# Estimating the Effects of Targeting Voluntary Medical Male Circumcision Programs to Different Age Groups: The Decision Makers Program Planning Toolkit (DMPPT 2.0)


HEALTH POLICY PROJECT

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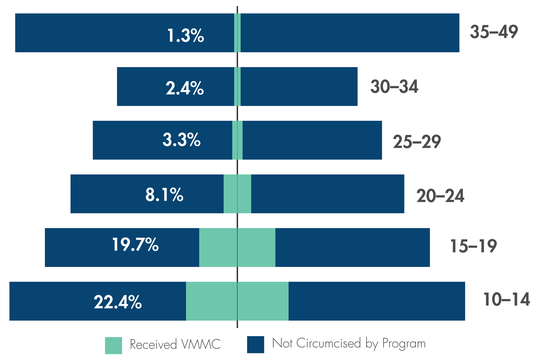
## BACKGROUND

Compelling evidence of the effectiveness of voluntary medical male circumcision (VMMC) as an HIV prevention intervention emerged during three randomized control trials that concluded in 2007.[1–3] In December 2011, the World Health Organization and UNAIDS established a global strategic target of scaling up VMMC to reach 80 percent male circumcision prevalence among priority countries by 2016.

As programs have rolled out VMMC, questions have arisen about how programs can be focused on populations where they will achieve the greatest impact. For example, most country plans focus on men ages 15–49, but recent experience shows that most clients are under age 25 (Figure 1). Should programs adjust demand creation efforts to focus on older men? The Health Policy Project, with funding from PEPFAR through USAID, constructed a new model, DMPPT 2.0, to examine the impact and cost of focusing circumcision services on different age groups and subnational regions.

### Figure 1. Percentage of Males Receiving VMMC by 2013

**The percentage of men circumcised by the VMMC program within each age group of the male population in Tanzania decreases with client age. The total size of each bar (teal plus navy) represents the size of the male population within each age group. The size of the teal bars represents the number of men circumcised by the program within each age group. Client age information is based on PEPFAR reporting data from 2012. The number of circumcisions was derived from PEPFAR reporting data for 2009–2013. The age distribution of the male population is derived from Spectrum/AIM[4] projections.**

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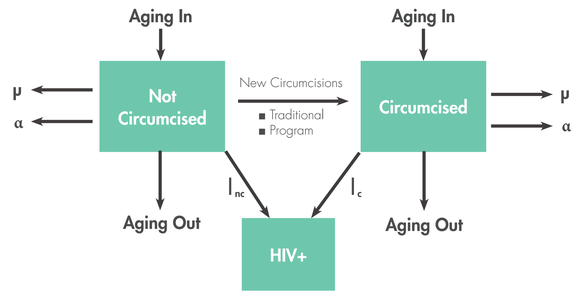
## METHODS

### Model procedure

1. Estimate HIV incidence among circumcised and uncircumcised males from data on MC effectiveness, total HIV incidence, and percentage circumcised.
2. Estimate the effect of scaling up VMMC on male HIV incidence each year. The circumcision effects are traced through time as men age and become infected or remain uninfected.
3. Estimate indirect HIV incidence reduction in females based on Goals modeling.
4. Specify scenarios for: various age groups, coverage by age group, time to maximum coverage.
5. Estimate key output indicators:
   - Infections averted by year
   - Cost per infection averted
   - Circumcisions per infection averted

### Figure 2. The DMPPT 2.0 Model Tracks the Population by Age, Sex, HIV Status, and Circumcision Status




μ = non-AIDS mortality; α = AIDS mortality; $I_{nc}$ $I_c$ = HIV incidence among uncircumcised (nc) and circumcised (c)

### Inputs required by the model

#### Country-specific Data

- National Spectrum/AIM or Goals projection (or subnational when analysis is desired)
- Current prevalence of circumcision by age
- Unit costs for service delivery and demand generation by age
- VMMCs performed since 2007 by age, year, subnational region
- Costs of antiretroviral therapy (ART) per patient
- Discount rate

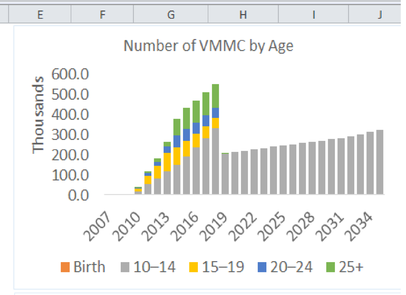
#### Default Data

- Effectiveness of MC
- Ratio of female infections averted to male infections averted

### Figure 3. Part of DMPPT 2.0 Model Dashboard

**This part of the dashboard illustrates a user-specified VMMC scale-up scenario by age and annual targets by age based on that scenario.**

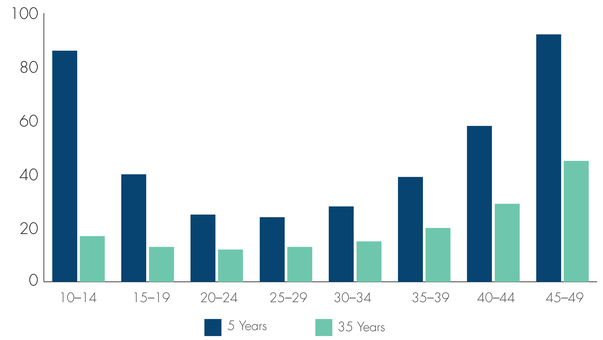
| | A | B | C |
|---|---|---|---|
| 1 | | Baseline MC Prevalence | Target Coverage in 2018 |
| 2 | EIMC | 5% | 5% |
| 3 | | | |
| 4 | 10–14 | 22% | 80% |
| 5 | 15–19 | 40% | 80% |
| 6 | 20–24 | 49% | 80% |
| 7 | 25–29 | 41% | 80% |
| 8 | 30–34 | 46% | 80% |
| 9 | 35–39 | 47% | 47% |
| 10 | 40–44 | 43% | 43% |
| 11 | 45–49 | 37% | 37% |
| 12 | 50–54 | 37% | 37% |
| 13 | 55–59 | 37% | 37% |




## RESULTS

In the short term, circumcising men ages 20–34 will be most effective because most new infections occur among this age group. In the long term, younger men would benefit most because a person who is circumcised at age 20 will be protected through 20 years of high incidence (ages 20–39) while a person circumcised at age 35 will only be protected through 5 years of high incidence (Figure 4). Neonatal circumcision provides lifetime protection, but since the benefits are delayed by 20 years this may not be the most cost-effective option unless the costs are significantly lower than adult circumcision and discount rates are low.

### Figure 4. Number of Male Circumcisions per HIV Infection Averted by Age at Circumcision, Cumulated over 5 Years and 35 Years and Discounted at 3% per Year, Illustrative Results




## CONCLUSIONS AND RECOMMENDATIONS

Male circumcision programs do not need to make special efforts to recruit older men. They are already reaching the most appropriate age groups to maximize impact and cost-effectiveness. The DMPPT 2.0 was applied in five African countries to assist governments with setting targets and prioritizing subpopulations by age and subnational regions. Results from these analyses have informed national VMMC operational plans and strategies.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