A pilot study on disaggregating SDG indicators by migratory status

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A pilot study on disaggregating SDG indicators by migratory status

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1. BACKGROUND: SDG INDICATOR DISAGGREGATION BY MIGRATORY STATUS

On 25 September 2015, the United Nations General Assembly formally adopted the 2030 Agenda for Sustainable Development, along with a set of 17 Sustainable Development Goals (SDGs) and 169 associated targets. The commitment to "leave no one behind" has been a key feature of all the discussions on the post-2015 agenda and the SDGs. As clearly stipulated in the UN Secretary-General's Synthesis Report, *The Road to Dignity by 2030*, progress means that targets can only be considered achieved if they have been met for all relevant income and social groups. This includes migrants as one population group with growing global relevance[1] and particular vulnerabilities.[2] Target 17.18 of the 2030 Agenda for Sustainable Development enshrines the "leaving no one behind" rationale in the global development framework:

> By 2020, enhance capacity building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable **data disaggregated** by income, gender, age, race, ethnicity, **migratory status**, disability, geographic location and other characteristics relevant in national contexts[3]

Limited availability of, access to and quality of data present a challenge to documenting whether UN Member States are fulfilling their commitments. This is particularly true for migration-relevant targets for which data is notoriously poor.[4] Especially in low-income countries, migrants are not well represented in national statistics. Ensuring that the commitments outlined in the 2030 Agenda are translated into effective action requires better understanding of migrants' baseline situation across the world. Progress among the native-born has to be plotted against progress among migrants to ensure that migrants are not left behind. Such analyses require a template for how progress for migrants can be measured across countries and over time.

For this purpose, the International Organization for Migration's (IOM) Global Migration Data Analysis Centre (GMDAC) conducted a pilot study on the potential of using harmonized census data to provide indications of how far migrants are "left behind." This report illustrates the potential of using census data to disaggregate national data by migratory status. It provides examples of how data on migrants can be disaggregated for the purpose of monitoring relevant SDG targets and illustrates, through a visualization template, how results for different population subgroups can be presented.

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[1] United Nations Department of Economic and Social Affairs (UN DESA), *International Migration Report 2017: Highlights* (New York, UN DESA, 2017). Available from www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf

[2] United Nations General Assembly, *Report of the Special Representative of the Secretary-General on Migration* (New York, 2017), p.16. Available from www.un.org/en/development/desa/population/migration/events/coordination/15/documents/Report%20of%20SRSG%20on%20Migration%20-%20A.71.728_ADVANCE.pdf

[3] Sustainable Development Solutions Network, "Indicators and a Monitoring Framework", webpage. Available from http://indicators.report/targets/17-18

[4] F. Willekens et al., "International migration under the microscope", *Science*, 352(6288):897–899; Center for Global Development (CGD), "Migrants count: Five steps towards better migration data" (Washington, D.C., CGD, 2009). Available from www.cgdev.org/publication/migrants-count-five-steps-toward-better-migration-data; F. Laczko, "Improving data on international migration and development – Towards a global action plan?" Available from http://gmdac.iom.int/sites/default/files/papers/Improving%20Data%20on%20International%20Migration%20and%20Development-%20Towards%20a%20Global%20Action%20Plan%3F.pdf

Using data samples from the 2000 and 2010 census rounds, the report demonstrates whether and to what extent migrants are left behind with respect to several SDG targets. The authors produced a collection of education-, employment- and demographic-related indicators, disaggregated by nativity and citizenship status, for 125 census samples from 73 countries and 2 territories. The results provide an overview of the disparities between native- and foreign-born populations within and across world regions, and offer a template for disaggregated SDG monitoring. The aim of the report is to deliver a first template for measuring progress towards the SDG goal of disaggregating data by migratory status, and advance the global discussion on the monitoring of migration-relevant SDGs.

The main analysis section focuses on SDG Indicator 8.6.1 (proportion of youth not in education, employment or training (NEET)), also known as "NEET rate," as an example of using disaggregated census data for measuring progress towards the SDGs among migrants. Results are presented for all regions where data is available. Results for other SDG indicators are included in the Annex.

The results included in the report highlight the importance of internationally comparable, disaggregated data for determining where and to what extent migrants are "left behind."

2. DATA: IPUMS-INTERNATIONAL

Reliable, internationally comparable data on migration and migrant well-being are limited.[5] Data on migrants residing outside the traditional migrant-receiving countries of the developed world is particularly inaccessible. For countries that lack comprehensive population registers and/or have limited statistical and administrative resources to devote to targeted migration monitoring, census data is an important source of reliable information on migrant stocks, flows and well-being. However, it must be stated that even when data is available in low-income countries, it is often not utilized to its full potential.

To fulfil the disaggregation mandate associated with the SDGs, which requires that all relevant indicators be disaggregated by migratory status (among other demographic characteristics), national governments and UN custodian agencies must rely on census data, the only statistically robust source of information on the entire population of a country or territory. The IPUMS-International is currently the best source of such information for this exercise.

2.1. WHAT IS IPUMS-INTERNATIONAL?

IPUMS-International disseminates high-precision census microdata samples from around the world. Through its partnerships with national statistical offices, IPUMS-International has assembled the world's largest collection of publicly available census microdata. As of 2017, 301 anonymized microdata samples from 85 countries and territories had been made available to researchers free of charge through an online data dissemination system. Global in coverage, the series includes more than 50 samples each from Africa, Asia, Europe and the Americas.

IPUMS-International samples are individual-level subsets of full-count census data. Where possible, IPUMS-International provides 10-per-cent samples of census data by selecting every tenth household after a random start. Individuals are sampled as parts of households because many important topics require information about multiple individuals within the same household.[6] Most samples are truly nationally representative, as they include individuals living in group quarters such as prisons, nursing homes, children's homes and religious institutions, and thus provide information on population subgroups often excluded from household, health and labour force surveys.[7]

IPUMS-International census data includes variables related to a broad range of population and housing characteristics. The population questions pertain to, among others, fertility, migration, disability, labour-force participation, occupational structure, education, ethnicity and household composition.[8] Housing-related questions cover economic indicators (such as dwelling ownership and building material), possession of amenities (such as cars and television sets) and access to utilities (such as water, sewage disposal and cooking fuel).[9]

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[5] International Organization for Migration, *World Migration Report 2013: Migrant Well-being and Development* (Geneva, 2013). Available from https://publications.iom.int/books/world-migration-report-2013

[6] K. Jeffers et al., "Data Resource Profile: IPUMS-International", *International Journal of Epidemiology*, 46(2):390–391 (2017). Available from https://academic.oup.com/ije/article/46/2/390/2907776

[7] Ibid.

[8] S. Ruggles et al., "IPUMS-International", *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 36(2):60–65 (2003). Available from www.tandfonline.com/doi/abs/10.1080/01615440309601215; M. Sobek, "Data Prospects: IPUMS-International", in *International Handbook of Migration and Population Distribution–International Handbooks of Population*, vol. 6 (M. White, ed.) (New York, 2016).

[9] K. Jeffers et al., "Data Resource Profile: IPUMS-International", *International Journal of Epidemiology* (2017). Available from https://academic.oup.com/ije/article/46/2/390/2907776

2.2. HOW ARE MIGRANT POPULATIONS IDENTIFIED?

In this report, migrants are identified using the IPUMS-International variable NATIVITY, which indicates whether an individual is native- or foreign-born. This approach is consistent with that taken by the United Nations Department of Economic and Social Affairs (UN DESA) to estimate the international migrant stock; that is, both IPUMS and UN DESA define "migrant" as an individual who is foreign-born.[10] In most countries and territories, information on place of birth is collected for all individuals included in the census.

As IPUMS-International compiles and harmonizes existing census data to measure migration, it is subject to the inherent strengths and weaknesses of population censuses.[11] One key question pertains to what extent migrants are included in the sampling frame of a population census. The answer varies depending on the type of the census in question. De jure censuses enumerate only permanent or usual residents. In most de jure censuses, temporarily absent residents are enumerated in their place of usual residence. Many de jure censuses exclude even long-term visitors, which can lead to an undercount of transient persons such as seasonal and short-term migrants. On the other hand, de facto censuses enumerate all persons who are present at the time of the census. De facto censuses may therefore overestimate the size of the migrant population by including tourists and other temporary visitors. Table A1 indicates, by sample, whether the census and/or study population is de facto or de jure.

It is also not clear how far censuses include undocumented migrants – a group that may represent a considerable proportion of the migrant population in many countries and may be in particularly vulnerable situations due to their undocumented migratory status. In its recent *Handbook on Measuring International Migration through Population Censuses 2017*, the United Nations Statistics Division notes:

> Because of its universal coverage, the census also covers undocumented migrants. Even if the census is not able to reach some portions of undocumented migrants, it is the best source available, given that administrative sources like population registers and residence permit systems, by definition, exclude undocumented migrants. (UN DESA, 2017:22)

Where possible, indicators are disaggregated by citizenship status. The IPUMS-International variable CITIZENSHIP, which provides additional details on citizenship acquisition, is recoded to distinguish between citizens and non-citizens. Data for this variable, however, is not as widely available as data for the variable NATIVITY, as disaggregation by citizenship status is possible for only 129 samples.

[10] United Nations Department of Economic and Social Affairs (UN DESA), *International Migration Report 2017: Highlights* (New York, 2017). Available from www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf

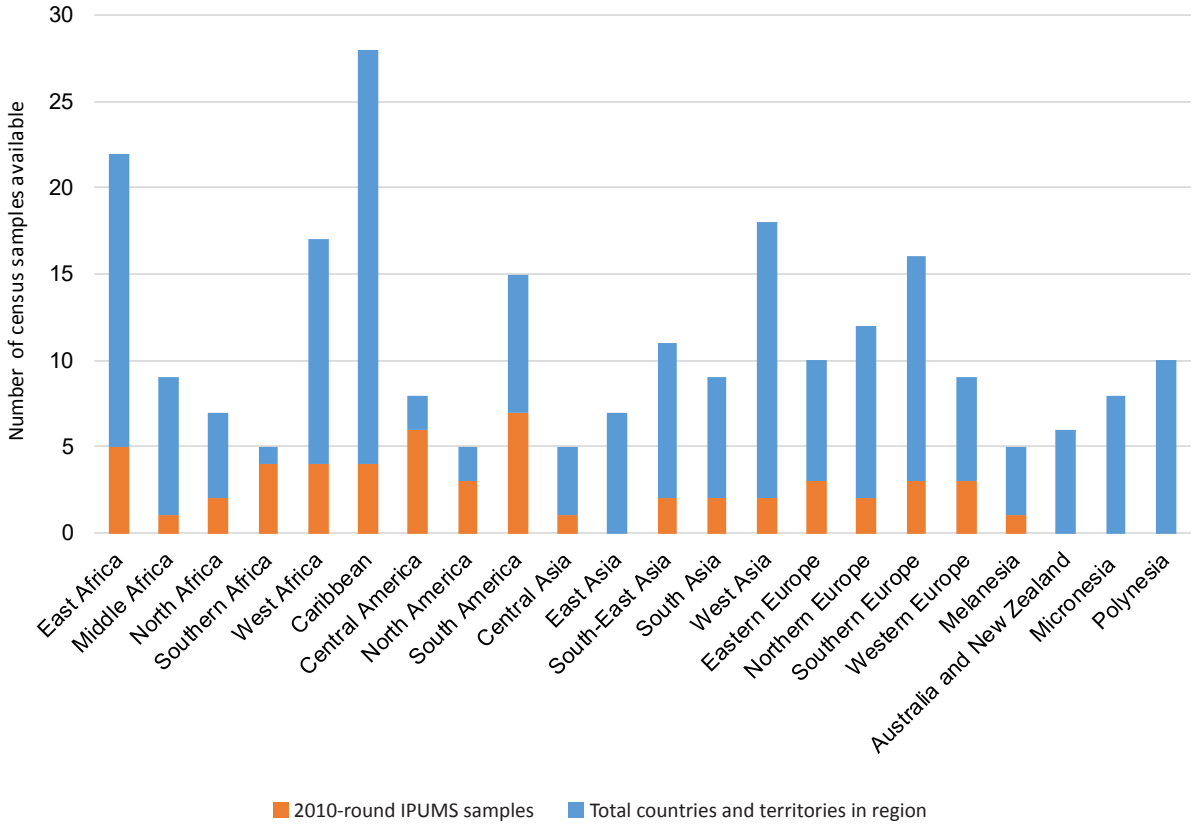
[11] United Nations Department of Economic and Social Affairs (UN DESA), "Handbook on measuring international migration through population censuses", background paper (New York, UN DESA, 2017). Available from https://millenniumindicators.un.org/unsd/statcom/48th-session/documents/BG-4a-Migration-Handbook-E.pdf; United Nations Economic Commission for Europe, "Measuring Hard-to-Count Migrant Populations: Importance, Definitions, and Categories", working paper (Geneva, United Nations, 2012). Available from www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.10/2012/WP_9_UNECE.pdf; H. Zlotnik, "The concept of international migration as reflected in data collection systems", *International Migration Review*, 21(4):925–946 (1987).

2.3. COVERAGE

The availability of data on place of birth, which indicates whether an individual is native- or foreign-born, is the primary criterion for inclusion of a census sample in this study. All IPUMS-International samples that provide scientifically robust data on foreign-born persons are included in the study. Table A1 provides a complete list of the census samples included in the study.

Many samples included in the IPUMS-International database were taken from censuses conducted during the 2000 census round, covering censuses taken between 1995 and 2004. Because it can take national statistical offices several years to process census data and prepare public-use microdata samples, IPUMS-International continues to integrate samples from the 2010 census round as and when they become available. Fifty-five IPUMS-International samples taken from this round identify foreign-born persons. Figure 1 visualizes the geographic coverage of these 2010-round samples.

Figure 1: 2010-round IPUMS-International census samples identifying foreign-born persons, by UN world region



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017.

Regional groupings are based on the methodology of the United Nations Statistical Division: "Standard country or area codes for statistical use." Available from https://unstats.un.org/unsd/methodology/m49

2.4. HOW CAN IPUMS-INTERNATIONAL BE USED IN SDG MONITORING?

More than 30 indicators for 10 of the 17 Sustainable Development Goals can be calculated as officially operationalized using census microdata. These include indicators related to fertility, mortality, access to basic services, enrollment in school and labour-force participation and composition. For dozens of additional targets that rely on "big data" and other non-traditional data sources that are not nationally representative, census data is required in order to produce population-level estimates. Likewise, census data is required for the disaggregation of indicators derived from data sources that lack the sample sizes or stratifying variables necessary to support disaggregated estimates. While targeted household surveys often provide more detail than population censuses, they rarely produce sample sizes large enough to support the multidimensional disaggregation suggested for SDG monitoring. When empirical disaggregation is not available, census data can be used to model indicator estimates for population subgroups and subnational geographic units.[12] Census data may also provide proxy estimates for Tier-II and Tier-III indicators in countries and territories where new data cannot be easily collected.[13]

Census microdata disseminated by IPUMS-International offer several advantages for SDG monitoring. First, IPUMS-International represents the world's largest collection of publicly available census microdata. Many of these nationally representative samples are unavailable elsewhere. Second, variable harmonization and data integration facilitate analyses across time and space, as harmonized variables from a single source improve the reliability of cross-national comparisons.[14] The principal advantage of IPUMS-International is its replacement of census-specific variable codes with new, integrated codes that are consistent across space and time. The basic goal of variable harmonization is to make data suitable for comparative analysis across time and space by applying a unified coding scheme across all samples in the data series. Microdata are integrated so that identical concepts have identical codes;[15] currently, over 700 integrated variables are included in the IPUMS-International database. This variable harmonization process allows for the integration of all census samples into a single database from which researchers can build customized, downloadable data sets free of charge.

