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**International migration and movement of doctors to and within OECD countries – 2000 to 2018:
Developments in countries of destination and impact on countries of origin**

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Abstract

This paper presents the most recent data on the number of migrant doctors in the health workforce in the OECD countries, as well as the impact these regular migration flows have on the countries of origin, including an analysis of the developments since 2000. The objective of this paper is to inform policy dialogue at the national and international levels. The share of migrant doctors has continued to rise over the last two decades across the OECD countries, with around two-thirds of all foreign-born or foreign-trained doctors originating from within the OECD area and upper-middle-income countries. The lower-middle-income countries account for around 30% and low-income countries for 3-4% of the foreign-born and 4% of the foreign-trained doctors. In countries of origin that are large, migration to (other) OECD countries has a moderate impact, but some of the relatively smaller countries or those with weak health systems experience significant losses of (needed) health professionals.

Sommaire

Ce document présente les données les plus récentes du nombre de médecins migrants parmi les personnels de santé dans les pays de l'OCDE, ainsi que l'impact de ces flux migratoires réguliers sur les pays d'origine, y compris une analyse de l'évolution depuis 2000. L'objectif de ce document vise à nourrir le dialogue politique aux niveaux national et international. La part des médecins migrants a continué d'augmenter au cours des deux dernières décennies dans les pays de l'OCDE, avec environ les deux tiers des médecins nés à l'étranger ou formés à l'étranger originaires de la zone OCDE et des pays à revenu intermédiaire supérieur. Les pays à revenu intermédiaire inférieur représentent environ 30% des médecins nés à l'étranger, alors que les pays à faible revenu représentent 3 à 4% des médecins nés à l'étranger et 4% des médecins formés à l'étranger. Dans les pays d'origine de grande taille, la migration vers (d'autres) pays de l'OCDE a un impact modéré, mais certains des pays relativement plus petits ou ceux dont les capacités des systèmes de santé sont faibles subissent des pertes importantes de professionnels de la santé (jugés nécessaires).

Executive summary

Drawing on the OECD's long experience in collecting data across the OECD countries to quantify the trends in international migration and movement of doctors, this paper presents new data on the extent to which migrant doctors contribute to the health workforce in the OECD countries, as well as the impact these regular migration flows to and within OECD countries have on the countries of origin, including an analysis of the developments since 2000.

The data analysis behind this work was completed in 2019. It exploits the two main sources of data:

- the most recent (2017/18) data on foreign-trained doctors working in the OECD countries, collected through the OECD/Eurostat/WHO-Europe Joint Questionnaire on Health Care Statistics, with internationally comparable time series since 2006/07;
- the most recent (2015/16) data on foreign-born doctors working in OECD countries, collected in Database on Immigrants in OECD Countries from population censuses and labour force surveys, with internationally comparable time series since 2000/01.

Combined, these sources provide the most complete picture of migration and movement patterns possible, relevant for both countries of destination and the countries of origin of the migrant doctors.

For the countries of destination, the main findings reveal that while the number of domestic medical graduates has increased significantly in nearly all OECD countries, the shares of foreign-born or foreign-trained doctors have continued to rise over the last two decades. Moreover, during the COVID-19 pandemic, many of the OECD countries have implemented additional policy measures to ease the entry of foreign doctors.

Since 2000/01, the number of foreign-born doctors working in the OECD countries rose by around 70%. Over the same time span, the total number of doctors rose by around 30% and the adult foreign-born population by around 50%. As a result, the proportion of foreign-born doctors rose from around one-fifth in 2000/01 to more than one-quarter in 2015/16.

- The proportion of doctors born abroad ranges from less than 2% in the Slovak Republic to more than 50% in Australia and Luxembourg.
- In most OECD countries, the number of doctors born abroad is higher than the number of doctors trained abroad, reflecting the fact that destination countries provide education to migrants who may have moved at an early age or to pursue their studies.
- Nonetheless, the number and share of foreign-trained doctors also rose. In 2017/18, more than one in six doctors working in an OECD country had obtained at least the first medical degree in another country, up from one in seven a decade earlier.
- The share of foreign-trained doctors ranges from less than 3% in a number of countries, to around 40% in Norway, Ireland, and New Zealand, and to nearly 60% in Israel.

- In some of the main destination countries – Israel, Norway, or the United States - a large and growing share (up to around 50%) of foreign-trained doctors are native-born.

Regarding the countries of origin, around a third all foreign-born or foreign-trained doctors working in OECD countries originate from within the OECD area and another third from upper-middle-income countries (non-OECD). The lower-middle-income countries account for around 30% and low-income countries for 3 and 4% of the foreign-born and the foreign-trained doctors, respectively.

The top ten countries of origin for foreign-born or foreign-trained doctors comprise non-OECD as well as the OECD or EU countries: India, Pakistan, China, Germany, Romania, the Russian Federation, the United Kingdom, Poland, Iran, Italy, and the Philippines.

Regarding the impact of international migration to and within the OECD area on total number of doctors working in the countries of origin, on average, in countries of origin that are large, migration to (other) OECD countries has little or at most a moderate impact. However, some of the relatively smaller countries or those with weak health systems and with a low number of doctors, experience a substantial impact, as measured by emigration rates (the ratio between the number of native-born/home-trained doctors working in (other) OECD countries and the sum of all doctors born/trained or working in the country of origin).

- For the top ten countries of origin, emigration rates to OECD countries for home-trained or native-born doctors are moderate (from 5 to around 10%) or low (from less than 1 to 3%), with the exceptions of Romania (33% emigration rate for home-trained and 32% for native-born doctors), followed by Poland and Iran, with emigration rates for native-born doctors of 17% and 16%, respectively.
- Emigration rates of between one-third and one-half, for either doctors born or trained in a country, are found for 20 out of the 188 countries of origin, predominantly in Africa and Latin America, but also in Europe, Middle East, and Western Pacific.
- For another 10 countries of origin – again in Africa and Latin America - the emigration rates for native-born doctors exceed 50%, which means that more doctors born in these countries are working in the OECD area than in the country of origin.

When taking into account the number of doctors per 1 000 population, the analysis reveals that the global health workforce shortage is not primarily because of migration. In particular, the shortages of doctors in low- and lower middle- income countries largely outstrip the numbers of immigrant doctors working in the OECD countries. This contributes to highlight the need to invest not only in education but also in employment and health systems in general.

In relatively few countries of origin, the number of doctors would increase significantly by retaining all native-born or home-trained doctors that are presently working in (other) OECD countries. This regards especially the countries of origin that have less than one doctor per 1 000 population (around 40% of the 188 studied countries), the majority of which are in Africa. Thus, the global shortage of health human resources, notably doctors, goes well beyond migration issues even if it may exacerbate the acuteness of the problems in some countries. However, for some countries of origin, where a large part of their migration takes place outside OECD corridors, the data presented here may be insufficient to fully support this conclusion.

Concerning the developments since 2000, the average emigration rate to the OECD area for native-born doctors has remained at around 6%, while the global physician workforce has increased. Between 2000/01 and 2015/16, the total number of doctors and the number of doctors not working in their country of birth but in (other) OECD countries both grew by around 50%. While most countries followed this general growth trend and did not experience a significant change in the emigration rate between 2000/01 and 2015/16, there are sizable changes at the regional level and in some countries:

- Low-income countries experienced the fastest growth of number of doctors at home and a relatively slower growth in the number of native-born doctors working in the OECD area. Accordingly, overall the emigration rate dropped most for the low-income countries, while it increased most for the high-income countries. Correspondingly, the emigration rate decreased most in Africa, while it grew most in Europe.
- Among the main countries of origin of foreign-born doctors working in the OECD area, the emigration rate increased from 8 to 12% in Pakistan. In contrast, the Philippines registered a significant decrease in the emigration rate and a sizeable increase (well above the average global growth) in the domestic physician workforce.
- Around ten countries in Africa and Central America saw large – two-fold and more – increases in the emigration rates, as exceptions to the general trend.

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1. Introduction

1. This paper presents the most recent data on the extent to which migrant doctors contribute to the health workforce in OECD countries (Section 2) as well as the impact these regular migration flows have on the countries of origin (Sections 3 and 4), including an analysis of the developments between 2000/01 and 2017/18. The objective of this paper is to inform policy dialogue at the national and international levels.

2. This work is part of the OECD/ILO/WHO “Working for Health” programme – a five-year Action Plan for Health Employment and Inclusive Economic Growth (2017–2021) – that has led to the launch of an [International Platform on Health Worker Mobility](#), among other initiatives. This paper focusses on the first objective of the *Platform*, i.e. to improve the monitoring of health workforce migration through better data collection, analysis, and data exchange practices.

3. The data analysis behind this work was completed in 2019. It exploits the two main sources of data on international migration and movement of doctors: (i) the most recent (2017/18) data on foreign-trained doctors working in the OECD countries, collected through the OECD/Eurostat/WHO-Europe Joint Questionnaire on Health Care Statistics (OECD Health Statistics), with internationally comparable time series since 2006/07; and (ii) the most recent (2015/16) data on foreign-born doctors working in the OECD countries, compiled in the Database on Immigrants in OECD Countries (DIOC) from population censuses and labour force surveys, with internationally comparable time series since 2000/01. Box 1 provides a summary of the pros and cons of the two approaches, i.e. the use of data on foreign-trained or foreign-born doctors, for monitoring their international migration and movement to and within the OECD countries. Neither considering place of birth or place of training offers a complete picture; therefore, both data sources are analysed together to present the most comprehensive picture of migration patterns available.

4. Despite important efforts to gather corresponding data in many countries of origin, statistical evidence on outflows of native-born/home-trained doctors remains scarce or is difficult to compare internationally. Therefore, the data reported by the OECD countries as countries of destination, remain the most comprehensive as well as internationally and longitudinally comparable source of information. However, for the interpretation of the results presented in this paper, one should keep in mind that there are also significant (but not uniformly documented) regular flows of migrant doctors among non-OECD countries, in particular within Africa and South America, and into China.

Box 1. Methods and sources used to monitor the international migration of doctors

Migration patterns can be measured based on place of birth or place of medical education/training.

A regular monitoring of the international migration of health personnel needs to be based on two key criteria: 1) relevancy to both countries of origin and countries of destination; and 2) feasibility of regular data collection.

Data by the place of birth from the [Database on Immigrants in OECD Countries](#) (DIOC), amassing information from population censuses or large-scale population surveys¹, enable to identify cross-border movements independently of acquisition of nationality. These data also include only the currently practicing doctors as opposed to

¹ For details, please see Annex A in (d’Aiglepiere, 2020_[16]).

other doctors who might be professionally inactive or work outside medicine at a given point of time. The data may, however, include people who have moved at younger age, most probably accompanying their family, and therefore completed their medical education in the country of destination.

Data by the place of education/training collected in the [OECD Health Statistics Database](#), from the professional registers and other health workforce databases² through the annual OECD/Eurostat/WHO-Europe Joint Questionnaire, identify doctors who have completed at least their first medical degree abroad. These data, however, do not account for foreign-trained doctors, who in the process of accreditation/validation of their qualifications repeated in fact their medical education in the country of destination. A related issue has to do with the internationalisation of medical education, which means that a certain number of foreign-trained doctors may be people who were born (and raised) in one country but pursued their medical studies in another country before returning to their home country. The Joint Questionnaire seeks to collect data on the number of such native-born but foreign-trained doctors, but so far only a limited number of OECD countries have been able to isolate this group of doctors in the professional registers. Moreover, some of the registers do not allow for distinguishing between doctors currently practicing in the country and those who are licensed to practice but work in administrative positions, are professionally inactive, work outside medicine, or work abroad. The existence of different types of registration status is another source of concern, as there are variations in the rights and obligations associated with each type of registration. Generally, the data reported by the OECD countries refer to full registration (including interns and medical residents) and exclude doctors registered in one receiving country but practising in another.

Lastly, due to data gaps in the above-described data sources the results should be treated as lower-bound estimates.

5. This paper builds on earlier work of the OECD on the international movement and migration of health workers as well as migration policies of the OECD countries related to health professionals. In 2007, the chapter devoted to immigrant health workers in the *International Migration Outlook* presented an internationally comparable picture of immigrants in the health sector in OECD countries, in order to better inform the policy dialogue at national and international levels (OECD, 2007^[1]). This information on health workers movement and the related migration policies was updated in the 2015 edition of the *International Migration Outlook* (OECD, 2015^[2]) and the 2019 report on trends in international migration of doctors, nurses, and medical students (OECD, 2019^[3]). This topic was also addressed in a chapter in the 2016 OECD publication, *Health Workforce Policies: Right Jobs, Right Skills, Right Places*, which analysed the impact of health and migration policies on the international movement and migration of foreign-trained doctors and nurses into the OECD countries (OECD, 2016^[4]).

² For details, please see https://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT#

2. Share of foreign-born and share of foreign-trained doctors continued to grow in most OECD countries

2.1. The overall number of doctors has continued to increase in most OECD countries

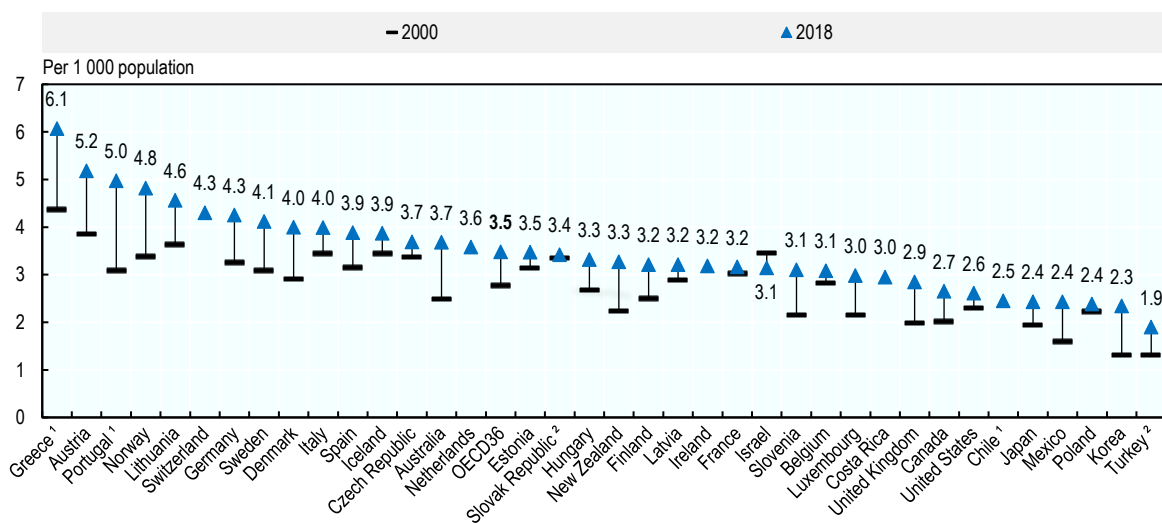
6. Concerns about shortages of health professionals are not new in OECD countries and have grown with the prospect of the retirement of the ‘baby-boom’ generation of doctors (OECD, 2016^[5]; OECD, 2008^[6]; OECD, 2007^[11]). Over the past decade, in many OECD countries these concerns prompted an increase in the number of students in medical education (OECD, 2019^[7]).

