Substantial but spatially heterogeneous progress in male circumcision for HIV prevention in South Africa

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Introduction

- Preventing HIV infection continues to be a major public health priority.
- Voluntary medical male circumcision (MMC) reduces the risk of male HIV acquisition by 60% and programmes to provide circumcisions for HIV prevention have been introduced in sub-Saharan countries with a high HIV burden and low male circumcision coverage.
- Ambitious targets were set to achieve 80% circumcision coverage among men aged 15–49 years and a 90% coverage in men aged 10–29.
- Traditional male circumcision (TMC) is also a long-standing male coming-of age ritual, but practices vary considerably across populations.
- Accurate estimates of circumcision coverage by age, type, and time at subnational levels are required for planning and delivering MMCs to meet targets and evaluate their impacts on HIV incidence.

Methods

- We developed a Bayesian model to produce region-age-time-type specific probabilities and coverage of male circumcision, that jointly synthesises data from household surveys and health system data on the number of MMCs conducted.
- Probabilities of MMC and TMC by region, age, and time estimated using a competing risks discrete-time time-to-event model, informed using household survey data.
- Supplemented with the reported number of MMCs conducted in each district for HIV prevention using a Poisson model.
- A weighted pseudo-likelihood was used to account for survey design.
- Used the model to produce estimates of circumcision coverage for 52 districts in South Africa between 2008 and 2019.

Results

- Nationally, between 350,000 and 650,000 MMCs were conducted in South Africa each year from 2010 to 2019.
- Circumcision coverage among men aged 15–49 years was estimated at 64.0% in 2019, an increase of 20.5% since 2008.
- TMC was more common in 2008 with coverage of 24.1% among men 15–49 years compared with MMC coverage of 19.4%.
- This reversed by 2019 with a MMC coverage of 42.0% compared with a decrease in TMC coverage to 22.0%.

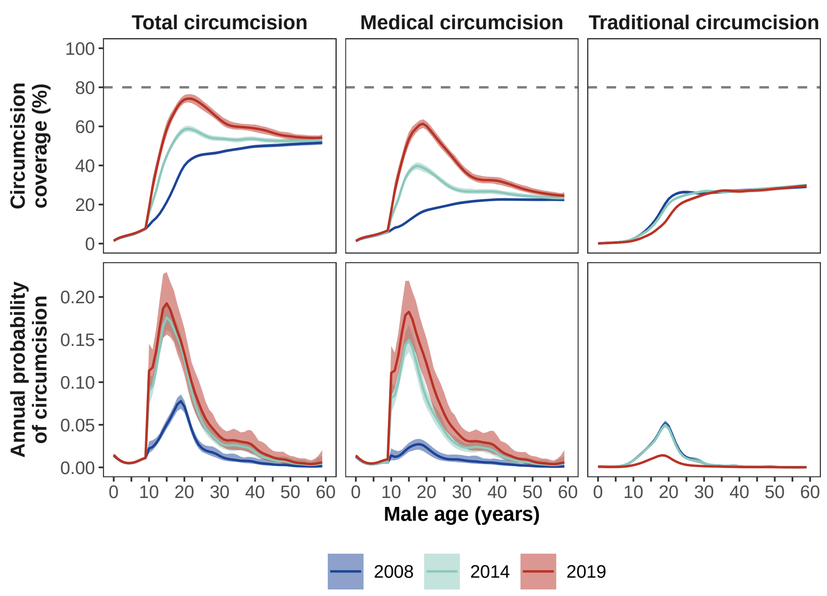

Figure: National coverage and probability of total, medical and TMC by age in 2008, 2014 and 2019. Lines denote the posterior mean with shaded regions denoting the 95% CI. Dashed line denotes the target circumcision coverage of 80%.

- Circumcision coverage varied considerably across of South Africa, ranging from 18.4% to 94.3% at the district level, in 2019.
- Coverage increased in all districts in South Africa since 2008, however this has not been uniform, due to MMC programme targeting.
- Districts with the largest increases in coverage (up to 47%) were located KwaZulu-Natal, Mpumalanga, and Free State.

