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**Bilateral Agreements as an Instrument to Regulate Mobility of
Healthcare Professionals: A Case Study on India**

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Abstract

Global demand for health workforce has increased in recent decades, especially in developed countries, thus drawing health workers from developing countries. Further, the COVID-19 pandemic has highlighted the importance of health worker availability. Shortage of healthcare workers aggravated by the pandemic resulted in policies to attract and retain foreign health workers in several receiving countries, which have direct repercussions on the already burdened health systems of the source developing countries. Issues like brain drain and how to mitigate its impact on developing countries are still important concerns. It requires us to first identify countries with a critical shortage of health workforce. This paper creates a modified framework, drawing upon the existing World Health Organization (WHO) methodology to classify countries with “critical shortages.” Using this modified framework, it attempts to classify India’s position in terms of health worker availability. The analysis suggests that policymakers can actively engage in formulating bilateral agreements by incorporating more provisions specific to the mobility of health workers to ensure they continue to provide human resources for health (HRH) to other countries and to better manage the mobility of health workers in the interests of both sending and receiving countries. The paper next examines emigration trends for Indian healthcare professionals and policies undertaken by the Government of India (GoI) to ensure India’s continued role as a global supplier. It also discusses India’s approach to signing agreements addressing the mobility of healthcare professionals and the scope for tapping new markets. Lastly, we analyze the reverse flows to India from key destination countries in the form of remittances, official development assistance (ODA), and foreign direct investment (FDI) based on the argument that source countries can be compensated through targeted arrangements with receiving countries in the areas of medical education and training, health infrastructure, and technologies.

Keywords: Health workforce, Migration, Bilateral Labour Agreements, Critical shortage, Reverse capital investment, Government Health Expenditure, Remittances

JEL codes: F13, F22, F21, F24, H51, I11, J61

4.1 Introduction

Demographic imperatives such as ageing populations, rising global disease burden, and the recent Covid-19 pandemic have emphasized the critical role of human resources in health (Scarpetta, Dumont, & Socha-Dietrich, 2020).¹ The onset of the COVID-19 pandemic resulted in various policy reactions from governments globally, like the call for retired doctors and nurses to rejoin the health workforce or the permission granted to students in their last year of training in medical and nursing courses to start working. Several such steps were adopted by developed and developing countries to overcome the health worker shortage that emerged during the pandemic. Many OECD countries recognized migrant health workers as crucial assets to support the medical systems in their countries and introduced policies to facilitate the arrival of foreign health workers or extend their visas (see *Table 1*). Countries like Canada facilitated the recognition of qualifications of foreign-trained doctors. Austria, which relies heavily on healthcare professionals from Bulgaria, Romania, and Slovakia, started special flights only for those health workers to travel to Austria even when the borders were closed. The UK government launched the “health and care worker visa,”² and Australia allowed international medical students to work longer hours to ease the workload of existing health professionals.

Table 1: Policy responses by Governments of selected countries during COVID

Countries	Policies undertaken during COVID
Canada	In Ontario, international medical graduates (IMG) who had graduated in the past 2 years were allowed to apply for a 30-day Supervised Short Duration medical license to support domestic health workers to meet the surge in demand for health care.
Czech Republic	Proposed a bill on 6 th April 2020 that would allow non-EU medical staff without fully validated degrees to work in Czech hospitals and help overcome the health workers crisis.
Luxemburg	The government offered a hotel room and childcare facilities to health workers traveling from France, Germany, and Belgium, who constitute 2/3 rd of Luxemburg’s health workers.
Germany	In Bavaria, foreign doctors could work as assistants for one year.
USA	The state of New Jersey allowed foreign-licensed physicians to get a temporary emergency license to practice.
UK	In August 2020, the UK government launched the “health and care worker visa,” exempting individuals from paying the immigration health surcharge.
Italy	Issued temporary licenses to foreign-trained health professionals.

¹ We use health workers to include individuals working in the healthcare delivery like mid-skilled caregivers, geriatric nurses, community health practitioners, and health professionals to signify the relatively more-skilled individuals working in this domain, such as, physicians and nurses. The WHO Health workforce classification includes Physicians, Nurses, Dentists, Pharmacists, Midwifery professionals, Audiologist, Optometrists, Dieticians and many more. Source: https://www.who.int/hrh/statistics/Health_workers_classification.pdf?ua=1

² Source: Immigration health surcharge: guidance for health and care reimbursements. Available at <https://www.gov.uk/government/publications/immigration-health-surcharge-applying-for-a-refund/immigration-health-surcharge-guidance-for-reimbursement-2020> accessed on 21 April 2022

Spain	Spanish ministries coordinated and started urgent hiring of foreign health workers willing to work in Spain and recruited around 400 people as early as the end of April 2020. ³
Austria	Started special flights only for health care professionals from Bulgaria, Romania, and Slovakia to travel to Austria and offered additional bonuses to stay in Austria.
Australia	International nursing students were allowed to work more than 40 hours every two weeks.

Source: Datta (2023). Note: These policies are collected from 1) Policy Tracker from OECD Health Division, accessed on 26th November 2020; 2) Government reports; 3) OECD Policy Responses to Coronavirus (COVID-19).

Even before the pandemic, many countries faced a shortage of health workers and relied on international recruitment to meet their domestic healthcare needs.

Table 2 shows the sector-wise share of immigrants across 22 countries. The share of immigrants in the health sector is significantly high in countries like Israel, the USA, and many European countries like Denmark, Germany, UK, Belgium, Ireland, France, and Italy. Meanwhile, African countries like Côte d'Ivoire and the Republic of Mali have a large share of immigrants in manufacturing and agriculture and not in the health sector.

³ Source: OECD Policy Responses to Coronavirus (COVID-19) Contribution of migrant doctors and nurses to tackling COVID-19 crisis in OECD countries. Available at <https://www.oecd.org/coronavirus/policy-responses/contribution-of-migrant-doctors-and-nurses-to-tackling-covid-19-crisis-in-oecd-countries-2f7bace2/>, accessed on 18 April 2022

Table 2: Share of immigrants across industries

Industries	DNK	ISR	DEU	GBR	BEL	IRL	FRA	USA	AUT	ITA	LUX	URY	EST	PER	CZE	SRB	ESP	POL	SVK	GEO	CIV	MLI
Human health and social work activities	17.3	15.8	14.9	14.6	13.9	13.7	13.4	12.7	10.3	10.2	8.3	7.0	6.7	5.7	4.8	4.6	4.4	3.9	2.1	0.8	0.5	0.4
Manufacturing	11.2	17.5	23.6	9.9	10.7	13.7	8.8	11.1	20.0	19.0	4.6	10.7	28.4	8.1	19.0	17.7	8.8	17.2	26.8	3.3	10.4	8.1
Wholesale and retail trade; repair of motor vehicles	12.9	11.6	11.5	11.2	10.9	13.6	11.6	12.6	13.9	6.1	9.5	18.9	11.9	20.7	21.6	14.3	15.2	13.9	11.8	9.0	24.9	26.9
Accommodation and food service activities	9.3	3.3	7.2	9.5	6.8	12.7	6.9	8.9	10.2	8.5	7.3	6.8	2.7	14.6	9.7	2.5	18.3	8.2	7.8	1.4	2.6	0.9
Construction	3.3	3.7	4.5	6.8	8.5	3.7	10.3	9.9	8.5	12.7	11.2	5.7	8.8	5.7	10.8	5.7	8.0	10.3	7.3	5.8	2.2	2.3
Agriculture, forestry and fishing	2.9	0.7	0.6	0.6	0.4	1.7	1.3	1.8	0.5	4.9	0.2	4.3	1.2	3.9	0.3	13.6	5.5	3.3	0.6	63.8	47.0	42.9
Transportation and storage	5.7	3.8	6.8	7.8	4.7	4.8	5.5	5.6	6.0	2.9	4.0	4.2	10.5	6.1	4.2	6.8	4.4	7.6	4.3	1.6	2.9	2.4
Information and communication	3.9	5.0	3.4	5.3	2.9	8.2	3.9	5.0	1.9	0.8	4.7	4.6	1.0	2.4	3.9	2.7	3.0	6.4	5.1	0.5	1.0	0.2
Financial and insurance activities	1.7	2.7	1.6	4.2	3.3	3.9	2.8	3.9	1.8	0.6	12.9	1.7	1.2	2.1	1.9	2.6	0.7	3.2	3.2	0.2	0.0	0.4
Real estate activities	0.9	0.8	0.5	0.6	0.4	0.1	1.8	1.7	0.8	1.1	0.8	0.8	2.1	0.2	1.0	0.2	0.7	0.9	3.1	0.0	0.1	0.0
Professional, scientific and technical activities	5.4	7.5	4.7	7.4	5.0	5.1	5.8	4.5	4.7	1.1	10.1	5.2	3.7	7.3	6.3	3.0	2.2	4.2	1.7	0.4	1.0	3.4
Administrative and support service activities	10.7	6.2	6.7	6.5	10.5	4.8	7.4	6.1	7.7	0.0	7.4	7.2	5.3	4.8	5.2	2.5	4.6	5.0	2.0	0.5	1.1	0.9
Public administration and defence; social security	2.3	6.0	2.4	2.8	5.7	2.9	5.6	2.9	2.8	1.5	5.3	2.2	1.7	2.7	1.7	5.5	1.3	2.4	5.2	1.2	0.4	1.1
Education	7.7	8.5	5.9	7.5	7.3	5.1	6.5	6.3	5.7	1.0	1.1	7.3	6.8	4.6	3.3	9.2	4.0	7.1	4.2	5.9	0.8	3.7
Arts, entertainment and recreation	1.8	1.8	1.3	1.5	1.3	1.4	1.5	1.4	1.6	0.8	0.6	2.2	1.6	1.6	0.7	2.2	1.6	1.6	2.2	0.8	0.2	0.8
Other service activities	2.4	2.9	2.4	2.3	2.4	2.9	2.7	4.7	2.2	16.5	1.8	4.0	2.0	6.0	4.0	2.2	3.3	2.3	3.9	1.9	2.5	3.1
Producing activities of households	0.0	1.3	0.7	0.3	0.1	0.9	2.7	0.0	0.2	11.5	3.4	5.9	0.0	2.1	0.0	0.9	13.0	0.9	0.0	1.1	1.5	0.8
Activities of extraterritorial organizations and bodies	0.0	0.1	0.1	0.2	4.1	0.0	0.4	0.0	0.4	0.3	5.9	0.7	0.0	0.4	0.7	0.2	0.0	0.1	2.0	0.0	0.0	0.0
Mining and quarrying	0.2	0.0	0.0	0.4	0.2	0.3	0.1	0.3	0.2	1.0	0.1	0.1	2.1	0.6	0.3	0.5	0.2	0.2	0.0	0.1	0.7	1.6
Electricity, gas, steam and air conditioning supply	0.3	0.4	0.5	0.3	0.5	0.2	0.4	0.3	0.3	0.7	0.3	0.2	2.1	0.1	0.0	1.0	0.5	0.6	0.0	0.7	0.0	0.1
Water supply; sewerage, waste management	0.2	0.4	0.3	0.4	0.2	0.2	0.7	0.4	0.4	0.0	0.3	0.2	0.1	0.1	0.5	2.3	0.4	0.5	0.9	1.2	0.1	0.0

Source: Datta (2023). Note: The data is collected from the LIS Cross-National Data Center, formerly the Luxembourg Income Study from 2015-2020 (Waves X and XI). This table includes all 22 countries with (non-missing) data on immigrant status and industry information on the main job of individuals. Appropriate weights are applied while producing this table.⁴

Healthcare is a labor-intensive service industry. The World Health Report (2006) finds that the number of health workers and their quality are positively correlated with health outcomes like infant mortality rate (IMR) and maternal mortality rate (MRM), immunization coverage, and even cardiovascular diseases. Moreover, health worker density is ranked first in achieving Universal Health Coverage (UHC) (Reid et al., 2020). Therefore, health workers are crucial to any healthcare system. According to estimates from the WTO TiSMoS data,⁵ trade in services through the movement of health workers represented over US\$ 3 billion in 2017. We attempt to estimate bilateral trade in health services for selected country-pairs, in Appendix .

Between 2004 and 2014, employment in the health and social work sectors in the OECD countries grew by 48%. In 2017, health and social services accounted for 11% of all OECD employment.⁶ From 2001 to 2015, the number of native-born nurses working in OECD countries increased by 285%.⁷ The number of foreign-trained doctors working in the OECD countries increased by 50% between 2006 and 2016. The European Union (EU) has recently recognized that it is facing skill shortages in health and medical care (European Commission, 2020) and immigrants staying in the EU are contributing towards reducing these skills gaps and increasing the dynamism of the EU labour market. Similarly, more than 10,000 physicians were employed on temporary visas, comprising 1.4% of the total workforce in the USA in 2016 (Kahn & Gardin, 2017).

Despite the significant rise in health employment globally, there is still a global shortage of health workers. According to WHO estimates, the world faced a global shortage of 4.3 million doctors, nurses, and other health workers in 2006. The demand for health workers was around 48.3 million in 2013, while the supply was approximately 43 million, creating a shortage of around 5.3 million health workers. As per WHO projections, the demand for health workers under the assumption of no further health shocks is estimated to be 80.2 million by 2030, while the supply of health workers will be around 67.3 million, leading to a massive (expected) deficit of 23 million.⁸ According to these estimates, although the supply of health workers is expected to increase by 55%, there will still be a five-fold increase in the health worker deficit globally.

⁴ Country codes: DNK: Denmark, DEU: Germany, GBR: United Kingdom, BEL: Belgium, IRL: Ireland, FRA: France, AUT: Austria; ITA: Italy, LUX: Luxembourg, EST: Estonia, CZE: Czech Republic; ESP: Spain, POL: Poland, USA: United States of America, ISR: Israel, URY: Uruguay, PER: Peru, SRB: Serbia, SVK: Slovakia, GEO: Georgia, CIV: Côte d'Ivoire, MLI: Republic of Mali

⁵ TiSMoS (Trade in Services data by Mode of Supply) provides data on international trade in services by the four modes of supply as defined in the GATS, for around 200 economies for the period 2005-2017. The information is broken down by service sector and refers to the economies' trade with the rest of the world.

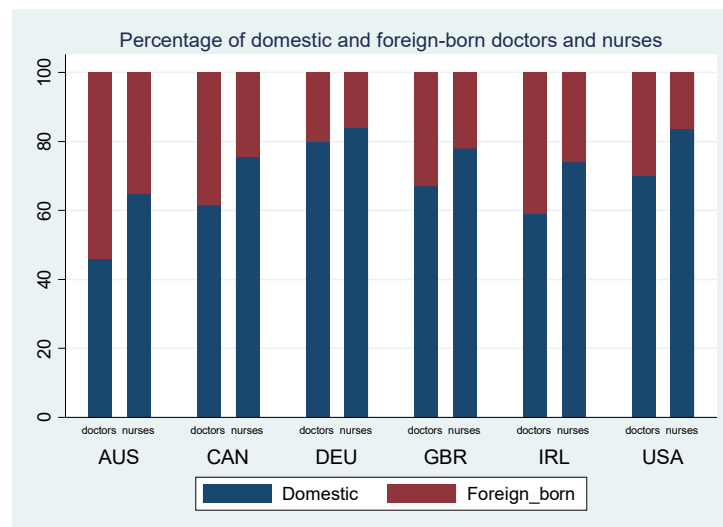
⁶ Working for health and growth: investing in the health workforce. Report of the High Level Commission on Health Employment and Economic Growth. Geneva: World Health Organization; 2016.

