# COD-PS Rwanda
# Update Year 2023 / Reference Year 2023

## Objective of This Explanatory Technical Note

This explanatory technical note provides supplementary notes on the strengths and limitations of each Common Operational Dataset on Population Statistics (COD-PS) against the projections by the WPP 2022 Revision of the UN to enable informed humanitarian decision-making.

## Structure of Supplementary Note

This supplementary note is organized into the following sections:
1. Metadata
2. Methodological Documentation
3. Intrinsic Population Growth Rates (ADM-0 & 1)
4. Population counts by age and sex (ADM-0)
5. Relative population size by age and sex (ADM-1)

## 1. Metadata

| Item | Metadata |
|---|---|
| Country | Rwanda |
| Source(s) | (Baseline) National Institute of Statistics Rwanda, (Projections) US Census Bureau |
| Source(s) Link(s) | (Baseline) https://statistics.gov.rw, (Projections) https://www.census.gov/data/tables/time-series/demo/international-programs/subnationalpopulation.html |
| Population Data Type (Census enumeration, Direct estimate, or Population projection) | Population projection |
| Year of the Baseline Population | 2012 |
| Reference year of this COD-PS | 2023 |
| Publication year of this COD-PS | 2023 |
| ADM-1 Name | Province |
| ADM-1 Number of Units | 5 |

| Item | Metadata |
|---|---|
| ADM-1 Sex and Age Disaggregation | Sex and age disaggregated by 5-year age groups |
| ADM-1 Open-ended Age Group | 80+ |
| ADM-2 Name | District |
| ADM-2 Number of Units | 30 |
| ADM-2 Sex and Age Disaggregation | Sex and age disaggregated by 5-year age groups |
| ADM-2 Open-ended Age Group | 80+ |
| ADM-3 Name | Sector |
| ADM-3 Number of Units | 416 |
| ADM-3 Sex and Age Disaggregation | Sex and age disaggregated by 5-year age groups |
| ADM-3 Open-ended Age Group | 80+ |
| General Notes | This COD-PS is based on the projections prepared by the US Census Bureau (USCB) projections. |
| Data Limitations | The USCB projections, on which this COD-PS is based, does not take into account unique national or subnational population dynamics. It is because the USCB subnational projections are built on the predication that population growth rates follow an S-curve progression of initially being slow, accelerating, peaking, and finally tapering, a path that is consistent with Malthusian theory. |
| COD-PS Demographic Data Quality Assessment | The COD-PS was assessed against ADM-0 estimates and projections published in the World Population Prospects (2022 Revision) by the United Nations Department of Economic and Social Affairs (UN-DESA). |

## 2. Methodological Documentation

| Item | Methodological Documentation |
|---|---|
| Methodology Used | The estimates for the population totals of 5 ADM-1 units were calculated using the Logistic Growth Rate method, based on population trends between the 2002 and 2012 censuses. The estimates for sex-specific 5-year age groups for the 416 ADM-3 units were calculated using Iterative Proportional Fitting, based on the age group proportions from the 2012 census. Furthermore, in general the impacts of cataclysmic events such as earthquakes or tsunamis are factored into the calculations for the |

| Item | Methodological Documentation |
|---|---|
| | subnational age and sex group population estimates for the affected areas - contingent on obtaining the numbers of fatalities and displacements ascertained from authoritative sources, as well as numbers reflecting the trajectories of the recoveries of those areas. |
| Baseline Population | 2012 census |
| Post-enumeration survey (PES) | The post enumeration survey (PES) report from the 2012 census reports net coverage rate of 99.25%, census omission rate of 1.33%, match rate of 98.66%, erroneous inclusion rate of 0.58%, and gross coverage error rate of 1.92%, with little differences between the rural and urban areas as well as between male and female. |
| Assessment and Adjustment of the Baseline Population | There is no evidence of assessing and adjusting the baseline population prior to building the projections on which this COD-PS is based. The source file states that the U.S. Census Bureau cannot guarantee the accuracy of non-U.S. census and survey data. |
| Fertility (births) | No fertility assumptions. It is because the projections on which this COD-PS is based were built on the predication that population growth rates follow an S-curve progression of initially being slow, accelerating, peaking, and finally tapering, a path that is consistent with Malthusian theory - rather than following the national or subnational population dynamics unique to each country. |
| Mortality (deaths) | No mortality assumptions. It is because the projections on which this COD-PS is based were built on the predication that population growth rates follow an S-curve progression of initially being slow, accelerating, peaking, and finally tapering, a path that is consistent with Malthusian theory - rather than following the national or subnational population dynamics unique to each country. |
| International migration (net migration) | No international migration (net migration) assumptions. It is because the projections on which this COD-PS is based were built on the predication that population growth rates follow an S-curve progression of initially being slow, accelerating, peaking, and finally tapering, a path that is consistent with Malthusian theory - rather than following the national or subnational population dynamics unique to each country. |
| Internal migration (migration within country) | No internal migration (migration within country) assumptions. It is because the projections on which this COD-PS is based were built on the predication that population growth rates follow an S-curve progression of initially being slow, accelerating, peaking, and finally tapering, a path that is consistent with Malthusian theory - rather than following the national or subnational population dynamics unique to each country. |

