

**Physician Migration from Nigeria: A Look at the influential factors
and Suggested Policy Options**

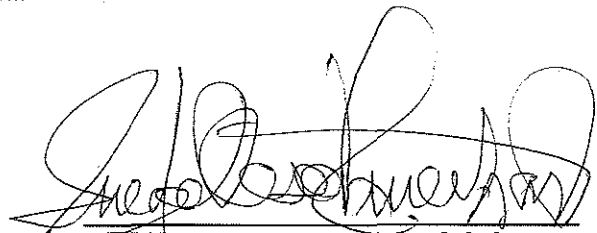
By

Oritsetsemaye Otubu MD

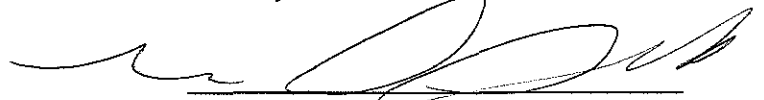
A Master's Paper submitted to the faculty of
The University of North Carolina at Chapel Hill
In partial fulfillment of the requirements for
the degree of Master of Public Health in
the Public Health Leadership Program.

Chapel Hill

2008



Sue Tolleson-Rinehart PHD, First Reader and Advisor



Martha Carlough MD MPH, Second Reader

22 July 2008
Date

Abstract

Physician migration from Nigeria is a concerning trend in a country already experiencing critically low physician numbers and extremely poor health. It is a significant financial loss to the country and a drain of innovative minds that can positively contribute to a faltering health system. An online survey of Nigerian physicians in living in Nigeria was conducted to determine which factors they consider to be most influential in their decision to migrate. The survey findings reveal that Nigerian physicians consider inadequate working and living conditions, inadequate income, insufficient opportunities for advanced and specialty training for career advancement to be the major contributing factors for migration. A country specific strategy addressing these problems within the country will most likely help to improve quality of life and work satisfaction among Nigerian physicians and mitigate migration.

Table of Contents

I. Introduction.....	1
II. Background.....	2
A. Migration of Nigerian physicians.....	2
B. Health statistics in Nigeria.....	3
C. A review of the Literature on 'Push' and 'Pull' factors.....	4
1. 'Push' factors.....	4
2. 'Pull' factors.....	8
i. Physician shortage and Aging population.....	8
ii. Graduate Medical Education and visa policies.....	8
iii. Medical school language and ties in receiving countries.....	11
III. Eliciting Nigerian Health Professional's views.....	11
A. Methods.....	13
B. Results.....	14
i. Judgments about postgraduate training opportunities.....	14
ii. Destination countries.....	14
iii. Professional and personal factors influencing migration.....	15
iv. Factors that could decrease migration.....	17
v. Work Environment.....	17
vi. Professional Development.....	17
C. Study Limitations and Validity.....	18
D. Discussion.....	18
1. Poor work conditions.....	20
2. Increased Income.....	20
3. Insufficient Internships/Specialty training positions.....	21
4. Lack of Technology and Research.....	21
5. Opportunities for career advancement.....	22
6. Living Conditions.....	22
IV. Recommendations for Nigerian Policy makers.....	24
A. Increase funding for health sector.....	25
B. Improve Working environment.....	25
C. Increase remuneration.....	26

D. Train mid-level providers.....	27
E. Improve living conditions	30
F. Collect better migration data.....	31
1. Collect remuneration from migrating physicians.....	32
V. Recommendations for destination countries (primarily the USA and UK).....	32
A. Country remuneration.....	34
B. Support Collaborative training.....	35
C. Increase local supply of physicians.....	36
D. Stop recruiting Nigerian physicians	38
VI. Conclusions.....	39
VII. References.....	41
VIII. Appendix 1.....	46

Introduction

Physician migration and health inequalities have existed for decades.¹ However, the current trend of migration reveals an exponentially increasing migration of physicians from low income countries to high-income countries. The migration of doctors from low-income countries in sub-Saharan Africa (hereafter SSA), where 10% of the world's population is shouldering 24% of the world's disease burden, and where countries are experiencing communicable diseases like malaria, Tuberculosis, and HIV/AIDs, juxtaposed by an increasing incidence of chronic diseases like diabetes and hypertension,²⁻⁴ is a particular concern. The majority of these countries have critical health care worker shortages, with less than one doctor per 1000 population compared to high-income countries which have an average of 2.5 doctors per 1000 population.² This makes the problem of migration even more serious.

Nigeria is one example of such an African country. It is the most populous country in Africa and it is experiencing a significant physician migration in spite of having an existing critical shortage² with approximately 0.28 physicians per 1000 population.^{2a} Physician migration from this country is a problem not only because it contributes to a decrease in the total number of available health care workers and potential leaders, but also because it is a drain of innovative minds that can positively contribute to the health system through mentorship of future physicians and new health initiatives.^{5a} In addition, because most medical schools in Nigeria are heavily subsidized by the government physician migration is a significant financial loss to the country.^{5,6} The trend of international physician migration from Nigeria needs to be mitigated. In order to achieve this, country leaders will need to understand the causative factors of migration so they can develop a country specific strategy to decrease it, and the international community will need to address their role in supporting migration of talented physicians who could make an enormous difference to health in Nigeria.

This paper explores the causative factors of physician migration from Nigeria through the use of a web-based survey of a convenience sample of Nigerian health professionals, and a review of the literature. Recommendations proposed to reduce migration are presented for both the national and international community.

Background

Migration of Nigerian physicians

An estimated 21,988 health workers migrated from Nigeria between 2001 and 2006, 10,000 of whom were physicians.² That is an average of 2000 physicians migrating yearly over a six year period. The numbers of Nigerian physicians outside the country can be appreciated to some degree by looking at data available on international medical graduates (IMGs) in the destination countries. This information is limited in that it only accounts for physicians registered in the country, primarily those who have had to register for training, and so may actually be an underestimation of the true numbers. However, it does provide some insight into the situation. Available descriptive studies show that the majority of Nigerian physicians typically emigrate to the USA and the UK; these receiving nations will be the focus of this paper.⁷⁻¹¹

Study calculations evaluating the use of international medical graduates (IMG), a term used to refer to physicians working outside their country of training, reveal that IMG's make up 26.8% and 28.3% of the USA and UK physician workforce respectively.^{7, 11} In the UK, Nigerian IMGs were the second largest group of SSA IMG's and the 6th largest group of all IMG's by 2004.^{7, 11} The actual number of Nigerian trained physicians registered in the UK has increased by 113% over the last decade from 1352 to 2881. In the US, Nigerian IMG's were the largest group of SSA IMG's as of 2002 with a total number of 2158. By 2007 the total number of Nigerian physicians in the US had increased to 2884.^{7, 12} In the mean time, only a reported 35,000 physicians in Nigeria are available to serve a population of approximately 135 million

citizens.¹³ This is the equivalent of 2.6 physicians per 10,000 population, compared to 23 physicians per 10,000 in the UK, and 26 per 10,000 in the US.^{2, 8}

Health statistics in Nigeria

According to a global network of professionals known as the Joint Learning Initiative, a ratio of 2.5 health care workers per 1000 population is necessary to achieve adequate coverage of essential health interventions, including immunizations and skilled health personnel attendance at deliveries.² Additionally, data from the WHO suggest that the density of health care workers in an area is inversely related to mortality;² few health care workers mean more deaths. Not surprisingly, the health statistics in Nigeria are quite dismal. Life expectancy in Nigeria is currently about 47 years, relatively unchanged from over a decade ago.^{2, 13} Neonatal and under five mortality are both higher than the regional average at 53 and 197 deaths respectively per 1000 live births.¹⁴ Maternal mortality is also among the highest in the world, at 1100 per 100,000 live births, compared to 9 per 100,000 live births in the developed regions of the world.^{14, 14a} In comparison, the UK experiences 8 maternal deaths per 100,000 live births and in the US there are 11 maternal deaths per 100,000 live births. Overall, Nigeria's maternal mortality ratio is actually worse than the average for the region of SSA which is 900 per 100,000 live births.^{14a} Nigeria endures more deaths from communicable diseases than is average for the WHO African region. In addition, levels of non-communicable diseases are expected to rise over the next decade.¹⁵ Given the already high existing mortality and low current physician-to-population ratio in Nigeria, one can predict that continued physician migration in even small numbers will produce even more dismal health statistics.

Causative factors of migration are often referred to as 'push' and 'pull' factors. 'Push' factors are the agents in the donor country that facilitate the decision to migrate. 'Pull' factors on the other hand, are the determinants in the receiving countries that attract migrating

physicians. Several of these factors have been elucidated and some factors act as both push and pull factors, while others are more specific.

A Review of the Literature on "Push" and "Pull" Factors

A literature search was done in Pub med and Google scholar, using the terms, "physician migration", "brain drain", "Africa", "Nigeria", and "international medical graduates". The Pubmed search "physician migration" and "Africa" yielded the most articles, with a total of 116 articles written in English. All articles written before Dec 2007 were considered. Editorials and letters were excluded. Articles were then selected using their abstracts and were included if they focused on causes of physician migration from Nigeria and other SSA countries, trends of migrating physicians from Nigeria and other SSA countries, policies in the USA or UK affecting migration, or other factors in the USA or UK contributing to physician migration from SSA. Articles focused on Nigeria were very limited, so the search was done for articles which focused on countries in SSA, with the hope that this would provide a general understanding of migration from Nigeria because these other countries are low-income countries like Nigeria. When an abstract was not available, the whole article was read to determine its content. A total of 10 articles were finally chosen for full review. Using Google Scholar, the same search was done with the terms "physician migration and "Africa". One hundred and thirty-four articles were identified. Using the same criteria for inclusion, 17 articles were selected, including 8 of the articles found in Medline. Additional articles were hand picked from the references of the retrieved Medline and Google scholar articles. Data on specific policies and 'pull' situations in the USA and UK was obtained from the websites of the UK National Health Service, USA Citizenship and Immigration Service, and the World Health Organization.

"Push" factors

After a review of the articles, only three of the articles found actually focused on 'push' factors contributing to migration. The other articles were more focused on the discussion of 'pull' factors, like policies and conditions, in the destination countries that were contributing to migration of physicians from SSA. A few of these articles did mention that some 'push'/'pull' factors were known, namely lack of remuneration, poor health infrastructure, lack of opportunities for postgraduate training, and civil unrest and security, but the topics are not discussed in detail. Of the three articles focused on causes of migration, only two of them, Hagopian et al and Astor et al actually investigated the 'push' factors specific to Nigeria. The third article, by Oberoi and Lin was more specific to South Africa, Botswana and Zimbabwe but is included here because these countries, like Nigeria are SSA countries experiencing a debilitating loss of physicians.^{15a}

Oberoi and Lin conducted interviews with a convenience sample of 10 physicians and found that factors within the health system, or endogenous factors, inciting migration were poor wages and remuneration, lack of job satisfaction, poor working conditions, lack of further education and career development, and fear of contracting HIV/AIDS.^{15a} Societal, exogenous or non-health care related, factors for migration identified by Oberoi and Lin were civil conflict, political instability, lack of quality of life, high levels of crime, and social pressure. The presence of these factors varied depending on the country. For instance, among the South African doctors, political unrest and crime were the identified exogenous problems whereas the Zimbabwean doctors indicated that migration was due to poor government decisions that "seemed to work against the best interest of the health professional"^{15a,(pg 30)}. Country variances of this sort are important to know when considering policy options because it enables policy makers to create policies that are specific and relevant to the country. Data was not presented on the participant from Botswana that was interviewed and this is not explained. An example of the actual interview guide used by the researchers was also not provided and no mention is

made about consent or anonymity. This introduces the risk of measurement bias as it is possible for the authors to report only what they want the reader to know. However, the information obtained appears to be in line with what is now generally known about 'push' factors for migration from SSA countries but provides no data specific to Nigeria.

