

Estimating the male circumcision rates for the evaluation of public health programmes in South Africa.

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March 2, 2020

1 Data

Data from five nationally representative household surveys that asked men about their circumcision status conducted in South Africa between 2002 and 2017 were included in the analysis; South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey (SABSSM) from 2002, 2008, 2012 and 2017 as well as the Demographic and Health Survey (DHS) from 2016. Information related to age, residence, population group, language spoken at home, circumcision status and age at circumcision was extracted for a total 51,886 individuals across all surveys.

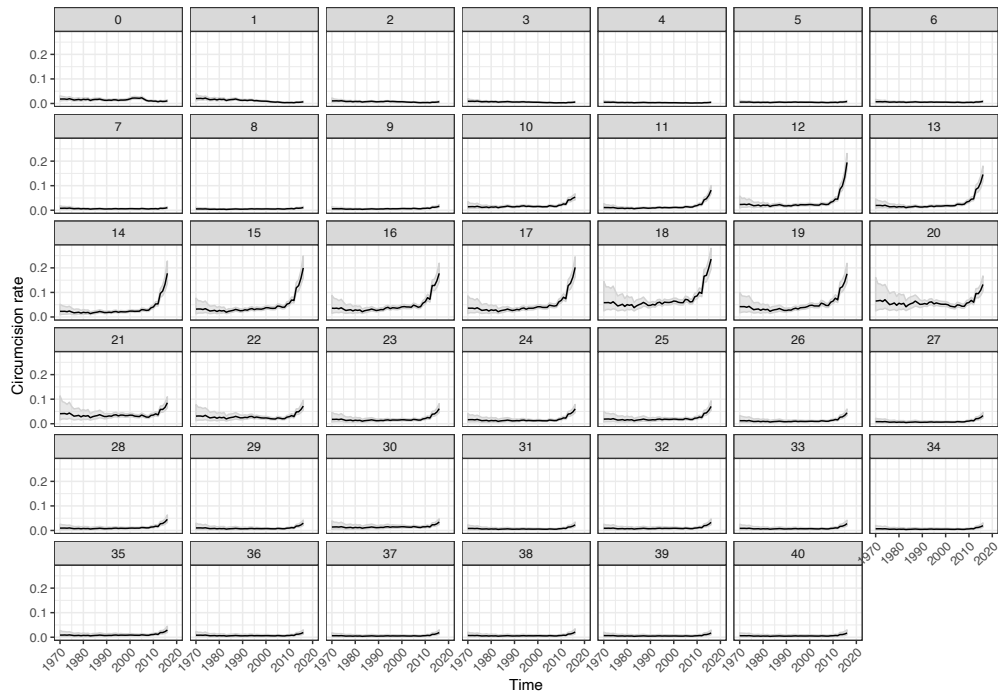
2 Statistical Methods

Circumcision rate was modelled using a survival analysis with a hazard rate (with a log link). The linear predictor included an intercept, a random walk on time, IID random effects on any stratification variable/group (for example language group) along with interaction terms between time and the stratification variable to account for any intra-stratification/time effects on circumcision observed. Models were implemented using template model builder (TMB).