IPUMS-International samples include subnational geographic identifiers, facilitating spatially disaggregated analysis, including for migrant populations in some countries and territories. Geographic detail varies across samples, however. For most countries and territories, only the first and second administrative levels are identified. Smaller units such as municipalities are identified for a limited selection of countries and territories.

[12] S. Zhang, "Small area estimates: An illustration for family planning using Nepal as a case study", paper presented at World Data Forum, Cape Town, 15–18 January 2017.

[13] SDG indicators are classified as Tier I, Tier II or Tier III according to the following criteria: Tier I: The indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries/territories for at least 50 per cent of countries/territories and of the population in every region where the indicator is relevant. Tier II: The indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries/territories. Tier III: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested.

[14] K. Jeffers et al., "Data Resource Profile: IPUMS-International", *International Journal of Epidemiology*, 46(2):390–391 (2017). Available from: https://academic.oup.com/ije/article/46/2/390/2907776

[15] K. Jeffers et al., "Monitoring Sustainable Development Goals with census microdata from IPUMS-International", poster presented at the Annual Meeting of the Population Association of America, Washington, D.C., 31 March to 2 April 2016. Available from https://pop.umn.edu/sites/pop.umn.edu/files/7.compressed.pdf

The large samples distributed by IPUMS-International—most commonly, 10 per cent of all enumerated households—make it possible to study small subpopulations and subnational regions of countries/territories. Correspondingly, IPUMS-International accounts for changing administrative boundaries that can otherwise invalidate spatiotemporal analyses required for monitoring SDGs at subnational levels.[16] Geographic units that have changing boundaries cannot be compared across time in any meaningful way. Fixed geographic units are thus necessary for accurate measurements of changes over time involving contextual or spatial elements.[17] IPUMS-International creates geographic variables that provide fixed subnational units across time. Boundary files that match units identified in the microdata are also available.

Certain limitations restrict the usefulness of census data for SDG monitoring. Accessing public-use microdata samples from countries/territories that do not participate in IPUMS-International remains challenging. And while 85 countries and territories have already disseminated data through the project to date, not all of them have contributed 2010-round census data. Furthermore, even as census questions cover a broad range of topics, they do so with limited detail. Household surveys are often a better source of in-depth information necessary for qualitative SDG indicators. Such targeted surveys may also be useful for collecting data on hidden populations such as undocumented migrants. Household surveys are also conducted more frequently than censuses, providing timelier indicator estimates. One clear limitation of using census data for SDG monitoring is that results of census data processing are only available after a delay of several years. Collecting, analysing, sharing and harmonizing census data is therefore a complex, lengthy process that waits until meaningful data that can be compared across countries and/or territories becomes available.

Despite their limitations, harmonized census microdata, like those disseminated by IPUMS-International, represent an important resource for national statistical offices and UN custodian agencies. Many indicators can be directly measured using census microdata, and other data sources can be used in conjunction with them to produce disaggregated, population-level indicator estimates.

[16] Ibid.

[17] S. Sula et al., "Harmonized census geography and spatio-temporal analysis: Gender equality and empowerment of women in Africa", paper presented at the Annual Meeting of the Population Association of America, San Diego, California, 30 April to 2 May 2015.

3. RESULTS: THE EXAMPLE OF SDG INDICATOR 8.6.1

3.1. A GRAPHICAL METHOD FOR REPORTING SDG INDICATOR DISAGGREGATION

Reporting progress towards the SDG migration disaggregation goal is a complex endeavour, given the multidimensional nature of the analysis.

1. To monitor progress towards the overall SDG goal, the graph must display changes over time, that is, between two census rounds in the same country/territory.
2. To examine whether and to what extent migrants are left behind, the graph must also display disparities in outcomes for native- and foreign-born (i.e. migrant) populations in the same year and in the same country/territory.
3. To monitor progress towards reducing disparities between native and migrant populations, the graph must enable a comparison of gaps observed in the two census rounds in the same country/territory.
4. Lastly, to compare regional and global trends, multiple countries and/or territories must be included in the graph.

The report developed a specific graphical method to display each of the abovementioned dimensions for each world region.

Section 3.2 presents results for SDG Indicator 8.6.1 (proportion of youth not in employment, education or training (NEET)), also known as "NEET rate," disaggregated by migratory status. Figure 2 shows the proportions (in percentages) of native- and foreign-born youth in selected African countries who were not in employment, education or training in 2000 and 2010 (i.e. the NEET rates among the native- and foreign-born, respectively).

The graph is interpreted as follows: Light and dark orange dots represent NEET rates among native-born youth of various African countries. Light and dark blue dots represent NEET rates among foreign-born (i.e. migrant) youth. Light colours show NEET rates based on census samples from the 2000 census round; dark colours show NEET rates based on the 2010 round. Paired blue and orange dots that are closer together indicate a smaller disparity between native-born and migrant youth. Comparing how far apart the paired dark-coloured dots are to how far apart the light-coloured dots are reveals whether the disparity between native- and foreign-born youth populations have decreased or increased over time.

3.2. RESULTS BY REGION

Youth who are neither attending school nor working risk social exclusion and poor labour-market outcomes later in life. SDG Indicator 8.6.1, also known as "NEET rate," expresses the proportion or percentage of these youth aged 15 to 24 who are not in education, employment or training. NEET rates can be estimated, as most censuses collect information on employment status and school attendance. Used together, the IPUMS-International variables SCHOOL and EMPSTAT identify youth who are neither attending school nor are employed at the time of a given census round.[18] These two variables are available in 43 of the 2010-round IPUMS-International census samples that identify foreign-born persons.

Figures 1 to 4 visualize results for SDG Indicator 8.6.1 by world region. The graphs include data from both 2000 and 2010 census rounds and provides a template for monitoring SDG progress with respect to this indicator across time. The results reveal heterogeneity within and across regions. Overall NEET rates and the direction and magnitude of disparities between native- and foreign-born populations vary greatly across countries and territories. The absence of clear regional trends underlines the importance of internationally comparable, disaggregated data for all countries and territories and smaller geographic units for SDG monitoring.

3.2.1. AFRICA

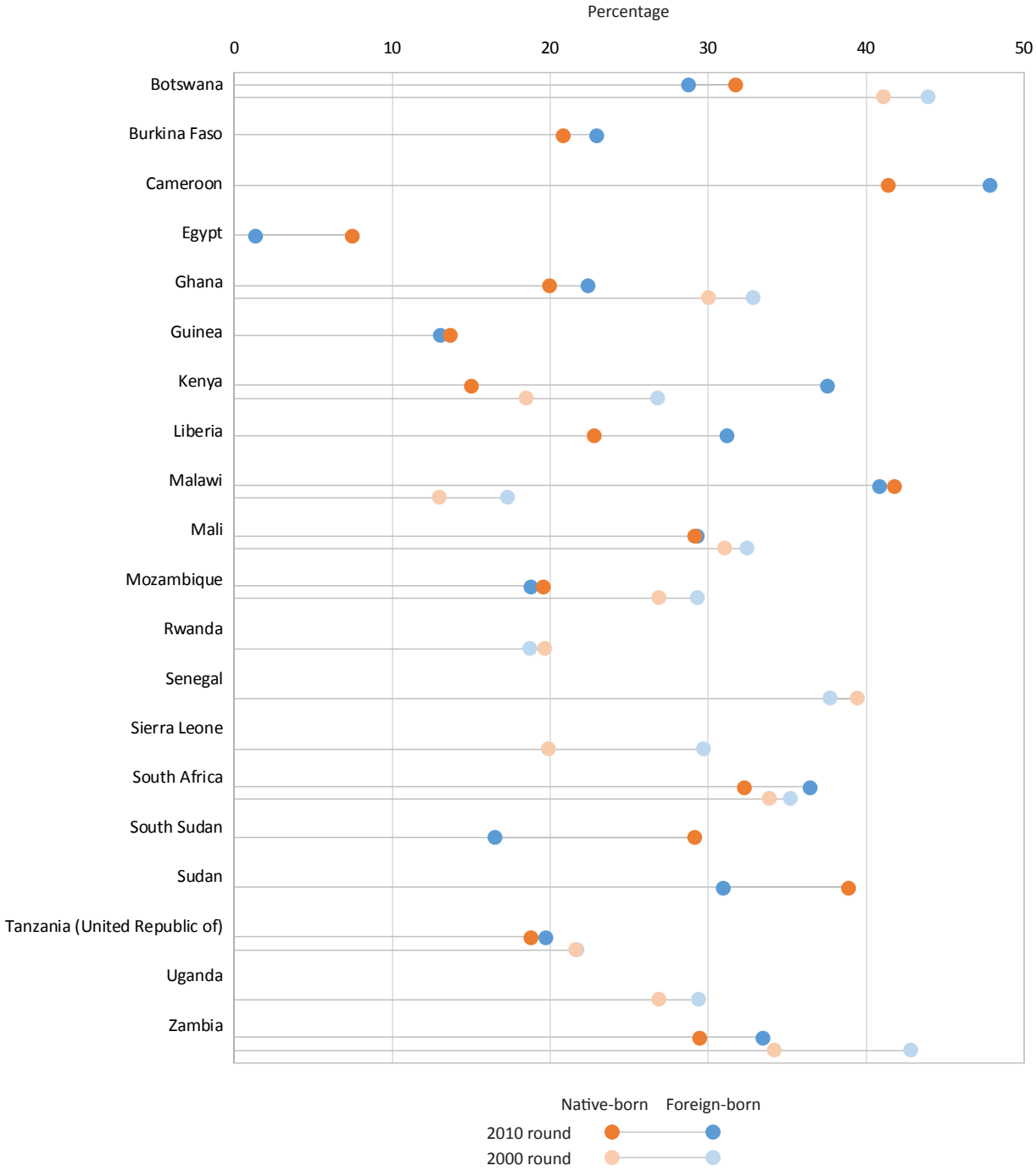
Figure 2 shows the results of disaggregating SDG Indicator 8.6.1 by migratory status (in this case, native- and foreign-born) for selected countries in Africa. The wide dispersion of dots indicates that the situation is vastly different across these countries.

In Ghana, for example, the percentage of youth aged 15 to 24 who were not in education, employment or training (i.e. the NEET rate) was higher among the foreign-born than among the native-born in both the 2000 and 2010 census rounds. The NEET rate among the total (i.e. combined native- and foreign-born) youth population decreased from 30 to 20 per cent, with a stable gap between foreign- and native-born populations. One may interpret this as an indication that migrants have equally benefited from progress in this area, thus the lower NEET rate in the 2010 census round. However, the disparity between migrant and native-born youth remains.

Overall, 2010-round census data shows lower NEET rates among the foreign-born population than among the native-born population in Botswana, Egypt, the Sudan and South Sudan (Figure 1). In Burkina Faso, Ghana, South Africa and Zambia, foreign-born youth experience higher NEET rates compared to native-born youth, but the gaps are small. Disparities between native- and foreign-born youth are highest in Cameroon, Kenya and Liberia. Time-series analysis reveals widening gaps in Kenya and South Africa from the 2000 to the 2010 census rounds.

[18] The reference period for school attendance and employment questions varies from census to census. Visit the IPUMS-International website for details on reference period by country/territory/sample: https://international.ipums.org/international-action/variables/EMPSTAT#comparability_section

Figure 2: NEET rate (%) among youth aged 15 to 24 in selected African countries, by place of birth and census round



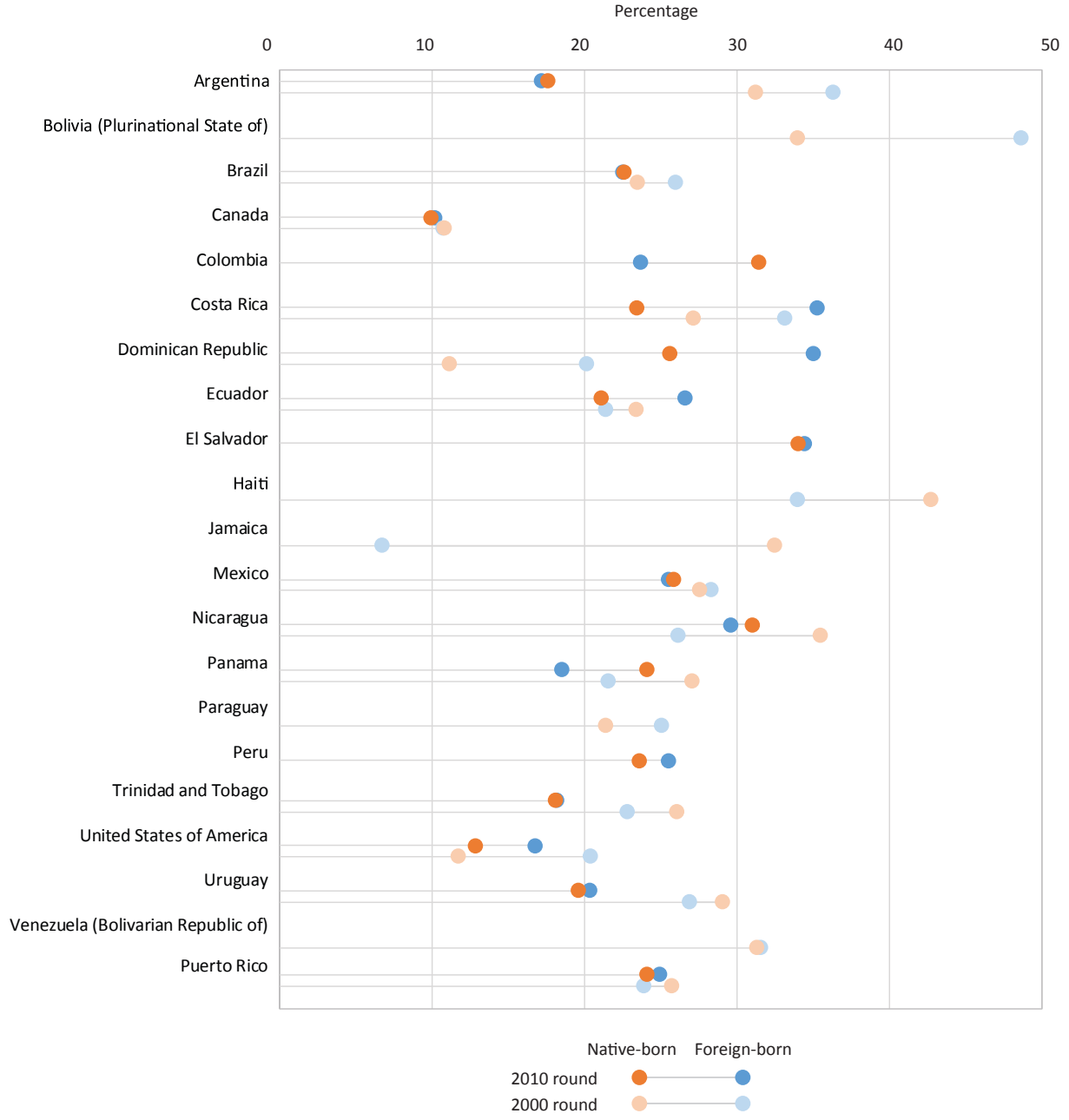
Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent NEET rates among the native-born youth population of a country; light and dark blue dots represent NEET rates among foreign-born youth. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) youth. Light colours show NEET rates based on census samples from the 2000 round; dark colours show NEET rates based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born youth in a certain country.

