PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (see an example) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

ARTICLE DETAILS

TITLE (PROVISIONAL)	**International Medical Graduates in the United States: a Qualitative Study on Perceptions of Physician Migration**
AUTHORS	Chen, Peggy; Nunez-Smith, Marcella; Berg, David; Gozu, Aysegul; Curry, Leslie

VERSION 1 - REVIEW

REVIEWER	***Luis Gabriel Cuervo*** Senior Advisor, Research Promotion & Development Pan American Health Organization / World Health Organization United States of America. Conflicts of interest: None Note: this review has been performed on a personal basis and does not necessarily reflect the views of my employers.
REVIEW RETURNED	27-Apr-2011

THE STUDY	The list of authors does not provide a clear description of the skills in place, but the filiations suggest there is a team of capable writers/researchers who can surely deliver a report in much better shape. I would like to encourage them to do this; they picked a good topic and they are surely capable of delivering a robust report.
REPORTING & ETHICS	CONSORT is not an adequate reporting statement for this study. I have reviewed the study using reporting guidelines for observational studies available at www.equator-network.org
GENERAL COMMENTS	Congratulations for picking a relevant and important research topic. In my view the report needs substantial work and I would like to encourage you to undertake and provide helpful information to improve knowledge on this important topic.

REVIEWER	***Jishnu Das*** Senior Economist, World Bank, Washington DC and Visiting Fellow, Centre for Policy Research, Delhi, India No Competing Interests Declared
REVIEW RETURNED	17-May-2011

THE STUDY	Overall Study Design: There is a question of whether the sample size of 25 is sufficient to generate general results. Are Patients Representative: No patients involved in the study
RESULTS & CONCLUSIONS	The problem of physician migration internationally is conceptually similar to that of physician migration within a country---its going to be hard to ask someone to work in a context with poor institutional support, difficult working conditions and lower wages when you can get improvements in all three elsewhere---be it an urban hospital or

	an international destination. The authors identify the key reasons why physicians left (and why they chose to stay on) as a combination of poor home institutions, better training potential, better working conditions, higher pay and (interestingly) the inability to transfer training without incurring a high cost back to the home country. They suggest that a uniform standard of education and training and better linkages between the sending and the receiving country (thinking about migration as a back-and-forth process) can help. Yet, here I would try and separate out the problem and think more broadly. For instance, is the problem that the home country education was paid for, but the cost was never recovered? In this case, would things be better if migrating doctors were stipulated to "pay back" the amount due for their education when they leave (perhaps starting on a voluntary contribution basis)? Or, alternatively, if the key issue is that the cost of medical education is much lower in low-income countries, why not encourage US institutions to setup medical training facilities in low-income countries on a more systematic basis? This would both expand supply in the low-income country and increase migration, but now only of those people who were brought in as a result of the additional supply. I think that separating out the component of the problem that is due to subsidized education systems in low-income countries from the decline in supply due to physician emigration may be important. Finally, the authors also suggest that governments of low-income nations should also direct efforts by improving working conditions etc. But this is a throw-away statements. Of course, everyone agrees that this should be done, but how it can be done is less than clear. There is very little evidence that its easier to retain doctors when working conditions improve, and the very institutional failures that lead to poor working conditions are also the ones that lead to physicians migrating in the first place. If the authors are wedded to this recommendation, I would definitely suggest adding that this is well known, but very hard to do---and it may be far from sufficient. To the extent that they can do so, the better institutions (and this includes not only working conditions, but also ad-hoc transfers of doctors to different locations, systematic corruption etc.) this would have a large direct impact on health--and perhaps decrease migration as well.
GENERAL COMMENTS	There is much to like about the paper, and especially the framing of the problem that global policies have very local effects on the lives of people. This plays out in the very local decision to migrate and remain in a new country, but in turn has global consequences. I have three main concerns with the paper: 1. The average reader may be less convinced by the very small sample size (25 doctors) and wonder whether this is going to be big enough to provide general guidance on the problem. I would shore this up a bit by stressing the study as exploratory rather than definitive. I don't think that this will take away from the uniqueness of the contribution; at the same time it will guard against inflated expectations! 2. I would also situate the study a bit better in a global context; here I wonder whether some information from the physician migration database on Africa created by Clemens and Petterson (http://www.human-resources-health.com/content/6/1/1) could help. For migration from one high-end institution, the data presented in Kaushik and other's work: http://www.who.int/bulletin/volumes/86/1/07-041681-ab/en/index.html may also be of interest for the reader.

	3. My third main concern is thinking harder about the policy; this is discussed above, but just to reiterate, I think the main issue is separting out whether we think of the problem primarily as a cost issue (all these physicians received hugely subsidized educations) or as a problem of creating shortages. Both of these can be significantly alleviated if high-income medical institutions were encouraged to set up their own medical training colleges in low-income countres, for instance. and perhaps refer to Clemens' very nice discussion piece in Global Health: http://www.globalhealthmagazine.com/cover_stories/health_worker_migration/ For micro evidence from a single institution, I would also refer to http://www.who.int/bulletin/volumes/86/1/07-041681-ab/en/index.html Kaushik and others, High-End Physician Migration from India. Bulletin of the WHO

VERSION 1 – AUTHOR RESPONSE

Reviewer: Luis Gabriel Cuervo's Comments

Overall comment: the authors have selected a relevant and important topic but the reporting of the study does not follow good reporting standards for observational studies (e.g. see www.equator---network.org) mostly because the descriptions are superficial and vague or short in detail. The study as presented has significant limitations that compromise the external and internal validity of the data and needs substantial improvement to be helpful and worthy of publication. I would strongly encourage the researchers to adhere to reporting
guidelines for observational studies providing informative descriptions that allow understanding the methods in a way that would make it replicable.

