Population structure by age and sex: a multi-temporal subnational perspective.

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Abstract

The age and sex composition of populations varies substantially between and within countries, and is tightly intertwined to economic and health outcomes. This is particularly true for low- and middle-income countries, where the fast paced population increase is not nationally homogeneous but rather urban-driven, with important repercussions on health infrastructures, resources availability, internal migration and shifting dependency ratios. As a result of this, the association between population increase Indeed, population structure has long been considered to be a predictor for the development of nations, their economic growth, demographic burdens and challenges. In this context, the Sustainable Development Goals moral imperative of leaving no-one behind requires accurate measures at local scale that take into account high degrees of spatial heterogeneity present sub-nationally. However, the spatial detail is often overlooked losing substantial demographic variation, as preference for national-level measures is still widespread, due to longstanding practice in research and data availability. We aim to provide population based metrics of population exposures by 17 age-groups and sex detail at subnational level for all 248 countries in the world over a timeframe of 21 years.

Introduction

The age and sex composition of populations varies substantially between and within countries, and is tightly intertwined to economic and health outcomes. This is particularly true for low- and middle-income countries, where the fast-paced population increase is not nationally homogeneous but rather urban-driven, with important repercussions on health infrastructures, resources availability, internal migration and shifting dependency ratios.

Population structure has long been considered to be a predictor for the development of nations, their economic growth, demographic burdens and challenges. In this context, the Sustainable Development Goals moral imperative of leaving no-one behind requires accurate measures at local scale that consider high degrees of spatial heterogeneity present sub-nationally. However, the spatial detail is often overlooked losing substantial demographic

variation, as preference for national-level measures is still widespread, due to longstanding practice in research and data availability.

This study provides mid-year population denominators by 17 age-groups and sex detail at subnational level for all 248 countries considered over a timeframe of 21 years.

Compiling subnational estimates of age and sex structures

Data on subnational population compositions from 2000 to 2020 were derived using a variety of data sources for all populated countries in the world, excluding unpopulated or military operated areas (i.e. Antarctica). The data sources used are recent and can be divided into three groups: census based, register based, and survey based.

Contemporary census-based counts are broken down at administrative unit level and generally provide the most reliable source for population composition, due to the large sample sizes supplying reliable information summarized for small areas. Census based sources (census and IPUMSI) with age and sex data reported at subnational levels were employed if undertaken since year 2000. Census counts were aligned to be mid-year population estimates (1st July of the calendar year), and age-sex based counts grouped into the relevant age groups. The subnational population age and sex structure was grouped into 5-years age groups up to 80 year old (abridged) for a total of 17 age groups and 2 sexes. Due to the importance of having detailed information on child and infant related statistics (i.e. child and infant mortality), the age group 0-4 was split in two groups: population under 1 year of age and between 1 and 4 years old. All counts are mid-year population estimated at the 1st of July, to allow a ready use of population numbers as denominators for demographic rates. The transformation from Census date to mid-year population was implemented using UN growth rates applied to the Census data (see UN manual I, ch. 4 p. 25).

Contrary to census data, which is usually collected every 10 years, EUROSTAT collects data every year, with countries reporting to EUROSTAT their population on the 1st of January, along with breakdowns of the population by various characteristics, resulting in abundance of information on European population also at subnational level with yearly updates mainly from the National Statistical Institutes.

Survey based sources provide samples of household-level records that offer age and sex structures, usually by administrative level 1 (e.g., province) or 2 (e.g., district). While census data are often readily available for high-income countries, for low-income countries, census data with subnational detail of age and sex structure can often be either unavailable or very old. To overcome this deficiency, national household survey data sources were employed to provide the most up to date and spatially detailed estimates as possible. Therefore, national household survey data on population age and sex compositions were obtained from the most recent Demographic and Health Survey (DHS), or from Multiple Indicator Cluster Surveys

(MICS). Subnational age and sex proportions were used to obtain population counts, based on the UN population total estimates for a specific country.

Where neither census nor surveys at subnational level were available, we employed national estimates of age and sex structures for 58 countries, coming from EUROSTAT, UN, and US Census Bureau for countries with less than 15,000 inhabitants.

Table 1 describes all the data sources complete with reference years and number of administrative units employed for the realization of the denominator index. Population age structures by age and sex have been estimated for all countries at subnational level, by 5 years age groups, with the addition of children under 1 and children between 1 and 4 years old (also by sex), given the importance that those two age groups represent for health measures.