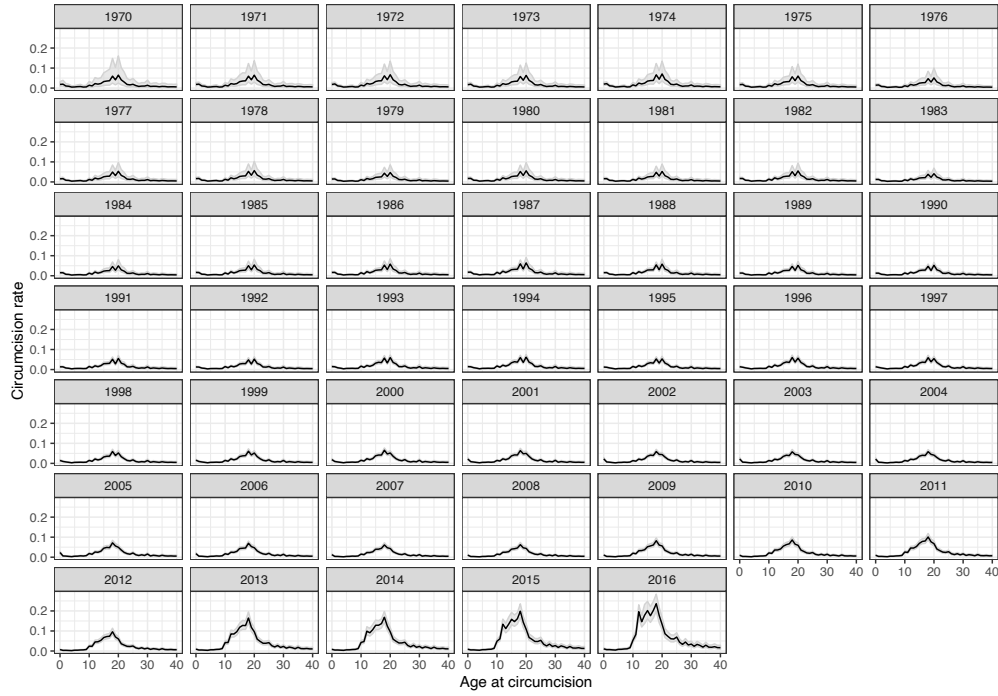
3 Next Steps

Future developments of this model include

- Integrating VMMC programme data about number of MCs conducted into the model.
- Separate components in the model to estimate the traditional and medical circumcision rates.



(a) By time



(b) By age

Figure 1: Estimated circumcision rate in South Africa by by age and time. Lines denotes the median and the shaded area denotes the 95% CI.

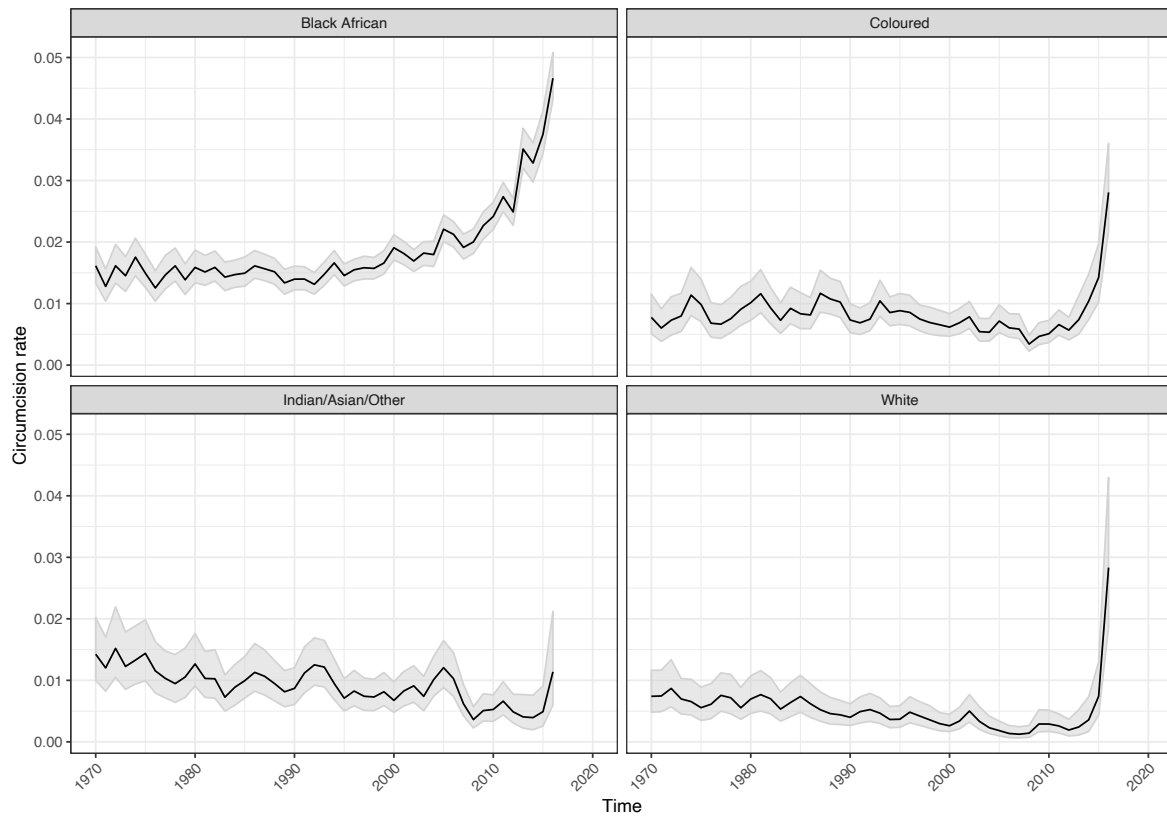


Figure 2: Estimated circumcision rate in South Africa between 1940 and 2016 by population group. Lines denotes the median and the shaded area denotes the 95% CI.

