

# COD-PS Botswana

## Update Year 2023 / Reference Year 2023

### Objective of This Explanatory Technical Note

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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

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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

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Item	Metadata
Country	Botswana
Source(s)	(Baseline) Statistics Botswana, (Projections) US Census Bureau
Source(s) Link(s)	(Baseline) <a href="http://www.statsbots.org.bw">http://www.statsbots.org.bw</a> , (Projections) <a href="https://www.census.gov/data/tables/time-series/demo/international-programs/subnationalpopulation.html">https://www.census.gov/data/tables/time-series/demo/international-programs/subnationalpopulation.html</a>
Population Data Type (Census enumeration, Direct estimate, or Population projection)	Population projection
Year of the Baseline Population	2011
Reference year of this COD-PS	2023
Publication year of this COD-PS	2023
ADM-1 Name	District, Town, and City
ADM-1 Number of Units	17

<b>Item</b>	<b>Metadata</b>
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	Sub-District
ADM-2 Number of Units	28
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	Village, Unaffiliated Locality
ADM-3 Number of Units	519
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. Overall, the WPP 2022 estimates relatively higher population counts (2,675,354) than this COD-PS (2,418,064). Note that the preliminary total count of the 2022 Population and Housing Census of Botswana is 2,346,179 - which implies that, Botswana's population continues to grow, albeit at a decreasing rate than predicted by WPP 2022. Moreover, in this COD-PS notably higher shares of working age persons were observed for Gabraonne and Orapa, both of which are largely urban and have high levels of rural-to-urban labor-related migration.
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	<p>The estimates for the population totals of 17 ADM-1 units were calculated using the Logistic Growth Rate method, based on population trends between the 2001 and 2011 censuses. The estimates for sex-specific 5-year age groups for the 519 ADM-3 units were calculated using Iterative Proportional Fitting, based on the age group proportions from the 2011 census. Furthermore, in general the impacts of cataclysmic events such as earthquakes or tsunamis are factored into the calculations for the 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.</p>
Baseline Population	2011 census
Post-enumeration survey (PES)	PES was scheduled for September 2011, but it did not take place [1]
Assessment and Adjustment of the Baseline Population	<p>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.</p>
Fertility (births)	<p>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.</p>
Mortality (deaths)	<p>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.</p>
International migration (net migration)	<p>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.</p>
Internal migration (migration within country)	<p>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.</p>

Ref 1. "Evaluation of Data Quality of the Botswana 2011 Population and Housing Census" (2014) by Kenabetsho Bainame and Gobopamang Letamo, accessed online at <https://www.jstor.org/stable/90024359>

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

At ADM-0, the implied postcensal (2011-2023) population growth rates of this COD-PS (1.53% per year: female 1.62%, male 1.44%) are relatively lower than the growth rates of the UN's population projections across the postcensal years published in the 2022 revision of the World Population Prospects (WPP) (2012: 1.90%, 2016: 2.07%, 2020: 1.80%, 2023: 1.67%).

At ADM-1, the USCB predicts a wide range of postcensal (2011-2023) population growth rates for the districts of Botswana. The USCB predicts the highest postcensal growth for South East District where the national capital Gaborone is located (2.94% per year: female 2.99%, male 2.89%); Kweneng District lying adjacent to South East District (2.55% per year: female 2.63%, male 2.48%); and Chobe District where the largest national park serves as a major source of tourism industry (2.66% per year: female 2.69%, male 2.63%). In contrast, USCB predicts negative population growth for Lobatse Town which borders with South Africa (-1.02% per year: female -0.97%, male -1.02%); Selibe Phikwe Town which is a nickel and copper mining town but the mining operations had shut down in 2016 (-0.88% per year: female -0.94%, male -0.81%); and Orapa Town which has the largest diamond mine in the world (-0.37% per year: female -0.47%, male -0.27%).