3.2.2. AMERICAS

Better data availability in Central and South America provides a more complete picture of the NEET situation across the region. In most countries, gaps between native- and foreign-born youth are small according to the 2010 census round. Large and widening gaps exist between native- and foreign-born youth in Costa Rica, Dominican Republic and Ecuador. The time-series analysis identifies improvements in overall NEET rates and in the disparities between native- and foreign-born populations in Argentina, Brazil, Trinidad and Tobago, and Uruguay.

Figure 3: NEET rate (%) among youth aged 15 to 24 in selected countries and territories in the Americas, by place of birth and census round



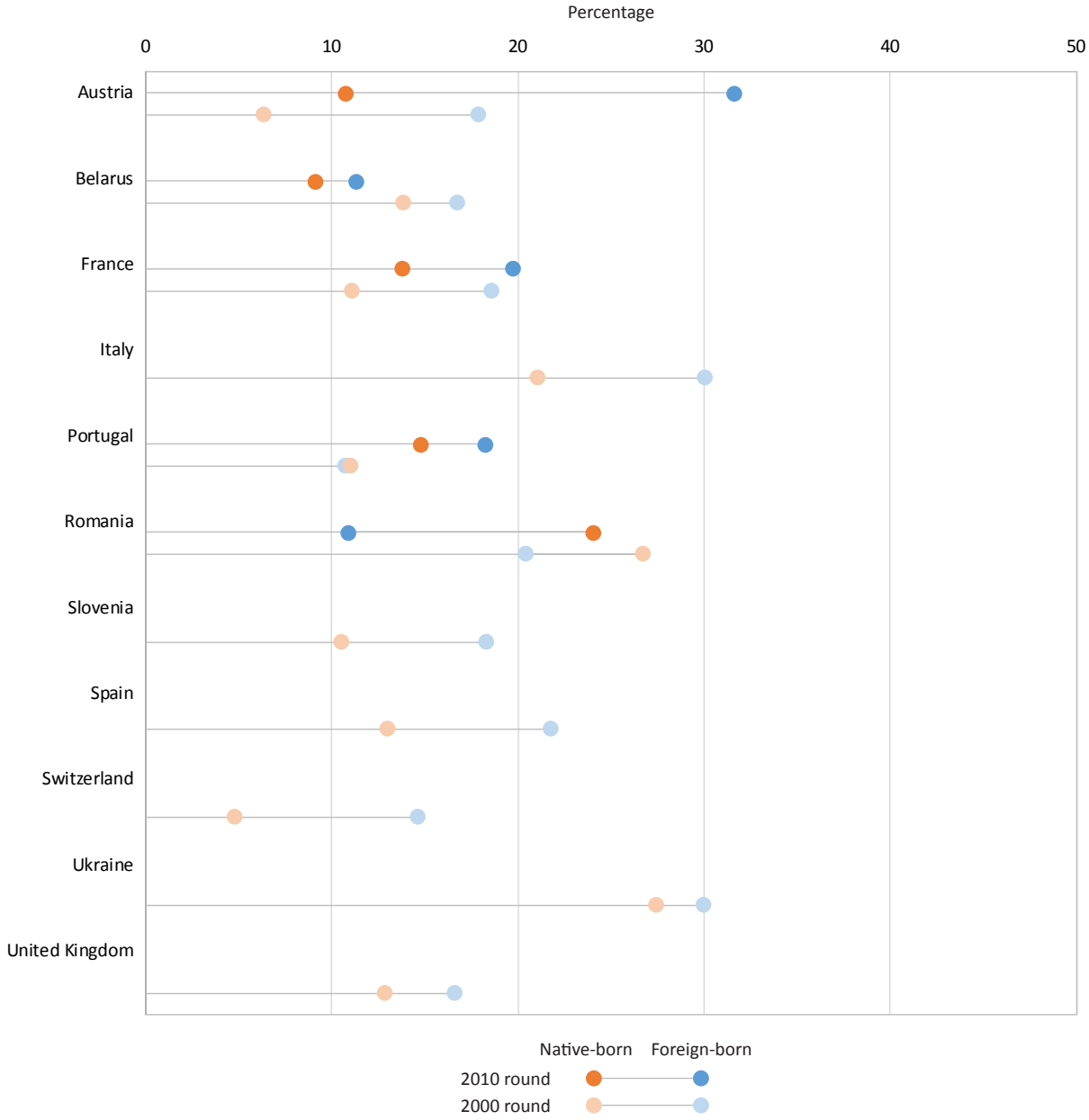
Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent NEET rates among the native-born youth population of a country/territory; light and dark blue dots represent NEET rates among foreign-born youth. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) youth. Light colours show NEET rates based on census samples from the 2000 round; dark colours show NEET rates based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born youth in a certain country/territory.

3.2.3. EUROPE

Available data suggest more homogeneity in Europe than in other regions, though very few countries are represented. Foreign-born youth experience higher NEET rates than native-born youth in all countries with available data except Romania. In both Austria and France, NEET rates increased between 2000 and 2010 among both native- and foreign-born populations. While the gap between foreign- and native-born youth was stable in France between 2000 and 2010, it increased in Austria and Portugal during the same period.

Figure 4: NEET rate (%) among youth aged 15 to 24 in selected European countries, by place of birth and census round



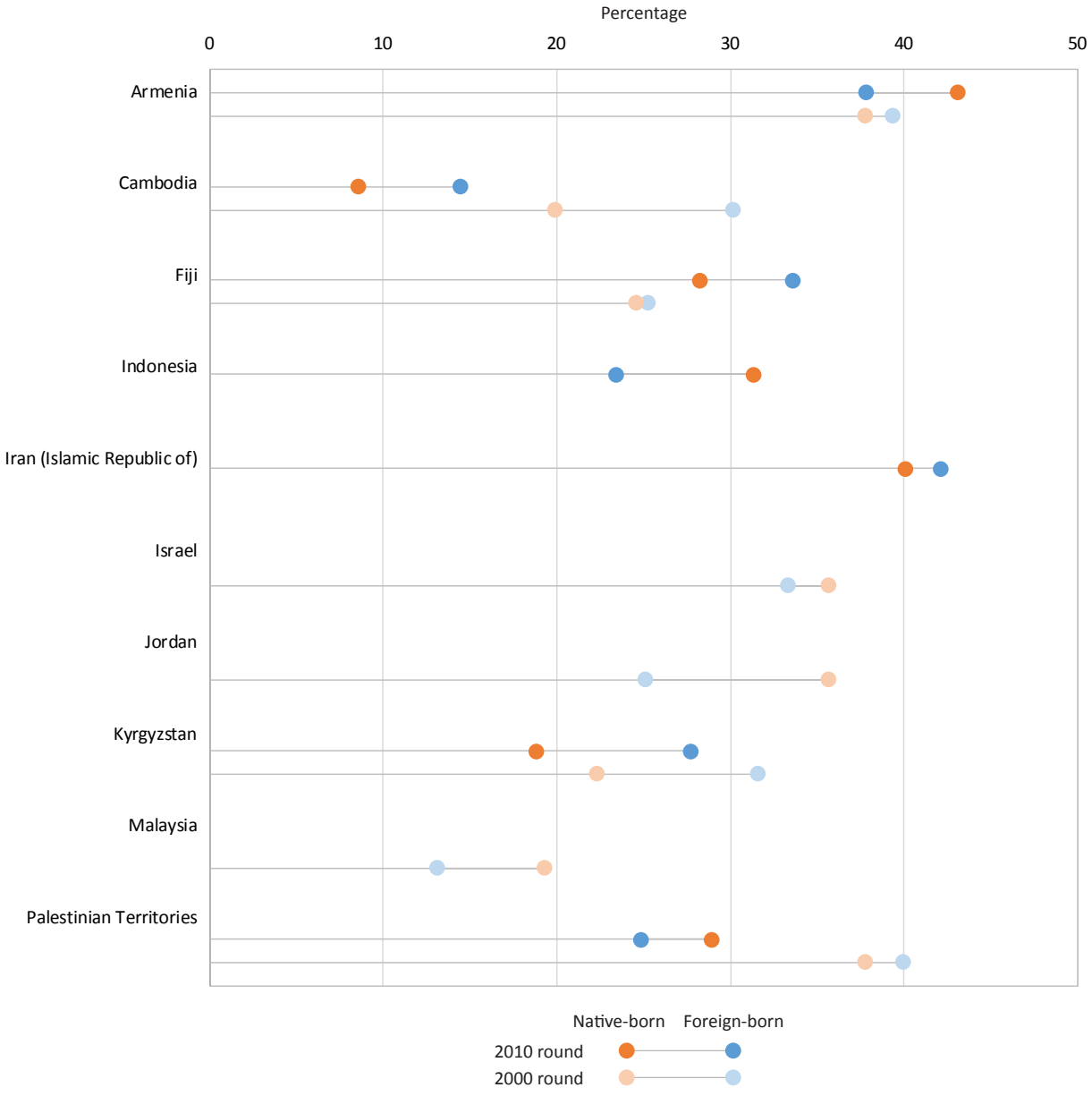
Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent NEET rates among the native-born youth population of a country; light and dark blue dots represent NEET rates among foreign-born youth. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) youth. Light colours show NEET rates based on census samples from the 2000 round; dark colours show NEET rates based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born youth in a certain country.

3.2.4. ASIA AND OCEANIA

Limited data for Asia and Oceania hampers analysis of regional trends. In countries with 2000- and 2010-round census data, gaps between native- and foreign-born youth remained large or increased between census rounds. In the Palestinian Territories and Armenia, gaps increased between census rounds, with foreign-born youth actually experiencing lower NEET rates compared to the native-born during the 2010 census round.

Figure 5: NEET rate (%) among youth aged 15 to 24 in selected countries and territories in Asia and Oceania, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent NEET rates among the native-born youth population of a country/territory; light and dark blue dots represent NEET rates among foreign-born youth. Paired blue and orange dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign) youth. Light colours show NEET rates based on census samples from the 2000 round; dark colours show NEET rates based on 2010-round samples. Comparing light with dark-coloured dots elucidates the change over time in the gap between migrant and native-born youth in a certain country/territory.

3.2.5. SUMMARY OF FINDINGS

Figures 1 to 4 illustrate one way of disaggregating census data by migratory status and comparing outcomes across a span of 10 years (i.e. between the 2000 and 2010 census rounds).[19] The graphs also indicate which countries and territories had available census data for each round.

NEET rates vary considerably by country/territory, migratory status and year. No clear picture emerges for any region. The same is true of other SDG indicators (see Annex). NEET rates are driven by a host of factors, including a country's economy, its education system and the characteristics of its migrant population, to name a few. Countries and territories differ substantially with regard to each of these factors. This makes direct comparisons of countries/territories difficult. This finding underscores the need to use SDG monitoring as a country-level tool. At the country level, the graphs can be useful in identifying trends, informing policy and measuring SDG progress.

[19] Note that the time between two census rounds is not always 10 years. It can be more or less in some cases.

4. RECOMMENDATIONS: THE WAY FORWARD

This report provides a first template and graphical method for reporting on SDG Target 17.18 – specifically regarding disaggregation by migratory status. The results highlight the potential use of harmonized census data, as provided by IPUMS-International, in comparing the outcomes for migrants and natives in 62 countries and territories. The report also illustrates how to analyse trends over time by comparing two census rounds for the same country/territory. The analysis allows UN Member States to track progress towards the SDG targets in this area.

For further development of and discussion about migration-relevant SDG monitoring based on census data, the report gives five concrete recommendations:

I. Disaggregating SDG indicators by migratory status and comparing results over time is most useful at the national level. The results for SDG Indicator 8.6.1 indicate large variations within and across regions. The results do not suggest clear patterns or trends. This finding underscores that the situation regarding migration, the economy, the education system and other areas is very different across countries and that comparisons should be made with caution. Continued SDG reporting in this area should make use of data first and foremost as a self-assessment tool to facilitate policy monitoring and the exchange of best practices with other countries in the region and beyond. The results of this pilot study suggest that any type of league table or ranking is not suitable without accounting for important structural differences among countries.

II. Census data has to be made available in a timelier manner. The earlier the data is available after collection, the sooner results can inform policy in various areas. However, years can pass before microlevel census data is cleaned, analysed and released. National statistical offices – particularly in low-income settings – require financial support and training to collect, analyse and report census data in a timelier fashion. There is also a need to add more key questions about migration in censuses, such as when a migrant arrived in the census country/territory, a question asked in only approximately half of the countries and territories of the world today.[20]

III. More countries and territories should share high-precision census microdata samples to enable data harmonization and facilitate more comprehensive SDG monitoring. IPUMS-International – currently the largest provider of harmonized census data around the world – includes 242 census samples with which disaggregation by migratory status is possible (through either birth place or citizenship) for all available years. For the 2010 census round, however, there are only 55 countries/territories with the necessary data to disaggregate by migratory status. Census data from more countries and territories are therefore needed to assess whether UN Member States are making progress towards SDG targets at the global level.

IV. The report illustrates the magnitude of the analysis involved in monitoring just one SDG indicator. Given that the potential for disaggregation of SDG targets by migratory status is enormous, and that data is limited, countries need to prioritize which targets should be disaggregated by migratory status consistent with their policy agenda in certain areas.

V. Censuses are a key source of data on international migration, but given the fact that they are not conducted very frequently and may not fully capture data about hidden populations such as migrants, countries will also need to consider using other sources of data to assess how far migrants are being left behind. Census data should be complemented with other sources such as surveys and administrative data to capture information on specific subgroups of migrants such as refugees, internally displaced persons, undocumented migrants and victims of trafficking.