⁷ Source: International migration and movement of nursing personnel to and within OECD countries - 2000 to 2018, OECD Health Working Papers No.125, 2021. Available at <https://www.oecd-ilibrary.org/docserver/b286a957-en.pdf?expires=1650390699&id=id&accname=guest&checksum=E77625BEB10FABC48E8D990F5330A536> accessed in April 2022.

⁸ Source: Global strategy on human resources for health: Workforce 2030, World Health Organization 2016, page 40 and 45, available at https://www.observatoriorh.org/sites/default/files/webfiles/fulltext/2019/global_strategy_workforce2030_who.pdf, accessed in Nov 2021.

The shortage of health workforce globally has been persistent. For example, the UK has been facing a shortage of health workers since the 1990s. This shortage has been met by increasing domestic medical education, improving current staff retention rates, encouraging professionals currently not working to join the labour market, and most remarkably, through international recruitment (*Buchan, Baldwin, & Munro, 2008*). Around 16% of the nurses in OECD countries are foreign-born (OECD, 2020). The share of foreign-born doctors in 2016 was as high as 54% in Australia and approximately 40% in Canada, Ireland, and the UK (refer to Figure 1). Similarly, the share of foreign-born nurses is around 20-30% in these four countries, as shown in Figure 1.

Figure 1: Share of domestic and foreign-born doctors and nurses in selected OECD countries



Source: Datta (2023). Note: This figure shows the share of Domestic and Foreign-born doctors and nurses in six OECD countries. These countries have the highest stock of foreign-born doctors and nurses.

This figure is based on data from DIOC 2015/16.⁹

The migration related policies adopted by various countries show the extent of dependence of certain countries on foreign-trained or foreign-born health workers. Against this backdrop, the international mobility of health workers becomes crucial, and there is an urgent need to regulate their mobility to reallocate human resources effectively across the globe to improve health outcomes. Thus, just like health, health workers are also a global public good, where countries have to coordinate and regulate the mobility of health workers without impairing the UHC goals in the source developing countries. (Hogan, Stevens, Hosseinpoor, & Boerma, 2018). Government-to-government agreements have the potential to ensure that participating countries benefit from health worker migration and mobility.¹⁰

The rest of the paper is organized as follows. Section 4.2 outlines the literature on the migration of health workers. Section 4.3 proposes the methodology for a modified method to classify countries with a critical shortage of health workforce and discusses the corresponding results. Section 4.4 highlights the role of Agreements in regulating the mobility of health workers. Section 4.5 discusses India as a global supplier of healthcare professionals and the growing demand for Indian professionals. Section 4.6 discusses India's position in health status on dimensions like nutrition, maternal and child mortality, and health facilities like the number and quality of health workers. Section 4.7 elaborates on agreements signed by India with different countries on healthcare. Section 4.8 discusses the role of compensatory reverse flows entering India in the form of remittances, ODA, and FDI in the health sector. Lastly, Section 4.9 concludes and provides the key findings and policy prescriptions.

4.2 Literature Review

This section provides a brief overview of the relevant literature on the mobility and migration of health workers. It discusses the push and pull factors responsible for their movement and highlights the important migration corridors. Next, it focuses on issues like brain drain from origin countries, which can be mitigated through bilateral and plurilateral cooperation.

4.2.1 Push-pull factors and major source countries

Literature has cited many push factors responsible for migration, like low wages, high poverty and unemployment rates, corruption, political unrest, lack of law and safety, crime and violence, and pull factors like higher wages and employment opportunities, higher living standards, better education (Sachs, 2016) (Docquier & Rapoport, 2015) (Mayda, 2010) (Parkins, 2010). Push factors specific to health migration include low remuneration, risks of infection like HIV/AIDS, inflexible working hours, heavy workload, the limited scope of continuing education, lack of advanced training facilities, poor career

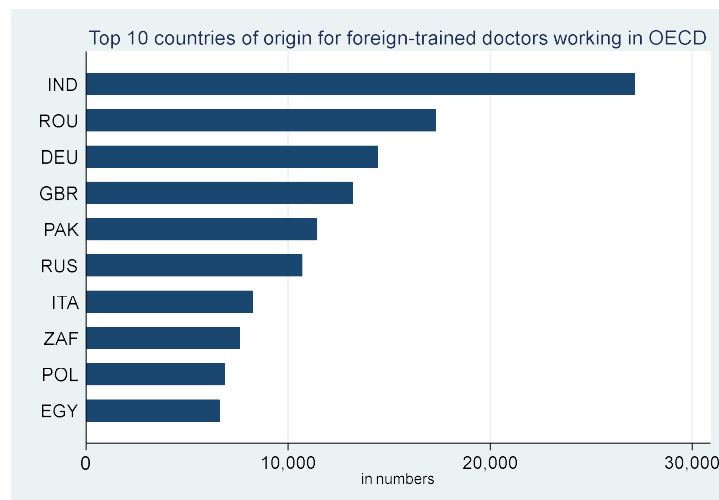
⁹ Source: International migration and movement of nursing personnel to and within OECD countries - 2000 to 2018, OECD Health Working Papers No.125, 2021.

¹⁰ For the purpose of this essay, mobility is the movement (physical or virtual) of health workers and students in health sciences from one country to another irrespective of status, purpose or duration of movement. Migration refers to the physical movement of health workers from one country to another irrespective of the reason or legal status. Short-term or temporary migration covers a duration of 3-12 months. Long-term or permanent migration refers to a change of country of residence for a duration of 1 year or more.

development, and work environment (Nair & Webster, 2012) (Aluttis, Bishaw, & Frank, 2014).

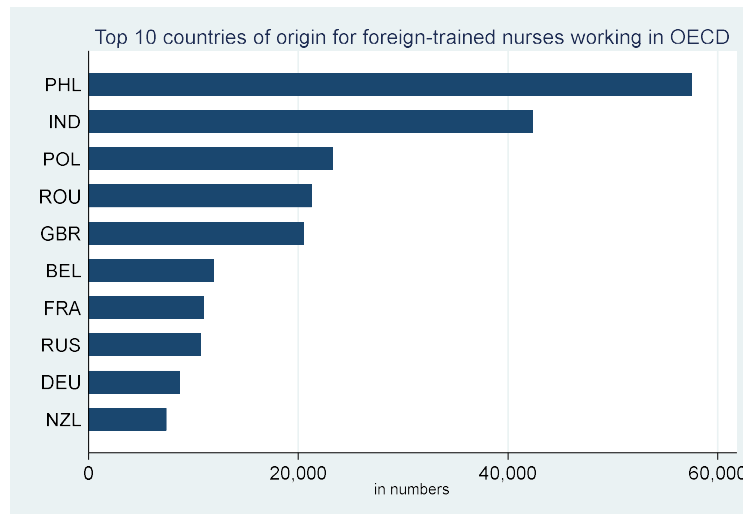
According to an OECD report of 2019, the USA and the UK are two major destinations for foreign-trained doctors, with more than 215,000 working in the US in 2016 and over 50,000 working in the UK in 2017.¹¹ In 2015-16, of all the foreign-born health workers who practice in the OECD countries, 42% of doctors and 45% of nurses practice only in the USA, followed by Germany and the UK. The major suppliers of health professionals working in OECD are countries like India, the Philippines, Germany, the UK, Romania, Pakistan, Russia, and South Africa, as shown in *Figure 2*. As evident, it includes a mix of countries across all income groups. Around one-third of all foreign-born or foreign-trained doctors and nurses originate from OECD countries like France, Poland, the UK, etc., and another one-third is from non-OECD upper-middle-income countries like South Africa, and the remaining one-third from low-middle income and low-income countries like India and the Philippines.¹²

Figure 2: Foreign-trained doctors and nurses in OECD countries from 10 major countries of origin



¹¹ Recent Trends in International Migration of Doctors, Nurses and Medical Students, OECD 2019. Available at <https://www.oecd-ilibrary.org/sites/5571ef48-en/1/2/1/index.html?itemId=/content/publication/5571ef48-en&csp=66c6de543a12108c60fc09cd6f3a3f37&itemIGO=oecd&itemContentType=book#annex-d1e12384>, accessed on 2 March 2022.

¹² <https://www.oecd.org/coronavirus/policy-responses/contribution-of-migrant-doctors-and-nurses-to-tackling-covid-19-crisis-in-oecd-countries-2f7bace2/>, accessed 18 April 2022.



Source: Datta (2023). Note: It shows the number of foreign-trained doctors and nurses working in OECD countries from the top 10 origin countries.¹³ This figure is based on data from *OECD Health Statistics 2019*.

4.2.2 Migration corridors and networks

Health worker migration has not only increased in volume but has also become more complex, involving cross-border and intra-regional migration networks.¹⁴ Literature has determined corridors for the mobility of the healthcare workforce. For example, the North-South corridor includes India-USA, Philippines-USA, and Philippines-UK (Connell, 2010). In addition, some South-South migration corridors exist, such as between India and the Gulf countries and between Nigeria and South Africa. Recent studies have observed that health professionals move from Asian countries to Nigeria, from where they move to Trinidad and Tobago for closer access to the US market. Intra-regional migration is observed within Africa, where health workers move from Nigeria and the Democratic Republic of Congo to South Africa and eventually migrate to some European countries (WHO 2017a). Similarly, nurses, midwives, and nursing assistants from Kerala migrate to the Gulf countries and then relocate to the UK, the USA or Australia. This phenomenon is termed as ‘*Chain Migration*’ (Adkoli, 2006).

The European Union witnesses a high rate of intra-regional migration of health workers. This migration is facilitated by recognizing professional qualifications, including medical diplomas, across the EU countries (OECD 2019; WHO 2016). For instance, Romania has attracted many foreign medical students who find employment in Italy and France, leaving shortages of health workers in Romania. Like Romania, Ireland faces shortages as the number of nurses and midwives registered as ‘inactive due to working abroad’ increased by 60% between 2007–2014. Despite doubling the number of Irish and EU graduates from 370 to 725 per year during 2006-2015, the percentage of Irish graduates registering in the Medical

¹³ Country codes – AUS: Australia, CAN: Canada, DEU: Germany, GBR: United Kingdom, ITA: Italy, IRL: Ireland, NZL: New Zealand, USA: United States of America, PHL: Philippines, ROU: Romania, PAK: Pakistan, RUS: Russia, ZAF: South Africa, POL: Poland, EGY: Egypt, BEL: Belgium, FRA: France

¹⁴ International Health Worker Migration, A High Level WHO Dialogue, 14th November 2017.

Council of Ireland decreased from 65% to 62% between 2012 to 2015. From 2002 to 2015, Pakistan contributed around 21% of the international medical graduates in Ireland, quadrupling from 375 in 2000 to 1,481 in 2015 (RCSI, 2017).

4.2.3 Brain Drain

The movement of health workers has been associated with one persistent concern among many governments and international bodies. As mentioned previously, around 2/3rd of all foreign-born or foreign-trained doctors and nurses are from non-OECD countries, and half of them are from lower-middle- and low-income countries. Countries like India, the Philippines, Pakistan, Kenya, Nigeria, Zimbabwe, Morocco, Haiti, and Ghana are some of the main source countries for doctors and nurses in OECD countries, but these also appear in the list of countries with health workforce shortages (Dumont & Lafortune, 2016). Governments of many Sub-Saharan African countries have been concerned about external emigration and the growing shortage of Nursing and midwifery personnel (WHO 2003). South Africa and Nigeria experience large outflows of health workers to lucrative destinations like the USA, UK, and other developed countries. From 2010-16, 600 general practitioners emigrated annually from Nigeria, with 50% going to Europe and North America, and some within Africa, especially South Africa (WHO 2017a). Using the Bhargava and Docquier dataset (2006), medical brain drain is highest in sub-Saharan Africa (20%) and 13% in South Asia. However, in a study across 53 African countries, Clemens (2007) found that emigration does not create a shortage of medical doctors in Africa, as the effect of the log of emigrant doctors per capita on the log of domestic doctors per capita becomes insignificant after controlling for GDP per capita, school enrolment, and ethnic conflicts. Migration prospects have a positive effect on medical training, though the magnitude is too small to generate a net brain gain in the medical sector (Docquier & Rapoport, 2015). This implies that stopping the medical brain drain would increase staffing levels in developing countries. Moreover, the emigrants positively select themselves, i.e., the most qualified doctors leave the country, thus lowering the average quality of health personnel remaining in the country unless supported by additional investments in the form of health infrastructure, technology, training, government spending, and institutional support.

Sub-Saharan Africa has one of the highest disease burdens but the lowest share of the health workforce and the least financial resources spent on healthcare, as shown in *Figure 3* and *Table 3*. Therefore, there is clear evidence of an unequal distribution of health workers and unequal access to health, which undermines the realization of UHC worldwide.

Figure 3: Share of Global Disease Burden and Global Health Workforce across WHO regions



Source: Reproduced from *World Health Report 2006*

Table 3: Comparison of health indicators between North America and Sub-Saharan Africa

Share of World's	North America	Sub-Saharan Africa
Population	14%	11%
Disease Burden	10%	24%
Health Workers	37%	3%
Financial Resources spent on Health	50%	1%

Source: *Based on Anyangwe & Mtonga (2017)*

The problem worsens when the recipient countries are reluctant to establish effective, ethical codes of recruitment or other forms of compensation or technology transfer (Connell et al. 2007). This culminated in the adoption of the WHO 'Global Code of Practice on the International Recruitment of Health Personnel' in 2010 and the 'Fair Recruitment Policy' in 2016 by the International Labour Organization (ILO). The Global Code emphasizes the need to strengthen and safeguard the health workforce. It also discourages active recruitment of health personnel from developing countries facing critical shortages unless the government of the source country agrees to it. The 2010 Code is a comprehensive, multilateral framework for cooperation to promote fair and ethical recruitment practices for international health workers and information sharing on health worker migration.

Moreover, members of an agreement can collaborate on temporary opportunities for health workers, aligning the demand and supply conditions in their respective markets. Under the 2010 Code, the member states are required to submit a report on health worker statistics and nominate focal persons who can engage in the work on international health worker mobility. As of 2018, only 63 States had submitted the report; among them, only 44 Member States reported policies, laws, and good practices consistent with the Code.¹⁵ In 2013, Germany became one of the first countries to prohibit the recruitment of health workers from the 57 countries facing 'critical shortages' of health workers

¹⁵ WHO Global Code of Practice on the International Recruitment of Health Personnel: third round of national reporting, December 2018.

(Dumont, WHO 2016).

4.3 Classifying Countries with Critical Shortage

In 2006, WHO identified 57 countries with less than 2.28 healthcare workers per 1,000 population as countries with critical shortages. In 2016, the threshold was increased to 4.45 per 1,000 population. Since then, the WHO has been continuously working towards developing a comprehensive measure that is most suitable for all countries and meets the global agenda of UHC. Thus, there is a need to understand the placing of countries in terms of capacity to correctly classify those with critical shortages, to manage the migration of health workers (WHO 2006, 2020).

