Research Mobility and Local Problem Solving*

Caroline Fry[1] and Gauri Subramani[2]

[1]Shidler College of Business, University of Hawai'i at Manoa

[2]College of Business, Lehigh University

Abstract

Mobile researchers can play a key role in facilitating knowledge transfer and advancing innovation focused on local challenges in the Global South. While most prior research has examined South-North migration, this study investigates how South-South fellowships influence the research agendas of non-migrating scientists at home institutions. Specifically, we analyze changes in the disease focus of non-migrant colleagues' research output before and after a fellow departs from their institution. We find that non-migrants with a South-South fellow in their organization tend to publish more after the fellowship. We also document an increase in their publication rate on diseases that are highly prevalent in both their home country and the fellow's host country. However, these effects decline with greater geographic distance between the home and host countries, driven by fewer collaborations between researchers in the two locations. These findings highlight how mobile researchers can expand access to relevant knowledge at home, thereby increasing research on local challenges. They also underscore the importance of geographic proximity in shaping the extent to which international mobility spurs research on local issues.

*Both authors contributed equally. We are grateful to Jeff Furman for sharing data and to the NBER Science of Science Small Grants for financial support. Thank you also to Akanksha Roy, Muzammil Khan, Sanchita Shrivastava, and Ben Subramani for research assistance.

1 Introduction

Migrants play an important role in the exchange of knowledge and resources between organizations and across borders (Nanda and Khanna, 2010; Agrawal et al., 2011a; Borjas and Doran, 2012; Ganguli, 2015; Wang, 2015; Choudhury and Kim, 2019; Hernandez and Kulchina, 2020). A growing body of literature highlights the positive impact of migrants—both those who remain in their host country and those who return home, such as participants in international fellowship programs—on innovation outcomes for individuals at home. These outcomes include increased access to knowledge and international networks (Kahn and MacGarvie, 2016b; Fry and Furman, 2023; Kang and Eklund, 2024; Choudhury and Kim, 2019; Wang, 2015), as well as enhanced productivity (Kerr, 2008; Choudhury, 2016; Fry, 2023a). Recent research has identified particularly strong benefits for scientists in the Global South,[1] who face structural barriers such as limited funding, infrastructure, and access to global knowledge networks—barriers that migrants can help to overcome. Local scientists in the Global South, who possess deep contextual knowledge of pressing challenges, play a vital but often overlooked role in advancing solutions to their own local problems (Fry, 2023b), many of which remain grossly under-studied (Moscona and Sastry, 2022; Vakili and McGahan, 2016; Kremer and Glennerster, 2004). Understanding how these constraints shape scientific progress—and, more importantly, identifying strategies to mitigate them—is essential for fostering innovation that directly addresses the challenges of the Global South.

While prior research has deepened our understanding of how skilled migration affects innovation in home regions—particularly in the Global South—the vast majority of studies focus on South-North migration pathways.[2] Critics argue that such pathways may still perpetuate a lack of focus on local challenges, with research agendas continuing to be shaped by priorities of the Global North. By contrast, we know far less about

[1]The Global South countries referenced in this study comprise most low- and middle-income countries and are listed here: https://owsd.net/sites/default/files/OWSD%20138%20Countries%20-%20Global%20South.pdf

[2]There are some exceptions; for example, Fry and Furman (2023), who study the same fellowship program as this paper, show that researchers in the Global South have more international collaborations following the departure of a colleague from their institution.

how South-South migration shapes innovation outcomes, particularly those targeting local needs. On the one hand, South-South migration may offer fewer benefits, as migrants may not facilitate access to resources and frontier knowledge concentrated in traditional knowledge centers. On the other hand, South-South migrants may provide access to more contextually relevant knowledge and connections, potentially leading to innovation outcomes better aligned with local challenges. Given rising global barriers to mobility—such as visa restrictions and limited access to fellowships in higher-income countries—it is increasingly important to understand how South-South mobility pathways can uniquely foster innovation in the Global South.

In this paper, we ask: How does exposure to a South-South mobile colleague shape the research trajectories of low- and middle-income country (LMIC) scientists, particularly their research output focused on local problems? We address this question and contribute to the literature on migration and innovation in two main ways. First, we examine the effect of South-South migration on research addressing local challenges within the context of disease studies. Second, we investigate when South-South mobility matters most for innovative outcomes by analyzing heterogeneity based on the geographic distance between home and host countries. The extent to which non-migrants' research trajectories are influenced by exposure to a fellow likely depends on this geographic distance. In the Global South, where travel and communication barriers remain significant, proximity may play a critical role both in enabling knowledge flows and in amplifying their impact on research and innovation outcomes.

We conduct our analysis using data on female scientists who apply for an international fellowship administered by the Organization for Women in Science for the Developing World (OSWD). This fellowship program provides opportunities for female scientists in developing countries to study in another country in the Global South. To assess the relationship between the fellowship and the research agendas of non-migrant researchers at the fellows' originating organizations, we construct a panel dataset of non-migrants' publication outcomes. We focus on non-migrants at the OWSD fellowship applicants' home institutions and in the same scientific fields, limiting to fellows and non-migrants who publish in disease-related topics. Combining publication data with data on country-

specific disease prevalence, we analyze changes in the likelihood that a non-migrant publishes on diseases that are more prevalent in their home (and/or the fellow's host) country before and after the fellowship. We compare the publication output of non-migrants whose colleagues received an OWSD fellowship with that of non-migrants whose colleagues applied for but did not receive the fellowship, and therefore do not travel abroad. This design allows us to control for career, field, disease, and temporal changes in publication output.

Consistent with prior literature on South-North fellowships and innovation, we document that non-migrants exposed to a successful OWSD fellow publish more after the fellowship, as compared to non-migrants from institutions with an unsuccessful fellowship applicant. However, we also document a novel dynamic: that non-migrants exposed to a South-South fellow tend to increase their research focus on diseases that are highly prevalent in their home countries following the fellowship, particularly those diseases that are also highly prevalent in the host country. Conversely, they experience a smaller increase in research productivity in diseases that are prevalent in only the host or home country and not the other. Given that many of these diseases that are highly prevalent in these countries are neglected tropical diseases,[3] these results indicate that the mobility of researchers plays a crucial role in advancing much-needed research on global health grand challenges.

That said, we also document that following exposure to a South-South fellow, non-migrants decrease their publication output into low prevalence diseases at home, particularly those diseases where there is a high concentration of the global disease burden in the home country, including Ebola and Sleeping Sickness. This highlights a strategic trade-off: while fellowships can boost overall productivity, they may also divert attention away from certain locally concentrated health challenges. Institutions must weigh these trade-offs carefully when designing and supporting fellowship programs.

Finally, our findings suggest that while non-migrating colleagues of successful fellows see increased levels of increased productivity and their relative focus on home-country

[3]Neglected tropical diseases (NTDs) are diseases that are primarily present in low-income and tropical areas that affect more than 1 billion people worldwide (https://www.who.int/news-room/questions-and-answers/item/neglected-tropical-diseases last accessed 8.23.24).

disease research increases more following the fellowship if the host destination is geographically closer to the home country. Those with geographically close host locations also reduce their output into low prevalence concentrated diseases less. This finding suggests that the location of the fellowship can have a significant influence on the focus and outcomes of research of colleagues back at home.

We investigate possible mechanisms for these effects and do not find strong evidence that direct collaboration with the fellow, or competitive effects with the departing fellow, are primary drivers of non-migrants' increased focus on locally-relevant research topics, particularly for those traveling to more proximate host countries. Nor do we find strong evidence for selection effects driving our results. Instead, we find suggestive evidence that non-migrants increase the rate at which they collaborate with researchers in the fellows' new host institutions and countries, particularly on diseases that are highly prevalent in both countries. This is particularly salient for those exposed to more geographically close host locations, which appears to be driven by travel frictions between more distant locations.

We seek to bridge two literatures to contribute to our understanding of how mobile researchers can catalyse innovation addressing problems faced by countries in the Global South. While an extensive prior literature has documented the important role of mobile researchers in global knowledge diffusion, network formation, and ultimately in innovative productivity, in particular for scientists in the Global South (Saxenian, 2002, 2005; Agrawal et al., 2006; Saxenian, 2007; Kerr, 2008; Oettl and Agrawal, 2008; Agrawal et al., 2011b; Choudhury, 2016; Kahn and MacGarvie, 2016b; Kerr, 2018; Choudhury and Kim, 2019; Fry and Furman, 2023), this literature has tended to examine migration pathways from South to North. Our findings highlight the important role that South-South migration can play in targeting context-specific problems back at home. However, the extent and nature of this influence depend on home and host proximity. These findings complement a literature seeking to understand the drivers of innovation addressing grand challenges in the Global South (Arslan and Tarakci, 2022; Vakili and McGahan, 2016; Kremer and Glennerster, 2004), providing a potential explanation as to why rates of innovation addressing problems in the Global South remain low. Our findings have implications for

policies and programs as well as for organizations aiming to leverage scientific mobility to tackle pressing societal challenges.