## 3. Intrinsic Population Growth Rates (ADM-0 & 1)

At ADM-0, this COD-PS implies relatively lowe[illegible]population growth rates (2.21% per year: female 2.05%, male 2.37%) than the rates implied by WPP 2022 (2013: 2.37%, 2016: 2.50%, 2019: 2.37%, 2022: 2.30%).

At ADM-1, the postcensal population growth rates reflect a wide variation between provinces. The USCB projects the highest rate of growth for Kigali, the national capital and economic centre, at 4.03% per year (female 3.89%, male 4.17%). In contrast, the USCB projects the lowest rate of growth for the Northern Province at 0.54% per year (female 0.42%, male 0.66%).

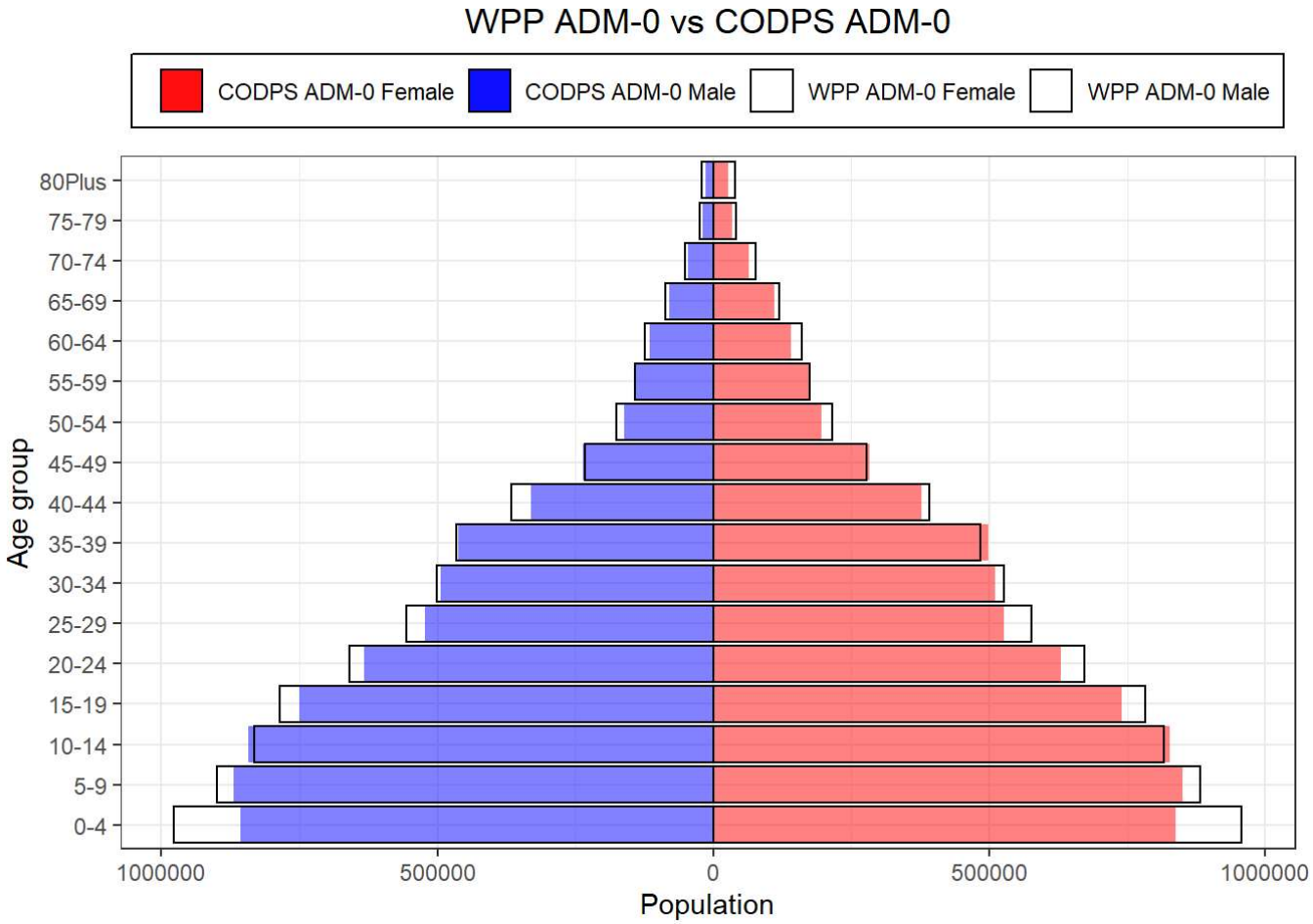
| ADM-1 | Last Census, Female | Last Census, Male | CODPS, Female | CODPS, Male | PGR(%), Female | PGR(%), Male | PGR(%), Both |
|---|---|---|---|---|---|---|---|
| Eastern Province | 1,337,613 | 1,258,090 | 2,002,569 | 1,945,622 | 3.67 | 3.96 | 3.82 |
| Kigali City | 546,563 | 586,123 | 838,077 | 926,754 | 3.89 | 4.17 | 4.03 |
| Northern Province | 907,914 | 818,456 | 950,785 | 879,641 | 0.42 | 0.66 | 0.54 |
| Southern Province | 1,356,221 | 1,233,754 | 1,574,954 | 1,469,876 | 1.36 | 1.59 | 1.48 |
| Western Province | 1,302,794 | 1,168,445 | 1,462,144 | 1,350,119 | 1.05 | 1.31 | 1.18 |
| Total | 5,451,105 | 5,064,868 | 6,828,529 | 6,572,012 | 2.05 | 2.37 | 2.21 |