Response: We agree the report of methods must be sufficiently complete to allow readers to understand fully the study methodology and rationale, and have added additional detail to the methods section as indicated below, including information and citations to reflect that our methodology is consistent with established guidelines for rigor (as described for example in Mays, BMJ 1995 and Malterud, Lancet 2001). In preparing the manuscript, we followed the reporting format used for empirical qualitative studies published in peer reviewed scientific journals such as BMJ (for example, Dowrick, BMJ 2009). We would note that our study was not an observational design as noted by the reviewer, but rather an exploratory qualitative study to generate hypotheses for future investigation.

Further detail on rationale and goals of using qualitative methodology on page 8, paragraph 2:

"We chose a qualitative design to characterize participant perspectives and generate hypotheses for future testing in larger, quantitative studies. This approach is optimal for capturing the essential aspects of a phenomenon from the perspective of study participants, when addressing potentially sensitive subjects, and when there may be fear of reprisals or repercussions.48, 49"

Additional details on sampling strategy on page 9, paragraph 1:

"To construct the sample, we utilized the strategy of random purposeful sampling49, 52 in which

groups of interest (gender, specialty, region of origin) were identified and key informants within each group were randomly selected to achieve a diverse sample."

Further details of the recruitment strategy were not included in the revision due to the space limitations of publication but are discussed below. If the Editors feel this would be beneficial to the manuscript, we can add these details to the manuscript. Specifically, PC contacted each randomly selected physician by phone to explain the study and its procedures. If the physician was not available, a message was left with office staff and an introductory letter was faxed to the office. PC followed up with another phone call the next day or at a time suggested by the office staff. If this was not successful, PC placed a third call attempting to reach the physician. After three unsuccessful attempts, physicians were considered "unreachable", another physician was randomly selected and the process was repeated.

And further explanation of the term "theoretical saturation" on page 9, paragraph 2:

"Recruitment and data collection were conducted until thematic saturation,49 the point at which no new concepts emerge from subsequent interviews, was achieved."

Overall the study seems to spread thin trying to capture many things with very unspecific tools and missing key factors that could have been better identified if a systematic review had been used to inform the background and justification of the document to better support key determinants for migration, sources of confounding and bias. The authors picked an excellent topic but they need to do a better job developing/reporting it. It is unclear to me whether the problem is poor reporting or a flawed research process. A review of the protocol approved by the ethics committee should shed some light on this. This report is not ready for publication.

Results: We appreciate the reviewer's caution that the study must be placed in proper context relative to extant empirical literature. For this manuscript, as well as from two other papers published from this study (cites), we conducted a thorough literature review related to the topic of IMGs, including the phenomenon referred to as 'brain drain' or physician migration, including these studies where relevant. We are unclear as to the concern regarding 'unspecific tools,' which we interpret may refer to the methodology. Accordingly, we have added further detail on the rationale and goals of using qualitative methodology on page 8, paragraph 2:

"We chose a qualitative design to characterize participant perspectives and generate hypotheses for future testing in larger, quantitative studies. This approach is optimal for capturing the essential aspects of a phenomenon from the perspective of study participants, when addressing potentially sensitive subjects, and when there may be fear of reprisals or repercussions.48, 49"

We also agree that further details on sampling and recruiting may help to address the reviewer's concerns and have included these details on page 9, paragraph 1:

"To construct the sample, we utilized the strategy of random purposeful sampling49, 52 in which groups of interest (gender, specialty, region of origin) were identified and key informants within each group were randomly selected to achieve a diverse sample."

Further details of the recruitment strategy were not included in the revision due to the space limitations of publication but are discussed below. If the Editors feel this would be beneficial to the manuscript, we can add these details to the manuscript. Specifically, PC contacted each randomly selected physician by phone to explain the study and its procedures. If the physician was not available, a message was left with office staff and an introductory letter was faxed to the office. PC followed up with another phone call the next day or at a time suggested by the office staff. If this was

not successful, PC placed a third call attempting to reach the physician. After three unsuccessful attempts, physicians were considered “unreachable”, another physician was randomly selected and the process was repeated.

Finally, as suggested by both the reviewer and the Editor, the research protocol approved by the Yale University Human Investigations Committee has been included in the revision as a supplementary file.

Relevance of the question: the authors have identified a relevant topic that would help to better understand the determinants for international medical migration. The question is not explicitly presented. The objectives in the abstract suggest that they intend to identify what determinants have lead foreign international medical graduates who completed residence in the United States and were registered in the IMG section of the AMA database and the board licensures for the States of Connecticut, or New York or New Jersey, to settle in the United States.