[20] United Nations Department of Economic and Social Affairs (UN DESA), "Handbook on measuring international migration through population censuses" background paper (New York, UN DESA, 2017) 1 March 2017. Available from https://unstats.un.org/unsd/statcom/48th-session/documents/BG-4a-Migration-Handbook-E.pdf

ANNEX

Table A1: IPUMS-International samples included in the study (2000 and 2010 census rounds)

Census sample	Sample density (%)	Sample size	Number of foreign-born, *N*	Type	Smallest geographic unit
Argentina, 2001	10	3,626,103	153,523	de facto	province
Argentina, 2010	10	3,966,245	175,470	de facto	province
Armenia, 2001	10	326,560	30,355	de jure	province
Armenia, 2011	10	301,704	18,236	de jure	province
Austria, 2001	10	803,376	100,319	de jure	state
Austria, 2011	10	839,474	130,924	de jure	state
Belarus, 2009	10	919,087	91,282	de jure	region
Bolivia (Plurinational State of), 2001	10	827,692	9,338	de facto	department
Botswana, 2001	10	168,351	7,514	de facto	district
Botswana, 2011	10	201,649	9,346	de facto	district
Brazil, 2000	6	10,136,022	35,654	de jure	state
Brazil, 2010	5	9,693,058	21,667	de jure	state
Burkina Faso, 2006	10	1,398,386	65,505	de jure	region
Cambodia, 1998	10	1,138,839	14,702	de facto	province
Cambodia, 2008	10	1,340,097	8,255	de facto	province
Cameroon, 2005	10	1,745,560	47,947	de jure	province
Canada, 2001	2.7	800,910	154,280	de jure	province
Canada, 2011	2.7	925,466	209,908	de facto	province
Chile, 2002	10	1,483,046	19,807	de facto	province
Colombia, 2005	10	4,005,557	7,595	de jure	department
Costa Rica, 2000	10	381,500	29,817	de jure	province
Costa Rica, 2011	10	430,082	38,996	de jure	province
Cuba, 2002	10	1,118,767	1,564	de jure	province
Dominican Republic, 2002	10	802,038	9,680	de jure	province
Dominican Republic, 2010	10	943,784	39,548	de jure	province
Ecuador, 2001	10	1,212,189	10,487	de facto	province
Ecuador, 2010	10	1,448,233	19,520	de facto	province
Egypt, 1996	10	5,882,762	10,400	de facto	governorate
Egypt, 2006	10	7,228,638	15,964	de facto	governorate
El Salvador, 2007	10	574,364	3,771	de jure	department
Fiji, 1996	10	77,200	1,204	de facto	division
Fiji, 2007	10	84,323	1,319	de facto	division
France, 1999	5	2,934,758	311,782	de jure	region
France, 2006	33	19,973,287	2,537,199	de jure	region
France, 2011	33	20,541,337	2,731,050	de jure	region
Ghana, 2000	10	1,894,133	74,475	de facto	region
Ghana, 2010	10	2,466,289	32,455	de facto	region
Greece, 2001	10	1,028,884	102,466	de facto	department
Greece, 2011	10	1,056,607	124,979	de facto	department
Guinea, 1996	10	715,572	35,496	de jure	prefecture

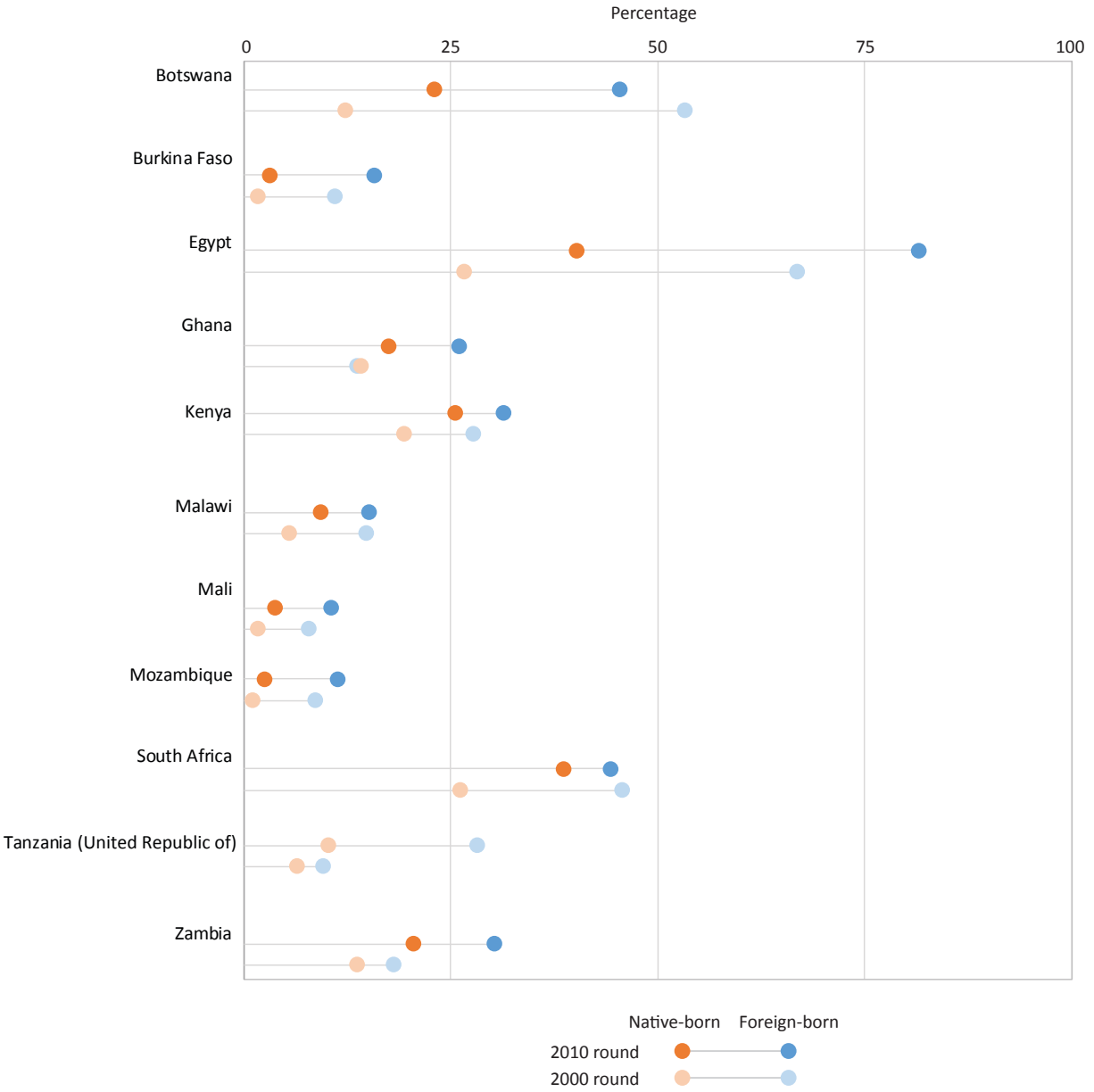
Census sample	Sample density (%)	Sample size	Number of foreign-born, *N*	Type	Smallest geographic unit
Haiti, 2003	10	838,045	1,676	de jure	department
Indonesia, 2000	10	20,105,626	3,102	de jure	province
Indonesia, 2010	10	23,602,694	23,615	de jure	province
Iran (Islamic Republic of), 2006	2	1,281,393	13,314	de jure	province
Iran (Islamic Republic of), 2011	2	1,451,444	16,574	de jure	province
Iraq, 1997	10	1,925,174	9,550	de jure	governorate
Ireland, 1996	10	365,323	23,156	de facto	region
Ireland, 2002	10	399,622	51,641	de facto	region
Ireland, 2006	10	421,626	65,640	de facto	region
Ireland, 2011	10	455,112	80,577	de facto	region
Israel, 1995	10	556,365	179,580	de jure	district
Israel, 1972	10	315,608	142,241	de jure	none
Italy, 2001	5	2,990,739	117,890	de jure	region
Jamaica, 2001	10	202,638	1,919	de jure	parish
Jordan, 2004	10	510,534	38,942	de facto	governorate
Kenya, 1999	5	1,407,547	24,216	de facto	province
Kenya, 2009	10	3,841,804	35,168	de facto	province
Kyrgyzstan, 1999	10	476,884	38,831	de jure	region
Kyrgyzstan, 2009	10	564,986	25,206	de jure	region
Liberia, 2008	10	346,179	7,370	de facto	county
Malawi, 1998	10	991,393	5,652	de facto	district
Malawi, 2008	10	1,308,048	21,112	de facto	district
Malaysia, 1991	2	345,938	19,728	de facto	state
Malaysia, 2000	2	435,300	30,083	de jure	state
Mali, 1998	10	990,972	16,686	de jure	region
Mali, 2009	10	1,451,386	30,939	de jure	region
Mexico, 1995	0.4	331,907	1,607	de jure	state
Mexico, 2000	10.6	10,050,399	49,022	de jure	state
Mexico, 2010	10	11,914,576	85,696	de jure	state
Mexico, 2015	9.5	11,278,624	82,162	de jure	state
Mongolia, 2000	10	243,725	815	de jure	province
Morocco, 2004	5	1,482,645	2,451	de jure	region
Mozambique, 1997	10	1,502,791	32,914	de jure	province
Mozambique, 2007	10	2,008,088	27,861	de jure	province
Netherlands, 2001	1.2	189,725	15,998	de jure	none
Nicaragua, 1995	10	432,146	2,613	de jure	department
Nicaragua, 2005	10	515,485	3,391	de jure	department
Pakistan, 1998	10	13,102,024	133,192	de jure	province
Panama, 2000	10	283,875	8,169	de facto	province
Panama, 2010	10	340,231	14,350	de facto	province
Paraguay, 2002	10	512,713	17,281	de facto	department
Peru, 2007	10	2,745,891	7,835	de facto	region
Philippines, 2000	10	7,165,960	124,655	de jure	province
Poland, 2002	10	3,765,180	77,707	de jure	voivodeship
Poland, 2011	10	4,046,297	69,027	de jure	voivodeship
Portugal, 2001	5	516,655	32,136	de jure	subregion
Portugal, 2011	5	528,870	43,903	de jure	subregion

Census sample	Sample density (%)	Sample size	Number of foreign-born, *N*	Type	Smallest geographic unit
Romania, 2002	10	2,137,874	12,488	de jure	county
Romania, 2011	10	1,991,924	14,251	de jure	county
Rwanda, 2002	10	808,755	37,159	de jure	province
Senegal, 2002	10	984,034	20,821	de jure	region
Sierra Leone, 2004	10	494,298	8,992	de facto	district
Slovenia, 2002	10	179,632	14,679	de jure	region
South Africa, 1996	10	3,547,995	74,808	de facto	province
South Africa, 2001	10	3,725,655	82,593	de facto	province
South Africa, 2007	2	939,722	21,475	de facto	province
South Africa, 2011	8.6	4,281,312	178,633	de facto	province
South Sudan, 2008	7	542,721	1,829	de facto	state
Spain, 2001	5	2,039,274	107,394	de jure	communities and autonomous cities
Spain, 2011	10	4,107,465	274,559	de jure	communities and autonomous cities
Sudan, 2008	16.6	5,065,811	10,882	de facto	state
Switzerland, 2000	5	350,511	78,050	de facto	canton
Tanzania (United Republic of), 2002	10	3,698,791	22,675	de facto	region
Tanzania (United Republic of), 2012	10	4,493,985	12,134	de facto	region
Thailand, 2000	1	603,070	2,587	de jure	province
Trinidad and Tobago, 2000	10	111,665	4,201	de facto	region
Trinidad and Tobago, 2011	8.8	109,680	4,420	de facto	region
Turkey, 2000	5	3,443,584	63,550	de facto	province
Uganda, 1991	10	1,546,658	41,308	de facto	district
Uganda, 2002	10	2,443,247	39,149	de facto	district
Ukraine, 2001	10	4,807,311	516,607	de jure	region
United Kingdom, 2001	3	1,825,595	134,892	de jure	region
United States of America, 2000	5	14,081,466	1,614,057	de jure	state
United States of America, 2005	1	2,878,380	329,781	de jure	state
United States of America, 2010	1	3,061,692	386,527	de jure	state
Uruguay, 1996	10	307,931	9,493	de facto	department
Uruguay, 2006	8.4	64,009	1,190	de jure	department
Uruguay, 2011	10	316,801	7,658	de jure	department
Venezuela (Bolivarian Republic of), 2001	10	2,305,065	99,152	de jure	state
Zambia, 2000	10	932,289	13,342	de facto	province
Zambia, 2010	10	1,245,663	10,252	de facto	province
Palestinian Territories, 1997	10	259,191	98,499	de facto	governorate
Palestinian Territories, 2007	10	200,337	12,553	de facto	governorate
Puerto Rico, 2000	5	189,828	17,520	de jure	*puma*
Puerto Rico, 2005	1	35,416	3,137	de jure	*puma*
Puerto Rico, 2010	1	36,032	3,018	de jure	*puma*

ANNEX:
IPUM-International samples included in the study (2000 and 2010 census rounds)

SDG Indicator 4.5.1: Persons who have completed secondary education or higher

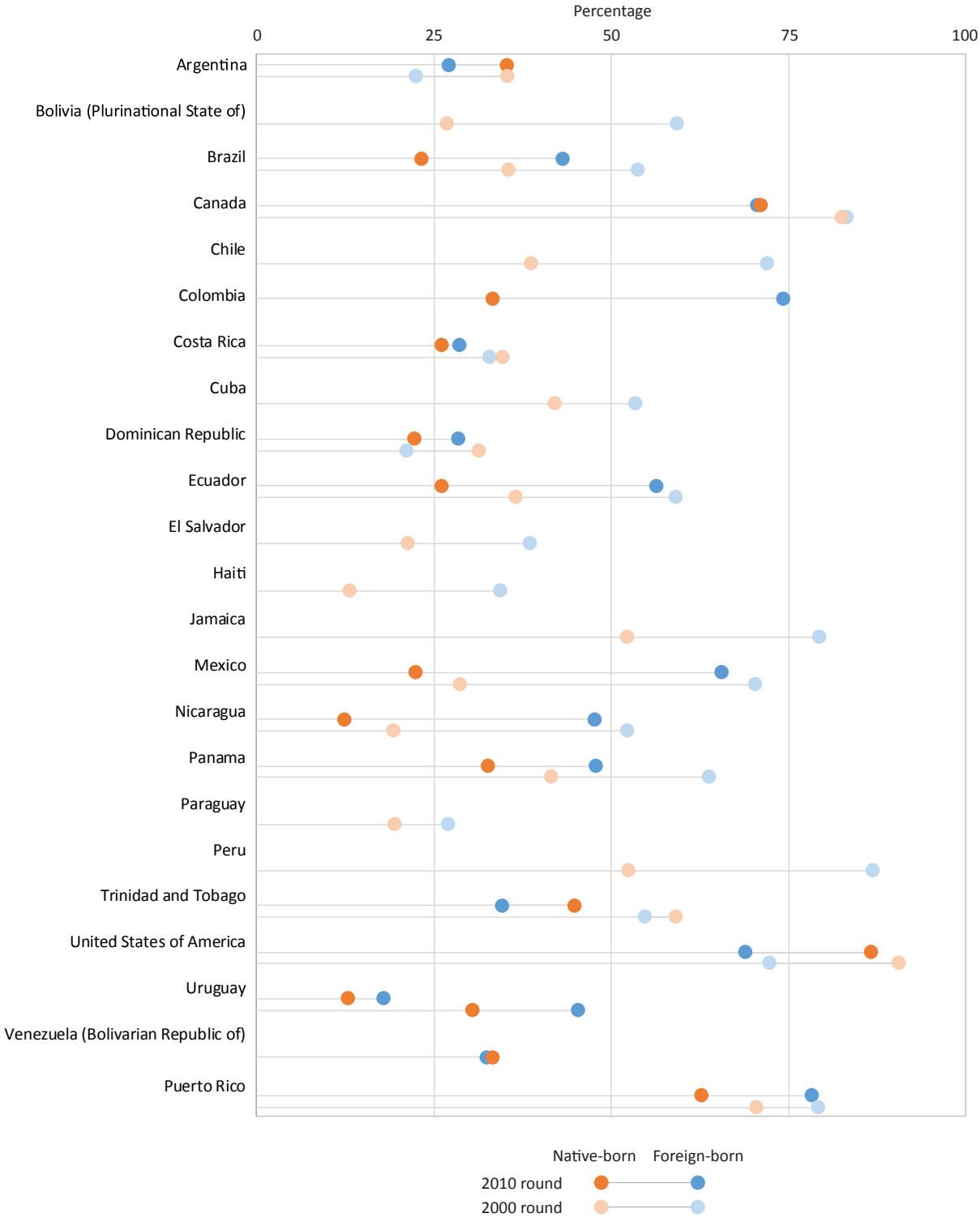
Figure A1: Percentage of persons aged 25 and above who have completed secondary education or higher in selected African countries, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

