

# COD-PS Bhutan

## 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	Bhutan
Source(s)	National Statistics Bureau
Source(s) Link(s)	<a href="https://www.nsb.gov.bt/publications/census-report">https://www.nsb.gov.bt/publications/census-report</a>
Population Data Type (Census enumeration, Direct estimate, or Population projection)	Population projection
Year of the Baseline Population	2017
Reference year of this COD-PS	2023
Publication year of this COD-PS	2023
ADM-1 Name	Dzongkhag (district)
ADM-1 Number of Units	20
ADM-1 Sex and Age Disaggregation	Sex and age disaggregated by 5-year age groups

Item	Metadata
ADM-1 Open-ended Age Group	75+
General Notes	Within this COD-PS, the rate of fertility decline assumed by the NSO (1.9 in 2017 to 1.83 in 2022, 1.77 in 2027, and remaining at 1.70 from 2032 to 2047) is slower than that more recently estimated by WPP 2022 (1.41 in 2021, 1.40 by 2022). Therefore, this COD-PS may overestimate the number of 0-4 year olds for both sexes.
Data Limitations	The NSO subnational projections, on which this COD-PS is based, may not reflect the actual internal migration dynamics because the NSO projected using the district shares extrapolated from the national projection during the intercensal period (2005-2017).
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	This COD-PS is based on postcensal population projections prepared by the National Statistics Bureau of Bhutan using the 2017 population and housing census data. Cohort component method was used to construct the postcensal projections, on which this COD-PS is based. Due to the lack of detailed fertility and mortality data at the subnational level, the postcensal projections were first created at the national level using national fertility, mortality, net migration indicators. Then, the change in sex- and age-disaggregated shares of each district (Dzongkhag) population from 2005 to 2017 was used to extrapolate the shares of districts for projections.
Baseline Population	2017 census
Post-enumeration survey (PES)	A formal PES report or results cannot be located in the public domain.
Assessment and Adjustment of the Baseline Population	To ensure the quality of the baseline population data and accuracy of the population dynamics projected forward, the 2017 census results were compared against the Bhutan Living Standard Survey (2003, 2007, 2012, 2017), National Health Survey (1984, 1994, 2000, 2012), and Bhutan Multiple Indicator Survey (2010, 2012) and the estimates implied by the UN Population and Estimates 2017 Revision. The 2017 census results were also checked for age heaping (Myers' Index 1.8) and accuracy (Whipple's Index 105.4, UN joint score index 19.8) and showed good indications.
Fertility (births)	For the medium variant scenario, it was assumed that the TFR will decline from 1.903 (2017) to 1.7 (2032). The NSO notes that the age pattern of

Item	Methodological Documentation
	fertility is not likely to change notably due to three reasons: a) age at marriage is already high, b) Contraceptive Prevalence Rate (CPR) has shown a smooth pattern with a high value, and c) the fertility has already achieved a low level. Therefore, the age pattern observed for 2016-17 on the basis of 2017 census, adjusted for standard age groups as noted earlier, has been assumed to continue throughout the projection period.
Mortality (deaths)	Using gradients of the improvements in the life expectancy drawn from the trends in the data sets of the UN-WPP, the life expectancy was projected for future years. For the medium variant scenario, it was assumed that the life expectancy at birth will increase from 69.1 years (female: 71.0, male: 68.0) to 76.8 years (female: 78.5, male: 75.2).
International migration (net migration)	The assessment of available international migration data showed that net international migration was negligible, therefore net migration was assumed to be zero for these projections.
Internal migration (migration within country)	An assessment of the changes in the shares of districts (Dzongkhags) between 2005 and 2017 showed that some of the declines in populations of certain regions were due to phasing out of major infrastructure projects; such trends were abnormal and not likely to continue in the future. Therefore, the district shares extrapolated from the national projection during the intercensal period (2005-2017) were re-examined and the projected shares were adjusted after taking into account the judgments of experts. These shares have been used in the projections of district (Dzongkhag) populations.

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

At ADM-0, the implied postcensal population growth rates of this COD-PS (0.97% per year: female: 1.05%, male 0.88%) are somewhat relatively higher than the UN's population projections published in the World Population Prospects (WPP) 2022 Revision (2018: 0.74%, 2020: 0.65%, 2022: 0.64%).