Response: Our research objective was to characterize the perspectives of IMGS who have experienced physician migration to the United States. We have clarified this in the abstract which can be found on page 5, paragraph 1 of the revised manuscript:

“The authors sought to characterize the experiences of IMGs from limited resource nations currently practicing primary care in the United States, with a focus on their perspectives on physician migration.”

The authors provide reference to back statements about the findings of previous work and state that existing literature has not investigated the determinants and motivations that lead to residents settling in the US as opposed to returning to their countries of origin. Furthermore, they state in the discussion that this might be the first study to systematically categorize the experiences and perceptions of IMGs. But they provide no evidence that they conducted a thorough (systematic) review of the literature that supports such statement and there are no explicit criteria for picking the specific references they cite. The authors should provide a robust background section starting with a systematic
review that points out specific knowledge gaps and builds on the methods and knowledge accrued. Such a review may help to better shape the research question and identify key factors that appear to have been missed from the analysis and survey, such as gender issues, political situation, a definition on whether the decision to settle in the US preceded the decision to do residency, the migratory status at arrival to the US (e.g. refugee, work visa, study visa, illegal immigration, support networks), marital status at arrival, at the end of
residence, work options in place of origin, etc.

Response: Our literature review was thorough, using a standard approach for literature searches. We utilized the OVID database, using the keywords “international medical graduates”, “foreign medical graduates” and “emigration and immigration”. Relevant studies were included in the background and discussion of this manuscript. For the revision, we have reviewed the literature again and cited several additional studies. We believe that a separate systematic review (such as in the style of the Cochrane Review with scores for quality of evidence, etc.) is beyond the scope of this particular study and would warrant its own separate study.

The factors noted by the reviewer are indeed interesting and potentially important. Our focus was on characterizing the perspectives of IMGs on their role in physician migration in order to generate hypothesis for future research and to begin developing potential solutions for the issues related to this phenomenon. Some of the factors mentioned by the reviewer such as immigration issues, family issues and political and economic situations in home country were certainly evident in the data.

However, our study was meant to generate hypotheses which will need to be studied using quantitative methods in order to support valid generalizations from the data to larger populations. In order to clarify this, we have added it as a limitation in the discussion section on page 20, paragraph 2:

"First, as a qualitative study, this work was meant to be exploratory in nature and not definitive. We sought to characterize a range of experiences with physician migration among a diverse group of IMGs in order to generate hypotheses that may be tested in future, quantitative studies."

Appropriateness of qualitative method: A qualitative approach is adequate to address the implicit research questions and interviews are appropriate, but this does not preclude an adequate literature review, the comprehensive identification of determinants, the data gathering on key factors and variables, and complementing the qualitative methods with some quantitative analysis describing better the study group. Key descriptors are missing in table 1 (e.g. gender and sex descriptors, age at arrival to the US, age at the end of residency, marital status, socio--economic situation in place of origin, sources of support to study, cost of education, etc.).

Response: Consistent with recommended qualitative research methods, the demographic survey we conducted was meant only to provide a brief description of the overall sample. It was not meant to be a comprehensive structured survey. Gender is included in table 1, and we have also revised the table to include one additional piece of data on the average number of physicians per 1,000 in the countries of origin of study participants. However, we did not collect other data requested by the reviewer (age at arrival in the US, socio-economic situation in place of origin, etc) because it would have expanded the survey far beyond the purpose of a brief demographic survey. We have included the original demographic survey as a supplementary file for your review.

Transparency of procedures:
Sampling: How were participants selected from the databases? Apparently there was no random sampling made from the available databases. The authors should explain why this was the case. The criteria applied for the sampling need to be clearly presented and the theoretical base needs to be presented.
Response: Thank you for the opportunity to clarify the sampling strategy. We used random purposeful sampling (Patton, 2002) in order to compile a small, but diverse sample. We emphasize that such a sample is meant to be used for exploratory purposes, not representativeness, and is not meant for making generalizations. We have added additional details on page 9, paragraph 1:

"To construct the sample, we utilized the strategy of random purposeful sampling49, 52 in which groups of interest (gender, specialty, region of origin) were identified and key informants within each group were randomly selected to achieve a diverse sample."

Further details of the recruitment strategy were not included in the revision due to the space limitations of publication but are discussed below. If the Editors feel this would be beneficial to the manuscript, we can add these details to the manuscript. Specifically, PC contacted each randomly selected physician by phone to explain the study and its procedures. If the physician was not available, a message was left with office staff and an introductory letter was faxed to the office. PC followed up with another phone call the next day or at a time suggested by the office staff. If this was not successful, PC placed a third call attempting to reach the physician. After three unsuccessful attempts, physicians were considered "unreachable", another physician was randomly selected and the process was repeated.

Recruitment: Why does the sample state that they picked 25 (and the gender distribution suggests that all were analyzed) but the results section state that there was a participation rate of 93%?

Response: We apologize if this was not sufficiently clear in the methods. We were able to make contact with 27 physicians, among whom 25 physicians agreed to participate in the study, were interviewed and their transcripts analyzed. This comprises the participation rate of 93% (25/27=0.93).