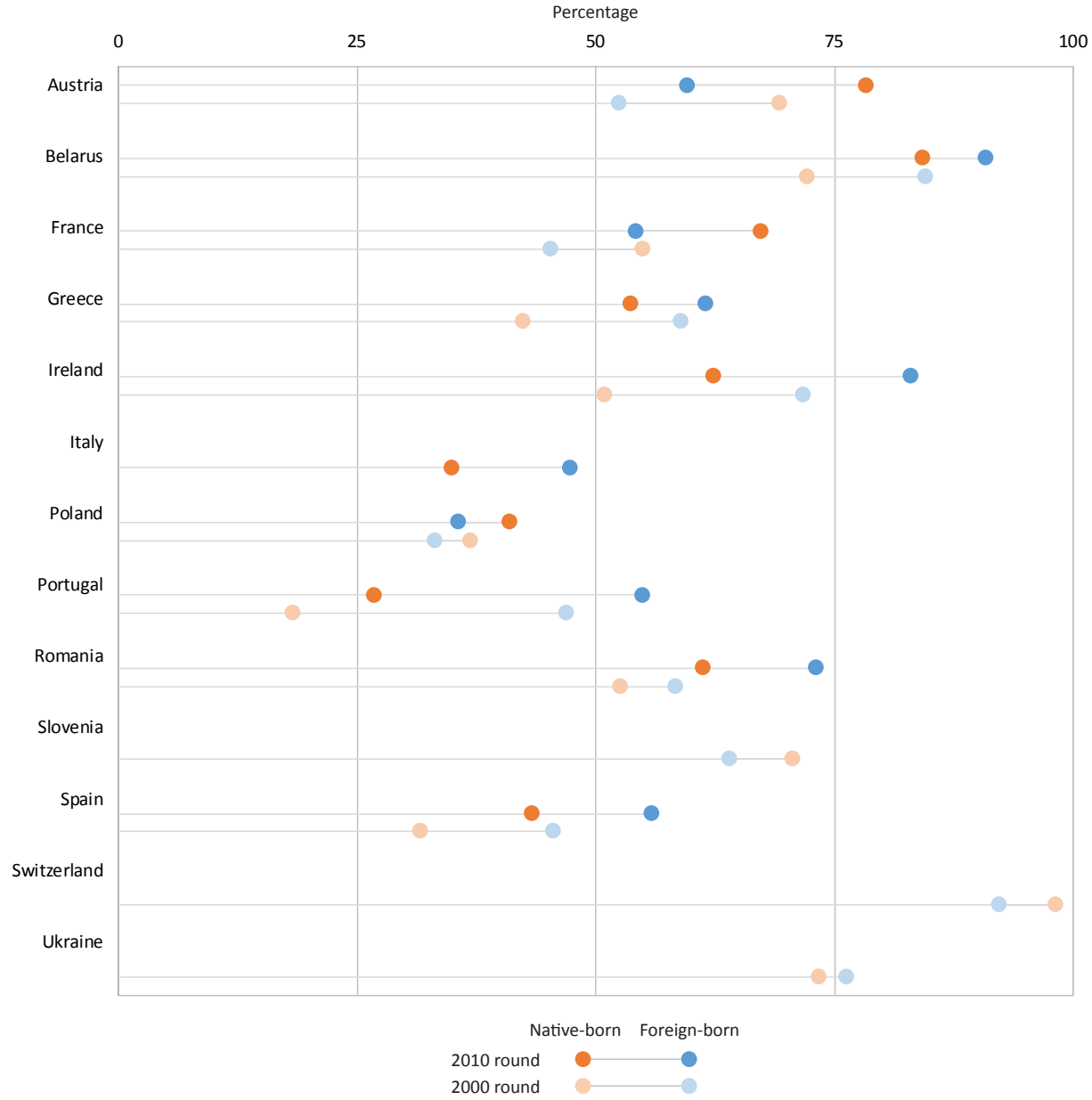
Figure A2: Percentage of persons aged 25 and above who have completed secondary education or higher in selected countries and territories in the Americas, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country/territory; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

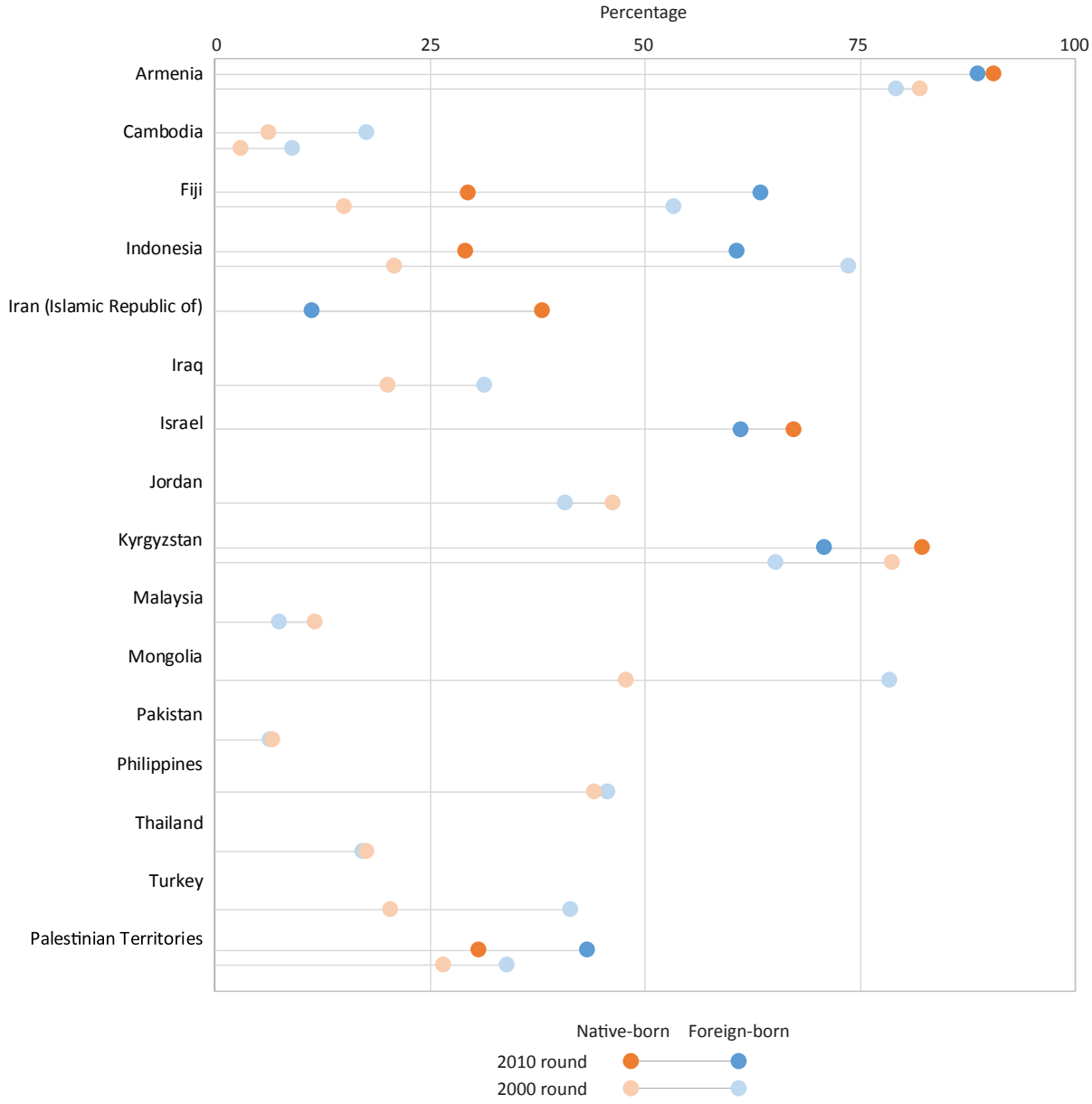
Figure A3: Percentage of persons aged 25 and above who have completed secondary education or higher in selected European countries, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

Figure A4: Percentage of persons aged 25 and above who have completed secondary education or higher in selected countries and territories in Asia and Oceania, by place of birth and census round

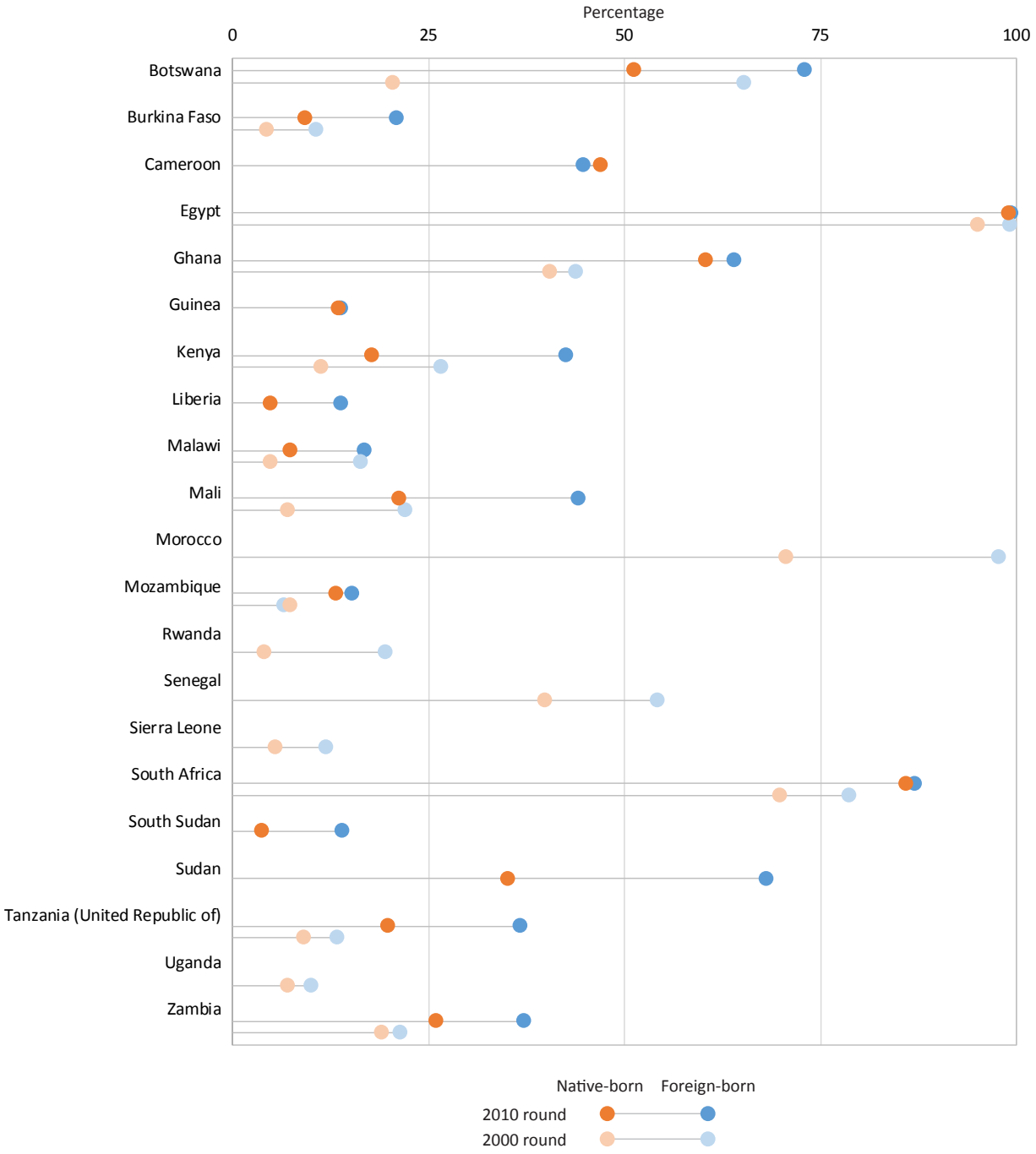


Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country/territory; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

SDG Indicator 7.1.1: Proportion of the population with access to electricity

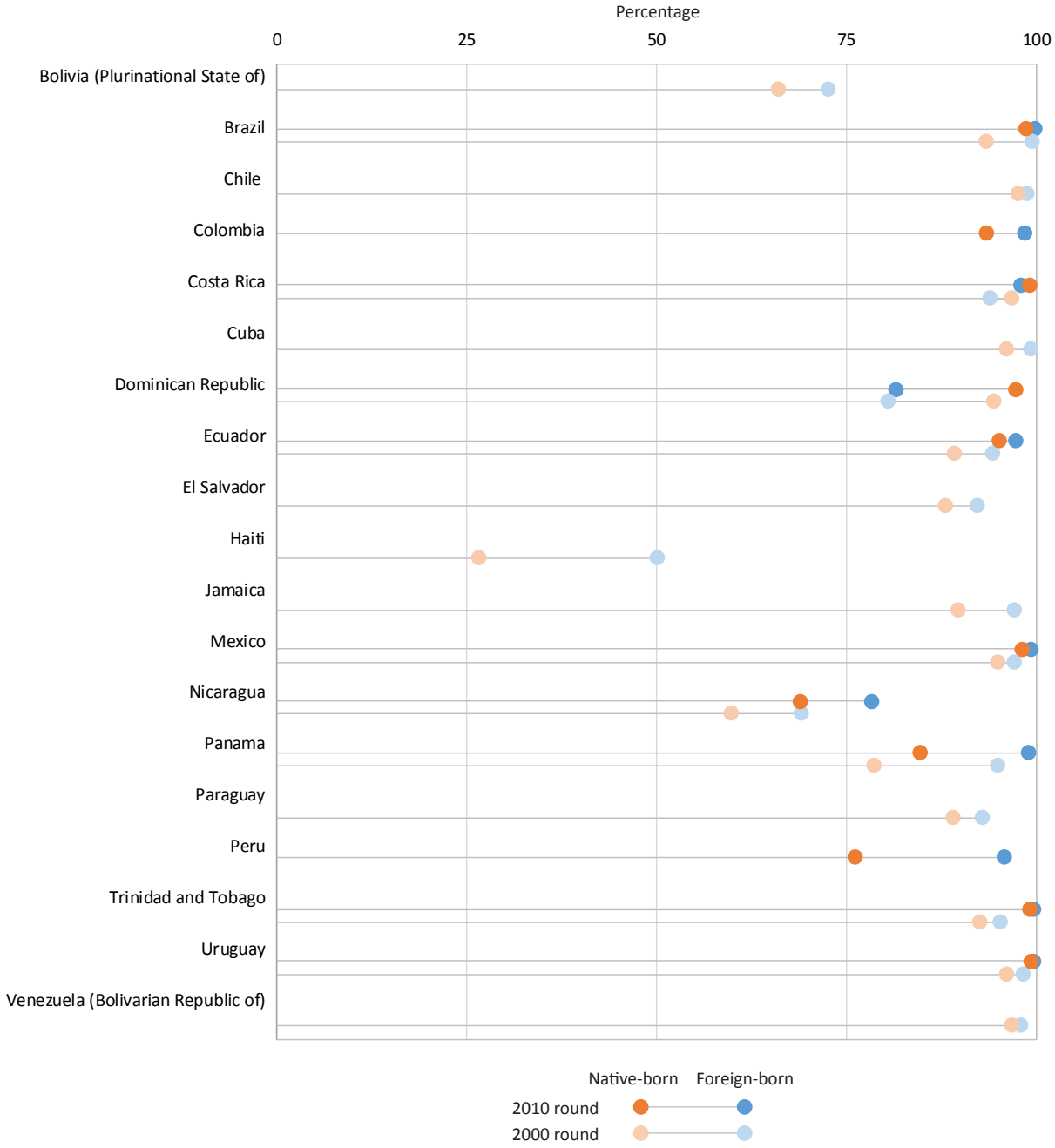
Figure A5: Percentage of the population with access to electricity in selected African countries, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