Hagopian et al and Astor et al. found similar migration factors in Nigeria. They identified frustration with postgraduate training, low wages, poor overall economic conditions, social conditions-'labor strikes, political corruption, and poor infrastructure' (p1754), and poor work conditions, especially in rural areas, as factors pushing Nigerian physicians to migrate.^{8,33} However, HIV/AIDS was not a 'push' factor noted by in either of the studies. The reason for this could be related to the fact that a question about HIV/AIDS was not included in the questions used by either of the authors. But in the question guideline provided by Hagopian et al it is clear that an open-ended question is used to ask about perceived push factors. It seems logical that one of the Nigerian participants would have mentioned it if it was as significant a stressor as the other factors. Perhaps the difference here is that both South Africa and Zimbabwe have a significantly higher prevalence of HIV/AIDS. This could be an example of how specific 'push' factors are particular to different countries.

Hagopian et al sought input from Nigerian and Ghanaian medical students, residents, and medical school faculty, and found that the aforementioned variables were abetted by a "culture of migration" among faculty and students in Nigerian medical schools. Students and faculty alike view medical training experience abroad as a "marker of success". Medical school faculty members were also reported to measure their own success as teachers by whether their 'students are competent enough to practice in the competitive medical environments of the UK and US' ^{8 (p.1755)} Societal factors identified in Nigeria were recurring labor strikes, poor infrastructure, high levels of corruption, and a universally low standard of living. Even though the sample size for this study is small, the information is relevant. Even though the study is of

two countries, the data is often presented in series, allowing for an understanding of the situation in Nigeria specifically. Some cluster responses suggesting that the situation in the two countries is quite similar. It is obtained from key medical schools in the country, which are known to produce the largest number of physician emigrates. Sampling method is one of convenience which seems appropriate for this kind of study. This article is fairly well done and the information provided is specific to Nigeria.

The study by Astor et al evaluated views from health professionals in 5 different countries, including Nigeria.³³ They studied professors or health professionals working in universities or medical schools, policy and human resource officials, and researchers working for government organizations, representatives of private and non-government organizations with a focus on migration, health, and human resources, physicians of varied specialties, and experts in related fields. The study findings suggest that the opportunity to earn more money was the most significant inducement to migrate, followed by a desire for advanced medical technology. 62.4% of the Nigerian professionals also agreed that the medical education in Nigeria provided specialized skills that they would more readily be able to use outside the country. They also found that migration was guided by a desire for improved prospects for one's children, and a desire to live in a country with increased economic stability. The results of all three studies indicate that push factors for SSA countries are fairly similar, but subtle societal differences do exist and these may be important to know when creating a country specific policy.

This article, though providing some useful information does have some flaws. Although the identified sections of the questionnaire do appear to relate to the objective of the study, a sample of the questionnaire is not included and so we are unsure of how the questions were presented to the respondents. Also there is no mention of IRB approval. Selection bias is a concern because the authors do not detail the selection process and state simply that

respondents were 'selectively' chosen. Also, we know that respondents are chosen from a variety of professional sectors but are not told which categories of respondents are actually chosen from each country and no demographic information is provided. This could have affected the responses because, as the authors pointed out in their discussion in the first paragraph on page 2496, "the responses [to this question] varied significantly with professional background". It is possible that this could have affected the overall response from each country. Country specific responses were provided at the discretion of the author, but the results were often analyzed in clusters rather than in series, making it difficult for the reader to know which the response from respondents of a specific country. However, the authors do seem to have obtained a good number of survey responses in all countries surveyed and do provide a little insight on what factors professionals, including physicians, believe are contributing to physician migration.

"Pull" factors

The data used for this discussion are a combination of primary and secondary data. The majority of them were secondary data, so the information provided is subject to the interpretation of the authors. The question of whether the information is correct is a concern when primary data but much of the information presented in the secondary data used correlates with that found in the primary data, original studies and actual policies reviewed, suggesting some degree of accuracy. Also, the authors of the articles are known experts in their fields and qualified to be writing on the topic of discussion.

The physician shortage and an aging population. Physician shortages in the US and UK health systems have been identified as a prominent 'pull' factor^{2, 16-18} Unequal distribution of available physicians and a significant lack of physicians in underserved and rural areas in these countries contributes to this 'pull' effect, and specific programs and recruitment to meet these needs results.^{2, 16-19} The increase in the aging population with increasing need for health

services, in the receiving countries, together with a generation of aging physicians about to retire, also creates a need for more physicians.^{18, 20-22}

Graduate medical education and Visa policies. Graduate Medical Education (GME) or residency is the specialty training that medical graduates in the USA receive after medical school and is often the main point of entrance for International medical graduates.¹⁶ All IMG's in the USA are required to go through residency in order to practice, regardless of any postgraduate training in their home country. Funding for GME is provided by Medicaid and Medicare because residents are used to meet the health care needs of the nation's elderly and poor, many of whom are treated at the teaching hospitals.^{16, 23} Funding for resident education was initially provided to training hospitals based on the number of residency positions at the institution, and was originally without limit. The result was an increase in resident slots by about 19% between 1983 and 1996.^{16, 23} While resident slots were increasing, the number of students graduated from USA medical schools remained fairly constant.^{16, 18, 24} A need for more resident doctors than medical schools were producing was met by IMGs. An attempt to resolve the inflation of residency positions came through inserting caps on GME-funded residency positions into the 1996 Balanced Budget Act (BBA), inducing teaching hospitals to engage in a voluntary reduction of resident training positions.²³ The number of first year residency positions did indeed decline in the first two years, by 542 positions, but positions began to increase again in 1998 and had grown by 1636 positions as of 2007.²⁵

Visa policies in the USA and UK have also been cited as pull factors. Migration of IMGs to the USA increased significantly over the last two decades, facilitated by certain federal and state policies and visa programs like GME, the J-1 and H-1B visas, in the USA, and the highly skilled migrant visa with point system developed by the UK.^{16, 26} All of these visa policies have helped to ease the flow of migrant physicians into the USA and the UK.

The J-1 visa is a temporary visa in the USA created in 1948 and designed to allow foreign nationals to visit the country for the purpose of increasing knowledge or skill levels that could then be transferred to the home country of the visitor. Medical graduates with a J-1 visa are expected to complete their residency training within a maximum of seven years and subsequently return home for a minimum of 2 years before they are permitted re-entry back in to the USA.^{16, 26-28} However, J-1 visa holders who are primary care physicians can be granted a waiver of the requirement if: (1) it is in the public interest of the state, (2) the physician agrees to work for 3 years in a designated area of shortage, and (3) compliance with the return requirement would be detrimental to the USA government.^{16, 26-28} The number of waivers that can be granted by USA government agencies is unlimited, and the number of waivers allowed by state agencies was increased from 20 to 30 in 2001.⁷ When a physician with a J-1 visa is granted a waiver for the purpose of delivering health care, his or her visa status is changed to an H-1B visa.

The H-1B visa is a non-immigrant temporary visa allowing visiting physicians to enter the USA for the purpose of teaching or research. Initially, visiting physicians permitted entry with this visa were restricted from having any patient contact, but in 1990 the Immigration and Nationality Act (INA) lifted the restrictions, permitting physicians to obtain visas with the intent of coming to provide care.¹⁶ In the years following the change, US Citizenship and Immigration Service (formerly known as Immigration and Naturalization Service or INS), reported a drastic increase in the number of foreign physicians admitted to the USA with an H-1B visa.^{16,}
²⁶ A physician with an H-1B visa can have it converted to permanent status through family- or employment-based petition. Unfortunately, this only serves to further limit return migration and sharing of knowledge in the home country.^{16, 26} The majority of IMGs apply for the H-1B visas, possibly because of the easier potential for conversion to permanent status.¹⁶ That being said, it

is important to note that the USA has put restrictions on overall immigration since September 11, 2001, without heightening restrictions for H-1B or J-1 visas.⁷

In 2000 the British government decided to expand its National Health System, and this exaggerated the discrepancy between the number of physicians available in the country and the number of physician's needed.^{29, 30} International recruitment was a key strategy in the plan to rectify the discrepancy. The highly skilled migrant program introduced in the UK in 2002 led to increased numbers of IMG's in the UK⁶ and a point system within the program made it easier for overseas physicians to gain entry in to the country.²⁷ With this program visa applicants are not required to have secured a job or work permit prior to entering the country, as long as they have enough money to support themselves during the job search. There is no quota or limit to the number of work permits that can be given, and the British government, like the USA government, regulates immigrant entry based on the social and economic needs of its own country. In 2006 visa regulations related to physician recruitment to the UK changed in an effort to increase 'home-grown' medical professionals and decrease reliance on international physicians outside of the UK and the European Union.³⁰

The UK also adopted a code of conduct to not recruit from countries with significant shortages without prior consent. These changes are expected to eventually decrease the number of IMG's in the UK. Unfortunately, the number of Nigerian-trained physicians in the UK has continued to grow. According to the Information access officer for the UK General Medical Council (E. Hiley [ehiley@gmc-uk.org], email, May 14th, 2008), ninety-one Nigerian-trained physicians were newly registered in the UK in 2006, and 188 were newly registered in 2007.

Medical School language and ties in receiving countries. Medical school language and ease of Integration into the receiving country are two noted country-specific pull factors.^{7, 8} English-speaking countries like the UK and the USA are prime destinations for Nigerian physicians because of the language. All 18 medical schools in Nigeria are training physicians in

English.³² The ability to speak the language makes it fairly easy for these graduates to assimilate into the medical workforce upon arrival in the receiving country. They can readily take entrance exams and apply for residency positions without the hurdle of a language barrier.

Ease of integration into the receiving country is facilitated by the presence of family, Nigerian medical organizations, and ethnic organizations in the receiving countries. Family ties in the receiving country are a pull factor because a desire to join family members can be the initiating factor for migration. Family members and Nigerian organizations provide avenues for physician migrants to find out about jobs and lodging, and to gain knowledge about how the destination country's system works.⁷

Physician migration from Nigeria is a real problem that is threatening the ability of the current health system to function. More understanding of the factors within the country that determine a Nigerian physician's decision to migrate could help direct policy. I conducted this study to get a firsthand picture of Nigerian physicians' opinions about which professional and personal factors they consider to be the most important influences on the decision to migrate, as well as to elucidate the current working conditions and training opportunities, limits to which might make migration seem more attractive.

Eliciting Nigerian Health Professionals' Views

The most important perspectives on physician workforce migration are those of Nigerian professionals themselves, for they form the pool of potential migrants, those who take their training and skills out of Nigeria, most often to the USA or the UK. Identifying Nigerian health professionals' attitudes toward their work in Nigeria, and toward migration, is challenging, but beginning the process of measuring their views is necessary to any systematic attempt to

reverse the migration trend. What follows is a discussion of the results of survey completed by a rolling reputational sample of convenience.

Methods

I worked with my advisor, Dr. Tolleson-Rinehart, to develop a survey that could be converted to a web-based version. We sought and received IRB approval for the survey, and then used Qualtrics software provided by the Odum Institute for Research in the Social Sciences at The University of North Carolina at Chapel Hill. We chose to conduct a web-based survey because no other survey technique was practical; time and resource constraints made it impossible to conduct mail, telephone, or in-person interviews. I obtained email addresses from contacts in the medical profession in Nigeria. I deliberately asked anyone who received my recruitment message to pass the message along, in an attempt to produce a "snowball effect" and increase the reach and size of the survey sample. Respondents were able to remain anonymous; survey respondents were assigned a numeric ID code by the web survey software when they commenced the survey. The recruitment email message and a printed version of the web survey can be found in Appendix 1.