At ADM-1, the NSO predicts positive postcensal growth for the capital district of Thimphu (2.66% per year: female 3.00%, male 2.31%) and the central district of Trongsa (2.32% per year: female 1.60%, male 3.04%). In contrast, the NSO predicts negative postcensal growth for two easternmost districts: Lhuentse (-1.17% per year: female -1.30%, male -1.03%) and Trashigang (-1.22% per year: female -1.18%, male -1.26%).

ADM-1	Last Census, Female	Last Census, Male	CODPS, Female	CODPS, Male	PGR(%), Female	PGR(%), Male	PGR(%), Both
Bumthang	8,424	9,396	8,915	9,482	0.94	0.15	0.54
Chhukha	32,925	36,041	33,959	36,061	0.52	0.01	0.26
Dagana	12,009	12,956	12,378	13,524	0.50	0.72	0.61

<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>
Gasa	1,848	2,104	2,039	2,324	1.64	1.66	1.65
Haa	6,220	7,435	6,299	7,550	0.21	0.26	0.23
Lhuentse	7,030	7,407	6,501	6,963	-1.30	-1.03	-1.17
Monggar	18,903	18,247	18,864	17,364	-0.03	-0.83	-0.43
Paro	22,375	23,941	25,510	26,402	2.19	1.63	1.91
Pema Gatshel	11,710	11,922	11,813	12,024	0.15	0.14	0.15
Punakha	13,661	15,079	14,741	16,492	1.27	1.49	1.38
Samdrup Jongkhar	16,750	18,329	16,615	18,266	-0.13	-0.06	-0.10
Samtse	30,568	32,022	31,402	31,747	0.45	-0.14	0.16
Sarpang	21,986	24,018	24,135	26,086	1.55	1.38	1.46
Thimphu	66,214	72,522	79,270	83,323	3.00	2.31	2.66
Trashi Yangtse	8,581	8,719	8,232	8,341	-0.69	-0.74	-0.72
Trashigang	22,104	23,414	20,589	21,710	-1.18	-1.26	-1.22
Trongsa	8,082	11,878	8,897	14,253	1.60	3.04	2.32
Tsirang	10,850	11,526	11,689	12,384	1.24	1.20	1.22
Wangdue Phodrang	17,884	24,302	19,288	28,090	1.26	2.41	1.83
Zhemgang	8,568	9,195	8,048	8,706	-1.04	-0.91	-0.98
Total	346,692	380,453	369,184	401,092	1.05	0.88	0.97

