

01 October 2019

United Nations Economic Commission for Europe

Conference of European Statisticians

Work Session on Migration Statistics

Geneva, Switzerland

29–31 October 2019

Item 3 of the provisional agenda

Data integration for measuring migration

Data integration and inter-agency co-operation for the measurement of immigration: the Chilean experience

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Summary

Statistical agencies and policymakers face a wide range of challenges in measuring immigration. In Chile, some of the challenges are the limitations of the data resources (a 10-year gap between censuses), the fragmentary nature in which administrative records capture immigration (different ways of and purposes for capturing data), and the variability of immigration patterns (related to economic and political factors).

To overcome these challenges, the Chilean National Statistics Institute (INE) and the Department of Immigration (DEM), in collaboration with the Investigative Police Service (PDI), the Ministry of Foreign Affairs, and the Office of Civil Registration and Identification, designed a methodology to estimate the number of foreigners residing in Chile in December 2018. The methodology integrates information from the 2017 Population Census and administrative data.

This paper describes the methodology, its scope and limitations, and statistical data regarding immigrants in Chile and their demographic characteristics. This work responds to the growing demand for statistical information about these sub-populations. It also relates new experiences in the measurement of international migration, which resulted from data integration and inter-agency co-operation.

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I. Introduction

1. Migration flows are social, economic, and political phenomena that have been of particular interest in Chile in recent years. Their projection as an important topic in the future is due to the sustained growth of international immigration, which has garnered far more attention than has the return of Chileans or second-generation immigrants. Similarly, international emigration is very seldom discussed.
2. Historically, population censuses have monitored the accumulated stock of international immigrants by including questions on nationality and place of birth (1854–1952, nationality; 1952–2017, place of birth). However, the most recent census captured the phenomenon in ascent, which required a 2018 estimate of the new population with a wide use of administrative records.
3. The estimate of the foreign population resident in Chile as of December 2018 was presented at national and subnational levels by sex, age, and nationality (the principal 15 countries of origin). The technical details and methodological limitations are provided below.

II. Interagency Cooperation

A. Participating institutions of the immigration process

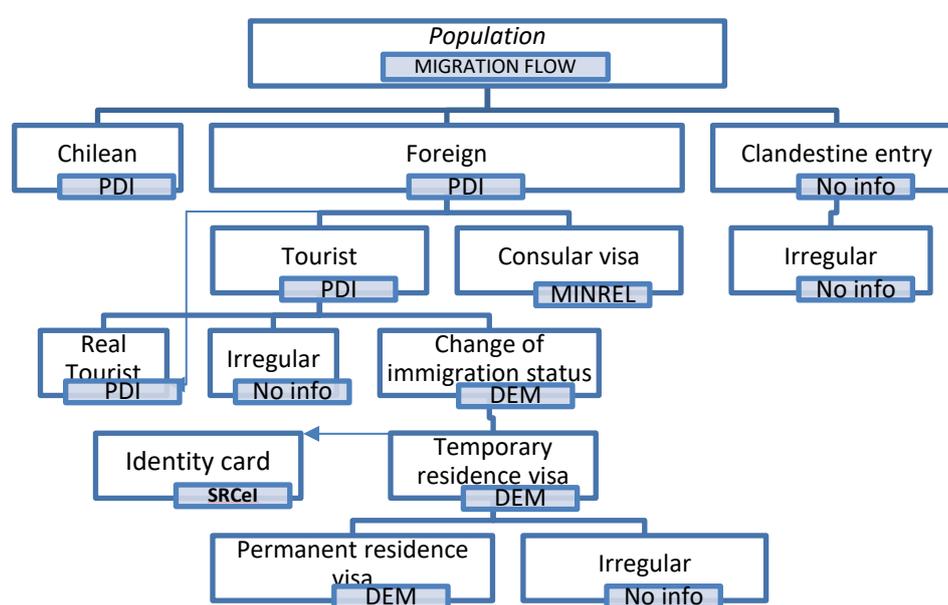
4. In Chile, there is no single institution charged with supervising the administrative processes of immigration. The principal institutions charged with monitoring migration flows are the following:
5. Department of Immigration (Departamento de Extranjería y Migración, or DEM): The DEM forms part of the Ministry of Interior and Public Safety. Its mission is to guarantee the execution of Chile's current immigration laws (including entry and exit, temporary and permanent residence, expulsion, and regulation of foreign citizens within the national territory) in the framework of the National Migration Policy of the Government of Chile. Among its functions is reviewing applications for temporary and permanent residence, asylum, and nationalization.
6. Investigations Police (Policía de Investigaciones, or PDI): The PDI forms part of the Ministry of Interior and Public Safety. According to article 4 of the Organic Law of the Investigations Police of Chile, its mission is to investigate crimes in accordance with the instructions of the Public Prosecutor's Office. Its functions include the control of migration and overseeing the residence of foreigners in the country.
7. Civil Registration and Identification Service (Servicio de Registro Civil e Identificación, or SRCel): The SRCel forms part of the Ministry of Justice and Human Rights. It serves all citizens residing in the country, establishing the identity of each of them and providing documents that confirm it. In addition, the SRCel registers and confirms a series of life events that affect civil status and patrimony.
8. Ministry of Foreign Affairs (Ministerio de Relaciones Exteriores, or MINREL): The mission of MINREL is to contribute to the formulation of Foreign Relations, as defined by the President of the Republic, and guide and coordinate their implementation in the context of a foreign-policy system to which the State, civil society, and other public and private actors concur. Among its functions is to handle consular affairs of immigration and of Chileans abroad.
9. At the time of this investigation, the steps that a person may take to immigrate to Chile (as can be seen in Illustration 1) are the following: the person, whether Chilean or foreign, enters at an authorized port of entry or enters clandestinely. No direct information exists for producing statistics on clandestine entry. The registration of entry or exit of a person at an authorized port of entry is controlled by the PDI. The person may enter as a tourist or with a visa obtained outside the country in the respective consulate. MINREL handles the registration of consular visas, and the person who

