding processes and norms pose a challenge for African scientists

Across the conversations, participants shared several challenges scientists face in conducting research in Africa. One key factor is lack of access to and availability of funding. For many, this is a fundamental challenge to overcome in attracting talented researchers to the continent and building research capacity. Much of the effective and successful research funding comes from international sources; however, there are several obstacles in this process.

In terms of hard barriers, many successful programs are subject to limitations on volume or duration of funding. For example, participants noted the highly successful H3 Africa initiative that empowers African researchers in the field of genomics is funded by the NIH. Funding will end in 2021 due to legal limitations on the duration of foreign funding from the United States. As a result, a highly successful and now well-established program that is generating results is at risk. A number of suggested interventions recommended building on what works or has yielded results, ensuring that programs making a difference are

continued and developed. "It hurts to see people with good intentions get sucker punched by the environment… so before giving money come and see what works on the ground," one scientist reflected.

For individual researchers looking to secure grants, the vast majority of funds are administered and available from the global north, requiring many African scientists to apply for grants abroad. In doing so, African scientists who study and work on the continent are subjected to standards and norms they may be unfamiliar with and may not appreciate the unwritten rules and norms within the grant application process (soft barriers). This results in a low success rate, which has a knock-on effect on the entire research community – less funding results in fewer projects and limited opportunities for researchers.

Suggested interventions would help both grantees and grantors. A number of initiatives in Africa for training scientists in grant applications, including AREF, have proven successful, as have cross-national collaborations and mentorships in supporting African scientists in their grant applications as well as providing perceived legitimacy for the grantor. These initiatives have been as simple as weekly tutoring sessions over Zoom. On the side of the grantor, there are tendencies to invest in their own systems or even build new institutions from scratch in a manner that is familiar to them, rather than investing in local African and African-led institutions.

> "We need substantial and long-term investment in our institutions. So often the solution is just to create a parallel institution, owned by an international funder that will continue to receive international funds; instead you need to strengthen what is local rather than starting from scratch."
>
> *– Medical Researcher who has relocated back to Africa*

Although recommendations included building on international initiatives that are effective, it was also clear that investment in local institutions would be the most effective way of building capabilities, differentiating between "on-the-ground" investment and local investment.

Systems, infrastructure and more limited governmental interest pose hurdles at the national level

At the national level, there are several barriers that create highly challenging conditions for scientists to excel, particularly African diaspora scientists who are re-adjusting to conditions on the ground. Participants shared frustrations with the overall physical environment for scientific research, such as power outages in some countries and a lack of overall infrastructure to conduct high-level research. Notably, frustrations peaked at the lack of understanding from governments of just how crucial reliable sources of power and timely delivery of reagents, equipment and consumables are to the advancement of science. "If the power can be kept on in hospitals during power cuts, surely the same can be done for laboratories," a scientist said. Key materials and reagents may not be viewed as perishable items through customs, leading to a lack of viability once delivered. Both basic consumables and equipment can be costly, with a lack of manufacturing on the continent, and complex and burdensome import processes or purchasing systems.

> "[African researchers] have less money available through grants but have to pay five times as much for nitryl gloves as in Europe."
>
> *– Research Support Provider*

These issues extend to aftersales service and repair, making it difficult to maintain equipment on the continent unless staff can be trained to do so themselves. Organizations such as Seeding Labs, which provides discarded but useable equipment from the global north to institutions in the global south, have stepped in to help address barriers around access to equipment, but the scale of the challenge is significant.

In addition to these hard barriers, many participants were keen to see more funding for science from their own governments. In many instances, there have been funds set aside, but the grants did not come to fruition. Some commented that the lack of political motivation often comes from a lack of understanding. In the same vein, governments have not fully understood the knock-on effects of a successful research lab for society at large. One participant shared that "Once I explained that this one lab was providing 40 jobs in the community, the politicians were more than happy to pay for it." Effective communication between the scientific community and governments are key in overcoming the barriers to developing research capacity within the region. Programs, such as that of the Gates Foundation, which include training scientist in policy and political communications, have proved successful in bridging the gap.