2 South-South Migration and Innovation Addressing Local Problems

Migrants play a key role in both transferring knowledge and connections from their home regions to their new locations (Borjas and Doran, 2012; Ganguli, 2015; Wang, 2015; Choudhury and Kim, 2019; Fry, 2023a; Fry and Ganguli, 2023). Whether they remain in their host location or return home, migrants can act as a bridge between individuals in their home and host regions. This brokerage effect has been well-established in scientific and innovative fields; for example, migrants can facilitate the formation of new collaborations and boost the patenting and publication productivity of their non-migrating peers (Choudhury, 2016; Fry and Furman, 2023; Fry, 2023a; Xie and Freeman, 2023). This effect is particularly salient for researchers based in countries in the Global South who have limited opportunities to access resources, knowledge and connections.

However, the majority of this research has explored migration from countries in the Global South to the North–such as fellowships supporting African scientists to study in the United States (Kahn and MacGarvie, 2016a; Fry, 2023a). There is much less evidence about how and when exposure to a migrating colleague moving to a country within the Global South affects non-migrants in their home institutions. Whilst Fry and Furman (2023) demonstrate that South-South fellows can facilitate network building across countries, there is a gap in our understanding of how this kind of migration can shape the production of knowledge, particularly towards local problems. This study addresses this gap by analyzing how the research trajectories of non-migrating colleagues of a fellow evolve after the South-South fellowship.

The relationship between exposure to a South-South fellow and non-migrating colleagues' outcomes is ambiguous ex-ante. On the one hand, while mobility is often seen as a mechanism for knowledge diffusion, the benefits of South-South migration may be

more limited compared to migration toward well-established scientific hubs in the Global North. When scientists travel to another low- or middle-income country, they may face similar constraints in funding, infrastructure, and access to high-impact networks as they did in their home institutions, which could have limited impact on their colleagues back at home, and ultimately on progress towards local problems.

On the other hand, a fellow leaving from their institution traveling to another country in the Global South might result in their non-migrating colleagues focusing more on salient local problems. Mobile individuals play a key role in creating a bridge from their home regions to knowledge and collaborators in their new locations (Borjas and Doran, 2012; Choudhury and Kim, 2019; Fry, 2023a; Fry and Ganguli, 2023; Ganguli, 2015). Insofar as the knowledge and collaborations transferred home are relevant to local problems, this could increase the rate of research into these problems. For example, scientists from malaria-endemic countries may gain new insights or discover alternative solutions, or meet new collaborators, during a fellowship in another Global South country where malaria is also prevalent. These new learnings and connections might be shared with colleagues back home, resulting in an improved propensity and ability to address local malaria challenges.

Moreover, the extent to which non-migrants' research trajectories are shaped by exposure to a fellow may vary substantially, particularly based on the geographic distance between the home and host countries. While exposure to a fellow can help reduce frictions between more distant locations—facilitating knowledge flows that might not otherwise occur—it is reasonable to expect that, in the context of South-South mobility, these effects would be stronger between geographically closer countries. This is especially relevant given the resource constraints, limited infrastructure, and persistent challenges related to communication and travel across much of the Global South. Even relatively short distances can present significant barriers in these settings.

Indeed, prior research highlights the critical role of travel costs and geographic frictions in shaping innovation and collaboration outcomes (Catalini et al., 2020; Bahar et al., 2023). Other studies show that knowledge transfers most effectively when there is some degree of overlap or similarity between home and host contexts—whether in terms of

knowledge distance and cultural distance (Kolympiris et al., 2019; Lane et al., 2021; Kang and Eklund, 2024). Taken together, these insights suggest that in South-South mobility schemes, geographic proximity between home and host countries may not only influence the ease of accessing new knowledge but also amplify its eventual impact on research and innovation outcomes.

In this paper we take a question-driven approach to explore two central research questions:

1. How does a Global South researcher traveling to another Global South country on a fellowship program influence the research by non-migrating colleagues at their home organization?

2. To what extent is the influence of a researcher's South-South mobility moderated by the geographic proximity of the home and host country?

3 Setting, Data and Empirical Strategy

To study these questions, we explore the relationship between exposure to a scientist who is supported by a South-South fellowship operated by the Organization for Women in Science for the Developing World (OWSD) and outcomes of their non-migrating colleagues. We compare changes in the types of research output of non-migrating colleagues of a successful OWSD PhD fellow to changes in the types of research output of non-migrating colleagues of an unsuccessful OWSD PhD fellowship applicant. The colleagues of the unsuccessful applicant allow us to identify counterfactual outcomes in the absence of the OWSD fellowship.

3.1 Organization for Women in Science for the Developing World

OWSD provides grants to female scientists to study abroad during their PhDs. Female scientists in developing countries apply to OWSD for funding to support their PhD studies after having obtained approval from their proposed host institution in another country in the Global South. Fellows can apply for a full-time fellowship, which allows

them to complete their PhD degrees at a host institution for up to four years, or they can pursue a “sandwich" fellowship which enables them to study for a shorter period in another country and then return to their home institutions to complete their degrees.

Fellows are selected based on the feasibility of completing their proposed research project, the match between the proposal and the potential host institution, and the quality of the connection that the applicant has made with the host and other relevant partner organizations. OWSD also aims to achieve diversity each year in terms of the fellows' locations and scientific fields. Importantly for our study, there is no evidence that OWSD selects fellows based on the alignment of their home organization's research interests and the prevalence of these topics in their home or proposed host countries.

The unsuccessful OWSD applicants in our sample are unlikely to have opportunities to travel abroad. In the absence of the OWSD fellowship, access to international opportunities is limited for female scientists in the Global South. OWSD applicants are generally “young women who may never have left their home town before, let alone their country" (Quadrio-Curzio et al., 2020). Indeed, our conversations with OWSD administrators confirmed that the majority of unsuccessful applicants fail to visit their proposed host institutions, providing us with a reasonable control group to which we can compare the effect of exposure to a fellow.

3.2 Sample construction

3.2.1 OWSD applicants

We begin with a sample of OWSD PhD fellows who applied to the program from 1996 to 2016 and agreed to have their data used for research. We have data on 315 applicants in total, which includes data on 134 successful applicants and 181 unsuccessful applicants.[4] We have information on their home institution, proposed host institution, year of fellowship, and field of study. The home institution is where they are based at the time of applying for the OWSD fellowship. We match the names, institutions and field of study of the fellows with their full publication record, if any, using the Elsevier Scopus

[4]There are a total of 2,952 applicants, out of which which 654 were awarded fellowships. Our sample of 315 applicants is representative of all applicants in terms of country of origin and field of study.

database.

3.2.2 Non-migrant colleagues

As we are primarily interested in the effects of being *exposed* to a fellow as opposed to the effects on the fellow directly, we generate a sample of applicants' non-migrating colleagues in their home institution.

To identify non-migrant colleagues, we select individuals from the Elsevier Scopus publication database who are affiliated with applicants' home institutions in the three years prior to fellowship application and who publish in the same broad field (such as agricultural research or health research).[5] We extract each non-migrant scientist's entire publication history from the Elsevier Scopus publication database to generate annual variables on research output as described below. We retain publication records of sample scientists for the five years prior and up to ten years following the fellowship application year.[6]

Measuring the extent to which researchers focus on local problems is challenging. We do so by concentrating our publications and measures on diseases (more details in the next section) and leverage geographic variations in disease burden worldwide to create clear indicators of both the local nature of issues and the focus of a scientist's research agenda. Given this focus, we restrict our sample to the set of OWSD applicants and their non-migrating colleagues who ever publish in *any* disease. This leaves us with 3,667 treated non-migrant scientists (those whose colleague received an OWSD fellowship) and 2,943 control scientists (those whose colleague applied for but did not receive an OWSD fellowship) who ever publish in diseases. This corresponds to 198 OWSD applicants, of whom just over 50% applied for sandwich fellowships. Of the non-sandwich successful

[5]Many scientists in our sample are exposed to more than one OWSD applicant. We treat each non-migrant $\times$ applicant pair as a separate observation, and cluster standard errors at the level of the colleague. Appendix Table A14 shows our results limiting only to the set of non-migrants treated by a single applicant.

[6]For ancillary analysis, we impute the gender of each non-migrant scientist in the sample. We use a commercial database obtained from the company Ethnic Technologies that identifies gender using first names. However, we only have data on first names for 45% of the individuals in our data because the remainder of our individuals do not have a first name listed on their publications. For the sample of people for whom we do have first names, we can identify gender unambiguously for 35%. Our gender-identified sample of non-migrants is 27% female and 73% male.

fellows, just over 35% of them returned home following their fellowship, but conversations with OWSD administrators and fellows suggest that a large proportion of fellows remain connected with their home countries even if they remain abroad. Just over 59% of the non-migrant disease sample is from Nigeria, with other common home countries being South Africa, Zimbabwe, Cameroon, Bangladesh, Ethiopia, and Kenya. Around 40% of the sample identified South African host institutions, with other common host institutions situated in China, Malaysia, India, Pakistan, Kenya, and the Philippines.[7]

3.3 Data and measurement

3.3.1 Disease publications and prevalence

In addition to annual counts of total publications, we develop several measures of research topics of focus. For all non-migrating scientists' publications, we identify whether each publication is related to diseases that are prevalent in their home country and/or the applicant's proposed host country.[8] To measure the disease focus of each publication, we use a key word search to identify whether a publication covers a specific disease topic out of all 156 diseases[9] included in the Global Burden of Disease database (i.e., for each disease we identify whether it is mentioned in the title or abstract of the publication). 30% of publications in our sample match to at least one disease.