enters with a consular visa registers it with the PDI and then may obtain an identification card at the SRCeI.

10. The person who enters as a tourist may be a real tourist or may be a person who later declares their intent to reside in Chile. In the latter case, the person must change their immigration status. The DEM registers the change in status by granting a temporary visa. Cases in which tourists exceed their allotted stay in the country without taking further steps to extend it are considered irregular; no specific statistics are available about these cases. The temporary residence visa granted by the DEM normally permits residence for one year, and once obtained, foreign persons must register their visas with the PDI, after which they may apply for an identity card. After one year of temporary residence, foreign persons may apply for a permanent residence, which, if granted, establishes their permanent residence in the country.

Illustration 1

Institutional pathways for immigrants in Chile



B. Participating Inter-institutional Working Group for Migration Statistics

11. Between 2012 and 2017, various sources of information such as censuses, surveys, and administrative records showed an increase in international immigration and a change in the principal countries of origin. The problem, in communications terms, was the variability of the figures provided by the different institutions of the State. As recently as 2017, INE provided a figure of 746,465 international immigrants as of April of that year, the Survey of National Socioeconomic Characterization (Casen) of the Ministry of Social Development showed 777,407 immigrants at the end of the year while the DEM provided an estimate of 1,119,267 immigrants as of December 2017.
12. Although in theory INE is the head of the national statistical system, in practice many State institutions have research departments and work groups for the production of statistics. Likewise, the general demand for information within short time periods has increased because of Law 20.285, or the Law on Transparency of Public Office and Access to Information of State Administration. The law requires public institutions to provide data that in some cases resulted in crude figures being released by the media before their official publication, which requires technical rigor.

13. Within the framework of the elaboration of Population Estimates and Projections based on the 2017 Census, INE began collaborating with the DEM in order to incorporate the observed changes in international migration. Later in 2018, when the need to incorporate a large number of relevant parties in discussions on international migration statistics was better understood, the Inter-institutional Working Group for Migration Statistics was initiated as a framework for the permanent collaboration among State institutions for the creation, processing, and analysis of international migration statistics.
14. In the framework of this working group, the objective was established as the “estimation of the number of foreign persons in Chile on 31 December 2018 by means of the integration of census data and administrative records of the services associated with the migration process”. Specifically, the objective was to develop a methodology for the estimation of the immigrant populations in Chile and characterization foreign persons in Chile as of December 31, 2018, on a national level and by sex, age group, and country of birth.

