Benchmarking International Migration Indicators

TECHNICAL REPORT

Contents

Executive Summary

This report assesses the feasibility of producing new international migration indicators, endorsed by the United Nations Statistical Commission in 2023. Through comprehensive analyses of official data, census questions and metadata available in the United Nations Statistics Division (UNSD)'s Demographic Yearbook database, its Census Topics Database, and other relevant sources, the report identifies current gaps in data and metadata and potential needs for capacity building and technical cooperation, and offers insights and recommendations aimed at enhancing the national production of the new indicators and the global data collection related to international migration.

The main findings are as follows:

Data Availability

- Based on the official data reported to UNSD during the 2010 round of the World Population and Housing Census Programme, **about one third of countries and areas may be able to officially produce the recommended core international migration indicators**.
- Many countries reporting migration data also collected information on age, sex, country of citizenship and country of birth, enabling disaggregation by these primary topics.
- Disaggregation by secondary topics is less feasible.
- Capacity building needs are highest in Africa and in Latin America and the Caribbean.

Census Topics

- During the 2010 round, **most countries incorporated questions related to citizenship status and native-/foreign-born status in their census questionnaires**.
- Secondary topics, such as duration of stay and reasons for migration are less commonly addressed.
- Disaggregation based on country of citizenship and country of birth for foreign-born and foreign citizen populations varies, affecting the feasibility of comprehensive analysis.

Metadata and Comparability of Data

- **Diverse methodologies, concepts, and definitions across countries impact the comparability of migration data**, including different treatment of populations and inclusion of internal migration.
- **Gaps in metadata collection** further complicate data interpretation and analysis.

1. Introduction

The United Nations Statistics Division (UNSD), under the guidance of the United Nations Expert Group on Migration Statistics, has initiated revisions to the 1998 Recommendations on Statistics of International Migration, motivated by shifts in international migration patterns and policy needs, and the accompanying growing demand for more accurate, frequent and timely migration data.

Since the publication of the 1998 Recommendations, international migration has undergone significant changes. Obstacles to migration have decreased, modern communication technologies have made it easier for migrants to maintain contact with their home countries, and regional agreements have facilitated free movement among certain countries. These factors have contributed to the increasing importance of migration in demographic and social change.

At the core of the revision work, lie the revised conceptual framework on international migration and mobility and accompanying statistical definitions, which were discussed and endorsed by the UN Statistical Commission in its 52nd session through its Decision 52/109[1]. Following the endorsement, the Expert Group has worked to operationalize the conceptual framework, including through the identification of six policy areas relevant to international migration and temporary mobility and the development of a list of core and additional migration indicators (MI) to measure progress across the policy areas:

1) Improve the measurement of international migration and temporary mobility stocks and flows
2) Address irregular cross-border movements and visa overstays
3) Ensure access to basic services by migrants and temporary populations vis-à-vis other population groups
4) Increase the integration and wellbeing of migrants
5) Empower labour migrants
6) Eliminate all forms of discrimination and end violence against migrants and temporary populations

For each policy area, the Expert Group on Migration Statistics identified a set of core and additional indicators, which the UN Statistical Commission endorsed as an integral part of the upcoming revision of the Recommendations on Statistics for International Migration in its 54th session through its Decision 54/104.

This report details UNSD's benchmarking exercise aimed at evaluating the feasibility of the newly endorsed core migration indicators[2] recommended for countries to regularly produce in support of Policy Area 1: *Improve the measurement of international migration and temporary mobility stocks and flows.*

The exercise first assesses international migration data and metadata reported by national statistical offices to UNSD and compiled in the United Nations Demographic Yearbook

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[1] https://unstats.un.org/unsd/statcom/52nd-session/documents/2021-30-FinalReport-E.pdf
[2] Presented in https://unstats.un.org/unsd/demographic-social/Standards-and-Methods/files/technical-report/national-reporting/Indicators-for-international-migration-and-temporary-mobility.pdf

(hereafter DYB) and provides insights into data and metadata gaps, as well as potential capacity building needs. Secondly, it compiles a preliminary result from an analysis of the Census Topics Database which UNSD has maintained through historical collection of census questionnaires. Based on the results of the analyses, a set of recommendations is also proposed to modify existing DYB data collection questionnaires to be in line with the latest international standards and to capture relevant data more accurately. The ultimate goal of the exercise is to enhance the accuracy, reliability, and comparability of international migration statistics across countries.

2. Objectives

The main objectives of the benchmarking exercise are:

    a. to assess the potential capacities of countries to produce the new core indicators for Policy Area 1, based on (a) the availability and comparability of data in the DYB database and (b) Census Topics Database;
    b. to identify data gaps and need for additional metadata from countries sending international migration data for inclusion in the DYB; and
    c. to provide recommendations for the revision of relevant DYB questionnaires in line with the new conceptual framework on international migration and temporary mobility.

3. Conceptual Framework

The conceptual framework on international migration and mobility [3] defines international migration as all movements resulting in a change in the country of residence within a given year. A person's country of residence is defined as the country in which the person has lived continuously for most of the last 12 months (at least 6 months and a day) or at least the last 12 months, not including temporary absences. Consequently, an international migrant is a person who has changed his or her country of residence and established new residence in the country within a given year. In line with the conceptual framework, the indicators for Policy Area 1: *Improve the measurement of international migration and temporary mobility stocks and flows* are associated with the statistical definition of residence and changes in the country of residence (i.e., migrant stocks and migration flows). There are three resident subpopulations critical for understanding immigrant and emigrant populations and their international movements: foreign-born foreign citizens, foreign-born citizens, and native-born foreign citizens. The two foreign citizen populations include individuals with regular and irregular migratory statuses, as stated the conceptual framework[4]. For completeness and comparison, it is also important to produce comparable statistics on a fourth population, namely, native-born citizens.

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[3] Final Report on Conceptual Frameworks and Concepts and Definitions on International Migration (2021),
https://unstats.un.org/unsd/demographic-social/migration-expert-group/task-forces/TF2-ConceptualFramework-Final.pdf
[4] The terms 'irregular', 'undocumented' and 'unauthorized' are often used interchangeably.

<u>Policy Area 1: Improve the measurement of international migration and temporary mobility stocks and flows</u>

***Stock* indicators** capture the size, characteristics and geographic distributions of international migrant and temporary populations present in the country at a particular point in time. With appropriate disaggregation, they can be used to quantify the importance of migration and mobility across a range of policy areas, from integration to infrastructure, to assess migrants' contributions to the labour market and their need for health and social services, and to gain knowledge of particular sub-groups such as return migrants. In addition, other countries' migrant population stock data may be used to quantify and describe emigrant populations living abroad.

***Flow* indicators** provide evidence for policies on entries and exits. International mobility includes all movements that cross international borders within a given year (excluding tourists and business visitors). It is important to know how many persons are arriving and departing during a period of time and key information about their demographic characteristics (age, sex). It is also useful to know whether the persons entering (and exiting) the country are citizens or foreign citizens. Among foreign citizens entering, categories of authorization or entry permits are key to understanding the rights and entitlements attached to them.

The conceptual framework proposes **four core migration indicators** for Policy Area 1, two dedicated to measuring international migration stocks, and two dedicated to measuring international migration flows. These indicators may be disaggregated by four primary topics (considered priority): age, sex, country of birth and country of citizenship, and several secondary topics (considered optional).

		Migration Indicator	Primary topics for disaggregation	Secondary topics for disaggregation
Stock	**MI 1.1**	Number/proportion of _____ in the total resident population Foreign-born population Foreign citizens Foreign-born citizens Native-born foreign citizens Foreign-born foreign citizens Native-born (native) citizens	1. Age 2. Sex 3. Country of birth 4. Country of citizenship	Duration of stay, educational attainment, labor force status, location of residence within country, reason for migration, NB/FB status of parents
	MI 1.2	Number of _____ who obtained citizenship over a given year Native-born foreign citizens Foreign-born foreign citizens		Educational attainment, labor force status, location of residence within country, duration of stay, legal grounds for obtaining citizenship (or reasons for migration), NB/FB status of parents

Flow	MI 1.3	Annual number of immigrants who are ___ Foreign-born Foreign citizens Foreign-born citizens Native-born foreign citizens Foreign-born foreign citizens Native-born (native) citizens		Country of previous residence, educational attainment, reason for move, labor force status prior to move, location within country
	MI 1.4	Annual number of emigrants who are ___ Foreign-born Foreign citizens Foreign-born citizens Native-born foreign citizens Foreign-born foreign citizens Native-born (native) citizens		Country of next residence, educational attainment, reason for move, labor force status, departure location within country

It is noteworthy that the unit of measure of the above flow indicators is persons entering or leaving the resident population of a country, not entries or exits. At present, some countries report the number of entries/exits to UNSD, not identifying multiple entries/exits belonging to a single person. Indeed, the Expert Group notes that time is needed to introduce this new concept in national statistical systems.