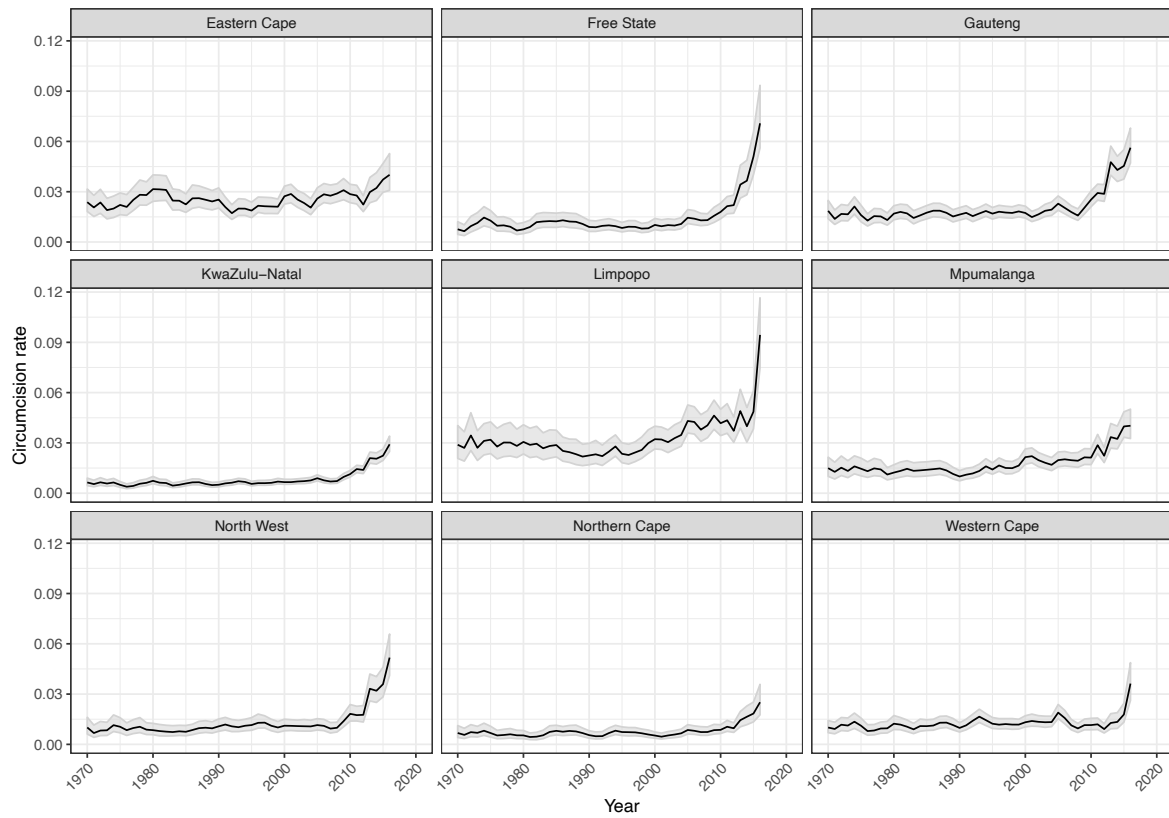


Figure 3: Estimated circumcision rate in South Africa between 1940 and 2016 by province. Lines denotes the median and the shaded area denotes the 95% CI.