7. Because of these education and training policies, but also because of greater retention rates of current doctors and greater immigration of doctors in some countries, the overall number of doctors has continued to increase in most OECD countries since 2000. On a per-capita basis, there were 3.5 doctors per 1 000 population on average across OECD countries in 2018, up from 2.7 in 2000 (Figure 1).

8. Countries with a rapid relative growth in the number of doctors are found among those that have a per-capita number of doctors below the OECD average – such as Korea, Mexico, and the United Kingdom – as well as among countries above the OECD average – such as Australia, Sweden, and Austria. The number of doctors per capita has also grown quite rapidly in Norway, Sweden, and Germany.

9. At the other end of the spectrum, the number of doctors per capita has grown much more slowly or remained stable since 2000 in Belgium, France, Poland, and the Slovak Republic. In the latter four countries, the number of domestic students admitted in medical schools has increased in recent years, which should contribute to increasing the number of new doctors who will be available to replace those who will be retiring in the coming years, if these newly-trained doctors should end up working in these countries. The only exception is Israel, where the substantive growth of the absolute number of doctors by 20% did not keep pace with the population growth of 33%, resulting in a decrease in the number of doctors per capita from 2000 to 2018.

Figure 1. OECD countries – practising doctors per 1 000 population, 2000 and 2018 (or nearest year)



Notes: 1. Data refer to all doctors licensed to practice, resulting in a large over-estimation of the number of practising doctors (e.g. of around 30% in Portugal).

2. Data include not only doctors providing direct care to patients but also those working in the health sector as managers, educators, researchers, etc. (adding another 5-10% of doctors).

Source: OECD Health Statistics 2019

2.2. Foreign-born and foreign-trained doctors have significantly contributed to this rise

10. While the increase in the overall number of doctors in the OECD area has been driven largely by growing numbers of domestic medical graduates, foreign-born and foreign-trained doctors have also significantly contributed to this rise in many OECD countries. In particular, the total numbers as well as the shares of foreign-born or foreign-trained doctors in the overall number of doctors practicing in the OECD countries have continued to rise since 2000.

11. The proportion of doctors born abroad ranges from less than 2% in the Slovak Republic to more than 50% in Australia and Luxembourg (Table 1). Unsurprisingly, the proportions of foreign-born doctors are highest in the OECD countries with the highest share of immigrants (e.g. Australia, Canada, and Israel, Luxembourg and Switzerland). Ireland and the United Kingdom are also near the top of the list for shares of foreign-born doctors, while countries in Southern, Central, and Eastern Europe have the lowest proportions.

12. Among the 18 OECD countries for which data are available and comparable over time, the number of foreign-born doctors rose by nearly 70% between 2000/01 and 2015/16, a much higher growth rate than the overall increase in the number of doctors of around 33% (Table 1). As a result, the proportion of foreign-born doctors across these OECD countries rose by nearly 6 percentage points to 26.7%. This growth is due to both migration dynamics and differences in age structures between foreign-born and native-born doctors, which affect their exits from the labour market via retirement.

Table 1. Foreign-born doctors working in OECD countries, 2000/01, 2010/11 and 2015/16

	2000/01			2010/11			2015/16		
	Total	Foreign-born	% Foreign-born	Total	Foreign-born	% Foreign-born	Total	Foreign-born	% Foreign-born
Australia	48 211	20 452	42.9	68 795	36 076	52.8	87 471	47 154	53.9
Austria ¹	30 068	4 400	14.6	40 559	6 844	16.9	36 782 ¹	5 225 ¹	14.2
Belgium*	..	..	..	..	..	..	39 265	6 174	15.7
Canada	65 110	22 860	35.1	79 585	27 780	34.9	100 780	38 780	38.5
Czech Republic*	..	..	..	39 562	3 468	8.8	42 363	4 110	9.7
Denmark ²	14 977	1 629	10.9	15 403 ²	2 935 ²	19.1	18 593	3 904	21.0
Estonia*	..	..	..	4 145	747	18.0	5 299	742	14.0
Finland	14 560	575	4.0	18 937	1 454	7.7	20 121	1 917	9.5
France	200 358	33 879	16.9	224 998	43 955	19.5	198 802 ¹	31 227 ¹	15.7
Germany	282 124	28 494	11.1	366 700	57 210	15.7	390 039	78 907	20.2
Greece*	..	..	..	49 577	3 624	7.3	49 922	2 103	4.2
Hungary	24 671	2 724	11.0	28 522	3 790	13.3	33 532	3 761	11.2
Ireland	8 208	2 895	35.3	12 832	5 973	46.6	13 538	5 565	41.1
Israel*	..	..	..	23 398	11 519	49.2	28 264	13 753	48.7
Italy*	..	..	..	234 323	11 822	5.0	234 704	10 163	4.3
Latvia*	..	..	..	..	..	..	6 868	1 197	17.4
Luxembourg	882	266	30.2	1 347	536	40.0	2 006	1 103	55.0
Mexico*	205 571	3 005	1.5	..	..	..	..	..	..
Netherlands	42 313	7 032	16.7	57 976	8 429	14.6	65 744	11 247	17.1
New Zealand*	9 009	4 215	46.9	12 708	6 897	54.3	..	..	..
Norway	12 761	2 117	16.6	19 624	4 460	22.7	22 348	5 082	22.7
Poland*	99 687	3 144	3.2	109 652	2 935	2.7	..	..	..
Portugal	23 131	4 552	19.7	36 831	6 040	16.4	35 592	3 508	9.9
Slovak Rep.*	..	..	..	..	..	..	13 127	153	1.2
Slovenia*	..	..	..	5 556	1 006	18.1	..	..	..
Spain ¹	126 248	9 433	7.5	210 500	21 005	10.3	189 396 ¹	25 875 ¹	13.7
Sweden ³	26 983 ³	6 148 ³	22.9	47 778	14 173	29.8	50 437	15 372	30.5
Switzerland ³	23 039 ³	6 431 ³	28.1	43 416	18 082	41.6	49 760	23 438	47.1
Turkey*	82 221	5 090	6.2	104 950	3 003	2.9	..	..	..
UK ⁴	147 677	49 780	33.7	236 862 ⁴	83 951 ⁴	35.4	262 465	86 866	33.1
USA	807 844	196 815	24.4	838 933	221 393	26.4	958 666	289 106	30.2
OECD Total* (18 countries)	1 899 165	400 482	21.1	2 488 227	590 503	23.7	2 536 072	678 037	26.7
OECD Total for a given year	2 295 653	415 936 (22 countries)	18.1	3 072 098	635 524 (27 countries)	20.7	2 955 884	716 432 (26 countries)	24.2

Notes: Doctors whose place of birth is unknown are excluded from the calculation of the percentage of foreign-born doctors.

* OECD total includes 18 countries, for which data is available in 2000/01, 2010/11, and 2015/16. Countries with an asterisk (*) are not counted.

1. Other source indicate an increase in the number of doctors in Austria, France, and Spain between 2010/11 and 2015/16.

2. Some doctors undergoing specialty training may not be counted in 2011. 3. Some doctors undergoing specialty training may not be counted in 2000. 4. The increase in the total number of doctors and number of foreign-born doctors is partially due to change of data source from census data to Labour Force Survey (LFS) between 2000/01 and 2010/11.

Source: (OECD, 2007^[1]) for 2000/01, DIOC 2010/11 and LFS 2009/12, DIOC 2015/16 and LFS 2015/16³.

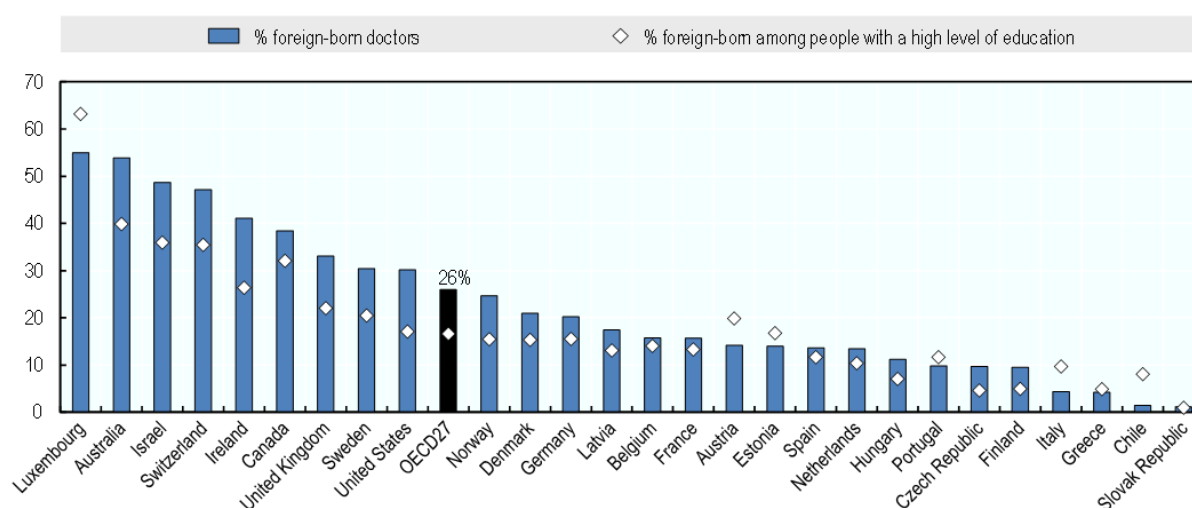
³ Countries for which data for 2000/01 are derived from a census: AUS, AUT, CAN, CHE, ESP, FIN, FRA, GBR, HUN, IRL, LUX, MEX, NZL, POL, TUR, USA; Countries for which data for 2000/01 are derived from LFS: BEL, DEU, NLD,

13. Between 2010/11 and 2015/16, increases in the share of foreign-born doctors were highest in Luxembourg (+15 percentage points), Switzerland (+6), Germany (+5), Canada (+4), and the United States (+4). In terms of absolute numbers, the greatest increase in the number of foreign-born doctors is observed in the United States (+67 700) and Germany (+21 700), followed by Australia and Canada (+11 000). By way of comparison, the increase in the United Kingdom was below 3 000.

14. Declines in the number and share of foreign-born doctors occurred in some OECD countries, in particular in Greece and Portugal (-3 and -6 percentage points) between 2010/11 and 2015/16. This negative trend may be related to the economic difficulties and government-debt crisis after 2010, which may have made these countries relatively less attractive for migrant doctors.

15. The share of foreign-born doctors does not always mirror that of immigrants – particularly those who are skilled – in the workforce as a whole. For those countries, for which data is available, the percentage of foreign-born doctors tends to be greater than the percentage of immigrants among highly educated workers, especially among countries hosting higher shares of migrant doctors (Figure 2).

Figure 2. Percentage of foreign-born among doctors and among people with high level of education in 27 OECD countries, 2015/16



Note: The OECD average is the unweighted average for the 27 OECD countries presented in the chart.

Source: DIOC 2015/16, LFS 2015/16.

16. In most OECD countries, the proportion of doctors born abroad is also higher than the proportion trained abroad. In some cases, this might be reflecting the fact that destination countries provide education and training to migrants who may have moved at an early age with their families or moved to pursue their medical education. For instance, around 40% of foreign-born doctors in Australia received their medical education there

NOR. Countries for which data for 2010/11 are derived from a census: AUS, CAN, CZE, DNK, ESP, EST, FIN, FRA, HUN, ISR, LUX, NLD, NOR, NZL, POL, PRT, SVK, SVN, USA; Countries for which data for 2010/11 are derived from LFS: AUT, BEL, CHE, CZE, DEU, GBR, GRC, HUN, IRL, ITA, SWE, TUR. Countries for which data for 2015/16 are derived from a census: AUS, CAN, DEU, FRA, HUN, IRL, USA; Countries for which data for 2015/16 are derived from LFS: AUT, BEL, CHE, CHL, CZE, ESP, GBR, GRC, ISR, ITA, LUX, LVA, NLD, PRT, SVK, SVN, SWE; Countries for which data for 2015/16 are derived from a population register: DNK, FIN, NOR.

(OECD, 2019^[7]). In Denmark, nearly all foreign-born doctors have completed their medical education in one of the Danish medical schools.

17. Still, the number and share of foreign-trained doctors working in the OECD area have also grown significantly. In 2017/18, on average more than 18% of the doctors working in OECD countries had obtained at least their first medical degree in another country, up from less than 14% a decade earlier. The share of foreign-trained doctors ranges from less than 3% in Turkey, Lithuania, Italy, the Netherlands, and Poland, to around 40% in Norway, Ireland, and New Zealand, with Israel having the highest share of nearly 60% in 2017/18 (Table 2).

18. However, as with the classification of doctors by place of birth, there are also caveats to the classification by the place of training. It is important to keep in mind that not all of the foreign-trained doctors are foreigners: a large and growing number in some countries – in particular, Israel, Norway, Sweden, and the United States – are people born in the country who went to study medicine abroad before coming back to practice in their home country. Frequently, these foreign-trained but native-born doctors had to pay the full cost of their studies abroad, from their own resources or through loans/scholarships from their home countries (OECD, 2019^[3]). The most recent data and additional studies reveal that:

- In Israel, in 2017, around 40% of the foreign-trained doctors are native-born, up from 22.5% in 2006.
- In Norway, in 2018, more than half of the foreign-trained doctors are native-born, with the share remaining at around 50% since 2006.
- In Sweden, the number of foreign-trained natives nearly quadrupled since 2006, accounting for 15% of foreign-trained doctors in 2016.
- In the United States, a growing number of foreign-trained doctors are American citizens who studied mostly in the Caribbean before coming back to their home country to practice medicine. In 2017, American citizens were by far the most numerous group – more than 30% – of international medical graduates who obtained a certification to practice in the United States (up from 17% in 2007) (OECD, 2019^[7]).

