

# Data on the migration of health-care workers: sources, uses, and challenges

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**Abstract** The migration of health workers within and between countries is a growing concern worldwide because of its impact on health systems in developing and developed countries alike. Policy decisions need to be made at the national, regional and international levels to manage more effectively this phenomenon, but those decisions will be effective and correctly implemented and evaluated only if they are based on adequate statistical data. Most statistics on the migration of health-care workers are neither complete nor fully comparable, and they are often underused, limited (because they often give only a broad description of the phenomena) and not as timely as required. There is also a conflict between the wide range of potential sources of data and the poor statistical evidence on the migration of health personnel. There are two major problems facing researchers who wish to provide evidence on this migration: the problems commonly faced when studying migration in general, such as definitional and comparability problems of "worker migrations" and those related to the specific movements of the health workforce. This paper presents information on the uses of statistics and those who use them, the strengths and limitations of the main data sources, and other challenges that need to be met to obtain good evidence on the migration of health workers. This paper also proposes methods to improve the collection, analysis, sharing, and use of statistics on the migration of health workers.

**Keywords** Health manpower/statistics; Brain drain/statistics; Emigration and immigration/statistics; Data collection/standards; Statistics/standards; Data interpretation, Statistical; Developing countries; Developed countries; (source: MeSH, NLM).

**Mots clés** Personnel santé/statistique; Exode des compétences/statistique; Emigration et immigration/statistique; Collecte données/normes; Statistique/normes; Interprétation statistique données; Pays en développement; Pays développé (source: MeSH, INSERM).

**Palabras clave** Recursos humanos en salud/estadística; Éxodo intelectual/estadística; Migración internacional/estadística; Recolección de datos/normas; Estadística/normas; Interpretación estadística de datos; Países en desarrollo; Países desarrollados (fuente: DeCS, BIREME).

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Voir page 606 le résumé en français. En la página 606 figura un resumen en español.

## Introduction

The migration of health personnel, both within a country and across international borders, is of growing concern worldwide because of its impact on health systems in developing countries and developed countries alike. It is estimated that more than 20% of physicians working in Australia, Canada and the United States of America come from other countries (1). This migration affects service provision, quality of care, and distribution of staff across administrative units and countries. As a result of globalization, the migration of health workers has become such an important phenomenon that *it is one of the priority issues* being addressed by mode 4 of the General Agreement on Trade in Services (GATS), which deals with temporary movement of people travelling from their own country to supply services in another country (what GATS calls "movement of natural persons").

In this paper, the terms "health workers", "health workforce", "health personnel" and "human resources for health" are used interchangeably, although "human resources for health"

may comprise people other than those who have been trained in health-related field, such as health policy analysts, health planners, medical statisticians or ambulance drivers.

Although the migration of members of the health workforce is moving up the political agenda in almost all countries, the evidence needed to monitor and evaluate the phenomenon and provide decision-makers with a solid basis for making policy is weak or often non-existent. In addition, despite the fact that there are many sources for statistics on the migration of health personnel, most datasets are neither complete nor fully comparable, and they are often underused, limited (in that they often provide only broad information on the phenomena associated with migration) and not timely (2). Moreover, evidence suggests that the availability of statistics on international migration has declined, particularly in developing countries (3). For instance, while several publications have highlighted the chronic shortages of health personnel in Africa and claimed that these are due partly to migration, evidence to sustain these claims is often anecdotal. This does not make such claims wrong, but it does make it impossible to say how the situation is developing.

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There are two major problems facing researchers who wish to provide evidence on this migration: the problems commonly faced when studying migration in general, such as definitional and comparability problems of “worker migrations”, and those related specifically to the movements of the health workforce. This paper focuses mainly on the second issue.

The purpose of this paper is to discuss some of the challenges researchers face in improving the quality of data collected on the migration of health workers and to advocate for the use of good evidence in decision-making. The discussion will be limited to the main sources that can be used to estimate the number of health workers (often referred to as the stock), the flow of workers, and to the potential uses of data. This paper does not discuss return flow to the home country, illegal migration or specific factors that affect migration in each country, nor does it focus on definitional problems unless they have an impact on the quality and comparability of data. (Comprehensive definitions of the main concepts can be found in reference 2.)