III. December 2018 estimate

A. Sources of information

15. In Chile, the main sources of information on international migration can be divided into three major groups: household surveys, housing and population censuses, and administrative records. Chile does not conduct a survey specifically targeting migration. The existing surveys provide depth on other aspects such as poverty, social expenses, and the labour force, but these surveys are not necessarily representative of all resident immigrants. Although these surveys have provided reference data for the description of phenomena related to migration, their objectives are not directly related to this population group and thus may limit the usefulness of this information.
16. Housing and population censuses provide information on the total number of immigrants (accumulated stock) in the country at a determined point in time. In the 2017 Census, the question used to identify the immigrant population resident in the country shows the number of the population who declared that they habitually reside in Chile and, with another question: “When you were born, in which commune of the country did your mother live?”, the number of persons born abroad can be determined. This census, which was of an abbreviated nature, did not ask about nationality. Therefore, those categorized as immigrants by these questions may be Chilean or foreign.
17. The census showed two phenomena: a) the recent growth in the immigrant population—66.7% of the international immigrants stated that they had arrived in the country between 2010 and 2017, and b) the capture of phenomena was during a period of rapid growth of this group. Of the total of persons who arrived in Chile in the 2010-2017 period, 30.9% arrived in 2016 and 15.6% in 2017 (Note that the latter figure includes only the period January–April 2017.) Thus, although information from population censuses are available, the need for statistical data on the total foreign population for the period after the census stemmed from an increased demand for information, which was based on administrative records that account for these figures.
18. The purpose of administrative records of public services related to the foreign population is to support the administration of each organization. Thus, they were not originally designed to generate statistics as their principal objective; rather, they seek to make existing information available for the development of the governance of migration.
19. In general, the reliability of these records depends on the degree of the completion as well as on the consistency of the concepts and definitions they use. In addition, the records must be submitted to specific procedures of data production in order to be used as statistics. Because of the characteristics of the institutional framework that underlie the process of settlement of foreigners in the country, the

estimation of the number of foreigners in Chile requires combining records that originate from their contact with the different services that are part of the process. In Chile, the main administrative records in the migration process of foreign persons residing in the country are the following:

20. Records from the application for and granting of temporary resident visas and permanent residence in Chile: the Department of Immigration (DEM) keeps records of foreign persons who apply for temporary residence visas and for permanent residence in the country. Records from the granting of consular visas: at consulates and embassies, the Ministry of Foreign Affairs (MINREL) registers the residency permits granted to foreigners through the Consular Service System. Records based upon ports of entry: the Investigations Police (PDI) registers the entry and exit of both foreigners and citizens through information collected at ports of entry (both land and air). Death certificates: the Civil Registration and Identification Service (SRCeI) registers deaths in the country of both citizens and foreigners.

B. Methodology

21. We propose a model for the estimation of foreign persons. The model is based on the aggregation of data from census and administrative registers. The 2017 Census is the starting point of the estimation because it provides the first element: a statistical source that accounts for the accumulated number, as of the date of the census, of persons born abroad that state that they habitually reside in Chile. Two adjustments are proposed for this number: i) an adjustment for those not captured in the national census, by sex, and ii) an adjustment for “ageing” of the population of one year. It should be noted that the census does not ask for identification numbers, thus persons in administrative records are integrated into the data as an aggregate.
22. In order to capture migration flows after April 20, 2017 (the day after the census), administrative records that capture these flows were adjusted for statistical purposes. Thus, persons were observed by the number of applications they have submitted to the DEM and MINREL. The number of these persons was adjusted according to habitual residence up to the date the estimate was made (December 31, 2018). That is, the group of persons are excluded who, according to the data of the PDI from ports of entry, were not present in the country on December 31, 2018, and those who, according to death certificates issued by SRCeI, had died during the period.
23. One of the steps taken by the institutions associated with the administrative records was to obtain the following: the number of persons who, having entered the country after the census (April 19, 2017), have completed their first application through the DEM; the number, among these persons, of those whose last migration as of December 31 was exiting the country; and the number, among this same population, who died on or before December 31. The next step was to subtract all those persons who stated they had a consular visa when they completed their first application through the DEM and then to add at a general level those persons who obtained a consular visa after the day of the census. Thus, an estimate can be made of the cumulative number of persons who arrived in the country on or after April 20, 2017 and who were in Chile on December 31, 2018 (See illustration 2).