Recent WHO reports (2020) contemplate formulating a comprehensive measure to classify countries into the 'with' and 'without' critical shortage categories. There are 5 options. Option 0 is the case where there is no change from the 2016 classification list of countries. Option 1 is the case that allows for self-selection by countries, including the possibility that many countries may not correctly declare their true status due to the lack of official records and other reasons, such as different educational standards and qualification requirements for health professionals. For instance, India includes AYUSH (Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy) practitioners as a part of the formal health workforce, which may not be acceptable given the standards of other recipient countries. Option 2 pertains to the case where countries are classified based on income and development indices, though these indices often do not account for the number of doctors and nurses. Therefore, each option has its limitations.

Option 3 uses a combination of a threshold level of the health workforce and a health service indicator. Countries below the median health workforce (of 4.5/1000) and in the lowest quartile of the Service Coverage Index (SCI) are classified as those with critical shortages (shown in Figure 18). More countries are below the median health workforce but don't fall in the lowest quartile of the Service Coverage Index, and hence they cannot be labelled as countries with critical shortages. The service coverage indicator is calculated based on 12 indicators: 5 on infectious diseases, 3 on maternal, newborn, and child health, and 4 on non-communicable diseases.¹⁶

Option 4 is a work in progress method at the WHO. It aims to account for the share of foreign-trained/foreign-born workers and educational production capacity of countries, etc., to come up with a very comprehensive and all-encompassing measure. However, no work has been published yet on this method.

4.3.1 Method and Data

Following option 3 of the WHO methodology, we aim to provide a more robust measure for identifying countries with critical shortages. We use a two-dimensional measure constituting a health status

¹⁶ Source: https://apps.who.int/gb/ebwha/pdf_files/WHA73/A73_9-en.pdf, accessed July 2020

indicator and a health facility indicator. The health status indicator is similar to the one used by WHO and is calculated by a simple average of life expectancy at birth (years), immunization (% of children aged 12-23 months vaccinated against DPT or diphtheria-pertussis-tetanus), 150 – infant mortality rate,¹⁷ 1000 – incidence of tuberculosis, 100 – prevalence of anaemia among children (% of children under 5), 100 – prevalence of undernourishment (% of the population), percentage of total population ages 65 and above. All the relevant data are collected from the World Development Indicators (WDI), World Bank.

However, we use a modified measure for health facility indicator by including more variables, like government expenditure on health as a percentage of total government expenditure, government expenditure as a percentage of current health expenditure, hospital beds per 10,000 population,¹⁸ in addition to the number of Nursing and midwifery personnel per 10,000 population (used by WHO in option 3), as the number of doctors alone is not sufficient. The quality of medical facilities is also important, as noted by Bhargava et al. (2011). Medical facilities are often complementary to the number of healthcare workers. Health facility is calculated as a simple average of government expenditure as a percentage of current health expenditure (CHE), government expenditure on health as a percentage of total govt expenditure, hospital beds per 10,000 population, and the number of nursing and midwifery personnel per 10,000 population. All the required data are collected from the Global Health Workforce Statistics database of the National Health Workforce Accounts (NHWA).

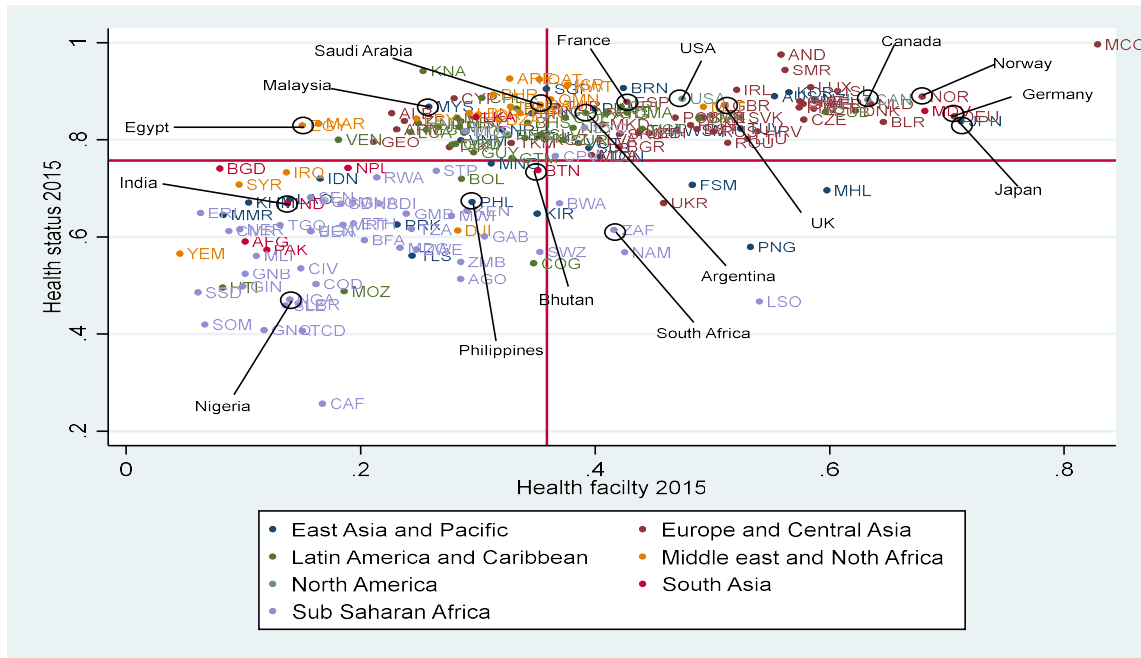
4.3.2 Results

We classify countries into four categories (refer to *Figure 4*), where countries like the USA, Canada, Norway, Germany, Ireland, and several developed countries lie in the top-right quadrant, i.e., they have good health status and good health facilities. On the other hand, countries like Malaysia, Vietnam, Venezuela, Egypt, etc., have good health status with poor health facilities. Next, we classify 58 countries in the bottom-left quadrant of *Figure 4*, i.e., in the intersection of below-global average health facility and below-average health status, as countries with a critical shortage. Most of these countries are situated in Sub-Saharan Africa and South Asia (shown in *Figure 5*).

Figure 4: Mapping countries based on health status and health facilities

¹⁷ We subtract the value of the indicators from the largest value across countries, rounded-off to the nearest multiple of 50 or 100 to get a positive measure.

¹⁸ Source: [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/hospital-beds-\(per-10-000-population\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/hospital-beds-(per-10-000-population)), accessed in March 2023. The data is last updated in July 2020, and several countries have data till 2017. Hence, we limit our analysis till 2015.



Source: Datta (2023). Note: The solid red lines indicate the global average. This measure is constructed for 2015 data, where 2015 data was missing, +/- 2 years data is considered. Some countries are highlighted only to provide better visibility.

Figure 5: Countries with critical shortages in 2015

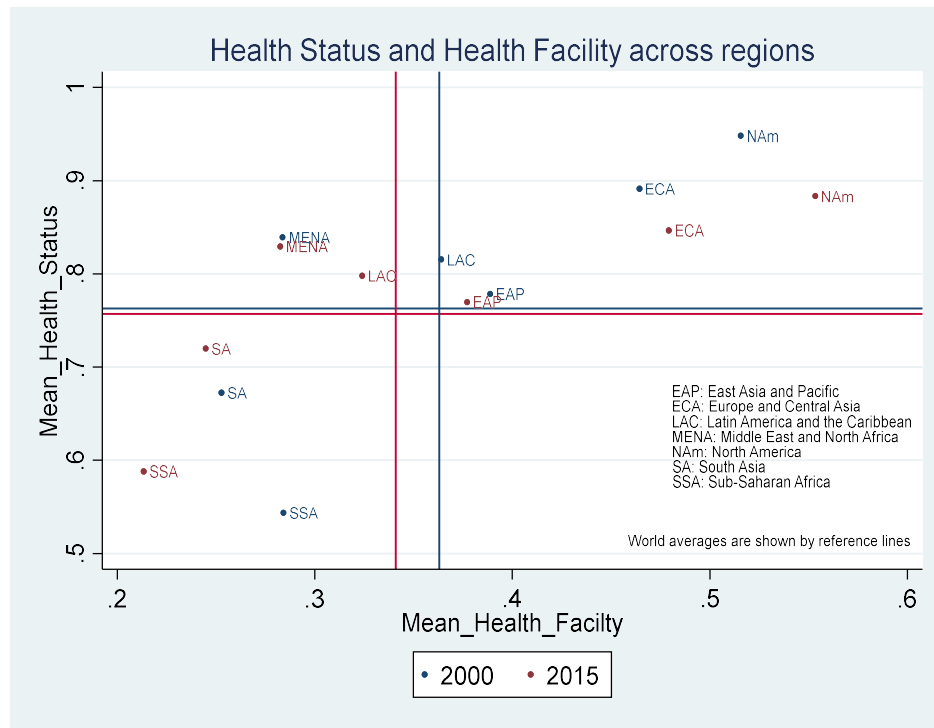


Source: Datta (2023). Note: This is based on the calculation in the previous section

This list is very similar to the 57 countries identified by the WHO report of 2006, except for some countries such as Bhutan, Papua, New Guinea, Peru, Nicaragua, El Salvador, and Honduras, which were included in the critical shortage list in 2006 but were not found to have a critical shortage in 2015. Indonesia, Korea, Mongolia, Philippines, Timor-Leste, Gabon, Sudan, and South Sudan were not included in the report of 2006 but are found to have a critical shortage based on our analysis for 2015. This

highlights that the identification of critical shortage depends on the measure used and that there continue to be many countries that can be classified as such.

Figure 6: Mapping regions based on health status and health facilities



Source: Datta (2023). Note: The blue and red solid lines indicate that global average for 2000 and 2015 respectively. The points on the graph represent the average health status and health facility in that region. The regions are grouped as per the World Bank classification system.

As an additional exercise, we show a comparison of 2000 and 2015 for different regions in Figure 6. An interesting observation is that the medical facilities worsened in 2015 compared to 2000 in the case of South Asia and Sub-Saharan Africa. However, the health status has improved in these regions due to increased vaccinations and improvements in child and maternal care. Among the developed countries in Europe and North America, while health facilities have improved, the health status has deteriorated, primarily due to the ageing population in the latter countries. These results again point to the increasing gap in health facilities between developed countries and Sub-Saharan African countries. Lastly, the worst case is observed among Latin American and Caribbean countries, where both, health facilities and health status deteriorated in 2015 compared to 2000.

The above analysis points to the growing inequality in health infrastructure, hindering the goal of achieving Universal Health Coverage for all countries. While health facilities in developed countries like the UK, the USA, and Australia are already among the best in the world, yet according to the 'Getting Skills Right' reports by OECD (2017(a), 2017(b), 2018(a), 2018(b)), Spain, the UK, and Australia have skills

shortages in health services, and only a few countries like France have a surplus. In the case of Sub-Saharan African countries, the shortage of health workers is coupled with the lack of infrastructure and health facilities.

Countries have to focus on strengthening their health systems. Health workers are a critical part of the health system and are key to delivering quality health services. Countries require an optimal mix of health workers with different skill sets, like doctors, nurses, care workers, physicians, and others. These human resources need to be equitably distributed and adequately supported by health facilities and the availability of medical devices and products. Against this backdrop of differential health systems conditions across countries and the persistent global shortage of health workers, managing and facilitating health worker mobility assumes importance. Although migration is a personal choice, governments can play an important role in managing migration, including in the health sector, by signing different kinds of agreements that can facilitate the flow of health workers with decent work contracts abroad and by assuring their integration into the domestic health system upon their return to the home country. Therefore, it is important to study the role of trade agreements, especially in the health sector.

4.4 Role of Bilateral Labour Agreements

Health is a global public good, where countries come together to fight against global pandemics like COVID-19 and SARS (Smith, 2003). Similarly, the shortage of health workers is a shared problem requiring shared responsibility for cooperative action (Chen, Evans, Anand, Boufford, & Brown, 2004), more so after the COVID-19 pandemic, making the health workforce a global public good (Aluttis, Bishaw, & Frank, 2014). The onset of the pandemic led to a relaxation in immigration policies and allowed foreign health workers to practice in several OECD countries (see *Table 1*). This made the shortage of domestic health workers and the dependence of these countries on foreign-born and foreign-trained health workers more evident. As mentioned in the earlier discussion, many countries perform poorly in health status indicators and also experience a critical shortage of health workers, yet these are some of the major source countries exporting doctors and nurses across the world. There is a need to address the global health worker shortage and to better manage human resources for health, including policies that promote cooperation between host and destination countries to manage the bilateral mobility of health workers. One such mechanism for strengthening cooperation is through bilateral arrangements, which can be in the form of signing Bilateral Labour Agreements (BLA), Preferential Trade Agreements (PTA), Memorandum of Understanding (MoU), Mutual Recognition Agreements (MRA), and Memorandum of Cooperation (MoC).

ILO, OECD, and WHO have promoted BLA as important mechanisms for planning and managing health workforce migration. Twenty-nine of the 63 WHO Member States reported the use of bilateral, multilateral, or regional arrangements for international recruitment and migration of health workers. The ILO has advised on the usefulness and design of bilateral agreements in order to serve the interests of both countries and the migrant workers. A formal bilateral agreement lists each party's commitments and provides for quotas, if any. Agreements can meet the needs of employers in the destination

markets, serve as a continued access to foreign markets for the source countries, and promote protection and welfare of migrants. Most of the agreements help facilitate the migration of health workers in a transparent and regular manner by reducing uncertainty and asymmetry of information. Agreements serve as a signal of a country's intent and future policies. Some of the provisions included in these agreements relate to circular migration with possibilities of re-entry, duration of stay, recognition of qualifications, and streamlining the documentation process with collaboration from relevant authorities. Agreements can play an important role in facilitating mobility, yet several countries have not signed agreements with their major partner countries. For example, the source country with the most number of bilateral labour agreements is the Philippines, yet it does not have agreements with major destinations for Filipino workers like Singapore, Japan, and Saudi Arabia.¹⁹ Therefore, countries should increasingly sign more bilateral labour agreements.

These instruments help regulate health worker mobility by streamlining recruitment procedures, providing predictable market access, and harmonizing standards in a way that best serves the interests of both countries. Agreements can cover a wide range of provisions, including mutual recognition of foreign qualifications, exemption of language tests or medical exams in the destination countries, timely recruitment of health workers, easing visa procedures, managing timely return to the home country, exchange of medical students or providing scholarships to international students, building medical schools and hospitals, and many more. They can help reduce uncertainty, enable accurate estimation of domestic demand and supply within the country, and ease the mobility of migrating workers by providing timely and transparent information on vacancies, requirements, and other formalities in the foreign country.