This paper has three objectives:

- to describe some of the potential uses of statistical information on the migration of health workers and who might use these data;
- to present the main sources of migration statistics and discuss their strengths and limitations;
- to discuss some of the challenges inherent in measuring the migration of health workers and look at ways to overcome these.

## Definition and uses of data

### Types of health-worker migration

When studying movements of health workers, we can distinguish three types of migration: internal, international and the “cross-industry” migration of people leaving the health system to work in areas not related to health (Fig. 1).

Internal migration describes movements of health personnel within national borders, across subnational administrative units, or between rural and urban areas. In most countries, health workers move from poorer settings and rural areas faster than the rest of the local population, leaving such locations understaffed in comparison with wealthier regions and cities. If not regulated, this type of migration tends to increase geographical imbalances and inequities in access to care (4).

International migration describes the movements of health workers who temporarily or permanently settle abroad (mainly

because of problems in their home country), such as poor working conditions, low remuneration and lack of incentives, or insufficient availability of training and avenues for professional development. The main factors pulling health workers to migrate are attractive salaries and benefits, better working environments, or improved quality of life for the worker and the family (5, 6). International migrants include those who are no longer working in health in the host country, foreign trainees and graduates who do not return to their home country, and migrants who return and continue to work in health care.

Studies of the international movement of health workers usually distinguish between the countries that send health personnel (the source country) and those that receive them (the destination country). This paper recommends differentiating between those source countries that send their health personnel voluntarily and those that involuntarily lose health workers; this differentiation is important because the impact on each is different. The effect of migration on service provision in the first group is rather small. These countries usually have sufficient stock of health workers and “export” health workers mainly to benefit from their remittances. In the Philippines, for instance, the remittances from physicians working abroad were estimated to compensate for the costs of training and emigration (7). The impact on service provision in countries that are losing workers and are already suffering from shortages is more severe because migration of highly skilled health workers limits access to health care and erodes the quality of care.

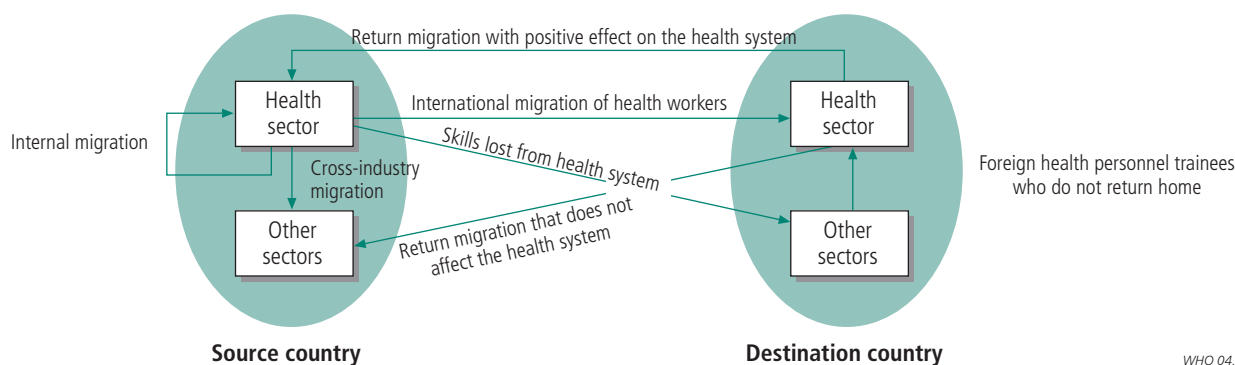
We can count health personnel who leave their usual activities for more attractive activities in non-health-related fields as “skills lost”, and this can have the same impact as migration. This “cross-industry migration”, another type of internal migration, has an impact on service provision because vacancy rates in the health-care sector increase.

### Potential users and uses of data

The migration of health personnel is a complex issue, and developing policy options to manage it is not easy. There is a wide spectrum of potential uses of statistics on internal and international migration. Those who use these data, both in the source and destination countries, are to be found at subnational, national, and international levels. Table 1 presents some potential uses of migration indicators and data sources.