We then identify the country-specific prevalence of each of our 156 diseases using the Global Burden of Disease database. The majority of our analysis utilizes the disease prevalence measure of the percent of 'Disability-Adjusted Life Years' (DALYs) in a country in the year prior to the publication year (to allow for publication lag). We consider a

[7] Appendix Table A1 lists the set of home and proposed host countries for non-migrating colleagues. In Appendix Table A8, we run our main analyses excluding non-migrants who are exposed to an applicant who selected an institution in South Africa to ensure that our results are not driven only by one host country.

[8] As a robustness check, we validate our main results using data on crop and pest prevalence. This is discussed in greater detail in Appendix B. In a manner identical to the disease identification, we use key word searches of the title and abstract of the publications to identify whether each publication covers a crop or pest topic. We next merge the set of all sample publications to data on country-specific crop/pest prevalence in using the Centre for Agriculture and Bioscience International's (CABI) Crop Protection Compendium (CPC). Results of these analyses are presented in Appendix Table A15

[9] We exclude diseases that are not endemic to physical environments; eg, "falls", "drowning", "fire, heat, and hot substances".

disease to be of high prevalence in a country if its percent of DALYs is greater than the median percent as calculated from our full set of diseases and countries.[10] As an example, if malaria is responsible for 0.05 percent of DALYs in a country, i.e. contributes towards 0.05 percent of DALYs there, whereas the median DALYs across all diseases and all countries is 0.005 percent, malaria would be considered highly prevalent in that country. There is significant variation in highly-prevalent diseases across home and host countries. For some home countries, high-prevalence diseases include liver cancer and diabetes, whilst for others they include malaria and schistosomiasis.[11]

We leverage our data on diseases featured in publication abstracts and titles to generate several key measures that capture the local nature of research. In our primary analysis, we measure individual-level annual publication counts to evaluate the number of articles a non-migrant publishes[12] on diseases that are of high prevalence in:

- The home country
- The host country[13]
- Both the home and host countries
- The home country but *not* the host country

And one measure that captures the number of publications on diseases that are *not* high prevalence in the home country. These tend to be diseases that are low prevalence, as most countries have at least some cases of the majority of diseases in the sample.

[10] Appendix Table A3 shows our results using alternative measures of disease prevalence.

[11] We are also particularly interested in research on Neglected Tropic Diseases (NTDs); thus, in additional analysis, we narrow our set of diseases to specifically examine non-migrant scientists' proclivities to publish on NTDs.

[12] Around 8% of our sample publications cover more than one disease. In this instance, if there is at least one disease covered in the publication in the named measurement category, the publication takes the value of 1 for that measure. If there is more than one high prevalence disease covered in the named category, the publication takes the value of the count of diseases covered. These measures therefore reflect the number of disease publications per person per year.

[13] For non-migrating colleagues, the host country is where their colleague who applies for the fellowship identifies as the country they will visit.

3.3.2 Geographic Distance

In order to evaluate the extent to which distance between the home and host location shapes the non-migrant scientists' research agenda we use data on bilateral distance in kms between countries gathered from CEPII (Mayer and Zignago, 2011). To explore mechanisms we generate data on primary language in each home and host country to identify those with shared primary languages, and we leverage our data on disease prevalence to identify countries that have a high proportion of shared diseases. We look at home–host country pairs that are in the top 25 percent of country pairs when it comes to shared disease prevalence, as these represent countries that have a high level of problem overlap. Lastly, we use data on flight time between countries.

3.3.3 Collaborations

To explore any mechanisms driving our observed effects, we evaluate whether the fellow shapes the non-migrants' research trajectory directly by collaborating with non-migrant colleagues or indirectly via facilitating international collaborations. We generate variables that reflect the rate at which non-migrant colleagues collaborate with both the OWSD applicant and with individuals in the applicant's host country. Namely, we evaluate the author lists of each publication in our sample and identify if they include: 1) the OWSD applicant, 2) anyone in the host institution, and 3) anyone in the host country.

3.4 Empirical strategy

In order to identify the relationship between exposure to a fellow and non-migrant scientists' research agendas, we leverage a differences-in-differences design. We compare publication patterns on specific disease topics before a colleague's fellowship versus after, relative to the change in non-fellow-exposed scientists' outcomes, using a scientist fixed effect specification. Our preferred analysis uses data at the person-year level and our outcome variables measure the annual count of publications in each category of interest (publications on home topics, publications on host topics, publications on topics prevalent in both home and host contexts, and publications on topics prevalent only in home

or host contexts). Our estimating equation (1) relates a non-migrant scientist i's publications in year t to the timing of the fellowship. The first year of treatment is the year after fellowship application (to allow for publication lag and migration time). We estimate the following:

$$E\left[y_{it}|X_{it}\right] = exp\Big[\beta_0 + \beta_1(After_Fellowship \times Successful_Applicant)_{it} + \beta_2(After_Fellowship)_t + \sigma_t + \tau_i + f(AGE_{it})\Big] \quad (1)$$

Where σ_t are year fixed effects, τ_i are individual fixed effects, and $f(AGE_{it})$ is a flexible function for scientist's career age. Standard errors are clustered at the person level.[14]

While our primary results are based on a person $\times$ year-level dataset, we also conduct analyses at the person $\times$ year $\times$ disease-level; that is, we construct a dataset that identifies the number of publications an individual has on each of the 156 diseases in our sample in each year. In these specifications, we include person $\times$ disease and disease $\times$ year fixed effects, as well as person $\times$ year fixed effects. This allows us to account for unobserved propensities of individuals to publish in particular diseases overall, variation in disease research output trends over time, and person-level general research output trends over time.

In heterogeneity analysis we include a triple interaction between the $After_Fellowship$ and $Successful_Applicant$ variables with a continuous variable $LogHome/HostDistance(kms)$.

One concern with the baseline, and heterogeneity, analysis is that in the absence of the OWSD fellowship, the research trajectory of the treated scientists, or non-migrants exposed to a fellow, would have changed even in the absence of the fellowship. This could happen if the likelihood of receiving the fellowship is correlated with home institution strength in local problem research. Another concern is that the home and host institutions were developing informal relationships and that corresponds to the success of the fellowship application. To the extent that this is more likely in cases with similar home and host countries, this would bias our results. We address this concern in two

[14]In Appendix Table A16, we estimate our main results using a Poisson Maximum Likelihood model.

main ways.

First, we are evaluating non-migrant colleagues' publication patterns, not fellows' own publications; based on conversations with OWSD administrators, we anticipate that an applicant's fellowship outcome is unlikely to be based on their colleagues' research trajectories. However, in the event that it is, our empirical strategy accounts for underlying heterogeneity between individual non-migrants through the use of the fixed-effects specification. Therefore, our effect measures the change in outcomes pre- and post-fellowship, net of any differences between individuals in the sample. Because we are relying on the timing of the fellowship event to identify our main relationship, we test whether there were already differences in publication patterns between our treatment and control groups in the pre-treatment periods. Figures 1 and 2 present these results for publications on home-country diseases. These figures demonstrates that there is no significant pre-trend; treated and control colleagues publish on diseases present in their home countries at equivalent rates prior to the fellowship.[15]

Second, we conduct a series of tests (described in detail later in Section 4.4) to assess the extent to which pre-treatment characteristics of the fellow and the home institution, in particular – the fellow's and the home institution's proclivities to publish in local problems – is driving the observed effects. Our results are robust to accounting for these features that could potentially drive our results.

While we attempt to account for alternative explanations that could be driving our findings, in the absence of an experimental context, we are unable to claim causality. Rather, we are documenting an important relationship between mobile researchers and the rate of research into local problems back at home.

[15]Treatment occurs at various times in our setting; not all fellows are treated in the same year. When treatment timing varies, our estimation approach using difference-in-differences estimation compares already-treated units and later-treated units (a "forbidden comparison" (Goodman-Bacon, 2021)), which can negatively weight units that are treated earlier and lead to inaccurate estimates. As a result, we also evaluate our results using differences-in-differences estimators that avoid comparing already-treated units to later-treated units. We identify that the estimators developed by Borusyak et al. (2022) and Gardner (2022) are best suited for our setting. Appendix B provides further detail about our empirical approach. We conduct our main analysis using these estimators and Figure B1 shows pre-trend figures using these results. Our results are very similar to what we find in our Ordinary Least Squares analyses.

