

Assessing the Quality of Birth Data within the Civil Registration and Vital Statistics System for Fertility Estimation in Malawi

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Background

Fertility is an important demographic measure as it accounts for the largest changes in population size besides mortality and migration. It also influences the age structure of a population, which essentially defines the socio-demographic and economic characteristics of the country. Thus, fertility informs a country's profile for the potential attainment of the demographic dividend – an accelerated economic development resulting from a shift in the population's age structure resulting in a higher proportion of the working-age population should all other factors hold. Such information is necessary for efficient development planning.

Traditionally, Malawi collects its fertility data through censuses and surveys by asking women about children ever born to them. However, these methods are only implemented at definite time periods – 10 years for censuses and 2 to 5 years for surveys – which affects the timeliness of fertility data. Furthermore, such undertakings are logistically involving and financially draining. For instance, Malawi's 2018 Population and Housing Census costed approximately USD 19.8 million to implement. Therefore, birth registration data from the civil registry can provide a low-cost and timely alternative to estimating fertility data, as they are continuous and need no adjustment when complete.

In 2015, Malawi started the compulsory registration of all births occurring in health facilities and communities following the National Registration Act of 2010. The data collected during birth registration pertains to characteristics of the child, the mother and the event itself. However, the extent of the utility of this data for fertility estimation is unknown. We, therefore assess the quality of Malawi's birth registration data with respect to its timeliness, completeness and accuracy for fertility estimation.

Methodology

Birth registration data covering August, 2015 – December, 2022 were obtained from the civil registry at the National Registration Bureau. Microsoft Office Excel 2021 and STATA version 17 were used to clean and analyze the data. Descriptive statistics were run through univariate and bivariate analyses. Timeliness of birth registration categorized as current (one that is registered within six weeks of occurrence), delayed (captured after six years but within a year of its occurrence) and late (registered after the 1-year grace period), as informed by the National Registration Act. Completeness of birth registration was calculated by dividing the number of registered births for each year by the expected number of births for the corresponding year as provided by the National Statistical Office. Crude birth rate (CBR), age-specific fertility rate (ASFR) and total fertility rate (TFR) against comparator data sources e.g., 2018 census and WHO, to determine the accuracy of birth registration data. The measures were also adjusted for completeness using base data from census.

Results

Between 2015 and 2022, 2,358,001 births were registered with a sex ratio at birth of 101.8 males per 100 females. Almost half (48%) of the births were current registrations, about 12% were delayed and 40% were registered after a year of their occurrence (see Figure 1). Births that occurred in their year of registration (useful for calculating fertility measures) aggregated to 1,126,649. Completeness of birth registration rose from 2.2% in 2015 to 32.8% in 2022 with the highest completeness rate (36.7%) being observed in year 2020 (see table 1)

Until adjusted for completeness, calculated CBR from birth registration data were lower when compared with other sources. CBR_{CR} was 7.9 births per 1000 population in 2018 compared to 34.6 from the census. CBR_{CR} moved closer to the true CBR with increasing completeness e.g., 11.3 births per 1000 population in 2021 vs 33.2 reported by WHO (see Figure 2).

Overall, ASFR and TFR computed from CR data show declining trends, as is the case with projected census findings. There was an average difference of 0.1 child per woman between adjusted TFR values estimated from civil registration data and those projected from the 2018 population and housing census. Adjusted TFR_{CR} for 2018, 2020 and 2022 were calculated at 4.1, 3.9 and 3.7 children per woman respectively compared to 4.2, 4.0 and 3.9 children per woman as per the 2018 census estimates (see Table 2).

Conclusion

While birth registration is on an improving trajectory, delayed and late registrations, which account for 52% of the records, affect the timeliness and utility of the data. This is aggravated

by low completeness of registration data. The need to adjust calculated fertility measures for completeness suggests a strong dependence of the civil registration data on alternate data sources (e.g., census). It is, therefore, pertinent that continued investments be made into the system to improve the utility of its data as an independent system.