Illustration2

Basic scheme for the estimation of the Foreign Population in Chile



C. Limitations

24. From the demographic point of view, housing and population censuses enable an approach to the measurement of the phenomenon by the distinction of place of birth and the place of habitual residence. For every census that attempts to gather information on place of birth, the population born in the country and those born abroad must be distinguished. However, the country of birth is not necessarily the same as country of citizenship (United Nations, 2003). Thus, for the purposes of the 2017 Census, international immigrants were defined as those who were born in a foreign country, who were present within the national territory, who were enumerated in the census on April 19, 2017, and who stated that they habitually reside in Chile (INE, 2018).
25. Administrative records of the DEM and MINREL, originating from the administration of migratory flows, apply to foreign persons who do not have valid permission to reside in the country. Thus, all foreign persons who seek permission to reside in Chile are registered by one of two institutions at some stage of the immigration process.
26. The nationality of persons can be obtained from administrative records; this is a fundamental distinction for their incorporation as subject of these records. The legal basis of this distinction is Law 1.094 of 1975, which establishes the norms on foreigners in Chile. The law also refers to the Constitution of Chile, which defines the conditions under which persons may be considered Chilean. Thus, in the framework of the present estimation, foreign residents are defined as those persons born abroad who are habitual residents of Chile, or who are foreigners and have applied for permission to reside in the country.
27. Therefore, the estimation shows a conceptual asymmetry, which is due to the combination of census data and administrative data. In particular, this situation is reflected in the two subpopulations of foreign persons who are part of the immigration stock (persons born outside the national territory according to the census standard) and who are part of the flow (foreign persons habitually residing in Chile according to administrative records of the DEM and MINREL). As an example of the effect that this group can have, nationalization figures were gathered between January 2000 and December 2018, from which it was observed that 15,355 persons have been nationalized.
28. Because the census does not ask for identification, it cannot be assured that persons who were captured in the census are still residing in Chile, whether in a regular or irregular manner. This factor may worsen because of the time gap between the measurement of the census and data of the DEM.
29. The following groups are not included: those who entered the country clandestinely; those who, after the expiration of their tourist visa¹, reside in the country in an irregular manner; and those who have not completed any administrative procedure at the DEM.
30. The PDI databases on entry and exit were originally created to monitor administrative acts rather than to create statistics. Their purpose was also to police the country (namely, to observe the background of persons entering the country in order to decide whether they may enter). Thus, at the time of the estimate, a timely accounting of the stay of persons, which would enable the calculation (with only this record) of the number of persons who in year x stayed y months in the country is not possible.

¹ This is based on the understanding that those with a current tourist visa are indeed tourists and thus cannot be added to the list of foreign residents.

IV. Results

A. Treatment of census data

31. For this estimate, it was decided to adjust the number of persons born abroad who were enumerated in the 2017 Census by adding an estimate of those who were not enumerated in the census. Although immigrants not counted in the census are different from the total population, their number is very difficult to measure².
32. After the census in Chile, INE published estimates and projections of the population for the period 1992-2050, estimating that 4.7% of the population was not counted in the census. The estimated percentage of men not counted in the census is 5.3% and of women is 4.1% (INE, 2018). Steps in the treatment of those not counted in the census:
33. The total of international immigrants actually measured in the census according to figures from the 2017 Census was 746,465. This figure consists of 369,142 men and 377,323 women. By applying the formula for omission from the census, which is defined as (Estimated population - Population measured in the census) / Estimated Population * 100, the resulting values of omission are 5.34305 for men and 4.06294 for women. The new values for men and women were rounded to zero decimals by the Round function of Excel and were then added to obtain a total. The resulting figure was 783,282 international immigrants (See table 1).

Table 1

Treatment of immigrant stock, by omission from the general census

Sex	International immigrants surveyed in the census	International immigrants surveyed in the census + immigrants not counted in the census, by sex
Total	746,465	783,282
Men	369,142	389,979
Women	377,323	393,303

Notes: Omission from the census is calculated as (Estimated population – Population surveyed in the census) / Estimated population) * 100. For men, this figure is 5.34305 and for women, it is 4.06294.

Source: INE

B. Treatment of Administrative Records

34. Databases have been built from information on the number of residence permits requested by or granted to foreign persons. Duplication was avoided (i.e., records were eliminated that were repeated two or more times, whether because of errors in the application or because of processing errors). In addition, to avoid invalid values in any fields of the database, each category of the databases has been reviewed, correcting mainly errors in typing.
35. Thus, the database indicated that, as of December 31, 2018, 1,718,810 persons had completed the first immigration procedure in Chile, through the DEM, or abroad, through MINREL. The data from the DEM includes permanent residency permits granted between 1936 and 2018, applications for

² The censuses contain an omission that, in addition, differentiates the total population from international immigrants. The latter group is very difficult to measure because members of this group more often do not belong to a household and are sometimes undocumented, and, for this reason, falsify their country of birth, declaring it as the country in which the census is conducted (Martínez, 2003).

visas, and visas granted between 2000 and 2018. MINREL provided data on visas granted between 2015 and 2018.

