



Stemming the Brain Drain of Medical Graduates From Developing Countries: Controversies and Solutions



Adithi Gowda¹, Hamad N. Alhazza¹, Eoin D. Cahill¹, Jane B.S.Q. Ong¹, Gerard Thomas Flaherty^{1,2*}

¹School of Medicine, National University of Ireland Galway, Galway, Ireland

²School of Medicine, International Medical University, Kuala Lumpur, Malaysia

Corresponding Author: Gerard Thomas Flaherty, MD, PhD, Professor, School of Medicine, National University of Ireland Galway, Galway, Ireland. Tel: +35-391495469, Email: gerard.flaherty@nuigalway.ie

Received April 6, 2022; Accepted June 30, 2022; Online Published July 11, 2022

Abstract

Brain drain is a term used to describe the migration of highly skilled or educated people from their home country to other locations across the world. One of the existing strategies to combat the brain drain of medical students and graduates from poorer countries is the practice of conditional or bonded scholarships. Conditional scholarships have been relatively successful in stemming brain drain and have been implemented all over the world, even in developed nations such as the USA, Kuwait, and Australia, although this perspective focuses on Nepal and Malaysia as developing countries. While bonding has proven to be effective in reducing the emigration of medical graduates from poorer to wealthier countries, it is not a perfect solution. In this policy review we argue on ethical grounds that it may not be truly justifiable to limit the freedom of movement of medical graduates. Another problem associated with bonding schemes is that they further widen the gap between rich and poor in developing nations. Most countries that implement this compulsory service following graduation allow a means to escape the bond through monetary payments, which may be equivalent to the cost of their undergraduate medical education. The problem arises when wealthier graduates can pay this cost and emigrate to countries with better resources, salaries, and opportunities, while poorer students remain in their home countries. An analysis of the factors that push medical graduates away from their home countries and pull them to countries abroad is provided.

Keywords: Health Workforce, Medical Education, Foreign Medical Graduates, Health Economics

Citation: Gowda A, Alhazza HN, Cahill ED, Ong JBSQ, Flaherty GT. Stemming the brain drain of medical graduates from developing countries: controversies and solutions. Int J Travel Med Glob Health. 2022;10(3):104-107. doi:10.34172/ijtmgh.2022.19.

*'Such wind as scatters young men through the world
To seek their fortunes farther than at home,
Where small experience grows.'*

William Shakespeare

Petruchio to Hortensio in The Taming of the Shrew, Act I,
Scene ii

'Brain drain' is a term used to describe the migration of highly skilled or educated people from their home country to other locations across the world.¹ Brain drain can occur from both developed and developing countries, but brain drain from developing nations is of particular interest as it can have devastating consequences on already resource-poor countries. Furthermore, a significant proportion of the world's population lives in developing countries, which have some of the highest global disease burdens, yet have the smallest percentage of doctors in their medical workforce.¹

The brain drain phenomenon occurs mainly due to factors that influence general migration away from poorer countries and towards richer countries, such as inadequate remuneration, poor working conditions, an oppressive political climate, the wish to provide quality education for their children, as well

as just the personal preferences of the international medical graduates that come from poorer countries. There are also factors specific to the medical profession in developing nations, such as the central government's paucity of healthcare investment, finite residency positions, limited career structure, and poor intellectual stimulation of those professionals.²

Bonding Schemes as a Potential Solution

One of the existing strategies to combat the brain drain of medical students from poorer or underserved nations is the practice of conditional or 'bonded' scholarships. The basic concept is that a full or partial scholarship for medical education is awarded by a government or a non-governmental organisation, either for education in the student's home country or to pay for education abroad, in exchange for a pre-commitment to serve for a specific length of time in the country's own health system. This length of time is usually a year for every year of education the scholarship is paid, but some conditional scholarships mandate longer service periods.³

Conditional scholarships have been relatively successful in

stemming brain drain, and in more than one capacity. The first is providing healthcare service to underserved or poorer countries by having doctors committed to serving a set length of time there, thus actively reversing the brain drain. The second is providing the opportunity to students, who would have been otherwise unable, due to financial constraints, to become doctors. Not only does it stem the brain drain of medical professionals from the country, but also creates new medical professionals by providing education to those who would not have been able to access it.⁴

Countries That Have Implemented Bonding Schemes

Bonding schemes have been implemented all over the world, even in developed nations such as the USA, Kuwait, and Australia, although this perspective focuses on developing or poorer nations such as Nepal and Malaysia.