If information required to compute MI 1.3 and 1.4 is not collected or unavailable to the national statistical office, it is recommended that total net migration over a given year (MI 1.5) be computed through estimation or demographic accounting. Demographic accounting calculates a residual as an annual change in the resident population minus births plus deaths. However, the method was not advised by the Expert Group as it may involve errors from the measurement of population and vital events.

		Migration Indicator	Primary topics for disaggregation
Flow	MI 1.5	Total net migration over a given year	1. Age 2. Sex

The conceptual framework also proposes four additional indicators to measure international temporary mobility, considered ancillary depending on national priorities and circumstances, and which are outside the scope of this exercise.

4. Data Source and Methodology

The benchmarking exercise primarily uses migration data and metadata available in the DYB database. The DYB is an international compendium of official demographic statistics provided by national statistical authorities to UNSD.[5] To collect data for the publication, UNSD annually sends questionnaires to over 230 countries and areas, covering a wide range of population-related tabulations including migration stocks and flows, and publishes the data in the [UNdata portal](#).

Currently, UNSD collects migration data in line with the previous statistical definitions, which date from 1998[6]; thus, this data collection does not strictly correspond with the new indicators endorsed by the UN Statistical Commission in 2023. Therefore, in this exercise, seven tabulations on migration stocks and five tabulations on migration flows, currently part of the DYB data collection, are identified as relevant to the three indicators (namely MI 1.1, 1.3 and 1.4). MI 1.2 is not assessed with data in this report because information on the number of persons who obtained citizenship is not collected for the DYB. The number of countries reporting data for the identified tables is considered reflective of the current national capacities to produce each indicator.

In terms of disaggregation, the main focus is on the primary topics (namely age, sex, country of birth and country of citizenship), though data availability for secondary disaggregation topics is also discussed. Footnotes detailing national data sources, concepts and definitions, exclusions and limitations provide further insight into data availability and comparability.

There are a couple of caveats on the use of DYB data for this analysis. First, DYB data is based on voluntary data reporting by national statistical authorities. If a country produces migration statistics but does not report them to UNSD for any reason, the country is not considered in this exercise. Second, periods covered in this analysis vary across indicators. The time period covered by the analysis is primarily the decade surrounding the last complete census round (2010) for migration stock data, and the last reporting year for migration flow data.

Migration Stock Data

For assessing [MI 1.1](#), two basic tabulations on migration stocks are used: [B09][7] native and foreign-born population by age, sex and urban/rural residence and [B61] population by citizenship status, age and sex. These data are reported through the DYB Census Questionnaire, dispatched to 237 countries and areas, with the frequency of data reporting being every 5 or 10 years, depending on the country or area. Each tabulation is accompanied by its sub-tabulations, detailing specific characteristics (such as country of birth, country of citizenship, educational attainment and labour force status), as outlined below and shown in Figure 1.

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[5] More information on the DYB can be found on UNSD's website: https://unstats.un.org/unsd/demographic-social/products/dyb/
[6] Recommendations on Statistics of International Migration, Rev. 1
(https://unstats.un.org/unsd/publication/seriesm/seriesm_58rev1e.pdf)
[7] The DYB database uses notation for each tabulation comprised of a letter and a two-digit number, e.g. B09.

[B09]: Native and foreign-born population by age, sex and urban/rural residence

- [B59]: Foreign-born population by continent/country of birth, age and sex
- [B64]: Foreign-born population 15 years of age and over by continent/country of birth, educational attainment (ISCED 2011) and sex
- [B30]: Economically active foreign-born by occupation (ISCO-08), age and sex

[B61]: Population by citizenship status, age and sex

- [B62]: Foreign population (non-citizens) by country of citizenship, age and sex
- [B65]: Foreign population (non-citizens) 15 years of age and over by continent/country of citizenship, educational attainment (ISCED 2011) and sex
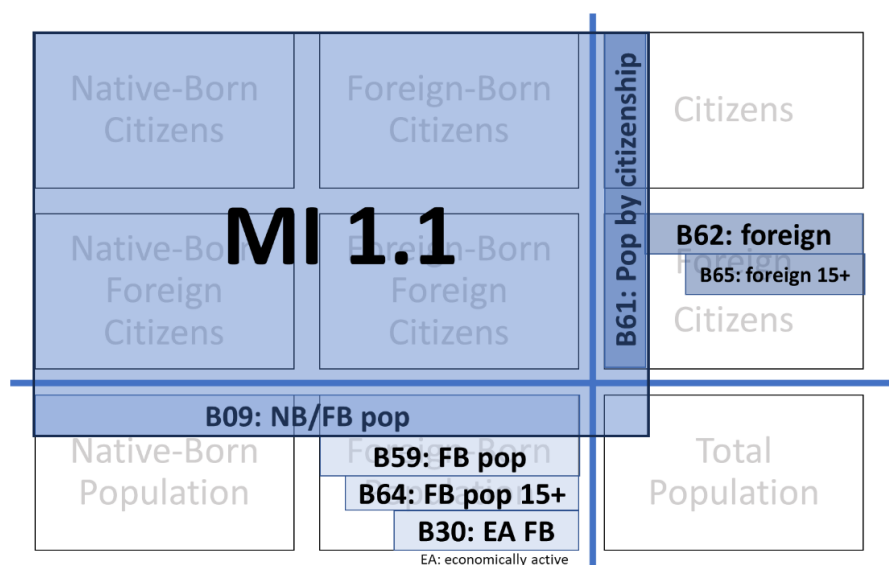
Figure 1. Relevant DYB migration stock tables for calculation of MI 1.1

Figure 1 shows what population groups each DYB table covers. [B09] covers native- and foreign-born populations regardless of citizenship status, while [B61] covers citizens and foreign citizens without distinguishing native- or foreign-born. Other tables cover a subset of population groups by age groups, educational attainment and activity status. Currently, no DYB tables collect disaggregated data by both citizenship status and native- and foreign-born status.

The underlying assumption here is that if a country or area can produce and report both basic tabulations on migration stocks (namely [B09] and [B61]), it is able to generate MI 1.1 disaggregated by age and sex. For country of birth and citizenship, the availability of two additional tabulations is considered: namely, [B59] foreign-born population by country of birth, age and sex and [B62] foreign population by country of citizenship, age and sex.

To assess the feasibility of disaggregating MI 1.1 further by the secondary topics, the following tables are considered: for educational attainment, [B64] foreign-born population 15 years of age and over by country of birth, educational attainment and sex and [B65] foreign population 15 years of age and over by country of citizenship, educational attainment and sex; and for labour force status, [B30] economically active foreign-born by occupation, age and sex.

The above sub-tabulations focus only on the foreign-born population or foreign citizens. In order to produce MI 1.1 disaggregated by secondary topics of disaggregation, national statistical offices should be able to produce statistics on native-born citizens disaggregated by educational attainment and labour force (or activity) status, along with age and sex.

The calculation of MI 1.2 hinges on the availability of information about acquisition of citizenship, as well as country of birth, which is currently not collected by UNSD for the DYB. This requires countries to maintain registers containing information on country of birth / nationality and citizenship status. Alternatively, administrative data from citizenship granting authorities could be collected annually by the national statistical office and disseminated. Data availability for MI 1.2 in the Eurostat data portal is discussed in Section 5.

Migration Flow Data

For migration flow indicators MI 1.3 and MI 1.4, DYB tabulations on migration statistics and Eurostat migration data (discussed in detail in Box. 1) are used.

The relevant DYB tables are [Q11] number of incoming migrants by citizenship status, age and sex; and [Q14] number of departing international migrants by citizenship status, age and sex, respectively, along with other tables that represent subsets of those populations, as outlined below and shown in Figure 2. It should be noted that the data in the DYB tables on incoming and outgoing migrants does not include country of birth (COB), one of the primary topics for disaggregation, which precludes the possibility of disaggregation of migration flow indicators by native-born / foreign-born status.