4 Results

4.1 Descriptive Statistics

In Table 1, we provide details on the treated and control samples at the year of application. Columns 1 and 2 show averages and standard errors in brackets for our control and treatment groups, respectively. Column 3 shows the raw difference in means between treated and control groups, and column 4 shows the t-statistic for significance of that difference.[16] As we see in this table, there is balance of key productivity statistics, career, gender and research direction at the time of treatment. While there are some small differences in the collaboration rate between home and host country researchers between treated and control scientists, for our empirical approach, we include individual-level fixed effects in our regressions and run a number of of robustness checks to verify if it is these non-migrants driving our results.

Across the sample of treated and control scientists, on average, sample scientists publish more on home country diseases than host country diseases, and these papers on home-country topics make up a large proportion (on average, 42%) of their overall publications pre-treatment. Collaborations with outside researchers are fairly rare, and non-migrants produce just 0.07-0.11 publications with host country researchers in the five years prior to treatment.

4.2 Changes in research addressing local problems

We start by examining the effect of exposure to a fellow on non-migrants' overall productivity. Table 2 presents these results.[17] Consistent with prior research in this area, we show that non-migrants whose colleagues received an OWSD fellowship publish more after their exposure to a fellow (column 1). Non-migrants' annual publication outputs are 5% higher following their colleagues' initiation of a fellowship abroad.

[16] The t-test compares the control and treatment group means and assumes a null hypothesis that the two means are equal. If the t-statistic is greater than 1.96, we can reject the null hypothesis that there is no difference between means at a 5% level of significance.

[17] Note that the coefficients for $After_Fellowship$ and $Successful_Applicant$ are absorbed by fixed effects for years since treatment, and individual level fixed effects.

Our central question is: do non-migrants publish more on diseases that are prevalent in their home countries after exposure to a fellow from their institution? Table 2 shows results for publication counts on diseases that are of high prevalence in home (and host) countries. We start by evaluating the change in the count of publications on high-prevalence home country diseases. We show the raw data representing the changes in publication output on locally-prevalent diseases plotted in Figure 1 and the corresponding regression results in column 1 of Table 2. Through looking at both the total number of publications annually in high prevalence diseases (top row), and looking at the proportion of publications in home country diseases (bottom row), we see that non-migrants are more likely to publish on diseases that are high prevalence in their home countries after the fellowship (column 2). We also find that they are more likely to publish on diseases that are high prevalence in their colleagues' host countries (column 3). However, these effects are mostly driven by publications on diseases that are high prevalence in *both* home and host countries (column 4) with are smaller observable increase in research on diseases prevalent only the home country (column 5). Interestingly, column 6 demonstrates that the non-migrants decrease their output (and proportional output) into diseases that are not high prevalence at home, a finding to which we will return.[18][19]

Figure 2 illustrates the temporal nature of these changes in research focus; the increase in home country publications happens relatively quickly following their colleagues' fellowship (about two years after the fellowship, we see a noticeable change), and this effect is sustained (although with slightly less intensity) until 10 years after the fellowship.

In Table 3, we explore whether non-migrants increase their output in diseases classified as neglected tropical diseases (NTDs). These diseases represent major grand challenges, and non-migrants in the Global South may possess a unique comparative advantage in addressing them, given their direct exposure to local disease burdens. The results

[18] In Appendix Table A2, we show that this increase in relative focus in home , and home and host country disease publications is not just driven by low-quality publications. We measure the sum of quality adjusted-publications, as well as the average quality of the annual publications of treated scientists in these diseases areas, demonstrating increases in both measures after the fellowship.

[19] We consider how some of our measures may contribute to the results. Appendix Table A3 shows our results using alternative measures and margins of disease prevalence. We see that even using these alternate measures, the propensity at which non-migrants increase their relative focus on local, and particularly on shared, problems increases.

show a significant increase in publications on high-prevalence NTDs following exposure to a fellow. In contrast, the decline in research output on non-high-prevalence diseases is concentrated in NTDs—specifically, those with an outsized share of the global disease burden in the home country (e.g., Ebola and Sleeping Sickness).

This finding suggests an important trade-off: while fellowships may catalyze greater engagement with widely prevalent neglected diseases—possibly aligning research with global or regional priorities—they may inadvertently draw researchers away from diseases that, while highly concentrated locally, remain less prevalent elsewhere.

4.3 Heterogeneity by Geographic Distance Between Home and Host Country

Next, we examine whether geographic distance between host and home countries shapes changes in non-migrants' productivity and research direction. Table 4 shows that non-migrating colleagues of successful fellowship applicants experience a significant increase in total publication output following the fellowship, as indicated by the positive and significant coefficient in column 1. However, this overall productivity boost—as well as the increase in publications on diseases relevant to both home and host countries—is stronger when the two countries are geographically closer. In contrast, the effect on research focused specifically on home country diseases is unaffected by distance. This suggests that geographic proximity plays a key role in shaping collaborative spillovers, particularly in steering research toward shared regional challenges.

As shown in column 6, distance also appears to moderately reduce the negative effect of fellow exposure on research into non-high-prevalence diseases, though this relationship is weaker. These findings underscore the importance of geographic proximity in amplifying research benefits of globalization. While international, in this case, South-South fellowships can boost overall productivity regardless of distance, closer geographic ties between home and host countries foster stronger shifts toward research on shared regional challenges, big or small.

4.4 Potential Mechanisms

We investigate several potential mechanisms that could be driving our observed effects. Namely, fellows might collaborate with researchers at home and directly transfer new knowledge or resources that support research into local problems. Or, they could indirectly facilitate access to knowledge and collaborators relevant to local problems.

4.4.1 Direct effect

First, we consider that fellows could directly influence their home country colleagues' research trajectories either by collaborating with them, advising them, or acting as role models who research local topics on an international stage. Non-migrating colleagues could also be influenced by a departing fellow through competitive dynamics, such as the freeing up of resources, particularly as it pertains to specific topic areas, allowing them to move into those topic areas (Borjas and Doran, 2015; Azoulay et al., 2019).

To understand if these direct effects are driving our results, we evaluate our results separately for non-migrants based on whether or not their fellow publishes in home country diseases.[20] In Table 5, we start by looking at whether successful fellows themselves orient their research trajectories towards home country topics (columns 1 and 2). Interestingly, we see that treated fellows are not significantly more likely to research home country diseases after they migrate. Next, we explore any heterogeneity of results according to the fellows' orientation. Column 3 shows results for colleagues of applicants who never publish on home country diseases, and column 4 shows results for colleagues of applicants who do publish on home country diseases. In both of these samples, we see a similar magnitude of increase in the non-migrating colleague's propensity to publish on home country diseases, which further suggests that collaboration (or competition) with the fellow, or specific role model or advising channels, are not likely to be driving the publication outcomes we observe. Note also that collaboration with a fellow is extremely unlikely; just 0.6% of sample scientists in this sample ever have a publication with a fellow. In addition to a low rate of collaboration with the fellow themselves, we see that our

[20] We identify whether fellowship applicants publish in any home country disease at any point in the 5 years before or 10 years after applying for the fellowship.

sample of non-migrant scientists are not more likely to publish with fellowship recipients following the fellowship (column 5). In column 6, we drop non-migrants who publish with the fellow from our sample and our results remain robust.

Together, we fail to find strong evidence that indicates that non-migrants' increased research investment in local diseases is driven by the fellow directly. This also serves as a robust test: insofar as we are concerned that a fellow is being sent to a similar host institution *in order to* strengthen home institution research into local problems, we would expect the fellows' local research focus to be correlated with non-migrant outcomes. We fail to find evidence for this channel, which is comforting.

4.4.2 Indirect effect

Another way in which exposure to a fellow can affect a home country colleague is if they facilitate connections or knowledge flows between their host country and home country colleagues. As shown in Fry and Furman (2023), fellowships of this nature can increase the rate at which home country colleagues collaborate with the migrant's new colleagues in the host country. Given this, we first examine the coauthorship patterns with host country researchers to understand the extent to which access to collaborators could be driving the changes we see in non-migrants' research agendas.

Our results are presented in Table 6. In columns 1 and 2, and consistent with prior research in this area, we see that after being exposed to a fellow, non-migrants are more likely to coauthor on any subject with a researcher from the host institution and host country as compared to the control non-migrants. Consistent with the productivity and research direction findings, these effects are greater for home and host locations that are closer geographically.

To further investigate this collaboration mechanism, we examine the content of publications coauthored by non-migrants and host country scientists. We evaluate whether these publications are on high prevalence home country diseases (column 3), non-home country diseases (column 4), shared home and host diseases (column 5), or diseases that are prevalent only in the home country and not host country (column 6). We see that coauthored publications focus predominantly on diseases that are prevalent in *both* home

and host countries, particularly when there is a short distance between home and host countries, and that there is no effect on collaborative research on diseases that are present in one environment but not the other. These results imply that the fellowship creates opportunities for home and host colleagues to invest in areas of common interest and relevance, but only if they are close in geographic space.

