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BRIEF COMMUNICATION

Research on Medical Migration from Sub-Saharan Medical Schools: Usefulness of a Feasibility Process to Define Barriers to Data Collection and Develop a Practical Study

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ABSTRACT

Context: The maldistribution of physicians in sub-Saharan Africa is having serious impacts on population health. Understanding the effect requires investigation from both *donor* and *recipient* countries. However, investigation from the perspective of donor countries has been lacking.



Methods: This brief communication describes a model process for the design of a research project that addresses medical migration issues from the perspective of eight African medical schools. During an international meeting, the participants designed an initial “ideal” study, and then rapidly tested its feasibility through a brief survey, and group discussion through a listserv, teleconferences and one face-to-face meeting.

Findings and practical implications: Innovative research ideas can be followed-up with surveys to test the feasibility of an “ideal” research design, modifying the design accordingly. This is currently occurring with our medical migration survey study.

Keywords: medical migration, Sub-Saharan Africa, data sources, data sets

Introduction

The maldistribution of physicians and other healthcare workers throughout the world can have serious impacts, not only in terms of population health, but in long-term educational and social opportunities for skilled workers (de Castella, 2003; Marchal & Kegels, 2003; Hagopian et al., 2004; Astor et al., 2005; Hagopian et al., 2005; Dovlo, 2005; Norcini & Mazmanian, 2005; Cooper, 2005; Mullen, 2005; Hallock et al., 2003).

In Sub-Saharan Africa, a significant rise in disease burden, emigration, productivity losses, and lack of adequate physician output has resulted in a health resource crisis (Aluwihare, 2005). There are only 72 medical schools (4.1% of world total), with an estimated annual graduating class of <15,000, for 10.6% (678 million) of the global population. In comparison, there are 307 medical schools (about 17% of world total) in North America and the Caribbean, for only 8% (508 million) of the world’s population (FAIMER, 2006). Certainly, if the total number of physicians per unit population are considered, African nations can simply no longer afford to lose doctors to the rest of the world.

Most studies on medical migration have been performed from the perspective of recipient developed countries and not the perspective of donor developing countries. Such a “paucity of sending-country data makes it difficult to fully describe the impact of migration on countries of origin” (Hagopian et al., 2004). Investigation of migration of physicians from Africa (de Castella, 2003; Marchal & Kegels, 2003; and Dovlo, 2005) has tended to focus on numbers, without exploring underlying reasons for emigration, describing characteristics of individuals who seek opportunities elsewhere, estimating the potential negative impact on local healthcare systems, or considering factors and/or incentives to alleviate the problem. Even where quantification of emigration was the focus, data have been difficult to obtain, often incomplete, and typically lack detail with respect to country of origin or birth, medical school attended, etc. In fact, many African country ministries of health and education appear to know the extent of their own emigration through data from destination countries (Stilwell et al., 2003).

Clearly, any workable efforts to stem the physician “brain drain” (Nullis-Kapp, 2005) will require accurate data from *both* donor and recipient countries. This necessitates accurate counts of graduates from African medical schools, basic demographic information, and some method to track individuals over time. The present report describes the process of: (1) designing an initial “ideal” study; and (2) developing a tool to collect information rapidly in order to determine the feasibility of conducting the proposed research on medical migration within sub-Saharan Africa, given the reports of incomplete databases, and revising the study as necessary.



Methods

A group of mid-career clinical and basic science medical educator faculty from developing countries were Fellows of the Foundation for Advancement of International Medical Education and Research (FAIMER) Institute (Norcini et al., 2005; FAIMER, 2006). During a one day session - "Medical Migration: Toward Equitable Medical Expertise Across the World" - within the two and a half week FAIMER Institute in Philadelphia, participants proposed research projects addressing medical migration.

During that day, nine FAIMER Fellows from Sub-Saharan Africa designed a project to follow career progression of medical graduates from graduation through postgraduate training to clinical practice and location, and a survey to assess the feasibility of obtaining the required data to conduct the research. The initial research design was a descriptive study of migration patterns of medical school graduates from 1990 through 2000 at each school representing a FAIMER Fellow, in which databases of sub-Saharan graduates would be linked by name with registration databases of U.S. medical residents and practitioners. The year 2000 was selected as study endpoint anticipating there existed an up to five year gap between graduation and medical registration in a recipient country; however, in the 2004 feasibility survey, graduation data were collected through that current year. The selection of U.S. registration as the migration variable was based on access to data from the Educational Commission for Foreign Medical Graduates (2006). The research questions initially envisioned were: (1) percentage graduates seeking and obtaining registration to practice in the U.S.; (2) percentage graduates who leave and eventually return to their home country; and (3) impact of migration on the economy of donor countries. Analysis of both quantitative (questions 1 and 2) and qualitative (question 3) data would be conducted from information obtained through key informant interviews, survey questions (multiple choice with some short answer), and comparisons of databases in donor and recipient countries.