Nepal

Nepal currently does not have enough doctors to provide adequate healthcare to its citizens. The country has a physician-to-population ratio that is among the lowest in the world at 0.7 physicians per 1000 total population.⁵ The country has also been decimated by the brain drain phenomenon, with many medical graduates opting to leave for more developed countries, such as the United States and the United Kingdom, thus further straining its failing health system. To combat the brain drain of medical graduates, Nepal implemented a bonding agreement in 2005/2006, where all private medical schools must provide medical education free of cost to their MBBS students. In return, students must complete a two-year compulsory service following graduation in public hospitals in Nepal. Initially, the scheme was ineffective due to poor monitoring. In response, more stringent measures were introduced, such as graduates being denied medical registration if the service had not been completed. As a result of these new measures, the completion rates increased significantly to 74%-98%.⁵

Malaysia

Malaysia has also implemented a conditional scholarship programme to combat the brain drain of its medical graduates. Jabatan Perkhidmatan Awam (JPA) and Majlis Amanah Rakyat (MARA) programmes are the two main scholarship programmes in Malaysia, offering up to 71% of Malaysian medical students scholarships as of July 31, 2020.⁶ However, the Malaysian bonding scheme is one of the most restrictive, with two years of service for every year of study, equating to a ten-year compulsory service in public sectors for the typical five-year undergraduate medical programme. Additionally, contract physicians are unable to pursue specialist training during their ten-year service in public hospitals or join private hospitals. These are ongoing issues that have yet to be resolved.⁶

Termination of the bond is possible but can be a controversial subject. Officially, termination of the long, compulsory service is achieved by repaying the bond in full, to compensate the government for the loss of human capital

resources. Convertible loans were introduced at the start of 2021 in JPA scholarships, which included 25% and 50% loan repayment if working in a government-linked company or private sector, respectively.⁷ Alternatively, the STAR initiative, which was launched in 2011, allows bonded doctors to gain employment in the private sector without having to terminate their bonds or repay the government. Unfortunately, many medical graduates default the bond where they 'unofficially' terminate the bond without repaying the government.⁸ This practice of defaulting the bond is seen in many countries where bonding has been implemented and can lead to decreased effectiveness of the bonding scheme.

Shortcomings of Bonding Schemes

While bonding has proven to be effective in reducing the emigration of medical graduates from poorer to wealthier countries, it is not a perfect solution. An ethical perspective must be considered, and we must question if it is truly justifiable to limit the freedom of movement of medical graduates. Autonomy, the right to self-governance, is a cornerstone of medical ethics and patient autonomy should always be respected. However, this respect for autonomy may not always be extended to doctors, as evidenced by the practice of bonding. Bonding schemes restrict the individual freedoms of doctors. Doctors are deprived of the ability to choose the country in which to live and work. At a deeper level, it is their access to opportunities and a better standard of living that is being limited.

Another problem associated with bonding schemes is that they further widen the gap between rich and poor in developing nations. Most countries that implement this compulsory service following graduation allow a means to escape the bond through monetary payments, which may be equivalent to the cost of their undergraduate medical education. The problem arises when wealthier graduates can pay this cost and emigrate to countries with better resources, salaries, and opportunities, while poorer students remain in their home countries. Bonding schemes further perpetuate the inequalities present in poorer countries and favour the wealthy.

Furthermore, providing the option to withdraw from the bond through monetary payments may be counterproductive to the primary aim of stemming the tide of brain drain. The retention of new medical graduates cannot be achieved when the choice to opt-out exists and the majority choose that option. Additionally, we must question if these conditional scholarships are being awarded to those who truly need them if some medical graduates have the means to provide monetary payments to terminate the bond. More stringent selection criteria may be required.