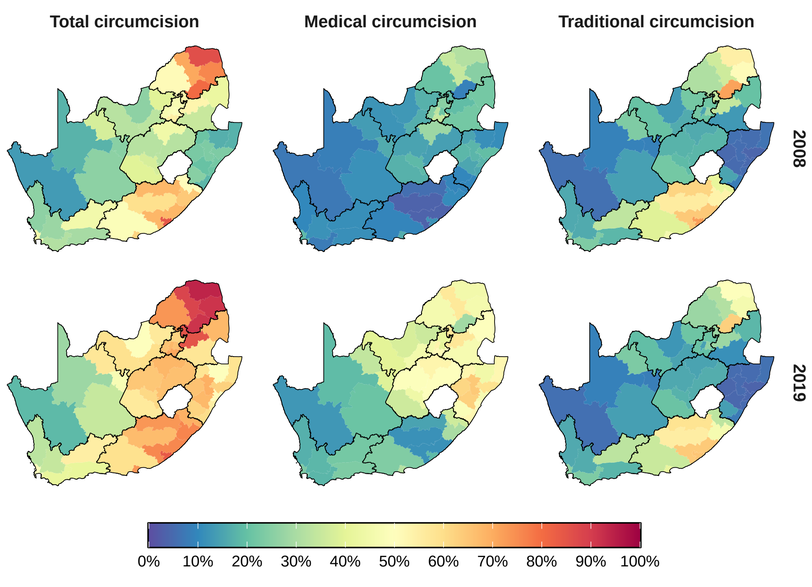

Figure: Estimated coverage of total, medical and TMC for men aged 15-49 in each district in 2008 and 2019. Colours denote the posterior mean.

Results

- The distribution of age at circumcision varied considerably by circumcision type and geography in South Africa.
- Nationally, the average age of circumcision was 18.4 years for MMC and 17.4 years for TMCs.
- The average age of TMC was considerably lower in Limpopo for both TMC (12.2 years) and MMC (14.7 years).
- Western Cape had a lower average age of MMC (15.6 years) due to high number at birth, but had the highest average age of TMCs (20.2 years).

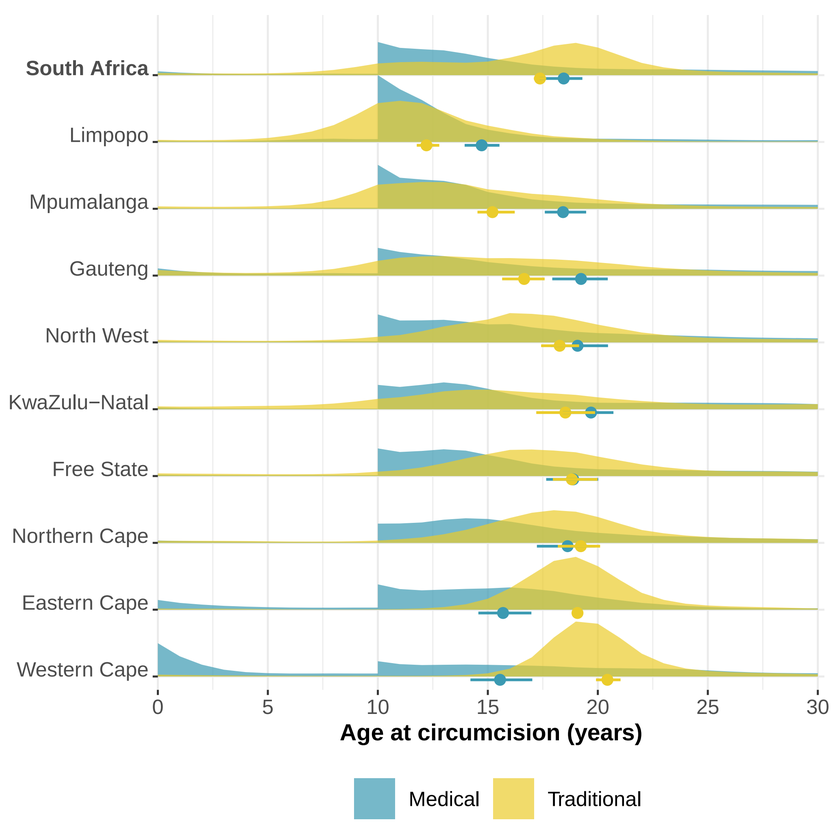

Figure: Distribution of age at circumcision for medical and TMCs in 2019. Results shown for South Africa overall and for each province. Dots below each density denote the average age of circumcision, with the bars denoting the 95% CI.

- By 2019, only 6 out of 52 districts were estimated to have achieved the 80% circumcision coverage target in men aged 15–49.
- No districts achieved the ambitious targets of 90% coverage in adolescent boys and young men aged 10–29 years.
- In 2019, there were estimated to be 5.4 million uncircumcised men aged 15–49 years, with the largest number located in metropolitan areas of Cape Town, Johannesburg, and eThekwini.

Conclusions

- South Africa has made considerable progress towards increasing coverage of MMC for HIV prevention.
- Results highlight considerable heterogeneity in circumcision coverage across South Africa and in the changes between 2008 and 2019.
- Detailed subnational information on coverage and practices can guide programmes to identify unmet need to achieve national and international targets.

Full paper

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