Supplementary File 2: Methodological Appendix

I. Abortion Incidence Complications Methodology (AICM) steps and data inputs and sources

Figure 1 illustrates the steps of the age-specific variant of the Abortion Incidence Complications Methodology (AICM). Table 1 outlines the data input and sources used for each corresponding step of the AICM, and the assumptions made with each data source.

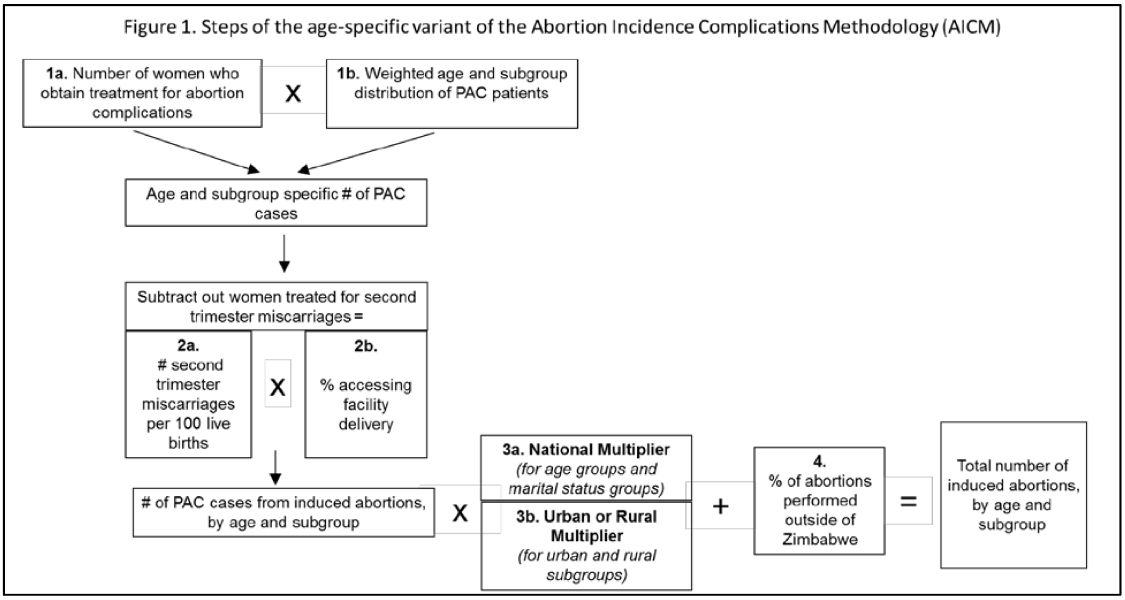

Table 1. Data sources and assumptions made in age-specific variant of AICM

Step of AICM	*Data Input*	*Source*	*Data coverage*	*Assumption*
1a	Number of women who obtain treatment for abortion complications	Sully EA, Madziyire MG, Riley T, et al. Abortion in Zimbabwe: A national study of the incidence of induced abortion, unintended pregnancy and post-abortion care in 2016. PLOS ONE 2018; 13:e0205239. doi:10.1371/journal.pone.0205239	National number	N/A
1b	Weighted age and subgroup distribution of PAC patients	Prospective Morbidity Survey	Age and subgroup* specific	N/A
2a	# second trimester miscarriages per 100 live births	(1) Sully E, Dibaba Y, Fetters T, *et al.* Playing it Safe: Legal and Clandestine Abortions Among Adolescents in Ethiopia. *J Adolesc Health* 2018;62:729–36. doi:10.1016/j.jadohealth.2017.12.015 (2) Harlap S, Shiono P, Ramcharan S. A life table of spontaneous abortions and the effects of age, parity and other variables. In: Porter I, Hook E, eds. Human embryonic and fetal death. New York: Academic Press 1980. 145–58.	Age specific	We assume that the proportion of second trimester miscarriages does not differ by marital status or residence within each age group.