[Q11]: Number of incoming migrants by citizenship status, age and sex

- [Q12]: Number of incoming foreign migrants by country of citizenship and sex
- [Q13]: Number of incoming international migrants by previous country of usual residence and sex

[Q14]: Number of departing international migrants by citizenship status, age and sex

- [Q15]: Number of emigrating citizens by future country of usual residence and sex
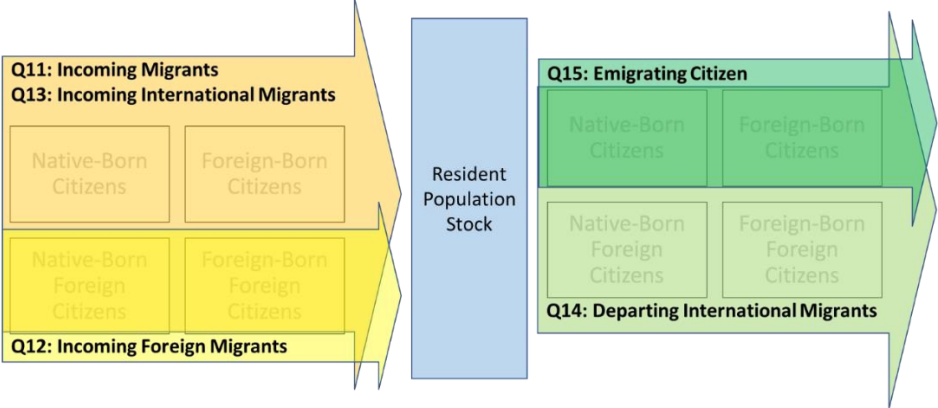

Figure 2. Relevant DYB migration flow tables for calculation of MI 1.3 and MI 1.4

These tables are annually reported to UNSD through the DYB Questionnaire on International Travel and Migration Statistics, dispatched to around 190 countries. For another 47 countries in the European region, Eurostat has been collecting and processing demographic and migration data from national statistical offices and forwarding to UNSD. The analysis includes the Eurostat dataset to enable the assessment of the capacities of all countries, including those pertaining to the European Union.

Box 1. Eurostat's migration data collection

From 2008 onwards, in the region covered by Eurostat, annual migration data fall under the requirements of Regulation (EC) No 862/2007 of the European Parliament and of the Council on Community statistics on migration and international protection.

As per the regulation, the definition of migrants aligns with that of the population. For example, if the population is defined in terms of usual residence, then the number of immigrants should be the number of persons who establish their usual residence in the territory of a country for a period of at least 12 months, or expect to do so, having previously been usually resident outside. The table below gives an overview of national definitions for immigrants and emigrants.

Countries by time criteria used for the definition of migration and typology of flow:

		Actual 12-month	Intended 12-month	Actual and intended 12-month	Other
Nationals	Immigrants	BE, CZ, DK, EE, NL, AT, RO, IS, NO, CH	DE, IT, HU, FI, SE, UK	BG, IE, EL, ES, FR, HR, CY, LV, LT, LU, MT, PL, PT, SI, SK, LI	
	Emigrants	BE, CZ, DK, DE, EE, NL, AT, RO, IS, NO, CH	IT, HU, UK	BG, IE, EL, ES, FR, HR, CY, LV, LT, LU, MT, PL, PT, SI, SK, LI	FI, SE
EEA citizens	Immigrants	BE, DK, DE, EE, NL, AT, RO, IS, NO, CH	IT, HU, FI, SE, UK	BG, CZ, IE, EL, ES, FR, HR, CY, LV, LT, LU, MT, PL, PT, SI, SK, LI	
	Emigrants	BE, DK, DE, EE, NL, AT, RO, IS, NO, CH	CZ, IT, HU, UK	BG, IE, EL, ES, FR, HR, CY, LV, LT, LU, MT, PL, PT, SI, SK, LI	FI, SE
Non-EEA citizens	Immigrants	BE, DK, DE, NL, AT, RO, IS, NO, CH	IT, HU, FI, SE, UK	BG, CZ, EE, IE, EL, ES, FR, HR, CY, LV, LT, LU, MT, PL, PT, SI, SK, LI	
	Emigrants	BE, DK, DE, EE, NL, AT, RO, IS, NO, CH	CZ, IT, HU, UK	BG, IE, EL, ES, FR, HR, CY, LV, LT, LU, MT, PL, PT, SI, SK, LI	FI, SE

Note: The national statistical definition of emigration of FI and SE is based on a six-month criterion for some countries of next residence (Nordic agreement), although the impact is declared negligible.
EEA European Economic Area (EU-28 plus IS, LI, NO).

Source: International Migration statistics Reference: Metadata in Euro SDMX Metadata Structure

Table B1. National definitions for migrants

Eurostat's POPSTAT tabulation program defines various tabulations for immigration and emigration, as outlined below.[B1] Five tabulations, denoted in bold, align with the DYB tables. In Eurostat statistics, citizenship (COC.M) consists of a. reporting country (NAT); b. EU 28 countries (EU28_FOR); c. Non-EU countries (NEU28_FOR); d. stateless (STLS); and e. Unknown (_U). The country of birth tabulation (COB.M) includes the same categories, except for the stateless category (omitted by definition).

Immigration by age completed

IMM06 (Q12) Immigrants by age group, sex and citizenship
IMM06R Immigrants by age group, sex and group of citizenship
IMM07R (Q11) Immigrants by age, sex and group of citizenships
(nationals/nonnationals)
IMM08 Immigrants by age group, sex and country of birth
IMM09R Immigrants by age, sex and group of countries of birth (native-born/foreign-born)
born)
IMM10 (Q13) Immigrants by age group, sex and country of previous usual residence
IMM11 Immigrants by group of citizenships and group of countries of birth
IMM12 Immigrants by age and sex

Immigration by educational attainment

IMM13 Immigrants by year of birth group, sex, educational attainment and group of citizenships (nationals/non-nationals)
IMM14 Immigrants by age group, sex, educational attainment and group of citizenships (nationals/non-nationals)
IMM15 Immigrants by year of birth group, sex, educational attainment and group of countries of birth (native-born/foreign-born)
IMM16 Immigrants by age group, sex, educational attainment and group of countries of birth (native-born/foreign-born)

Emigration by age completed

EMI06 (Q14) Emigrants by age group, sex and citizenship
EMI07 (Q15) Emigrants by age group, sex and country of next residence
EMI08 Emigrants by age group, sex and country of birth

Emigration by educational attainment

EMI09 Emigrants by year of birth group, sex, educational attainment and group of citizenships (nationals/non-nationals)

Census Topics Database

UNSD has been collecting and processing national census questionnaires, submitted by national statistical offices or found online, and recording census questions into the UNSD Census Topics Database[8] since the 2000 round of the World Population and Housing Census Programme. The database provides a solid foundation for analysing the feasibility of producing migration stock indicators MI 1.1 and MI 1.2 through censuses.

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[8] The database is partly published as the National Census Questions Repository at UNSD's webpage:
https://unstats.un.org/unsd/demographic-social/sconcerns/migration/census/index.html#!/home

For this analysis, data from the 2010 round were utilized since the collection and processing of national census questionnaires for the 2020 round are still ongoing. First, questions related to citizenship status, native- and foreign-born status, and acquisition of citizenship were identified and then categorized into primary topics (country of citizenship and country of birth) and secondary topics (duration of stay, reason for migration and native- and foreign-born status of parents) by examining each question and its answer options.[9] Some questions may be assigned to multiple topics. For instance, a question such as "When [individual name] was born, in which municipality or country did [individual name]'s mother live" with an answer option "In another country, specify which country, and in what year did [individual name] arrive in the country?" can provide information on both the country of birth and duration of stay.

By the nature of a census, information about the age, sex and location of residence of enumerated individuals is collected. Thus, we assume that the disaggregation of the migration stock indicators by these variables is feasible.

Some limitations of the analysis should be noted. First, other secondary topics (i.e., educational attainment and labour force status) may be collected in censuses together with migration-related information, but the current analysis does not delve further into these topics. Secondly, even though questions regarding international migration were asked during census data collection, it does not necessarily imply that the migration stock indicators can be produced, as it depends on the item response rate or the quality of collected data. Therefore, the data availability analysis in the DYB database is also critical to determine how many countries and areas can actually produce international migration statistics, based on what is officially disseminated to UNSD. Additionally, the results of the analysis in Chapter 6 should be regarded as preliminary due to some coding issues found in the course of analysis and the subjective categorization of census questions, which may require additional time and resources to address.

5. Data Availability Analysis

Migration Stock Indicator MI 1.1

In assessing data availability for migration stock indicator MI 1.1, an examination was carried out of the three most recent population and housing census rounds: 2000, 2010, and the ongoing 2020 round. The relevant data utilized for this analysis was extracted from the DYB tables outlined in Section 4. The summarized outcomes are presented in Table 1 below.

	2000 round (1995-2004)	2010 round (2005-2014)	2020 round (2015-2024) Ongoing
[B09] Native- and Foreign-Born Population	43% (101)	41% (101)	21% (49)
[B61] Citizens and Foreign Citizens	38% (89)	41% (97)	15% (36)
Both [09] and [B61]	**27%** (65)	**30%** (71)	**11%** (26)

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[9] Some census questions are also categorized into emigration (including remittance), ever travel abroad and nomad population.