19. Outside Europe, the share of foreign-trained doctors has increased greatly in New Zealand and Australia between 2006 and 2011, but has started to decline in recent years as the number of home-trained doctors increased faster. In Canada, both the number and share of foreign-trained doctors have increased steadily, whereas the share has remained relatively stable in the United States as the number of foreign-trained doctors increased at the same rate as the home-trained.

20. In Europe, the share of foreign-trained doctors has increased rapidly over the past decade in Ireland, Norway, Sweden, and Switzerland, whereas it has decreased slightly in the United Kingdom, as the number of home-trained doctors has increased slightly more rapidly. However, as mentioned above, in Norway and Sweden the growth is largely due to the rising numbers of foreign-trained but native-born doctors. In Belgium, France, and Germany, the number and share of foreign-trained doctors has also increased steadily over the past decade, with the share doubling from about 5% to 6% of all doctors in 2006 to 11 to 12% in 2017/18.

Table 2. Foreign-trained doctors working in OECD countries, 2006/07, 2011/12, and 2017/18 (or nearest year)

	2006/07 (or nearest year)				2011/12				2017/18 (or nearest year)			
	Year	Total	Foreign-trained (of which natives) ¹	% Foreign-trained (natives) ¹	Year	Total	Foreign-trained (of which natives) ¹	% Foreign-trained (natives) ¹	Year	Total	Foreign-trained (of which natives) ¹	% Foreign-trained (natives) ¹
Australia	2007	62652	14808	23.6	2012	75258	24892	33.1	2017	90417	29000(333)	32.1(0.4)
Austria	2006	30426	926	3.0	2011	33656	1372(151)	4.1(0.4)	2018	38252	2282(399)	6.0(1.0)
Belgium	2006	49695	2636	5.3	2011	54851	5033	9.2	2018	66561	8061	12.1
Canada	2006	70870	15275	21.6	2011	84313	19864	23.6	2017	99812	24587	24.6
Chile ^{2*}		..	..	..		..	..	..	2018	48531 ²	11038(2030)	22.7(4.2)
Czech Rep.	2006	44064	1744	4.0	2011	42166	1984	4.7	2018	43951	3232	7.4
Denmark	2006	18402	1144	6.2	2011	20201	1141	5.7	2016	22902	2111	9.2
Estonia	2006	5336	30	0.6	2011	5884	102	1.7	2018	6787	262	3.9
Finland [*]		2011	20502	3882	18.9		..	..	..
France	2006	212711	12261	5.8	2011	216762	17857(542)	8.2(0.2)	2018	226859	26048(715)	11.5(0.3)
Germany ³	2006	284427	14703 ³	5.2	2011	312695	22829 ³	7.3	2017	352869	41934 ³	11.9
Greece ^{2, 4, *}		..	..	..	2012	63838 ²	8005 ⁴ (7716)	12.5(12.1)	2017	65240 ²	8367 ⁴ (7832)	12.8(12.0)
Hungary	2006	37908	2917	7.7	2011	32966	2525	7.7	2017	32543	2614(400)	8.0(1.2)
Ireland ^{2*}		..	..	..	2011	18812 ²	6708	35.7	2018	23012 ²	9583	41.6
Israel	2006	2467	15342(3448)	62.2(14.0)	2011	26337	15777(4342)	59.9(16.5)	2018	29580	17133(6963)	57.9(23.5)
Italy ²	2006	357519 ²	2488(1193)	0.7(0.3)	2011	377376 ²	3088(1339)	0.8(0.3)	2018	402811 ²	3378(1443)	0.8(0.4)
Latvia	2006	7510	605	8.1	2011	7930	567	7.2	2017	8022	477	6.0
Lithuania [*]		2018	14836	72	0.5
Netherlands	2006	45051	941	2.1	2011	51939	1352	2.6	2016	60233	1336(483)	2.2(0.8)
New Zealand	2006	11889	4833	40.7	2011	14039	6111	43.5	2018	17025	7228	42.5
Norway	2008	18557	5996(2987)	32.3(16.1)	2011	20649	7153(3529)	34.6(17.1)	2018	25428	10248(5492)	40.3(21.6)
Poland	2008	119604	2529	2.1	2011	123281	2172	1.8	2017	135468	2549	1.9
Portugal ^{2*}		..	..	..		..	..	..	2017	51241 ²	6229(2865)	12.2(5.6)
Slovak Rep. [*]		2011	16899	506	3.0		..	..	..
Slovenia [*]		2011	5121	604	11.8	2018	6409	1085(147)	16.9(2.3)
Spain [*]		2011	207042	19462	9.4		..	..	..
Sweden	2006	32833	6351(542)	19.3(1.7)	2011	37499	9106(1011)	24.3(2.7)	2016	40851	14195(2117)	34.8(5.2)
Switzerland	2008	29653	6477	21.8	2011	30849	7808	25.3	2017	36900	12570	34.1
Turkey	2006	104475	240(210)	0.2(0.2)	2011	126029	261(222)	0.2(0.2)	2015	141259	262(223)	0.2(0.2)
UK	2008	147417	44050	29.9	2011	158439	46399	29.3	2018	174845	51115	29.2
USA	2006	664814	166810	25.1	2011	791602	195196	24.7	2016	862965	215630	25.0
OECD Total* (22 countries)		2358280	323106	13.7		2644721	392589	14.8		2916340	476252	16.3
OECD Total for a given year		2358280	323106	13.7		2976935	503805	16.1		3125609	587933	18.2
			(22 countries)				(28 countries)				(28 countries)	

Notes: 1. So far only 14 OECD countries report data on the number of foreign-trained but native-born doctors.
2. Data refer to all doctors licensed to practice, resulting in a large over-estimation of the number of practising doctors.

3. Data refer to foreign citizens (not necessarily foreign-trained).

4. Limited data coverage: Information is partially missing (e.g. 35% missing for 2017).

* OECD total includes 22 countries, for which data is available in 2006/07, 2011/12, and 2017/18. Countries with an asterisk (*) are not counted in this total due to data gaps at least for one year.

Source: OECD Health Statistics 2019.

2.2.1. Mobilising foreign-trained doctors in response to COVID-19 pandemic

21. The COVID-19 pandemic revealed once more that migrant doctors are key assets for health systems in many OECD countries. Availability of a sufficient number of skilled and motivated health workers is central to maintaining resilience of health systems in times of health emergencies. Along with bringing into the spotlight the important role and dedication of frontline health workers, the COVID-19 crisis has further highlighted the deeply embedded challenge of staff shortages as well as the significant contribution that migrant doctors make to the health workforce in many OECD countries.

22. During the COVID-19 pandemic, many of the OECD countries already reliant on migrant doctors have further recognised them as key assets, and implemented additional policy measures to ease their entry or renew work authorisation (Box 2).

Box 2. Mobilising foreign-trained doctors in response to COVID-19 pandemic

In response to COVID-19, a number of OECD countries (or states and provinces in the United States and Canada, respectively) have taken action to enable migrant health professionals to help meet the surge in demand for health care. These actions may have taken the form of facilitating renewal of work authorisation or recruitment, temporary and/or restricted licensure, fast-track processing of recognition of foreign qualifications, or enhancing access to some jobs in the health sector.

- International mobility and recruitment of foreign health workers
 - In April 2020, the European Commission called on “Member States to facilitate the smooth border crossing for health professionals and allow them unhindered access to work in a healthcare facility in another Member State” [C\(2020\) 2153](#).
 - Most OECD countries have exempted health professionals with a job offer from travel bans and some continued processing their visa applications (including the United States).
 - In the United Kingdom, doctors, nurses and paramedics with visas due to expire before 1 October 2020 will have them automatically extended for one year.
- Work authorisations
 - In Chile, in health emergencies, the National Health Service can hire foreign health professionals even if they have not their qualifications formally recognised.
 - In France, non-licensed foreign-trained health professionals can work as support staff in non-medical occupations.
 - Spanish ministries have launched urgent, coordinated action for the immediate hiring of foreign health workers willing to work in Spain.
- Facilitating recognition of foreign qualifications
 - A number of OECD countries have decided to expedite current applications for the recognition of foreign qualifications of health professionals (e.g., Belgium, Germany, Ireland, Luxembourg), or to simplify procedures (e.g.,

reduced language test in Germany, no in-person meeting in Lithuania, fee waivers in Ireland).

- In the Canadian province of Ontario, international medical graduates (IMG) who have passed their exams to practise in Canada or have graduated in the past two years can apply for a supervised 30-day medical licence (Supervised Short Duration Certificate). In the province of British Columbia, IMG with at least two years of postgraduate training and who passed the Licentiate of the Medical Council of Canada qualifying exams can work as associate physicians under supervision.
- Italy has adopted a decree that enable temporary licensing of foreign-trained health professionals.
- In Germany, in Bavaria, foreign doctors may be offered permission to work as assistants for one year.
- In the United States, the State of New York gives IMGs access to a limited permit already after one year of approved postgraduate training instead of three (EO 202.10). Similar measures have been adopted by the State of Massachusetts (2 years of postgraduate resident medical training instead of 3) while New Jersey has created a pathway for foreign-licensed physicians to get a temporary emergency license to practice medicine. In other states such as California, Colorado or Nevada, authority has been delegated to the Chief of Medical Services to provide waivers regarding licensing of foreign health professionals (<https://web.csg.org/covid19/executive-orders/>).

Source: (OECD, 2020^[81])

3. Main countries of origin for migrant doctors working in the OECD area

3.1. Main countries of origin represent all income levels

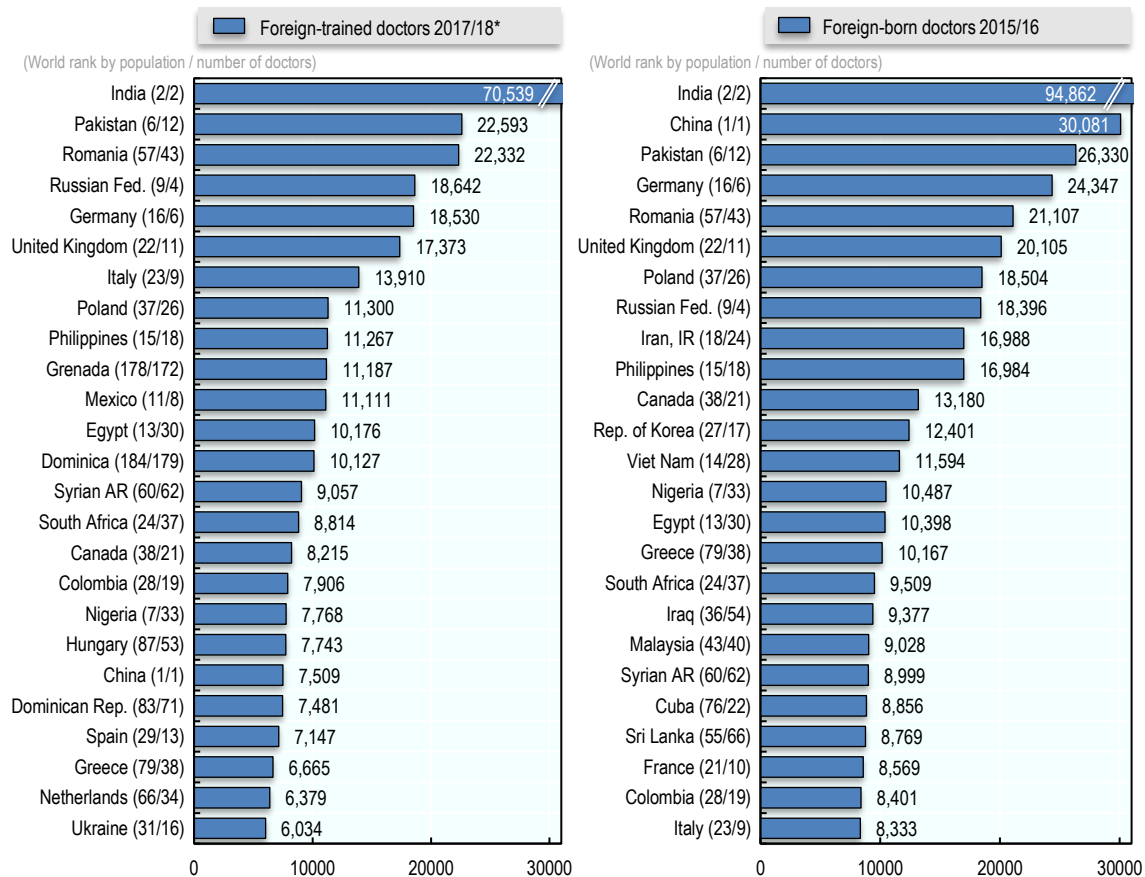
23. The main countries of origin of foreign-born or foreign-trained doctors working in the OECD area comprise both non-OECD and OECD countries and represent all income levels (Figure 3).

24. The largest groups of foreign-born or foreign-trained doctors working in the OECD area originate from among the countries with the largest populations (left-hand number inside the brackets next to the country names indicates the world rank by population size) such as India, China, or Pakistan, but also relatively less populous countries belonging to the European Union (EU) or the OECD, such as Romania, Germany, the United Kingdom, or Poland. The Russian Federation, with its large total number of physicians (right-hand number in the brackets next to the country names) also ranks high.

25. Given its vast size by the population and the number of doctors as well as English as the official language, India comes out as the main country of origin for foreign-born or foreign-trained doctors working in the OECD area. China is second in terms of foreign-born doctors, but is overtaken by much smaller countries for foreign-trained doctors, for instance, by Grenada and Dominica. It should be noted, however, that these small Caribbean countries have made an industry of providing medical education to fee-paying foreign students, coming mainly from the United States and Canada (OECD, 2019^[91]). Moreover, the relatively low reported number of migrant doctors trained in China may be

partially due to medical students moving abroad already after completing the undergraduate part of medical education (i.e. before obtaining the first medical degree) or repeating their medical education in countries of destination.