To better understand why geographic distance shapes collaborative outcomes in shared disease research, we further analyze the results in columns 6–8. In columns 6 and 7, we control for shared primary language between home and host countries, as well as overlap in disease burden. The distance effect remains unchanged, suggesting that neither linguistic similarity nor shared epidemiological profiles explain the relationship. However, in column 8, once we control for flight time between home and host locations, the distance effect becomes statistically insignificant and even reverses in sign. This indicates that the observed distance effect is likely driven by travel frictions, rather than by geographic distance itself.

This finding suggests that reducing travel barriers—rather than simply focusing on geographic proximity—may be critical for enabling productive collaborations and supporting research on shared regional health challenges. Programs aiming to foster collaboration may benefit from supporting easier and more frequent travel between partners.

4.5 Alternative Explanations

To assess the extent to which the increase we observe in non-migrants colleagues' relative focus on problems shared by the home and the host country could be driven by alternative explanations, we conduct several tests featured in the online appendix.

First, to account for the possibility that there are person-disease trends or disease-specific trends in research that might be driving our results, we conduct our analysis at the person $\times$ year $\times$ disease level in Appendix Table A6. Note that this analysis includes scientist $\times$ disease fixed effects as well as disease $\times$ year fixed-effects and scientist $\times$ year fixed effects. The scientist $\times$ disease fixed effects remove time-invariant differences in the extent to which scientists research on particular diseases. Disease $\times$ year fixed

effects remove the possibility that any trends observed are driven by general changes in the level of research into given diseases over the observed time period. Scientist $\times$ year fixed effects account for any changes in productivity of scientists over years which could generate changes in levels of research in given diseases. As we see in Table A6, our results are robust to this alternative data structure. In fact, the coefficient on the diseases prevalent at home and not in the host country is close to zero using this specification, suggesting that the small effect picked up in the baseline specification was due to one of these alternative channels (such as an increase in research more generally into those diseases).

Second, we evaluate the possibility that the observed effect is driven by OWSD fellows who are traveling from institutions with a greater focus on shared home and host diseases. In other words: are fellows traveling to countries with similar problems more likely to be from institutions with a focus on those problems, and is that driving our effects? We test this in a few ways in Appendix Table A7. First, we drop the minority of non-migrants who had coauthored publications with anyone in the host country prior to the fellowship, and second, we split the sample of non-migrants into those in an institution with above median relative publication output prior to the treatment on home and host diseases, and the remainder. We fail to find any evidence that institutions with prior relationships with the host country or that non-migrants in institutions with high home and host disease focus are driving the observed effects. Further, we run the full analysis excluding fellows who travel to South Africa, the most common host country in our sample, in Appendix Table A8. Our results remain robust.

Third, we compare colleagues of OWSD fellows who had “sandwich" fellowships for just to those who had longer, full-time PhD fellowships. Of our sample, 36% apply for full-time fellowships. Presumably, the sandwich fellows had less time in which to build relationships and connect their home and host country colleagues. In Table A9, we see that our results are meaningfully smaller for sandwich fellows. This suggests that the intensity of the connection to the host institution does matter for the outcomes we find. While not the focus of the paper, in a reduced sample of non-migrants for which we could obtain gender data, we show that the female non-migrants are more likely to

increase their local research focus following the fellowship (Appendix Table A10). Given the potential for homophily, this is likely to be the group of non-migrants most affected by the departure of a female fellow from their institution, thus providing further evidence that the observed effects are less likely to be driven by institution-specific characteristics, and seem to be driven by the fellowship itself.

Fourth, it could be that non-migrating colleagues are more likely to study problems that are of high prevalence globally (for example, HIV) and we are inaccurately characterizing these as shared home and host problems as opposed to problems that are shared across a variety of countries because of their global prevalence. In addition to dropping NTDs with higher global prevalence and attention (malaria, HIV and TB) in Appendix Table 3, in columns 2-4 of Table A11, we limit only to diseases with high global prevalence. Namely, we want to test whether non-migrants are orienting their efforts towards diseases that are high prevalence in general, not necessarily specific to the home and host country. We see that non-migrants are actually no more likely to focus on high global prevalence diseases that are also high prevalence in home not host countries, host only, and diseases that are not high prevalence in the home country, after the fellowship. This result suggests that we are observing an increase in focus towards diseases specifically prevalent in the home and host countries, as opposed to towards diseases that are important globally.

We also test whether our effects are mechanical by randomly assigning treated colleagues to a placebo host country. Appendix Table A12 presents these results. The results of this counterfactual exercise are directionally similar but meaningfully smaller (2% of the size) of the effects we find in our main analysis.[21].

Lastly, we are proposing that the effects of the fellowship are indirect, but what if the non-migrant also migrates and that is driving our observed effects? We evaluate this concern in Appendix Table A13 by excluding migrating non-migrants from the sample (i.e. any non-migrant who is affiliated with another institution in another country at any point in the post-fellowship period). The results remain similar using this alternative

[21]Of note, many of the placebo host countries disease prevalence overlaps with actual home countries and so in column 2 we drop those observations, and find a null effect of the fellowship to this placebo host on home and host disease research focus

sample.

Overall, these analyses show that even accounting for additional institution and disease-level observable characteristics, the effects we find on non-migrating colleagues' research trajectories are robust.

4.6 Crop and Pest Results

To complement our analysis of disease publications and to check whether the results we find are unique to the disease setting, we evaluate publication patterns on crops and pests.[22] This analysis is less granular as our data on crop and pest prevalence is binary and time invariant; there is a dummy variable that takes the value of 1 if a specific crop or pest has appeared a country and 0 otherwise, but we do not have data on when this measure was collected or how prevalent in a continuous manner the crop or pest is.

We conduct our baseline analysis with this data in an identical manner as we do with disease outcomes and explore if there are changes in the frequency with which agriculture research focused non-migrants publish on local or global crops and pests. In Appendix Table A15, we see that non-migrants are more likely to publish on crops and pests that are present in their home countries and on those that are present in their colleague's host countries after the fellowship. However, this effect is not significant when we focus only on crops and pests that are present in home or host countries (columns 4 and 5). These findings mirror our disease results.

5 Discussion

In this paper, we explore the extent to which there exists a relationship between exposure to a fellow traveling from and to a country in the Global South and the research agendas of their non-migrating colleagues. Specifically, we ask whether non-migrant scientists at the fellow's home institution change their propensity to research more locally-relevant problems after the departure of the fellow in the context of disease research. We document

[22]This analysis is discussed in greater detail in Appendix B.

that following the departure of the fellow, the non-migrating colleagues of the fellow are more productive, and this effect is driven by an increase in non-migrants' propensities to publish papers on diseases with high prevalence in their home countries. This result appears to be driven specifically by diseases shared by the home and host countries and is stronger when the fellow travels to geographically proximate host countries. In contrast, we find that non-migrants reduce their relative output into lower prevalence, but concentrated, diseases, implying trade-offs in globalization goals. We explore mechanisms and find suggestive evidence that an increase in collaborations with host country scientists, particularly when travel frictions are low, drive our observed changes in research focus.

This work is subject to several limitations. First, we study the implications of South-to-South migration of scientists, and as a result, we cannot be sure that our results will generalize to fellowships supporting migration to developed countries. Second, insofar as the organizations with successful fellows were those also more likely to collaborate with the host countries and contribute to local research, we could be overestimating the effects. While we attempt to address potential biases through robustness tests and careful consideration of the mechanisms, our results should be considered as descriptive rather than causal. Third, we observe only female fellows and thus our results may not hold if migrating fellows are both male and female. While these limitations may affect the generalizability of our analysis, we believe that given that our work is one of the first explorations into the relationship between research mobility and progress towards local, often grand, challenges, our results provide insights that are relevant for both theory and practice.

We contribute to two main literatures. First, we contribute to a growing literature on the role of migration in organizational innovation outcomes (Saxenian, 2002, 2005, 2007; Agrawal et al., 2006; Kerr, 2008; Oettl and Agrawal, 2008; Agrawal et al., 2011b; Kerr, 2018; Kahn and MacGarvie, 2016b; Fry and Furman, 2023; Choudhury and Kim, 2019; Choudhury, 2016). Our results extend this research by demonstrating that by facilitating the flow of knowledge, connections and resources back to their home regions —especially from countries facing similar issues— South-South mobile researchers can shape the research orientation of their colleagues back at home. By highlighting the important

role of shared problems in shaping innovative outcomes, we propose that the influence of researcher mobility depends on the characteristics of the host locations.

Our findings also contribute to a growing literature the drivers of innovation addressing grand challenges, particularly problems affecting the Global South (Arslan and Tarakci, 2022; Vakili and McGahan, 2016; Kremer and Glennerster, 2004). We highlight the role of mobile individuals and document how and when exposure to fellows spending time in another country in the Global South can accelerate innovation addressing local problems, many of which are grand challenges. But, by documenting the important role of the host location features in shaping innovation towards local problems, we surface important insights on some of the barriers to innovation towards problems in the Global South.