I sought survey responses from Nigerian medical graduates, Nigerian medical students, and Nigerian health officials living in Nigeria. As can be seen in Appendix 1, I asked them to indicate which factors they would consider most influential in the decision to migrate from Nigeria. I used a variety of question styles to measure opinion, including questions that asked respondents to rank their answers, choose from among likert responses, and provide open-ended responses. Response options for questions about medical training opportunities were 'more than enough for all who need it', "just about right for all who need it", or "not enough for all who need it." Likert responses gauged importance of variables as migration influences (very unimportant to very important) and agreement with the burden of training/working conditions (strongly disagree to strongly agree).

I sent the recruitment email message to a total of 50 people after the survey initiation on February 13th, 2008. I do not know how many additional people received the message, in

response to my request that the message be passed to relevant colleagues and fellow students, but did not respond. I allowed 30 days for responses before closing the survey. I analyzed the survey responses using SPSS 16.0 for Windows.

Results

Twenty-nine people completed the survey, of which 25, or 86%, were men. This is typical for Nigeria because there are more men than women in medicine.⁸ Twenty-eight respondents were physicians; one was a dental resident. Seventeen of the physicians were in post graduate training, one physician was a specialist, and ten said they were generalist physicians. Twenty-six of the respondents were between 25 and 34 years of age, 1 was younger than 25, and 2 were between 35 and 54 years old. This correlates with the fact that Nigerian physicians are typically young and are often identified as having a younger Diaspora. Fifteen of the respondents worked in a public hospital, and 11 worked for a private hospital. Six respondents worked for a medical school system, and three of them worked at more than one institution, one of which was a government-run facility. Two of the respondents were not living in Nigeria when they completed the survey, although they had attended medical school there. The remaining 27 respondents were living in Nigeria, where 24 of them had also trained; 3 of them, including the dental resident, had trained elsewhere. All told, respondents attended 6 different medical schools, two of which are listed among the top ten medical schools from SSA with medical graduates practicing in the US. The responses of the dental resident are included in this analysis because even though he is not a medical school graduate, his plight as a dental school graduate and resident in the Nigerian health care system is similar to that of the medical graduates.

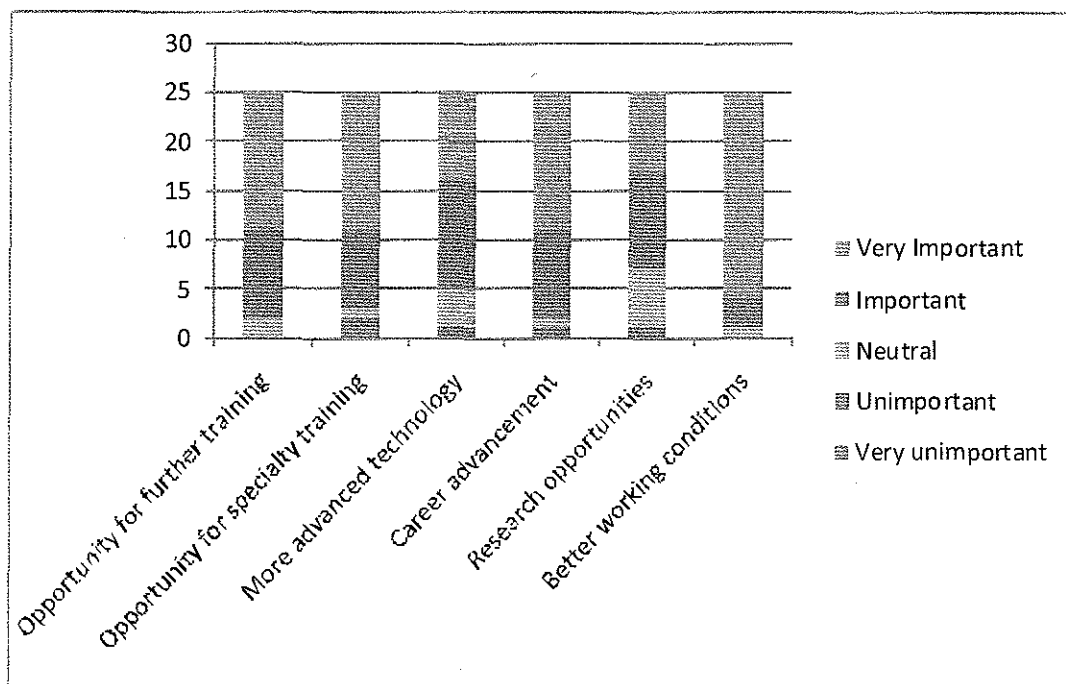
Judgments about postgraduate training opportunities The number of available internships for medical graduates in Nigeria was considered inadequate by 22 (75.9%) of the

respondents, while one person (3.6%) thought that there were more than enough for all who needed it, and five people felt the number of available internships were 'just about right'. One person did not respond to the question. Twenty-five of the respondents believed that the opportunities for Specialty Training in Nigeria were not enough, three of them believed Nigeria had just about the right number of Specialty Training opportunities, and one person did not respond to the question. Similarly, 24 respondents believed that the opportunities to conduct medical research in Nigeria were not enough, while three respondents thought the opportunities were enough and one respondent thought there were more than enough opportunities for research.

Destination Countries Only one of the respondents denied knowledge of a physician who had emigrated from Nigeria. Respondents reported that they knew of physician emigrants to 11 destination countries (Australia, Canada, Cuba, Cyprus, Germany, Ireland, Saudi Arabia, South Africa, New Zealand, USA, and UK). The USA and the UK were the most often mentioned by respondents (n=22, n=23), followed by Canada (n=13), and Australia (n=9). Four people did not respond to the questions in this section.

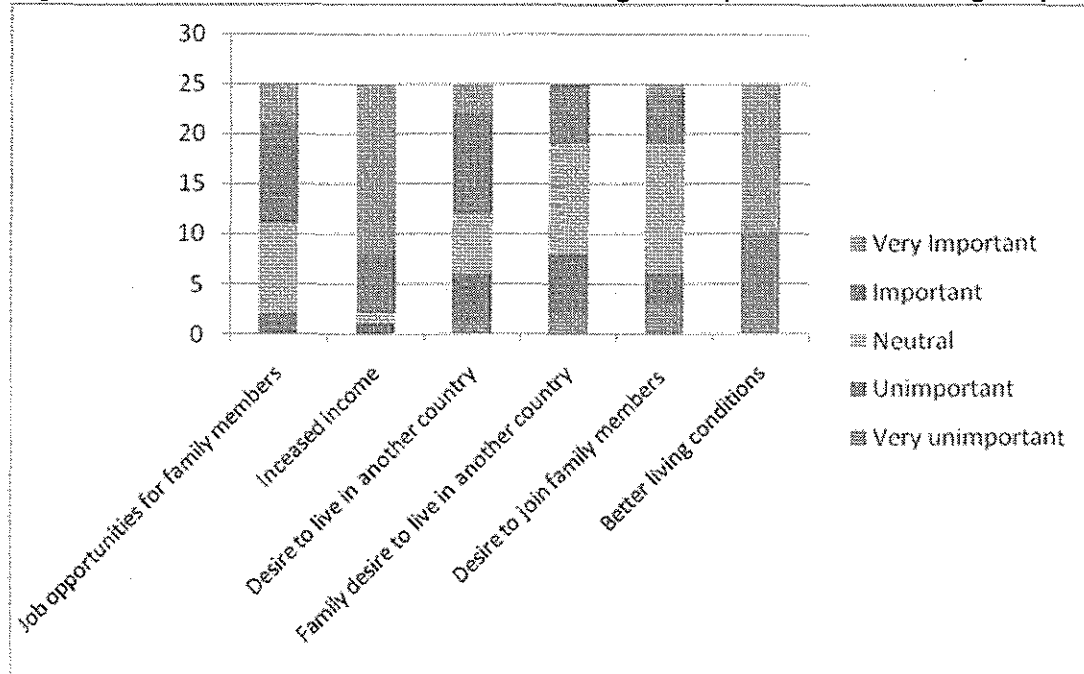
Professional and Personal factors influencing migration I asked respondents to evaluate several "push" factors by assessing the degree of importance of each. More than half of the respondents considered the following factors to be very important factors influencing migration opportunities: opportunities for advanced and specialty training, opportunity for career advancement, better working conditions, increased income, and better living conditions. One physician responded that 'health workers are made to work under sub-standard conditions'. Responses of survey respondents are displayed in Figures 1 and 2.

Figure 1. Professional factors that influence migration (actual non-missing responses)



*4 missing responses; y axis =no. of respondents

Figure 2. Personal Factors that influence Migration (actual nonmissing responses)



*4 missing responses; y axis=no. of respondents

Factors that could decrease migration. I asked respondents what they thought would decrease migration – or, alternatively, make staying in Nigeria more appealing. Seventeen respondents said that better working conditions were "very important" with only 4 people attaching no importance to working conditions. Opportunities for further training (51.7%) and opportunities for career advancement (48.6%) were also rated as very important factors for retention. Table 4, on the next page, shows all reactions to proposed inducements not to migrate.

Work environment. Categories for work environment were collapsed for ease of evaluation (strongly agree+ agree= agree; neutral=neutral; strongly disagree+ disagree= disagree). The responses showed that respondents disagreed that their workplaces were well staffed with physicians (72%), nurses (68%), or ancillary staff (60%). Slightly more respondents felt safe at work (40%), than didn't (28), and 32% of the respondents answered with 'neutral' for this question. 58.6% of respondents disagreed that they had the necessary equipment to care

for their patients and 52% disagreed that they had the equipment they needed to protect themselves from infection. A little over half said they had electricity at work when they needed it (56%), but not water when they needed it (52%).

Professional development. Respondents disagreed that it was easy to keep up with new developments in their field (60%). They also disagreed that they were encouraged to go to medical conferences (52%), or that provision was made for them to go to conferences (64%). Respondents did not agree that they had the necessary training opportunities (56%) or administrative support to do their work as they wished.

Table 4. Factors that could decrease migration. *4 missing

Factors	Very Unimportant	Unimportant	Neutral	Important	Very Important
A. Professional Considerations	0	0	2(6.9%)	9(31.0%)	14(48.3%)
Opportunity for further training in ones field	0	2(6.9%)	0	8(31.0%)	15(51.7%)
Opportunity for specialty training in a new field	0	2(6.9%)	2(6.9%)	10(34.5%)	11(37.9%)
More advanced technology for patient care	1(3.4%)	1(3.4%)	2(6.9%)	10(34.5%)	11(37.9%)
Opportunity for career advancement	1(3.4%)	3(10.3%)	1(3.4%)	6(20.7%)	14(48.3%)
Research Opportunities	4(13.4%)	1(3.4%)	1(3.4%)	9(31.0%)	10(34.5%)
Better working conditions	4(13.4%)	0	1(3.4%)	3(10.3%)	17(58.6%)
Opportunity to improve the health of Nigerians	1(3.4%)	2(6.9%)	4(13.4%)	8(27.8%)	10(34.5%)
B. Personal Considerations	2(6.9%)	1(3.4%)	3(10.3%)	8(27.8%)	10(34.5%)
Job opportunities for family members	2(6.9%)	2(6.9%)	5(17.2%)	9(31.0%)	7(24.1%)

Personal desire to live in Nigeria	2(6.9%)	4(13.4%)	7(24.1%)	9(31.0%)	3(10.3%)
Family desire to live in Nigeria	2(6.9%)	4(13.4%)	7(24.1%)	9(31.0%)	3(10.3%)
Opportunity to improve Nigerian society	0	4(13.8%)	4(13.8%)	9(31.0%)	8(27.8%)

Study limitations

The limitations of the study include small size of respondents and the variability between the respondents. Also, the fact that I asked specific questions, drawn from the literature, to which respondents answered, but I may not have asked the questions that are uppermost on Nigerian physicians' minds. It is also possible that some respondents considered the social desirability of their responses. One participant stated, *"I would even say I have been [a] little subjective in my opinions. Otherwise if one considers best practice all my answers would perhaps be in the extremes of negativity"*. More respondents may have felt the same way, and if that is the case, then their opinions are even more negative than they appear here.