Data collection: The authors state that they identified recurrent and unifying themes And that they recruited participants and collected data until they reached thematic saturation. However, they do not support these statements adequately and it is difficult to understand how, for example, they were able to find thematic saturation for populations such as Caribbean migrants or Latin American doctors considering that these are two prominent groups of IMGs in the US and the sample had no Caribbean representation and only 2 Latin American participants –with the likelihood of having very diverse determinants
influencing their migration (considering the political and socioeconomic diversity in the region, inequities, heterogeneity of gender approaches, and other relevant factors). The methods do not describe any criteria for the selection of the quoted texts of participants (other than the databases where they were identified). The study mentions that a standardized data collection and coding was done, but no templates, forms, or informative references illustrating this are provided. The argument used to stop data collection is difficult to believe with the limited representativeness of the sample for issues that can be quite complex and diverse.

Response: Our study design does not permit us to represent specific groups such as Caribbean or Latin American physicians as suggested by the reviewer. The region of origin of participants does roughly reflect their representation in the population of IMGs in the US (American Medical Association, 2007). Of note, although Caribbean medical school graduates play a large role in the US physician workforce, the large majority are US Citizens who attend private, offshore medical schools as described in Lynn Eckhert's recent article in Academic Medicine (Eckhert, Acad Med 2010). Since our study was focused specifically on foreign-born IMGs, these particular Caribbean medical school graduates would have been ineligible.

We emphasize that the goal of this work was to provide a range of perceptions on brain drain and potential solutions among a diverse group of IMGs. A structured survey approach would be required and is planned in future work, to make generalizing statements about specific populations as requested by the reviewer. With regards to the point at which we stopped data collection, theoretical saturation is a standard element of qualitative research, and occurs when no new themes are elucidated in further interviews (see: Patton, 2002). We have added this explanation to the revised manuscript on page 9, paragraph 2:

"Recruitment and data collection were conducted until thematic saturation,49 the point at which no new concepts emerge from subsequent interviews, was achieved. "

Role of researchers: it is unclear if the researchers had the experience and support to conduct the research adequately. The credentials presented in the paper do not speak about their expertise in qualitative research. It is unclear what data was collected in the anonymous 45min demographic survey; data in table 1 is unlikely to represent such a lengthy survey.

Response: We appreciate the importance of the credentials of each member of the study team. All members have experience in qualitative research, including several seminal works in qualitative methodology which are included as references in this manuscript. The senior author, Leslie Curry, is an internationally recognized expert in qualitative and mixed methods in health services research with experience as an NIH study section reviewer, independent investigator, and faculty member teaching and mentoring a wide range of graduate students and faculty in these methods. If the Editor feels additional information regarding the authors' credentials would be useful to readers we can prepare

brief summary as an appendix or supplementary file.

The brief demographic survey was meant to provide a brief description of the sample, and lasted only 1-2 minutes on average. We have attached the actual survey as a supplement for your review. The study itself was a qualitative study utilizing in-depth interviews as the form of data collection, not a structured survey as the reviewer infers. The in-depth interview using the interview guide as a framework, was the substantive form of data collection for this study, and this is what lasted an average of 45 minutes.

Ethics: Informed consent was sought and granted for this study as reported in the "study design and sampling" section. The report does not elaborate further on ethical implications and the informed consent process is not described.

Response: We have attached the study protocol approved by the Yale Human Investigations Committee for your review. We did not include further details on the ethical implications of this work because of space limitations of publication and because measures such as de-identification of transcripts, destruction of audio files following analysis and a participant confirmation process are standard elements of qualitative research. However, if the Editors feel it would be helpful, we can add additional details on these elements to the manuscript.

Soundness of interpretive approach:
Analysis: the analysis presented in this study is insufficient and needs to be better linked to the demographics and other relevant data about determinants for migration and confounding. The interpretations require robust support and data need to be validated. The authors should describe the strategies used to minimize different sources of bias and imprecision, how themes were derived from data and alternative explanations for the quoted statements. They need to also determine what data and quotes represent a common situation versus an outlier, and highlight key contextual factors in more detail. The reliability checks need to be described as well.

Results: We appreciate the reviewer's concerns. However, the goal of qualitative research is not to be definitive but rather, to be exploratory. To that end, the themes identified and the illustrative quotes used are meant to provide a range of experiences among a diverse group of IMGs who practice primary care in the US. There will be both common situations and outliers within this data. However, attempts to distinguish them from one another are not the goal of this study. In order to measure the magnitude of effect, future work will need to employ a structured survey or other quantitative approach.

We have described the process of data analysis including the derivation of themes from the data in the methods section of the original manuscript. Further details were not included in the manuscript due to space constraints of publication, and because these methods are frequently used in qualitative research. We have provided extensive references on our methodology if
readers require further detail. We have also attached our final code structure as a supplementary file. Finally, we were cognizant of the potential for biased viewpoints and thus utilized the methods described by Gubrium (Gubrium and Holstein, 1997) coupled with regular debriefing sessions with an organizational psychologist on our research team to help all team members engage in processes of reflexivity in analyzing this data. In addition, as recommended
by many experts (Mays, BMJ 1995, Patton, Health Serv Res 1999) we assembled a multi-disciplinary analysis team to improve the breadth and depth of the analysis, including an IMG working in the US, a second-generation immigrant physician, a physician leader who has chosen to remain in his home country of Rwanda, a health care workforce expert physician, an organizational psychologist and a health services researcher, all with experience with
qualitative methodologies.