Within a month, nineteen Fellows from 15 medical schools of eight sub-Saharan African countries (Democratic Republic of the Congo, Ethiopia, Kenya, Nigeria, South Africa, Tanzania, Uganda, and Zambia) received an invitation to participate and the brief feasibility survey to complete. The nine participants who joined the study used two teleconferences to discuss the project, and an electronic listserv to facilitate survey distribution. Five Fellows met about six months later in Kampala, Uganda to analyze survey results.

Findings and Practical Implications

A total of eight feasibility surveys (8/15 potential schools or 52%) were completed. The necessary data to complete the study as originally designed were available only in paper form from seven of the schools. All schools required ethics committee approval for the study. Available demographic data were limited (Table 1). Even basic data, such as names, date of birth, country of birth and nationality were not uniformly available, and most schools did not have data on marital status. Data on ethnicity and origin (urban or rural) of students were either not available, or were defined differently across countries so it was not possible to obtain consistent data.



Table 1. Results of a feasibility survey on studying the medical migration of graduates from eight Sub-Saharan African medical schools.

Information available on graduates	Data availability from number of medical schools			Comments
	Readily available	Possible with considerable effort	Not possible	
Name	6	0	2*	*Inadequate data on individual students
Date of birth	6	1	1	
Gender	5	2	1	
Ethnicity	3	1	4*	*Definitions vary across countries, so no meaningful categories
Marital status at time of entry to medical school	2	2	4	
Cumulative grade average	8*			*One school has scores (pass, fail) and not numeric grades
Urban vs. rural origin and secondary education	0	2	6*	*No consistent definitions across countries, so no meaningful categories
Country of birth	3	2	3	
Nationality	5	3	0	

The magnitude of the proposed data collection was larger than originally anticipated (Table 2). Among the eight schools there were approximately 6300 medical school graduates over the initial proposed study period (1990-2000) and a total of 9500 from 1990 to 2004. Of note, there were quite variable numbers of graduates per annum, dictated by factors such as political instability (DRC, Nigeria), government mandates to increase medical student intake and graduate throughput (Uganda, Nigeria, Tanzania) and variable academic performance (South Africa, Nigeria). In some schools there is a high drop out and failure rate at the end of the third year of the typical six-year program, with some students repeating years subsequently. All these factors obviously impact both the graduation rates and migration plans.

The results were sobering in their implications for studies of medical migration involving sub-Saharan medical schools. They clearly point out the lack of data and systems for such research, and the need to rethink project scope. Lack of computerized records would necessitate systems and templates, extensive data entry and validation, recruiting and training personnel. Solving this problem still leaves lack of completeness of the medical school databases identified by the collaborators. Finally, ethics approval for this multi-institutional study would require complex coordination among schools, each of which may have different procedures and requirements as has been noted by Morahan et al. (2006).

The model process described here for developing a feasible, low cost , multi-institutional research project on workforce migration from under-resourced Sub-Saharan African medical schools includes: (a) the use of one international meeting to cooperatively identify a research problem and propose an idealized study design; (b) testing the study design validity through a rapid feasibility survey process, together with electronic document sharing and review, group telephone calls and one face-to-face meeting; and (c) modification of the research design based on the survey results.



Table 2. Number of records of graduating medical students that would be involved in the originally proposed study.

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	TOTAL
DRC	26	34	^a	^a	15	^a	72	29	^a	54	34	50	40	^a	69	423
Kenya	^b	^b	^b	^b	^b	^b	^b	18	43	40	25	44	38	41	51	300
Nigeria	112	148	132	134	^a	114	109	65	177	134	111	155	124	113	93	1721
Nigeria	149	143	155	127	^a	177	^a	128	171	188	231	226	299	16 ^a	186	2196
Nigeria	^b	^b	^b	^b	^b	12	53	69	74	34	75	76	42	56	94	585
South Africa	143	125	139	167	146	114	111	165	184	136	143	163	167	155	156	2214
Tanzania	28	40	29	23	26	46	28	31	30	42	45	56	60	104	103	691
Uganda	75	58	58	45	98	67	63	106	89	198	103	119	1 ^c	173 ^c	122	1375
								Total 1990-2000 =			6313				Total =	9505

^a None or few graduates due to local or national political unrest in the matriculation year, which resulted in the school being closed for all or part of the year.

^b Schools graduated first classes in 1995 and 1997.

^c School changed graduation time, so the 2002 class graduated during the 2003 class year.

The rapid survey process itself informed the medical educators in training at FAIMER about research methods for designing and conducting a multi-institutional study among under-resourced schools. Based upon the results, the collaborators have revised the research protocol. A small cross-sectional survey of students in their final year of study, using a convenience sample of medical schools, is now being conducted to identify students' intended type and location of postgraduate training and clinical practice. It is relatively low cost, involving primarily the time of the collaborating faculty, data entry and statistical expertise within FAIMER. The experience gained will inform a subsequent prospective study to compare the reported intentions of graduating students with what actually occurs in the process of migration to the U.S.

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