A web-based survey was our only practicable means of soliciting survey responses, but this choice, along with the choice to recruit participants via e-mail, means that our respondent pool is limited to those with access to a computer and the Internet. Our respondents, then, might possibly come from among those with more, rather than fewer, resources. The unstable availability of electricity in Nigeria could have meant that even those who have computer access may have been hindered in their ability to respond and may have resulted in some of the missing data. The Qualtrics software application used for the survey also required high speed internet access for fast and complete downloading, making it virtually impossible for those with slow Internet access to take the survey.

In spite of the limitations, the findings of this study are similar to those in available data, suggesting that the results can be generalized to Nigerian physicians working in Nigeria. Also, despite the fact that the survey respondent population is drawn from a convenience sample, the respondent pool of mostly young physicians-in-training is representative of the physician population most likely to migrate. Finally, a third of the respondents of this survey went to University of Ibadan, a medical school identified as the number one supplier of Nigerian medical graduates to the U.S.A.⁸ This makes the viewpoints of these survey respondents extremely important with regard to likely causes of migration.

Discussion

The survey findings reveal that Nigerian physicians consider inadequate working conditions, inadequate income, insufficient opportunities for advanced and specialty training, insufficient technology and research, inadequate opportunities for career advancement, and inadequate living conditions to be the major contributing factors for migration.

This study finds, as did those by Hagopian et al and Astor et al, that a desire for better working conditions and increased income were major push factors. Hagopian et al.'s study included Nigerian and Ghanaian medical students, school administrators and some residents in a medical school setting but not physicians at different career levels and in varied work settings. Hagopian et al also explored the culture within medical schools and the society that encourage migration. Hagopian and colleagues conducted in-person, group interviews, rather than a web-based survey, and they had almost three times as many participants⁵. Astor et al, also conducted a larger study, using written questionnaires, of physicians in five countries³³ Their Nigerian component contained surveys from 133 Nigerian physicians, health care administrators, officials and researchers of policy and human resources working in national and international government organizations, representatives of private organizations and national and international non-governmental organizations who focus on migration, health, human

resources, and development issues. Even though the study group of Astor et al is different from that presented in this paper, the results regarding migration factors were similar to the ones presented in this paper in that work conditions and salary were the major push factors identified.

Hagopian et al., Astor et al., and I all found a similar emphasis on certain critical "push" variables, including poor working conditions, low income, poor training opportunities, insufficient paths to career advancement, inadequate technology, and unsafe living conditions for the worker and his or her family. Each of these variables deserves further description before we turn to policy recommendations for both Nigeria and receiving countries.

Poor working conditions Nigerian hospitals often lack water, electricity, and equipment, making it difficult to carry out basic services for patients.^{18, 34} Also, lack of equipment like gloves and other protective devices puts doctors at risk of contracting infections like HIV/AIDs and Hepatitis B,^{35, 36} and increases concerns about personal safety in the work place.^{8, 37-39} Fear of contraction of HIV/AIDs and loss of infected co-workers further contributes to poor work conditions by decreasing work morale and subsequently increasing workload.² This is an added stressor in an environment where workloads are already difficult to manage due to high patient to staff ratios.

Increased income. A physician's annual salary in Nigeria is \$3600 to \$12,000.⁸ Doctors in the USA make an average annual salary of \$164,000 and GP's in the UK make an average of £80,000 to £120, 000 a year (equivalent to 160K to 240K USD).^{8, 40, 41} Comparing these different salaries is like comparing apples to oranges, because the cost of living also varies, but the discrepancy between them makes it obvious why physicians are fleeing to high income countries.

Nigeria's health sector is significantly under funded with only 3.1 percent of the GDP going towards health compared to an average of 11 percent in developed countries.⁴² In addition to relative low wages there is also a problem of timely compensation. An editorial in the

British Medical Journal in 2004 reported a strike by resident doctors in the public sector of Nigeria, to protest their lack of remuneration and their consistent receipt of only a portion of their monthly wages.⁴³The reason behind the delay is unclear, but corruption is likely a part of it. Delay in payments and partial payments equate insufficient remuneration. Ensuring the prompt and complete delivery of salaries would make a significant difference. Although it would be practically impossible for the Nigerian government to increase wages to the level found in the USA, UK and other destination countries, an increase in salary would be beneficial.

Insufficient internships/specialty training positions. Lack of internships available to medical graduates upon completion of medical school was noted as a significant problem. Nigeria does have established training facilities in the country⁸, but they are not considered to be enough.

In addition to insufficient residency positions, the system is stymied by labor strikes of members of the Academic Staff Union Universities as described above. These strikes cause delayed graduations and put the universities and residency programs out of sync with one another.⁸ So, graduates in need of internships end up being on a waiting list for training because the students who were admitted before them have not finished their term.⁸ As a result, medical graduates may have to wait for extended periods to obtain a training position. This is a problem because medical graduates in Nigeria are required to obtain internships within 2 years of graduation. If they are unable to secure an internship in that time, they are obligated to return to medical school for recertification.⁸ In such a situation, migration for training certainly appears to be a more favorable option. Many physicians travel to the USA and other countries for this purpose but then fail to return home after completing their training.^{16, 26} If opportunities for training were readily available perhaps less people feel the need to migrate.

Lack of technology for patient care and research. My study and others have identified the lack of technological resources as a significant problem. This is not unique to

Nigeria, of course; it is a problem throughout the developing world.^{2, 39} In practice, it means that medical students in Nigeria are educated at high levels that often require technology superior to what is available at the local health facilities.^{8, 33} Not having the necessary equipment to care for patients creates a frustrating environment, limiting the physician's ability to do what he or she has been trained to do. The lack of technology also limits the capacity to conduct research. Fortunately, technology is not always required for research. While experimental research does require advanced technology, clinical research is not necessarily as dependent on technology and it can still yield answers to important medical questions. But this kind of research requires motivated researchers, and conditions in Nigeria work against such sustained motivation.

Opportunities for career advancement. Opportunities for further training in one's field of study and being able to keep abreast of current developments in one's field are a part of career advancement. Respondents to my survey said that they do not have enough of these opportunities and are not sufficiently encouraged or supported to engage in the opportunities they do encounter. Physicians are trained in a context of professional norms that say that medicine is constantly changing and advancing, requiring continuing education to keep up to date. The inability to obtain such training creates job dissatisfaction, and can lead to a stagnant career and a desire for the better job opportunities that migration can represent.⁴⁴

Living conditions in Nigeria. Sixty percent of the population in Nigeria lives in poverty and many are living in overcrowded living spaces and squatter settlements.^{13, 45} Half of the population is without improved access to clean water and only about two thirds of the population actually has access to clean drinking water.⁴⁵ Electricity is inconsistent and approximately half of the population is without it.⁴⁵ These basic infrastructural requirements should be available to all, but are not. Nor is a good educational system available. The school system has suffered much neglect over the last twenty years and federal funding for education has dwindled.^{46, 47} A

Universal Primary Education program, launched in 1976 failed to reach its full potential and country leaders over the last several decades have not given education the attention it deserves.⁴⁸ Primary and secondary schools have been the most affected but the universities have had many problems over the years as well.^{46, 47} The Academic Staff Union of Nigerian Universities (ASUU) have gone on multiple strikes causing mass shut down of universities nationwide for extended periods, resulting in academic disruptions.⁴⁹ As a result, the completion of undergraduate programs, including medical programs, takes longer than it should.

The findings of this survey emphasize the influence that local conditions internal to the country exert on the decision to migrate. They underline the fact that the Nigerian authorities have elements within their control that can be manipulated to decrease migration. The onus is not just on destination countries to stop recruiting or to increase physician output, even though these two strategies are extremely necessary. The onus is also on the Nigerian government to address the problem by finding ways to alleviate the push factors. Certainly, both Nigeria and receiving countries require a multipronged strategy that addresses both local and international causes of the physician drain in order to mitigate migration, but if country conditions are not prioritized, it is unlikely that any mitigation strategy will work.

Policy Recommendations

Ending the damage caused in Nigeria by health workforce migration will require coordination and cooperation between Nigeria and the US and UK, the two places to which Nigerian health professionals are most likely to migrate. In the following pages, we begin with recommendations for Nigerian public officials, followed by recommendations for policymakers in the US and UK, before drawing final conclusions.

Recommendations for the Nigerian policy makers

Increase funding for the health sector. Government expenditure on health in Nigeria is among the lowest in the world. Only 3.5% of total government expenditure is spent on the health sector, compared to an average of 8% in other African countries and 8-17% in the world's best health systems.^{8, 14, 50} The investment in the health sector in Nigeria has showed a steady decline over the last decade.¹⁴ It is the fiduciary responsibility of the government to ensure a functioning health system.⁵⁰ The Nigerian government needs to increase its financial allotment for health in order to improve the existing health system and ultimately improve health outcomes. Indeed, the necessary investments for change may be more than a developing country can afford, but Nigeria is actually rich in natural resources like cocoa, rubber and petroleum. It is especially known to be an oil rich country with plenty of crude oil reserves. Unfortunately the corruption in the country has stunted economic development and siphoned the funds necessary for investments in health care. But an increase in funds for the health sector is especially important in Nigeria because the majority of health institutions are public institutions. In addition to contributing to the improvement of overall country health, an increase in health funding will help impede physician migration by enabling institutions to increase salaries and improve physician working environment. It will also allow for more investment in public health, an extremely important investment in a country struggling with communicable diseases and poor sanitation. Increased investment in the health sector will additionally provide the leverage needed to do more national data collection, as well as increase finances available for medical education, and for training mid-level providers. These investments would contribute to decreased migration through creation of more jobs for physicians, and improvement of the work environment.

Improve the working environment. Increased investments in the health sector would enable improvement of the work environment by providing more technology and resources for career advancement. Facilities need to be equipped with the necessary technologies for patient care. Diagnostic equipment like x-ray machines, CT scans, and more advanced laboratory technologies are needed in medical facilities. Nigerian physicians are trained to practice medicine with these technologies, so lack of such equipment in the work place likely produces frustration as it limits their capacity to care for patients. In addition to advanced technology, basic equipment like gloves, syringes, and needles are also necessary. These devices would contribute to improved work environment by decreasing infection risk to the physician and therefore anxiety about personal safety. Finally, investment in more advanced but appropriate technology also has the potential to make the health system more efficient⁵¹ and this would not only improve the working environment but also maximize the health outcomes Nigerians can achieve for their patients with the available resources.