Note: The figures refer to the percentage of 237 of countries and areas that have reported both tabulations or either of them to the United Nations Demographic Yearbook System <u>at least once in the respective rounds.</u> The figures in brackets refer to the number of countries and areas.

Table 1. Percentage (and number) of countries with available data in the DYB for calculating migration stock indicator MI 1.1, by census round

Given the ongoing nature of the 2020 round during the benchmarking exercise, the 2010 round emerges as the most recent complete round, and therefore the focus of the analysis. Notably, during the 2010 round, 30% of the 237 countries and areas reported the two basic tabulations related to migration stock, showing a slight increase from the 27% reported in the 2000 round. Additionally, 41% of countries and areas submitted one of the two tabulations to UNSD during the round. This indicates that approximately one-third of countries and areas contributing data to the DYB can potentially generate MI 1.1, either entirely or partially for variables such as native- and foreign-born status or citizenship status.

A breakdown of countries reporting both tables in the 2010 round is provided in Table 2. Noteworthy is the observation that a majority of European and North American countries (62% of the region) demonstrate capability in producing the indicator, while other regions, namely Oceania including Australia and New Zealand (30%), East and South-eastern Asia (28%), Northern Africa and Western Asia (24%), Sub-Saharan Africa (17%), Latin America and the Caribbean (16%) and Central and Southern Asia (14%), reveal potential needs for capacity building. Australia, Canada, Hong Kong (SAR of China) and Malta reported the tabulations twice during the round, suggesting a more frequent ability to produce the indicator.

Sub-Saharan Africa	Year	Europe and Northern America	Year	Latin America and the Caribbean	Year
Benin	2013	Albania	2011	Aruba	2010
Burundi	2008	Austria	2011	Bahamas	2010
Eswatini	2007	Belarus	2009	Brazil	2010
Ghana	2010	Belgium	2011	Colombia	2005
Guinea	2014	Bermuda	2010	Nicaragua	2005
Lesotho	2006	Bulgaria	2011	Peru	2007
Liberia	2008	Canada	2006/2011	Sint Maarten (Dutch part)	2011
Namibia	2011	Croatia	2011	Venezuela (Bolivarian Republic of)	2011
Rwanda	2012	Czechia	2011		
		Estonia	2011	Oceania, Australia and New Zealand	Year
Northen Africa and Western Asia	Year	Finland	2010	Australia	2006/2011
Algeria	2008	Germany	2011	Cook Islands	2011
Armenia	2011	Greece	2011	French Polynesia	2007
Azerbaijan	2009	Hungary	2011	Kiribati	2010
Cyprus	2011	Ireland	2011	Norfolk Island	2006
Georgia	2014	Italy	2011	Palau	2005
State of Palestine	2007	Latvia	2011	Tokelau	2011
		Liechtenstein	2010		
Central and Southern Asia	Year	Lithuania	2011		
Iran (Islamic Republic of)	2011	Luxembourg	2011		
Nepal	2011	Malta	2005/2011		
		Montenegro	2011		
Eastern and South-eastern Asia	Year	Norway	2011		
China, Hong Kong SAR	2006/2011	Poland	2011		
Mongolia	2010	Portugal	2011		
Republic of Korea	2010	Republic of Moldova	2014		
Singapore	2010	Romania	2011		
Thailand	2010	Russian Federation	2010		
		Serbia	2011		
		Slovakia	2011		
		Spain	2011		
		Sweden	2011		
		Switzerland	2011		
		United Kingdom	2011		

Note: the presented regional groupings are based on the Standard Country or Area Codes for Statistical Use (known as M49). The total number of countries and areas in each regional grouping is as follows. 52 for Sub-Sharan Africa; 25 for Northern Africa and Western Asia; 14 for Central Asia and Southern Asia; 18 for Eastern Asia and South-

eastern Asia; 55 for Europe and Northern America; 50 for Latin America and the Caribbean; and 23 for Oceania including Australia and New Zealand.

Table 2. Countries and areas with data available to produce MI 1.1, 2010 PHC round

Analysis of the 2010 census round indicates that most of the countries and areas with reported basic tabulations were able to disaggregate MI 1.1 by the primary topics age and sex, as outlined in Table 3. The other two primary topics for disaggregation, country of citizenship and country of birth, were more limited: 22% of the national statistical offices produced and reported population by country of citizenship, while 24% reported foreign-born population by country of birth.

When looking just at the foreign-born population [B59], country of birth disaggregation was provided by 81 countries/areas for the 2010 round. For the foreign citizen population [B62], country of citizenship disaggregation was provided by 70 countries/areas. Between the most recent complete census rounds (2000 and 2010), there has been an overall increase in availability of data disaggregated by primary topics.

	2000 round (1995-2004)	2010 round (2005-2014)	2020 round (2015-2024) Ongoing
Both [09] and [B61]	**27% (65)**	**30% (71)**	**11% (26)**
Age and Sex [B09]	**23%** (55)	**26%** (62)	**10%** (24)
Age and Sex [B61]	**17%** (30)	**28%** (66)	**10%** (24)
Country of citizenship [B62]	**23%** (55)	**22%** (51)	**7%** (17)
Country of birth [B59]	**18%** (43)	**24%** (56)	**8%** (19)

Note: [B09] and [B61] refer to DYB tabulations on native and foreign-born population and population by citizenship status, respectively. The figures refer to the percentage of 237 of countries and areas that have reported both tabulations or either of them to the United Nations Demographic Yearbook System at least once in the respective rounds. The figures in brackets refer to the number of countries and areas.

Table 3. Availability of primary topics for disaggregation for MI 1.1 (percentage and number of countries)

Migration Stock Indicator MI 1.2

Currently, information about the year citizenship was acquired, as well as country of birth, is not reported by countries to UNSD and not available in the DYB. Some countries are able to produce this data through the use of population registers containing information on country of birth and citizenship status. As of 2013, over 20 European countries maintain a central population register, of which 17 include data about current citizenship status, 6 include

information on previous citizenship status, 13 include place of birth, and 15 store the date of immigration.[10] Other countries also maintain population registers, including Armenia, Iran, Israel, Japan and Republic of Korea.[11]

Eurostat collects and publishes acquisition of citizenship data for its Member States and other countries in the region over a given year as part of its international migration dataset, disaggregated by age, sex, and country of former citizenship (not country of birth).[12] As of the year 2023, a total of 38 countries reported data to Eurostat for reference year 2021, listed below in Table 4. Eurostat also collects and publishes loss of citizenship data, disaggregated by sex and country of new citizenship (19 Eurostat countries are currently producing such data).

Acquisition of citizenship		Loss of citizenship
Armenia	Italy	Belgium
Austria	Liechtenstein	Bulgaria
Belgium	Lithuania	Denmark
Bulgaria	Luxembourg	Estonia
Belarus	Latvia	Greece
Switzerland	North Macedonia	France
Cyprus	Malta	Croatia
Czech Republic	Netherlands	Ireland
Germany	Norway	Liechtenstein
Denmark	Poland	Lithuania
Estonia	Portugal	Luxembourg
Greece	Romania	Malta
Spain	Russia	Netherlands
Finland	Sweden	Poland
France	Slovenia	Portugal
Croatia	Slovakia	Sweden
Hungary	Turkey	Slovenia
Ireland	Ukraine	Slovakia
Iceland	United Kingdom	United Kingdom

Table 4. Countries producing acquisition and loss of citizenship statistics

It is noteworthy that the datasets currently lack disaggregated information on native birth status (native-born and foreign-born). The absence of these disaggregations raises questions about the feasibility of MI 1.2, as citizenship changes among these specific demographic groups remains unavailable.

Migration Flow Indicator MI 1.3

In evaluating data availability for MI 1.3, two primary data sources were considered: (a) the number of incoming migrants by citizenship status, age and sex in the DYB database and (b) immigrants by age, sex and group of citizenship (nationals/non-nationals) in the Eurostat database. Table 5 compiles the percentage and number of countries and areas reporting

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[10] Poulain and Herm, 2013, Central Population Registers as a Source of Demographic Statistics in Europe, Population, Vol.68, Issue 2, pp. 183-212
[11] UNESCAP, 2020, Stats Brief: "Population Registers: A Key Resource for Producing Vital Statistics", October 2020, Issue 26
[12] Eurostat, 2023, Acquisition and loss of citizenship (migr_acqn) Reference Metadata in Euro SDMX Metadata Structure (ESMS), https://ec.europa.eu/eurostat/cache/metadata/en/migr_acqn_esms.htm

immigration flow data at least once in the two recent rounds of the population and housing census programme, for the purpose of availability comparison to migration stock indicator MI 1.1.