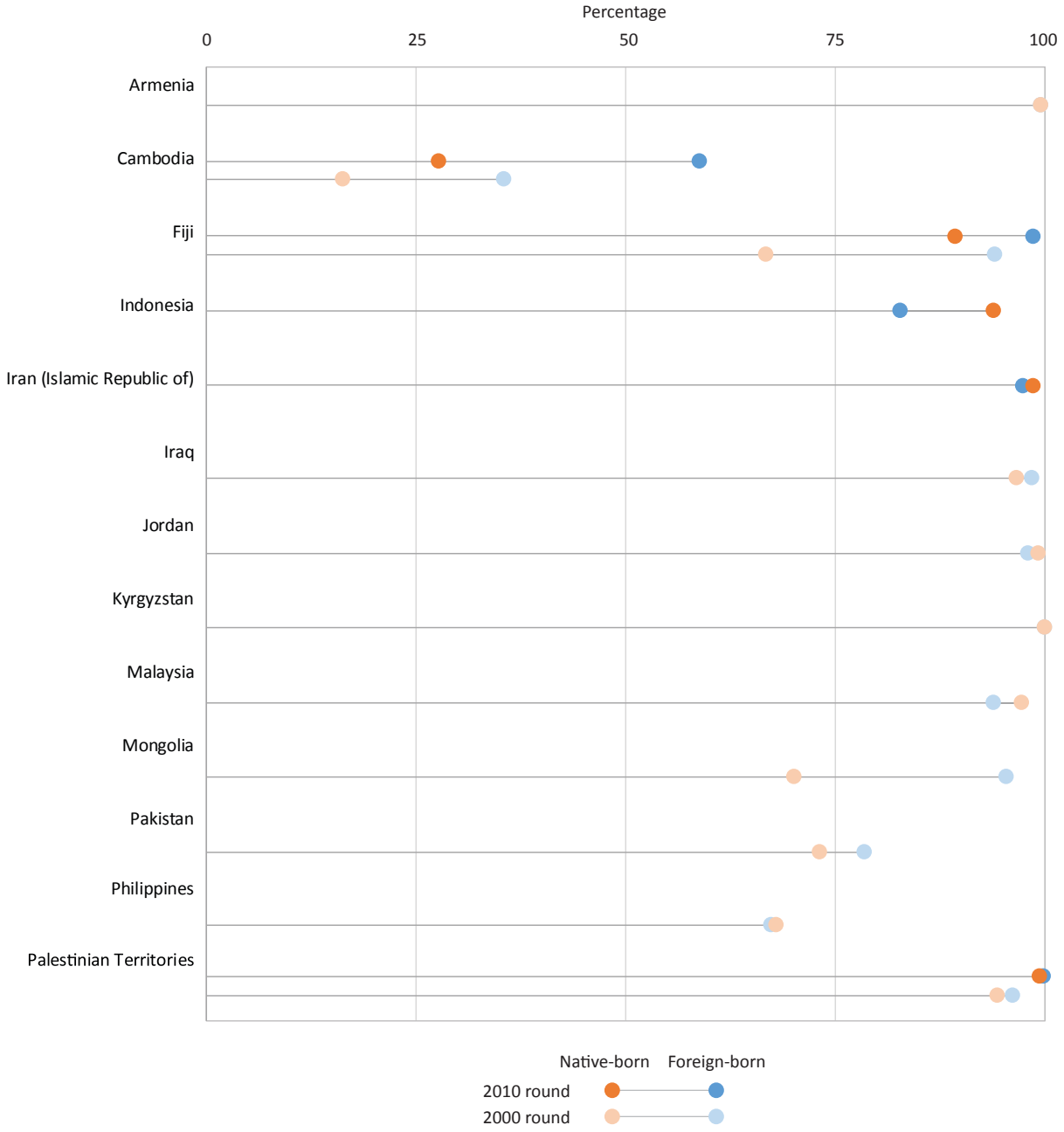
Figure A6: Percentage of the population with access to electricity in selected countries and territories in the Americas, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country/territory; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

Figure A7: Percentage of the population with access to electricity in selected countries and territories in Asia and Oceania, by place of birth and census round

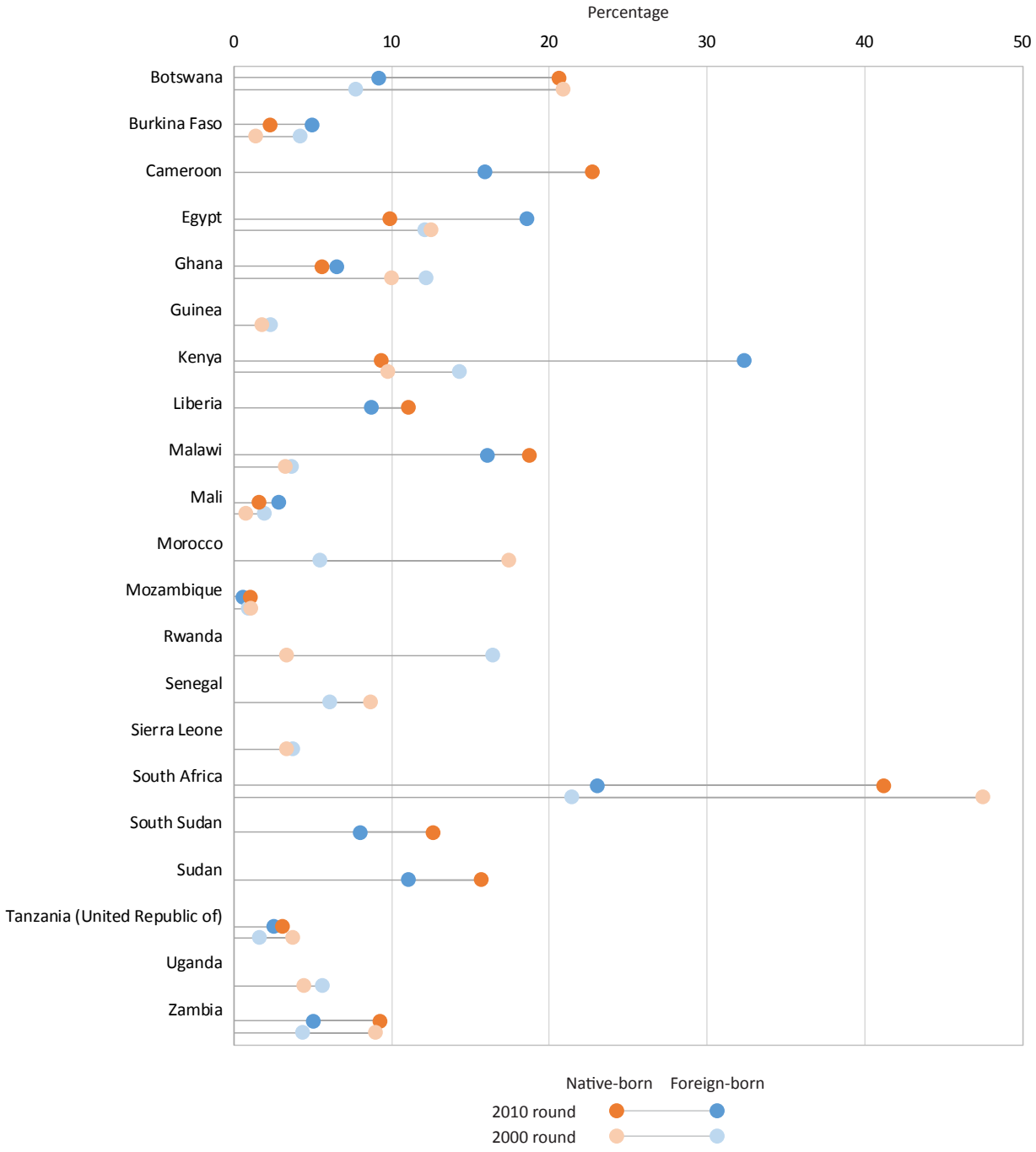


Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country/territory; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

SDG Indicator 8.5.2: Unemployment rate

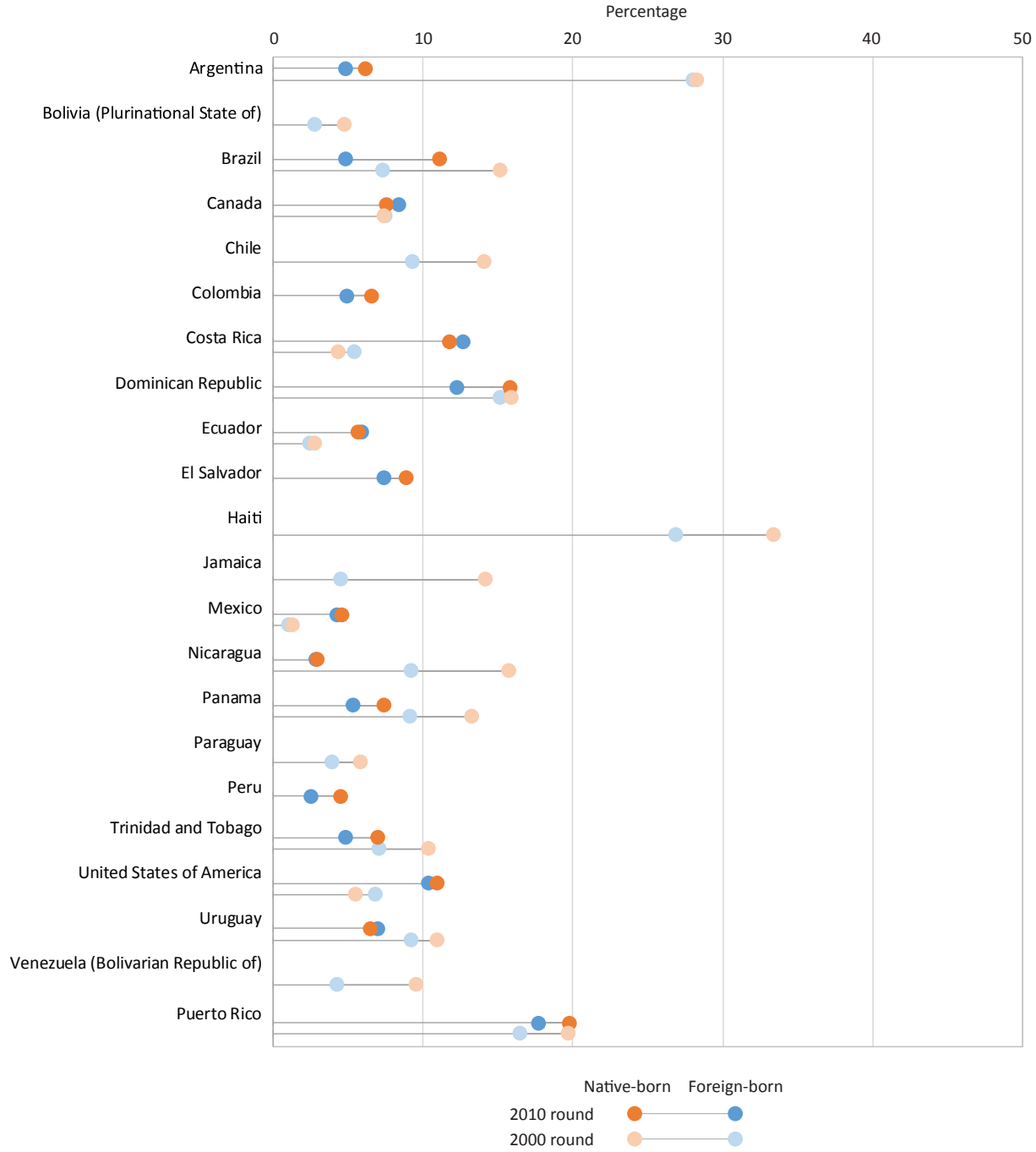
Figure A8: Unemployment rates (%) in selected African countries, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent unemployment rates among the native-born population of a country; light and dark blue dots represent unemployment rates among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show unemployment rates based on census samples from the 2000 round; dark colours show unemployment rates based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