At the country level, national and local authorities require information that allows them to assess the impact of health-personnel migration on staffing taking local needs or national standards

Fig. 1. Types of migration of health workers



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Table 1. Potential sources of data on migration of health-care workers and possible uses of data

Country	Main indicators	Main data sources for these indicators	Potential uses	
			National and subnational levels	International level
<b>Destination country</b>	No. of foreign health workers by occupation	Censuses, work permits, and registries of professional associations	Manage migration flow and estimate needs; formulate deployment and retention policies	Develop information on cross-border trends
	Annual flow of migrants into country by occupation	Entry visas, work permits, registries of professional associations	Develop policies to manage health personnel; develop integration and deployment policies	Identify emerging patterns
	Factors pulling migrants to country	Surveys	Manage flow of workers into country	Identify main source and destination countries
	Distribution (age, sex, geography, etc.) of migrant health personnel	Tax and social security records, censuses	Formulate integration and deployment policies; develop policies to provide equity of access to care	Define common actions for monitoring and evaluating trends and policies in migration of health personnel
<b>Source country</b>	Factors pushing people to migrate	Surveys of workers in destination countries or of those intending to migrate	Manage flow of health workers out of country; develop retention policies in countries “losing” health workers	Identify best management practices (that is, retention, deployment, etc.)
	Flow of workers out of country	Estimates from administrative records (entry visas, work permits, registries of professional associations) in main destination countries	Estimate loss of skills and potential gain in remittances	Develop guidelines for ethical recruitment
		Vacancy rates for health workers in source countries (excluding retired or deceased workers)	Evaluate impact on service delivery and estimate shortages and vacancies	
	Remittances	Banks in source and destination countries or other organizations monitoring the flow of money into or out of a country	Assess impact on national economy and household income	
		National health accounts	Estimate positive benefits of migration	
	No. of trainees who do not return	Records of destination country’s training institutions and professional associations	Plan training of health workers; formulate policies to encourage return	
		Scholarship registries in source country		
	Financial costs and other impacts of migration	Sources of educational budget data, census data, vacancy rates, epidemiological information	Assess financial impact (costs of training, loss of taxes versus gain in remittances); reorganize service delivery systems; develop delivery systems; policies to allow equitable access to care	
<b>Both destination and source countries</b>	Return flow of migrants	Records from the ministry of health, surveys	Assess impact on supply of health workers; assess impact on improvements in quality of care	
	Internal movement between rural and urban areas and its impact	Records from the ministry of health	Organize service delivery; implement deployment policies	
	Cross-industry movement	Censuses and workforce surveys	Assess impact of entire workforce on service delivery; develop retention policies; plan for human resources needs in health care	

into account. Such data are used to define, implement, manage, monitor and evaluate policies. These data can also serve to define training needs and attrition rates, to shape deployment and retention policies, or be used to strengthen the attractiveness of the national and local health labour markets. Information on the migration of those who train medical professionals is especially important because of its impact on the capacity of a country to provide quality training and to conduct high-level research programmes (8).

At the international level, migration data on health personnel are critical in providing insight into cross-border trends and emerging patterns and destinations, in suggesting areas of common actions, and when describing, monitoring, and evaluating national policies (9). Data on the international migration of health workers can help identify best practices with respect to ethical recruitment and retention policies.

## Main data sources on migration: types, quality, and problems

### Specific features of migration data

Migration data usually come from a variety of sources and are collected by different organizations to be used for a range of purposes. While the United Nations recommendations on statistics on international migration may be useful in improving quality and comparability (10), most countries have problems implementing them because the minimum available dataset specified in the recommendations does not always exist. In addition, the UN recommendations specify that data on occupation is optional, but to analyse the migration of health personnel, data sources need to identify at least citizenship status and occupation in a way that separates health workers from other workers.

Proxies, such as country of birth, country of citizenship at birth, or country or place of usual residence, are sometimes used to distinguish citizens from foreigners. However, these proxies may lead to an overestimation or underestimation of the number of migrant health workers. Estimates based only on citizenship, for instance, do not capture naturalized immigrants, who are being counted as emigrants by their home countries.

Health workers can be identified only if their occupation is classified using at least the three-digit level of the International Standard Classification of Occupations (ISCO-88) (11) or an equivalent scheme. Moreover, occupations like physicians and dentists can be separately identified only by using the four-digit level. In some cases, using information on occupation alone is not sufficient to distinguish different categories of health personnel and their activities. The use of other international standardized classifications, such as those for education (the International Standard Classification of Education) or industry (the International Standard Classification of all Economic Activities) can be helpful (12) because the profiles of health workers differ across countries; this is particularly true for nurses. To optimally characterize health professions, the most detailed level of standardized classification systems should be used.