Opportunities for growth, career advancement, and increased income over time in the work environment need to be available to physicians. Opportunities for career advancement within the working environment would provide physicians with goals, and a sense of accomplishment upon reaching these goals. A clinical ladder in the physician work environment is one way to help address this problem. Clinical ladders heighten a clinician's skills through professional development and continuing education and reward the attainment of such skills by advancement to the next level on the ladder and a salary increase.⁵² Nursing departments have used this strategy for years, and evidence suggests it results in increased job satisfaction and staff retention.⁵² The effectiveness of the strategy is likely rooted in the fact that it addresses several facets of the construct of job satisfaction, including personal growth, promotion opportunity, recognition, and pay.⁵³ Professional development through continuing education

encourages peer interaction, professional identity, and professional connections that can be supportive to the physician and contribute to a sense of job satisfaction.

All of these professional goals can hopefully be achieved with the help of the Nigerian medical association (NMA) and employers in health facilities across the nation.

Recommendations on professional development could be presented by the NMA and carried out by physician employers. Staff physicians can be encouraged to brainstorm ideas that will help them achieve these professional goals in their particular environment, and employers will need to be encouraged to listen and allow for these often simple yet innovative ideas to be implemented.² This activity in and of itself is a form of professional development because it fosters a supportive environment as ideas are exchanged and implemented, and it also lends to a sense of accomplishment because the physicians themselves have contributed to improving their environment. Also, there is a sense of professional identity associated with this activity because the recommendation is from the NMA and physicians across the nation will hopefully be working toward the same goal. International bodies like the WHO and the World Medical Association can contribute to this goal by helping to organize conferences in different parts of the country.

Increase remuneration. Salary scale has to be addressed in order to reduce the number of physicians that migrate and Nigerian authorities have in fact increased physician salary over the last two years.⁸ Although it is unlikely that any salary increase will be able to compete with the salaries offered in destination countries, a salary increase is still beneficial and has the potential to improve physician morale. In addition to an overall salary increase, a graduated pay scale should also be available to resident physicians and consultants as they progress in their careers.

However, remuneration is not limited to salary compensation. Compensation in terms of housing, cars, health care, and retirement benefits are other forms of remuneration the

government can consider. Ghana has instituted this type of compensation in the hopes of retaining its physicians.⁸ This can also be extended to the physician migrants interested in returning.

It behooves the government to facilitate the re-entry of migrant physicians who want to return home. These physicians bring with them expertise and new ideas that can help propel the health sector to new levels. The Philippine government in recognition of this instituted the Philippines Overseas Employment Administration in 1995.² The administration has created special programs as aids to facilitate reintegration for returning migrants. Programs include special rate business loans, tax free shopping for a year, and subsidized scholarships. The Nigerian Government should consider adding incentive packages like these for physicians within the country and for returning Diaspora.

Train mid-level providers. One solution to help reduce the workload for physicians as well as to fill in the gap in the provider crisis is to train more mid-level providers. Several countries with physician shortages are resorting to the use of physician assistants (PAs) to help manage their health needs.⁵⁴⁻⁵⁷ Programs have mostly been instituted in industrialized countries like the USA, UK, Netherlands, and Canada, but more recently less industrialized countries like South Africa and Ghana are considering PAs.⁵⁷

PA's were first introduced to the USA in 1967 and have proved to be an effective non-physician alternative for providing health care.⁵⁸ The USA has also introduced nurse practitioners as mid-level providers and found them to be equally as effective as PA's. In addition, most nurse practitioners are providing care in underserved areas of need.

However, the introduction of a PA or NP program is probably not what Nigeria needs now. If PAs or NPs were introduced to Nigeria, it is hard to believe that they would remain in the country and not become a part of the 'brain drain' problem the country is already experiencing. Nigerian trained PAs, like the physicians and nurses, would have an

internationally recognized degree that would make them attractive to more industrial countries with health worker shortages. Hence, the cycle of training professionals to be used in other more developed countries would perpetuate.

What Nigeria needs now is a mid-level provider specific to the country's needs and therefore less desirable and transplantable internationally. The international undesirability and immobility of this cadre of health care worker will not reflect an inferior level of training, but rather a specificity that can not be applied outside of the country. Health workers of this kind are referred to by some as 'substitute' or 'alternative' health workers.⁶⁰ Nigeria currently has traditional birth assistants, and village health workers, which, although potentially helpful in their scope of practice, are rather limited. This is partly because of the level of education attained by these providers who are mainly volunteers and typically only receive on the job training.

Nigeria needs trained mid-level providers that can function semi-independently, but in association with physicians, in the health areas of greatest need. The providers should be trained in areas of primary care including basic maternal and child health, and major communicable diseases, as these are the main health issues plaguing the country currently. These mid-level providers should be recruited from the rural areas and should receive didactic and clinical training in a 30 month course. After completion of training, students would receive a diploma and the title of 'Primary Care Officer' (PCO) and would be able to work in association with a physician whom they would have to keep in contact with. In the era of telecommunication and cell phones in Nigeria where 1 in every 100 inhabitants subscribes to a cell phone¹⁵, communication with the supervising physician would be relatively easy. Telemedicine would have been a more ideal way to communicate in this situation, but it is not practicable in light of the limited and unreliable electricity supply in the country. In addition, PCOs would easily be able to contact their supervising physician in the event of a complicated patient issue. As part of the training, PCOs would be required to return to work in their local community for a minimum of

two years, the goal being that they would remain in the locale. If the majority of PCO students are recruited from the rural areas, they might be more likely to return; evidence in the USA suggests that students recruited from such areas tend to return.⁵⁹ Registration and regulation of PCOs would need to be carried out by the Ministry of Health. A mechanism for evaluation of effectiveness would have to be incorporated by the program upon initiation. This would allow for monitoring and collection of data that would be useful for quality improvement and country statistics.

The PCO would be similar to physician assistants in the USA except that these officers will possess maternal and child health skills in addition to those of general medicine and surgery. PCOs will also be more specific to Nigeria and will have accreditation that is unique to Nigeria and so not transferrable. Other countries in Africa have created their own type of physician substitute to deal with health crisis.⁶⁰ In Ghana medical assistants (MA) are used as partial substitutes for doctors. Unfortunately, Ghanaian medical assistants require prior nursing training and so often flee internationally with their nursing education before they complete the MA training.⁶⁰ Mozambique has assistant medical officers who perform surgical procedures independently.^{8, 60} Zambia has medical officers who are primarily involved with medical care but not surgery. Assistant medical officers of Tanzania are more complete substitutes for doctors and are able to perform tasks independently. Studies suggest that mid-level providers deliver care at levels equal to that delivered by physicians and are cost-effective.^{54, 61}

Introduction of more mid-level providers would be cost-effective for a low-income government like Nigeria with already limited funds for health care because it would help to more rapidly address the health worker shortage with lower cost and time than it takes to train physicians. It would also result in decreased physician workload and therefore improved work conditions, which ultimately should contribute to decreased migration. Key stakeholders in health at the Federal government, state, and local government level, including national

associations and the ministries of health, will need to be rallied for the discussion of this new type of provider to ensure a smooth introduction into the health field and to avoid head butting between the old and new professionals.

Improve living conditions. Improved living conditions will require decreased corruption and a substantial investment in basic societal infrastructure. In the last few years the World Bank and the Nigerian government, have worked to recover monies averted to Swiss banks by Nigerian leaders.⁴⁵ In June, 2006, the Financial Action Task Force, an international and inter-governmental agency that creates policies to 'combat money laundering and terrorist financing', removed Nigeria from the list of non-cooperative countries and Territories.^{64a} This acknowledges the renewed efforts to limit corruption within the country and provides hope that monies designated for development assistance will actually be used for development. The success of any strategy that will result in improved standards of living will depend on the ability of those in power to conduct themselves with integrity.

The Nigerian Economic Empowerment and Development Strategy (NEEDS), developed in 1999, is designed to address the country's unfavorable economic environment.⁴⁷ The hope is that this homegrown reform strategy will create a platform for "sustainable poverty reduction, employment generation, wealth creation, and value reorientation". Individual states need to be encouraged to implement local versions of the strategy known as SEEDS, State Economic Empowerment and Development Strategy. Key sectors of the program -- health, education, water, electricity and roads, which are proposed to receive 'highest priority in resource allocation', need actually to receive this high level of priority.⁴⁷

The NEEDS program was developed by the authorities of the Nigerian government during President Obasanjo's term but hopefully the current government, under President Yar'Adua, will be able to sustain the efforts that have already been initiated. Improving security

within the country and addressing the need for better education for children are both issues in society that also need to receive high priority in the attempts to improve living conditions.

Collect better migration data. The Nigerian government needs better data on who is migrating where. Without data, policies cannot be evidence-based. A special task force dedicated to collecting and analyzing these data is necessary.⁶⁴ A special task force should be set up specifically to monitor physician migration and the effects of any introduced interventions. Members of the taskforce should be primarily Nigerian nationals with training in epidemiology, statistics and other related fields that will qualify them to gather comprehensive and useful data. Source countries, and International organizations like the WHO, United Nations, International Monetary Fund, and Family Health International, can contribute to this much needed endeavor through assistance with setup, training, and financial resources. Assistance from local and international private or non-governmental organizations could help the country get off to a good start.

Fortunately, the Federal Office of statistics is currently being reorganized to promote efficiency⁴⁷ and Nigeria is a member of the International Organization of Migration, an intergovernmental agency that works to manage migration, promote international cooperation on migration issues and provide help to migrants.^{64a} The migration taskforce could work with this office. Country investment in research would need to be scaled up in order to achieve this aim. Research and documentation of migration data would provide jobs in the country and potentially attract migrants back. However, social conditions would probably need to be addressed as a first step to attracting emigrated physicians and other professionals. Research on effectiveness of set policies and affects of migration on individuals and countries would also need to be done.

Donors like the IMF and the World Bank need to relax requirements of expatriate employment that often come with corporate assistance. It is important that local experts are

sought out to work on projects. In addition, these jobs could be given to migrated nationals willing to return to the country. However, the most important thing for countries to do is focus on improving the society at large, in terms of basic daily needs like water, electricity, affordable housing, food, and transportation. In Nigeria, this means regulating fuel prices so that transportation and therefore food is affordable for the general population. If electricity and water are made available, then daily living becomes more bearable. The Diaspora of health professionals and other highly skilled individuals will probably be willing to return to build up the country.

Collect remuneration from migrating physicians. Nigerian losses from training physicians who then migrate are enormous. The exact numbers are unknown but given that it costs approximately \$15 -\$20 million per year to train medical students in Nigeria⁸ it is in the country's best interest to develop a method for recovering those funds.

The Nigerian authorities should consider requiring a training deposit for all medical graduates that leave the country. India requires this method of country compensation from its medical school graduates, and graduates have to post a bond if they travel overseas for training. If they do not return to India to practice for two years after the training, they lose the bond money regardless of whether they obtained a J-1 waiver.⁶⁵ Ghana has a slightly different bond system in place. It requires physicians to practice for five years in the country after medical training before migrating. Graduates are required to pay back their education cost if they fail to complete their five-year term. The choice of a five-year term is based on the idea that the physicians will be settled with families by the end of that time and be less likely to leave⁸.

Given the number of physicians emigrating from Nigeria, the country stands to recuperate a substantial sum of its investment if individual remuneration is instituted. In order to achieve this, the country would require a surveillance system that enabled it to know when a

medical graduate left the country. This could easily be achieved with airport surveillance of people leaving the country with a training visa. Medical graduates planning to leave for training would be required to present their deposit before or upon departure from the country. The deposit would be fully refundable upon the return of the graduate to the country and would be retained by the government if the graduate did not return. The idea here is that funds retained would be reinvested in medical education.