2b	% accessing facility delivery	Zimbabwe National Statistics Agency, ICF International. 2016. Zimbabwe Demographic and Health Survey 2015: Final Report.	Age and subgroup* specific	We use the AICM assumption[1] that facility delivery access is equivalent to access for treatment of second trimester miscarriages.
3a	National Multiplier	Details on calculations and sources in Section 3 below.	National	The national multiplier for all age and marital status groups assumes that complications and treatment seeking do not differ by age or marital status.
3b	Urban or Rural Multiplier	Details on calculations and sources in Section 3 below.	Specific to urban and rural subgroups, but not age specific	The residence-specific multiplier assumes that complications and treatment seeking do not differ by age within rural or urban subgroups.
4	% of abortions performed outside of Zimbabwe	Sully EA, Madziyire MG, Riley T, et al. Abortion in Zimbabwe: A national study of the incidence of induced abortion, unintended pregnancy and post-abortion care in 2016. PLOS ONE 2018;13:e0205239. doi:10.1371/journal.pone.0205239	National	We assume the proportion of abortions performed outside of Zimbabwe does not differ by age or subgroup.
Sources used for Unintended Pregnancy calculations				
N/A	Proportion of births that are unintended	Zimbabwe National Statistics Agency, ICF International. 2016. Zimbabwe Demographic and Health Survey 2015: Final Report.	Age and subgroup* specific	N/A
N/A	Pregnancies ending in miscarriage	Leridon H. Human Fertility: The Basic Component. Chicago: University of Chicago Press; 1977.	National	We assume 20% of live births and 10% of induced abortions end in miscarriages.[1]

*Subgroups refer to marital status (currently married or unmarried) and residence (urban or rural).

II. Adjustments to align summed age groups to the national total

To ensure that the age groups summed to the national total, we made adjustments at two keys points. We adjusted the sum of total number of induced abortions by age group to add up to the national total of induced abortions [2]. We also did this adjustment for unintended births, intended births, unintended miscarriages, and intended miscarriages to ensure the unintended pregnancy, intended pregnancy, and overall pregnancy totals aligned with the national numbers [2]. After adjusting the summed age groups to the national total, we calculated one further adjustment for the subgroups within the 15-19 year old age group and the 15-49 age group. We adjusted at those same two key points to ensure that, for instance, 15-19 unmarried women plus 15-19 married women equaled the 15-19 year old total. We only looked at subgroup differences among the adolescent age group (15-19) and all women of reproductive age (15-49).

III. Calculation of the multipliers

a. National

We used the approach outlined in the methods section and mathematical appendix A of Sully et al. [2], which was used to calculate regional multipliers, in order to calculate the national multiplier for this analysis. We applied the national multiplier to all age groups and marital status subgroups in the absence of age-specific and marital status-specific multipliers

b. Urban and rural multipliers

Since complications and access to treatment likely vary based on residence or wealth status, the proportion of treated complications from induced abortions was estimated for four subgroups of women: rural poor, rural non-poor, urban poor and urban non-poor [2]. We used this subgroup data to construct two new multipliers, a multiplier for all women in rural areas and a multiplier for all women in urban areas. Using rural as an example, we calculated the proportion of rural poor women and rural non-poor women who received treatment for complications, and weighted these by the population proportion of rural women who are poor and non-poor, respectively, to estimate the rural multiplier. We did the same for the urban multiplier. The population of women in each residence and wealth group was from the Zimbabwe Demographic and Health Survey and the Zimbabwe National Statistic Agency, respectively.[3,4]

References

1 Singh S, Prada E, Juarez F. The Abortion Incidence Complications Method: A Quantitative Technique. In: Singh S, Remez L, Tartaglione A, eds. *Methodologies for Estimating Abortion Incidence and Abortion-Related Morbidity: A Review*. New York and Paris: : Guttmacher Institute and International Union for the Scientific Study of Population 2010. 63–70.

2 Sully EA, Madziyire MG, Riley T, *et al.* Abortion in Zimbabwe: A national study of the incidence of induced abortion, unintended pregnancy and post-abortion care in 2016. *PLOS ONE* 2018;**13**:e0205239. doi:10.1371/journal.pone.0205239

3 Zimbabwe National Statistics Agency, ICF International. Zimbabwe Demographic and Health Survey 2015: Final Report. 2016.

4 ZIMSTAT. Poverty and Poverty Datum Line Analysis in Zimbabwe 2011/12. Harare, Zimbabwe: : Zimbabwe National Statistics Agency 2013. https://www.undp.org/content/dam/zimbabwe/docs/Governance/UNDP_ZW_PR_Zimbabwe%20Poverty%20Report%202011.pdf (accessed 1 Aug 2019).