Figure 3. Top 25 countries of origin of foreign-trained or foreign-born doctors working in the OECD area



Note: *or nearest year
 Source: OECD Health Statistics 2019; DIOC 2015/16 and LFS 2015/16

26. The third and fifth position on the top-25 lists of the comparatively small (in population and number of doctors at home) Romania is notable. A number of factors contributed to the growing international movement of the Romanian doctors, particularly the country’s relative wealth and accession to the European Union (EU) in 2007, with the automatic recognition of medical qualifications across all EU countries since 2005. It should be noted, however, that Romania has also become an attractive international medical education hub, as the country’s medical schools offer diplomas with EU-wide recognition for relatively low tuition fees and living costs. In academic year 2018/19, nearly all medical schools offered programmes in English and/or French, taking up around 30% of the total new-entrant teaching capacity (OECD, 2019_[10]).

27. Similarly, Poland is among the top-10 countries of origin on the foreign-born as well as foreign-trained lists, despite coming relatively far down in the ranking with regard to the size of general population or physician workforce. Here too, the EU-wide recognition of medical qualifications plays a major role. Also, since 1993, most Polish medical schools have offered study programmes in English for fee-paying foreign students. In the academic

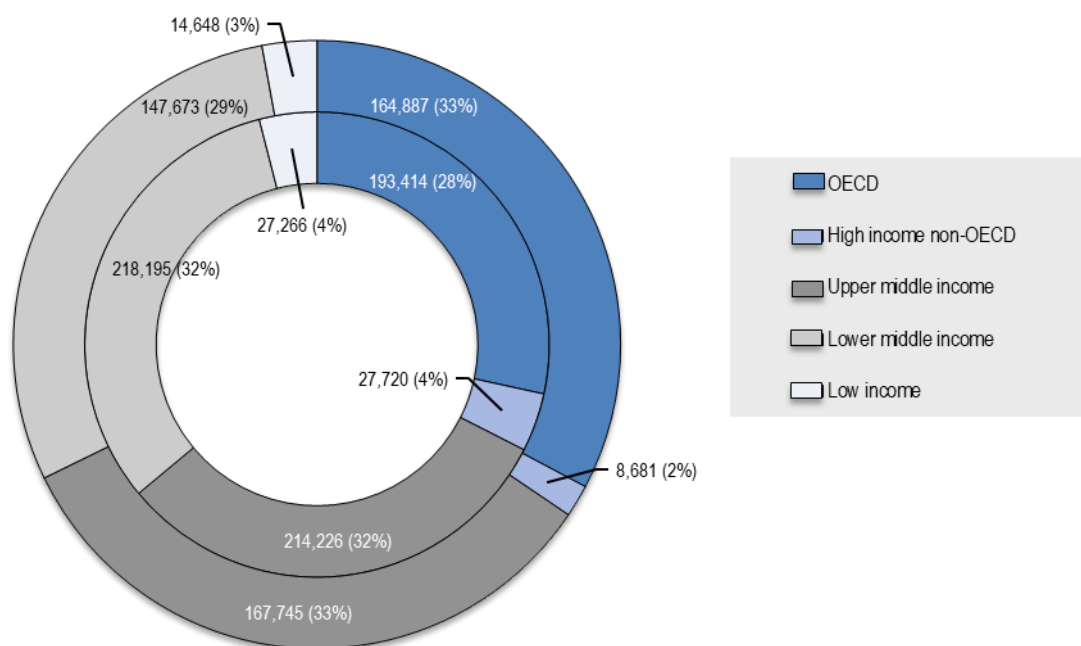
year 2017/2018, international students accounted for one-fifth of all medical students in Poland (OECD, 2019^[11]).

28. The sizable contribution from some of the African and Middle East countries – such as Egypt, Iran, Nigeria, or South Africa - becomes also remarkable considering the comparatively small total number of doctors in these countries, especially in relation to the size of the population. Moreover, the Syrian Arab Republic is the only low-income country among the top 25 countries of origin. Its high rank can be partially explained by the armed conflict the country has been suffering from, which led to exodus of the population.

3.2. Intra-OECD flows make up a third of the migration volume into the OECD countries

29. The OECD area is the origin for exactly a third of all foreign-trained and almost a third of all foreign-born doctors working in the OECD countries (Figure 4). Another third of the migrant doctors originate from the upper-middle-income countries (non-OECD), around 30% from the lower-middle-income countries, and around 3-4 % from the low-income countries.

Figure 4. Distribution of foreign-trained (outer ring) and foreign-born (inner ring) doctors working in OECD area by country income groups



Note: Data for foreign-trained doctors is from 2017/18 (or nearest year); Data for foreign-born doctors is from 2015/16.

For income groups, the [World Bank classification](#) is used, in which economies are currently divided into four income groupings using gross national income (GNI) per capita, in USD, converted from local currency.

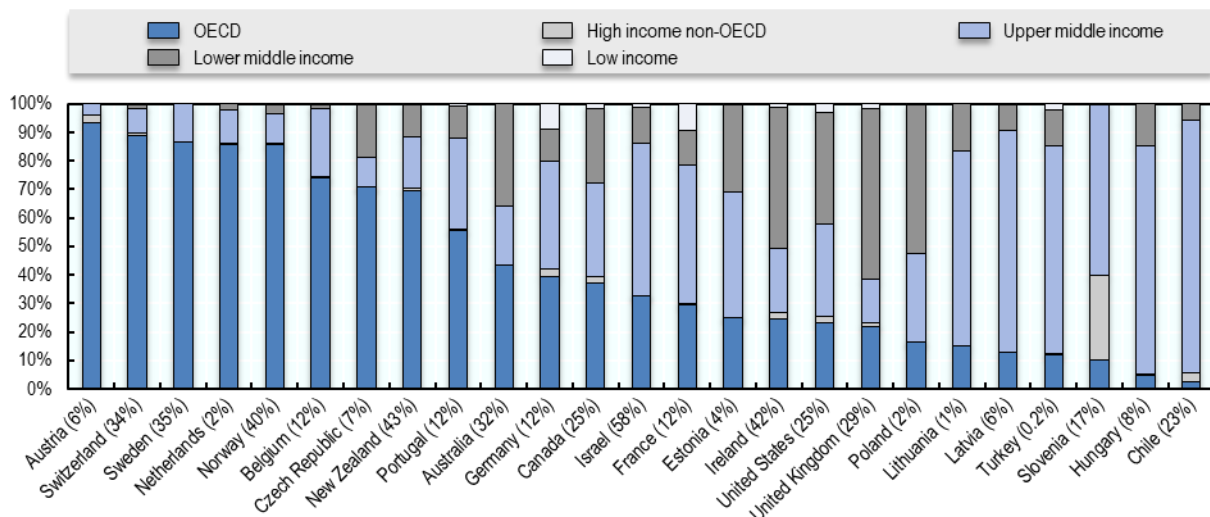
Source: OECD Health Statistics 2019; DIOC 2015/16 and LFS 2015/16

30. While generally, the majority of foreign-trained or foreign-born doctors working in the OECD area, are coming from high and upper-middle-income countries, different groups of OECD countries host migrant doctors from different income regions (Figure 5 and Figure 6).

31. For some of the OECD countries with the largest shares of foreign-trained doctors – such as Switzerland, Sweden, Norway, or New Zealand – between 70% to nearly 90% of foreign-trained doctors come from within the OECD area (Figure 5). Also in some of the countries with low to medium shares of migrant doctors – Austria, Netherlands, the Czech Republic, Belgium, or Portugal - the majority of foreign-trained doctors come from other OECD countries.

32. The highest shares of doctors trained in lower-middle-income and low-income countries taken together can be found in the United Kingdom (62%), Ireland (51%), and the United States (42%). Poland also hosts high share (52%) of doctors trained in lower-middle-income and low-income countries, but its general share of foreign-trained doctors is among the lowest in the OECD area (below 2%). Doctors trained in low-income countries work in around half of the OECD countries, with the average share of 2% and a maximum share of 9%, realised in France and Germany.

Figure 5. Distribution of foreign-trained doctors by country income groups in selected OECD countries, 2017/18 (or nearest year)



Note: Numbers in the brackets next to the country names indicate the overall share of foreign-trained doctors in each country. For income groups, the World Bank classification is used, in which economies are currently divided into four income groupings using gross national income (GNI) per capita, in USD, converted from local currency.

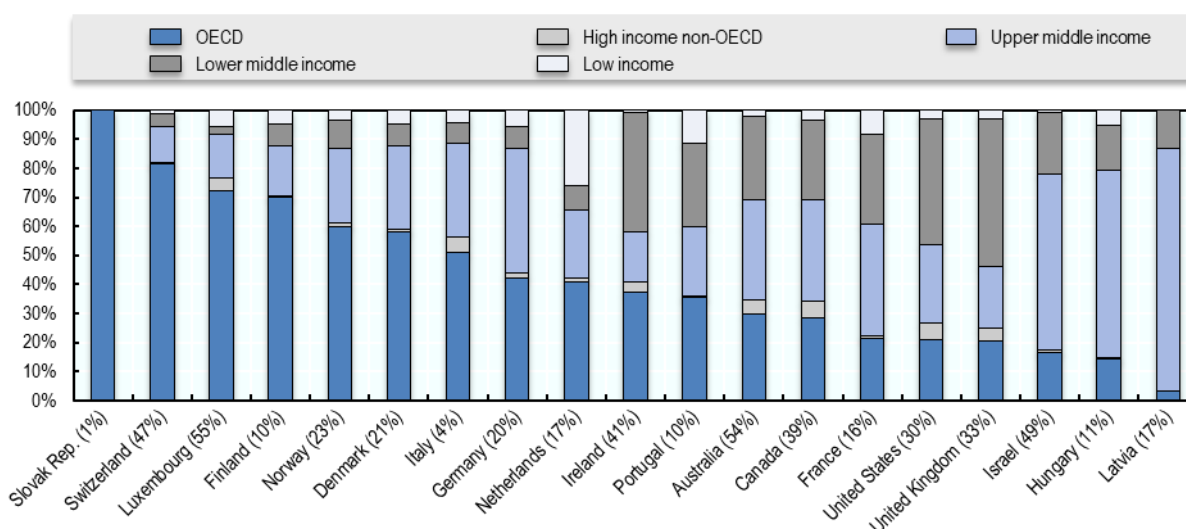
Data are presented for 25 OECD countries that submitted detailed statistics allowing to group foreign-trained doctors by country of training.

Source: OECD Health Statistics 2019

33. When it comes to foreign-born doctors, the available data reveals patterns similar to that described above for foreign-trained doctors working in the OECD area. A third of the OECD countries (all in Europe) – including some of the countries with the largest shares of migrant doctors, such as Luxembourg and Switzerland – host doctors born predominantly in other OECD countries (Figure 6).

34. The United Kingdom and the United States receive relatively high share of doctors born in lower-middle and low-income countries taken together, with the combined share exceeding 50% in the United Kingdom. The largest share of doctors born in low-income countries is in the Netherlands (26%), followed by Portugal and France – 12 and 8%, respectively.

Figure 6. Distribution of foreign-born doctors by country income groups in selected OECD countries, 2015/16



Note: Numbers in the brackets next to the country names indicate the overall share of foreign-born doctors in each country. For income groups, the [World Bank classification](#) is used, in which economies are currently divided into four income groupings using gross national income (GNI) per capita, in USD, converted from local currency.

Data are presented for 19 OECD countries that submitted detailed statistics allowing to group foreign-born doctors by country of birth.

Source: DIOC 2015/16 and LFS 2015/16.

3.2.1. Intra-OECD sending and receiving countries

35. The unique data collected by the OECD allows to analyse each of the OECD countries as a country of origin and as a country of destination simultaneously, allowing to calculate net stocks of migrant doctors, i.e. the number of doctors born/trained in an OECD country A and working in an OECD country B minus the number of doctors born/trained in country B and working in country A.

36. Figure 7 depicts all these within-OECD net stocks⁴ for foreign-trained doctors (see also Table A.2), which are very well approximated by a cascade pattern, i.e. generally, countries higher in the cascade send net-stocks of home-trained doctors to one or more countries lower in the cascade.

- The United States (bottom of the Figure) hosts net stocks of doctors trained in 18 other OECD countries and is the main net-receiving country, with the exception of a relatively smaller net stock of doctors trained in the United States and working in New Zealand.
- Chile (top of the Figure), to the contrary, is connected with only one other country – sending net-stocks of home-trained doctors to the United States - and does not receive doctors from any other OECD country.
- A high-volume net exchange occurs in the Anglosphere countries, which form a sub-cascade (dark blue lines) proceeding from Ireland, over the United Kingdom, Australia, and Canada to the United States, and to New Zealand. All other OECD countries, send net-stocks of home-trained doctors to one or more countries in the

⁴ The net stocks of more than +/-100 doctors.

Anglosphere, with the exception of Estonia (sending net stocks only to Finland) and Portugal (sending net stocks only to Germany).

- One can also distinguish a Scandinavian sub-cascade (light blue lines), which leads from Sweden into Norway and Finland (including Estonia that feeds into Finland).
- Other sub-cascades characterised by linguistic and geographic proximity are formed by Austria, Germany, and Switzerland as well as the Netherlands, Belgium, France, and Switzerland as the main receiver again. Germany stands out as a turntable, insofar as it maintains net stocks in 11 as well as from 10 other OECD countries, i.e. it is more connected than any other OECD country.
- Eastern European countries are standing out as sending countries, of which Hungary, Poland, and Slovak Republic are not receiving any net-stocks of doctors trained in other OECD countries.