Methodology

The standard approach adopted to produce age and sex structures at subnational level when data are available for one year only (i.e. a Census) is Iterative Proportional Fitting (IPF). After obtaining the mid-year population counts at sub-national level, we employ IPF using UN population estimates as target population for the year to be predicted. The Iterative Proportional Fitting method takes into account age and sex group population distributions in the subnational areas. The base for calculating the mid-year population age and sex structures for the subnational areas come from the country's census 5-year age and sex groups. The numbers are prorated by a series of iterations to two sets of controls for that target date: UN midyear 0-1, 1-4, and successive 5-year age and sex group population projections for the country and the total population estimates for the subnational areas or national whenever the subnational estimates are not available.

The IPF method requires a two-step procedure, one where the subnational area age groups (both males and females) are raked to the corresponding UN midyear projected national population for that age group. Age and sex group repeats this process until the iterations lead to the same estimates. The number of iterations has been programmed through RCran and set arbitrarily to 30, which abundantly ensures convergence. These steps are then repeated to estimate each year of the time series. IPF input years are then smoothed against UN total population estimates to avoid a jump between estimated years and the observed year, maintaining intact the age and sex structure at subnational level in the observed year.

When more than one year is available, we apply a trend method: shift share and IPF. Trend methods, have the advantage of allowing for different growth patterns across each subnational area, as controls can be calculated based on the population growth rates of the individual subnational areas relative to the country. This means that if a region grows more quickly with respect to the national growth rate then the shift share will capture this trend. The Shift-Share method can be used to compute a population estimate for a subnational area for a target date based on the linear rate of growth of its share of the country's

population between two censuses. With the Shift- Share method, it is possible to obtain the average annual rate of change of the ratio of the population of each subnational area between the country's latest two censuses. Then the intercensal rate of change is extrapolated to the target year to yield a new ratio. With the projected national population from the UN estimates for a specific target midyear it is possible to estimate a target population for each subnational area for the target midyear.

Some countries with very small populations (i.e. Pacific islands), do not have population estimates with age and sex detail for target years within out time-series. In this case, we employed a pro-rating technique. Pro-rating distributes the population observed on the census date to a more recent date, keeping sex and age in the same proportions as those observed at the census (Manual III, ch. 2, A.49). This method is implemented by finding the ratio between the total population on two dates, then multiplying all the observed numbers in each sex-age category by such ratio. This method has been applied for countries with small populations, where yearly estimates of total population were available, thus updating the incremental ratio yearly.

For those countries with no subnational detail, we used United Nations and US Census Bureau national estimates, highlighted in table one in column 3 whenever "Administrative Units" equals 1.

Results and validation

The results have been validated selecting countries with multiple data sources and applying measures of precision and bias. The dataset has been further employed to obtain fine grid scale data at 100m grid cells.