Figures and tables

Figure 1: Live births by time of registration

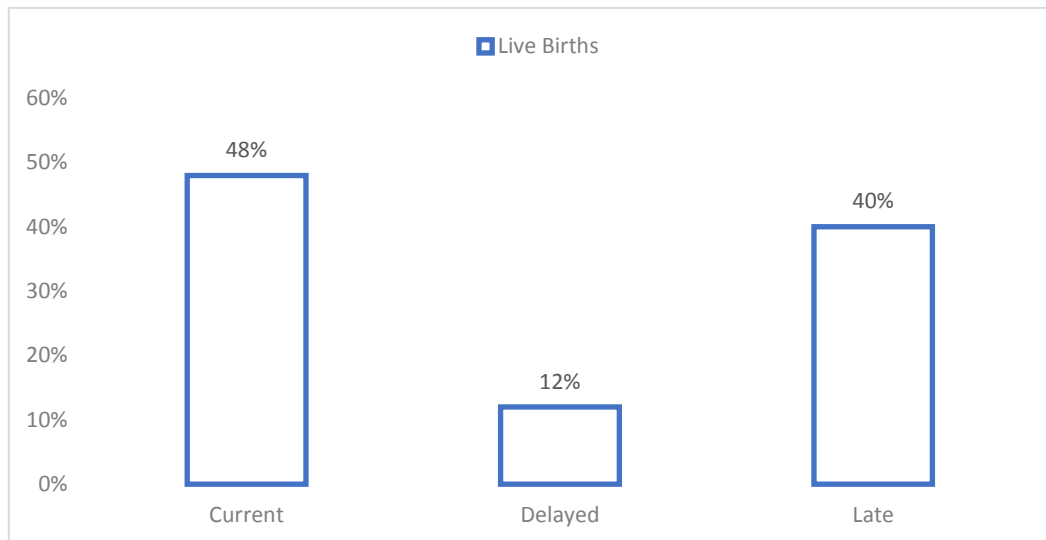


Table 1: Live births by year of occurrence and completeness of registration

Year	Live births	Estimated births	Completeness (%)
2015	15,657	718,982	2.2%
2016	51,719	713,042	7.3%
2017	128,267	724,956	17.7%
2018	138,884	608,074	22.8%
2019	148,145	611,614	24.2%
2020	225,806	614,670	36.7%
2021	213,102	620,346	34.4%
2022	205,069	625,434	32.8%
Total	1,126,649	5,237,118	21.5%

Figure 2: Crude Birth Rate calculated from civil registration, with comparator data

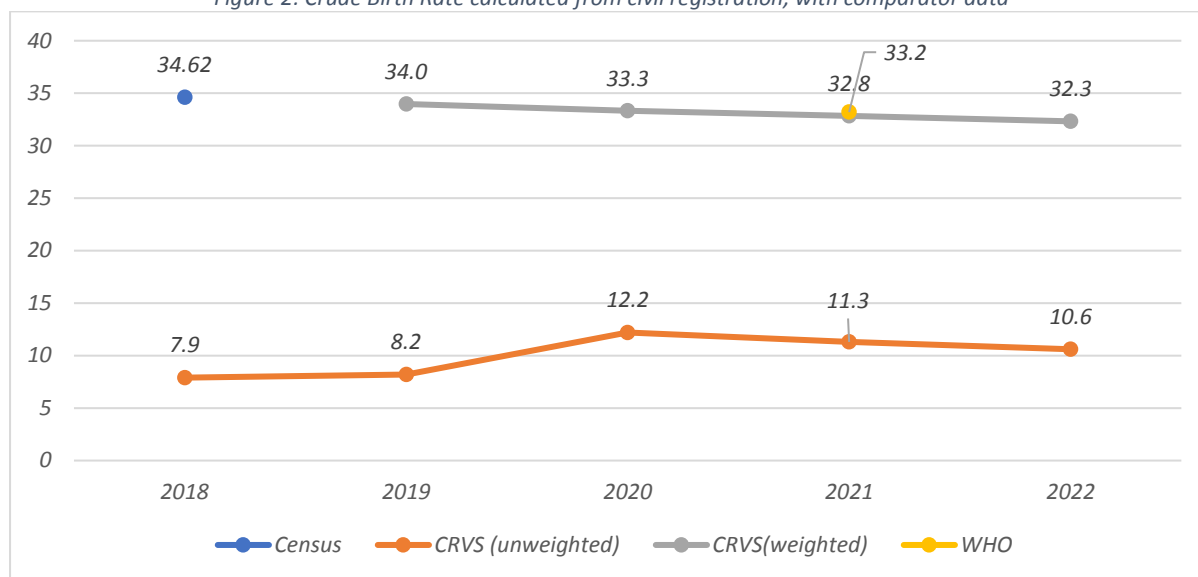


Table 1: Unweighted and weighted ASFR & TFR from Civil Registration Data, Malawi, 2018 - 2022.

Mother's age group (years)	2018				
	Number of Women	Registered live births	Weighted births	ASFR (CRVS)	Weighted ASFR
15-19	1,019,532	60,332	136,699	59.2	134.1
20-24	866,402	78,527	183,979	90.6	212.3
25-29	730,839	52,246	125,001	71.5	171.0
30-34	591,342	39,183	94,454	66.3	159.7
35-39	480,477	22,094	51,845	46.0	107.9
40-44	374,021	5,527	12,622	14.8	33.7
45-49	295,326	904	2,009	3.1	6.8
TFR Census Projections				1.8	4.1
Mother's age group (years)	2020				
	Number of Women	Registered live births	Weighted births	ASFR (CRVS)	Weighted ASFR
15-19	1,077,303	50,884	130,302	47.2	121.0
20-24	921,840	70,828	186,142	76.8	201.9
25-29	773,244	51,824	139,569	67.0	180.5
30-34	633,213	32,359	87,338	51.1	137.9
35-39	514,554	20,665	54,298	40.2	105.5
40-44	408,429	5,439	13,493	13.3	33.0
45-49	320,963	829	2,013	2.6	6.3
TFR Census Projections				1.5	3.9
Mother's age group (years)	2022				
	Number of Women	Registered live births	Weighted births	ASFR (CRVS)	Weighted ASFR
15-19	1,131,129	40,705	158,730	36.0	140.3
20-24	981,091	49,339	189,541	50.3	193.2

25-29	818,101	34,278	131,361	41.9	160.6
30-34	678,369	20,699	79,772	30.5	117.6
35-39	548,413	12,933	49,391	23.6	90.1
40-44	445,570	3,699	14,144	8.3	31.7
45-49	347,301	302	1,156	0.9	3.3
TFR Census				1.0	3.7
Projections					