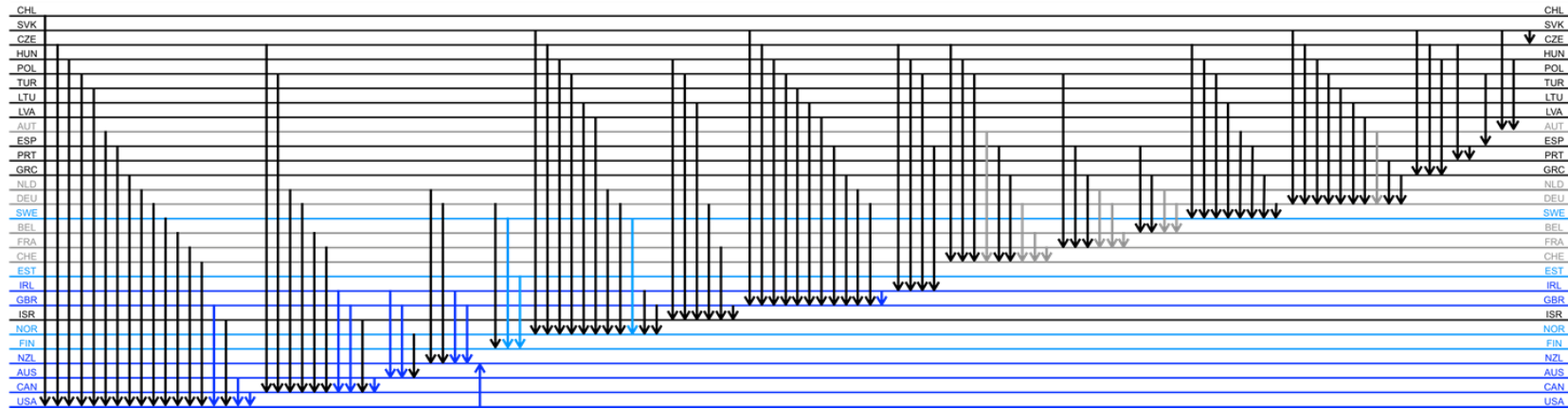
37. It should be noted that the ordering of the countries according to the direction of the net flows does not generally coincide with the ordering with respect to the total net stock of doctors each country has owing to the exchanges with all other OECD countries taken together. This is because the ordering according to the net stocks takes into account the direction/sign of the flows, but not their magnitude.

38. The net stocks with respect to the place of birth give a more turbulent picture, i.e. with more retrograde flows. Still, a cascade pattern remains discernible (Figure 8 and Table A.3).

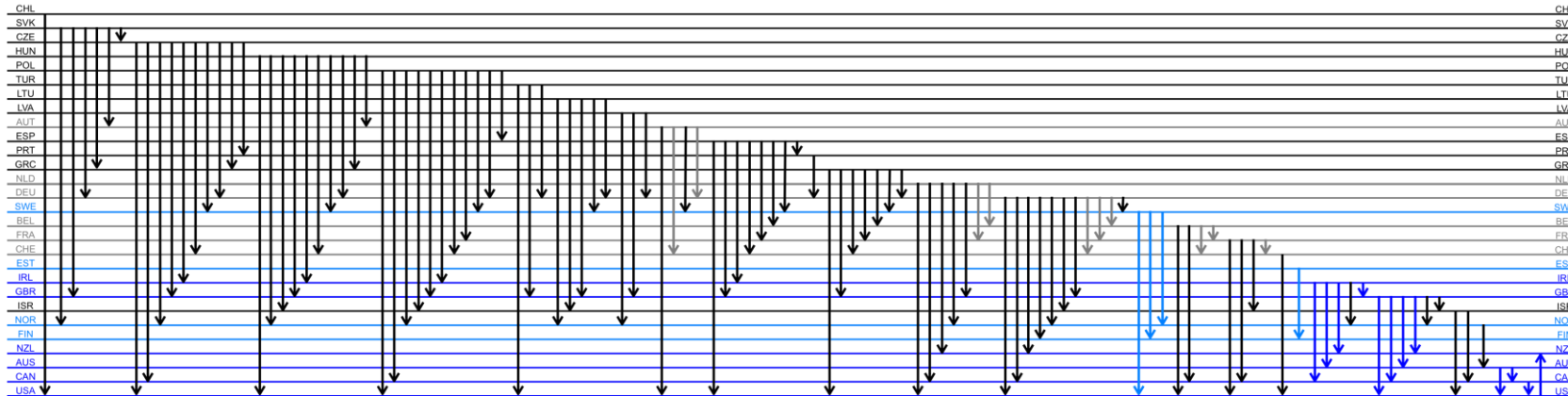
- The United States is receiving net stocks of doctors born in 13 other OECD countries, but is not at the bottom of the cascade anymore as it sends net stocks of native-born doctors to Australia, Portugal, and Sweden.
- The Anglosphere sub-cascade (dark blue) runs again from Ireland through the United Kingdom, Canada, the United States, but ends in Australia, which is the only country not sending net stocks of native-born doctors to any other OECD country. Again, all other OECD countries, send net-stocks of native-born doctors to one or more countries in the Anglosphere, with the exception of Luxembourg (sending net stocks only to Germany) and Sweden (having exchange only with Norway).
- A Scandinavian sub-cascade (light blue) can still be identified. With respect to the place of birth Finland – previously at the receiving end when looking at the place of training – sends net stocks of native-born doctors to Sweden, which sends net stocks to Norway.
- A Western European sub-cascade (grey) can be distinguished for the foreign-born doctors, with Luxemburg at the top, progressing through Germany and France into the Netherlands and Switzerland. Here again, Germany is the most connected country, but the number of countries receiving doctors born in Germany is twice as high (12) as those sending to Germany (6).

Figure 7. Intra-OECD migration of doctors by place of training, net stocks 2017/18 (or nearest year)

Net stocks by place of training, grouped by country of destination



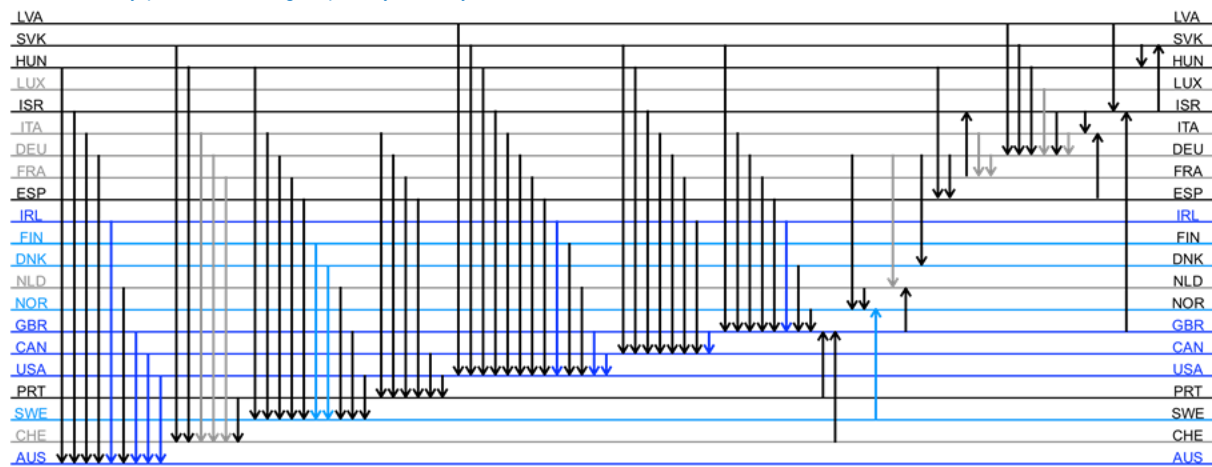
Net stocks by place of training, grouped by country of origin



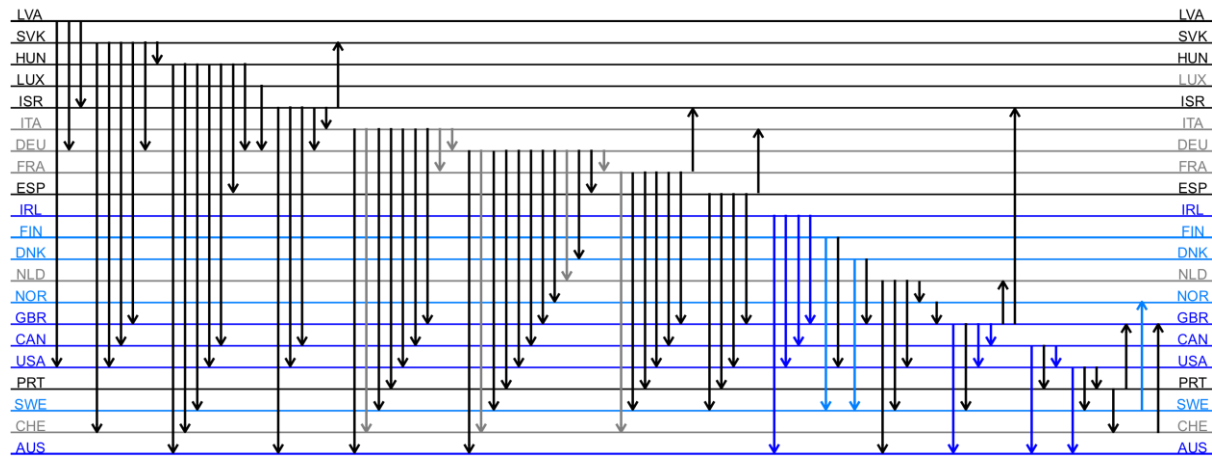
Source: OECD Health Statistics 2019

Figure 8. Intra-OECD migration of doctors by place of birth, net stocks 2015/16

Net stocks by place of birth, grouped by country of destination



Net stocks by place of birth, grouped by country of origin



Source: DIOC 2015/16 and LFS 2015/16

4. Impact of international migration of doctors to and within the OECD area on origin countries

4.1. Impact on overall number of doctors in countries of origin

39. The international migration of doctors gives rise to concerns about the impact on countries of origin. One way to quantify the impact of emigration to and within the OECD area on the countries of origin, is to calculate emigration rate, i.e. to compare the number of doctors born or trained in a given country but working in (other) OECD countries to the number of doctors that would be in the country, if all these migrants worked there as doctors⁵ (OECD, 2007^[1]). By taking data on doctors in the countries of origin from the

⁵ Emigration rates are computed as follows: X_i = number of foreign-born or foreign-trained doctors working in OECD countries born in country i ; Y_i = number of doctors working in country i ; emigration rate = $X_i / (X_i + Y_i)$.

WHO Global Health Observatory⁶ (and OECD Health Statistics for the OECD member and partner countries⁷), the emigration rates were computed for 188 countries (Table A.1 in the Annex)⁸. The emigration rates are, however, lower-bound estimates as they do not account for migrant doctors who work outside medicine and due to data gaps in the data sources discussed in Box 1.

40. Moreover, as mentioned earlier, for the interpretation of the results presented in the remainder of this paper, one should keep in mind that there are also significant (but not uniformly documented) regular flows of migrant doctors among non-OECD countries, in particular within Africa and South America, and into China.

41. Almost three quarters of all the countries of origin have at most 10% of their home-trained doctors working in (other) OECD countries, and around half have at most 10% of native-born doctors working in (other) OECD countries. In the vast majority of countries, the number of emigrated native-trained doctors is lower than the number of emigrated native-born doctors, on average 20% lower, but following rather different patterns.

42. Generally, in the largest countries of origin, migration to (other) OECD countries remains moderate, but in some smaller countries, some of which have relatively weak health systems with low number of doctors, emigration can be substantial (Figure 9). Among the three main countries of origin for migrant doctors working in OECD countries (see Figure 3), emigration rates for home-trained or native-born doctors are moderate (6 and 8% for India) or low (0.3 and 1% for China), but not in Romania with emigration rates of about one third for both home-trained as well as native-born doctors.

43. Among the remaining top 10 countries of origin, the emigration rates for doctors trained or born in the country are also moderate to low, except for Poland and Iran, with emigration rates for native-born doctors of 17% and 16%, respectively. For Pakistan, the trained/born emigration rates are 11 / 12%; for the Russian Federation, 3 / 3%; for Germany, 5 / 6%; for the United Kingdom, 8 / 10%; for Italy, 5 / 3%; and for the Philippines, 9 / 12% (Table A.1 in the Annex).

44. Emigration rates of between one third and one half, for doctors either born or trained in a country, are found in 20 out of the 188 studied countries of origin, predominantly in Africa (e.g. Cameroon, Congo, Mozambique) and the Americas (e.g. Belize, Jamaica, Suriname), but also in Europe (Malta and Albania), the Western Mediterranean region (Afghanistan, Lebanon, and Syrian Arab Republic), and the Western-Pacific (Fiji, Haiti, and Papua New Guinea). Lower but still substantial emigration rates of around 20% to 30% for home-trained doctors are found in a number of European countries such as Iceland, Ireland, the Slovak Republic, and Estonia (Figure 9).