Under the General Agreement on Trade in Services (GATS), there are four modes of services trade. All four modes are important for health services (Francois & Hoekman, 2010). Mode 1 refers to the cross-border supply of services, for example, telemedicine and online consultation; mode 2 refers to the consumption of services abroad, for example, patients from other countries traveling to India for treatment; mode 3 refers to the commercial presence, for example setting up medical colleges or hospitals in another country; mode 4 refers to temporary movement of service providers, i.e., mobility of health workers. All four modes of supplying health services are affected by restrictions or constraints of various forms. For example, there are data protection-related issues in the transfer of medical data and test reports; patients often do not disclose medical reasons as this may prolong the visa process and create difficulties later, such as for post-travel money transfers; poor infrastructural connectivity and lack of quality and standards harmonization; restrictions on FDI in the health sector; language barriers; restrictions on entry; and difficulties in securing a license to practice. BLAs and PTAs can serve as important tools to facilitate services trade through all modes.

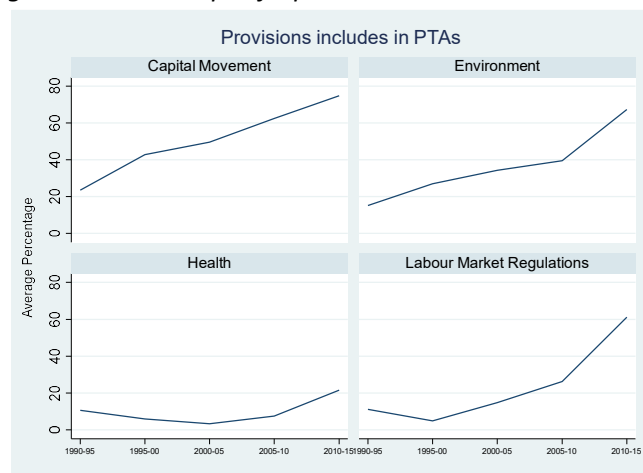
There are very few empirical papers that assess the role of trade agreements in influencing migration. Orefice (2015) shows that migration flows between partner countries of PTAs increased by 26.7% for 29 destinations in OECD countries. Another paper that aims to answer this question finds that signing RTAs

¹⁹ Source: https://www.ilo.org/asia/areas/labour-migration/WCMS_226300/lang--en/index.htm, accessed in May 2023.

increased bilateral migration stocks by 8% from 1960-2010 (Figueiredo, Lima, & Orefice, 2016). Similarly, Ortega & Peri (2013) showed that European treaties like the Maastricht Treaty and the Schengen Treaty have increased internal migration but decreased immigration from outside the EU. The lack of data on sectoral mobility restricts us from empirically investigating the effect of health provisions in bilateral agreements on health worker mobility. Thus, in this paper, we present qualitative analysis on the role of agreements in the health sector and the reverse transfers in the sending country.

Over the last two decades, trade agreements have become broader and deeper to cover more services and behind-the-border restrictions, going beyond conventional tariff reductions. PTAs are increasingly covering more and more provisions and offering substantial liberalization measures under these provisions. *Figure 7* shows the coverage of some of the provisions in the PTAs signed between 1990 and 2015 (from the Deep Trade Agreements Database, World Bank), averaged over five years. The provisions are divided into WTO-plus areas with 14 provisions and WTO-X areas with 38 provisions. Health is included in WTO-X provisions,²⁰ i.e., health is outside the current mandate of the WTO. However, unlike capital, environment, and labour market regulations, health is one of the least covered areas in PTAs, and its coverage has not increased much in the last two decades. Therefore, there is a need for more commitments in the health sector, which can mutually benefit both the sending and destination countries.

Figure 7: Percentage of agreements with specific provisions



Source: Datta (2023).

In 2020, several European countries like Belgium, Germany, Denmark, Estonia, Finland, France, Hungary, Ireland, the Netherlands, Romania, and Sweden reported a shortage of health and personal care workers (European Commission, 2022). In 2022, the European Commission estimated that around 7 million jobs will be created for health professionals and personal care workers by 2030. The EU labour market cannot fulfill this demand, as two-thirds of the personal care workers are from outside the EU. Therefore, the EU has announced initiatives like the Talent Partnerships (explained in *Table 4*) and EU

²⁰ Health provision = 1 if the agreement includes cooperation on monitoring of diseases; development of health information systems; exchange of information

Blue Card Directive (which was recently revised) to allow highly qualified migrants to benefit from the right to move and work in other EU countries, protect against labour discrimination and easy, streamlined procedures (European Commission, 2022).

Since late 2000, Germany has been reporting an acute shortage of qualified nursing staff, especially for geriatric care, and without changes in the recruitment policies, around 500,000 nursing positions would have been vacant. Hence, Germany went into agreements with developing countries to hire nursing graduates. Germany had a bilateral agreement with Vietnam in 2012 for a period of 4 years.²¹ The project was commissioned by the *German Federal Ministry of Economics and Technology* and was implemented by the German cooperation agency, the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)*, in collaboration with the *Vietnamese Ministry of Labour, Invalids and Social Affairs*. This programme initially selected 100 Vietnamese nursing graduates for six months of training in the German language and culture, and later they traveled to Germany for a period of two years. Before traveling to Germany, the nurses were required to participate in a 13-month programme organized in cooperation with the Goethe-Institute in Hanoi. This programme offers training in the German language, intercultural training, and practical sessions. Also, after reaching Germany, nurses are provided with one-to-one support for a year. For another project during 2016-2019, more than 300 Vietnamese nurses were successfully placed.²²

Similarly, Japan has been experiencing high demand for health workers, which is not met by its domestic supply. Hence, Japan has signed agreements with several Southeast Asian countries to recruit more foreign-born nursing professionals and geriatric care workers for its aging population. The Indonesia–Japan Economic Partnership Agreement (EPA) was signed in May 2008, where Japan agreed to accept 1000 Indonesian nurses. Japan also entered into Economic Partnership Agreements with the Philippines in 2009 and Vietnam in 2008, which had discussions on the immigration of health professionals. The professionals were required to learn Japanese and subsequently clear the nursing medical examination conducted in Japanese in a maximum of three attempts (Carzaniga, Dhillon, Magdeleine, & Xu, 2019). While the agreement with the Philippines specified that Japan would accept 200 nurses and 300 caregivers per year, the actual number of nurses and caregivers never reached this limit. From 2009 to 2016, the maximum number of arrivals in any year was 93 nurses and 278 caregivers.²³ Japan also launched a new trainee visa programme in April 2019 to address labour shortages, with 60,000 nursing helpers.²⁴ By 2018, approximately 1118 nurses and 2740 care workers entered Japan between 2008 and 2016 under the three EPAs.²⁵ *Table 4* provides important features of a few selected bilateral agreements on health worker migration.

Table 4: List of selected Bilateral Agreements on Health Worker Migration

²¹ Source: <https://www.giz.de/en/worldwide/18715.html>

²² Source: <https://www.giz.de/en/worldwide/69851.html>

²³ Source: <https://www.hs.yamagata-u.ac.jp/wp-content/uploads/2018/03/10TAKAHASHI.pdf>, accessed in May 2023.

²⁴ Source: <https://asia.nikkei.com/Spotlight/Japan-immigration/Japan-to-receive-60-000-nursing-helpers-in-new-visa-program>

²⁵ Pamphlet on the acceptance of nurse and care workers under EPA. Japan International Corporation of Welfare Services (JICWELS); 2017, taken from (Carzaniga, et. al., 2019).

Agreements	Year	Features	Comments
New Zealand-Malaysia	2009	Malaysian doctors were allowed to work in New Zealand, but with certain restrictions- e.g., foreign nationals working in hospitals with 50 or more beds have to work in specified locations, and any change of location will require approval, the qualifying examination is conducted in English language and the period of stay shall not exceed 10 years in total (Carzaniga et al., 2019).	
Ghana-Netherlands	2002 to 2012	It allowed for knowledge transfer through short-practical internships for Ghanaian medical residents in the Netherlands (Connell, 2010).	The Netherlands also agreed to develop a center for medical equipment in Ghana. ²⁶
UK-South Africa	2003	MoU was signed in response to the request of the South African Government to curtail active recruitment of nationals by the UK for National Health Service (NHS) employment.	As an effect of this MoU, there were 3206 new registrations in the UK by doctors trained in South Africa in 2003 and only 4 registrations in 2004. (Blacklock, et. al., 2012)
Philippines-UK	2002	In this MoU, the UK allowed the recruitment of healthcare professionals from the Philippines (Dhillon et al. 2010). It was terminated in 2006. In total, 175 nurses were recruited within the government-to-government agreement between 2002-2006, while most of the migration was outside this agreement. The limited significance of the MoU was linked to its poor implementation (Makulec et al. 2014).	According to the Philippine Overseas Employment Administration (POEA), statistics, between 2001 and 2011, the total outflow of nurses to the UK was 12,232. Between 2016 and 2019, over 4,000 Filipino health workers came to work in the NHS, becoming the second largest migrant group after Indians. ²⁷
France-Senegal Agreement	2006	Addressed migration flows with a particular focus on health professionals, information exchange, support for the reintegration of health professionals, and the broader development of source countries (Yeates & Pillinger, 2018).	Agreements can mitigate the negative effects of outward migration.

²⁶ Source: <https://www.iom.int/files/live/sites/iom/files/Country/docs/MIDA-Ghana-Health-Project-2012.pdf>

²⁷ Source: <https://www.cgdev.org/sites/default/files/Global-Skill-Partnership-Nursing-Nigeria-UK.pdf>, accessed in May 2023

Indonesia–Japan Economic Partnership Agreement (EPA)	2008	Japan agreed to accept 1000 Indonesian nurses. The professionals were required to learn Japanese and subsequently clear the nursing medical examination conducted in Japanese (Carzaniga et al., 2019)	Elaborated in the paper in section 4.4.
India-Singapore MRA	2018	Established mutual recognition of education, experience, the requirement of licenses, certificates, etc., to facilitate the mobility of registered nurses. The agreement identified 7 recognized Training Institutions from India and 4 from Singapore (Indian Nursing Council).	Elaborated in the paper in section 4.7.
EU Talent Partnerships	2021	<p>Announced in the new Pact on Migration and Asylum in 2020 to facilitate legal migration and mobility with key partner countries. Talent partnerships will be open to all skill levels and for various sectors such as ICT, engineering, health and long-term care, agriculture, transport, construction, transport, and logistics (European Commission, 2022).</p> <p>The Commission announced it would start the first Talent Partnerships in Egypt, Morocco, and Tunisia by the end of 2022.²⁸</p>	<p>It may also directly support schemes facilitating the mobility of researchers and students (European Commission, 2020).</p> <p>It will also be mindful of the risks of brain drain in source countries.²⁹</p>

Source: Datta (2023).

The Association of Southeast Asian Nations (ASEAN) signed three MRAs for Nursing Services, Medical Practitioners, and Dental Practitioners during 2006-2009 to facilitate the mobility of nurses, medical practitioners, and dentists by recognizing professionals licensed or certified by authorities within the framework of the MRAs. The ASEAN Joint Coordinating Committee (AJCC) on Dental Practitioners established ASEAN Dental Practice Standards in 2017. AJCC has developed common practices for dental undergraduate education, licensing arrangements for dentists and nurses, and accreditation standards

²⁸ Source: https://ec.europa.eu/home-affairs/policies/migration-and-asylum/legal-migration-and-integration/talent-partnerships_en#:~:text=The%20Talent%20Partnerships%20aim%20to,students%2C%20graduates%20and%20skilled%20workers. Accessed in May 2022.

²⁹ Source: Attracting skills and talent to the EU (European Commission 2022), available at https://eur-lex.europa.eu/resource.html?uri=cellar:85ff8b4f-ff13-11ea-b44f-01aa75ed71a1.0002.02/DOC_3&format=PDF, accessed in May 2022

for dental schools (Pachanee, et al., 2019). Representatives from the relevant regulatory authorities of each ASEAN Member State meet thrice a year to discuss changes in policies, practices, and procedures around the registration and licensing of health professionals (Mendoza & Sugiyarto, 2017).

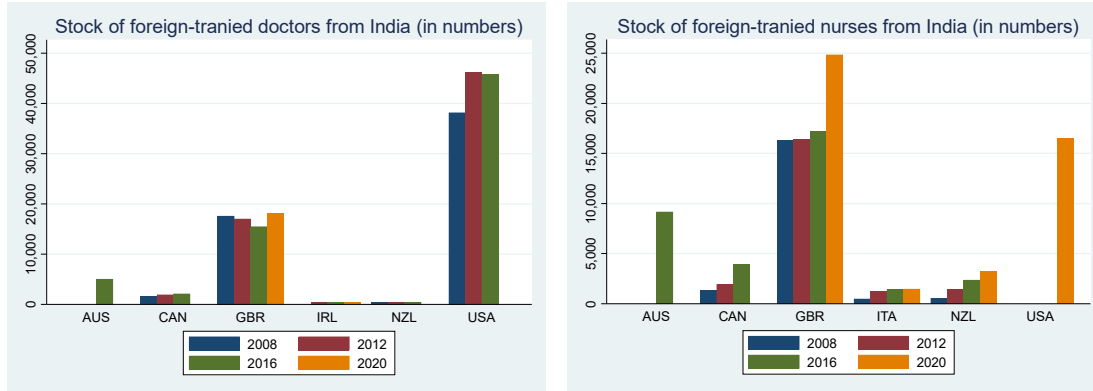
Implementation of health-related MRAs has been slow and incomplete due to complex entry barriers, resistance to the inflow of health professionals based on language and culture, and preferences for other high-income destinations. The MRA in nursing services in ASEAN was signed over a decade ago. However, according to the Asian Development Bank report by Mendoza and Sugiyarto, as of 2017, no physician or dentist had migrated within ASEAN using the MRA provisions. Countries like Indonesia and the Philippines restrict foreign health professionals to safeguard the domestic workforce. Thailand requires foreign practitioners to obtain a medical license in Thailand, which conducts the final exam in the Thai language only (Te, Griffiths, Law, Hill, & Annear, 2018). These can, however, be considered as the first wave agreements on health worker migration, with challenges in implementation. Thus, the outcomes are yet to be observed.

Next, we look at a case study of India, which is a major country for health workers. The following sections discuss several aspects of the migration of Indian health workers. Given the growing global demand for health workers, the GoI has undertaken many initiatives to increase the supply of health workers and help India continue to be a global supplier. However, we highlight some important features that concern the quality of health, the increasing number of health workers, and its implications for India's health status. We study several agreements signed by India on health services and examine whether the receiving countries are compensating India in some form of reverse flows such as official development assistance (ODA), loans, FDI, or technical assistance.

4.5 India as a major Global Supplier

As of 2020, India is the largest supplier of doctors and second largest in nurses, after the Philippines, as shown in Figure 2. In the 1990s, India ranked 6th in terms of the number of nurses applying for US licenses, but since 2003, Indian nurses have been the second largest applicants, next to the Philippines. By 2005, Indian nurses had surpassed the number of Filipino nurses in Ireland and the UK (Matsuno, 2009). As per an OECD report of 2017, there were 69,000 Indian doctors and 56,000 Indian nurses working in the UK, US, Canada, and Australia.