From discussions regarding barriers at the national level, there is a tension between bottom-up and top-down approaches. While there is a need for bottom-up strategies to ensure long-term and sustainable success, many of the initial barriers can be removed from top-down interventions at the governmental level. This is a trend that follows through to barriers discussed at the institutional level.

Institutions are not always equipped to facilitate research, or are not culturally supportive of investing in research

Aside from the macro-environment where African scientists face challenges across funding and infrastructure, there are also barriers in the micro-environment in which they work. Many participants cited a key part of scientific capacity building on the continent as not related to the technical science but to the systems around it. For example, many institutions do not have robust HR systems, which results in scientists having to take their attentions away from research.

> "Institutions do not have the overhead, so you have scientists having to spend time on managing funds, procurement, salary distribution. It is not enough to train scientists in funding management. We need to build the infrastructure and build the institution."
>
> *– Professor with dual appointments in a U.S. and an African institution*

The lack of systems becomes more significant when diaspora scientists return from institutions based in the United States where there are often systems in place to review and process the administrative side of grants. In these cases, not only are the diaspora scientists unfamiliar with this side of the grant process, but they feel frustrated that their attention has been diverted away from the science. A number of institutions have remedied this gap through partnerships with both public and private organizations. In one instance, instead of providing monetary donations, Novartis partnered with H3D to help set-up and operationalize a professional HR system within University of Cape Town. In other cases, participants described overseas partnerships with professors based in the United States. "My institution in the U.S. has the capability to manage the administration and budgeting for the joint project so I just put my name at the bottom in support of

the application," one participant explained. This creates a double benefit not only in providing system support to the researchers based in Africa but also adding credibility to the grant in the eyes of foreign funders.

In addition to the need for robust system infrastructure, there is also need for a strong team to support the scientists. Many participants discussed the need for more skilled technicians and opportunities for their development and training. "Africa doesn't just lack equipment but lacks the trained personnel to operate it and support the research," one participant said. Often there is little capacity to develop these vital individuals since they cannot afford to take time away from working to develop their skills, and the institutions do not have the capacity to grant them paid leave. This results in a group of talented professionals with limited opportunity to upskill themselves and better support lead researchers and institutions.

Aside from problems of systems infrastructure, participants discussed an environment that provides limited capacity for and encouragement of research excellence. Compensation for pure research roles is not sustainable, therefore most in pure research roles take on additional roles. In the case of clinical scientists, this means taking on part-time clinical roles in private practices to make ends meet. Furthermore, those working within academic institutions described an incentive structure that encourages or requires classroom teaching above research and mentorship, compounding the demand on scientists' time. "I have friends who are professors but only published 3 or 4 articles," commented one participant. "The institutions don't put a premium on research and discovery, therefore don't give time to do it – the institutions are not geared towards putting an emphasis on that and it's a culture that needs to be encouraged."

In many instances, participants described situations where scientists on the continent were attempting to conduct research alongside spending significant amounts of time teaching as well as practicing clinical medicine, leaving very little time to conduct their research, let alone have capacity for innovation. In some cases, grants provided to researchers in Africa have stipulated that in order to gain access to funding they must prove they are not supplementing their income with private practice hours and focusing their time on innovative research. In other cases, grants have been provided purely for the livelihood of the researcher so they have the option not to wear multiple hats and focus their energies.

This culture is reinforced, as there is little progression or training for individuals within the institutions, and when opportunities arise the institution does not support leave for further education. This results in many research scientists being stuck at technician level without means or opportunities to develop themselves on the continent. Training programs and scholarships, such as those provided by the African Centres of Excellence, are in great demand to provide individual scientists with opportunities for development.

Many participants described the need for African scientists to have the ability, time and encouragement to think about the health challenges facing Africa. "We need our own people thinking about our problems," one scientist said.