Discussion and presentation: despite the excellent topic, more work is needed to ground the conceptual framework adequately; a thorough review of the literature would be helpful for this, and to clarify what has been previously known about this topic in an authoritative and credible way and develop a more profound discussion and analysis section. Overall the writing is easy to follow but superficial in content. The limitations need to be better developed and the recommendations made with a deeper analysis of the determinants that lead to migration and richer options (even though they make a good start with some) to bring something good out of the diasporas and to promote conditions that allow skilled health care workers to thrive in the settings where they are needed (e.g. engagement in other activities such as research networks, pay for performance schemes and other tested retention strategies, and other ideas that might come from the literature review).

Response: Thank you for this suggestion. We did mention partnerships between home country and destination country as one potential way to mitigate the effects of physician migration. However, we did not specify the development of research networks, which we certainly believe can play an important role in building capacity in home country. We have added this on page 20, paragraph 1:

"Partnerships between limited resource nations and destination country institutions, through research networks or clinical collaborations offer further opportunities for capacity building in limited resource nations. "

As the reviewer has suggested, we have also further developed the limitations section on page 20, paragraph 2:

"Our findings should be interpreted in light of the potential limitations of the study. First, as a qualitative study, this work was meant to be exploratory in nature and conclusions are not meant to be generalized. We sought to characterize a range of experiences among a diverse group of IMGs in order to generate hypotheses that may be tested in future, quantitative studies. Second, we focused on IMG physicians in outpatient primary care specialties because of the concentration of IMGs in these fields. Experiences of IMG physicians in other specialties may differ, particularly in more competitive specialties with fewer IMGs. Additionally, our study was geographically circumscribed to New York, New Jersey and Connecticut, largely metropolitan regions of the country. IMGs who practice in other geographic regions, particularly rural areas, may have different perspectives. Future work should also examine the perceptions and decision-making processes of physicians who returned to limited resource countries following training in the US. Such data are not currently tracked and the experiences of this group are generally difficult to capture due to their global geographic distribution."

Reviewer: Jishnu Das' Comments

Overall Study Design: There is a question of whether the sample size of 25 is sufficient to generate general results.

Response: Our research objective was to characterize the perspectives of IMGS who have experienced physician migration. This study was meant to be exploratory, not confirmatory or definitive, and findings are not meant to be generalized. We have emphasized this in the methods section on page 9, paragraph 2:

"We chose a qualitative design to characterize participant perspectives and generate hypotheses for future testing in larger, quantitative studies. This approach is optimal for capturing the essential aspects of a phenomenon from the perspective of study participants, when addressing potentially sensitive subjects, and when there may be fear of reprisals or repercussions.48, 49"

And on page 20, paragraph 2:

""Our findings should be interpreted in light of the potential limitations of the study. First, as a qualitative study, this work was meant to be exploratory in nature and conclusions are not meant to be generalized. We sought to characterize a range of experiences among a diverse group of IMGs in order to generate hypotheses that may be tested in future, quantitative studies. "

1. The average reader may be less convinced by the very small sample size (25 doctors) and wonder whether this is going to be big enough to provide general guidance on the problem. I would shore this up a bit by stressing the study as exploratory rather than definitive. I don't think that this will take away from the uniqueness of the contribution; at the same time it will guard against inflated expectations!

Response: We appreciate this input from the reviewer. We have taken the reviewer's suggestion to emphasize that this study is exploratory rather than definitive and that any generalized assumptions must be tested with quantitative data. This has been done in the methods section on page 9, paragraph 2:

"We chose a qualitative design to characterize participant perspectives and generate hypotheses for future testing in larger, quantitative studies. This approach is optimal for capturing the essential aspects of a phenomenon from the perspective of study participants, when addressing potentially sensitive subjects, and when there may be fear of reprisals or repercussions.48, 49"

And on page 20, paragraph 2:

"Our findings should be interpreted in light of the potential limitations of the study. First, as a qualitative study, this work was meant to be exploratory in nature and conclusions are not meant to be generalized. We sought to characterize a range of experiences among a diverse group of IMGs in order to generate hypotheses that may be tested in future, quantitative studies. "

2. I would also situate the study a bit better in a global context; here I wonder whether some information from the physician migration database on Africa created by Clemens and Petterson (http://www.human-resources-health.com/content/6/1/1) could help. For migration from one high-end institution, the data presented in Kaushik and other's work: http://www.who.int/bulletin/volumes/86/1/07-041681-ab/en/index.html may also be of interest for the reader.