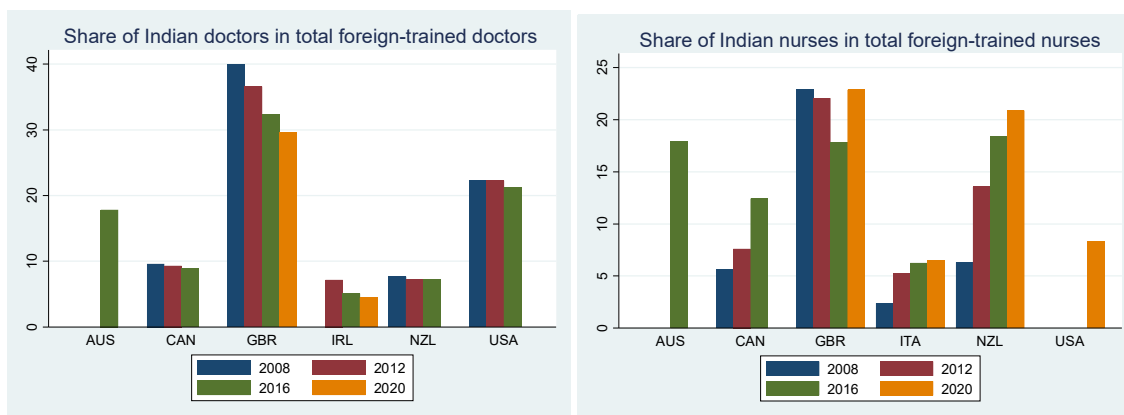
Figure 8: Stock of foreign-trained doctors and nurses from India in selected OECD countries



Source: Datta (2023). Note: These countries are selected because these are the major destination countries for Indian doctors and nurses.³⁰

According to the OECD Health Statistics 2019, the US is the most preferred destination for Indian doctors, and the UK is the major destination for Indian nurses (see Figure 8). Although in absolute numbers, the largest destination for Indian doctors has been the US, in percentage terms, India-trained doctors are highest in the UK. Figure 9 shows that although the share of India-trained doctors as a percentage of total foreign-trained doctors working in the UK decreased from 40% to around 30% between 2008 and 2020, India was still the highest source country for foreign-trained doctors. Similarly, around 20% of foreign-trained doctors in the US were from India in 2020. More than 20% of the foreign-trained nurses in the UK and New Zealand in 2020 were trained in India (as in Figure 9).

Figure 9: Share of Indian-trained doctors and nurses in total foreign-trained doctors and nurses in selected OECD countries



Source: Datta (2023).

³⁰ The country codes used are AUS: Australia, CAN: Canada, DEU: Germany, GBR: United Kingdom, ITA: Italy, IRL: Ireland, NZL: New Zealand, USA: United States of America, PHL: Philippines, ROU: Romania, PAK: Pakistan, RUS: Russia, ZAF: South Africa, POL: Poland, EGY: Egypt, BEL: Belgium, FRA: France

According to the Kerala Migration Survey of 2016, the emigration rate for medical doctors from Kerala is around 19.4%, with Gulf countries being the leading hosts. The WHO Report 2017 notes that more than 50% of the nurses from Kerala reside in the UAE, Saudi, Kuwait, Australia, the UK, and the USA. However, there is a slow change in the dynamic of external emigration from India. The share of Indian nurses emigrating to the US fell from 12.2% in 2011 to 6% in 2016, while those migrating to Saudi Arabia declined from 32% in 2011 to 22% in 2016, and those moving to Australia fell from 8% to around 3%. Only the share of nurses migrating to Canada witnessed an increase from 3.3% to around 5.2% from 2013 to 2016, as shown in Figure 9. The number of Indian nurses in Canada may be small compared to that in the USA and Saudi Arabia; however, the numbers are rising steadily from 181 in 2005 to 602 in 2015 (WHO 2017b).

During the recent pandemic, the demand for Indian nurses has increased around the globe, including in Malta, Saudi Arabia, Belgium, the UAE, and Ireland. Countries took steps in response to this rise in demand. For example, Dubai doubled the salary of Indian nurses, and the UK offered free accommodation for the first three months for Indian nurses.³¹ Many Gulf countries relaxed the entrance exams and certification requirements for Indian nurses and issued special visas. Indian nurses are recognized for their skills and tolerance to stressful working conditions. Indian doctors and nurses also have the advantage of being from an English-speaking country, especially the state of Kerala (the state with the highest literacy rate in India), which is the major source of migrating nurses.

4.5.1 India's scope in Traditional Medicine

India has an abundant variety of medicinal plants and has rich knowledge and experience in traditional medicines. Patients from all over the world come to India for treatment in these alternate health systems. Kerala is the prime destination for such healthcare services. There is plenty of scope for India to exploit its comparative advantage in traditional medicines (Chanda, 2001). India should engage in active marketing in regions with demand for these traditional treatments by providing package deals like tourism, spas, and yoga sessions with ayurvedic health services.

India and other South Asian countries formed the BIMSTEC (The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) Task Force on Traditional Medicine in October 2017.³² The meeting considered issues like Traditional Medicine Knowledge and Intellectual Property Rights (IPR) for traditional medicine. The members work towards harmonization of curricula to enable mutual recognition of traditional medicine degrees in the member countries. They also welcomed the BIMSTEC Ayurveda and Traditional Medicine University (BATMU), allowing countries to start their own colleges affiliated with BATMU (BIMSTEC, 2019). In addition, they appointed an Institute in each country that would be responsible for cooperation in R&D, education, and training of health professionals in traditional medicine, knowledge management, integration in National Health Systems, and regulatory issues.³³ Another initiative, primarily led by India, is the JIPMER - BIMSTEC Telemedicine

³¹ Source: <https://www.orfonline.org/expert-speak/exporting-indian-healthcare-workers-world/>, accessed in April 2022

³² Source: <https://bimstec.org/?event=the-first-meeting-of-the-bimstec-task-force-on-traditional-medicine>

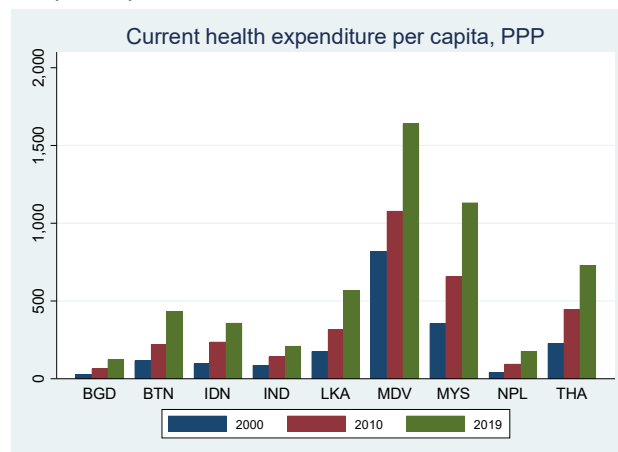
³³ Source: <http://www.ftm.edu.bt/bimstec/>

Network.³⁴ It facilitates knowledge sharing through telelectures, quality standardization by video sharing, digitalization of various documents, and teleconsultation to assist medical treatment as it provides the latest telemedicine infrastructure with high-speed internet connectivity (GOI, 2017).

4.6 India's position in health status and health facilities

India has emerged as a global supplier of doctors and nurses for the past two decades (see *Figure 8* and *Figure 9*), and the recent pandemic has made India an even more preferred source than in the past. However, as discussed earlier in Section 4.2.2 we found that many sub-Saharan African and South Asian countries are classified as countries with critical shortages. This list of critical shortage countries, i.e., countries that rank low in healthcare services and health facilities, also includes a major global supplier like India (see *Figure 5*). In 2000, India had only 5.25 medical doctors per 10,000 population; in 2016, the ratio was 7.59; by 2018, it reached 8.57.³⁵ India is expected to meet the WHO standard of 10:10,000 doctors (only modern medicine, excluding AYUSH practitioners) to population ratio by 2024. It was anticipated that with a yearly intake of 67,218 MBBS students, more than 4.7 lakhs MBBS doctors could be added to get a total of 14.9 lakhs doctors by 2024, even without setting up any new medical colleges (Kumar & Pal, 2018). According to the Ministry of Health and Family Welfare, as of March 2019, 11.6 lakh doctors were registered with State Medical Councils and the Medical Council of India.³⁶ This concurs with a study by Potnuru (2017), which forecasted the number of doctors in India, shown in *Figure 19* in Appendix A. The study estimated the number of registered doctors to be 11.9 lakhs by 2020 and around 17.3 lakhs by 2030. However, all these projections are based on studies from the pre-COVID situation, and the pandemic is likely to affect these estimates.

Figure 10: Health expenditure per capita



Source: Datta (2023).

To put India's health facilities in perspective, we briefly compare them with some neighboring developing countries – Bhutan, Bangladesh, Nepal, Myanmar, Sri Lanka, Indonesia, and Thailand. In

³⁴ Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) is an Institute of National Importance under Ministry of Health and Family Welfare, Government of India, started since 2013.

³⁵ Source: [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-\(per-10-000-population\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-(per-10-000-population))

³⁶ Source: <https://data.gov.in/resources/stateut-wise-number-doctors-registered-state-medical-councilsmedical-council-india-31st>

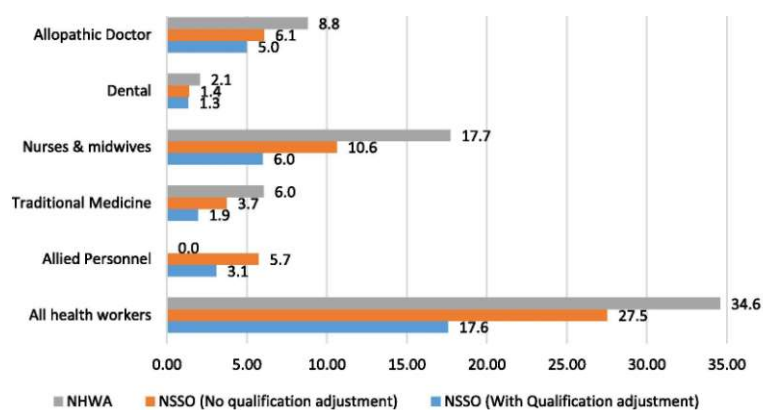
2006, WHO's threshold for delivering essential health care services was around 22.8 health professionals per 10,000 population. India and Thailand performed marginally better, with 24.1 and 25.6, while Sri Lanka has 30.5 (Kurian, 2017). Figure 10 shows that India ranked third last, only above Bangladesh and Nepal, in current health expenditure per capita in 2019. In terms of health status, the maternal mortality per 100,000 live births is 103 in India in 2022, while it is 60 in Bhutan and less than 30, in countries like Thailand, Malaysia, and Sri Lanka.³⁷ Thus, India has a much higher maternal mortality rate compared to its neighbours, except Indonesia, Myanmar, Bangladesh, and Nepal. Similarly, in 2021 India's under-five mortality rate per 1,000 live births is 30.6, while it is 8.3 in Thailand, 7.6 in Malaysia, 6.7 in Sri Lanka, and less than 3 in Nepal, Bhutan, and Bangladesh.³⁸ Therefore, all the neighbouring countries perform better than India in child mortality. Further, more than 15% of the children are affected by wasting (severe weight loss or failure to gain weight), which is the highest in the region.³⁹

Table 5: Health Workers by education level and by medical qualification

Health Worker	With Secondary schooling or less	With Tech or non-Technical Diploma	With Graduate Degree	With Post-graduate degree	With a medical Qualification
All Doctors and Nurses	46.6	6.0	38.0	9.5	29.7
All Doctors	30.8	3.4	50.1	15.7	45
AYUSH Doctors	28.8	4.1	59.8	7.3	52.8

Source: WHO Report 2016.

Figure 11: Number of health workers per 10,000 population (in 2018)



Source: Reproduced from WHO Report 2021. Note: This figure is based on NHWA 2018 and NSSO 2017-18 estimates.

Moreover, India is the largest source of foreign doctors and the second largest for nurses in OECD

³⁷ Source: <https://data.unicef.org/topic/maternal-health/maternal-mortality/>, accessed in May 2023.

³⁸ Source: <https://data.unicef.org/topic/child-survival/under-five-mortality/>, accessed in May 2023.

³⁹ Source: <https://data.unicef.org/topic/nutrition/malnutrition/>, accessed in May 2023

countries (Dumont & Lafortune, 2016). This raises serious concerns about whether India has a sufficiently large pool of health workers to afford such high emigration of doctors and nurses. The educational level of various categories of health professionals is a matter of concern, as observed in Table 5. In India, around 46.6% of doctors and nurses have just completed secondary schooling or even lower, and less than 10% have a post-graduate degree. Moreover, less than 50% of all doctors have a medical degree (Anand & Fan, 2016). Figure 11 provides further evidence of the domestic shortage of health workers. In 2018, India had only 27.5 health workers against the WHO norm of 44.5 per 10,000 population.⁴⁰ This number declines further to only 17.6 per 10,000 persons after adjusting for qualifications. Thus, even with the increase in the number of doctors and nurses as expected, inadequate healthcare service delivery is a long-standing concern arising from the external emigration of health workers and the inadequate quality of the existing stock of health workers.

Despite these concerns, the demand for Indian doctors and nurses will only rise further. The Ministry of Skill Development and Entrepreneurship (MSDE) has identified 300,000 jobs for healthcare workers, doctors, nurses, and allied health personnel, in countries like Australia, Germany, Canada, Japan, Singapore, and Sweden (ORF 2021).⁴¹ The National Skill Development Corporation (NSDC) collaborates with international agencies for skill development and overseas placement of qualified nurses. The GoI has actively focused on skilling and training healthcare professionals to supply more health workers to meet the global demand (Walton-Roberts, 2015). The GoI acknowledges that Indian nurses are considerably recognized in foreign countries, and hence they need to be at par with global standards for better opportunities abroad. In addition, the Government asserts that Indian nurses are highly skilled and they drive the healthcare system, but their numbers are below the globally accepted norms, which needs to be sufficiently enhanced. Thus, the GoI is working on the standardization of guidelines and curricula and on increasing the number of seats for medical and nursing education.⁴² The number of MBBS seats has increased by 53.22%, and M.Sc. Nursing seats have increased by 23.53% between 2014 and 2020. In addition, the government has taken steps to increase the availability of healthcare professionals by allowing the establishment of medical colleges in Public-Private Partnership mode and has also relaxed the requirements for faculty, staff, bed strength, and other infrastructure. According to the Indian Nursing Council, as of 2021-22, there are 1908 B.Sc. Nursing Institutes, inclusive of Government and Private management, offering around 60 seats on average (ranging from 40 to 100 seats in different institutes) and 630 M.Sc. Nursing Institutes offering several specializations,⁴³ compared to 1656 and 536, respectively, in 2016-17.⁴⁴ Thus, over the last 5 years, around 250 additional institutes have been established/recognized for B.Sc. Nursing and approximately 100 institutes have started offering M.Sc. Nursing. In April 2023, the GoI 157 new nursing colleges at the cost of Rs. 1570 crores in co-location with existing medical colleges to allow optimal utilization of existing infrastructure like labs, clinics, and faculty.⁴⁵

⁴⁰ The WHO threshold was updated from 22.8 to 44.5 per 10,000 population in 2016.