This research has implications for entrepreneurs, managers, organizations, and policymakers seeking to enhance and direct innovation. Organizations, broadly defined, particularly those aiming to make progress on specific topics, can effectively leverage mobile individuals to provide a strategic advantage in innovation. For example, by creating opportunities for international immersion for employees, organizations and managers can stimulate cross-country collaborations and facilitate access to knowledge that helps others within the organization contribute to targeted innovative solutions. Further, this research suggests that to direct innovation, particular attention should be paid to mobility across locations with shared problems. In other words, organizations and managers can select contexts for relationships based on the kinds of knowledge they seek to integrate. For policymakers, this research can provide evidence of the value of opportunities for international research exchange and inform the development of frameworks to harness the potential of mobile scientists and innovators.

References

Agrawal, A., Cockburn, I., and McHale, J. (2006). Gone but not forgotten: knowledge flows, labor mobility, and enduring social relationships. *Journal of Economic Geography*, 6(5):571–591.

Agrawal, A., Kapur, D., McHale, J., and Oettl, A. (2011a). Brain drain or brain bank? the impact of skilled emigration on poor-country innovation. *Journal of Urban Economics*, 69(1):43–55.

Agrawal, A., Kapur, D., McHale, J., and Oettl, A. (2011b). Brain drain or brain bank? The impact of skilled emigration on poor-country innovation. *Journal of Urban Economics*, 69(1):43–55.

Arslan, B. and Tarakci, M. (2022). Negative spillovers across partnerships for responsible innovation: Evidence from the 2014 ebola outbreak. *Journal of Management Studies*, 59(1):126–162.

Azoulay, P., Fons-Rosen, C., and Graff Zivin, J. S. (2019). Does Science Advance One Funeral at a Time? *American Economic Review*, 109(8):2889–2920.

Bahar, D., Choudhury, P., Kim, D. Y., and Koo, W. W. (2023). Innovation on Wings: Nonstop Flights and Firm Innovation in the Global Context. *Management Science*, 69(10):6202–6223. Publisher: INFORMS.

Borjas, G. J. and Doran, K. B. (2012). The Collapse of the Soviet Union and the Productivity of American Mathematicians*. *The Quarterly Journal of Economics*, 127(3):1143–1203.

Borjas, G. J. and Doran, K. B. (2015). Which Peers Matter? The Relative Impacts of Collaborators, Colleagues, and Competitors. *The Review of Economics and Statistics*, 97(5):1104–1117.

Borusyak, K., Jaravel, X., and Spiess, J. (2022). Revisiting Event Study Designs: Robust and Efficient Estimation. Technical Report 2108.12419, arXiv.org. Publication Title: Papers.

Butts, K. and Gardner, J. (2022). did2s: Two-Stage Difference-in-Differences. *The R Journal*, 14(3):162–173.

Callaway, B. and Sant'Anna, P. H. C. (2021). Difference-in-Differences with multiple time periods. *Journal of Econometrics*, 225(2):200–230.

Catalini, C., Fons-Rosen, C., and Gaulé, P. (2020). How do travel costs shape collaboration? *Management Science*, 66(8):3340–3360.

Choudhury, P. (2016). Return migration and geography of innovation in MNEs: a natural experiment of knowledge production by local workers reporting to return migrants. *Journal of Economic Geography*, 16(3):585–610.

Choudhury, P. and Kim, D. Y. (2019). The ethnic migrant inventor effect: Codification and recombination of knowledge across borders. *Strategic Management Journal*, 40(2):203–229. _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1002/smj.2977.

de Chaisemartin, C. and D'Haultfœuille, X. (2020). Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects. *American Economic Review*, 110(9):2964–2996.

Fry, C. and Furman, J. L. (2023). Migration and Global Network Formation: Evidence from Female Scientists in Developing Countries. *Organization Science*. Publisher: INFORMS.

Fry, C. and Ganguli, I. (2023). Return on Returns: Building Scientific Capacity in AIDS Endemic Countries.

Fry, C. V. (2023a). Bridging the Gap: Evidence from the Return Migration of African Scientists. *Organization Science*, 34(1):404–432. Publisher: INFORMS.

Fry, C. V. (2023b). Crisis and the trajectory of science: Evidence from the 2014 ebola outbreak. *Review of Economics and Statistics*, 105(4):1028–1038.

Ganguli, I. (2015). Immigration and Ideas: What Did Russian Scientists "Bring" to the United States? *Journal of Labor Economics*, 33(S1):S257–S288. Publisher: The University of Chicago Press.

Gardner, J. (2022). Two-stage differences in differences. arXiv:2207.05943 [econ].

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277.

Hernandez, E. and Kulchina, E. (2020). Immigrants and foreign firm performance. *Organization Science*, 31(4):797–820.

Kahn, S. and MacGarvie, M. (2016a). Do return requirements increase international knowledge diffusion? evidence from the fulbright program. *Research Policy*, 45(6):1304–1322.

Kahn, S. and MacGarvie, M. J. (2016b). How Important Is U.S. Location for Research in Science? *The Review of Economics and Statistics*, 98(2):397–414.

Kang, H. and Eklund, J. C. (2024). Fast Friends: The Impact of Short-Term Visits on Firms' Invention Outcomes. *Organization Science*. Publisher: INFORMS.

Kerr, W. R. (2008). Ethnic Scientific Communities and International Technology Diffusion. *The Review of Economics and Statistics*, 90(3):518–537.

Kerr, W. R. (2018). *The Gift of Global Talent: How Migration Shapes Business, Economy & Society*. Stanford University Press, Stanford.

Kolympiris, C., Hoenen, S., and Klein, P. G. (2019). Learning by Seconding: Evidence from National Science Foundation Rotators. *Organization Science*. Publisher: INFORMS.

Kremer, M. and Glennerster, R. (2004). *Strong Medicine: Creating Incentives for Pharmaceutical Research on Neglected Diseases*. Princeton University Press.

Lane, J. N., Ganguli, I., Gaule, P., Guinan, E., and Lakhani, K. R. (2021). Engineering serendipity: When does knowledge sharing lead to knowledge production? *Strategic Management Journal*, 42(6):1215–1244. _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1002/smj.3256.

Mayer, T. and Zignago, S. (2011). Notes on cepii's distances measures: The geodist database.

Moscona, J. and Sastry, K. (2022). Inappropriate Technology: Evidence from Global Agriculture.

Nanda, R. and Khanna, T. (2010). Diasporas and domestic entrepreneurs: Evidence from the indian software industry. *Journal of Economics & Management Strategy*, 19(4):991–1012.

Oettl, A. and Agrawal, A. (2008). International labor mobility and knowledge flow externalities. *Journal of International Business Studies*, 39(8):1242–1260. Publisher: Palgrave Macmillan.

Quadrio-Curzio, A., Blowers, T., and Thomson, J. (2020). Women, science and development: The leading role of OWSD. *Economia Politica*, 37(1):1–12.

Rambachan, A. and Roth, J. (2023). A More Credible Approach to Parallel Trends. *The Review of Economic Studies*, page rdad018.

Roth, J., Sant'Anna, P. H., Bilinski, A., and Poe, J. (2023). What's trending in difference-in-differences? A synthesis of the recent econometrics literature. *Journal of Econometrics*, 235(2):2218–2244.

Saxenian, A. (2002). Silicon Valley's New Immigrant High-Growth Entrepreneurs. *Economic Development Quarterly*, 16(1):20–31. Publisher: SAGE Publications Inc.

Saxenian, A. (2005). From Brain Drain to Brain Circulation: Transnational Communities and Regional Upgrading in India and China. *Studies in Comparative International Development*, 40(2):35–61.

Saxenian, A. (2007). *The New Argonauts: Regional Advantage in a Global Economy*. Harvard University Press, Cambridge, Mass., first thus edition edition.

Sun, L. and Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2):175–199.