<b>ADM-1</b>	<b>Last Census, Female</b>	<b>Last Census, Male</b>	<b>CODPS, Female</b>	<b>CODPS, Male</b>	<b>PGR(%), Female</b>	<b>PGR(%), Male</b>	<b>PGR(%), Both</b>
Central	295,876	276,525	347,357	312,587	1.34	1.02	1.18
Chobe	11,410	11,756	15,754	16,116	2.69	2.63	2.66
Francistown	51,234	47,078	57,574	53,032	0.97	0.99	0.98
Gaborone	119,147	110,827	140,784	131,813	1.39	1.45	1.42
Ghanzi	20,909	22,114	28,153	29,116	2.48	2.29	2.38
Jwaneng	8,313	9,582	9,109	10,907	0.76	1.08	0.92
Kgalagadi	24,975	25,169	30,356	29,862	1.63	1.42	1.52
Kgatleng	46,933	44,069	58,243	53,280	1.80	1.58	1.69
Kweneng	154,898	147,253	212,373	198,310	2.63	2.48	2.55
Lobatse	14,963	13,914	13,318	12,243	-0.97	-1.07	-1.02
North East	31,474	28,354	41,133	35,588	2.23	1.89	2.06
North West	78,554	72,674	95,674	86,306	1.64	1.43	1.53
Orapa	4,818	4,664	4,552	4,516	-0.47	-0.27	-0.37
Selibe Phikwe	24,892	24,295	22,231	22,039	-0.94	-0.81	-0.88
South East	44,394	39,906	63,534	56,446	2.99	2.89	2.94

<b>ADM-1</b>	<b>Last Census, Female</b>	<b>Last Census, Male</b>	<b>CODPS, Female</b>	<b>CODPS, Male</b>	<b>PGR(%), Female</b>	<b>PGR(%), Male</b>	<b>PGR(%), Both</b>
Southern	101,415	95,093	116,601	104,904	1.16	0.82	0.99
Sowa Town	1,647	1,922	1,927	2,326	1.31	1.59	1.45
Total	1,035,852	975,195	1,258,673	1,159,391	1.62	1.44	1.53

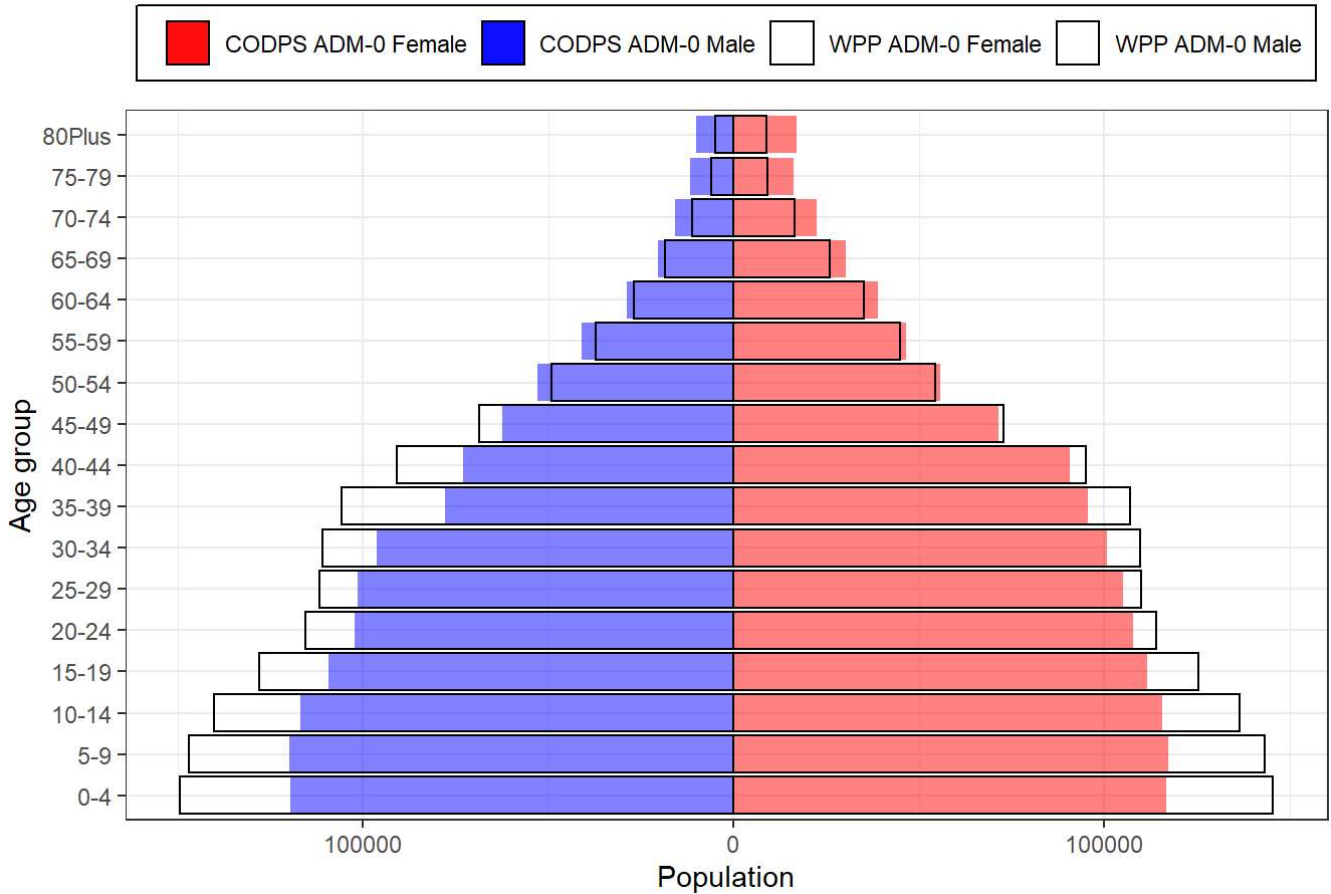
## 4. Population Counts by age and sex (ADM-0)