An additional disadvantage of bonding is that developing countries may not be in the position to absorb all newly qualified physicians. The main employment requirements of young doctors are reasonable salaries, fair working conditions, and access to training posts. However, these conditions may not be met if there is an excess of graduating doctors. This can result in the unemployment of doctors, as seen with nurses in

Zimbabwe under nursing bonding schemes⁹, or if the doctors are employed by the government, there may be decreased salary and a poorer quality of training.

Recommendations for Improvement

Although many different types of bonding schemes have been implemented in over 70 countries, they only provide short-term relief to the larger problem and have shown limited effectiveness over time.¹⁰ Provision of scholarships to medical students in return for compulsory government service may seem like an appropriate solution, but it does not address the root cause. Additionally, doctors can simply emigrate following the completion of their compulsory service, leaving behind inexperienced graduates to continue the cycle. New policies must be explored to reverse brain drain; recommendations are proposed in Table 1.

Analysis of the factors that push medical graduates away from their home countries and pull them to countries abroad along with the implementation of changes reflecting these push and pull factors should be the focus of the solution. Cross-sectional surveys of the views of medical students towards medical graduate migration have been published by researchers, including those based in Ireland and Pakistan.^{11,12} An appropriate example would be the triad of improved work-life balance, working conditions, and salaries found in countries like Australia. Factors that could further encourage, rather than mandate, graduates to stay would be additional benefits such as medical insurance, paid leave, and supportive academic and career mentoring schemes. Additionally, interns

and junior doctors should not be exploited. Governments should ensure that doctors are appropriately remunerated¹³ and increase posts so that workload can be distributed more fairly. This undoubtedly depends on the country's ability to bear these costs and provide employment. Therefore, central medical workforce resources should be wisely allocated. Medical brain drain is also influenced by destination country immigration policies aimed at attracting highly skilled overseas workers.¹⁴ The moral arguments that encourage a "duty to stay" on the part of medical graduates have been elegantly presented elsewhere.¹⁵

Conclusion

In conclusion, the brain drain of medical graduates is an issue faced by many developing countries. Poorer nations, such as Nepal and Malaysia, have implemented bonding schemes to increase the retention of doctors and, while these bonding schemes have proven to be effective in reducing brain drain, they are only a temporary solution to a complex problem. Improving the situation in the long term requires a deeper understanding of the root causes of healthcare worker migration and progress cannot be made unless policymakers cease the exploitation of medical graduates. However, this can be used as an opportunity for investment in the economic development of a country by improving the quality of education, working conditions, equalising training and working opportunities, and developing health infrastructures. If these fundamental issues are not addressed, a continuing exodus of doctors will be inevitable.

Acknowledgments

The authors are grateful to Dr. Yee Shean Ng, JPA scholar and House Officer working in Malaysia, for her insights regarding the JPA scholarship.

Authors' Contributions

GTF was responsible for study conception. HNA, EDC, AG and JBO contributed equally to the preparation of the first draft of the manuscript,

Table 1. Recommendations to improve the effectiveness of current bonding schemes and reduce medical brain drain

Proposed Solution	Specific Recommendations
Improved working conditions	Improved facilities and increased resources
	Limited working hours
	Increased number of positions to decrease burden
Career progression opportunities	Task shifting
	Adequate training posts for bonded students
	Equal opportunities to advance student's career
	Opportunities for up-skilling
	Improvement in technology
	More research opportunities
Socio-political factors	Opportunities abroad (e.g., bonded fellowship programmes)
	Academic and career mentoring schemes within hospitals
	Favourable living conditions
	Medical insurance
	Stopping the persecution of doctors in society
Incentives for bonded students	Acceptance of religions, ethnicities, sexual orientation, gender equality
	Political stability
	Access to grants for higher training
Other factors	Extra points are given on specialty application
	Increased salary
	Increased number of authenticated universities for affected countries

Review Highlights

What Is Already Known?

- The 'Brain Drain' of medical graduates is dramatically increasing and is disproportionately affecting developing countries.
- Brain drain from developing nations can have devastating consequences on already resource-poor countries.

What Does This Study Add?