Many diaspora returning to the continent have been trained in best-in-class international institutions and are keen to engender a culture of innovation and mentorship within the institutions they join in Africa. However, due to an entrenched hierarchical system, many who join at mid-career levels are faced with resistance when trying to enable change.

> "I was criticized when I said that I wanted to combine my research career with my academic career – it resulted in an undermining, rather than highlighting of a scientist's contribution more broadly."
>
> *– Senior Hematology Researcher*

On the other hand, those who join in senior positions, have more autonomy to enforce a culture transformation. As one senior professor described, "I would arrive to the meeting on time, and if my colleagues arrived after the allocated time slot I would leave – the next time they knew not to be late!"

Re-connecting to the African scientific environment as an individual can be challenging

In many of the experiences shared, the crucial driver of successful re-integration for diaspora scientists comes at the personal level.

For many, a key factor in not returning to the continent or pursuing a career there initially, is linked to the quality of life. "There's no compensation that could meet me halfway – the gap was just too big and the rest of my family was still in the UK," one participant shared. For most, the reason for leaving the continent was to access to high-quality education. Returning would result in a significant quality of life gap, particularly for those mid-career researchers who are also at a life stage caring for a young family. They would only consider a return to the continent once their children become independent or at least completed their studies. As a result, dual appointments between international and African institutions have become more prevalent, allowing individuals to spend time in both institutions whilst maintaining their standard of living. Another initiative mentioned by

a participant that never came to light was "11+1" appointments where the individual could spend 11 months in their home institutions and 1 month in Africa each year. Openness from both institutions to trial such appointments would be greatly welcome.

For those who do make a complete relocation, they realize they are not offered the same "package" as expats in the same positions with the same level of education and training.

> "When I relocated my family from the UK, I could not enroll my children in the international school, yet my colleague who was an expat had their children enrolled automatically by our employer."
>
> *– Clinician Scientist and Institute Leader*

Some successful exchanges in the early career stage came in niche opportunities for research where particular diseases or interventions are only observable in Africa which coincided with their chosen specialities. However, for others specialization becomes a hinderance if there was little opportunity for their research specialty. Looking to the future, the African continent has an untapped potential in population studies of human health – an area that desperately needs more investigation. This would encourage and provide opportunities for young diaspora scientists to conduct research in the field while studying internationally enabling them to start building connections and bridges to the continent from the start of their careers.

This building and maintaining of local networks is a crucial lynch pin in successful re-integration for diaspora scientists. In terms of cultural acceptance, many participants described instances of "othering" on their return, for example one participant shared "I was called the American Dean" which can take a huge emotional toll. Moreover, a lack of established networks, collaborators and partners can also hinder research. "If I didn't have a friend who understood how the bureaucracy operated, there was no way I would be able to transport my equipment," one participant shared. For some diaspora scientists, their networks were the most difficult aspect to maintain and build as at the time of their international transition, global communication platforms were not as well established and diverse as they are today. Being able to create and maintain a network on the ground is one desired intervention that would encourage diaspora to return to the continent, and with the prevalence of online networking and Zoom, this can be even easier. The creation of formalized mentorship networks or conferences for diaspora to have access to and opportunity to participate in local research is sought after.

There is significant desire among diaspora scientists to support the development of African science and scientists

Almost unanimously, African scientists were keen to find a way to give back or return to the continent, whether that be rooted in a sense of duty to their country or simply to be "closer to home." Across all successful re-integration experiences, the personal passion and determination to make it a success was clear. Although most successful transfers of skills came from established senior scientists, there are some key interventions that can be made to develop capacity on the ground as well as attract more mid-career researchers to establish themselves on the continent.

To complement and build on the findings outlined in this report, the MRC will conduct an online survey to solicit the views of more diaspora scientists at varying career stages. The results of the project will inform the direction of further activities by MRC and indicate whether partnerships with other institutions will be required to address the gap. The intent is not only to increase the opportunities for African scientists on the continent but also to provide opportunities to those based abroad to contribute further to the continent.

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