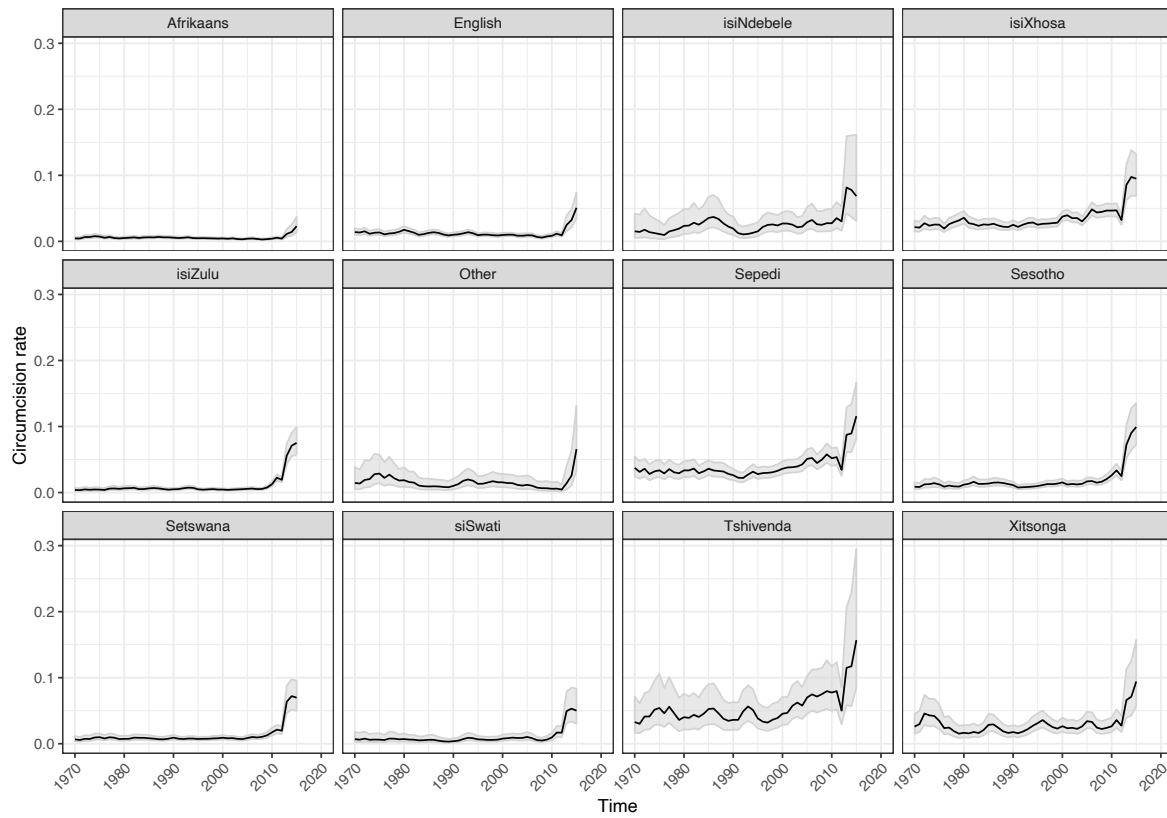


Figure 4: Estimated circumcision rate in South Africa between 1940 and 2016 by language group. Lines denotes the median and the shaded area denotes the 95% CI. Note: these results do not include the 2017 SABSSM survey as language variable is currently missing from the dataset.