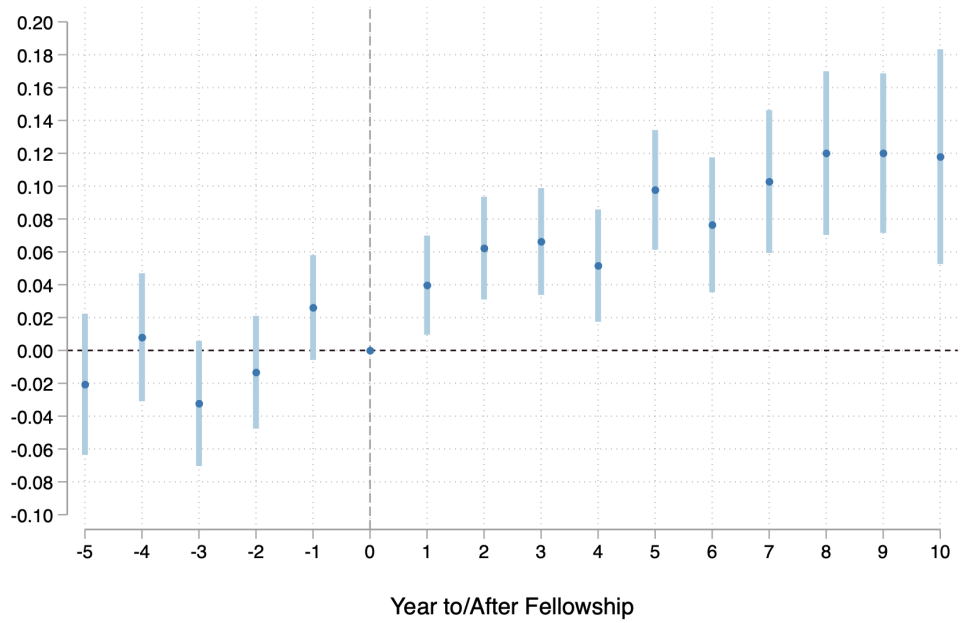
Vakili, K. and McGahan, A. M. (2016). Health Care's Grand Challenge: Stimulating Basic Science on Diseases That Primarily Afflict the Poor. *The Academy of Management Journal*, 59(6):1917–1939. Publisher: Academy of Management.

Wang, D. (2015). Activating Cross-border Brokerage: Interorganizational Knowledge Transfer through Skilled Return Migration. *Administrative Science Quarterly*, 60(1):133–176.

Xie, Q. and Freeman, R. B. (2023). Creating and Connecting US and China Science: Chinese Diaspora and Returnee Researchers.

Figures and Tables

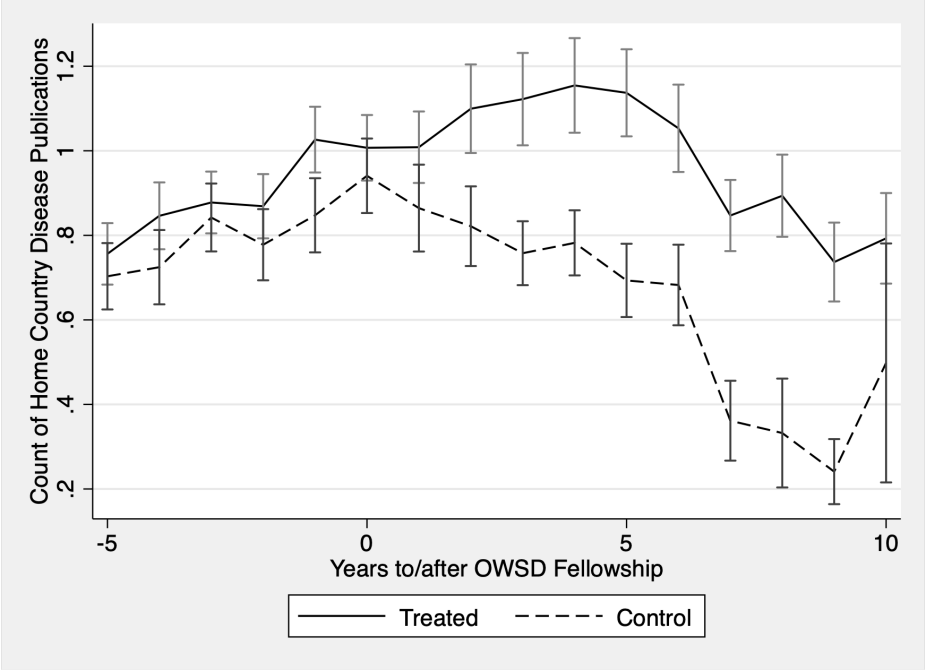
Figure 2: Differences in publication rate into home country diseases between treated and untreated non-migrant peer scientists



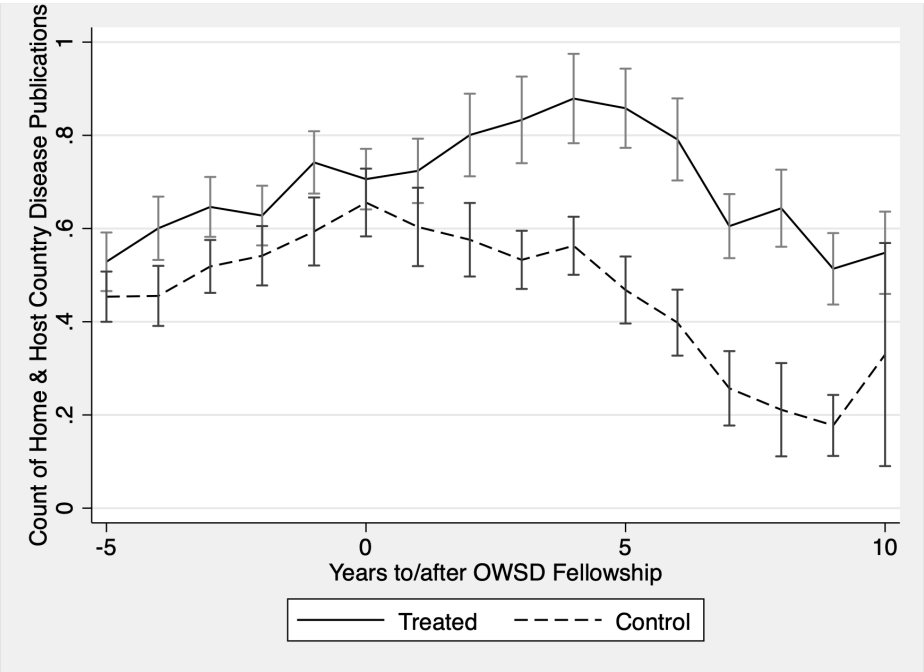
Notes: This figure shows coefficient estimates stemming from conditional (scientist) fixed-effects OLS specifications. The inverse hyperbolic sine outcomes are regressed onto year effects and scientist age effects, and include interaction terms between treatment status and the number of years before/after the OWSD fellowship, and a control variable representing the annual overall publication count for each scientist. The 90% confidence interval robust standard errors clustered around the scientist is plotted with solid bars.

Figure 1: Changes in Disease Publication Rates

Panel A: Home Country Disease Publication Rates



Panel B: Home and Host Country Disease Publication Rates



Notes: This figure plots raw trends of average publication rates on home-country diseases (Panel A) and home and host country diseases Panel B)per non-migrant peer scientist for the five years before and ten years after the fellowship.

Table 1: Summary statistics for non-migrant peer scientists (at year of application)

	(1) Disease Control Sample mean/sd	(2) Disease Treatment Sample mean/sd	(3) Difference Between Groups b	t
Female	0.32	0.25	0.07	3.94
	(0.47)	(0.43)		
Career Age	9.26	9.15	0.11	0.63
	(7.27)	(6.74)		
Total publications	9.94	11.06	-1.11	-3.25
	(13.61)	(14.05)		
Any disease publications	0.76	0.71	0.05	4.98
	(0.43)	(0.46)		
Total disease publications	4.58	5.12	-0.54	-2.06
	(10.43)	(10.83)		
Any home disease publications	0.71	0.67	0.03	3.02
	(0.45)	(0.47)		
Total home disease publications	4.06	4.60	-0.54	-2.21
	(9.68)	(9.97)		
Any host disease publications	0.60	0.54	0.06	4.72
	(0.49)	(0.50)		
Total host disease publications	2.81	3.38	-0.57	-2.89
	(7.35)	(8.70)		
Any home and host disease publications	0.58	0.53	0.05	3.83
	(0.49)	(0.50)		
Total home and host disease publications	2.72	3.29	-0.57	-2.96
	(7.17)	(8.50)		
Total home only disease publications	1.34	1.31	0.04	0.34
	(4.80)	(3.57)		
Total host only disease publications	0.09	0.09	0.00	0.11
	(0.53)	(0.77)		
Any collaborative publications with host country researchers	0.04	0.07	-0.03	-5.54
	(0.19)	(0.25)		
Total collaborative publications with host country researchers	0.07	0.11	-0.05	-3.37
	(0.50)	(0.59)		
High disease overlap between home and host country	0.33	0.09	0.25	25.24
	(0.47)	(0.28)		
Home and host country in same continent	0.49	0.63	-0.15	-12.16
	(0.50)	(0.48)		
Home and host country in same income band	0.33	0.11	0.22	21.66
	(0.47)	(0.32)		
Observations	2943	3667	6610	

Notes: This table depicts summary statistics for our treatment and control samples. All productivity statistics are generated for the 5 years prior to treatment. Columns 1 and 2 show averages and standard errors for our control and treatment groups, respectively. Column 3 shows the raw difference in means between control and treatment groups, and column 4 shows the t-value resulting from a t-test for the treatment and control samples. The t-test compares the control and treatment group means and assumes a null hypothesis that the two means are equal. If the t-statistic is greater than 1.96, we can reject the null hypothesis that there is no difference between means at a 5% level of significance.