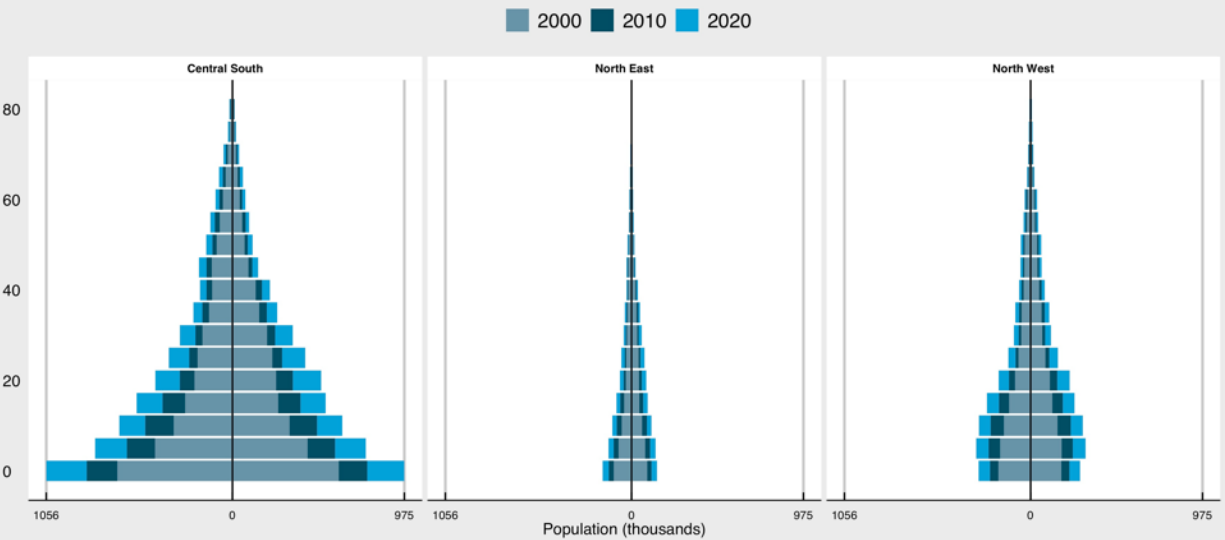Map 1. Old dependency ratio for year 2020 at administrative unit level.
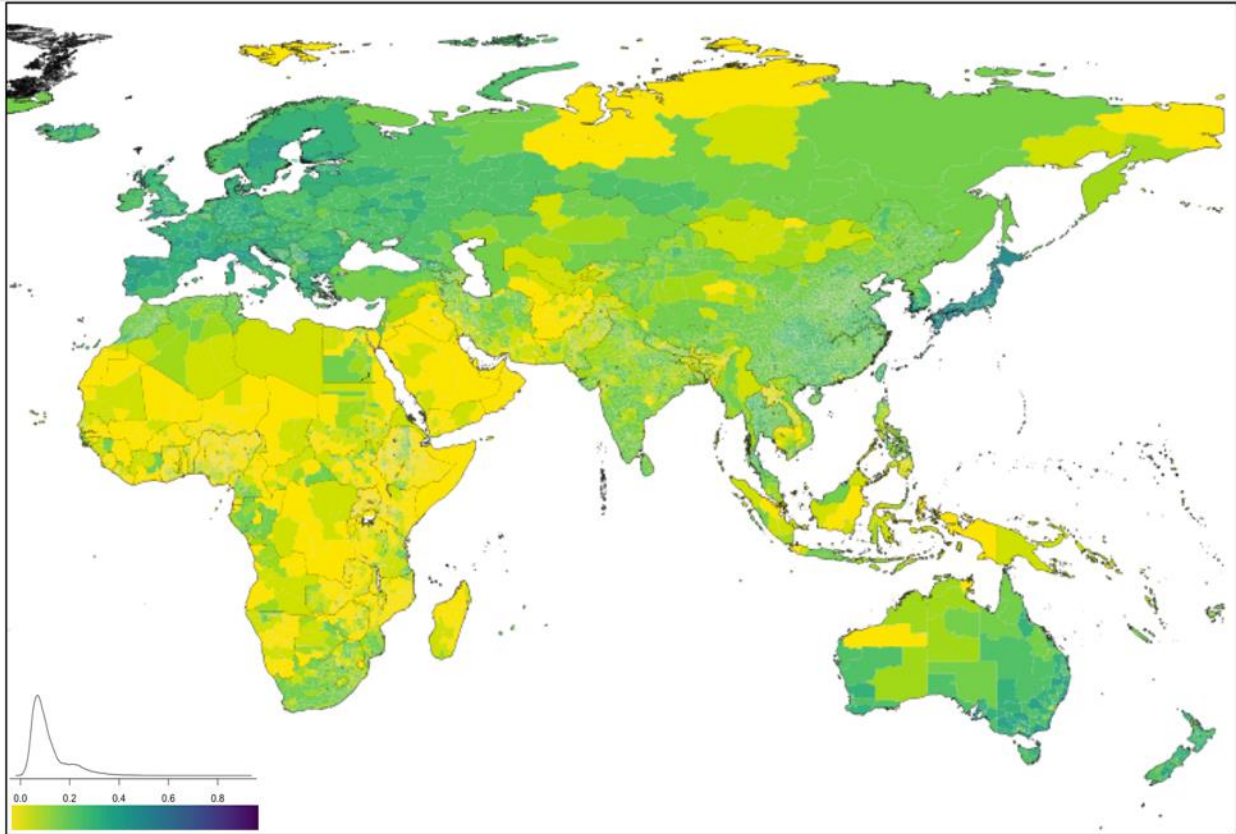
Figure 1. Population between 2000 and 2020 at national and administrative level for Somalia.