One specific feature of the migration of health personnel is that the total number of migrants from countries who “lose” health workers (those that have few health workers to start with) is usually small. The importance of migration should therefore be seen in terms of the scale and impact on the health system in the source country. As illustrated in Fig. 2, Zimbabwe lost the equivalent of about 30% of its newly graduated nurses in 2001 (most of them left for the United Kingdom), but in the

UK this accounted for only 91 new registrations. If we consider other destinations that are popular with Zimbabwean nurses, such as South Africa and Botswana, we can imagine the impact of migration on the shortage of nurses in Zimbabwe.

Another specific feature is that health workers often do not work in health care in their destination (or host) country or may take lower-level jobs. For example, some migrants, such as physicians, may still be working in health care but as medical assistants or at another lower level. It is therefore important to be able to capture the current and previous occupations of migrants to ensure the quality and comparability of statistics from source, transit, and destination countries. Few countries have established a system to monitor the flow of migration coherently, and most countries are better at controlling immigration than emigration (2, 6).

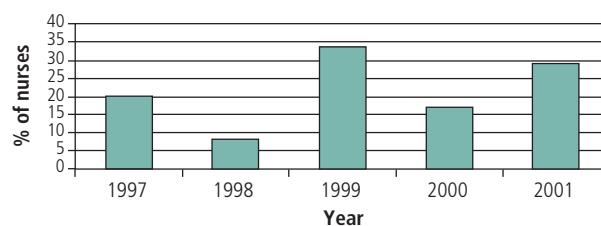
### Content, strengths, and limitations

Because there are rigid rules governing the recruitment and employment of migrant health personnel in many destination countries, the international migration of health workers is more likely to be legal migration. As a consequence, many sources can be used to capture and analyse this migration. Potential sources include registries of work permits, records of entry visas, registries of professional associations, population registries, facility surveys, workforce surveys, household surveys, population censuses, and economic censuses.

Different types of entry visas and work permits are issued depending on the agreements between countries, the occupation of the migrant and the intended duration of stay. Statistics from entry visas and work permits can give an insight into the annual flow of migrants by occupation and country of origin or residence; they may also give information on some other characteristics of health personnel who migrate. Some countries, such as the United States, require foreign health workers to take an examination before filing an application for a work permit or visa. Data from these examinations could be used as indicators of the intention to migrate but they do not tell us how many successful candidates have left their home country. Other limitations of these statistics are that there is no way of knowing whether migrants meet the conditions of their visas or work permits, for example, by working in a specific place or job. In addition, because different agreements exist between different countries, migrant health workers will need work permits for some countries but not for others.

In some countries, professional associations and regulatory bodies, such as the Nursing and Midwifery Council in the United Kingdom, maintain registries of health workers authorized to practise. These registries have information on applications and

Fig. 2. Zimbabwean nurses registered in the United Kingdom as proportion of new nurses graduated in Zimbabwe, 1997–2001



Source: NMC registrations in the United Kingdom; Ministry of Health of Zimbabwe

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admissions to the registry; these data could help describe the number of migrant health-care workers and the flow of health workers. Unfortunately, some of these registries may cover only qualified health professionals and may not cover assistants or auxiliaries. Moreover, although the data record registration, they may not provide information on whether the health worker has actually entered the country and whether she or he has taken up employment in the health sector. It is also possible that double counting may occur since nurses from some countries may apply for both nursing and midwifery registration (6).

Data from entry visas, work permits and professional associations are mainly collected for administrative purposes. The degree of effectiveness with which such administrative procedures are implemented and monitored in each country will have an impact on the quality and comparability of migration statistics (13).

Data from censuses permit an analysis of the number of health-care workers who migrate, their demographic and socio-economic profiles, and their distribution across administrative units. However, because censuses are conducted once every 5–10 years in most countries, they do not capture temporary migration that occurs between censuses and cannot always provide regular statistics on migration flow. Many facility, workforce, and household sample surveys capture data on citizenship, occupation, and some potential factors pushing people to migrate or pulling them towards destination countries, and therefore they allow for an analysis of immigration in a destination country. However, unless they are focusing especially on migration, such surveys have similar drawbacks to censuses (12, 14). In addition, without specially designed sampling strategies, it would be difficult to make the detailed assessments needed for migration studies since they will most probably rely on insufficient sample sizes.