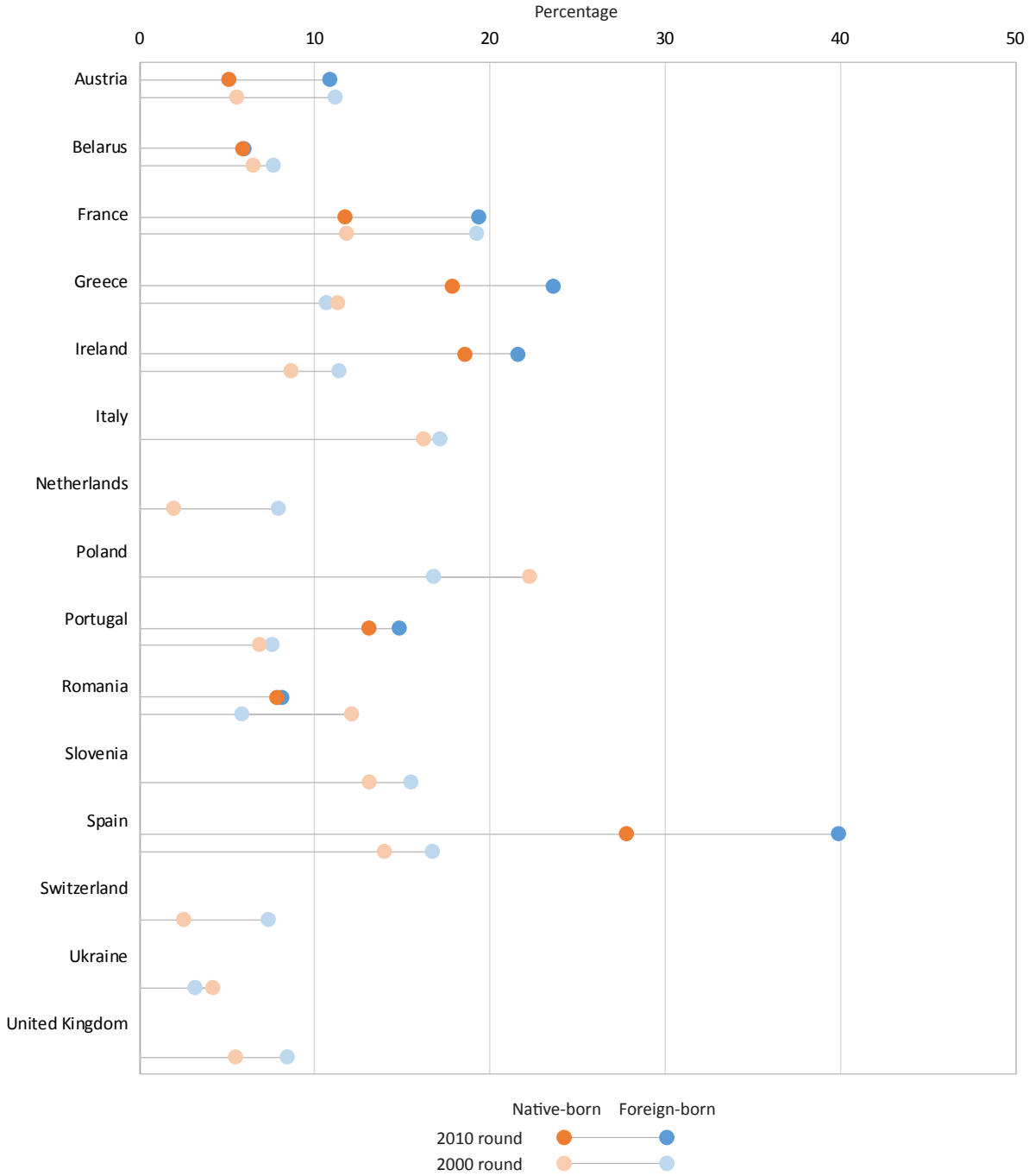
Figure A9: Unemployment rates (%) in selected countries and territories in the Americas, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent unemployment rates among the native-born population of a country/territory; light and dark blue dots represent unemployment rates among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show unemployment rates based on census samples from the 2000 round; dark colours show unemployment rates based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

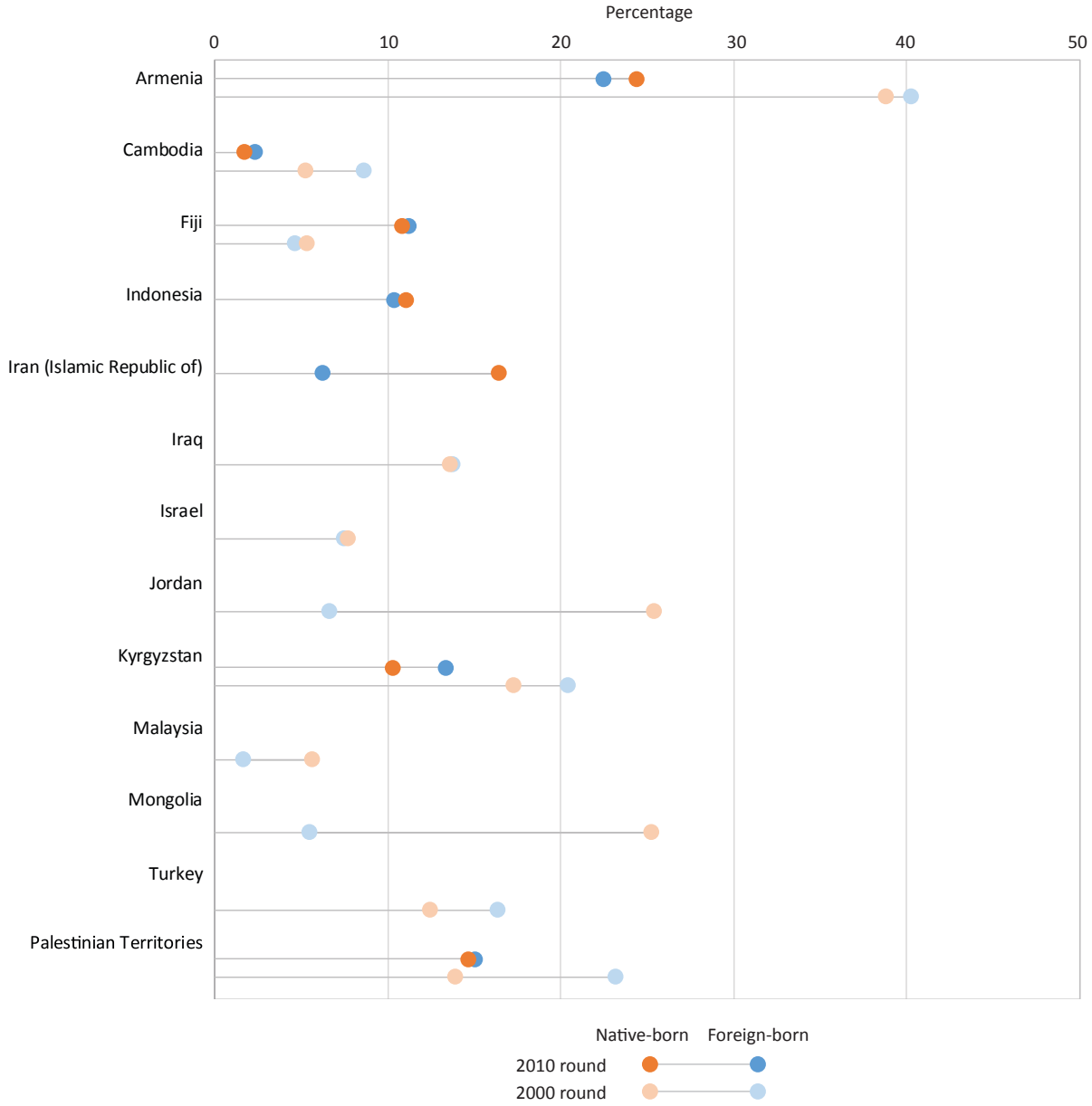
Figure A10: Unemployment rates (%) in selected European countries, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent unemployment rates among the native-born population of a country; light and dark blue dots represent unemployment rates among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show unemployment rates based on census samples from the 2000 round; dark colours show unemployment rates based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

Figure A11: Unemployment rates (%) in selected countries and territories in Asia and Oceania, by place of birth and census round

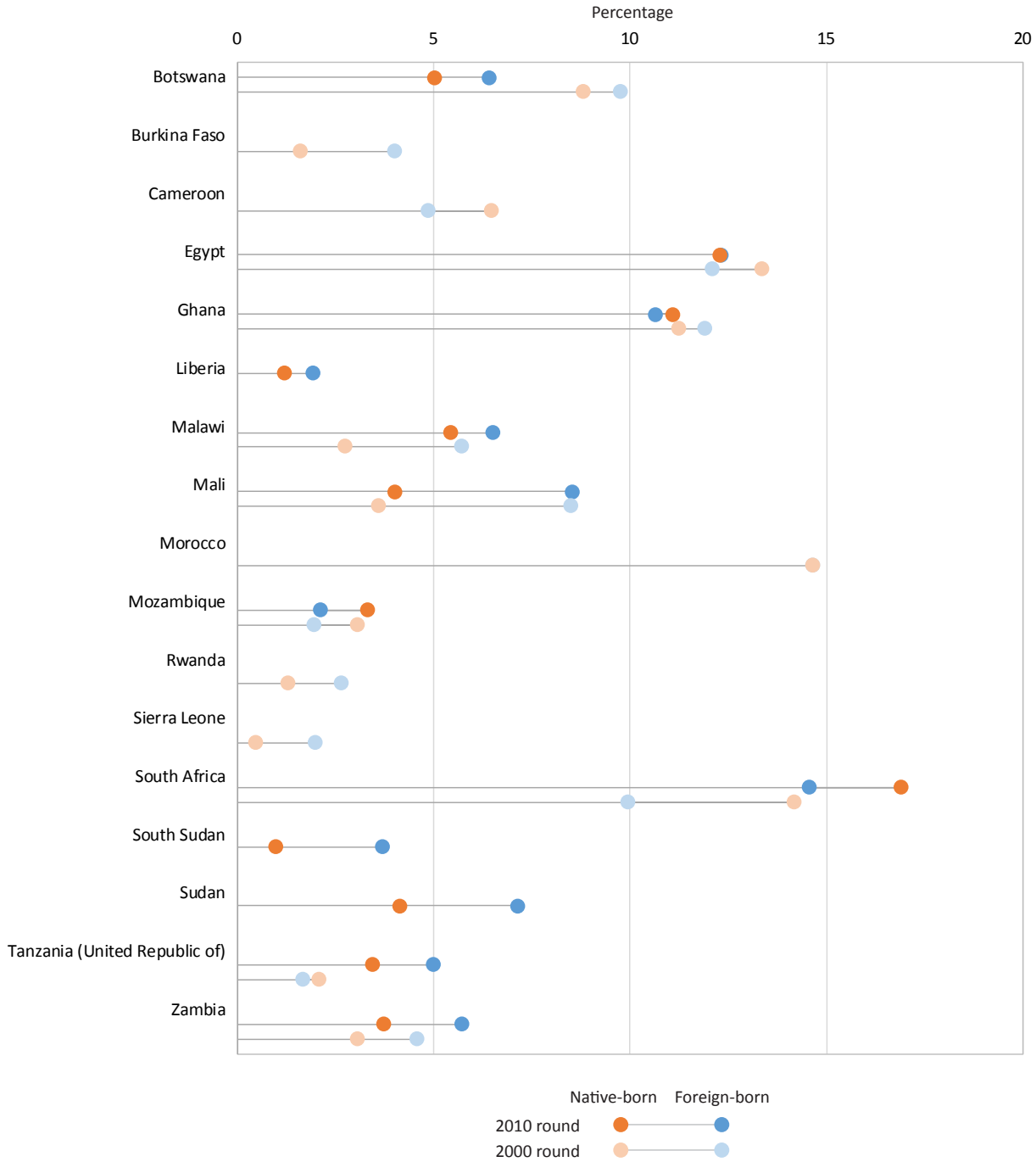


Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent unemployment rates among the native-born population of a country/territory; light and dark blue dots represent unemployment rates among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show unemployment rates based on census samples from the 2000 round; dark colours show unemployment rates based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

SDG Indicator 9.2.2: Proportion of employed persons working in manufacturing

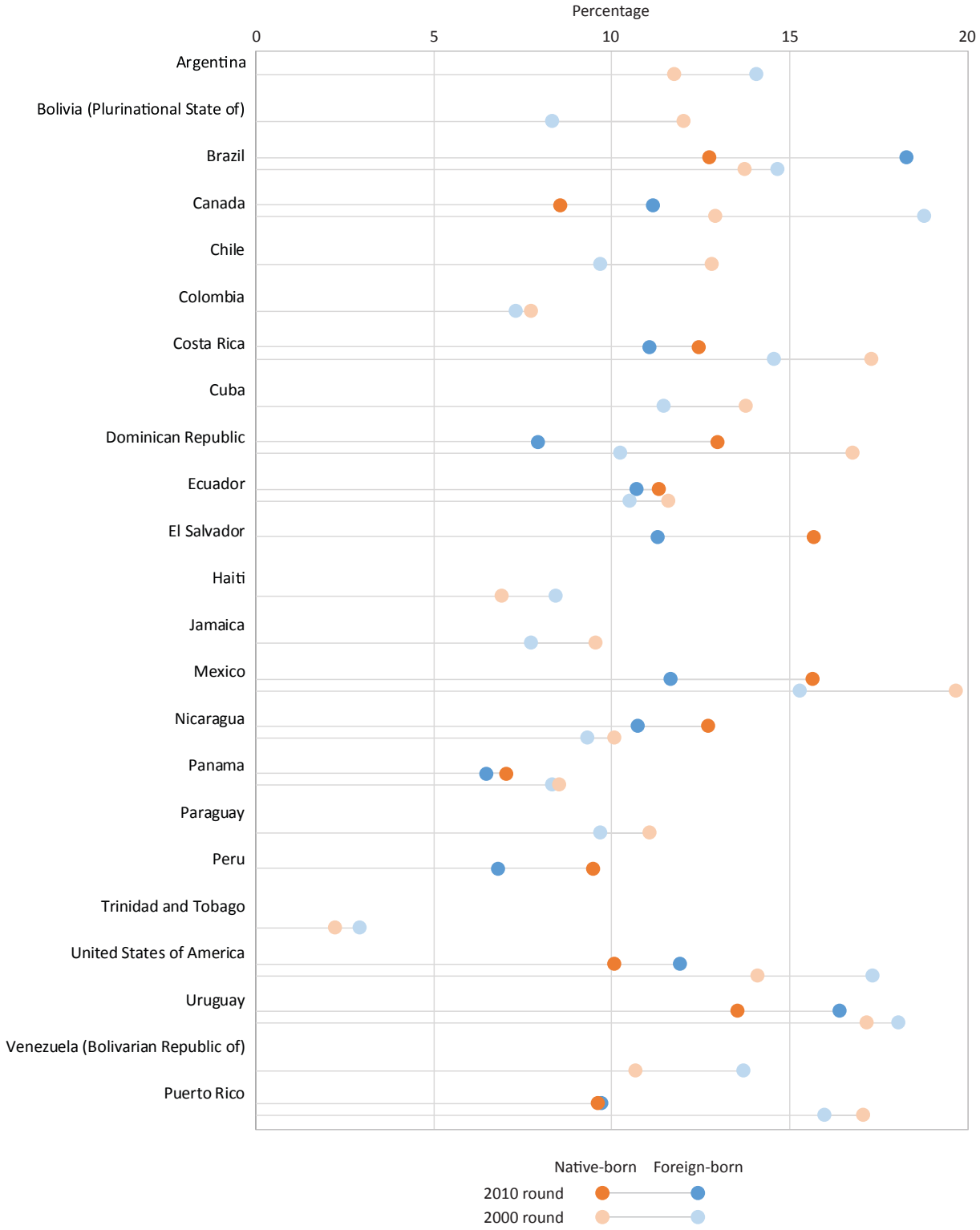
Figure A12: Percentage of persons aged 15 to 64 working in manufacturing in selected African countries, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