This policy would not inhibit the freedoms of educational exchange because physicians traveling for such purposes would still be free to do so. The policy would instead serve to limit the number of physicians who do not return home after training. Some might argue that such a policy would be somewhat punitive and impinging on the physician's right to freedom of movement. However, visitor and exchange student visas were created with a 'return home' requirement so that the home countries would also benefit from the exchange. The welfare of the country also needs to be considered: too many lives are at risk for us not to consider the greater societal good. The challenge with this policy would be how to ensure that each migrating physician is compensated for. Nigeria would need the collaboration of receiving countries that already have good record keeping systems for immigration.

An example of how such collaboration could work can be demonstrated using an existing USA system. In 2002 the USA federal government established an internet-based computer program, the Student and Exchange Visitor information System (SEVIS), to monitor foreign students entering the country on a J, F, or M visa.⁶⁶ It is run by the Department of Homeland Security and keeps track of information on foreign students and exchange visitors prior to, and at the time of entry into and movement through the USA. This system could easily be used to keep up with IMG's who need to remunerate Nigeria. An automatic reminder or alert program could be imputed into the system to notify administrators of when a J-waiver or other continuance is given to an IMG. Such an alert would actually be in keeping with one of the main

objectives of the program: “to support the oversight and enforcement of laws and regulations concerning foreign students, exchange visitors, and schools, as well as sponsors of exchange visitor programs who are authorized by the government to issue eligibility documents”.^{66(p.1,}

paragraph3) Documentation of this sort allows for the monitoring of registered physicians but would miss those physicians who migrate but are unable to register because of failure to pass board exams or other circumstances.² Ideally, these unregistered physicians who remain in the country should also be remunerated for if they were publicly trained in Nigeria because they contribute to the economy, even if they don't function as physicians in the destination country. They perform other revenue-generating jobs in the receiving country and represent a loss to the donor country. Unfortunately, tracking unregistered physicians or those who do not obtain visitor or exchange visas would prove difficult.

A remuneration policy will only work, however, if receiving countries are willing to participate, as the above example makes clear. Proposals so far have not been well accommodated by receiving countries.⁶⁷ The global community needs to establish a shared commitment to end the health professional brain drain from countries in desperate need of them.

Recommendations for the destination countries (primarily the USA and UK)

Remunerate Nigeria. The use of Nigerian trained physicians in the health systems of destination countries is a significant savings in training costs for these countries at Nigeria's expense. Receiving countries should provide compensation to Nigeria for the loss of financial investment in training. In a sense, the receiving countries would simply be giving back a token of the financial gain they received on a commodity in which they did not invest. Given the cost of medical education in a country like the United States, it is a huge savings to have already

trained physicians join the workforce. The additional gains include revenue from taxes paid by this set of middle class workers, and contribution to country economic growth.

Such a plan raises two questions: how much should be paid back? And how should the remuneration be provided to the source country? The cost of medical education is often expressed as the amount spent during the years of actual medical training.⁷ However, some authors suggest that the entire education of the physician should be considered, including primary and secondary education attained prior to medical school.⁶⁸ Kirigia et al recently evaluated the cost of the brain drain in Kenya and argued that elementary and secondary education costs should also be included, as is done in Kenya. The calculation involves the multiplication of the average *total* education cost by a compounding factor. The compounding factor takes into account the number of workable years the individual has until retirement, and interest on the investment applied at a specified rate. Calculating only the workable fraction of years until retirement allows the receiving country to pay for only that portion of the investment attained. Provision of education and especially primary education by any government is typically done with the intent of securing and sustaining future economic growth within the country. For this reason the percent of population educated at the primary level is an indicator of country development. The Millennium Development Goals emphasize this point, as the second listed goal is to 'achieve universal primary education'. With this in mind, it seems fair to request that the receiving country provide pay back for all education investments poured in to the migrating individual. Several potential payment strategies exist. First, the receiving countries could pay back the calculated dollar amount to the donor country. The money could be directly reinvested in education and training of more health professionals. Source countries could also decide to invest part of the money in the originating country's population health. Health sector investment would contribute to capacity building as existing clinics, hospitals, and labs are fortified with necessary equipment or new ones are built. Improvements in the work

environment as a result of these investments could reduce frustrations of physicians and possibly decrease the numbers that migrate. Monies received could also be used to supplement physician salaries.

Support collaborative training. An alternative to direct financial investment is investment through training. Collaborative efforts between physicians in the donor and receiving countries can be established through bilateral agreements with medical schools in Nigeria. Nigerian students would have the opportunity to gain training at their sister school in a developed country for short periods but still return to their own country to complete their training and work. The University of Michigan has a program for fellowship training in Obstetrics and Gynecology for students in Ghana that has achieved this aim. This particular training program was independently set up by the university and is having a lot of success. If receiving countries were required to foster collaborations as a form of remuneration, more effort would be made to create such programs.

Another potential option for remuneration is investment in telemedicine. Telemedicine is one form of collaboration that enables physicians to deliver care world-wide without having to relocate. Physicians in Nigeria would be able to experience and observe training cases to which they would otherwise not have had exposure. Telemedicine also creates opportunities for collaborative continuing education, closing an education gap and satisfying Nigerian professionals' desire for continued learning.

Increase the local supply of physicians. Increasing physician supply in the destination countries would create a decreased reliance on international medical graduates. Health policy authorities in the UK have actually incorporated this idea in to their strategy to expand the National Health Service. In the USA, this policy solution has been well supported by health policy advocates like Dr. Fitzhugh Mullan, a well known physician, author, and advocate of increased USA medical graduate output. He argues that an increased supply of

USMGs would help the USA meet its own need for more physicians while at the same time decreasing the number of residency positions available for IMGs. He suggests that that it would also decrease the number of US-born IMGs forced to do their training overseas because they cannot matriculate in a USA medical school.¹⁸

This self-sufficiency approach would decrease the dependence of the USA on IMGs and hopefully prevent further recruitment from developing countries. One setback to this proposal is that it will take a number of years before the actual increase in the numbers of USMGs is noticeable, and IMGs will likely continue to fill the gap in the interim. Of course the financial expenditure of building more medical schools and to scale up existing schools certainly presents a challenge. Dr. Mullan suggests that a 'buy-in from the public and medical educators and from policymakers at the state and federal level'¹⁸ is required to build a consensus that such a financial investment is necessary. An increase in USA national programs like the National Health Service Corps and National Institute of Health Loan Repayment plans is a way to meet needs in underserved and rural areas.¹⁸

As the National Health Service Corps program illustrates on a national level, individual medical schools can create novel programs to address physician shortages.⁵⁹ Dr. Rabinowitz of Jefferson Medical College (JMC) in Pennsylvania helped create a Physician Shortage Area Program that at JMC. This program enrolls students "who have grown up or spent a significant part of their lives in a rural area or small town, and who are also committed to practicing the specialty of family medicine."^{59(p729)} Students in the program are a small subset of the general student body. A Longitudinal cohort study of their program so far shows that students of the program are almost twice as likely to practice in a rural area long term.⁵⁹ A potential drawback of this program is that it only enrolls about fifteen students per class.

Rural medical schools dedicated to the training of students who will work in rural areas are another option for dealing with physician shortage in rural and underserved communities.

Australia and Canada are both taking this approach. The schools focus on the health issues of underserved rural communities and enroll students interested in practicing in these communities.^{69, 70} Small classes of 55 to 80 students live and learn in the rural areas that they will eventually serve. In Canada, clinical experience and teaching support is offered in French as well as English, for francophone students and because of the need for French speaking physicians. Both countries are hoping rural schools will prove to be a long term solution to their physician shortages. It is still too early to tell if students of these schools will yield the intended returns, but the idea is promising.

Rural residency tracks are an option that some training facilities have made available. Studies show that residents tend to remain in the areas in which they train.^{72, 73} The programs are known as one-two programs because the residents spend one year in an urban center and the remaining two years in the rural community. In the community they work primarily with rural doctors and faculty. Rosenthal et al found in their survey that 76% of residents trained in rural tracks remained after graduation to practice in the communities and 16% practiced within 50miles of the community.⁷²

Other countries strategies are have also been suggested but little data is available on them. In order to address the problem of physician migration from Nigeria to USA a country specific approach will be required. The following strategies should be considered by policy makers of both countries.

Stop recruiting Nigerian physicians. We must examine receiving countries' recruitment patterns. Currently, we have recommendations guiding international recruitment practices, but no laws or regulations. The best-known global recommendation is the Commonwealth Code of Practice for International Recruitment of Health Workers accepted in May, 2003 accepted by the health ministers of the Commonwealth countries (18 in Africa, 3 in Europe, 12 in N America, 1 in S. America, 8 in Asia, and 11 in Australia and Oceania). The

Code is intended to be a framework “....to provide guidelines for international recruitment of health workers in a manner that takes into account the potential impact of such recruitment on services in the source country, to discourage targeted recruitment of health workers from countries which are themselves experiencing shortages, (and) to safeguard the rights of recruits, conditions of recruits, and the conditions relating to their profession in the recruiting countries.”^{74(p4)} Countries are encouraged to dialogue and to be transparent and fair in their recruitment of health workers.⁷³ However, the Commonwealth is a voluntary association and the code of practice is only a recommendation and therefore not enforceable.⁶ In addition, not all 53 nations of the Commonwealth have agreed to sign the document, even though several countries have come into bi-lateral agreements about the recruitment of health workers as a result of the code.^{6,73} We need to institute an international code of conduct that will be adhered to globally. The International Organization for Migration could be instrumental in this endeavor.

Solutions to the brain drain will require developing and developed countries to work together. Many of the changes that need to be addressed in the home country of migrants relate to the push factors of the brain drain. Investments in health, good school systems, national security, basic water, and electricity for all citizens are things that seriously need to be addressed and made available in the home country. Improving the factors at home that incite migration will probably help to limit physician migration more than any foreign migration policy.

Conclusion

Physician migration from Nigeria is a serious problem because Nigeria already has a shortage of physicians and a poor health status. In addition, physicians from Nigeria are migrating to countries with more resources, and where there are significantly more physicians per population. Although both push and pull factors influence migration, it appears that the push factors are more important. Certainly pull factors exert their influence and need to be

addressed, but it seems logical that if Nigerian physicians were comfortable in their home country they would be less likely to move to another one.

Knowledge of specific push factors enables country leaders to focus their attention and resources on the problems that physicians regard as the most important forces driving them to migrate. Physicians in this survey cite poor work conditions and a desire for increased salary as major push factors. For these problems to be addressed, the government will need to invest more money in health care and focus on building up the health system. Increased investments would enable increases in salaries as well as improvements in work areas.

However, investments in health care alone are not enough. Nigerian authorities will also need to invest in the basic infrastructure of the country, which ultimately affects the physician's ability to live and function well in the country. The problems of inadequate water, electricity, security, and good schools for children are basic infrastructural needs that will have to receive dedicated efforts in order to achieve improvements. The advancements will serve not only to deter migration but will likely also facilitate the return of physicians who have migrated, and they will also contribute to improving the health status of all Nigerians.

While these basic needs and migration factors are addressed, interventions to help alleviate the current health situation will need to be undertaken simultaneously. The introduction of mid-level providers will help reduce the workload on physicians and help provide much needed care to citizens of the country, especially those in more rural areas. Country remuneration strategies both from individuals who migrate and destination countries to which they migrate can be established and the funds used to bolster the renovation efforts in the country.

Finally, the Nigerian Government will need to devote time and energy to fighting corruption in the country. This is extremely necessary in order for any mitigation efforts to be

successful. Without an end to corruption, the implementation of interventions to prevent migration will fail.