⁴¹ Source: Exporting Indian healthcare workers to the world, available at <https://www.orfonline.org/expert-speak/exporting-indian-healthcare-workers-world/>, accessed in March 2022

⁴² Source: Increase in Medical and Nursing Seats in Government and Private Colleges, MoHFW available at <https://pib.gov.in/PressReleaseframePage.aspx?PRID=1744362>, accessed in Feb 2022

⁴³ Source: <https://www.indiannursingcouncil.org/nursing-institute-for-the-year-2021-22>, assessed in May 2022

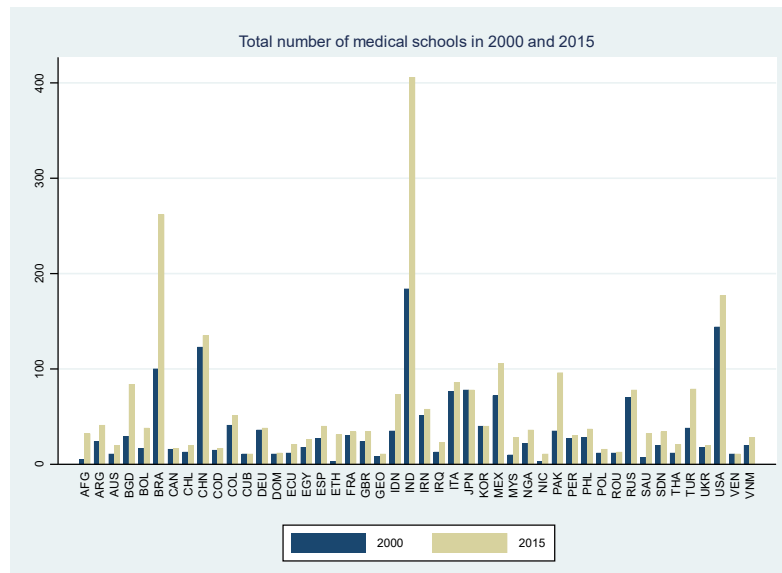
⁴⁴ Source: <https://www.indiannursingcouncil.org/nursing-institute-for-the-year-2016-17>, assessed in May 2022

⁴⁵ Source: <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1919985>, accessed in May 2023

Figure 12 shows the number of medical schools in 2000 and 2015 for countries with more than 10 colleges in 2015. It includes statistics for major developed countries such as the USA, Canada, Germany, Spain, Italy, France, Poland, the UK, Japan, and Korea. The largest increase in new colleges is observed in India and Brazil, however the quality of the schools cannot be assessed from the data. In 2015, India had the maximum number of medical schools, followed by Brazil, the USA, and China.

Figure 13 shows the number of medical schools⁴⁶ established annually in India from 1990 to 2016, categorized by public and private. We observe a rise in the number of private medical schools since the early 2000s, while the number of public schools has increased post-2010.

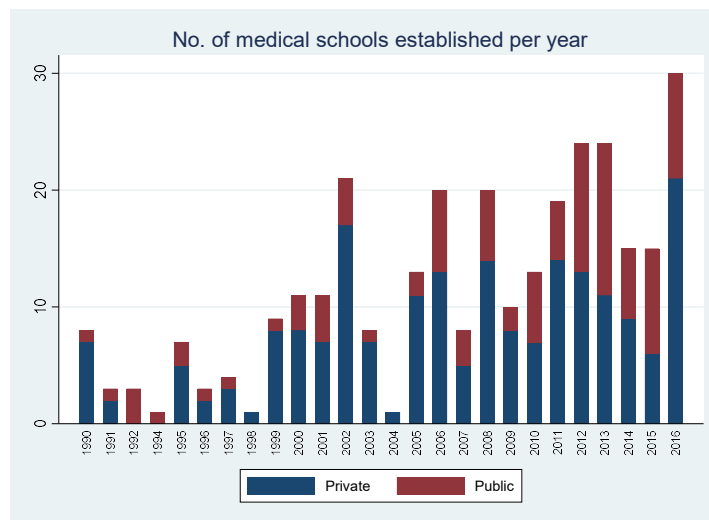
Figure 12: Increase in medical colleges from 2000 to 2015 across countries



Source: Datta (2023). Note: This figure includes only the countries with more than 10 colleges in 2015.

Figure 13: Number of medical schools established per year in India

⁴⁶ The data is collected from the World Directory of Medical Schools. It has been developed by has been developed through a partnership between the World Federation for Medical Education (WFME) and the Foundation for Advancement of International Medical Education and Research (FAIMER).



Source: Datta (2023).

The COVID-19 pandemic underscored the need to develop capacity for core public health infrastructure and improve the quality of health service delivery. In March 2023, the GoI received two complementary loans from the World Bank to support India's major healthcare program, the Pradhan Mantri-Ayushman Bharat Health Infrastructure Mission (PM-ABHIM). The two loans are granted under the Enhanced Health Service Delivery Program (EHSDP) and Public Health Systems for Pandemic Preparedness Program (PHSPP) of \$500 million each.⁴⁷ EHSDP will support the government's efforts to strengthen service delivery, improve access to primary healthcare facilities, and improve the quality of care by supporting the National Quality Assurance Standards certification across Health and Wellness Centers. PHSPP will support the government's efforts to strengthen coordination and build institutional capacity, detect and report epidemics of potential international concern and ensure a rapid response.

4.7 India's Agreements in the Health Sector

In addition to the above-mentioned government initiatives, like expanding the number of medical schools, the GoI has actively entered into several bilateral partnerships in healthcare to facilitate and manage the flow of health workers. According to the GOI, international cooperation in healthcare encourages capacity building, training, exchange of information, sharing, and enhancement of skills through the mobility of experts in a mutually beneficial way. The GoI has signed several MoUs, MoCs, MRAs, and other agreements in the healthcare sector with 53 countries as of 2018.⁴⁸ This list includes countries like Australia, Japan, Maldives, the UK, Poland, Germany, Italy, Netherlands, Qatar, Oman, Saudi Arabia, Vietnam, Myanmar, Cuba, and Egypt. Some of the Agreements are described below.

⁴⁷ Source: <https://www.worldbank.org/en/news/press-release/2023/03/03/world-bank-signs-a-1-billion-program-to-support-india-s-health-sector-for-pandemic-preparedness-and-enhanced-health-serv>, accessed in April 2023

⁴⁸ Source: <https://eparlib.nic.in/bitstream/123456789/779430/1/AS356.pdf>, accessed in April 2022

1. **India-Korea Comprehensive Economic Partnership Agreement (CEPA)** – signed in 2009, whereby Korea allowed mobility of veterinary service providers and certain categories of health workers from India, subject to conditions on practice.⁴⁹
2. **India-Malaysia Comprehensive Economic Cooperation Agreement (CEPA)** – signed in 2011, allowing Indian skilled professionals such as accountants, engineers, and doctors to work in Malaysia. It also encouraged relevant authorities to work towards mutual recognition of the education, qualification requirements, and experience acquired in sectors like medical (doctors), dental, and nursing.⁵⁰
3. **India-Singapore Mutual Recognition Agreement (MRA)** – signed in 2018 in nursing services. It established mutual recognition of educational qualifications and experience obtained to facilitate the mobility of registered nurses. It identified 7 training institutions from India and 4 from Singapore. Any nurse with a valid professional nursing qualification from the origin country with no record of violating technical or ethical standards can apply for practicing in the host country. The host country will evaluate qualifications, provide a license to foreign nurses allowing them to practice there, and monitor their professional practice to ensure that the foreign nurses maintain high standards of Practice. There can be other requirements, such as submission of a personal medical examination report, undergoing an induction program, and competency assessment, as imposed by the regulatory authority of the host country.⁵¹
4. **India-UK Memorandum of Understanding (MOU)** – signed between the Ministry of Health and Family Welfare in India and the Regional Office of Department of Health, UK and was valid until 2003. It was signed to enable “sustainable recruitment and employment of healthcare professionals from India.” The objective of this MOU was to provide an opportunity for Indian health workers to enhance their skills and explore the best practices in the healthcare delivery system. This MOU had enabled the UK to recruit nurses and allied health professionals like physiotherapists, radiographers, therapists, etc., from India, barring four Indian states of Andhra Pradesh, Madhya Pradesh, Orissa and West Bengal, which receive aid from the Department for International Development (DFID) (Buchan, 2008).⁵²

In 2018, Overseas Development and Employment Promotion Consultants Ltd. (ODEPC) signed an MoU with Health Education England (HEE) for the Recruitment of Nurses to the UK. HEE had informed the Government of Kerala of its requirement of 4500 nurses and requested a minimum of 1500 nurses per year. The UK government agreed to provide approximately Rs. 53,000 for IELTS (language test) and CBT (computer-based test) exams. The Indian nurses are required to get the

⁴⁹ Source: <https://dot.gov.in/sites/default/files/India%20Korea%20CEPA%2007.08.2009.pdf>, accessed in April 2022

⁵⁰ Source: Comprehensive Economic Cooperation Agreement between the Government of Malaysia and the Government of Republic of India, available at <https://dot.gov.in/sites/default/files/India%20Malaysia%20CECA%2001.07.2011.pdf>, page 56, accessed in April 2022

⁵¹ Source: Comprehensive Economic Cooperation Agreement between the Republic of India and the Republic of Singapore Mutual Recognition Agreement on Nursing Services, available at <https://www.indiannursingcouncil.org/uploads/pdf/16001723668534003245f60b14e8d7c1.Pdf>, accessed in April 2022

⁵² Source: <https://www.oecd-ilibrary.org/docserver/228550573624.pdf?expires=1613240838&id=id&accname=guest&checksum=97091256356A83C50CA552D2B1FE94A0>

Nursing and Midwifery Council (NMC) registration after clearing the Objective Structured Clinical Examination (OSCE) examination. Indian Nurses who join from the government sector can apply for the programme, provided they execute a bond that requires them to rejoin government service once they return after the contract period of three years.⁵³ This programme provides training and exposure to Indian nurses who can contribute to the Indian health system after re-joining.

5. **India-Kuwait MoU on Medical Cooperation** – signed in 2012 to provide training to Kuwait health personnel in India or Kuwait by Indian health professionals, and the government of Kuwait covered the training expenses.⁵⁴
6. **India-Japan Technical Intern Training Programme** – signed in 2017, this programme allowed Indian youth to avail of three-to-five years of internships in Japan in several fields, including healthcare, post which they are required to return to India and utilize the skills acquired in Japan. The sending organizations are required to train the candidates in Japanese language, lifestyle and business etiquette before the internship. National Skill Development Corporation (NSDC) monitors the program.⁵⁵
7. **India-Germany Joint Declaration of Intent (JDI)** – signed in June 2017. This JDI covers areas like cooperation in post-graduate education, training of medical personnel, and pharmaceuticals.⁵⁶ Unforeseen crises such as the COVID-19 pandemic are reminders of the need to efficiently plan for health workforce. After the onset of COVID-19, India has signed many MoUs in healthcare, for example, an MoU with Denmark in July 2021,⁵⁷ with the Republic of North Macedonia in December 2021, and with the US in September 2021, in the fields of health and biomedicine.⁵⁸ India signed an MoU with Suriname in December 2020, which entailed the exchange and training of medical doctors and setting up of medical facilities.⁵⁹ India signed an MoU with the UK in May 2021, where the UK agreed to offer information for facilitating the recruitment and immigration of skilled workers from India, including nurses and health care professionals.⁶⁰ India signed an MoC with Japan in January

⁵³ Source: <https://odepc.kerala.gov.in/events/odepc-signs-agreement-with-health-education-england/> and https://cdn.who.int/media/docs/default-source/searo/india/publications/review-of-international-migration-of-nurses-from-the-state-of-kerala--india-.pdf?sfvrsn=524dff1_2

⁵⁴ Source: https://cdn.who.int/media/docs/default-source/searo/india/publications/review-of-international-migration-of-nurses-from-the-state-of-kerala--india-.pdf?sfvrsn=524dff1_2, accessed in May 2023

⁵⁵ Source: Signing of the India-Japan Memorandum of Cooperation on Specified Skilled Workers, 2021. Available at https://www.mea.gov.in/press-releases.htm?dtl/33394/Signing_of_the_IndiaJapan_Memorandum_of_Cooperation_on_Specified_Skilled_Workers and <https://nsdcindia.org/home-titp>, accessed in April 2022

⁵⁶ https://www.pmindia.gov.in/en/news_updates/cabinet-approves-joint-declaration-of-intent-idi-between-india-and-germany-on-cooperation-in-the-field-of-health/, accessed in May 2022

⁵⁷ Source: Cabinet approves Memorandum of Understanding (MoU) between India and Kingdom of Denmark on Cooperation in the field of Health and Medicine, Jul 2021. Available at <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1735378>, accessed in April 2022

⁵⁸ Source: Ministry of External Affairs Annual Report 2021-22. Available at https://www.mea.gov.in/Uploads/PublicationDocs/34894_MEA_Annual_Report_2021-22.pdf accessed in April 2022

⁵⁹ Source: Cabinet approves MoU between India and Suriname on Cooperation in the field of Health and Medicine, 2020. Available at https://www.pmindia.gov.in/en/news_updates/cabinet-approves-mou-between-india-and-suriname-on-cooperation-in-the-field-of-health-and-medicine/, accessed in April 2022

⁶⁰ Source: MoU on the migration and mobility partnership between India and the United Kingdom, Policy paper, May 2021. Available at <https://www.gov.uk/government/publications/migration-and-mobility-partnership/mou-on-migration-and-mobility-partnership-between-india-and-the-united-kingdom>, accessed in April 2022

2021 to enable the mobility of skilled workers under 14 categories, including nursing care professionals from India to Japan. This provides employment opportunities on a contractual basis to workers who meet the skill requirements and clear the Japanese language tests.

India has started signing MOUs with major partners that are the major destination countries for its doctors and nurses. These include the UK, USA, and Japan. However, there is scope to sign agreements with other destination countries, such as Canada, which have grown in importance in recent years.

4.8 Reverse Flows in India

As discussed in Section 4.3, several major source countries like India and the Philippines are facing shortages of health workers. Despite the government initiatives to drastically increase the supply of health workers, the domestic demand cannot be met, and the threshold level of health workers to population ratio (45 per 10,000 people) is not achieved. In addition, several countries suffer the adverse consequences of brain drain. Therefore, the destination countries can directly contribute in several ways through aid, technology transfer, or FDI, in addition to signing bilateral arrangements to manage the movement of health workers. In this section, we discuss the role of reverse flows from the destination countries. It is worthwhile to note that the transfers need not directly flow into the health sector of the source country; instead, they can be in other forms which impact the overall development of the country and provide resources to the government of the source country to invest in sectors such as health, education, and related infrastructure.