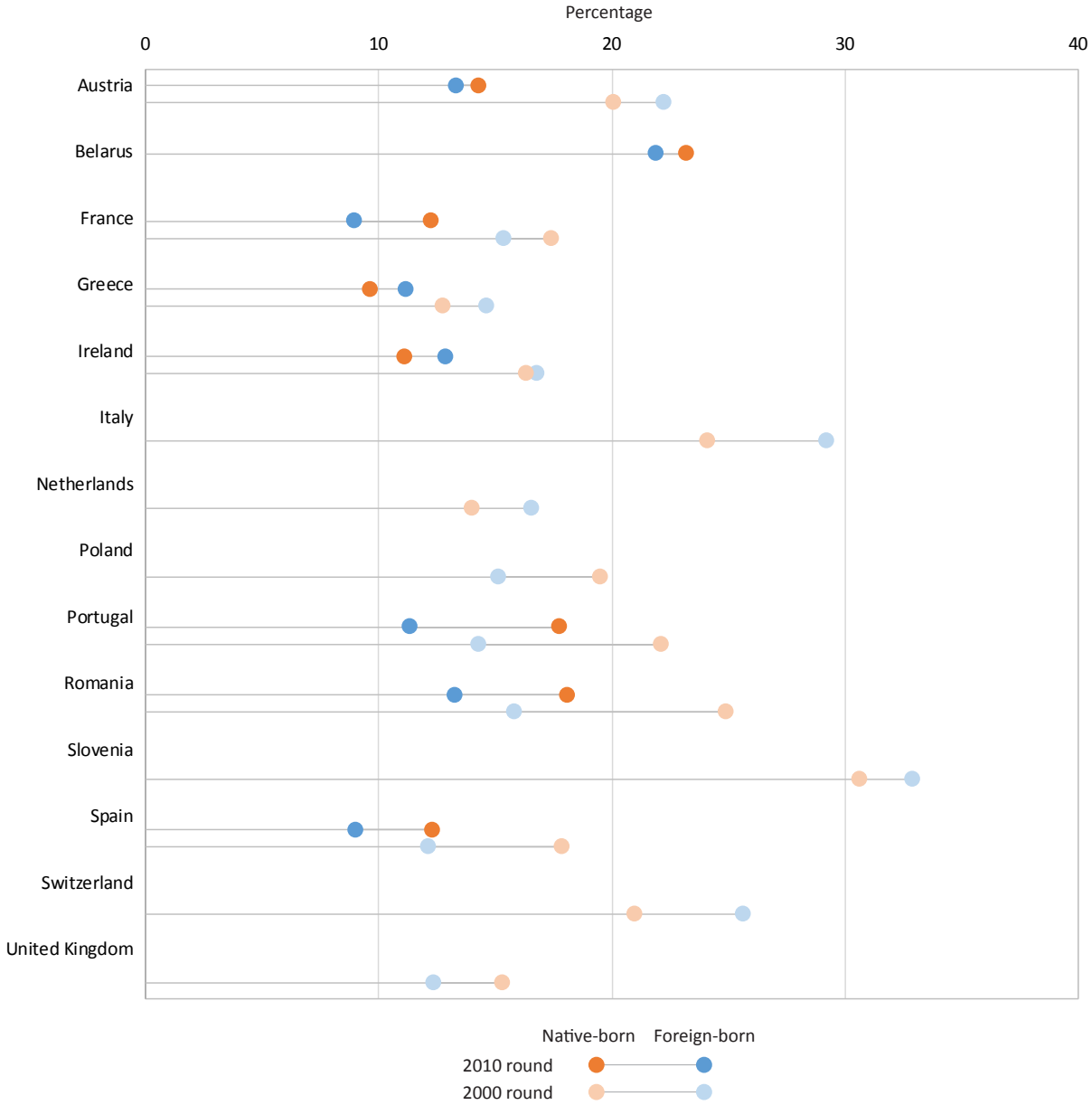
Figure A13: Percentage of persons aged 15 to 64 working in manufacturing in selected countries and territories in the Americas, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country/territory; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

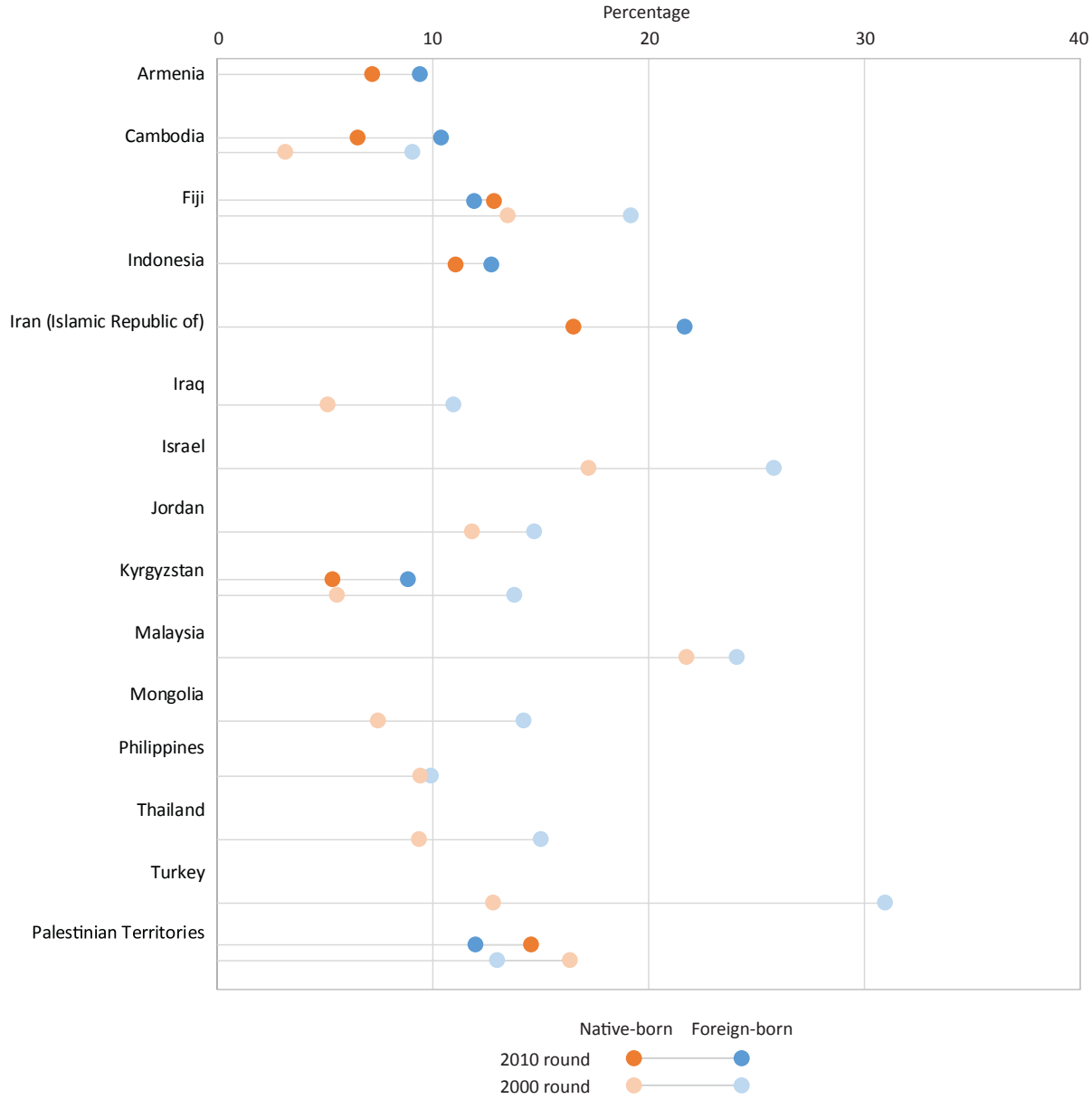
Figure A14: Percentage of persons aged 15 to 64 working in manufacturing in selected European countries, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

Figure A15: Percentage of persons aged 15 to 64 working in manufacturing in selected countries and territories in Asia and Oceania, by place of birth and census round



Source: Minnesota Population Center. *Integrated Public Use Microdata Series, International, version 6.5* (dataset). Minneapolis: University of Minnesota, 2017. Available from http://doi.org/10.18128/D020.V6.5, last accessed December 2017. Author's computations.

Note: Light and dark orange dots represent percentages among the native-born population of a country/territory; light and dark blue dots represent percentages among the foreign-born. Paired orange and blue dots that are closer together indicate a smaller disparity between native-born and migrant (i.e. foreign-born) populations. Light colours show percentages based on census samples from the 2000 round; dark colours show percentages based on 2010-round samples. Comparing light- with dark-coloured dots elucidates the change over time in the gap between migrant and native-born populations.

Table A2: SDG indicator definitions

The indicators described in this section were calculated to determine the well-being of migrants to assess whether and to what degree migrants are left behind in key areas of society. All indicators were disaggregated by place of birth and, in the case of migrants, citizenship status. Additional indicators (indicated below) were disaggregated by sex.

The IPUMS-International variable harmonization process aims to maximize comparability across census samples while retaining details provided in the original source data. Complete harmonization occasionally compromises important details collected in source data. When source data provided by participating national statistical offices cannot be accurately integrated into the IPUMS-International coding scheme, certain comparability issues arise. These issues are well documented in the variable-level metadata available on the IPUMS-International website to encourage researchers to accurately interpret the results of comparative analyses. A discussion of comparability issues related to affected indicators is included when relevant.

Indicator 4.5.1: Mean years of schooling	
Definition	Mean years of formal schooling for persons aged 25 and older
IPUMS-International variable(s)	AGE, YRSCHOOL
Population universe	Persons aged 25 and older
Disaggregation	Place of birth, citizenship status, sex
Comparability issues	The IPUMS-International variable YRSCHOOL is top-coded differently across samples. In some samples, the top codes underestimate years of schooling for persons with post-secondary education (Minnesota Population Centre, 2017). Visit the IPUMS-International website for information on top codes across samples: https://international.ipums.org/international-action/variables/YRSCHOOL#comparability_section
Indicator 4.5.1: Proportion of the population who have completed less than primary/primary/secondary/university education	
Definition	Percentage of persons aged 25 and older who have completed less than primary/primary/secondary/university education
IPUMS-International variable(s)	AGE, EDATTAIN
Population universe	Persons aged 25 and older
Disaggregation	Place of birth, citizenship status, sex
Comparability issues	The microdata for the Canada 2011 sample do not distinguish persons who have completed lower secondary, primary or less than primary education. They are all included in the “Less than primary” category. The number of persons completing university in Ireland 1981 is improbably low. None of the Austrian samples distinguish persons who have completed primary education from those who have not.
Indicator 5.5.2: Proportion of employed women working in managerial occupations	
Definition	Percentage of employed women aged 15 to 64 working in managerial occupations, as defined by International Standard Classification of Occupations (ISCO) standards. Managerial occupations correspond to ISCO Level 1.
IPUMS-International variable(s)	AGE, EMPSTAT, OCCISCO
Population universe	Employed persons age 15 to 64
Disaggregation	Place of birth, citizenship status, sex
Comparability issues	The IPUMS-International variable OCCISCO is generally comparable across samples, though it is more consistent within countries than across countries/territories (Minnesota Population Centre, 2017). Visit the IPUMS-International website for a detailed discussion of occupation coding across countries: https://international.ipums.org/international-action/variables/OCCISCO#comparability_section

Indicator 7.1.1: Proportion of the population with access to electricity	
Definition	Percentage of population living in a dwelling with access to electricity
IPUMS-International variable(s)	OWNERSHIP
Population universe	All persons
Disaggregation	Place of birth, citizenship status
Comparability issues	This variable is more commonly available for developing countries.
Indicator 8.5.2: Proportion of the working-age population that are unemployed	
Definition	Percentage of persons aged 15 to 64 in the labour force (employed persons plus unemployed persons) who are unemployed
IPUMS-International variable(s)	AGE, EMPSTAT
Population universe	Persons aged 15 to 64 in the labour force (employed or unemployed)
Disaggregation	Place of birth, citizenship status, sex
Comparability issues	The reference period for the employment status question varies across censuses (Minnesota Population Centre, 2017). Unemployment is difficult to define across countries/territories. Visit the IPUMS-International website for a complete discussion of comparability issues related to the employment status variable EMPSTAT: https://international.ipums.org/international-action/variables/EMPSTAT#description_section
Indicator 8.6.1: Proportion of youth not in education, employment or training (NEET)	
Definition	Percentage of persons aged 15 to 24 not in education, employment or training
IPUMS-International variable(s)	AGE, SCHOOL, EMPSTAT
Population universe	Persons age 15 to 24
Disaggregation	Place of birth, citizenship status, sex
Comparability issues	The comparability issues related to the employment indicators also apply to this indicator. Visit the IPUMS-International website for a complete discussion of comparability issues related to the employment status variable: https://international.ipums.org/international-action/variables/EMPSTAT#comparability_section
Indicator 9.2.2: Proportion of employed persons working in manufacturing	
Definition	Percentage of employed persons aged 15 to 64 working in manufacturing, as defined by International Standard Industrial Classification (ISIC) standards
IPUMS-International variable(s)	AGE, EMPSTAT, INDGEN
Population universe	Employed persons age 15 to 64
Disaggregation	Place of birth, citizenship status, sex
Comparability issues	The IPUMS-International variable INDGEN is generally comparable across samples. Visit the IPUMS-International website for a detailed discussion of industry coding across countries/territories.

Table A3: SDG indicators with the potential to be disaggregated using IPUMS-International data

1.4.1	Proportion of the population living in households with access to basic services
1.4.2*	Proportion of the total adult population with secure tenure rights to land, with legally recognized documentation, and who perceive their rights to land as secure, by sex and by type of tenure
3.1.1*	Maternal mortality ratio
3.2.1*	Under-five mortality rate
3.7.1	Under-five mortality rate
3.7.2*	Adolescent birth rate (among women aged 10 to 14 years and aged 15 to 19 years) per 1,000 women in that age group
3.c.1*	Health worker density and distribution
4.1.1	Proportion of children and young people: (a) in grade 2 or 3; (b) at the end of primary school; and (c) at the end of lower secondary school, achieving at least a minimum proficiency level in reading and mathematics, by sex
4.2.1	Participation rate in organized learning (one year before the official primary entry age), by sex
4.3.1	Participation rate of youth and adults in formal and non-formal education and training in the last 12 months, by sex
4.5.1	Parity indices (female/male, rural/urban, bottom/top wealth quintile and others, such as disability status, indigenous status and conflict-affected status, as data become available) for all education indicators on this list that can be disaggregated
4.6.1	Percentage of the population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex
4.c.1	Percentage of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least minimum organized teacher training (namely, pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country
5.3.1*	Proportion of women aged 20 to 24 years who were married or in a union before age 15 and before age 18
5.5.2	Proportion of women in managerial positions
5.a.1*	(a) Proportion of the total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights bearers of agricultural land, by type of tenure
5.b.1	Proportion of individuals who own a mobile telephone, by sex
6.1.1*	Proportion of population using safely managed drinking water services
6.2.1*	Proportion of population using safely managed sanitation services, including a handwashing facility with soap and water
6.3.1*	Proportion of safely treated wastewater
7.1.1*	Percentage of the population with access to electricity
7.1.2*	Proportion of the population with primary reliance on clean fuels and technology
8.3.1	Proportion of informal employment in non-agricultural employment, by sex
8.5.1	Average hourly earnings of female and male employees, by occupation, age and disability status
8.5.2	Unemployment rate, by sex, age and disability status
8.6.1	Proportion of youth aged 15 to 24 years not in education, employment or training
8.7.1	Proportion and number of children aged 5 to 17 years engaged in child labour, by sex and age
9.2.2	Manufacturing employment as a proportion of total employment
9.5.2	Researchers (in full-time equivalent) per million inhabitants
11.1.1*	Proportion of the urban population living in slums, informal settlements or inadequate housing
11.2.1*	Proportion of the population with convenient access to public transport, by sex, age and disability status
17.8.1	Proportion of individuals using the Internet

Note: *SDG metadata explicitly mention census data.

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A pilot study on disaggregating SDG indicators by migratory status

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