- This policy review article attempts to highlight one potential solution, bonding, by discussing its benefits and shortcomings.
- Recommendations are proposed on ways to improve the practice, as well as some longer-term solutions.
- Improving the situation in the long term requires a deeper understanding of the root causes of healthcare worker migration and an end to the exploitation of medical graduates.

which was edited for significant intellectual content by GTF. All authors read and approved the final version of the manuscript.

Conflict of Interest Disclosures

All authors declare that they have no conflict of interest.

Ethical Approval

Not applicable.

Funding/Support

None received.

References

- Karan A, DeUgarte D, Barry M. Medical "brain drain" and health care worker shortages: how should international training programs respond? *AMA J Ethics*. 2016;18(7):665-675. doi:10.1001/journalofethics.2016.18.7.ecas1-1607.
- Pang T, Lansang MA, Haines A. Brain drain and health professionals. *BMJ*. 2002;324(7336):499-500. doi:10.1136/bmj.324.7336.499.
- Eyal N, Bärnighausen T. Precommitting to serve the underserved. *Am J Bioeth*. 2012;12(5):23-34. doi:10.1080/15265161.2012.665134.
- Bärnighausen T, Bloom DE. "Conditional scholarships" for HIV/AIDS health workers: educating and retaining the workforce to provide antiretroviral treatment in sub-Saharan Africa. *Soc Sci Med*. 2009;68(3):544-551. doi:10.1016/j.socscimed.2008.11.009.
- Mahat A, Zimmerman M, Shakya R, Gerzoff RB. Medical scholarships linked to mandatory service: the Nepal experience. *Front Public Health*. 2020;8:546382. doi:10.3389/fpubh.2020.546382.
- CodeBlue. Shorten Bond for Contract Doctors on JPA Scholarship: Alor Setar MP. 2020. Available at: <https://codeblue.galencentre.org/2020/07/30/shorten-bond-for-contract-doctors-on-jpa-scholarship-alor-setar-mp/>. Accessed October 20, 2021.
- Fazil N. Here's the Latest on JPA Scholarships. 2021. Available at: https://eduadvisor.my/articles/heres-the-latest-on-jpa-scholarships-2021/?__cf_chl_jschl_tk__=pmd_0KNyOa1pLNjSVRclzMCA4ZqPFupO2JXGeN41QX0R6Gs-1635521664-0-gqNtZGzNAPCjcnBszQiR. Accessed October 26, 2021.
- Banner S. Medical Graduates Overseas Defaulting on JPA Scholarships. 2018. Available at: <https://m.malaysiakini.com/letters/428239>. Accessed November 3, 2021.
- Zimbudzi E. Stemming the impact of health professional brain drain from Africa: a systemic review of policy options. *J Public Health Afr*. 2013;4(1):e4. doi:10.4081/jphia.2013.e4.
- Dharmadhikari S, Dubey S, Zadey S. Why Bonded Service for Doctors Has Seen Only Limited Success. 2020. Available at: <https://science.thewire.in/health/why-bonded-service-for-doctors-has-seen-only-limited-success/>. Accessed October 28, 2021.
- Gouda P, Kitt K, Evans DS, et al. Ireland's medical brain drain: migration intentions of Irish medical students. *Hum Resour Health*. 2015;13:11. doi:10.1186/s12960-015-0003-9.
- Hossain N, Shah N, Shah T, Lateef SB. Physicians' migration: perceptions of Pakistani medical students. *J Coll Physicians Surg Pak*. 2016;26(8):696-701.
- Onu JU, Oriji SO, Aluh DO, Onyeka TC. Aftermath of COVID-19: forestalling irreparable medical brain drain in sub-Saharan Africa. *J Health Care Poor Underserved*. 2021;32(4):1742-1751. doi:10.1353/hpu.2021.0163.
- Adovor E, Czaika M, Docquier F, Moullan Y. Medical brain drain: how many, where and why? *J Health Econ*. 2021;76:102409. doi:10.1016/j.jhealeco.2020.102409.
- Ferracioli L, De Lora P. *Primum nocere*: medical brain drain and the duty to stay. *J Med Philos*. 2015;40(5):601-619. doi:10.1093/jmp/jhv022