Population pyramid, SOM

2000 2010 2020

80

60

40

20

0

1513.8   0   1400.7

Population (thousands)
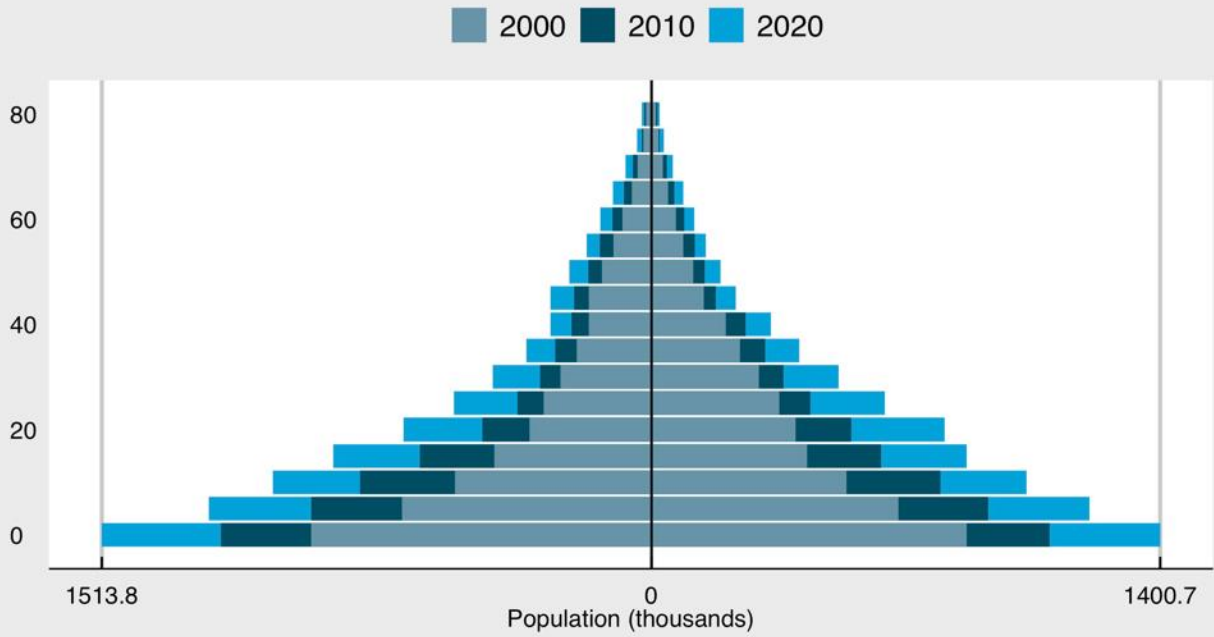
By AleDemogr   Source: Personal Elaboration

Population pyramid, SOM

2000 2010 2020

Central South

North East

North West

80

60

40

20

0

1056   0   975   1056   0   975   1056   0   975

Population (thousands)