In the 2020 round, one-third of the 237 countries and areas reported immigration data, marking a slight increase from the 31% reported in the 2010 round. The breakdown by citizenship status is available for all Eurostat countries; however, six countries and areas in the DYB dataset lack granular data, reporting only the total number of immigrants without distinguishing citizenship status (citizen, foreign citizen, and unknown citizenship status). Notably, since the 2010 round, an increasing number of countries and areas have been capable of producing data disaggregated by citizenship status.

	2010 round (2005-2014)	2020 round (2015-2024) Ongoing
Total	**31%** (74)	**33%** (79)
Eurostat	**14%** (34)	**14%** (34)
[Q11] Number of incoming migrants	**17%** (40)	**19%** (45)
Citizenship status [Q11]	**13%** (30)	**16%** (39)

Note: The figures refer to the percentage of 237 of countries and areas that have reported both tabulations or either of them to the United Nations Demographic Yearbook System at least once in the respective rounds. The figures in brackets refer to the number of countries and areas. All Eurostat countries report the data disaggregated by citizenship status.

Table 5: Percentage (and number) of countries with available data for calculating migration flow indicator MI 1.3, by census round

Table 6 details countries and areas reporting data for the basic tabulation in the 2020 round, listing reporting years available in the datasets. The Europe and Northern America region demonstrates the highest frequency of reporting immigration statistics disaggregated by country of citizenship (69% of the region), followed by Central and Southern Asia (36%), Eastern and South-eastern Asia (28%) and Latin America and the Caribbean (28%). Capacity building needs are greatest in Oceania (22%), Sub-Saharan Africa (17%) and Northen Africa and Western Asia (12%). Particularly in Africa, many countries compiled immigration flow statistics only once during the decade, likely due to census-based production, signifying a reliance on census data without established registers or effective use of administrative data for the production of migration flow statistics.

Sub-Saharan Africa	Reporting years	Europe and Northern America	Reporting years	Latin America and the Caribbean	Reporting years
Botswana	2015, 2017, 2018	Åland Islands	2015-2021	Argentina	2015-2017, 2020, ꞉
Burkina Faso	2019	Austria	2015-2021	Aruba	2015-2021
Eswatini	2018	Belgium	2015-2021	Bahamas	2016
Kenya	2019	Bulgaria	2015-2021	Chile	2015
Malawi	2018	Switzerland	2015-2021	Colombia	2017, 2019, 2020
Saint Helena ex. dep.	2018, 2021	Canada	2017-2022	Cuba	2015-2020
Seychelles	2015, 2019, 2020	Cyprus	2015-2021	Curaçao	2015, 2016
Uganda	2015	Czech Republic	2015-2021	Dominican Republic	2021
Zimbabwe	2020	Germany	2015-2021	Ecuador	2015-2020
		Denmark	2015-2021	Mexico	2015-2021
Northen Africa and Western Asia	**Reporting years**	Estonia	2015-2021	Panama	2015, 2017
Israel	2015-2020	Faroe Islands	2015, 2017-2021	Peru	2017-2021
Oman	2017, 2022	Greece	2015-2021	Puerto Rico	2015--2019, 2021
Saudi Arabia	2016	Guernsey	2016, 2018-2022	Suriname	2015-2021
		Spain	2015-2021		
Central and Southern Asia	**Reporting years**	Finland	2015-2021	**Oceania, Australia and New Zealand**	**Reporting years**
Iran (Islamic Republic of)	2016	France	2015-2021	Australia	2015-2021
Kazakhstan	2015-2019, 2021	Croatia	2015-2021	Fiji	2019-2022
Kyrgyzstan	2015--2017, 2019-	Hungary	2015-2021	New Zealand	2015-2021
Tajikistan	2016, 2017	Ireland	2015-2021	Tonga	2019
Uzbekistan	2015-2021	Iceland	2015-2021	Vanuatu	2019
		Italy	2015-2021		
Eastern and South-eastern Asia	**Reporting years**	Liechtenstein	2015-2021		
China, Macao SAR	2015, 2019, 2020,	Lithuania	2015-2021		
Indonesia	2015	Luxembourg	2015-2021		
Japan	2015-2021	Latvia	2015-2021		
Republic of Korea	2016-2020	Montenegro	2015-2020		
Thailand	2019-2022	North Macedonia	2015-2021		
		Malta	2015-2021		
		Netherlands	2015-2021		
		Norway	2015-2021		
		Poland	2015-2021		
		Portugal	2015-2021		
		Romania	2015-2021		
		Sweden	2015-2021		
		Slovenia	2015-2021		
		Slovakia	2015-2021		
		United Kingdom	2015-2019*		

Note: The presented regional groupings are based on the Standard Country or Area Codes for Statistical Use (known as M49). The total number of countries and areas in each regional grouping is as follows. 52 for Sub-Sharan Africa; 25 for Northern Africa and Western Asia; 14 for Central Asia and Southern Asia; 18 for Eastern Asia and South-eastern Asia; 55 for Europe and Northern America; 50 for Latin America and the Caribbean; and 23 for Oceania including Australia and New Zealand.

Note: The United Kingdom left the European Union on 31 January 2020. This may have affected the reporting years.

Table 6. Countries and areas with data available to produce MI 1.3, 2020 PHC round

Table 7 explores the potential for data disaggregation across primary topics, incorporating additional datasets: (a) the number of incoming foreign migrants by country of citizenship and sex in the DYB database; (b) immigrants by age group, sex, and citizenship in the Eurostat database; and (c) immigrants by age group, sex, and country of birth in the Eurostat database. In the DYB database, all 45 countries reporting to UNSD have granular data by country of citizenship during the period corresponding to the 2020 round, while only 36 countries and areas have data disaggregated by both age and sex. Country of birth information is not captured by DYB questionnaires.

For Eurostat data, both country of birth and citizenship are available and complete, albeit with some variations in reporting. In reference year 2021, for example, 22 and 20 Eurostat countries provided detailed disaggregation of immigrants by individual country of birth and citizenship, respectively, while 12 countries only disaggregated by native and foreign-born status, along with economic and political groupings of birth and citizenship. While sex disaggregation is comprehensive, age disaggregation is available only in 24 Eurostat countries. Eurostat also aggregates immigrants by economic and political groups of citizenship and of country of birth, with such tabulations available for 23 countries during the period corresponding to the 2010 round and 24 during the 2020 round.

	2010 round (2005-2014)	2020 round (2015-2024) Ongoing
[Q11] Number of incoming migrants	**40**	**45**
Age and Sex [Q11]	**32**	**36**
Country of citizenship [Q12] Foreign citizens only	**33**	**45**
Eurostat	**34**	**34**
Age and Sex	**25**	**24**
Country of citizenship	**34**	**34**
Country of birth	**34**	**34**

Note: The figures refer to the number of countries and areas that have reported the tabulations by the indicated variable to the United Nations Demographic Yearbook System <u>at least once in the respective rounds.</u>

Table 7. Availability of primary topics for disaggregation for migration flow indicator MI 1.3 (number of countries)

For secondary topics, information on previous country of usual residence is available for 22 countries reporting to the DYB in the 2010 round and in 28 in the 2020 round.

Migration Flow Indicator MI 1.4

In comparison to MI 1.3, compiling the emigration indicator <u>MI 1.4</u> may present greater challenges. Table 8 outlines the number of countries and areas compiling emigration data, examining (a) the count of departing international migrants by citizenship status, age, and sex in the DYB database and (b) emigrants by age group, sex, and citizenship in the Eurostat database.

	2010 round (2005-2014)	2020 round (2015-2024) Ongoing
Total	**26%** (61)	**29%** (69)
Eurostat	**14%** (33)	**15%** (35)
[Q14] Number of departing international migrants	**12%** (28)	**14%** (34)
Citizenship status [Q14]	**8%** (18)	**8%** (23)

Note: The figures refer to the percentage of 237 countries and areas that have reported both tabulations or either of them to the United Nations Demographic Yearbook System <u>at least once in the respective rounds.</u> The figures in brackets refer to the number of countries and areas. All Eurostat countries report the data disaggregated by citizenship status.

Table 8: Percentage (and number) of countries with available data for calculating migration flow indicator MI 1.4, by census round

During the time period corresponding to the 2020 round, 69 countries and areas (29% of the 237) were able to produce emigration statistics, reflecting a slight increase from 61 (26%) during the 2010 round. Only 23 countries and areas directly reporting to UNSD have data disaggregated by citizenship status.

Countries and areas reporting the basic emigration tabulation in the 2020 round are listed in Table 9. Similar to other indicators, Europe and Northern America leads in producing emigration statistics by citizenship (69% of the region) with high reporting frequency. The other regions – Central and Southern Asia (29%), Eastern and South-eastern Asia (28%), Oceania (17%), Latin America and the Caribbean (16%), Sub-Saharan Africa (15%) and Northern Africa and Western Asia (6%) – stand to benefit from capacity building in compiling emigration statistics.