References

1. Mejia A. Migration of physicians and nurses: a worldwide picture. *Bulletin of World Health Organization*. 2004; 82 (4):626-630.
2. World Health Report 2006: Working together for health. Available at: http://www.who.int/whr/2006/whr06_en.pdf Downloaded on March 28th, 2007.
- 2a. World Health Report 2006: Annex Table 4. Available at: http://www.who.int/whr/2006/annex/06_annex4_en.pdf Accessed on July 1st.
3. Lopez AD, Mathers CD. Measuring the global burden of disease and epidemiological transitions: 2002-2030. *Ann Trop Med Parasitol*. 2006; 100: 481-99.
4. Boutayeb Abdesslam. The double burden of communicable and non-communicable diseases in developing countries. *Trans R Soc Trop Med Hyg*. 2006; 100:191-9.
5. Hagopian A, Thompson MJ, Johnson KE, Lishner DM. International medical students in the United States: a review of the literature 1995-2003. Working paper #83. October 2003.
- 5a. Kaushik N, Jaiswal A, Shah N, Mahal A. High-end physician migration from India. *Bull World Health Organ*. 2008; 86:40-5.
6. Eastwood JB, Conroy RE, Naicker S, West PA, Tutt RC, Plange-Rhule J. Loss of health care professionals from Africa: the pivotal role of the UK. *Lancet*. 2005; 365:1893-900.
7. Hagopian A, Thompson MJ, Fordyce M, Johnson KE, Hart LG. Migration of Physicians from sub-Saharan Africa to the United States of America: measures of the brain drain. *Human Resources for Health*. 2004; 2:17.
8. Hagopian A, Ofosu A, Fatusi A, Biritwum R, Essel A, Hart L G, Watts C. The flight of physicians from Africa: views from African physicians and implications for policy. *Social Science and Medicine*. 2005; 61:1750-1760.
9. Ihekweazu C, Anya I, Anosike E. Nigerian medical graduates: where are they now? *Lancet*. 2005 May 28-Jun 3; 365(9474):1847-8.
10. Mullan F. The Metrics of the brain drain. *NEJM*. 2005; 353: 1810-8.
11. Mullan F. Filling in the gaps: international medical graduates in the United States, the United Kingdom, Canada, and Australia. In: Proceedings of the 8th international medical workforce conference; Oct 6-9, 2004; Washington DC.
12. American Medical Association. AMA Masterfile 2007.
13. CIA Worldbook Nigeria. Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html> Accessed Dec 10th, 2007.

14. Core health indicators. World Health Organization Statistical Information System (WHOSIS). World Health Organization website. http://www.who.int/whosis/database/core/core_select_process.cfm Accessed Dec 8th, 2007

14a. World Health Organization, UNICEF, UNFPA, The World Bank. Maternal Mortality in 2005. Available at: http://www.who.int/reproductive-health/publications/maternal_mortality_2005/mme_2005.pdf. Accessed July 2nd, 2008.

15. Facing Facts: The impact of chronic disease in Nigeria. World Health Organization website. http://www.who.int/chp/chronic_disease_report/media/NIGERIA.pdf Accessed on December 7th, 2007

15a. Oberoi SS, Lin V. Brain drain of doctors from southern Africa: brain gain for Australia. *Aust Health Rev.* 2006 Feb;30(1):25-33.

15b.. Astor A, Akhtar T, Mathallana MA, Muthuswamy V, Olowu F, Tallo V, Lie RK. Physician migration: views from health professionals in Columbia, Nigeria, India, Pakistan, and the Philippines. *Social Science & Medicine.* 2005; 61:2492–2500.

16. Council on Graduate Medical Education (COGME). Eleventh Report: International Medical graduates, the physician workforce, and GME payment reform. March 1998.

17. Fink KS, Phillips RL, Fryer GE, Koehn N. International medical graduates and the primary care workforce for rural underserved areas. *Health Affairs.* 2003; 22:255-262.

18. Mullan F. The case for more medical students. *NEJM.* 2000; 343:213-217.

19. Thompson MJ, Hagopian A, Fordyce MA, Hart LG. Do international medical graduates 'fill the gap' in rural primary care in the United States?: a national study. Working paper #106. Center for Health Workforce studies. January 2006.

20. Spike NA. International medical graduates: the Australian perspective. *Acad Med.* 2006 Sep; 81:842-6.

21. Kramara E, Lubitz J, Lentzner H, Gorina Y. Trends in the health of older Americans, 1970-2005. *Health Affairs (Project Hope).* 2007; 26: 1417-1425.

22. Center for Disease Control. Trends in aging in the U.S and worldwide. *MMWR Morb Mortal Wkly Rep.* 2003; 52(6):101-4, 106.

23. Phillips RL, Fryer JE, Chen FM, Morgan SE, Green LA, Valente E, Miyoshi TJ. The balanced budget act of 1997 and the financial health of teaching hospitals. *Annals of family medicine.* 2004; 2:71-78.

24. Mullan F. The future of medical education: a call for action. *Health Affairs.* 2003; 22:88-90

25. National Resident matching program Results and data: 2007 main residency match. NRMP website. <http://www.nrmp.org/data/resultsanddata2007.pdf>. Accessed on May 10th, 2008.

26. United States General Accounting Office. Foreign Physicians: Exchange visitor program becoming major route to practicing in U.S underserved areas. Report to Congressional Committees. December 1996.

27. McLaughlan G, Salt J. Migration policies towards highly skilled foreign workers. The United Kingdom home office web site.

<http://www.homeoffice.gov.uk/rds/pdfs2/migrationpolicies.pdf> Accessed April 8th 2008.

28. Code of Federal Regulations, Title 45, Part 50. U.S visitor exchange program—request for waiver of the two year foreign residence requirement. United States citizenship and immigration services web site.

<http://www.uscis.gov/propub/ProPubVAP.jsp?dockey=be69c19b2a908e14f0d67885e30a5582>
Accessed May 15, 2008.

29. Pond B, McPake B. The health migration crisis: the role of four Organization and Economic Corporation and Development countries. *Lancet*.2006; 367:1448-55.

30. National Health Service Careers. NHS website.

http://www.nhscareers.nhs.uk/explore_oversea.shtml Accessed April 8th 2008.

32. International Medical Education Directory. Foundation for Advancement of International Medical Education and Research (FAIMER) website.

<http://imed.ecfmg.org/results.asp?country=690&school=&currpage=1&cname=NIGERIA&city=®ion=AF&rname=Africa&psize=25> Accessed, December 20th, 2007.

33. Astor A, Akhtar T, Mathallana MA, Muthuswamy V, Olowu F, Tallo V, Lie RK. Physician migration: views from health professionals in Columbia, Nigeria, India, Pakistan, and the Philippines. *Social Science & Medicine*.2005; 61:2492–2500.

34. Declining standards in medical and dental education in Nigeria. Nigerian Medical Association website.2002. <http://www.nigeriannma.org/medinews.htm>. Downloaded on April 20th, 2007.

35. Pruss-Austin A, Rapiti E, Huti Y. Estimation of global disease attributable to contaminated sharps injuries among health care workers. *Am J Ind Med*. 2005 Dec; 48(6):482-90.

36. Olubuyide OI, Ola S.O, Aliyu B, Dosumu O.O, Arotibat JT, Olaleye O.A, Odaibo G.N, Odemuyiwa S.O, Olawuyi F. Hepatitis B and C in doctors and dentists in Nigeria. *Q J Med* 1997; 90:417–422.

37. Schafer L, McCaffrey J. Where have all the workers gone. Unpublished data. USAID mini-university.

38. Odusanya O.O, Nwawolo G.G. Career Aspirations in Lagos Nigeria. *Medical Education*.2001; 35(5): 482-7.

39. Dolvo D. The brain drain and retention of health professionals in Africa. A case study prepared for a regional conference on improving tertiary education in sub-Saharan Africa: things that work! Accra, September 2003. Available at:

http://www.medact.org/content/health/documents/brain_drain/Dovlo%20-%20brain%20drain%20and%20retention.pdf Downloaded on April 22nd, 2007.

40. Foreign exchange. Federal Reserve website.
<http://www.federalreserve.gov/releases/H10/hist/> Accessed April 8th, 2008.
41. GP salary. NHS website. <http://www.nhscareers.nhs.uk/details/Default.aspx?Id=553>. Accessed April 5, 2008.
42. WHR 2002 Statistical Annex. Available at:
http://www.who.int/whr/2002/en/whr2002_annex5.pdf. Accessed December 7th, 2007.
43. Odigwe C. Doctors in Nigeria strike over wages. *BMJ*. 2004; 329:1206.
44. Lichenstein R. Measuring the Job Satisfaction of Physicians in Organized Settings. *Medical Care*, Vol. 22, No. 1 (Jan., 1984), pp. 56-68
45. United Nations. Human development report 2007/2008- Nigeria. Available at
http://hdrstats.undp.org/countries/data_sheets/cty_ds_NGA.html Downloaded March 16, 2008.
46. Hinchliffe K. Public expenditure on education in Nigeria: issues, estimates, and some implications. World Bank website.
http://siteresources.worldbank.org/AFRICAEXT/Resources/no_29.pdf Accessed March 25th, 2008.
47. Nigeria: National and Economic Empowerment Strategy, NEEDS. Nigerian National Planning commission. Available at:
<http://www.cenbank.org/OUT/PUBLICATIONS/GUIDELINES/RD/2004/NEEDS.PDF> Accessed December Marche 15th, 2008.
48. Obiakor FE. Universal Primary education in Nigeria revisited. Available
http://eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=ED253342&ERICExtSearch_SearchType_0=no&accno=ED253342 Accessed March 10th, 2008.
49. Anugwom Edlyne. Cogs in the Wheel: Academic Trade Unionism, Government, and the Crisis in Tertiary Education in Nigeria. *African Studies Review*, Vol. 45, No. 2, Special Issue: African Universities in Crisis and the Promotion of a Democratic Culture. (Sep., 2002), pp. 141-155
50. World Health Report 2000: Improving Health Systems. World Health Organization website. http://www.who.int/whr/2000/en/whr00_en.pdf Accessed on April 2nd, 2007
51. Khan MH. Investment and Technology policies. United Nations website.
http://esa.un.org/techcoop/documents/PN_InvestmentTechnologyPolicyNote.pdf Accessed April 11th, 2008.
52. Drenkard K, Swartwout E. Effectiveness of a clinical ladder program. *Journal of Nursing Administration*. 2005; 35:502-506.