By AleDemogr   Source: Personal Elaboration

Map 2. General fertility rate for year 2000 (left and lower panels) and 2020 (right panel).
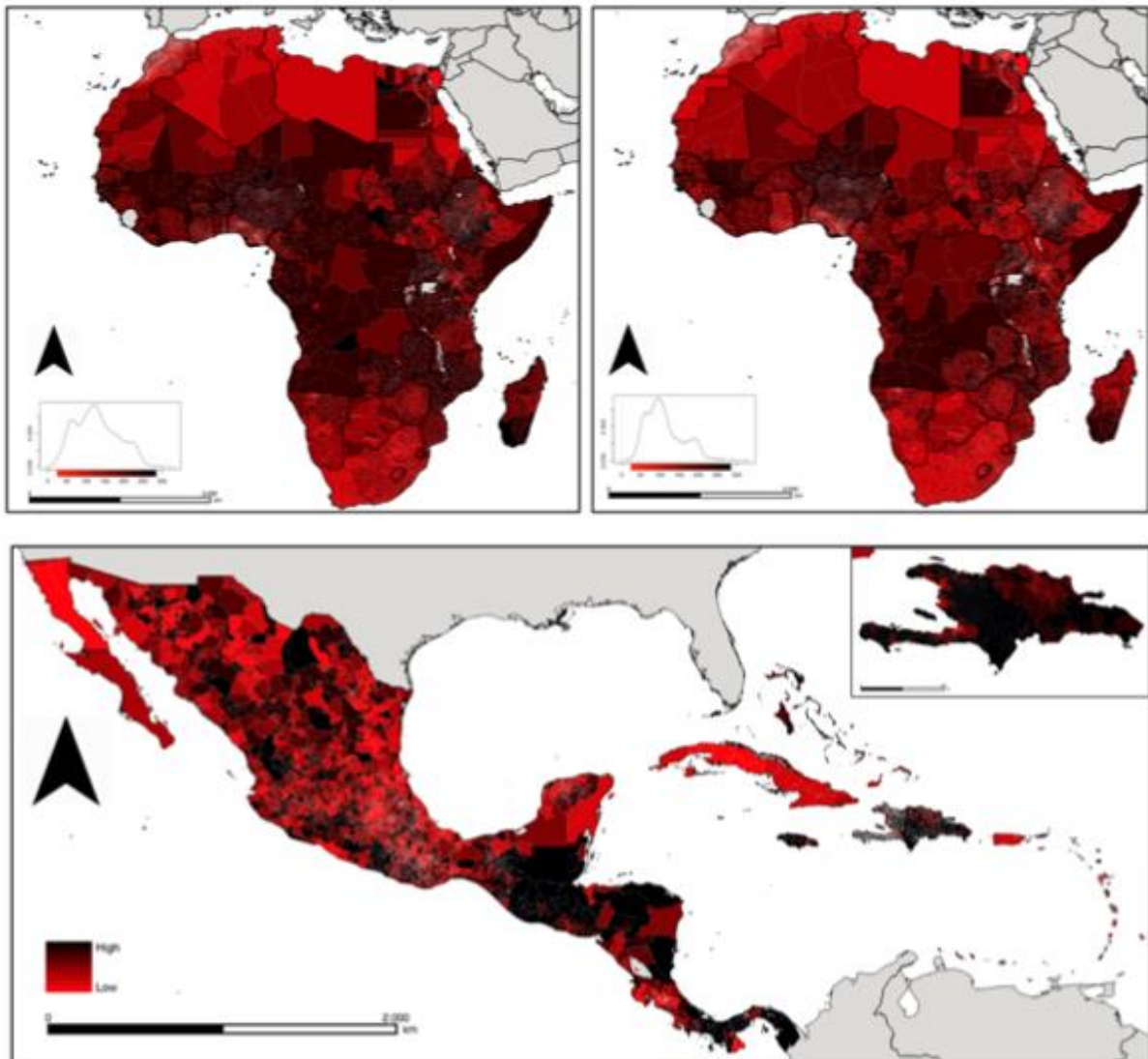
The dataset is available for use at high resolution gridded population counts for every age and sex category for the whole 2000-2020 time frame at ~100x100m grid cell resolution https://www.worldpop.org/geodata/listing?id=29 and at 1kmx1km resolution https://www.worldpop.org/geodata/listing?id=64

Table 1. Country sources and reference years, with detail of the number of administrative units.

Country	Year	Administrative Unit Numbers	Data source
Afghanistan	2015	34	DHS
Åland Island	2000-2016	1	Statistics Finland, statistics fact-sheet www.asub.ax/sites/www.asub.ax/files/attachments/page/statistisk_arsbok_for_aland17_0.pdf
Albania	2011	12	Institute of Statistics, Population and Housing Census 2011, Table 1.1.1, generated using INSTAT, http://www.instat.gov.al/al/figures/statistical-databases.aspx, Accessed 03/30/2015.
Algeria	2008	48	Office National des Statistiques, RPGH 2008, Table: Population résidente par age, par sexe et par commune, Office National des Statistiques, Published 01/01/2008, http://www.ons.dz/collections/w02_p3.pdf, Accessed 03/07/2012.
American Samoa	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Andorra	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Angola	2015-2016	18	DHS
Anguilla	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Antarctica	-	-	No population
Antigua and Barbuda	2000-2020	1	UNPD
Argentina	2001-2010	312	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
Armenia	2001-2011	11	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
Aruba	2000-2020	1	UNPD
Australia	2011	331	Based on Australian Bureau of Statistics, 2011 Census of Population and Housing, Tables 2011Census_B04A_AUST_SA1_short and 2011Census_B04B_AUST_SA1_short, https://www.censusdata.abs.gov.au/datapacks/DataPacks?release=2011, Accessed 10/16/2012.
Austria	2000-2016	9	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Azerbaijan	2009	74	State Statistical Committee of the Azerbaijan Republic, 2009 Population Census, Table: Distribution of population by age groups, sex and regions of Azerbaijan Republic, Received 04/23/2013.
Bahamas	2010	19	Department of Statistics of the Bahamas, Census of Population and Housing, Tables 4.0 - 4.19: Total population by sex and age in years last birthday, Published 08/01/2012, http://statistics.bahamas.gov.bs/download/084903300.pdf, Accessed 06/02/2014.
Bahrain	2000-2020	1	UNPD
Bangladesh	2011	64	Bangladesh Bureau of Statistics (BBS), Population & Housing Census 2011, ECLAC/CELADE Redatam+SP using REDATAM,