Sub-Saharan Africa	Reporting years	Europe and Northern America	Reporting years	Latin America and the Caribbean	Reporting years
Botswana	2017, 2018	Åland Islands	2015-2021	Aruba	2015-2021
Burkina Faso	2017, 2019	Austria	2015-2021	Colombia	2017, 2019, 2020
Kenya	2019	Belgium	2015-2021	Cuba	2015-2020
Liberia	2015	Bulgaria	2015-2021	Curaçao	2015, 2016
Malawi	2018	Switzerland	2015-2021	Dominican Republic	2021
Saint Helena ex. dep.	2020, 2021	Cyprus	2015-2021	Peru	2017-2021
Seychelles	2015, 2019, 2020	Czech Republic	2015-2021	Puerto Rico	2015-2019, 2021
Uganda	2015	Germany	2015-2021	Suriname	2015-2021
		Denmark	2015-2021		
Northern Africa and Western Asia	Reporting years	Estonia	2015-2021	Oceania, Australia and New Zealand	Reporting years
Israel	2015-2019	Greece	2015-2021	Australia	2015-2021
Oman	2022	Spain	2015-2021	Fiji	2019-2022
		Faroe Islands	2015, 2017-2021	New Zealand	2015-2021
Central and Southern Asia	Reporting years	Finland	2015-2021	Tonga	2019
Kazakhstan	2015-2021	France	2015-2021		
Kyrgyzstan	2015-2017, 2019-2(	Croatia	2015-2021		
Tajikistan	2016, 2017	Hungary	2015-2021		
Uzbekistan	2015-2021	Ireland	2015-2021		
		Iceland	2015-2021		
Eastern and South-eastern Asia	Reporting years	Italy	2015-2021		
China, Macao SAR	2015, 2019, 2020, 2	Guernsey	2016, 2018-2022		
Indonesia	2015	Liechtenstein	2015-2021		
Japan	2015-2021	Lithuania	2015-2021		
Republic of Korea	2016-2020	Luxembourg	2015-2021		
Thailand	2019, 2020, 2022	Latvia	2015-2021		
		Montenegro	2020		
		North Macedonia	2015-2021		
		Malta	2015-2021		
		Netherlands	2015-2021		
		Norway	2015-2021		
		Poland	2015-2021		
		Portugal	2015-2021		
		Romania	2015-2021		
		Sweden	2015-2021		
		Slovenia	2015-2021		
		Slovakia	2015-2021		
		Ukraine	2020		
		United Kingdom	2015-2019*		

Note: The presented regional groupings are based on the Standard Country or Area Codes for Statistical Use (known as M49). The total number of countries and areas in each regional grouping is as follows. 52 for Sub-Sharan Africa; 25 for Northern Africa and Western Asia; 14 for Central Asia and Southern Asia; 18 for Eastern Asia and South-eastern Asia; 55 for Europe and Northern America; 50 for Latin America and the Caribbean; and 23 for Oceania including Australia and New Zealand.

Note: The United Kingdom left the European Union on 31 January 2020. This may have affected the reporting years.

Table 9. Countries and areas with data available to produce migration flow indicator MI 1.4, 2020 PHC round

Table 10 illustrates data availability by primary topics for disaggregation. In the DYB database, analysis of information on country of citizenship and country of birth is not feasible due to the fact that this data is not collected on emigrants via the migration questionnaires. Out of 34 countries and areas reporting to the DYB for the period corresponding to the 2020 round, 28 reported emigrants disaggregated by both age and sex. Among Eurostat countries, disaggregation by both age and sex showed similar limitations, as did disaggregation of emigrants by country of birth, in contrast to the corresponding disaggregation for immigrants.

	2010 round (2005-2014)	2020 round (2015-2024) Ongoing
[Q14]: Number of departing international migrants	**28**	**34**
Age and Sex [Q14]	**25**	**28**
Eurostat	**33**	**35**
Age and Sex	**24**	**25**
Country of citizenship	**33**	**35**
Country of birth	**26**	**28**

Note: The figures refer to the number of countries and areas that have reported the tabulations by the indicated variable to the United Nations Demographic Yearbook System at least once in the respective rounds.

Table 10. Availability of primary topics for disaggregation for migration flow indicator MI 1.4 (number of countries)

6. Census Question Analysis

Census question analysis provides additional insights into the feasibility of producing the migration stock indicators, namely MI 1.1 and MI 1.2, using census data. It should be noted that the results in this report are preliminary and subject to updates following a comprehensive review of all census questions registered in the Census Topics Database.

Out of the 176 countries and areas with national census questionnaires available in the Census Topics Database, 145 (82%) included questions about citizenship status in their census during the 2010 round (see Table 11). Additionally, 123 countries and areas (70%) collected information on the country of citizenship if the individual was a foreign citizen. Questions regarding native- and foreign-born status were slightly more frequently asked than those about citizenship status: 151 countries and areas (86%) inquired whether an enumerated person was born in the country, and 145 (82%) further investigated in which country or region they were born if they were born outside of the country. In some countries, answer options were limited to pre-selected countries or regions only.

Secondary topics were less frequently asked. Out of 176 countries and areas, only 67 (38%) included questions related to the duration of stay in their census. Some directly asked how many years a person had stayed, while other countries inquired about the year of arrival, or return in the case of returned migrants. The reason for migration was asked by 39 countries and areas (22%): in some cases, it was part of broader inquiries into reasons for moving, making international comparison challenging. Only 20 countries collected information on the native- and foreign-born status of parents, making disaggregation by this topic difficult.

International migration topics	2010 round (2005-2014)
Citizenship status	82% (145)
Native- and foreign-born status	86% (151)
Acquisition of citizenship	6% (10)
Primary topics	
Country of citizenship	70% (123)
Country of birth	82% (145)
Secondary topics	
Duration of stay	38% (67)
Reason for migration	22% (39)
Native- and Foreign-born status of parents	11% (20)

Note: The results are based on available national census questionnaires in the 2010 round. The figures refer to the percentage of 176 countries and areas whose questionnaires are available in the Census Topics Database. The figures in brackets refer to the actual number of countries and areas asking related questions. Disaggregation by age, sex and location of residence is assumed to be feasible due the nature of census data collection.

Table 11. Number and percentage of countries and areas asking questions related to international migration

Finally, the acquisition of citizenship indicator (MI1.2) may be challenging to produce with current question framing. Some countries included "naturalized citizen" as an answer option to a question regarding citizenship status, potentially enabling them to calculate the stock of naturalized citizens. However, only a few countries inquired further about the year of citizenship acquisition. Consequently, the production of MI1.2 (number of persons who obtained citizenship over a given year) through census data may be less feasible. When census is the only data source for producing MI 1.2, a citizenship question should be followed up with inquiries about the year of citizenship acquisition and how citizenship was obtained if a person is a naturalized citizen. The second follow-up question would provide information about the legal grounds for obtaining citizenship as a secondary topic for MI 1.2.

7. Metadata Analysis and Comparability of Data

Footnote analysis of both international migration stock and flow data in the DYB database reveals a mix of approaches across countries, which can be categorized into sources, concepts and definitions, treatment of populations (including stateless and dual citizens), inclusion of internal migration and confidentiality.

Data sources

Undoubtedly, a census stands as the primary method for gauging the stock of the international migrant population[13]. However, several countries have reported employing non-census sources in generating migration stock data, including estimation through census samples, sample surveys[14], population and administrative registers[15], and population accounting[16].

It is worth noting that countries employ diverse methodologies to estimate the size of the international migrant stock, varying in terms of sample units and sizes. For instance, Canada estimated the foreign citizen population stock using a 20% sample of Canadian households, excluding institutional residents in the 1996 census, and increased it to 25% in the 2016 census. In contrast, the 2021 estimates for Chinese Hong Kong were derived from a detailed sample inquiry involving one-tenth of total households, whereas the 1996 estimates were based on a sample of one-seventh of the population. Similarly, Chinese Macao utilized one-fifth of living quarters as a sample base in the 2001 census.

In terms of producing stock migration indicators through population or administrative registers, UNSD has prepared a note on Slovenia's case, which is available upon request[17].

In the production of migration flow indicators, the primary data sources vary significantly across countries and regions. Many nations rely on border data collection (e.g. entry forms) or permits, as the foundation for their migration flow data. For instance, Chinese Macao utilizes various types of permits, including residence, work, student, and trainee permits, while Chile and Kazakhstan primarily use residence permits for immigration flow data. Conversely, for emigration flow data, Chinese Macao counts annulled permits, Aruba includes annulled residency certificates and rejected renewal applications, and Kazakhstan collects exit permits.