Response: Thank you for these very helpful references. In particular, Kaushik's study on high-end physician migration in India is relevant. Participants did note that because of the high cost of migration (examination fees, housing and board costs during examinations, travel to residency interviews, etc.) it is likely only a certain class of individuals who are leaving a country. In addition, the study from Clemens and Pettersson is very useful in illustrating the complexity of physician migration and its impact. We have included both citations in the revised manuscript on page 7, paragraph 2:

"Among health workers in the African diaspora, Clemens et al25 reports an inverse relationship between economic and political stability and physician migration. Evidence from India indicates that perceived greater professional opportunities drive many potential Indian migrant physicians.26 Similarly, a survey in Pakistan indicated that low remuneration, poor training and poor work environment influenced potential Pakistani migrant physicians.27 Finally, factors such as changing medical school curricula,5 and recent work indicating that within home countries, graduates from higher quality institutions are more likely to migrate have also been examined quantitatively.28, 29"

On page 7, paragraph 3:

“Recent calls to approach physician migration as a symptom of problems in home country emphasize the need for greater understanding of the complex decisions leading to migration.30”

And on page 19, paragraph 4:

“Our findings reflect prior work indicating the role of economic and political stability,25 professional opportunities,26 poor work environment27 and sub-optimal workforce dynamics.28, 29“

3. My third main concern is thinking harder about the policy; this is discussed above, but just to reiterate, I think the main issue is separting out whether we think of the problem primarily as a cost issue (all these physicians received hugely subsidized educations) or as a problem of creating shortages. Both of these can be significantly alleviated if high-income medical institutions were encouraged to set up their own medical training colleges in low-income countres, for instance.

and perhaps refer to Clemens' very nice discussion piece in Global Health:
http://www.globalhealthmagazine.com/cover_stories/health_worker_migration/

For micro evidence from a single institution, I would also refer to
http://www.who.int/bulletin/volumes/86/1/07-041681-ab/en/index.html
Kaushik and others, High-End Physician Migration from India. Bulletin of the WHO

Response: Thank you for these helpful suggestions. As suggested by the reviewer, the studies from both Clemens and Kaushik have now been incorporated into the manuscript. We have included both citations in the revised manuscript on page 7, paragraph 2:

“Among health workers in the African diaspora, Clemens et al25 reports an inverse relationship between economic and political stability and physician migration. Evidence from India indicates that perceived greater professional opportunities drive many potential Indian migrant physicians.26 Similarly, a survey in Pakistan indicated that low remuneration, poor training and poor work environment influenced potential Pakistani migrant physicians.27 Finally, factors such as changing medical school curricula,5 and recent work indicating that within home countries, graduates from higher quality institutions are more likely to migrate have also been examined quantitatively.28, 29”

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And on page 19, paragraph 4:

“Our findings reflect prior work indicating the role of economic and political stability,25 professional opportunities,26 poor work environment27 and sub-optimal workforce dynamics.28, 29”

We have also removed parts of the introduction referring to the financial and human capital losses as necessarily linked, as we acknowledge that they may have very different and separate solutions. While the majority of the manuscript remains dedicated to addressing the loss of human capital, we have also added a section in the discussion about the loss of financial capital and potential solutions, as suggested by the reviewer. This can be found on page 21 paragraph 1:

“Finally, education in general and medical education specifically is typically provided at low or no cost

in limited resource nations, representing a significant loss of investment when physicians migrate. Proposals to recoup this investment, such as educational bonding schemes9, 56 and better regulation and mandated compensation from destination countries to to limited resource nations3 need systematic examination."

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VERSION 2 - REVIEW

REVIEWER	***Jishnu Das***
REVIEW RETURNED	30-Jun-2011

GENERAL COMMENTS	My only remaining comment is that the lines in the abstract and introduction ("exacting substantial toll on both the financial and human resources of home countries") is somewhat at odds with the findings in the paper. After all, what the paper suggests, and what comes across clearly in the very skillful presentation is that the decision to migrate is generated by a host of sending-country policies that make it difficult (a) for these physicians to perform to the best of their abilities and (b) to return (even for short periods) given licensing requirements. The toll exacted depends on what they would have been doing had they stayed in their home countries, relative to what they are doing in the U.S., and as the authors point out, this toll could be both financial and human. I would separate out these two: do we think that physician migration would be as bad if the person (a) migrated before and studied in the U.S.; (b) paid for their own studies in the home country and (c) studied in a subsidized university in the home country and then migrated? The broad issue here seems to be the argument that labor mobility may cause problems and needs some global coordinated action--but what form this action may take depends on the comparisons of performance and subsidies in both the home and current residence countries. I would be much more careful with stating as a hypothesis that

	migration exacts a toll; then being clear about what we would need to study to understand the extent of this toll. From here, the findings of the paper would follow quite naturally---that although the toll is widely hypothesized, there is currently little evidence on what the nature or size of this toll is. The findings, for me, suggest that home country policies and environment dramatically affects the decision to migrate and therefore this would open up a much wider debate. This requires just a couple of line changes in the abstract and introduction, if the authors feel that this concern is valid.