			http://203.112.218.69/binbgd/RpWebEngine.exe/Portal?BASE=HPC2011_short&lang=ENG, Accessed 9/26/2016.
Barbados	2010	11	Barbados Statistical Service (BSS), 2010 Population and Housing Census, Table 01.01, Published 09/01/2013, http://www.barstats.gov.bb/files/documents/PHC_2010_Census_Volume_1.pdf, Accessed 05/02/2014.
Belarus	2001	6	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
Belgium	2000-2016	11	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Belize	2010	6	Statistical Institute of Belize, Population and Housing Census 2010, Population section: Tables 17 to 22, http://www.sib.org.bz/statistics/population, Accessed 03/20/2015.
Benin	2013	77	Institut National de la Statistique et de l'Analyse Economique, Census 2013, Published 6/1/2015, RGPH4: Que Retenir des Effectifs de Population en 2013, Tableau 2 : Effectifs de population par département, commune et arrondissement au RGPH4, http://www.insae-bj.org/recensement-population.html, Accessed 7/21/2016.
Bermuda	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Bhutan	2005	20	Office of the Census Commissioner, Royal Government of Bhutan, Population and Housing Census of Bhutan 2005, TABLE 3.8: Population by Age, Sex, Residence, Gewog/Town, Dzongkhag 2005, http://www.nsb.gov.bt/GIS/phcb/tables/PC/3.8%20%20POPULATION%20BY%20%20AGE,%20SEX,%20RESIDENCE,%20GEWOG.xls, Accessed 08/26/2011.
Bolivia (Plurinational State of)	2012	9	Instituto Nacional de Estadística (INE) Bolivia, Censo Nacional de Población y Vivienda 2012, Table: Es Mujer u Hombre, generated using REDATAM, http://datos.ine.gob.bo/binbol/RpWebEngine.exe/Portal?&BASE=CPV2012COM, Accessed 08/11/2014.
Bonaire, Saint Eustatius and Saba	2015, 2017	3	Statistics Netherlands, data on live births, deaths and population estimates. www.cbs.nl
Bosnia and Herzegovina	2013	284	BH Popis 2013, Popis stanovništva u Bosni i Hercegovini 2013, Stanovnistvo Prema Starosti Po Petogodistima i Spolu, http://www.popis2013.ba/, Accessed 7/20/2016.
Botswana	2000-2015	20	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Bouvet Island		-	No population
Brazil	2000-2010	1980	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
British Indian Ocean Territory	-	-	No population
Brunei Darussalam	2000-2020	1	UNPD
Bulgaria	2000-2016	6	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Burkina Faso	2006	13	L'Institut national de la statistique et de la démographie (INSD) Burkina Faso, Published 10/01/2009, Recensement General de la Population et de l'Habitation (RGPH) de 2006, Analyse des Resultats Definitifs (Theme 2: Etat et Structure de la Population), Annexes du Chapitre 4: Structure Par Sexe et Age, http://www.insd.bf/n/contenu/enquetes_recensements/rgph-bf/themes_en_demographie/Theme2-Etat_et_structure_de_la_population.pdf, Accessed 8/24/2011.