### Other data sources

Other potential sources of data include registries of residents, employers, registries of foreigners, tax and social security records, registries of refugees and asylum seekers, medical and nursing associations for migrant workers, and recruitment agencies. Such sources can be used to estimate the number of foreign health workers by region or state. They also offer the opportunity to analyse the attractiveness of the public or private health sector in a particular state or region.

In most countries it is more difficult to obtain information about emigration than immigration because exit visas are not compulsory and emigrants are not necessarily interviewed. Thus, estimates of the emigration of health workers from a specific source country may best be obtained indirectly through data from the main destination countries. However, the quality of the data depends on the level of coverage, the target population, and continuity in recording and updating these registries.

No single source of data can reflect the growing complexity of the migration of health workers, particularly their trajectories and itineraries. A combination of complementary sources can produce different types of statistics. Used with care, data from some sources may also establish the quality of the information provided from other sources (15). Some factors affecting the decision to migrate are not easily measurable, and to investigate them will require a variety of sources, both quantitative, to produce different types of migration statistics, and qualitative, to deal with the perceptions and motivation of health workers.

## Challenges in measuring migration

Given the constraints discussed above, any assessment of the scope of international migration and its impact on a country's health-care system will remain an important challenge. Many countries cannot afford the financial burden of producing reliable statistics, so finding ways of reliably recording international movements and information on occupations (to allow identification of the main occupations of health personnel) is difficult. Moreover, because data are collected and processed at different times in different places, it is difficult to ensure the comparability and timeliness of data.

Being able to provide evidence on the migration of health personnel requires political will to strengthen the capacity to produce and use statistics. While many destination countries have fairly good statistical systems, source countries often struggle with insufficient staff and uncoordinated administration (2). Source countries that export health personnel have a better potential to monitor the flow of health workers than those countries that "lose" health workers. In addition, some destination countries are used by health workers who are in transit. Statistics from these destination countries may therefore overestimate the number of health workers.

Another important challenge is to identify the factors that push health workers to leave their home country; source countries often have difficulty monitoring the phenomenon, and qualitative information is sometimes required. Migration information is considered sensitive, and many governments do not collect or share data, even between administrations in the same country. Governments need to be aware of the importance of collecting and sharing data on migration so that migration can be better managed. However, in poorer countries there are many other priorities that must be met from scarce resources.

### Better statistics

Better statistics on the migration of health workers can be obtained by standardizing, collecting, and analysing data on a regular basis. Adapting some of the UN recommendations so that they capture additional information specific to the migration of health workers may be a good starting point. Other specific actions may also improve our knowledge of the migration of health workers. They are:

- *Using existing data more effectively.* Many countries claim they lack data on health-personnel migration, but many sources could be used to analyse the phenomenon, even if their primary intention was not to collect data on the migration of health workers. It is better to formulate policies on the basis of limited data rather than on anecdotal information.
- *Improving the quality and comparability of data* to ensure a greater degree of confidence in the information. Compared with some areas of statistics, such as on the occupation, there is little international standardization of migration statistics. Data should be collected on the basis of established principles and methodological standards. Developing a minimum data requirement for tracking the movement of specific health personnel, such as nurses, could be helpful (16). Building the statistical capacity of the developing countries that have poor statistical systems should be part of this process.
- *Implementing a permanent follow-up system* to connect all stakeholders so that those who use the information can better explain what type of data they need and those who gather data can advocate for better use of it and get support for more data collection activities. This should include a permanent

system of data collection, not only to study the stocks and the flows of health personnel but also to analyse other specific policy issues.

- *Networking between source and destination countries* to harmonize their data collection instruments so that migration data on health workers can be compared using the same simple templates.

## Conclusion

Migration has both positive and negative effects, and it is important to learn how to maximize the benefits and minimize the risks and costs. Policy decisions need to be made to more effectively manage migration at the national and international levels, but those decisions will only be effective and correctly implemented and evaluated if they are based on adequate statistical data. There is a conflict between the wide range of potential sources and the poor statistical evidence on the migration of health-care workers. Each data source has its own strengths and limitations. It is better to use existing data than wait for an ideal system to be set up.