Table 2: Changes in publications of non-migrating peers after OWSD fellowship

	Total Publications	High-Prevalence Diseases in Home Country	High-Prevalence Diseases in Host Country	High-Prevalence Diseases in Home and Host Country	High-Prevalence Diseases in Home not Host Country	Non-High-Prevalence Diseases in Home Country
DV: Count of Publications	(1)	(2)	(3)	(4)	(5)	(6)
After Fellowship x	0.0506**	0.0744***	0.0651***	0.0653***	0.0192**	-0.0108*
Successful Applicant	(0.020)	(0.014)	(0.013)	(0.013)	(0.008)	(0.006)
Total Observations	79997	79997	79997	79997	79997	79997
Mean of Dep. Variable	2.1059	0.8908	0.6520	0.6339	0.2570	0.1057
Author FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Career Age FE	X	X	X	X	X	X
Time Since Grant FE	X	X	X	X	X	X
DV: Proportion of Publications		(2)	(3)	(4)	(5)	(6)
After Fellowship x		0.0407***	0.0322***	0.0335***	0.0072*	-0.0060**
Successful Applicant		(0.008)	(0.007)	(0.007)	(0.004)	(0.003)
Total Observations		79997	79997	79997	79997	79997
Mean of Dep. Variable		0.2572	0.1810	0.1761	0.0811	0.0319
Author FE		X	X	X	X	X
Year FE		X	X	X	X	X
Career Age FE		X	X	X	X	X
Time Since Grant FE		X	X	X	X	X

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: [a] Estimates stem from fixed-effects OLS regression specifications in which dependent variables are inverse hyperbolic sine transformed annual counts.[b] Heteroskedastic robust standard errors, clustered at the level of the scientist, are given in parentheses.

Table 3: Changes in NTD disease topic publications of non-migrating peers after OWSD fellowship

	Total NTD Output	High Prevalence Home Country NTDs	High Prevalence Host Country NTDs	High Prevalence Home and Host Country NTDs	High Prevalence Home not Host Country NTDs	Non-High Prevalence NTDs in Home Country	Non-High Prevalence Non-NTDs in Home Country	Non-High Prevalence, High Conc NTDs in Home Country
DV: Count of Publications	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After Fellowship x	0.0377***	0.0455***	0.0307***	0.0313***	0.0181***	-0.0072*	-0.0035	-0.0061***
Successful Applicant	(0.010)	(0.010)	(0.008)	(0.008)	(0.007)	(0.004)	(0.005)	(0.002)
Total Observations	79997	79997	79997	79997	79896	79997	79997	79997
Mean of Dep. Variable	0.4537	0.4767	0.2771	0.2752	0.2017	0.0460	0.0597	0.0086
Author FE	X	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X	X
Career Age FE	X	X	X	X	X	X	X	X
Time Since Grant FE	X	X	X	X	X	X	X	X
DV: Proportion of Publications	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After Fellowship x	0.0147***	0.0188***	0.0115***	0.0118***	0.0070*	-0.0042**	-0.0018	-0.0030***
Successful Applicant	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.002)	(0.002)	(0.001)
Total Observations	79997	79997	79997	79997	79935	79997	79997	79997
Mean of Dep. Variable	0.4537	0.4767	0.2771	0.2752	0.2017	0.0460	0.0597	0.0086
Author FE	X	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X	X
Career Age FE	X	X	X	X	X	X	X	X
Time Since Grant FE	X	X	X	X	X	X	X	X

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: [a] Estimates stem from fixed-effects OLS regression specifications in which dependent variables are inverse hyperbolic sine transformed annual counts. [b] Heteroskedastic robust standard errors, clustered at the level of the scientist, are given in parentheses. As described in text, NTDs are Neglected Tropical Diseases that are primarily present in low-income and tropical areas that affect more than 1 billion people worldwide (https://www.who.int/news-room/questions-and-answers/item/neglected-tropical-diseases last accessed 8.23.24).

Table 4: Variation in the effect by CEPII distance

	Total Publications	High-Prevalence Diseases in Home Country	High-Prevalence Diseases in Host Country	High-Prevalence Diseases in Home and Host Country	High-Prevalence Diseases in Home not Host Country	Non-High-Prevalence Diseases in Home Country
DV: Count of Publications		(2)	(3)	(4)	(5)	(6)
After Fellowship x	0.6493***	0.4718***	0.3657***	0.3642***	0.0102	0.0172
Successful Applicant	(0.214)	(0.153)	(0.140)	(0.139)	(0.078)	(0.062)
After Fellowship x	-0.0693***	-0.0460***	-0.0348**	-0.0346**	0.0011	-0.0032
Successful Applicant x						
Log Home/Host Distance (kms)	(0.024)	(0.018)	(0.016)	(0.016)	(0.009)	(0.007)
Total Observations	79997	79997	79997	79997	79997	79997
Mean of Dep. Variable	2.1059	0.8908	0.6520	0.6339	0.2570	0.1057
Author FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Career Age FE	X	X	X	X	X	X
Time Since Grant FE	X	X	X	X	X	X
DV: Proportion of Publications	(1)	(2)	(3)	(4)	(5)	(6)
After Fellowship x		0.2577***	0.2257***	0.2160***	0.0417	0.0018
Successful Applicant		(0.085)	(0.075)	(0.074)	(0.040)	(0.027)
After Fellowship x		-0.0252**	-0.0224**	-0.0211**	-0.0040	-0.0009
Successful Applicant x						
Log Home/Host Distance (kms)		(0.010)	(0.009)	(0.009)	(0.005)	(0.003)
Total Observations		79997	79997	79997	79997	79997
Mean of Dep. Variable		0.2572	0.1810	0.1761	0.0811	0.0319
Author FE		X	X	X	X	X
Year FE		X	X	X	X	X
Career Age FE		X	X	X	X	X
Time Since Grant FE		X	X	X	X	X

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: [a] Estimates stem from fixed-effects OLS regression specifications in which dependent variables are inverse hyperbolic sine transformed annual counts.[b] Heteroskedastic robust standard errors, clustered at the level of the scientist, are given in parentheses.

Table 5: Impact of fellow's research focus on non-migrating peer's research trajectory

	Number of Home Country Disease Publications (fellow sample)	Number of Home Country Disease Publications (non-migrant peer sample fellow not home country disease researcher)	Number of Home Country Disease Publications (non-migrant peer sample fellow home country disease researcher)	Number of publications with fellow (non-migrant peer sample)	Number of Home Country Publications (non-migrant peer sample excluding those who ever coauthor with fellow))
DV: Count of Publications	(1)	(2)	(3)	(4)	(5)
After Fellowship x	0.1051	0.0860***	0.0707***	0.0004	0.0744***
Successful Applicant	(0.108)	(0.018)	(0.021)	(0.000)	(0.014)
Total Observations	240	48832	31165	79997	79602
Mean of Dep. Variable	0.4344	0.9493	0.7993	0.0005	0.8852
Author FE	X	X	X	X	X
Year FE	X	X	X	X	X
Career Age FE	X	X	X	X	X
Time Since Grant FE	X	X	X	X	X

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: [a] Estimates stem from fixed-effects OLS regression specifications in which dependent variables are inverse hyperbolic sine transformed annual counts. [b] Heteroskedastic robust standard errors, clustered at the level of the scientist, are given in parentheses.

Table 6: Changes in host country collaborations of non-migrating peers after OWSD fellowship

	Coauthored with Host Country	Coauthored with Host Institution	High Prevalence Home Country Diseases Coauthored with Host Country	High Prevalence Home Not Host Country Diseases Coauthored with Host Country	High Prevalence Home and Host Country Diseases Coauthored with Host Country			
DV: Count of Publications	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After Fellowship x Successful Applicant	0.2055***	0.0881***	0.0677***	0.0085	0.0630***	0.0470**	0.0560***	0.0379**
	(0.058)	(0.026)	(0.023)	(0.008)	(0.021)	(0.022)	(0.018)	(0.015)
After Fellowship x Successful Applicant x Log Home/Host Distance (kms)	-0.0224***	-0.0099***	-0.0073***	-0.0010	-0.0068***	-0.0051**	-0.0061***	0.0060
	(0.006)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)
After Fellowship x Successful Applicant x Shared Language						0.0033		
						(0.003)		
After Fellowship x Successful Applicant x High Disease Overlap							0.0031	
							(0.003)	
After Fellowship x Successful Applicant x Flight Duration								-0.0134**
								(0.006)
Total Observations	79997	79997	79997	79997	79997	79997	79997	79997
Mean of Dep. Variable	0.0340	0.0068	0.0096	0.0096	0.0082	0.0082	0.0082	0.0082
Author FE	X	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X	X
Career Age FE	X	X	X	X	X	X	X	X
Time Since Grant FE	X	X	X	X	X	X	X	X

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: [a] Estimates stem from fixed-effects OLS regression specifications in which dependent variables are inverse hyperbolic sine transformed annual counts. [b] Heteroskedastic robust standard errors, clustered at the level of the scientist, are given in parentheses.