Burundi	2008	133	Le ministre de l'Interieur de Burundi, Troisieme Recensement General de la Population et de l'Habitat de 2008, Table: Repartition de la Population par Province et Commune selon le Sexe, Published 04/05/2010, www.paris21.org/sites/default/files/BURUNDI-population-2008.PDF, Accessed 08/04/2011. Institute national de la statistique et des etudes economiques (INSEE), Population des communes par age et sex, Received 2/20/2015.
Cambodia	2000-2015	189	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Cameroon	2005	58	Bureau Central des Recensements et des Etudes de Population, 3rd RPGH 2005, Rapport de Presentation des Resultats Definitifs, http://www.statistics-cameroon.org/downloads/Rapport_de_presentation_3_RGPH.pdf, Accessed 07/06/2011.
Canada	2011	10	Statistics Canada, 2011 Census, Census Profile-Age, Sex, Marital Status, Families, Dwellings and Language for Canada, Provinces, Territories, Census Divisions and Census Subdivisions, Beyond 20/20, http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/details/download-telecharger/comprehensive/comp-ivt-xml-dwnld-tlchrgr.cfm?Lang=E, Accessed 7/14/2015.
Cape Verde	2010	44	National Institute of Statistics Cape Verde, Resultados definitivos do RGPH 2010, Published 03/30/2011, http://www.ine.cv/actualise/destaques/files/CD/PDF/CARACTER%C3%8DSTICAS%20POP%20RGPH%202010%20[Modo%20de%20Compatibilidade].pdf, Accessed 07/06/2011.
Cayman Islands	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Central African Republic	2000, 2006, 2010	17	UNICEF
Chad	2004, 2014	8	DHS
Chile	2010	335	National Institute of Statistics (INE) Chile, 2010 Population Estimates, Table: Proyecciones y estimaciones de poblacion por sexo y edad. Comunas. 1990-2020., http://www.ine.cl/canales/chile_estadistico/familias/demograficas_vitales.php, Accessed 9/9/2013
China	2010	2872	University of Michigan China Data Center, CD: China 2010 County Population Census Data with GIS Maps
China Hong Kong Special Administrative Region	2011	18	Hong Kong Census and Statistics Department, 2011 Population Census, Table: Population by District Council Constituency Area, Sex and Marital Status, 2011 (A304), http://www.census2011.gov.hk/en/main-table.html, Accessed 11/13/2012.
China Macao Special Administrative Region	2011	8	Government of Macao Special Administrative Region Statistics and Census Service, Results of 2011 Population Census, Table 52: Population by Place of Birth and Statistical Area, Published 05/01/2012, http://www.dsec.gov.mo/getAttachment/f866e544-94c2-4161-b1a7-aba128c2523c/E_CEN_PUB_2011_Y_2.aspx?disposition=attachment, Accessed 11/08/2012.
Colombia	2005	33	Departamento Administrativo Nacional de Estadistica (DANE), Population Estimates 1985-2004 and National Population Projections, Departmental and municipal population by gender 2005-2020 five year age groups, http://www.dane.gov.co/index.php/eng, Accessed 7/14/2015.
Comoros	2000-2020	1	UNPD
Congo	2007	12	Centre National de la Statistique et des Etudes Economiques (CNSEE), 2007 Census of Population and Housing (RGPH-07), Structure of the Population, http://www.cnsee.org/index.php?option=com_content&view=article

			&id=137%3Argphstructure8congo&catid=43%3Aanalyse-rgph&showall=1, Accessed 2/26/2013.
Congo (Democratic Republic of the)	2007, 2013-2014	11	DHS
Cook Islands	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Costa Rica	2000-2011	55	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
Côte d'Ivoire	2005 2012	11	DHS
Croatia	2000-2016	2	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Cuba	2012	16	Oficina Nacional de Estadistica e Informacion (ONE), Censo de Poblacion y Viviendas 2012, Table 2: Población Total por Sexo y Relación de Masculinidad según Provincias y Municipios, http://www.one.cu/resumenadelantadocenso2012.htm, Accessed 12/10/2013.
Curaçao	2000-2020	1	UNPD
Cyprus	2000-2016	1	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Czech Republic	2000-2016	8	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Denmark	2000-2016	6	Statistics Denmark DST (2000-2006) and EUROSTAT (2007-2016)
Djibouti	2000-2020	1	UNPD
Dominica	2011	13	Central Statistical Office, 2011 Population and Housing Census Preliminary Results, Tables: 3 and 4, Published 09/01/2011, http://www.dominica.gov.dm/cms/files/2011_census_report.pdf, Accessed 05/05/2014.
Dominican Republic	2000-2015	227	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Ecuador	2010	1024	Instituto Nacional de Estadistica y Censos (INEC) Ecuador, Censo de Población y Vivienda 2010, using REDATAM, http://redatam.inec.gob.ec/, Accessed 06/11/2012.
Egypt	2006	290	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
El Salvador	2007	262	Census http://www.digestyc.gob.sv/
Equatorial Guinea	2000	7	UNICEF
Eritrea	2000-2020	1	UNPD
Estonia	2000-2016	1	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Ethiopia	2000-2020	757	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Falkland Islands (Malvinas)	2012	6	Falkland Islands Government, Census 2012, Table: Age and Gender by Location 2012, Received 11/16/2012.
Faroe Islands	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Fiji	2007	10	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
Finland	2000-2016	5	EUROSTAT: https://ec.europa.eu/eurostat/data/database