To ensure the accuracy and comparability of statistics, efforts should be made to harmonize the definition of migration and to strengthen mechanisms of data collection, recog-

nizing that the latter are subject to important constraints both because of limited resources and because of factors specific to the international migration of health-care workers. Collecting and sharing statistical information must be seen as a continual process. It needs to be neither extensive nor sophisticated, and mechanisms can be adjusted according to the specific needs and capacities of each country. In developing countries, in particular, the lack of capacity caused by the lack of resources and enough trained personnel as well as weak institutional infrastructure, limits the possibility of moving towards developing effective data management programmes.

Weak connections between data collectors and users are another major challenge. However, health workforce migration statistics should be considered a priority for health information systems. Some ways to improve the quality of the data on migration have been outlined in this paper. Many of them can be implemented on a short-term basis. WHO in collaboration with the International Labour Organization, the International Organization for Migration and other partners is working to harmonize instruments and methods for collecting and analysing data on the migration of health personnel. Interagency activities being undertaken in mode 4 of GATS will also be helpful. ■

**Conflicts of interest:** none declared.

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## Résumé

### Données sur la migration des agents de santé : sources, utilisations et problèmes

La migration des agents de santé d'un pays à l'autre et à l'intérieur d'un même pays pose un problème croissant partout dans le monde en raison de son impact sur les systèmes de santé dans les pays développés comme dans les pays en développement. Des décisions doivent être prises aux niveaux national, régional et international pour gérer plus efficacement ce phénomène, mais elles ne seront efficaces et leur mise en œuvre et leur évaluation ne seront correctes que si elles reposent sur des données statistiques adéquates. La plupart des statistiques sur la migration des agents de santé ne sont ni complètes ni totalement comparables, et elles sont souvent sous-utilisées, limitées (elles ne donnent souvent qu'une vue générale du phénomène) et insuffisamment tenues à jour. Il existe aussi une discordance entre la diversité des sources potentielles de données et la faiblesse des données statistiques

sur la migration des personnels de santé. Les chercheurs qui s'intéressent à ce phénomène se heurtent à deux problèmes principaux, ceux que l'on rencontre couramment lorsqu'on étudie les migrations en général, et qui sont des problèmes de définition et de comparabilité des migrations de travailleurs, et ceux liés aux mouvements spécifiques des personnels de santé. Le présent article donne des informations sur les utilisations et les utilisateurs des statistiques, sur les forces et les faiblesses des principales sources de données et sur les autres problèmes qui doivent être résolus pour obtenir des données de bonne qualité sur la migration des agents de santé. Il propose également des méthodes pour améliorer la collecte, l'analyse, le partage et l'utilisation des données statistiques sur la migration des agents de santé.

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## Resumen

### Datos sobre la migración de personal sanitario: fuentes, usos y problemas

La migración del personal de salud en el interior de los países y entre ellos es motivo de creciente preocupación en todo el mundo debido a su repercusión en los sistemas de salud tanto en los países desarrollados como en los países en desarrollo. Es preciso tomar decisiones de política a nivel nacional, regional e internacional para gestionar más eficazmente este fenómeno, pero esas decisiones sólo serán eficaces y se aplicarán y evaluarán correctamente si están basadas en datos estadísticos adecuados. La mayoría de las estadísticas de migración de personal sanitario presentan lagunas y no son plenamente comparables, y a menudo se infrautilizan, tienen un alcance limitado (porque suelen proporcionar sólo una descripción general de los fenómenos) y no están actualizadas. Existe también un conflicto entre la variedad de las posibles fuentes de datos y la escasa evidencia estadística sobre la migración del

personal de salud. Los investigadores interesados en aportar pruebas científicas sobre este tipo de migración tienen que hacer frente a dos importantes dificultades: por una parte, los problemas que surgen habitualmente cuando se estudian las migraciones en general, como son los asociados a la definición y la comparabilidad de las migraciones de trabajadores, y por otra parte los problemas relacionados con los movimientos específicos de profesionales de la salud. En este artículo se habla del uso de las estadísticas y de quienes las usan, de los puntos fuertes y débiles de las principales fuentes de datos, y de otros retos que es necesario afrontar para obtener evidencia sólida sobre la migración de personal sanitario. En el artículo se proponen también diversos métodos para mejorar la recogida, el análisis, el intercambio y el uso de datos sobre la migración de personal sanitario.

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## Arabic

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