Registers of foreigners also serve as a common source for migration flow data. Some countries integrate their register of foreigners into their population register[18], while others maintain independent registers. Examples include Colombia's Statistical Register of International Migration (REMI), Ecuador's Statistical Register of International Tickets and Departures, and Peru's administrative register of migration control.

Additionally, certain countries, particularly in Africa,[19] rely on census data as a source to capture migratory flows of population. This reliance on census data often results in less frequent data reporting, as observed in previous chapters.

It's important to note that data owners for migration flows can also vary, with law enforcement agencies often playing a significant role. For instance, Ecuador's National Police is responsible for migration control and maintains the register of migration data mentioned earlier. Similarly, in Japan, the Ministry of Justice publishes an annual report of statistics on legal migrants, with data reported to UNSD by its national statistical office.

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[13] United Nations, Handbook on Measuring International Migration through Population Censuses, Series F No. 115, Studies in Methods, ST/ESA/STAT/SER.F/115
[14] United States of America: American Community Survey in 1998 and 1999
[15] For example, Åland Islands, Finland, Norway, Singapore and Slovenia.
[16] The Netherlands.
[17] Please contact demostat@un.org
[18] For example, Aruba, Israel and Slovenia.
[19] For example, Brazil, Burkina Faso, Guinea, Kenya, Senegal, South Africa and Tunisia.

Concepts and definitions

Countries differ in their conceptual approach to census data collection with regard to whether the de facto or the de jure concept is used when people are counted, which has implications for migration stock indicators. In the tabulations for B09 and B61, de jure is used by significantly more countries than de facto, and this proportion saw an increase between the 2000 and 2010 census rounds (Table 12). Since de jure data focuses on the place of residence of individuals, it can capture international migrants who have changed their place of residence. It can also be aligned with other administrative records and databases that might have information relevant to migration, like residency permits or registrations. On the other hand, countries may have different definitions of "place of residence" thereby complicating comparability.

	2000 round (1995-2004)	**2010 round (2005-2014)**	**2020 round (2015-2024) Ongoing**
[B09] Native- and Foreign-Born Population	101	97	49
De jure	64	71	38
De facto	37	26	11
[B61] Citizens and Foreign Citizens	89	98	36
De jure	49	72	32
De facto	39	25	4

Table 12. Tabulations for B09 and B61 by data collection methodology (number of countries)

In the Principles and Recommendations for Population and Housing Censuses, Revision 3, it is recommended to define the place of usual residence of an enumerated person at the time of the census using the actual or intended duration of stay of that person, with two options provided to countries: (a) The place at which the person has lived continuously for most of the last 12 months (i.e. for at least 6 months and one day), not including temporary absences for holidays or work assignments, or intends to live for at least six months; and (b) The place at which the person has lived continuously for at least the last 12 months, not including temporary absences for holidays or work assignments, or intends to live for at least 12 months. While the most appropriate option can be chosen by a given country, in order to ensure comparability of data, countries are strongly encouraged to provide estimates using the at least the last 12 months criterion.

According to the definition of international migrant in the Final Report on Conceptual frameworks and Concepts and Definitions on International Migration[20], an international migrant

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[20] United Nations Expert Group on Migration Statistics, 2021. Final Report on Conceptual frameworks and Concepts and Definitions on International Migration. Available at https://unstats.un.org/unsd/demographic-social/migration-expert-group/task-forces/TF2-ConceptualFramework-Final.pdf.

is "a person who has changed his or her country of residence and established new residence in the country within a given year. International migrant can be either 'immigrant' or 'emigrant' and include those with national or foreign citizenships or stateless persons". The definition of country of residence is consistent with that of the Principles and Recommendations for Population and Housing Censuses, Revision 3. There are several challenges with the revised definition of "international migrant" stemming from non-traditional migration patterns that are becoming more common in recent years (e.g. digital nomads, circular migration, etc.).

Treatment of populations

Other conceptual differences include how countries treat different population groups when measuring them. For instance, Brunei Darussalam and Singapore include both citizens and permanent residents in their citizen population. Belarus, Croatia, Estonia, Lithuania and Sweden treat stateless persons as a separate category in the data on population by citizenship status, age and sex (B61). Czechia, Latvia, Lithuania, Montenegro, Rwanda, Serbia, Suriname and Tokelau explicitly state that the data includes persons with dual citizenship, while it is not apparent how other countries treat this population.

Inclusion of internal migration

Cautions should be paid when an autonomous area of a country include migration from its territory to the country it belongs to, or vice versa, in its international migration data. For instance, those who have moved from Åland Islands, an autonomous region of Finland, to Finland are currently counted in the international emigration data of Åland Islands. The move may not constitute international migration by the global definition since it does not involve a movement across international border[21]. Furthermore, if they would ever be considered as international migrants, a challenge still exists in counting them as citizens or foreign citizens since Ålanders are Finnish citizens[22]. Clear guidance for producing international migration indicators in autonomous regions may be required.

For another example, related to autonomous regions, Aruba's data does not distinguish between individuals born in Aruba and those born in other former territories of the Netherlands Antilles if they were born before 1986. For instance, an immigrant born in Curaçao before 1986 would be counted as a citizen immigrant in Aruba's data.

Confidentiality

Tabulations by some variables (e.g. country of citizenship) require attention to confidentiality due to the possibility of small numbers of individuals resulting in inadvertent disclosure of identities. The approaches countries use to preserve confidentiality vary, with some countries employing rounding (e.g. Australia, Canada, Israel) and others suppressing data under a certain value (e.g. Georgia, Lithuania).

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[21] The Expert Group considers international migration as a subset of international mobility, and defines international mobility as "all movement that cross international borders within a given year".
[22] https://www.norden.org/en/info-norden/finnish-citizenship-and-aland

Data and metadata gaps

Currently, the metadata collected through the annual DYB migration questionnaire focuses primarily on data sources. There is an option to include other metadata under "Notes" in an unstructured fashion. While some countries provide information on concepts and definitions, this is not complete across countries, which presents comparability challenges.

Not all countries provide clear metadata on how they treat or categorize stateless populations in their data. This omission can lead to underreporting or misrepresentation of stateless individuals, further complicating the global understanding of migration patterns.

The calculation of migration stock indicator MI 1.2 is particularly sensitive to data availability. This indicator requires information about the year in which citizenship was acquired and the migrant's country of birth. To accurately calculate MI 1.2, countries need to maintain registers that, at a minimum, contain information on an individual's country of birth or nationality, age, sex and their citizenship status.

Native-/foreign-born disaggregations are not available for migration flow indicators (MI 1.3 and MI 1.4) in the DYB database because country of birth is not being collected through the annual migration questionnaires. This omission can lead to an incomplete understanding of migration flows, as the distinction between native-born and foreign-born migrants is crucial for understanding migration dynamics. This would necessitate the revision of the questionnaires used by UNSD to collect migration data.

On the other hand, based on the immigration and emigration datasets shared by Eurostat countries via SDMX, country of birth information related to migration flows is available for Eurostat countries.

8. Conclusions

The feasibility of calculating migration stock indicator MI 1.1, which measures the number of international migrants (several subgroups) as a percentage of the total population, is limited to roughly 30% of countries/areas based on the 2010 PHC round, although around 80% of countries/areas included questions related to citizenship status and native-/foreign-born status in their census. This gap may be attributed to countries' unwillingness to report international migration data to UNSD. However, it may also underscore the need to build or enhance the capacity of national statistical offices to produce international migration indicators through censuses.

Disaggregation of MI 1.1 by age, sex, country of birth, country of citizenship (as well as educational attainment and labor force status) is possible when data are produced: For instance, 28% of countries could disaggregate by age and sex, and 22% and 24% could disaggregate by country of citizenship and birth, respectively (Table 13). Census question analysis support this conclusion: if a country collects international migration data through its census, it is likely able to produce statistics disaggregated by the primary topics.

Calculation of migration stock indicator MI 1.2, which measures the number of persons who obtained citizenship in a given year, may not be feasible through traditional data collection

methods. Census question analysis reveals that only a few countries collected data related to citizenship acquisition through the census. Instead, the use of administrative data or population registers should be explored for the production of this indicator.

Calculation of migration flow indicator MI 1.3 (immigration) is feasible for 33% of countries/areas, with disaggregation reducing this percentage. Migration flow indicator MI 1.4 (emigration) is feasible for 29% of countries/areas without disaggregation, and significantly less with disaggregation (Table 13).