45. There are nine countries with emigration rates for doctors born in the country exceeding 50%, which means that more doctors born in these countries are working in the OECD area than in the country of origin. The majority of these countries are in Africa, except for Samoa and Guyana (emigration rate of 64 and 53%, respectively). Sao Tome and Principe with an emigration rate of 82% for people born in the country but working as doctors in the OECD area is followed by Liberia (76%), Zimbabwe (64%), Gambia (60%), Malawi (58%), Somalia (57%), and Sierra Leone (54%). Most of these countries, however, train relatively few doctors and have zero or low emigration rates for home-trained doctors,

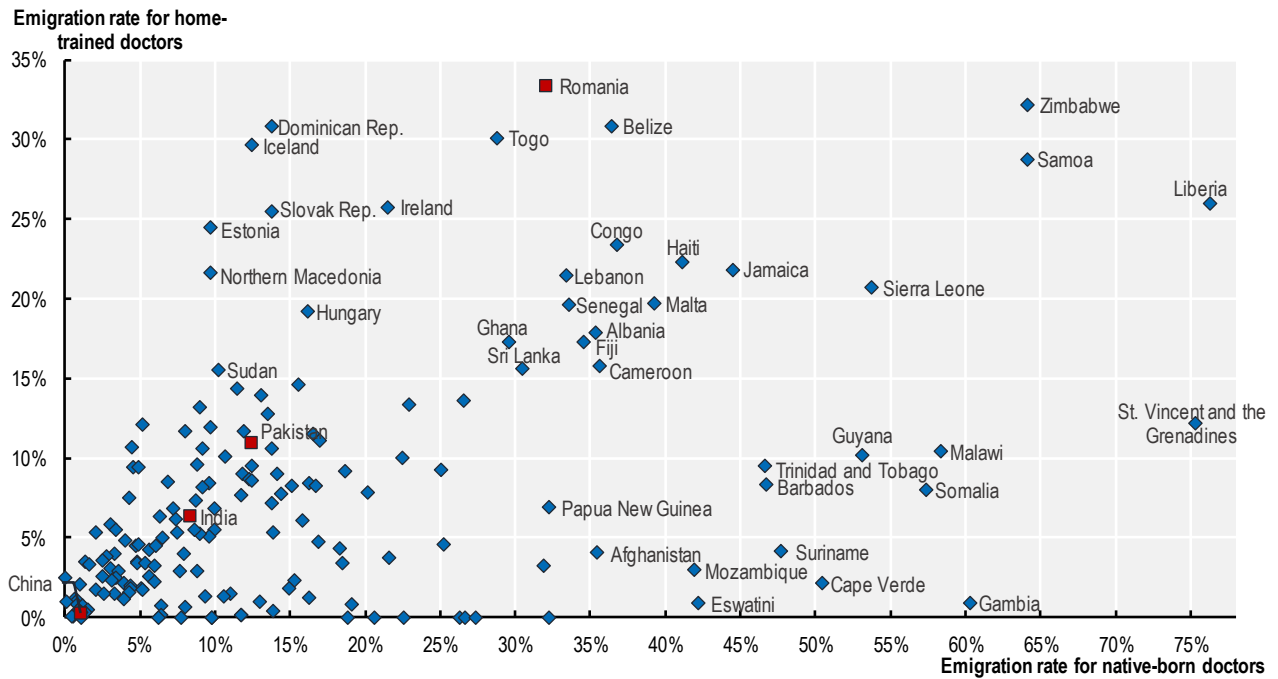
⁶ http://apps.who.int/gho/data/node.main.HWFGRP_0020?lang=en

⁷ https://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT#

⁸ Note that not all doctors working in the country of origin have necessarily been trained in that country so the emigration rate by place of training might be under estimated.

except for Zimbabwe, Liberia, and Sierra Leone, for which these rates are 32%, 26%, and 21%, respectively. Nearly all of these countries are recognised as priority countries for migration-related support and safeguards, in so far as they fall behind on the WHO established benchmarks regarding health workforce density and access to essential health services (WHO, 2019_[12]).

Figure 9. Countries of origin – top 25 emigration rates to OECD countries for home-trained or native-born doctors



Note: Data for 188 countries of origin. Data on native-born doctors is from 2015/16. Data for home-trained doctors is from 2017/18 (or nearest year).
 Source: OECD Health Statistics 2019, DIOC 2015/16 and LFS 2015/16; WHO Global Health Observatory 2019.

46. A stark exception are the Caribbean countries, which appear to be disproportionately affected by outward migration of doctors. The emigration rates for the majority of the Caribbean countries vary between 50 and 99%. However, those of the islands with the emigration rates for home-trained doctors exceeding or close to 90% – i.e. Antigua and Barbuda, Dominica, Grenada, Saint Lucia, as well as Saint Kitts and Nevis (excluded from Figure 7; see Table A.1) – are renowned international medical education hubs training predominantly fee-paying foreign students, majority of whom come from the United States and Canada and return to their home countries upon graduation. Despite the relatively small population of these countries, the size of their medical schools rivals and sometimes exceeds that of the largest medical schools in the United States. Moreover, people born in these five Caribbean countries (as well as the neighbouring countries, such as Saint Vincent and the Grenadines or Barbados) also study medicine there with an intention to work in the United States upon graduation.

47. As discussed in Section 1, the migration of native-born doctors takes place against a backdrop of larger migration trends, including migration of highly skilled professionals in general. From the vantage point of the countries of origin, the shares of the native-born working as doctors abroad or holding a tertiary degree and working abroad, respectively,

are of the same magnitude in general (Table A.1). While there are some exceptions to this general trend, these occur predominantly among the countries with small absolute migration outflows, and are explained by the law of small numbers (i.e., with only a few cases, variation becomes wider).

48. Among the main countries of origin, however, India stands out with an emigration rate of around 3% for native-born with a tertiary degree, which is much lower than the emigration rate of 8% for native-born doctors working in the OECD countries. In the other direction, among Chinese with a general tertiary education, physicians are 30% less likely to work abroad. Similarly, someone born in Cuba with a general tertiary degree is almost five times more likely to work abroad than a Cuban born doctor (Table A.1).

4.2. Impact on the number of doctors per population in countries of origin

49. The question remains whether the afore-described diasporas in OECD countries of native-born or home-trained doctors are actually the dominant reason for the limited availability of doctors per population in some countries of origin.

50. The median value for the 188 studied countries of origin is 1.3 doctors per 1 000 population, with more than 40% of the countries having less than one doctor per 1 000 population, the majority of which are in Africa (WHO, 2019^[12]). As already mentioned, almost three quarters of all the countries have at most 10% of their home-trained doctors working in (other) OECD countries, and almost half have at most 10% native-born doctors working in (other) OECD countries (Table A.1).

51. Actually, rather few of the countries of origin would significantly increase the number of doctors per 1 000 population, by having all doctors born or trained in that country in addition to those working there already. This regards especially the countries of origin that have less than one doctor per 1 000 population. For almost all of these countries the number of home-trained doctors working in the OECD area is very low (Table A.1).

52. The largest numbers per population of emigrated home-trained doctors working in the OECD area, are coming from the Caribbean countries (Antigua and Barbuda, Dominica, Grenada, and Saint Kitts and Nevis). However, as discussed earlier, these countries provide medical education to large numbers of foreigners, foremost from North America. Despite their small population, the size of their medical schools rivals and sometimes exceeds that of the largest medical schools in the United States (OECD, 2019^[9]).

53. Among the remaining countries of origin, the largest per population values – i.e. above one per 1 000 population – of native-born doctors working abroad in the OECD countries are found for Romania, Lebanon, Jamaica, Trinidad and Tobago, as well as for a number of countries with small population size (around or below 500 000), such as Malta, Luxembourg, Sao Tome & Principe, and Suriname. For home-trained doctors, the largest outflows - of more than one doctor per 1 000 population - are again from Romania as well as from Ireland, Estonia, and Iceland.

54. Taking stock, the analysis reveals that the global health workforce crisis goes far beyond the migration issue. In particular, the needs for doctors in low and lower middle income countries, as estimated by the WHO (WHO, 2016^[13]), largely outstrip the numbers of immigrant doctors in the OECD countries. Thus, international migration is neither the main cause nor would its reduction be the solution to the worldwide health human-resources shortages, although it exacerbates the acuteness of the problems in some countries. These include countries with weak health systems and low initial number of doctors or countries that experienced outflows of doctors within a short period. It should be also noted that younger doctors might be more prone to migrate. Hence, the impact on

countries of origin may have more aspects. Moreover, for the interpretation of the results presented in this paper, one should keep in mind that there are also significant (but not uniformly documented) regular flows of migrant doctors among non-OECD countries, in particular within Africa and South America, and into China. Overall however, this contributes to highlight the need to invest not only in education but also in employment and health systems in general.

55. As for the trends across the six WHO regions of origin and the four country income groups, the following can be observed with regard to doctors – at home and abroad - per 1 000 population:

- Generally, in a given WHO region, the number of doctors at home or abroad per 1 000 population decreases when descending through the income groups (from top to bottom in Table 3). There are, however, large variations across regions within the same income group.
- With respect to the number of doctors at home per 1 000 population, the region of WHO Europe⁹ is ahead of other regions with the exception of the low-income group, where South-East Asia has the highest number of doctors at home per 1 000 population.
- Regarding native-born doctors per 1 000 population working abroad, the highest value is found in high-income countries of the WHO Europe (0.29) and the upper-middle-income countries of the WHO Eastern Mediterranean region (0.27); the lowest in low-income WHO Africa (0.02).
- For home-trained doctors per 1 000 population working abroad, the highest value is found again in high-income (0.26) and upper-middle income countries (0.18) of the WHO Europe; the lowest in upper-middle income WHO Western Pacific (0.01) and low-income WHO Africa (0.01).

⁹ WHO Europe includes also a number of countries in Central Asia: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.

Table 3. Doctors per 1 000 population at home and native-born/home-trained doctors working abroad in an OECD country, by WHO region and country income group

	doctors per 1 000 population	Africa	Eastern Mediterranean	Europe	Americas	South-East Asia	Western Pacific
High income countries	at home	(0.95)	2.3	3.6	2.6	n.a.	2.6
	native-born abroad	(0.2)	0.1	0.3	0.1	n.a.	0.1
	home-trained abroad	(0.04)	0.04	0.3	0.04	n.a.	0.04
Upper-middle income countries	at home	1.2	1.2	3.2	2.3	0.8	2
	native-born abroad	0.2	0.3	0.2	0.1	0.1	0.03
	home-trained abroad	0.1	0.1	0.2	0.1	0.05	0.01
Lower-middle income countries	at home	0.3	0.8	2.7	1.1	0.7	1
	native-born abroad	0.1	0.1	0.1	0.1	0.1	0.1
	home-trained abroad	0.03	0.1	0.1	0.1	0.04	0.1
Low income countries	at home	0.1	0.4	(1.7)	(0.2)	2.1	n.a.
	native-born abroad	0.02	0.2	(0.02)	(0.2)	0.03	n.a.
	home-trained abroad	0.01	0.1	(0.01)	(0.1)	0.02	n.a.

Note: Data on native-born doctors is from 2015/16. Data for home-trained doctors is from 2017/18 (or nearest year).

Brackets indicate categories containing only one country: for high-income Africa it is Seychelles, for low-income Europe, Tajikistan, and for low-income Americas, Haiti.

Source: OECD Health Statistics 2019; DIOC 2015/16 and LFS 2015/16; WHO Global Health Observatory, 2019

4.3. Developments in emigration rates to OECD countries since 2000

4.3.1. The average emigration rate did not change significantly since 2000, but the regional picture is more diverse

56. This section relies exclusively on the analysis of data on foreign-born doctors working in the OECD countries due to the limited longitudinal coverage and international comparability of data on foreign-trained doctors working in the OECD area. The data on foreign-born doctors working in the OECD countries covering both the year 2000/01 and 2015/16 exist for 103 countries of origin.

57. Between 2000/01 and 2015/16, the total number of doctors and the number of doctors not working in their country of birth but in the (other) OECD countries both grew by more than 50%. Hence, the average emigration rate to OECD countries for native-born doctors remained at around 6% both in 2000/01 and in 2015/16. For comparison, concurrently, the world's population grew by less than 20% and the adult foreign-born population in the OECD countries by around 50% over the same time span.

58. Some WHO regions or country income groups, however, feature increases in emigration rates to OECD countries. Figure 10 shows that the domestic physician workforce as well as the number of native-born doctors working abroad grew in all the WHO regions as well as all country income groups. In some regions or income groups,

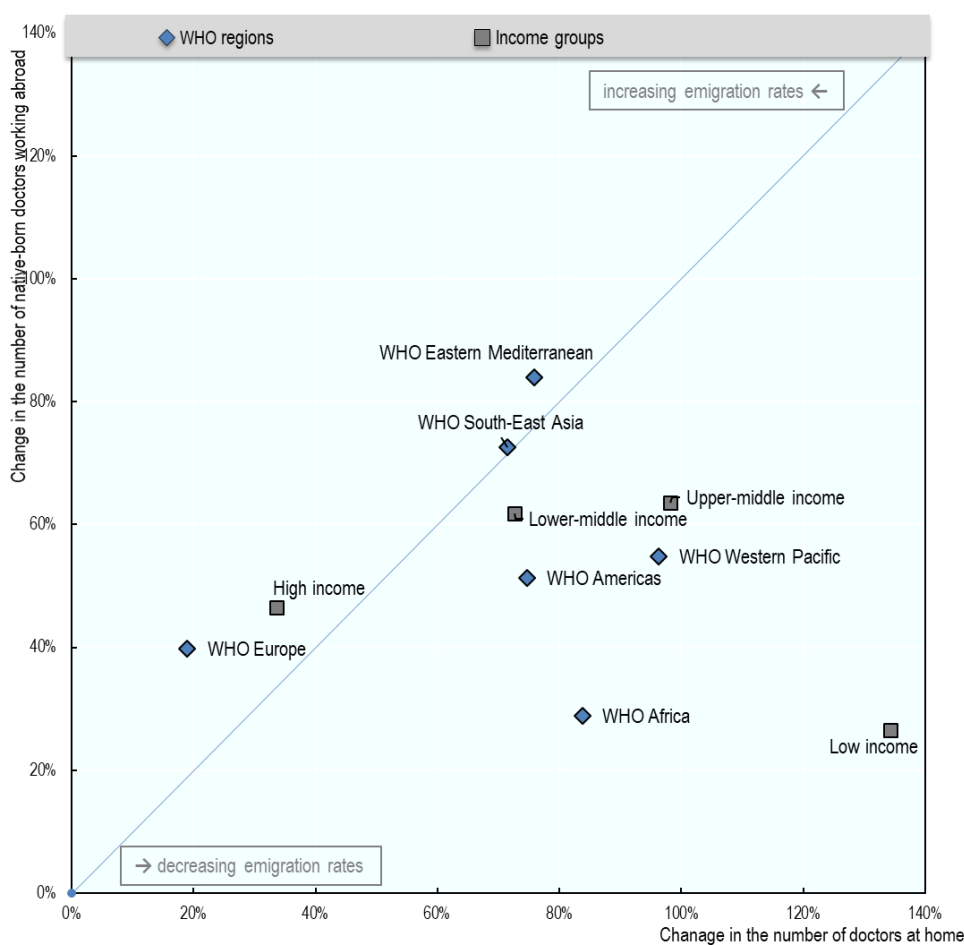
however, the domestic physician workforce grew slower than the number of native-born doctors working abroad in an OECD country, making the emigration rate grow.

59. For the income groups, between 2000/01 and 2015/16, the growth of the number of doctors is strongest in the low- and middle-income groups, while the high-income group lags behind the average global growth. The growth of the number of native-born doctors working abroad is strongest in the two middle-income groups, while the high- and especially the low-income group show much slower growth rates. Accordingly, overall the emigration rate falls most for the low-income countries – positioned well below the diagonal break-even line ('45-degree line') – and rises most for the high-income countries – positioned well above the diagonal in Figure 10. The middle-income groups feature smaller reductions in the emigration rate – positioned closer to the diagonal.