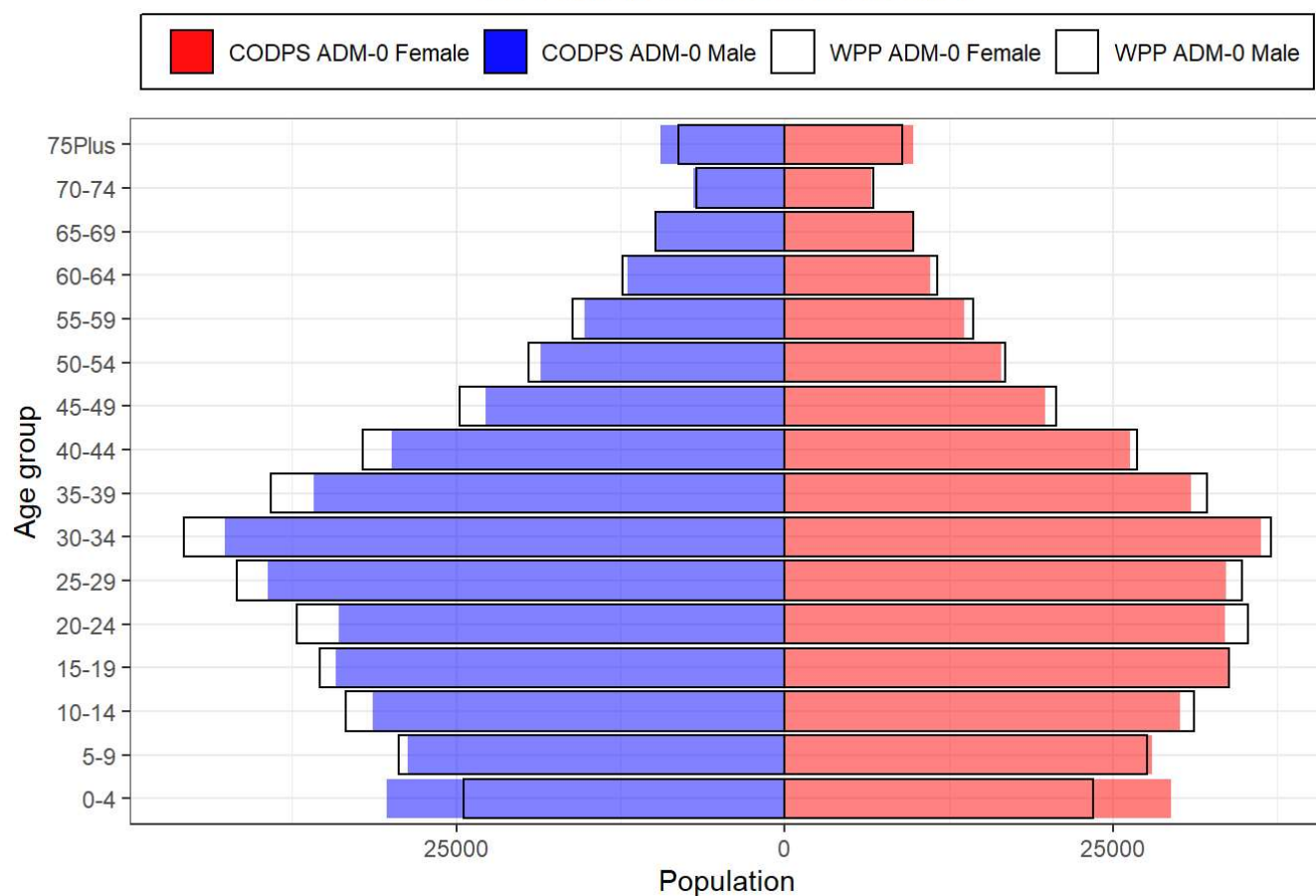
## 4. Population Counts by age and sex (ADM-0)

Below, we compare the population structure across sex and age groups between the USCB and WPP projections at the national level. The age- and sex-specific population counts of this COD-PS generally follow the WPP 2022 Revision projections, except among 0-4 years where the NSO predicts higher postcensal fertility than WPP (female: +25.33%, male: +23.85%).

Note that the rate of fertility decline assumed by the NSO (1.9 in 2017 to 1.83 in 2022, 1.77 in 2027, and remaining at 1.70 from 2032 to 2047) is slower than that more recently estimated by WPP 2022 (1.41 in 2021, 1.40 by 2022). Therefore, this COD-PS may overestimate the number of 0-4 year olds for both sexes.

	CODPS-WPP, Female	Difference(%)	CODPS-WPP, Male	Difference(%)
0-4	5,945	25.33	5,839	23.85
5-9	352	1.27	-663	-2.26
10-14	-1,046	-3.35	-2,097	-6.27
15-19	-72	-0.21	-1,194	-3.37
20-24	-1,736	-4.92	-3,260	-8.77
25-29	-1,154	-3.32	-2,400	-5.75
30-34	-804	-2.17	-3,116	-6.81
35-39	-1,176	-3.66	-3,342	-8.53
40-44	-572	-2.13	-2,194	-6.83
45-49	-903	-4.36	-2,026	-8.18
50-54	-260	-1.55	-934	-4.78
55-59	-694	-4.82	-849	-5.26
60-64	-523	-4.49	-353	-2.86
65-69	-104	-1.05	6	0.06
70-74	-135	-2.01	168	2.50
75Plus	836	9.34	1,316	16.21

WPP ADM-0 vs CODPS ADM-0



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

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Below compares relative population proportions by sex and age between USCB ADM-1 and WPP ADM-0 projections. The NSO predicts larger shares of working age adults (20-39 years) for both sexes for the capital district, Thimpu. The NSO projects relatively high proportions of 20-44 males and low proportions of females for the central districts of Trongsa and Wangdue Phodang. In the districts of Lhuentse, Monggar, Trashy Yangtse, Tsirang, and Zhemgang, the NSO predicts notably lower proportions of working adult populations. The NSO 2017-2027 Dzongkhag-level projection report attributes it to recent phasing out of major infrastructure projects and not likely to continue in the future.