36. From records obtained on the group of persons who began their first immigration procedure through the DEM or MINREL, the data of their entry into the country was determined. The date of entry into the country is obtained from the immigration management system of the DEM, which registers the visa declared by people at the time of entering the country and with which they make an application for a residence permit through the DEM. This visa may be a tourist visa granted by the PDI or a consular visa granted by MINREL.
37. This population was then defined as the group of people whose entry into the country took place after the census, that is, after April 19, 2017. Thus, a distinction is made between two sets of foreign persons in Chile: those who entered the country before the day of the census, and those who, having arrived in Chile after the census, were not counted. Thus, an estimate is sought that does not duplicate the persons of each of these groups.
38. Information recorded in the Border Control System administered by the PDI was joined with administrative records of the DEM, which used combinations of variables (Passport, Rut (i.e., Chilean ID number), Names, Surnames, Sex, Date of Birth and Nationality), and was sent by official letter by the DEM to the PDI. Two new variables were then added to the original records: RUMBO and FECHA_MOV, which refer to the address of the last border movement ("E" for Entry and "S" for Exit) and the date of the movement. These variables include all movements up to and including December 31, 2018³.
39. The SRCeI, using the Registry of Deaths, linked the information using as search criteria the RUN (i.e., national ID number) registered by foreigners in the immigration management system. The SRCeI also used a search by the DEM's Alien Registration Number, which was shared with SRCeI through Inter-operability Agreements. Thus, two variables were added to the original record: FALLECIDO AND FECHA.DEF, which refer to whether the identified person died in Chile and the date on which this occurred (if applicable), respectively.
40. Both the PDI and the SRCeI were responsible for applying this procedure in their own databases, submitting the resulting information to the DEM. This information was then compiled and aggregated by the DEM who, together with INE, proceeded to calculate the final estimate presented in this document. Thus, of the total number of people who had arrived in the country, 467,943 foreign persons have remained as habitual residents in Chile as of December 31, 2018.

Table 2

Foreign persons in administrative records dated after the general census

Sex	Record of residence permits granted after the census	Postcensal consolidated migratory flow
Total	513,405	467,943
Men	280,697	256,149
Women	232,708	211,794

Source: INE

³ Authorities decided to limit data at December 31 in order to observe the situations of persons up until that date, and with information on the exact number of persons in the country on December 31, they proposed estimating the number of foreign people residing in Chile.

V. Sociodemographic description

41. By combining the census figure and administrative records, as of December 31, 2018, authorities estimated that there were 1,251,225 foreign residents in Chile. This figure of the foreign population habitually resident in Chile is 67.6% higher than the number measured in the census.

Table 3

Estimate of the number foreign residents in Chile, by sex, December 31, 2018.

Sex	Total	Percentage
Total	1,251,225	100.0
Men	646,128	51.6
Women	605,097	48.4

Source: INE

42. Regarding the distribution by age, table 4 shows that close to 60% of the estimated population are between the ages of 20 and 39, indicating that foreign residents in Chile are in the age brackets of the potentially economically active population.

Table 4

Estimate of foreign residents in Chile, by age group, December 31, 2018

Age group	Total	Percentage
Total	1,251,225	100.0
0 to 19 years	183,315	14.7
20 to 39 years	746,587	59.6
40 to 59 years	266,298	21.3
60 years and over	55,025	4.4

Source: INE

43. Finally, table 5 shows the estimated percentage distribution of foreign residents according to country of birth. The five countries from which the majority of foreign residents come are Venezuela (288,233), Peru, (223,923), Haiti (179,338), Colombia (146,582), and Bolivia (107,346).
44. The three countries with the highest percentage variation when compared to the population measured in the census are Venezuela (247%), Haiti (186%), and Cuba (135%). Similarly, if the estimate of December 31, 2018, is compared with the population measured in the census, Peru has been replaced by Venezuela (23% of the total foreign population) as the most prevalent community. Haiti ranks as the third largest community with 14.3% of the total.

Table 5

Percentage distribution of the estimated foreign population by country of birth, 31 December 2018.

Country of birth	Total	Percentage
Total	1,251,225	100.0
Venezuela	288,233	23.0
Peru	223,923	17.9
Haiti	179,338	14.3
Colombia	146,582	11.7

Country of birth	Total	Percentage
Bolivia	107,346	8.6
Argentina	74,713	6.0
Other country	69,959	5.6
Ecuador	36,994	3.0
Spain	21,147	1.7
Brazil	18,185	1.5
Dominican Republic	17,959	1.4
United States of America	16,337	1.3
Cuba	15,837	1.3
China	13,528	1.1
Mexico	8,975	0.7
Germany	8,515	0.7
Undeclared	3,654	0.2

Source: INE

VI. References

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