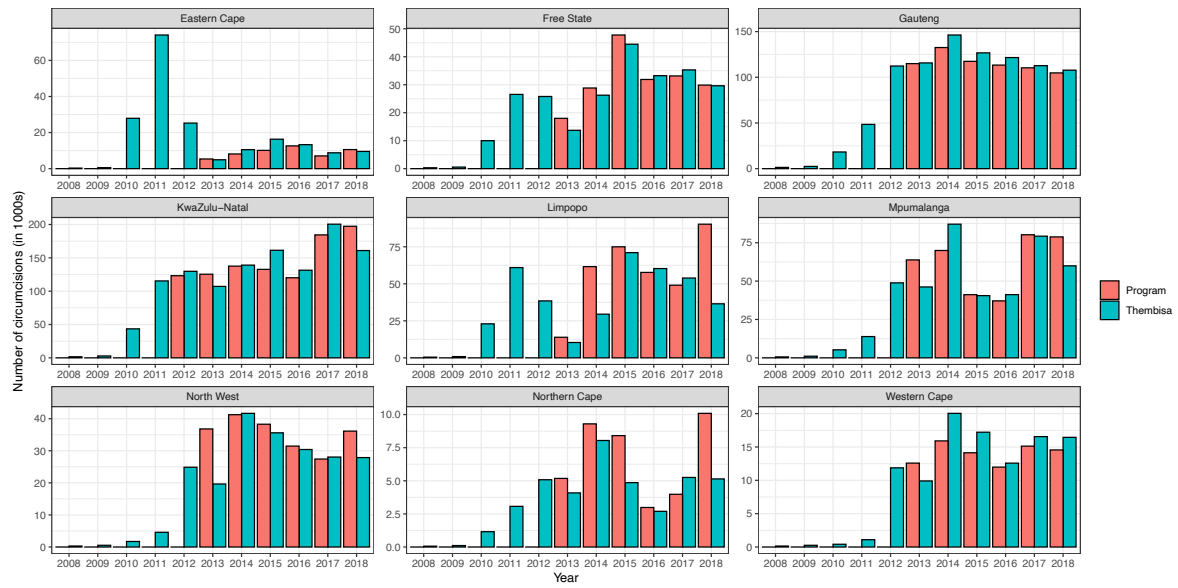


Figure 5: Estimated number of circumcisions performed in each province in South Africa between 2008 and 2018, as reported from Thembisa and VMMC programmes.

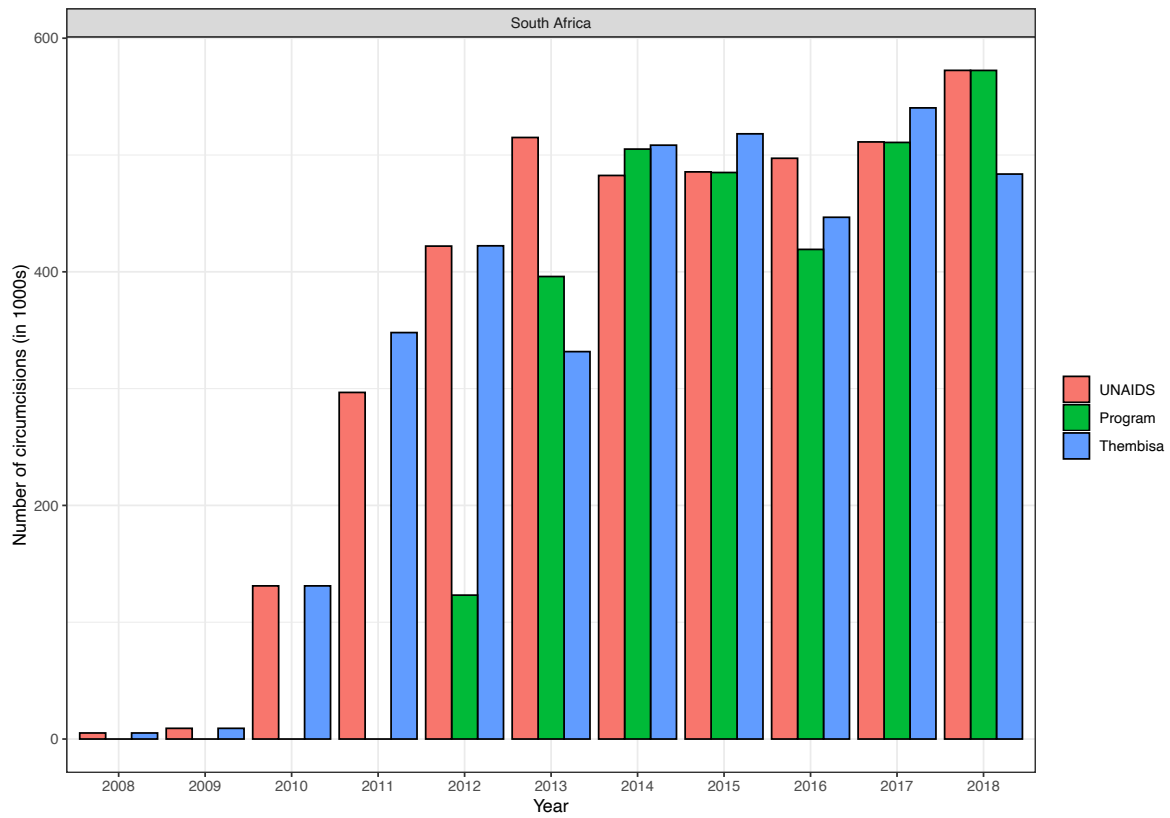


Figure 6: Estimated number of circumcisions performed in South Africa between 2008 and 2018, as reported from Thembisa, UNAIDS and VMMC programmes.