We can utilize a cost-benefit analysis framework to quantify the extent of brain drain from India, provided we have access to the necessary data. The cost of migrating doctors can be approximated by the explicit cost of education, especially in government medical colleges, plus the implicit cost of lost revenue (assuming the migrating doctors will practice in India) and the social cost of public health infrastructure and its effect on the healthcare system. The benefit from the migration of doctors and nurses is through the direct channel of remittances, i.e., only if the emigrants send remittances to their families in India and through the indirect channel of technology and skill transfers from their return to India after a few years of experience abroad and provided they are re-absorbed into the medical system. Therefore, it is possible that the cost of migration exceeds the benefits, and thus brain drain is indeed a challenge for large source countries like India.

$$\text{Cost} = (\text{average cost of MBBS or Nursig degree} + \text{lost revenue per doctor or nurse} \\ + \text{average social cost}) \times \text{no. of doctors or nurses emigrating from India}$$

$$\text{Benefit} = \text{remittances (by non – returnees with families in India)} \\ + \text{technology or skill transfer (only for returnees)}$$

As mentioned earlier, around two-thirds of the source countries are non-OECD and lower-middle- or low-income developing countries such as India, with poor health status indicators. These countries

already have capacity constraints. Hence, medical brain drain is a serious concern for such countries. Article 3 of the WHO Global Code 2010 states that the health systems of both source and destination countries should benefit from the international migration of health personnel. This would thus require destination countries to compensate for the brain drain from source countries by providing reverse flows in different forms, which can be used for improving health infrastructure or for other benefits in the source countries.

The most obvious source of inflows is through remittances. Remittances sent by high-skilled migrants such as doctors and nurses may help to overcome liquidity constraints, stimulate education investments, and reduce poverty at the origin.⁶¹ The magnitude of the effect depends on the amounts transferred and their distributional impact. Due to the absence of a sector-wise bilateral remittances dataset, we use the bilateral remittances dataset published by the Global Knowledge Partnership on Migration and Development (KNOMAD). In 2021, India received USD 89,375.15 million as remittances from over 100 countries, with the Middle-East accounting for the largest share. The top 5 source countries for remittances to India are the UAE, USA, Saudi Arabia, Oman, and Kuwait. While we can not make a one-to-one correspondence between the sectoral profile of migrants from India to the Middle East and the remittances flowing to India from these countries, clearly health workers are an important source of these remittances given their large numbers in that destination region. As shown in

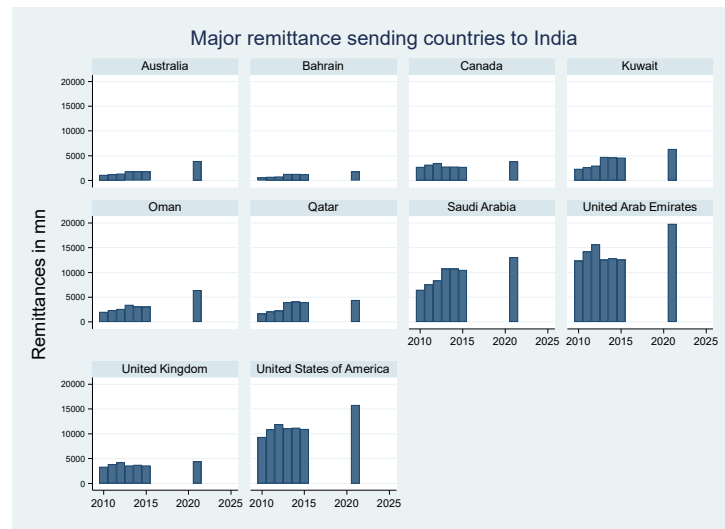
Figure 8 in Section 4.5, the main destination countries for Indian doctors and nurses are in the Gulf region, the USA, the UK, and Canada. These are also the top 10 remittance sending countries to India for the 2010 to 2021 period, as shown in Figure 14.⁶² Table 7 in

Appendix A lists the countries sending remittances of more than USD 100 million, which together contribute to more than USD 88 billion.

Figure 14: Top 10 remittance sending countries to India

⁶¹ Due to the lack of remittances data disaggregated by sector, it is difficult to ascertain the specific contribution of migrant health workers.

⁶² We are aware of the data limitations and acknowledge that these countries are popular destinations across occupations. However, due to unavailability of sector-wise bilateral remittances data, we rely on total bilateral remittances.



Source: Datta (2023). Note: Remittances are measured in current (nominal) USD.

Next, we analyze the Official Development Assistance (ODA) inflows in general and FDI inflows, particularly in the health sector, in India. ODAs are soft or concessional loans and grants for the economic development and welfare of developing countries. The relevant data is collected from 'Aid (ODA) disbursements to countries and regions,' OECD Statistics.⁶³ ODAs can come in different aid types, such as development, food aid, humanitarian aid, technical cooperation, etc. Among these, we analyze the ones with larger inflows like total grants (Figure 20 in

Appendix), net ODA, and technical cooperation, as shown in Figure 15 and

Figure 16, respectively. It is observed that most of the ODA inflows are from Japan, the UK, Germany, and the USA. Germany, Japan, the UK, the Netherlands, and the USA are the top countries contributing to technical cooperation. These are also some of the major destination countries for Indian doctors and nurses (shown in

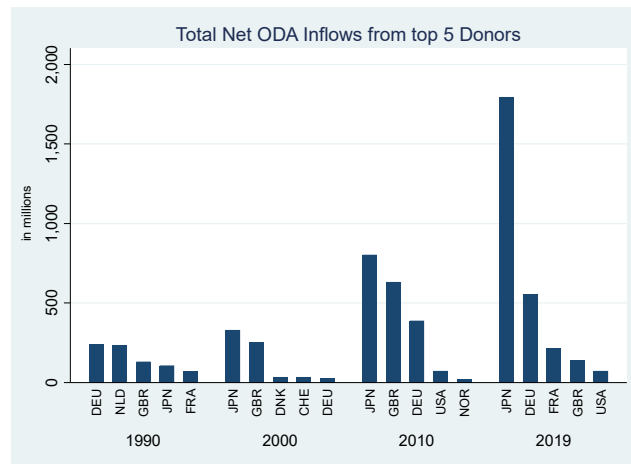
Figure 8). However, countries like Canada, New Zealand, Italy, and Australia are also some of the major destinations, but they don't have significant reverse flows for development in India.

Recently, in February 2023, the Japan International Cooperation Agency (JICA) signed loan agreements with the GoI to provide Japanese ODA loans of 9,918 million Yen for the Establishment of the Mizoram State Super-Specialty Cancer and Research Centre.⁶⁴ The objective is to improve access to cancer prevention, detection, and treatment in the north-eastern state of Mizoram, a state with a high cancer incidence and mortality rate. It also aims to support human resource development. The loan has been given at an annual interest rate of 1.5% over a period of 30 years with a grace period of 10 years.

⁶³ Source: <https://stats.oecd.org/Index.aspx?DataSetCode=Table2A>, accessed in Dec 2021.

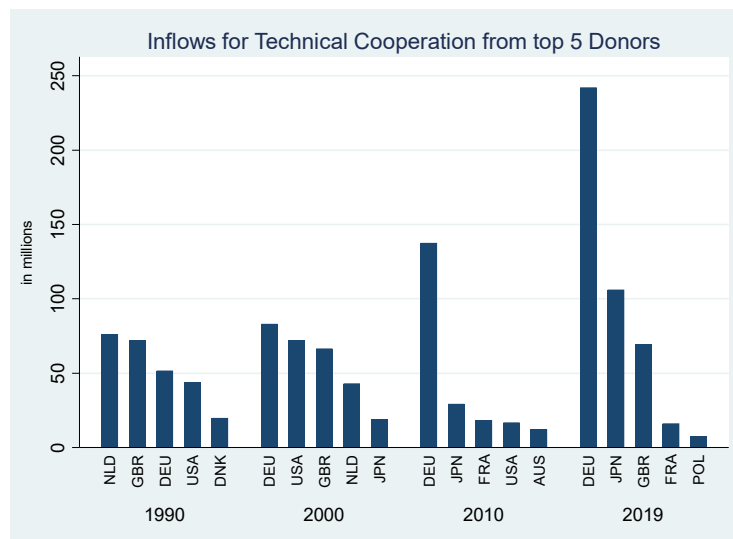
⁶⁴ Source: https://www.jica.go.jp/english/news/press/2022/20230303_33.html, accessed April 2023

Figure 15: Total net ODA inflows in India from 1990-2019 from the top 5 OECD Donors



Source: Datta (2023). Note: Net ODA inflows are measured in millions of USD at constant prices.

Figure 16: Inflows for Technical Cooperation in India from 1990-2019 from top 5 OECD Donors



Source: Datta (2023). Note: Inflows for technical cooperation are measured in millions of USD at constant prices.

Next, we look at the FDI contributions from major destination countries in India's healthcare sector. The FDI inflows data is collected from the fDi markets database, which gives bilateral investment flows by sector. This only includes the greenfield and not total investment i.e. data on M&As are not reported.⁶⁵

⁶⁵ fDi Markets data are on announced greenfield investment not all of which ends up getting realized. Therefore, the actual greenfield

The USA, Australia, the UK, Germany, and Japan are the top investors in India's health sector, as shown in Table 6.

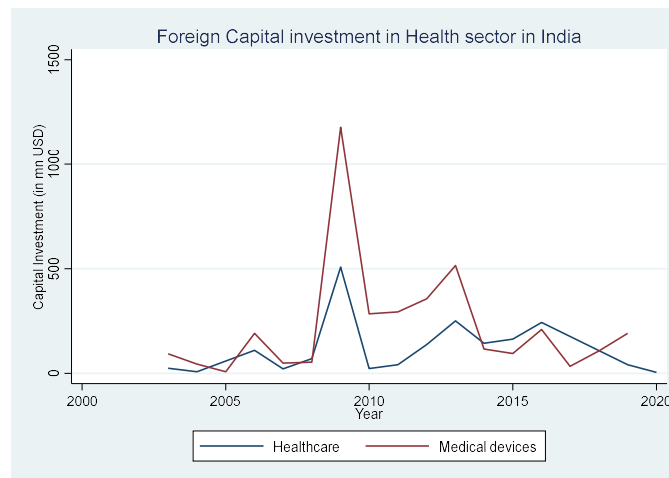
Figure 17 shows its composition by *industry* – healthcare and medical devices; and by *activity* - Business services, Construction and Manufacturing, Education, and R&D. Business services include Customer contact center; Logistics, distribution, and transportation; Maintenance and servicing; Sales, marketing, and support; Technical support center.

Table 6: Top 3 sources of Capital Investment (in mn USD) in India

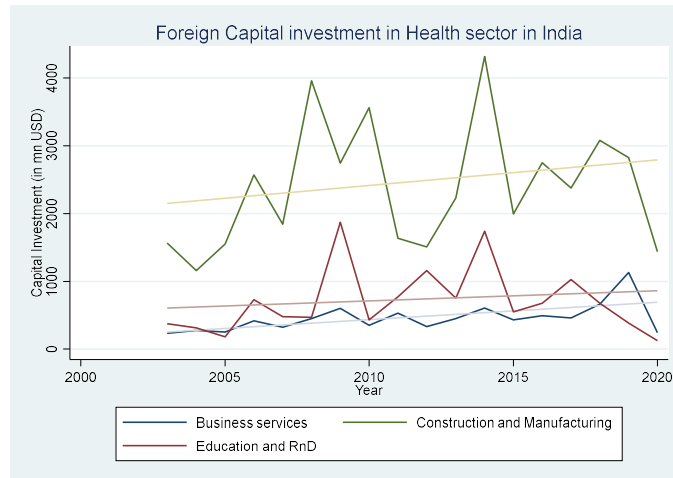
Rank	2005		2010		2015		2019	
1	United States	6.7	United States	118.7	United Kingdom	163.07	Germany	23.9
2	-		Australia	71.3	Netherlands	55	Italy	12.4
3	-		Japan	40.95	Belgium	16.18	-	

Source: Datta (2023).

Figure 17: Foreign capital investment in India, by industry and activity



investment maybe lower than the values reported.



Source: Datta (2023). Note: As the data were accessed in October 2020, it is only available for six months of 2020 (March to September 2020); hence the decline in the graphs should not be interpreted as a fall in investments.

It is observed that the major share of FDI inflows are in manufacturing of medical devices. This is further supported by the high share of inflows in construction and manufacturing activity, followed by education and R&D, and the least is in business services. According to the 'Consolidated FDI Policy 2020', the GoI has permitted up to 100% FDI under the automatic route for manufacturing medical devices like apparatus, instruments, appliances, and implants, including the software to be used specially for medical purposes. The GoI has also allowed 100% FDI in the construction of development projects, including hospitals and educational institutes, since 2017. Further, the investor is not subjected to the condition of a lock-in period.⁶⁶ The University Grants Commission (UGC) and All India Council for Technical Education (AICTE) allowed collaboration between Indian and Foreign Universities to offer students more choices; improve the curriculum and delivery of educational content.⁶⁷

Although there can be indirect benefits from investing in medical devices and manufacturing through technology spillovers, which can help upgrade the overall health facilities, investing in R&D and skilling health professionals directly impacts addressing issues like brain drain. Capital inflows contribute little to education and R&D, which are essential for the sustained production of a qualified health workforce. Therefore, there is an unequal flow between source developing countries like India and destination countries (mainly developed countries) in that the source countries are not commensurately compensated for the right kind of FDI inflows or foreign aid, which would enable technology transfer or the skilling of healthcare professionals. There is a need for more targeted agreements in pharmaceuticals,⁶⁸ R&D, knowledge sharing, and the skilling of future health workers through training and apprenticeship.

⁶⁶ Source: https://dpiit.gov.in/sites/default/files/FDI-PolicyCircular-2020-29October2020_0.pdf, accessed in May 2023

⁶⁷ Source: <https://pib.gov.in/newsite/PrintRelease.aspx?relid=181700>, accessed in May 2023

⁶⁸ Pharmaceutical allows brownfield investment and requires govt approval beyond 74% investment. Source: https://dpiit.gov.in/sites/default/files/Govt_RouteSectors_07July2020.pdf

4.9 Conclusion

Global demand for health workers has increased in the last two decades, thus widening the demand-supply gap. There will be a projected shortfall of 18 million health workers by 2030. According to WHO reports, health worker density and their quality are positively correlated with health outcomes like infant and maternal mortality, immunization coverage, etc. Thus, the health workforce must be treated as a global public good which is critical to achieving universal health coverage. Many OECD countries continue to face an acute shortage of domestic health workers and depend extensively on foreign-born doctors and nurses. The scenario has worsened since the COVID-19 pandemic. To understand the placement of countries in terms of health worker availability, we use a comprehensive modified framework to identify those countries which face a critical shortage of health workforce. Results also indicate that the disparity between the rich and poor countries has not reduced even after a decade. Rather health facilities have increased in developed countries while they have deteriorated in the Sub-Saharan region.

This paper highlights an important issue where major source countries like India and the Philippines are classified as countries with a 'critical shortage.' India is yet to meet the WHO norms of the required doctor-to-population ratio. The Government of India has undertaken several initiatives to increase the supply of health professionals to meet growing domestic demand as well as continuing to be a major global supplier of health workers. On the other hand, destination countries can also contribute to equipping the health system in the source country through foreign aid, investment, technical assistance, and knowledge transfers. Knowledge transfer can take place through the skill building of health workers who migrate and return to rejoin the health system in their home countries. The latter in turn depends on the reintegration policy of the source country, which determines the extent to which learning and experience gained abroad can be applied in the domestic health system. For example, Indonesian nurses experienced de-skilling and struggled to re-enter the nursing profession after returning to Indonesia (Kurniati et al. 2017). Thus, we analyze compensatory reverse transfers from major destination countries to an important source country like India.