	MI 1.1	MI 1.3	MI 1.4
Total	**30%** (71)	**33%** (79)	**29%** (69)
Age and Sex	**28%** (66)	**25%** (60)	**22%** (53)
Country of citizenship	**22%** (51)	**33%** (79)	**15%** (35) (Eurostat only)
Country of birth	**24%** (56)	**14%** (34) (Eurostat only)	**12%** (28) (Eurostat only)

Note: The figures for MI 1.1 refer to the percentage (and number) of countries and areas that have reported relevant data to the United Nations or Eurostat at least once in the 2010 round of the World Population and Housing Census (2005-2014). The figures for MI 1.3 and MI 1.4 refer to the latest available data (2015-2023).

Table 13: Feasibility of calculating international migration indicators based on current data availability (percentage and number of countries)

9. Recommendations

In order to compile migration data at the global level on the core migration indicators for Policy Area 1, the following additions are recommended to the DYB data collection process:

- Acquisition of citizenship data disaggregated by age, sex, country of birth and country of previous citizenship
- Country of birth data for migration flows

In addition, while secondary topics for disaggregation of migration indicators are outside the scope of this benchmarking exercise, given the revision of the Principles and Recommendations on Population and Housing Censuses being undertaken in parallel to this exercise, there is an opportunity to include recommended topics in the PHC questionnaires that would align with migration Policy Area 1 data needs:

- Reason for migration
- Native-born / Foreign-born status of parents

Finally, the DYB currently contains tabulations (B64, B30) of only the foreign-born population disaggregated by educational attainment (secondary topic for disaggregation) and occupation (relevant for the secondary topic labor force status) and only the foreign citizen population disaggregated by educational attainment (table B65). In order for this data to be comparable to the native-born population, the corresponding disaggregations need to also be collected for the

native-born and citizen populations. This may result in some modifications to the DYB Population Estimates or census questionnaires.

In summary, the following revisions are recommended to the annual migration questionnaire[23]:

1. Questionnaire name

Currently the name of the questionnaire is "United Nations Statistics Division: Demographic Yearbook Questionnaire on International Travel and Migration Statistics." In line with the new conceptual framework, the questionnaire should be renamed as "United Nations Statistics Division: Demographic Yearbook Questionnaire on International Migration and Temporary Mobility Statistics."

2. Definitions and terminology

In the sheet titled "United Nations Definitions", the new recommended definitions, including the "resident population" concept, should be clearly described and the terminologies should be consistently used throughout the questionnaire.

3. Tabulation programme in line with the indicators on international migration

(Tabulations are detailed in Annex I)

Acquisition of citizenship

- Table 1: Annual number of immigrants who obtained citizenship by age, sex and native birth status
- Table 1a: Annual number of immigrants who obtained citizenship by native birth status, sex and country of previous citizenship
- Table 1b: Annual number of immigrants who obtained citizenship by age, sex and country of birth

Immigrant flows

- Table 2: Annual number of immigrants by citizenship status, age and sex
- Table 2a: Annual number of citizen immigrants by native birth status, age and sex
- Table 2b: Annual number of citizen immigrants by country of birth and sex
- Table 2c: Annual number of foreign citizen immigrants by native birth status, age and sex
- Table 2d: Annual number of foreign citizen immigrants by sex and country of citizenship

Emigrant flows

- Table 3: Annual number of emigrants by citizenship status, age and sex
- Table 3a: Annual number of citizen emigrants by birth status, age and sex
- Table 3b: Annual number of citizen emigrants by country of birth and sex
- Table 3c: Annual number of foreign citizen emigrants by birth status, age and sex
- Table 3d: Annual number of foreign citizen emigrants by country of citizenship and sex

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[23] It is important to note that Eurostat plans to completely move away from using the questionnaire to collect data from its countries and towards SDMX data collection and dissemination as of reporting year 2023. The current SDMX data structure definition covers all of the necessary primary topics of disaggregation.

Temporary Mobility[24]

- Table 4: Annual number of foreign citizens entering the country temporarily by reason for admission and sex
- Table 5: Annual number of residents departing the country for temporary stays abroad by age and sex

4. Metadata questionnaire for international migration statistics

The current questionnaire on international travel and migration statistics collects only data source information in a structured manner. The questionnaire instructions suggest that additional metadata may be included in the "Notes" field beneath each table, but a specific structure is not provided. In order to facilitate correct interpretation of the reported statistics and their international comparability, it is recommended that a metadata questionnaire accompany the data questionnaire, included as an additional sheet within the data questionnaire (See Annex II). The metadata questionnaire should include, at minimum:

1. National definition of migrants if it differs from the "resident population" concept
2. Unit of measurement (persons vs. entries/exits); treatment of multiple entries/exits by a single person
3. Type of data: counts, estimates or demographic accounting
4. Whether data are reported by year of occurrence (of actual migration) or year of registration (or issuance of permits). Treatment of late registration
5. Inclusion of special population groups
   a. Refugees
   b. Asylum seekers
   c. Stateless persons
6. Methods for estimation or demographic accounting
7. Quality check methods
8. Treatment of no information on country of birth/citizenship
9. Treatment of dual citizenship

These recommendations are bearing in mind that the revision of the Principles and Recommendations on Population and Housing Censuses (Revision 4) are ongoing at the time of this writing, and therefore other revisions to the DYB Questionnaires relevant to international migration may become necessary.

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[24] Temporary mobility is outside the scope of this benchmarking exercise. However, the migration questionnaire currently includes tabulations on temporary mobility. Revisions, though not comprehensive, are included here to more closely align the data collection with the conceptual framework and indicators.

Annex I: Recommended tabulations for international migration indicators

Table 1: Annual number of immigrants who obtained citizenship by age, sex and native birth status

	Total			Native-born			Foreign-born		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total									
age group 1									
age group 2									
…									
Unknown									

Table 1a: Annual number of immigrants who obtained citizenship by native birth status, sex and country of previous citizenship

	Total			Native-born			Foreign-born		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total									
Country 1									
Country 2									
…									
Stateless persons									
Unknown									

Table 1b: Annual number of immigrants who obtained citizenship by sex and country of birth

	Both Sexes	Male	Female
Total			
Country 1			
Country 2			
…			
Unknown			

Table 2: Annual number of immigrants by citizenship status, age and sex

	Total			Citizen			Foreign Citizen			Stateless persons			Unknown citizenship status		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total															
age group 1															
age group 2															
…															
Unknown															

Table 2a: Annual number of citizen immigrants by native birth status, age and sex

	Citizen			Native-born Citizen			Foreign-born Citizen		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total									
age group 1									
age group 2									
…									
Unknown									

Table 2b: Annual number of citizen immigrants by country of birth and sex

	Citizen		
	Both Sexes	Male	Female
Total			
Native-born			
Country 1			
Country 2			
…			
Unknown			

Table 2c: Annual number of foreign citizen immigrants by native birth status, age and sex

	Foreign Citizen			Native-born Foreign Citizen			Foreign-born Foreign Citizen		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total									
age group 1									
age group 2									
…									
Unknown									

Table 2d: Annual number of foreign citizen immigrants by sex and country of citizenship

	Foreign Citizen		
	Both Sexes	Male	Female
Total			
Country 1			
Country 2			
…			
Stateless			
Unknown			

Table 3: Annual number of emigrants by citizenship status, age and sex

	Total			Citizen			Foreign Citizen			Stateless persons			Unknown citizenship status		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total															
age group 1															
age group 2															
…															

Unknown																			

Table 3a: Annual number of citizen emigrants by native birth status, age and sex

	Citizen			Native-born Citizen			Foreign-born Citizen		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total									
age group 1									
age group 2									
…									
Unknown									

Table 3b: Annual number of citizen emigrants by country of birth and sex

	Citizen		
	Both Sexes	Male	Female
Total			
Native-born			
Country 1			
Country 2			
…			
Unknown			

Table 3c: Annual number of foreign citizen emigrants by native birth status, age and sex

	Foreign Citizen			Native-born Foreign Citizen			Foreign-born Foreign Citizen		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total									
age group 1									
age group 2									
…									

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Unknown										

Table 3d: Annual number of foreign citizen emigrants by sex and country of citizenship

	Foreign Citizen		
	Both Sexes	Male	Female
Total			
Country 1			
Country 2			
…			
Stateless			
Unknown			

Table 4: Annual number of foreign citizens entering the country temporarily by reason for admission and sex

	Foreign Citizen		
	Both Sexes	Male	Female
Total			
(a) cross-border workers			
(b) engaged in seasonal work			
(c) other types of employment			
(d) engaged in training or education			
(e) seeking health-related treatment			
(f) asylum seekers/refugees			
Unknown			

Table 5: Annual number of residents departing the country for temporary stays abroad by age and sex

	Total			Citizen			Foreign Citizen			Unknown citizenship status		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total												
age group 1												
age group 2												
…												
Unknown												