53. Hwang J, Chang H. Explaining job turnover intention in Korean public community hospitals: occupational differences. [Published online ahead of print Nov6, 2006]. *Int J Health Plann Mgmt*
54. Mittman DE, Cawley JF, Fenn WH. Physician assistants in the U.S. *BMJ* 2002;325:485-7
55. Stewart A, Catanzaro R. Can physician assistants be effective in the UK? *Clin Med* 2005; 5:344-8
56. O'Connor TM, Hooker RS. Extending rural and remote medicine with a new type of health worker: physician assistants. *Aust J Rural Health*. 2007;15:346-51.
57. Legler CF, Cawley JF, Fenn WF. Physician assistants: education, practice and global interest. *Med Teach*. 2007 Feb; 29(1):e22-5.
58. Hooker RS. Physician assistants and nurse practitioners: The United States experience. *MJA* 2006; 185: 4-7.
59. Rabinowitz HK, Diamond JJ, Warkman FW, Rabinowitz C. Long term retention of graduates from a program to increase the supply of rural family physicians. *Academic Medicine*. 2005; 80:728-32.
60. Dolvo D, Martineau T. A Joint learning initiative: Human resources for health and development: A review of the migration of Africa's health professionals. 2004. Available at: <http://www.globalhealthtrust.org/doc/abstracts/WG4/DovloMartineauFINAL.pdf> Accessed on April 20th, 2007.
61. Warriner IK, Merrick O, Hoffman MH, Morrioni C, Harries J, My Huong NT, Vy ND, Seuc AH. Rates of complication in first-trimester manual vacuum aspiration abortion done by doctors and mid-level providers in South Africa and Vietnam: a randomized controlled equivalence trial. *Lancet* 2006; 368: 1965-72
62. Hooker RS, McCaig LF. Practitioners in primary care, 1995-1999. *Health Affairs*. 2001; 20:231-238.
63. Law and development. World Bank website. <http://go.worldbank.org/ROZCQJB1G0> Accessed December 14th, 2008.
64. Stilwell B, Diallo K, Zurn P, Vujicic M, Adams O, Dal Poz M. Migration of health-care workers from developing countries: strategic approaches to its management. *Bull World Health Organ*. 2004; 82:595-600.
65. Biviano M, Makarehchi F. Globalization and the physician workforce in the United States. Sixth international workforce conference. Ottawa Canada 2002.
66. United States Government Accountability Office. Homeland Security: Performance of Student Exchange Visitor Information System Continues to Improve, But Issues Remain. A testimony Before Congressional Subcommittees. <http://www.gao.gov/new.items/d05440t.pdf> Accessed September 2007.

67. Alkire S, Chen L. Global health and moral values. *Lancet*. 2004; 364:1069-74.

68. Kirigia JM, Gbary AR, Muthur LK, Nyoni J, Seddoh A. The cost of health professionals' brain drain in Kenya. *BMC Health Serv Res*. 2006 17; 6:89.
<http://www.pubmedcentral.nih.gov/libproxy.lib.unc.edu/articlerender.fcgi?tool=pubmed&pubmedid=16846492>. Accessed July 10, 2007.

69. NORMS liaison council, Laurentian University, Lakehead University. A northern rural medical school: Increasing rural medical graduates in Ontario. Preliminary Proposal 2000.

70. Crump J. Australia's First Rural Medical School prepares to graduate first MD's. *CMAJ*. 2002; 116(4):490.

71. Rosenthal TC, McGuigan MH, Osborne J, Holden DM, Parsons MA. One-two rural residency tracks in family practice: are they getting the job done? *Fam Med*. 1998; 30(2):90-3

72. Rosenthal TC, McGuigan MH, Anderson G. Rural residency tracks in family practice: graduate outcomes. *Fam Med*. 2000; 32(3):174-7.

73. Commonwealth Secretariat. Human Resources for Health. Available at:
http://www.thecommonwealth.org/Internal/34042/human_resources_for_health Downloaded on April 22nd, 2007.

74. Commonwealth declaration.
http://www.thecommonwealth.org/shared_asp_files/uploadedfiles/%7B7BDD970B-53AE-441D-81DB-1B64C37E992A%7D_CommonwealthCodeofPractice.pdf Last accessed on July 5th, 2008.

Appendix1

Dear Colleague,

My name is Aye Otubu and I am a medical student at the University of North Carolina in Chapel Hill. I am currently in my final year of medical school and I am also working on a Master's degree in Public Health. As part of my master's research, I am conducting a survey to help me identify the factors that affect the international migration of physicians from Nigeria. You have received this email because you are a colleague of Nere Otubu, a Nigerian medical student, a Nigerian medical graduate, or a Nigerian health official and I would like to get your opinion on this matter. I would appreciate if you could participate in this survey. It will take about 10 to 15 minutes to complete. If you would like to participate please proceed to the link provided below.

Link: Physician Migration from Nigeria

Sincerely,

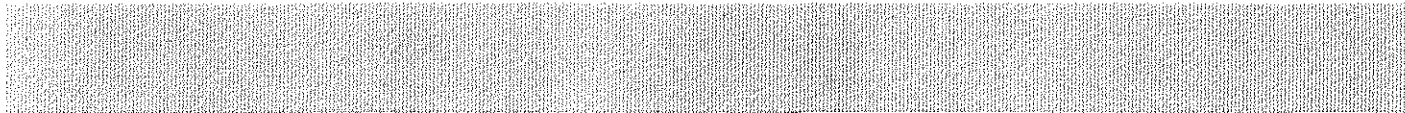
Aye Otubu

MD/MPH student
Public Health Leadership
School of Public Health
University of North Carolina
Chapel Hill, NC U.S.A
aye@med.unc.edu

Web survey:

Top of Form

0



Default Question Block

QID7

1

DB

TB

Selected

Thank you for deciding to take this survey!

First, I'd like to get a little information on the general background of the people completing this survey. Please check the answer that best describes you in each of the questions below.

QID1

1|2|3|4|5

MC

SAVR

TX

I am a:



Medical Student

- Resident (House officer)
- Generalist Physician
- Specialist Physician
- Other YToxOntzOjc6IIF

QID28	1 2	MC	SAVR	TX
-------	-----	----	------	----

I attended medical school in Nigeria

- Yes
- No YToxOntzOjg6IIF

QID35	1 2 3	TE	SL	
-------	-------	----	----	--

What Medical school did you attend?

QID2	1 2 3 4 5 6	MC	MAVR	TX
------	-------------	----	------	----

I principally work / train in:
(please check all that apply)

- Private Office
- Health Department

Medical School System

Public Hospital

Private Hospital

Other

QID29	1 2	MC	SAVR	TX
-------	-----	----	------	----

I currently live in Nigeria:

Yes

No

QID36	1 2 3	TE	SL	
-------	-------	----	----	--

What country do you live in?

QID3	1 2	MC	SAVR	TX
------	-----	----	------	----

I am:

Male

Female

QID4	1 2 3 4 5	MC	SAVR	TX
------	-----------	----	------	----

I am:

- Less than 25 years old
- 25 to 34 years old
- 35 to 44 years old
- 45 to 54 years old
- 55 years old or older

YToxOntzOjc6llF:

QID11	1	DB	TB	
-------	---	----	----	--

Selected

Next, I'd like to get your opinion of Nigerian medical training opportunities. For each question, please choose the answer that comes closest to your own view, as an observer of the Nigerian system.

QID12	1 2 3	MC	SAVR	TX
-------	-------	----	------	----

The number of internships available in Nigeria for medical graduates is:

- More than enough for those that need it
- Just about the right amount
- Not enough for those that need it

YToxOntzOjg6llF:

QID13	1 2 3	MC	SAVR	TX
-------	-------	----	------	----

The opportunities for specialty training in Nigeria are:

- More than enough for those that need it
- Just about the right amount
- Not enough for those that need it

YToxOntzOjg6IIF:

QID14	1 2 3	MC	SAVR	TX
-------	-------	----	------	----

The opportunities to conduct medical research in Nigeria are:

- More than enough for all who need them
- Just about the right amount
- Not enough for all who need them

YToxOntzOjg6IIF:

QID15	1	DB	TB
-------	---	----	----

Selected

The next set of questions deal with motivating factors for migration. You are in a very good position to observe and understand the conditions that might make Nigerian physicians more or less likely to consider leaving Nigeria to work elsewhere. For each of the questions below, please choose an answer that comes closest to your own view.

QID16	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5	Matrix	Likert	Single Answer
-------	----------------------	-----------	--------	--------	---------------

How important do you think the following factors are in influencing a Nigerian physician's decision to leave Nigeria to work in other countries?

Very Unim Ne Impo
 \$answ eUnim porta tra Impo
 porta nt l rtant Very Important
 nt

A.

Professional Considerations

opportunity for further training in one's field (e.g. residency or fellowship)

opportunity for specialty training in a new field (e.g. residency or fellowship)

more advanced technology for patient care

opportunity for

career advance ment					
research opportun ities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
better working conditio ns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Personal Consider ations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
job opportun ities for family members (includin g spouse)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase d income	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
personal desire to live in another country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
family desire to live in another country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

desire to
join
family
members
already
in
another
country

better
living
conditio
ns

<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO
<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjExOi	<input type="radio"/> YToxOntzOjExOi	<input type="radio"/> YToxOntzOjExOi
<input type="radio"/> YToxOntzOjExOi					

QID39	1 2 3 4 5 6 7	RO	RB	TX
-------	---------------	----	----	----

Please rank the following factors in order of importance with regard to it's influence on the decision to migrate.
(1=most important, 7=least important)

	1	2	3	4	5	6	7
Better living conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Better working conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Desire to live in another country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunity for career advancement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunity for research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunity for specialty training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remuneration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QID17	1 2	MC	SAVR	TX
-------	-----	----	------	----

Do you personally know of physicians who have emigrated from Nigeria to work in other countries?

Yes

No

QID18	1 2 3 4 5 6 7	MC	MAVR	TX
-------	---------------	----	------	----

And where have those physicians gone? Please choose all that apply

Australia

Canada

Germany

New Zealand

United Kingdom

United States

Other (please name the countries)

QID20	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5	Matrix	Likert	SingleAnswer
-------	----------------------	-----------	--------	--------	--------------

Next, I would now like to know the factors you believe are most important in keeping physicians in Nigeria, that is, the factors that will decrease migration.

\$answe	Very Unim Ne Unim portan tra Impo portant l rtant Very Important
---------	--

t

A.

Professional
Considerations

opportunity for
further
training
in one's
field (e.g.
continuing
education
, training
certificates,
conferences)

opportunity for
specialty
training
in a new
field (e.g.
residency
or
fellowship)

more
advanced
technology for
patient
care

opportunity for career advancement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
research opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
better working conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
opportunity to improve the health of Nigerians	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Personal Considerations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
job opportunities for family members (including spouse)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
personal desire to live in Nigeria	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

family
desire to
live in
Nigeria

Opportun
ity to
improve
Nigerian
society

<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO
<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjEwO	<input type="radio"/> YToxOntzOjExOi	<input type="radio"/> YToxOntzOjExOi	<input type="radio"/> YToxOntzOjExOi

QID33	1	DB	TB
-------	---	----	----

Selected

Finally, I'd like to get your views on your present working or training environment. For the final two questions please choose the answer that best describes your environment.

QID21	2 3 4 11 12 13	1 2 3 4 5	Matrix	Likert	SingleAnswer
-------	----------------	-----------	--------	--------	--------------

A. Training and Professional development in your environment

Answers	Strongly Disagre e	Disagre e	Neutra l	Agree	Strongly Agree
---------	--------------------------	--------------	-------------	-------	----------------

I have the
training
opportunities I
need

My
administration
does all it can to
support my work

It is easy to keep
up with the
current
developments in

my field

I am encouraged
to go to go to
medical
conferences

Provision is made
for me to go to
medical
conferences

Continuing
medical
education is
encouraged

<input type="radio"/> YToxOntzOjEwOj	<input type="radio"/> YToxOntzOjEwOj	<input type="radio"/> YToxOntzOjEwOj	<input type="radio"/> YToxOntzOjExOj	<input type="radio"/> YToxOntzOjExOj
<input type="radio"/> YToxOntzOjExOj				

QID34

1|2|3|4|5|6|7|8

1|2|3|4|5

Matrix

Likert

SingleAnswer

B. Your practice environment

Answers Strongly Disagree Disagree Neutral Agree Strongly Agree

I feel safe at
work

I have the
equipment I
need to care
for my
patients

I have the
equipment I
need to protect
myself from
infection