REVIEWER	***Luis Gabriel Cuervo***
REVIEW RETURNED	17-Jul-2011

THE STUDY	Thanks for inviting me to review manuscript bmjopen-2011-000138.R1 and the authors comments. This review was completed by Luis Gabriel Cuervo I am pleased to read that the authors consider that the previous review was helpful and shaped the paper making it better; hence the authors and Editor should consider acknowledging the review contributions as they have changed the manuscript (if published; the acknowledgement should be approved on the final version). However, I feel the manuscript should not be published as it is, and I will explain why. Manuscripts need to be written for the audience of BMJ Open; readers should be able to understand and appreciate what difference the study makes and even if methods are frequently used in a specialized area, they may need to be spelled out in a structured manner that makes it clear for the audience to interpret the value they have –jargon, excessive detail and complex references requiring expertise in the field may not be helpful to the audience. I believe the text of the manuscript should be shorter, to the point, with specifics about the methods and conclusions that are supported by the findings; I still find the article lacking on these regards. The authors try to reassure that they are discussing “well known methods”. Yet I believe they should spell out concepts, avoid using jargon and include a glossary with links/references to guide the average reader. Considering the different view between authors and this reviewer, I suggest the Editor discerning how to address this difference in opinions as per the journal’s needs. Examples of terms and concepts I felt should be better spelled out include: purposeful sampling, micro-evidence, systematic inductive procedures, constant comparison method. I also feel a bottom line message should be provided with the findings of previous works (described in the response letter but not on the text; e.g. work on economic and political stability, professional opportunity, poor work environment, suboptimal work force dynamics, opportunities emerging from diasporas, etcetera). I reckon these experts should elaborate and inform the audience about the complex decisions and determinants leading to migration. I also leave it to the Editor to address the following issue that I keep finding confusing: the study is presented as an exploratory study done to generate hypothesis that will be tested in quantitative studies. It is intended to be exploratory in nature, not definitive (although some conclusions are presented in a rather affirmative tone). The study characterizes experiences from few individuals selected from a narrow geographical area; external validity is not a consideration in this study -“findings are not meant to be

	generalized". In some areas of biomedical research a study with such characteristics would likely be reported as part of the larger study testing the hypotheses. I defer to the Editor to determine if this rather specialized narrow contribution is meaningful enough to merit publication in BMJ Open. When I read a paper I usually expect to learn or find an added value and I struggled to do so in this one – e.g. a different perspective, complementing data with values, the affirmation or change in a theory, etc. And when I read the conclusions I found that these are not supported by the methods and findings and ignore limitations including those presented by the authors including the admission of the poor external validity of the study. Hence I find the conclusions potentially misleading. I can not see how the study could have achieved broad representation (age, specialty, geographic origin, clinical experience) of IMG's that migrated to the US, as stated in Results section. The methods make it unlikely, and the statement is countered by the findings, objectives and sampling. The leading key message can be misinterpreted by readers: it states a causative effect but the study design only proposes hypothesis that are not intended to be extrapolated, as described by the authors. Perhaps they refer to their overall knowledge of the topic, but that is not how I read it. The study's power is insufficient. The authors should also clarify what specific quantitative methods they require to test the hypothesis and justify such specific methods (and why not others including broader and larger qualitative research studies, or different kinds of qualitative and quantitative approaches). The results section of the abstract relates the findings to IMGs from the United States; the sample focused on a small sample from a narrow geographical area that is unlikely to be representative of the US. Similarly, the Conclusion states that the perspectives of IMGs who migrated to the US are an important addition to the ongoing discussion to understand global workforce issues –this statement goes beyond the abilities of the study as the perspectives are from a small non-representative group of interviewed physicians and should not be extrapolated to the population of IMGs that migrated to the US. The Conclusion tells of the findings indicate that even small steps towards the end goal may be beneficial, but it is unclear to what and who's end goal they are referring to. The purpose of the study was to generate new hypothesis; these need to be clearly listed in the results as such. The statements presented here are quite vague and not very helpful (people affected…in unpredictable ways, migrants made pragmatic decisions, people had conflict about staying in the US; effects of policies affect different levels…) –some specifics illustrating any novel findings / hypothesis would be helpful. The description of how key informants were randomly selected is still missing. This is an important, does not need to be lengthy but needs to be precise and informative for readers to understand the randomization strategy and limitations in terms of precision and bias. As described it remains unclear what was the chance for each informant of being selected for the study (were their names picked from a coded ballot box, sealed envelope, sorted list? Was the list organized to allow for a certain geographical distribution, etc.)? The authors point out space limitations – I reckon this manuscript can in fact be edited to make it shorter, to the point, and more informative on highlighted key aspects. I am curious about the options for subgroup analysis and the non-emergence of new concepts considering that the subgroups coming from different settings and backgrounds are quite small; the authors

	should perhaps explain when is it legitimate to establish that saturation has been reached bearing in mind such subgroups were very small. The authors' response states they followed a standards approach to literature searches. Such standard approach should perhaps be described and perhaps included as an annex or reference file. I do not feel this addresses the comment provided earlier and it does not make it clear to me the sources and criteria were used to identify and select references. I hope these second review comments will be helpful for the authors and the Editor. Please note that I did not receive the protocol for the study in the Supplementary files made available to me.
REPORTING & ETHICS	I believe the Editor should look into the comments I have provided and make a judgement based on this. The authors have worked constructivedly with the comments yet they seem to suggest that they issues raised may relate to insufficient expertise from the peer reviewer; I feel they need to address some pretty fundamental questions relevant to the validity of the study, and the link between their methods, findings, analysis and conclusions. I also feel the Editor needs to determine if the manuscript is providing a meaningful contribution to knowledge; I feel it is lacking substance and value that could be gained if they were to test the hypothesis developed with the study using robust qualitative/quantitative approaches and sample.