60. As for the six WHO regions, the number of native-born doctors working in the OECD grew slowest for the African region and fastest in the Eastern Mediterranean region. The domestic physician workforce grew fastest in the Western Pacific and slowest in the European region. Accordingly, the emigration rate grew most for the WHO Europe, while it decreased most for the WHO Africa, followed by the WHO Western Pacific region.

61. At the country level, while most of the countries followed the above-described general growth trend and have not experienced a significant change in the emigration rate between 2000/01 and 2015/16, there are some exceptions in nearly all regions (see also Table A.1 in Appendix).

Figure 10. Developments in emigration rates to OECD countries since 2000/01 - change in the numbers of doctors working at home and native-born doctors working abroad - by WHO regions and income groups



Note: Results based on longitudinally comparable data for 103 countries of origin (see Table A.1 in the Annex). Source: (OECD, 2007^[1]); OECD Health Statistics 2019; DIOC 2015/16 and LFS 2015/16; WHO Global Health Observatory, 2019.

62. Among the main countries of origin of foreign-born doctors working in the OECD area (see Figure 3)¹⁰, emigration rates to OECD countries have changed statistically significantly in (Table A.1):

- Pakistan, where the emigration rate increased from 8% to 12% between 2000/01 and 2015/16, with the number of doctors in the country increasing but at a lower rate than the number of people born in the country and working as doctors in the OECD area;
- and the Philippines, which, to the contrary, registered a sizeable increase of 170% (well above the average global growth) in the number of doctors in the country and

¹⁰ Longitudinal analysis is not possible for Romania and the Russian Federation due to limited availability of data in 2000/01.

a significant decrease in the emigration rate - from 26% to 12% - between 2000/01 and 2015/16.

63. Sizable increases in emigration rates occurred also in a number of other countries, in WHO regions of Africa and the Americas. Emigration rates more than doubled for Eswatini, Cameroon, Zimbabwe, and Guatemala, between 2000/01 and 2015/16. For Cameroon and Guatemala, however, the sum of all doctors (in the country plus native-born abroad) also dropped; hence, the increase in the emigration rates for these two countries cannot be explained only by migration to the OECD area. A sizeable number of doctors must have either migrated to outside the OECD area or stopped practising. Sizable increases in emigration rates occurred also in Sao Tome and Principe – from 47 to 82% - and Saint Vincent and the Grenadines – from 53 to 75% - between 2000/01 and 2015/16.

64. Furthermore, the countries standing out for large increase in the total number of native-born doctors working in the OECD countries (Table A.1) are:

- the afore-mentioned Eswatini and Sao Tome and Principe, where, concurrently, the number of doctors in the country decreased;
- Gambia, where the number of doctors at home also increased, but at a slower rate (below the global average increase);
- Nepal, which, however, stands out for a large increase in the domestic physician workforce;
- Oman, Lesotho, and Liberia, which feature an at least average increases of the number of doctors in the country.

5. Conclusions

65. For the OECD area, the findings reveal that while the number of domestic medical graduates has increased significantly, the shares of foreign-born or foreign-trained doctors have continued to rise since 2000 in most OECD countries. These findings provide additional data to inform broader domestic health labour market analysis and health workforce development plans designed to achieve a sustainable health workforce. Moreover, the analyses directly support the implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel¹¹ and relevant ILO Conventions and Recommendations through consolidating and strengthening evidence.

66. For the countries of origin, the evidence gathered in this paper will help to assess the overall impact of international migration on their physician workforce and form the basis for a constructive international dialogue regarding a better management of international flows and targeted support for increasing training and improving retention of home-trained doctors.

The analysis also reveals that, at least for countries where most of their migration is taking place within OECD corridors, the global health workforce shortage goes far beyond the migration issue - in particular, the shortages of doctors in developing countries largely outstrip the numbers of immigrant doctors in OECD countries.

¹¹ https://www.who.int/hrh/migration/code/WHO_global_code_of_practice_EN.pdf

Annex A.

Table A.1. Emigration rates to OECD countries for home-trained doctors, native-born doctors, and all native-born with tertiary education, most recent and circa 2000

Country of origin	home-trained		native-born				change 2000/01 - 2015/16*		
	number of doctors working in (other) OECD countries 2017/18 (or nearest year)	emigration rate for home-trained doctors 2017/18 (or nearest year)	number of doctors working in (other) OECD countries 2015/16	emigration rate for native-born doctors 2015/16	emigration rate for all native-born with tertiary education 2015/16	emigration rate for native-born doctors 2000/01	in the number of native-born doctors working in (other) OECD countries	in the number of doctors working in the country of origin*	in the number of all doctors born or working in the country of origin*
Afghanistan	415	4%	5,406	35%	18%				
Albania	765	18%	1,921	35%	30%				
Algeria	4,336	6%	8,240	10%	11%	23%	-24%	+110%	+79%
Andorra	4	2%	7	3%					
Angola	213	3%	2,998	32%	58%	63%	+98%	+626%	+293%
Antigua and Barbuda	1,336	83%	370	57%	38%				
Argentina	5,223	3%	6,539	4%	4%				
Armenia	352	4%	721	8%	12%				
Australia	3,106	3%	1,501	2%	3%	4%	-27%	+89%	+84%
Austria	3,598	7%	4,341	9%	8%				
Azerbaijan	676	2%	317	1%	5%				
Bahamas			365	32%	15%	36%	+105%	+146%	+131%
Bahrain	175	12%	69	5%	5%	8%	-7%	+58%	+53%
Bangladesh	3,041	3%	4,885	5%	5%	5%	+130%	+125%	+126%
Barbados	65	8%	623	47%	50%	46%	+127%	+121%	+123%
Belarus	974	2%	1,346	3%	8%				
Belgium	4,152	11%	3,550	9%	7%				
Belize	188	31%	242	36%	30%	23%	+218%	+68%	+103%
Benin	113	6%	137	7%	11%	41%	-36%	+450%	+251%
Bermuda			20	6%					
Bhutan	1		3		15%				
Bolivia	1,420	7%	780	4%	5%				
Bosnia and Herzegovina	713	9%	1,191	14%	28%				
Botswana			90	10%	2%	4%	+173%	+16%	+23%
Brazil	3,333	1%	5,232	1%	2%	1%	+129%	+129%	+129%
Brunei Darussalam	3	0.4%	119	14%	25%	22%	+27%	+120%	+100%
Bulgaria	4,843	14%	3,723	11%	15%				
Burkina Faso	21	2%	60	5%	6%	8%	-8%	+42%	+38%
Burundi	56	10%	51	9%	13%	26%	-28%	+163%	+113%
Cambodia	48	2%	452	15%	21%	25%	-32%	+25%	+11%
Cameroon	344	16%	1,018	36%	10%	15%	+78%	-41%	-23%
Canada	8,215	8%	13,180	12%	4%	13%	+33%	+49%	+47%
Cape Verde	9	2%	418	50%	40%	42%	+153%	+77%	+109%

Central African Republic	16	5%	46	14%	16%	20%	-45%	-14%	-20%
Chad	1	0%	91	12%	4%				
Chile	691	3%	980	5%	6%				
China	7,509	0.3%	30,081	1%	1%	1%	+125%	+107%	+108%
Colombia	7,906	7%	8,401	7%	7%				
Comoros	1	1%	29	19%	14%	15%	+45%	+7%	+13%
Congo	160	23%	304	37%	18%	42%	-44%	-31%	-36%
Costa Rica	552	3%	202	1%	5%				
Cote d'Ivoire	139	3%	309	6%	10%	11%	+18%	+152%	+137%
Croatia	1,157	8%	2,457	16%	15%				
Cuba	5,446	5%	8,856	9%	30%	8%	+50%	+41%	+42%
Cyprus	233	9%	763	25%	13%				
Czech Republic	4,063	8%	3,235	7%	7%				
Democratic People's Republic of Korea	41	0%	410	0.4%					
Democratic Republic of the Congo	192	3%	617	9%	5%				
Denmark	2,373	9%	1,185	5%	6%				
Djibouti	3	1%	25	11%	17%	16%	+0%	+56%	+47%
Dominica	10,127	99%	183	70%		60%	+216%	+111%	+174%
Dominican Republic	7,481	31%	2,675	14%	17%	9%	+67%	+7%	+13%
Ecuador	4,029	11%	1,579	4%	9%				
Egypt	10,176	12%	10,398	12%	2%	16%	+44%	+100%	+91%
El Salvador	550	5%	986	9%	26%				
Equatorial Guinea	13	3%	0	0%	12%				
Eritrea	0	0%	81	27%	21%				
Estonia	1,481	24%	488	10%	7%				
Eswatini	1	1%	78	42%	5%	5%	+767%	-37%	+3%
Ethiopia	815	7%	1,679	14%	14%	25%	+165%	+442%	+374%
Fiji	156	17%	395	35%	37%				
Finland	371	2%	1,147	5%	5%				
France	4,700	2%	8,569	4%	5%				
Gabon	40	5%	58	8%	9%	13%	+2%	+81%	+71%
Gambia	2	1%	324	60%	18%	23%	+604%	+37%	+166%
Georgia	471	2%	644	3%	6%				
Germany	18,530	5%	24,347	6%	6%				
Ghana	1,084	17%	2,180	30%	14%	31%	+48%	+60%	+57%
Greece	6,665	11%	10,167	17%	6%				
Grenada	11,187	99%	20	11%	59%	73%	-82%	+280%	+17%
Guatemala	642	9%	870	12%	14%	5%	+79%	-39%	-33%
Guinea	83	8%	247	20%	6%	9%	+149%	-1%	+13%
Guinea-Bissau	3	1%	3	1%	28%	49%	-98%	+88%	-4%
Guyana	71	10%	707	53%	73%	72%	-26%	+71%	+1%
Haiti	747	22%	1,824	41%	73%	53%	-17%	+34%	+7%
Honduras	324	10%	846	23%	24%				
Hungary	7,743	19%	6,286	16%	10%				

Iceland	578	30%	195	12%	16%				
India	70,539	6%	94,862	8%	3%	8%	+70%	+61%	+62%
Indonesia	474	0.5%	1,575	2%	1%				
Iran, Islamic Republic of	5,888	6%	16,988	16%	6%	13%	+89%	+49%	+54%
Iraq	4,844	13%	9,377	23%	9%				
Ireland	5,338	26%	4,219	22%	14%	27%	+5%	+38%	+29%
Israel	4,000	13%	4,285	14%	7%				
Italy	13,910	5%	8,333	3%	7%	2%	+90%	+0%	+2%
Jamaica	1,063	22%	3,060	45%	51%	48%	+45%	+69%	+57%
Japan	891	0.3%	3,456	1%	1%	1%	+29%	+22%	+22%
Jordan	3,075	12%	2,450	10%	4%				
Kazakhstan	398	1%	3,865	6%	7%				
Kenya	354	4%	2,516	22%	7%	35%	+5%	+103%	+69%
Kiribati	0	0%	8	27%	46%				
Kuwait	133	1%	1,201	11%	9%	11%	+158%	+183%	+180%
Kyrgyzstan	103	1%	8	0%	4%				
Lao People's Democratic Republic	4	0%	438	12%	11%	11%	+32%	+17%	+18%
Latvia	823	12%	539	8%	14%				
Lebanon	3,775	21%	6,921	33%	18%	28%	+52%	+20%	+29%
Lesotho	0	0%	32	19%	2%	7%	+357%	+55%	+77%
Liberia	59	26%	540	76%	44%	54%	+343%	+63%	+215%
Libya	2,082	13%	1,357	9%	6%	9%	+129%	+116%	+117%
Lithuania	1,275	9%	1,721	12%	10%				
Luxembourg	280	14%	645	27%	15%				
Madagascar	386	8%	761	15%	15%	15%	-14%	-18%	-17%
Malawi	33	10%	398	58%	9%	38%	+146%	+7%	+59%
Malaysia	569	1%	9,028	16%	5%	22%	+93%	+188%	+167%
Maldives	5	1%	3	1%	2%	2%	-50%	+47%	+45%
Mali	89	3%	127	5%	9%	13%	-21%	+138%	+117%
Malta	401	20%	1,059	39%	24%	27%	+131%	+30%	+57%
Mauritania	5	1%	69	8%	9%	11%	+82%	+153%	+145%
Mauritius	89	3%	578	18%	48%	36%	-20%	+96%	+54%
Mexico	11,111	4%	7,691	3%	8%	2%	+82%	+52%	+52%
Mongolia	94	1%	73	1%	3%				
Montenegro	39	3%	37	2%	9%				
Morocco	1,303	5%	5,294	17%	20%	28%	-15%	+63%	+41%
Mozambique	67	3%	1,573	42%	27%	65%	+68%	+324%	+159%
Myanmar	2,156	4%	2,274	5%	2%	9%	+32%	+159%	+148%
Namibia	1	0%	53	6%	5%	11%	-29%	+29%	+23%
Nepal	1,295	6%	1,290	6%	15%	5%	+348%	+254%	+259%
Netherlands	6,379	9%	2,917	5%	8%				
New Zealand	2,624	14%	2,430	13%	13%	17%	+28%	+80%	+71%
Nicaragua	299	5%	406	6%	16%				
Niger	19	2%	44	4%	6%	6%	+69%	+154%	+149%
Nigeria	7,768	11%	10,487	14%	4%	12%	+127%	+88%	+93%
Northern Macedonia	1,649	22%	644	10%	19%				
Norway	397	2%	1,128	4%	4%				
Oman	65	1%	110	1%	1%	1%	+378%	+136%	+137%