France (Metropolitan)	2000-2016	22	EUROSTAT: https://ec.europa.eu/eurostat/data/database
French Guiana	2009	22	Institut National de la Statistique et des Etudes Economiques, INSEE Statistiques locales, POP1B : Population par sexe et âge, generated by Jane Mills, using ,http://www.statistiques-locales.insee.fr/carto/ESL_CT_cartethematique.asp?nivgeo=COM&submit=Ok, Accessed 8/8/2013.
French Polynesia	2000-2020	1	UNPD
French Southern Territories	-	-	No population
Gabon	2012	13	DHS
Gambia	2006, 2013	8	DHS
Georgia	2014	12	National Statistics Office of Georgia (GEOSTAT)
Germany	2000-2016	38	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Ghana	2000-2015	110	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Gibraltar	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Greece	2000-2016	13	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Greenland	2011-2018	6	Statistics Greenland http://bank.stat.gl/pxweb/en/Greenland/Greenland__BE__BE01__BE0140/BEXSTM2.PX/?rxid=BEXSAT112-09-2018%2012:11:36
Grenada	2010	7	Census"UN Urban and Rural Population by Age and Sex (URPAS) 2010 estimates, generated using URPAS, http://esa.un.org/unpd/popdev/urpas/urpas2014.aspx, Accessed 03/27/2015. "
Guadeloupe	2009	32	Institut National de la Statistique et des Etudes Economiques, INSEE Statistiques locales, POP1B : Population par sexe et âge, generated using INSEE, http://www.statistiques-locales.insee.fr/carto/ESL_CT_cartethematique.asp?nivgeo=COM&submit=Ok, Accessed 8/8/2013.
Guam	2000-2020	1	UNPD
Guatemala	2010	22	Instituto Nacional de Estadistica (INE) Guatemala, 2010 Population Estimates, Table: Estimaciones de la Población Total por Municipio. Período 2008-2020. (al 30 de junio), http://www.oj.gob.gt/estadisticaj/files/poblacion-total-por-municipio1.pdf, Accessed 07/22/2011.
Guernsey	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Guinea	2005, 2012	7	DHS
Guinea-Bissau	2009	9	Instituto Nacional de Estatistica Guinea-Bissau, Census 2009, População por região, sector e localidades por sexo, http://www.stat-guinebissau.com/publicacao/publicacao.htm, Accessed 12/11/2014.
Guyana	2000-2015	10	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Haiti	2000-2015	703	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/

Heard Island and McDonald Islands	-	-	No population
Holy See	2000, 2005, 2010, 2015-2018	1	United Nations World Population Prospects and the Holy See http://www.vaticanstate.va/
Honduras	2013	18	Instituto Nacional de Estadistica (INE), Censo de Población y Vivienda 2013, using READTAM, http://www.redatam.org/binhnd/RpWebEngine.exe/Portal, Accessed 1/22/2016.
Hungary	2000-2016	7	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Iceland	2000-2018	65	Statistics Iceland, 2010 Population Register, Table: Population by Municipality, Age and Sex 1998-2012 - Division into Municipalites as of 1 January 2012, generated using Statistic Iceland website, http://www.statice.is/Statistics/Population, Accessed 09/23/2013.
India	2000-2020	710	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Indonesia	2000-2015	33	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
Iran (Islamic Republic of)	2011	380	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
Iraq	2000, 2006, 2011	18	UNICEF
Ireland	2000-2016	2	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Isle of Man	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
Israel	2008	7	Central Bureau of Statistics Israel, 2008 Census, Table: Population Census 2008 - Geographic and Demographic Variables Sheet 1a, http://www.cbs.gov.il/census/census/pnimi_page_e.html?id_topic=11, Accessed 11/14/2012.
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Lao People's Democratic Republic	2005	142	Lao Decide Info, Data Dissemination Division, Lao National Population and Housing Census 2005, Village age 2005, Received 5/8/2013.
Latvia	2000-2016	1	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Lebanon	2000-2020	1	UNPD
Lesotho	2000-2015	10	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
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Liechtenstein	2000-2016	1	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Lithuania	2000-2016	1	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Luxembourg	2000-2015	1	EUROSTAT: https://ec.europa.eu/eurostat/data/database
Madagascar	2011, 2013, 2016	22	DHS
Malawi	2000-2020	32	USCB http://www.census.gov/population/international/data/idb/informationGateway.php and DHS program http://spatialdata.dhsprogram.com/
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Micronesia (Federated States of)	2000-2020	1	UNPD
Moldova (Republic of)	2004	42	National Bureau of Statistics of the Republic of Moldova, Population Census 2004, Table 2: Population by area, localities and sex, in territorial aspect, http://www.statistica.md/pageview.php?l=en&idc=295&id=2234, Accessed 12/12/2012.
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Mongolia	2000	21	Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D020.V7.0.
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Montserrat	2000-2020	1	USCB http://www.census.gov/population/international/data/idb/informationGateway.php
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Netherlands	2000-2016	12	EUROSTAT: https://ec.europa.eu/eurostat/data/database
New Caledonia	2000-2020	1	UNPD
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