We find that the FDI flows in the health sector are mostly concentrated in construction and manufacturing. Although there can be indirect benefits like technology transfers in manufacturing, it is not directly beneficial in terms of skilling young health graduates. Furthermore, even if the destination countries make a financial contribution to the education in the source country, this can seldom compensate for the loss of the health workers' experience, as it takes time to train senior health professionals. Thus, some countries could face a continuous cycle of brain drain of experienced health workers, even with reverse flows, leaving their population to be served by junior health workers.

In this context, bilateral agreements have emerged as an effective tool to address issues like brain drain by enabling the cyclical or temporary recruitment of health workers and facilitating skilling and technology transfers. For example, the India-Japan Technical Intern Training Programme 2017 allowed

Indians to acquire training in healthcare through internships in Japan. Agreements can reduce uncertainty by increasing transparency in recruitment procedures and by specifying qualification requirements. However, qualification recognition does not equate to permission to practice as the destination country may apply additional requirements like language tests and licensing exams, as deemed necessary to ensure patient safety. The governments of the source and destination countries can also take measures to ensure that the aspiring health workers can clear the required tests to work abroad. For example, the pass percentage of nursing candidates in IELTS is low in Kerala, despite attending special training programs. Thus, Higher Education England (HEE) has offered to provide £600 to nurses to prepare for IELTS and CBT exams.

Similarly, knowledge and communication skills in other languages, such as German and Japanese are a major challenge for Indian nurses, and the number of these language centres and faculty is limited. Hence the source countries should focus on these areas in addition to setting up new medical and nursing colleges, while the destination countries can also contribute by providing trainers or setting up language institutes. Further, many candidates approach private agencies for skill development and migration which may lead to exploitation and fraud. Therefore, there is a need for more government agencies like ODEPC for reliable consultation and migration procedures. The destination countries can also contribute to document verification and licensure procedures. For example, a team from the College of Registered Nurses of Newfoundland and Labrador is supposed to oversee the licensure to recruit more internationally- educated registered nurses from India to fill vacancies in Canada.⁶⁹

In addition, the agreements should consult all the relevant stakeholders while designing the agreements to ensure better implementation and regular feedback. For example, in the case of the UK-Nigeria nursing Global Skill Partnership, professional bodies, employers, trade unions, diaspora organizations, and international bodies like the WHO were consulted in addition to the respective governments.⁷⁰ Professional bodies like the Nursing and Midwifery Council of Nigeria (NMCN) were responsible for verifying that the nurses were accredited and for providing Letters of Good Standing and integration of returnees, while the Nursing and Midwifery Council (NMC) in the UK was responsible for accrediting the curriculum and registering Nigerian nurses. Similarly, employers in Nigeria, such as the National Primary Healthcare Development Agency, were responsible for recruiting “home” track trainees post-training and supporting their re-integration in Nigeria, while employers in the UK were responsible for recruiting “away” track nurses and facilitating the NMC registration by completing the Objective Structured Clinical Examination (OSCE).

Overall, more targeted agreements in health services can facilitate health worker mobility by including institutional mechanisms for managing bilateral mobility, which are mutually beneficial to the partner countries. Agreements can address issues like integration, return to source countries, working conditions and labour rights of health workers through BLAs, MoUs, and MRAs. Therefore, the agreements should consider benefits for the source and destination countries, the implications of mobility for the health sector needs of both countries, the need for health systems strengthening in

⁶⁹ Source: <https://www.gov.nl.ca/releases/2022/exec/1103n02/>, accessed in Dec 2022.

⁷⁰ Source: <https://www.cgdev.org/sites/default/files/Global-Skill-Partnership-Nursing-Nigeria-UK.pdf>, accessed in May 2023.

source countries, health worker rights, and gender needs, as health is a heavily gendered area of service provision. The agreements should also focus more on implementation through timely monitoring and evaluation by joint committees and should frequently review and discuss implementation gaps and challenges.

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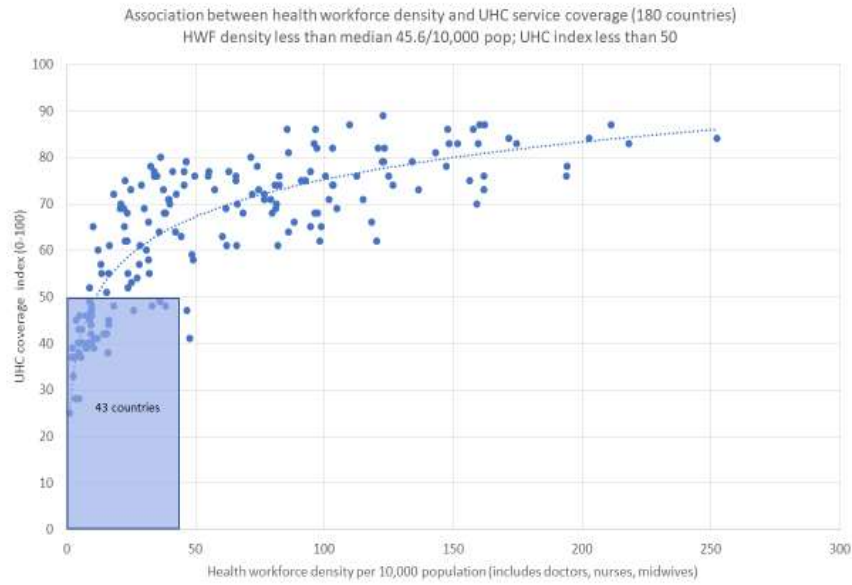
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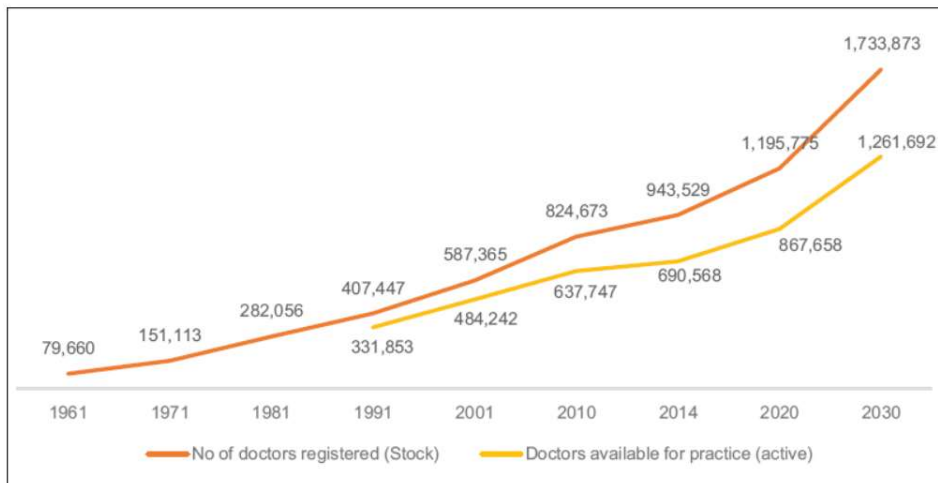
Appendix A

Figure 18: Countries with Critical Shortage



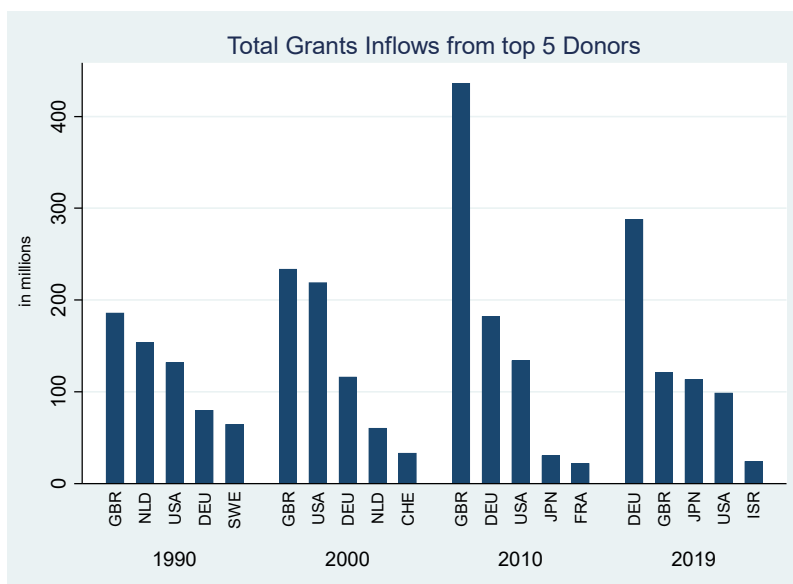
Source: Reproduced from WHO report 2020. https://apps.who.int/gb/ebwha/pdf_files/WHA73/A73_9-en.pdf , accessed July 2020

Figure 19: Number of doctors registered (stock) and available for practice (active)



Source: Reproduced from Potnuru (2017). Note: Data on registered stock of doctors for select years 1961–2014 are actuals and the same projected for 2020 and 2030 based on past decennial growth rates.

Figure 20: Total Grants inflows in India from 1990-2019 from top 5 OECD Donors



Source: Datta (2023). Note: Total grants are measured in millions of USD at constant prices.

Table 7: List of countries sending remittances of more than USD 100 mn to India in 2021

Sending Country	Remittance	Sending Country	Remittance
Norway	100.68	Italy	891.61
Myanmar	102.15	Singapore	948.87
Hong Kong SAR, China	109.14	Germany	951.13
South Africa	123.67	Nepal	1596.07
Bangladesh	126.22	Bahrain	1833.09
Ireland	136.42	Canada	3833.73
Switzerland	143.69	Australia	3907.61
Belgium	153.06	Qatar	4431.66
Japan	184.33	United Kingdom	4457.92
Bhutan	186.00	Kuwait	6356.27
Spain	219.95	Oman	6413.22
Sweden	263.81	Saudi Arabia	13052.35
Netherlands	276.97	United States of America	15808.03
France	326.77	United Arab Emirates	19821.05
New Zealand	631.36		
Malaysia	689.84		

Source: KNOMAD/World Bank Bilateral Remittance Matrix 2021, December 2022

Appendix B

Due to the lack of mode-wise bilateral services data, we present an approximation of the health services

traded between the UK and Canada with their major sending partners. We estimate the bilateral mode 4 imports by the UK and Canada, using back-of-the-envelope calculation through the following steps.

1. We identify the major sending countries from the respective countries' websites. We get the data from the Canadian Institute for Health Information (CIHI) for Canada.⁷¹
2. Table 8 shows the internationally educated nurses (IENs) in Canada by their country of graduation. We get data from the Nursing and Midwifery Council (NMC) for the UK.⁷²
3. Table 9 shows the major sending countries for nurses and midwives who were initially registered outside the UK but were working in the UK, and Table 10 shows nurses and midwives who are permanently registered in the UK.

Table 8: Internationally Educated Registered Nurses in Canada

Country of Graduation	2017	2018	2019	2020	2021
Philippines	7,972	8,002	7,444	7,735	8,155
India	2,652	2,849	3,105	3,539	4,007
United Kingdom	2,054	1,894	1,716	1,605	1,453
France	1,158	1,188	1,289	1,492	1,765
United States	1,453	1,483	1,409	1,405	1,408

Source: Canadian Institute for Health Information (CIHI)

Table 9: Internationally Educated Nurses and Midwives registered outside the UK

Country of Training	2017	2018	2019	2020	2021
Philippines	1,443	2,415	3,878	4,336	5,341
India	885	1,404	3,101	4,587	8,687
Nigeria	36	76	221	264	807
Zimbabwe	48	83	141	206	401
Spain	1,957	1,485	1,060	855	630

Source: Selected countries from Nursing and Midwifery Council (NMC) sending more than 500 nurses and midwives in 2021.

Table 10: Internationally Educated Nurses and Midwives registered in the UK

Country of Training	2017	2018	2019	2020	2021
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⁷¹ Source: <https://www.cihi.ca/en/registered-nurses>, accessed in May 2023.

⁷² Source: <https://www.nmc.org.uk/about-us/reports-and-accounts/registration-statistics/>, accessed in May 2023

Philippines	25,413	27,572	30,666	33,706	38,558
India	17,475	18,387	21,035	25,049	32,576
Nigeria	2,789	2,883	3,259	3,775	5,612
Zimbabwe	2,209	2,296	2,409	2,606	3,228
Spain	6,780	5,789	4,852	4,195	3,531

Source: Nursing and Midwifery Council (NMC).

4. Next, we get the mode-wise total imports of health services from the TiSMoS dataset, as shown in Table 11. We estimate the share of mode 4 health services imports in 2017.⁷³ Mode 4 comprises of 0.51% of total health services imports in Canada and 2.2% in the UK.

Table 11: Mode-wise imports of health services by the UK and Australia

Reporter	Partner	Indicator	Year	Mode	Imports (in million USD)	Share (in %)
Canada	World	SDB1SK21	2017	M1	18.76015	1.54
Canada	World	SDB1SK21	2017	M2	404.6565	33.15
Canada	World	SDB1SK21	2017	M3	790.8492	64.80
Canada	World	SDB1SK21	2017	M4	6.253383	0.51
United Kingdom	World	SDB1SK21	2017	M1	529.7851	6.62
United Kingdom	World	SDB1SK21	2017	M2	154.8081	1.94
United Kingdom	World	SDB1SK21	2017	M3	7137.206	89.23
United Kingdom	World	SDB1SK21	2017	M4	176.595	2.21

Source: Datta (2023).

5. We get bilateral trade in health services from the TiVA dataset, which includes services trade through all four modes. It includes medical tourism covered under mode 2, teleconsultation covered in mode 1, investments in hospitals and manufacturing of medical devices covered under mode 3, and services provided by health workers in another country covered in mode 4. From the above tables, we observe that India and the Philippines are sending countries for nurses and midwives to the UK and Canada. Next, we calculate the share of bilateral exports in health services through mode 4 from India and the Philippines to UK and Canada using the shares of mode 4 in total health services imports estimated in 2.

Table 12: Share of bilateral trade in Health services through mode 4

⁷³ We use the latest year available in the TiSMoS dataset.

Exporter	Importer	Year	Gross Exports in million USD	Share of mode 4 in million USD
<i>India</i>	<i>United Kingdom</i>	2017	35.3	0.78
<i>India</i>	<i>Canada</i>	2017	2.9	0.015
<i>Philippines</i>	<i>United Kingdom</i>	2017	2.3	0.051
<i>Philippines</i>	<i>Canada</i>	2017	1.7	0.0087

Source: Datta (2023).

Based on the above calculations in Table 12, India exported approximately health services worth USD 0.78 million to the UK in 2017, sending nurses and midwives to provide health services in the UK. Although the Philippines is also one of the largest source countries for nurses, the value of exports is less as we have calculated the bilateral mode 4 shares from total bilateral trade in health services, which is lower for the Philippines. This suggests that India supplies health services to the UK through other modes, which leads to a large export of total health services to the UK.

This analysis also highlights major data limitations and the inability to measure bilateral mode-wise services trade between sending and destination countries. Thus, there is a need for mode-wise bilateral sectoral trade data to estimate the value of services provided by foreign service providers. It will also help in understanding the extent of brain drain from the sending countries.