Pakistan	22,593	11%	26,330	12%	8%	8%	+151%	+59%	+66%
Panama	339	5%	675	10%	10%	19%	-34%	+43%	+28%
Papua New Guinea	28	7%	179	32%	6%	33%	+32%	+37%	+35%
Paraguay	529	5%	200	2%	3%	4%	-29%	+48%	+45%
Peru	3,845	9%	5,624	12%	5%				
Philippines	11,267	9%	16,984	12%	14%	26%	+7%	+170%	+127%
Poland	11,300	11%	18,504	17%	13%				
Portugal	790	2%	2,209	6%	12%	2%	+179%	+0%	+4%
Qatar	6	0%	37	1%	2%	3%	-18%	+446%	+431%
Korea	1,637	1%	12,401	9%	5%				
Republic of Moldova	956	7%	1,440	10%	22%				
Romania	22,332	33%	21,107	32%	18%				
Russian Federation	18,642	3%	18,396	3%	3%				
Rwanda	102	6%	51	3%	12%	10%	+13%	+310%	+280%
Saint Kitts and Nevis	1,572	92%	0	0%					
Saint Lucia	584	97%	530	97%	44%				
Saint Vincent and the Grenadines	10	12%	220	75%	56%	53%	+91%	-29%	+35%
Samoa	27	29%	120	64%	43%				
Sao Tome and Principe	0	0%	294	82%	63%	47%	+314%	-22%	+135%
Saudi Arabia	1,391	2%	3,547	4%	1%				
Senegal	260	20%	539	34%	19%	43%	+20%	+79%	+54%
Serbia	2,464	8%	2,787	9%	9%				
Seychelles	4	4%	20	18%	24%	23%	-44%	-26%	-31%
Sierra Leone	43	21%	192	54%	19%	58%	-19%	-2%	-12%
Singapore	306	2%	2,347	15%	4%	19%	+73%	+126%	+116%
Slovakia	4,594	26%	2,144	14%	10%				
Slovenia	214	3%	407	6%	8%				
Solomon Islands	0	0%	10	8%	5%	17%	-9%	+122%	+100%
Somalia	27	8%	416	57%	30%	33%	+168%	-0%	+56%
South Africa	8,814	15%	9,509	16%	11%	17%	+29%	+48%	+45%
South Sudan			28		4%				
Spain	7,147	4%	5,133	3%	3%	2%	+91%	+34%	+35%
Sri Lanka	3,692	16%	8,769	30%	7%	31%	+88%	+91%	+90%
Sudan	2,915	16%	1,801	10%	3%	9%	+131%	+110%	+112%
Suriname	30	4%	635	48%	56%				
Sweden	2,069	5%	1,707	4%	5%				
Switzerland	1,082	3%	3,012	8%	8%				
Syrian Arab Republic	9,057	29%	8,999	29%	13%				
Taiwan	7		8,599		5%				
Tajikistan	68	0.5%	130	1%	1%				
Thailand	861	2%	1,884	3%	2%	6%	+36%	+149%	+142%
Timor-Leste	0	0%	10	1%	5%	31%	-71%	+1081%	+727%
Togo	155	30%	146	29%	14%	40%	-5%	+60%	+34%
Tonga	0	0%	16	23%	51%	40%	-30%	+57%	+22%

Trinidad and Tobago	380	9%	3,171	47%	35%	55%	+163%	+262%	+208%
Tunisia	1,309	8%	2,901	17%	13%	15%	+20%	+9%	+11%
Turkey	2,587	2%	3,142	2%	3%				
Turkmenistan	27	0.2%	122	1%	2%				
Uganda	305	8%	614	14%	8%	33%	-43%	+65%	+29%
Ukraine	6,034	4%	7,967	6%	10%				
United Arab Emirates	266	1%	905	4%	2%				
United Kingdom	17,373	8%	20,105	10%	9%	11%	+18%	+41%	+39%
United Republic of Tanzania	100	5%	705	25%	5%	55%	-31%	+154%	+52%
United States	2,800	0.3%	8,113	1%	1%				
Uruguay	838	5%	897	5%	14%				
Uzbekistan	237	0.3%	1,003	1%	2%				
Vanuatu	0	0%	5	10%	13%	20%	+0%	+130%	+104%
Venezuela	5,378	10%	5,710	11%	7%				
Viet Nam	751	1%	11,594	13%	10%	15%	+53%	+83%	+79%
Yemen	338	4%	276	3%	29%				
Zambia	153	9%	347	19%	3%	31%	-39%	+20%	+2%
Zimbabwe	557	32%	2,107	64%	12%	28%	+154%	-44%	+13%

Note: The most recent data is available for 188 countries of origin. Longitudinal comparison between 2000/01 and 2015/16 available for 103 countries.

* Large changes in the number of doctors working in the country of origin between 2000/01 and 2015/16 might be due to modifications in methodology applied in collection of data by WHO Global Health Observatory.

Source: (OECD, 2007^[1]) for emigration rates of native-born doctors 2000/01; OECD Health Statistics 2019 for numbers of home-trained doctors; DIOC 2015/16 and LFS 2015/16 for numbers of native-born doctors; WHO Global Health Observatory, 2019 for numbers of doctors working in the country of origin.

Table A.2. Intra-OECD net stocks - foreign-trained doctors by country of education and country of destination, 2017/18 (or nearest year)

Country of destination → ↓ Country of education	SLV	CHL	SVK	CZE	HUN	POL	TUR	LTU	LVA	AUT	ESP	PRT	GRC	NLD	DEU	SWE	BEL	FRA	CHE	EST	IRL	GBR	ISR	NOR	FIN	NZL	AUS	CAN	USA	total
Slovenia	0	0	-4	-6	-20	-5	0	0	0	32	3	2	0	0	53	0	5	-2	17	0	3	23	44	7	1	0	-1	0	-1	+105
Chile	0	0	-1	1	-7	1	0	0	-1	-1	79	-1	0	-3	-11	-4	-1	2	1	1	0	14	24	0	0	3	-1	40	318	+438
Slovak Republic	4	1	0	2218	48	38	1	0	0	105	24	31	193	10	1062	0	21	49	43	0	74	184	0	406	8	5	0	63	0	+4588
Czech Republic	6	-1	-2218	0	15	19	0	0	-1	70	27	377	250	8	898	216	50	83	107	-1	122	707	29	307	8	16	0	136	547	+1773
Hungary	20	7	-48	-15	0	12	-1	-1	0	229	31	32	403	22	1412	703	60	90	174	-12	271	530	1251	1193	67	22	0	95	1058	+7603
Poland	5	-1	-38	-19	-12	0	-3	-40	-3	5	204	34	33	36	1696	1567	86	248	179	0	281	907	203	2112	95	36	-1	549	2831	+10973
Turkey	0	0	-1	0	1	3	0	-1	0	-6	7	2	3	7	848	0	11	29	58	0	5	107	38	14	24	5	-3	57	1336	+2544
Lithuania	0	0	0	0	1	40	1	0	6	2	6	5	0	6	369	156	37	50	25	-3	67	171	152	136	24	2	0	10	-2	+1261
Latvia	0	1	0	1	0	3	0	-6	0	3	4	8	2	6	272	0	18	39	11	-31	61	112	86	108	36	1	0	11	-1	+743
Austria	-32	1	-105	-70	-229	-5	6	-2	-3	0	14	2	8	9	540	100	24	31	711	0	6	76	20	70	41	13	0	31	248	+1454
Spain	-3	-79	-24	-27	-31	-204	-7	-6	-4	-14	0	2388	-18	-63	-26	167	255	535	150	-1	103	669	55	42	0	26	-3	62	1481	+4838
Portugal	-2	1	-31	-377	-32	-34	-2	-5	-8	-2	-2388	0	0	-38	34	-2	62	35	39	0	13	84	0	6	4	1	-1	16	68	-2659
Greece	0	0	-193	-250	-403	-33	-3	0	-2	-8	18	0	0	9	2358	627	308	224	187	1	52	1335	22	20	19	2	-6	54	968	+2312
Netherlands	0	3	-10	-8	-22	-36	-7	-6	-6	-9	63	38	-9	0	372	85	682	101	62	1	33	330	33	184	10	114	0	428	2870	+5255
Germany	-53	11	-1062	-898	-1412	-1696	-848	-369	-272	-540	26	-34	-2358	-372	0	935	184	424	6645	-38	60	975	227	1522	279	188	-24	172	2189	+2708
Sweden	0	4	0	-216	-703	-1567	0	-156	0	-100	-167	2	-627	-85	-935	0	9	22	24	6	4	-53	7	401	813	23	0	12	221	-4208
Belgium	-5	1	-21	-50	-60	-86	-11	-37	-18	-24	-255	-62	-308	-682	-184	-9	0	428	129	-3	3	38	46	39	-3	27	-5	109	725	-1173
France	2	-2	-49	-83	-90	-248	-29	-50	-39	-31	-535	-35	-224	-101	-424	-22	-428	0	716	-6	0	35	495	33	17	18	-3	410	638	-1663
Switzerland	-17	-1	-43	-107	-174	-179	-58	-25	-11	-711	-150	-39	-187	-62	-6645	-24	-129	-716	0	-5	0	9	24	21	14	12	-9	75	282	-9946
Estonia	0	-1	0	1	12	0	0	3	31	0	1	0	-1	-1	38	-6	3	6	5	0	0	22	30	15	1251	1	0	5	1	+1413
Ireland	-3	0	-74	-122	-271	-281	-5	-67	-61	-6	-103	-13	-52	-33	-60	-4	-3	0	0	0	0	989	2	262	1	271	1060	1710	-41	+2980
United Kingdom	-23	-14	-184	-707	-530	-907	-107	-171	-112	-76	-669	-84	-1335	-330	-975	53	-38	-35	-9	-22	-989	0	172	133	21	2907	5055	2108	4571	+6510
Israel	-44	-24	0	-29	-1251	-203	-38	-152	-86	-20	-55	0	-22	-33	-227	-7	-46	-495	-24	-30	-2	-172	0	-1	1	10	-80	117	3002	-1355
Norway	-7	0	-406	-307	-1193	-2112	-14	-136	-108	-70	-42	-6	-20	-184	-1522	-401	-39	-33	-21	-15	-262	-133	1	0	23	6	-87	2	32	-8178
Finland	-1	0	-8	-8	-67	-95	-24	-24	-36	-41	0	-4	-19	-10	-279	-813	3	-17	-14	-1251	-1	-21	-1	-23	0	5	-3	-1	30	-2825
New Zealand	0	-3	-5	-16	-22	-36	-5	-2	-1	-13	-26	-1	-2	-114	-188	-23	-27	-18	-12	-1	-271	-2907	-10	-6	-5	0	1521	27	-176	-2379
Australia	1	1	0	0	0	1	3	0	0	0	3	1	6	0	24	0	5	3	9	0	-1060	-5055	80	87	3	-1521	0	394	1019	-5996
Canada	0	-40	-63	-136	-95	-549	-57	-10	-11	-31	-62	-16	-54	-428	-172	-12	-109	-410	-75	-5	-1710	-2108	-117	-2	1	-27	-394	0	6640	-178
United States	1	-318	0	-547	-1058	-2831	-1336	2	1	-248	-1481	-68	-968	-2870	-2189	-221	-725	-638	-282	-1	41	-4571	-3002	-32	-30	176	-1019	-6640	0	-33210

Note: Red indicates positive net stocks of above 100; blue, negative net stocks of above 100. Source: OECD Health Statistics 2019

Table A.3. Intra-OECD net stocks - foreign-born doctors by country of birth and country of destination, 2015/16

Country of destination →	LVA	SVK	HUN	LUX	ISR	ITA	DEU	FRA	ESP	IRL	FIN	DNK	NLD	NOR	GBR	CAN	USA	PRT	SWE	CHE	AUS	total
↓ Country of birth																						
Latvia	0	0	0	0	103	0	101	16	14	9	10	10	0	13	0	55	111	0	66	15	16	+539
Slovak Rep.	0	0	290	0	-153	39	832	63	66	18	7	11	0	32	222	115	281	0	0	134	34	+1991
Hungary	0	-290	0	0	-33	-52	4165	29	182	46	32	78	-39	83	72	170	461	0	351	419	137	+5811
Luxembourg	0	0	0	0	0	0	176	67	0	2	0	4	0	0	0	0	-73	-24	0	21	0	+173
Israel	-103	153	33	0	0	276	686	-455	0	4	3	5	0	15	-227	267	1607	0	-78	41	124	+2351
Italy	0	-39	52	0	-276	0	305	719	-156	33	22	25	70	36	806	117	1529	515	112	1082	179	+5131
Germany	-101	-832	-4165	-176	-686	-305	0	533	381	79	-23	315	320	747	1937	560	4122	474	968	8934	696	+13778
France	-16	-63	-29	-67	455	-719	-533	0	-7	-14	7	12	-97	36	474	556	1109	1266	151	1183	94	+3798
Spain	-14	-66	-182	0	0	156	-381	7	0	35	13	34	0	33	1332	90	990	495	296	-11	52	+2879
Ireland	-9	-18	-46	-2	-4	-33	-79	14	-35	0	-1	1	-11	7	1039	539	273	-13	99	-14	643	+2350
Finland	-10	-7	-32	0	-3	-22	23	-7	-13	1	0	18	23	45	-11	25	180	-1	475	45	18	+747
Denmark	-10	-11	-78	-4	-5	-25	-315	-12	-34	-1	-18	0	-31	48	162	7	-75	-15	101	-26	29	-313
Netherlands	0	0	39	0	0	-70	-320	97	0	11	-23	31	0	109	-109	-62	507	38	176	67	242	+733
Norway	-13	-32	-83	0	-15	-36	-747	-36	-33	-7	-45	-48	-109	0	218	-19	84	-11	-182	-28	19	-1123
United Kingdom	0	-222	-72	0	227	-806	-1937	-474	-1332	-1039	11	-162	109	-218	0	2266	5559	-610	307	-245	6443	+7805
Canada	-55	-115	-170	0	-267	-117	-560	-556	-90	-539	-25	-7	62	19	-2266	0	8178	546	20	74	498	+4630
United States	-111	-281	-461	73	-1607	-1529	-4122	-1109	-990	-273	-180	75	-507	-84	-5559	-8178	0	412	476	14	230	-23711
Portugal	0	0	0	24	0	-515	-474	-1266	-495	13	1	15	-38	11	610	-546	-412	0	42	246	10	-2774
Sweden	-66	0	-351	0	78	-112	-968	-151	-296	-99	-475	-101	-176	182	-307	-20	-476	-42	0	50	50	-3280
Switzerland	-15	-134	-419	-21	-41	-1082	-8934	-1183	11	14	-45	26	-67	28	245	-74	-14	-246	-50	0	24	-11977
Australia	-16	-34	-137	0	-124	-179	-696	-94	-52	-643	-18	-29	-242	-19	-6443	-498	-230	-10	-50	-24	0	-9538

Note: Red indicates positive net stocks of above 100; blue, negative net stocks of above 100.
Source: DIOC 2015/16 and LFS 2015/16

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