Below, we compare the population structure across sex and age groups between the USCB and WPP projections at the national level. Overall, the WPP 2022 estimates relatively higher population counts (2,675,354) than the USCB (2,418,064). Across most age groups (0 to 49) the WPP 2022 predicts higher population counts than the USCB, largest absolute differences in the 0-19 year age groups. This can be explained by the postcensal population growth rates estimated by the WPP 2022, where the annual growth rates prevailed around 2.0% per year up until 2022 and 2023 (1.7%).

Note that the preliminary total count of the 2022 Population and Housing Census of Botswana is 2,346,179 - which implies that, Botswana's population continues to grow, albeit at a decreasing rate.

	<b>CODPS-WPP, Female</b>	<b>Difference(%)</b>	<b>CODPS-WPP, Male</b>	<b>Difference(%)</b>
0-4	-28,860	-19.83	-29,820	-19.96
5-9	-26,000	-18.15	-27,184	-18.49
10-14	-21,049	-15.41	-23,266	-16.61
15-19	-13,919	-11.10	-18,960	-14.80
20-24	-6,186	-5.43	-13,396	-11.59
25-29	-4,990	-4.54	-10,114	-9.06
30-34	-9,064	-8.26	-14,576	-13.16
35-39	-11,479	-10.74	-27,732	-26.26
40-44	-4,428	-4.66	-17,922	-19.71
45-49	-1,315	-1.81	-6,040	-8.81
50-54	1,288	2.37	3,776	7.67
55-59	1,572	3.51	3,800	10.19
60-64	3,755	10.67	1,839	6.82
65-69	4,320	16.70	1,868	10.08
70-74	5,885	35.75	4,699	41.98
75-79	7,130	77.77	5,646	94.73
80Plus	8,324	95.27	5,112	105.21

## WPP ADM-0 vs CODPS ADM-0



## 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. Besides for the ADM-1 units where the USCB predicts population proportions similar to those of the WPP ADM-0 projection, in other ADM-1 units USCB predicts two notable types of population patterns for Botswana. The first type is of relatively high proportions of working-age adults but low proportions of children: Gaborone (national capital city), South East District (capital district), and Francistown City (second largest city of Botswana). This pattern is usually anticipated for well-developed economic centres of a country to where many working adults migrate in search of economic and educational opportunities. The second type is disproportionately high shares of mostly working-age males but low shares of all other age groups for the places with large and active diamond mines (Jwaneg Town, Orapa Town) and sodium carbonate/sodium bisulfate mines (Sowa Town).