VERSION 2 – AUTHOR RESPONSE

Editor Comments
1. Please note that as BMJ Open uses open peer review the reviews will be published online. It is therefore up to you whether you choose to acknowledge the reviewers' contributions.

Response: We do appreciate the significant contribution of time and effort of both reviewers, and have revised the manuscript to list them in the acknowledgements section. This can be found on page 23, paragraph 2:

"The authors thank Susannah Bernheim (SB) for contributions to data analysis and interpretation; the American Medical Association IMG section for assistance in recruiting; the Educational Foundation for Foreign Medical Graduates for helpful comments; Dr. Jishnu Das and Dr. Luis Gabriel Cuervo for their contributions in the peer review process; and all physicians who participated in this study. "

2. Could you also edit the Article focus bullets to be more succinct? These should provide an at-a-glance summary for the browsing reader.

Response: We have edited the Article focus section to be more succinct. The changes appear on page 3, paragraph 1 of the revised manuscript:

"- International medical graduates (IMGs) play a significant role in the health workforce in many nations.
- Prior literature has largely limited the consideration of physician migration to isolated factors such as financial pressures in home country or expanded training opportunities in the US.
- The experiences and perspectives of IMGs have not been included in current discussions surrounding physician migration."

After internal discussion we would like you to address the following points that emerge from the

Cuervo review:

1. On p12 of the PDF, under Themes, you state 'Our focused analysis revealed four recurrent and unifying themes which reflect the perspectives of IMGs in the United States on physician migration'. It seems too strong to state that this reflects much other than the perspectives of the people interviewed, especially in light of the limitations you acknowledge elsewhere (e.g. you didn't interview docs from rural US). Please amend accordingly.

Response: Although we have noted the limitations to the generalizability of our findings in the study, we do appreciate the importance of clarity in providing framing the results. Accordingly, we have revised the cited sentence on page 12, paragraph 1 of the manuscript:

“Our focused analysis revealed four recurrent and unifying themes which reflect the perspectives of IMGs in this study on physician migration”

2. The key messages and conclusions are quite disjointed from each other, and we think that the reviewer's point that the article doesn't explicitly state what the hypotheses generated were is fair. So, please ensure that these outcomes are presented clearly.

Response: As requested, we have added a paragraph to the discussion in which some of the generated hypotheses are explicitly stated. We have also specified how these hypotheses could be tested in future studies in order to further contribute to the body of work surrounding physician migration. This can be found on page 20, paragraph 1:

“These findings have generated hypotheses that might be examined in future work. The current study suggests that these include: a) physician migration is influenced by both personal and environmental circumstances; b) as initially conceived by IMGs, physician migration is largely intended to be temporary; and c) decisions to remain in host country permanently are influenced by specific costs and benefits afforded by remaining in host country. These broad hypotheses inform future research questions such as: to what extent is physician migration influenced by individual factors, such as personal and professional goals, compared with political and economic circumstances of home countries? What factors are associated with temporary versus permanent physician migrants? What are the relative effects of the specific factors cited as contributing to the transition from temporary to permanent migration? Such data may assist both home and host countries in designing policies to minimize the impact of physician migration.”

Comments from Reviewer #1: Jishnu Das

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Response: We agree with the reviewer's comments that the nature and size of the toll of physician migration depends in large part on diverse individual, environmental and political factors; further these factors vary across countries and individual contexts. We have revised the abstract and the introduction according to our understanding of the reviewer's comment, and are open to further revision if we have not interpreted the comment correctly. These changes can be found on page 5, paragraph 1:

"Physician migration from low-income to high-income nations is a global concern. Despite the centrality of understanding the perspectives of IMGs who have experienced migration to understanding the causes and consequences of this phenomenon, empirical literature is limited. The authors sought to characterize the experiences of IMGs from limited resource nations currently practicing primary care in the United States, with a focus on their perspectives on physician migration."

And on page 7, paragraph 1:

"Physician migration from low-income to high-income nations is a global concern.1, 2 In the United States, United Kingdom, Canada and Australia physicians from limited resource nations account for between 20% and 30% of the physician workforce in these destination countries.1, 3, 4 In the United States, international medical graduates (IMGs), defined as physicians who attended medical school outside the US or Canada play an important role in primary care, 5-10 particularly for vulnerable populations11, 12 and care in physician shortage areas. 11, 13, 14 In light of the scale of worldwide physician migration, significant literature has been dedicated to elucidating the potential costs of physician migration.15-20 However, the motivations behind physician migration have been less thoroughly explored.

Extant literature has largely approached the reason for migration as a single decision point.1, 21-24 Among health workers in the African diaspora, Clemens et al25 reports an inverse relationship between economic and political stability and physician migration. Evidence from India indicates that perceived greater professional opportunities drive many potential Indian migrant physicians.26 Similarly, a survey in Pakistan indicated that low remuneration, poor training and poor work environment influenced potential Pakistani migrant physicians.27 Finally, factors such as changing medical school curricula,17 and recent work indicating that within home countries, graduates from higher quality institutions are more likely to migrate have also been examined quantitatively.28, 29"