## 4. Population Counts by age and sex (ADM-0)

Below, we compare the population structure across sex and age groups between the USCB and WPP projections at the national level. The sex and age specific population counts of this COD-PS are generally consistent with the WPP estimates but among the 0-4 year olds where the USCB estimates smaller than WPP (female by 12.59%, male by 12.28%).

| | CODPS-WPP, Female | Difference(%) | CODPS-WPP, Male | Difference(%) |
|---|---|---|---|---|
| 0-4 | -120,568 | -12.59 | -120,052 | -12.28 |
| 5-9 | -30,562 | -3.47 | -30,742 | -3.42 |
| 10-14 | 10,482 | 1.28 | 11,051 | 1.33 |
| 15-19 | -42,708 | -5.46 | -36,164 | -4.60 |
| 20-24 | -41,462 | -6.17 | -27,598 | -4.18 |
| 25-29 | -50,218 | -8.72 | -33,406 | -6.00 |
| 30-34 | -15,458 | -2.93 | -7,797 | -1.56 |
| 35-39 | 14,612 | 3.02 | -3,146 | -0.68 |

| | CODPS-WPP, Female | Difference(%) | CODPS-WPP, Male | Difference(%) |
|---|---|---|---|---|
| 40-44 | -13,240 | -3.39 | -35,211 | -9.62 |
| 45-49 | 5,670 | 2.04 | 2,766 | 1.19 |
| 50-54 | -19,986 | -9.25 | -15,500 | -8.80 |
| 55-59 | -3,162 | -1.80 | 1,054 | 0.75 |
| 60-64 | -18,881 | -11.80 | -8,309 | -6.74 |
| 65-69 | -8,372 | -7.05 | -8,326 | -9.51 |
| 70-74 | -11,085 | -14.56 | -5,270 | -10.14 |
| 75-79 | -7,644 | -18.14 | -5,126 | -20.58 |
| 80Plus | -12,311 | -31.50 | -7,474 | -36.62 |




## 5. Relative population size by age and sex (ADM-1)

Below compares relative population proportions by sex and age between USCB ADM-1 and WPP ADM-0 projections. The relative population proportions of the Eastern, Western, Northern, and Southern provinces generally follow those of the WPP ADM-0 projections. But the proportions of Kigali show a different pattern, where the proportions of young working-age adults are notably higher than those of the WPP ADM-0 projections, reflecting the economic opportunities in the capital city. Specifically the

proportions of 20-39 year old males are almo proportions of WPP ADM-0 projections, and the proportions of 20-39 year old females are greater than WPP by 10 to 25%.