**S1 Table. Definitions of the symbols in the equations of the age-structured mathematical (ASM) model**

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| Parameter | Definition |
|  | HIV-susceptible population belonging to sex and circumcision group   |
|  | Populations with HIV infection where the index  marks the stage of HIV pathogenesis;  stand for acute, latent, and advanced stages, respectively |
|  | Total female population size in each sexual risk group |
|  | Total male population size in each sexual risk group |
|   | Population growth rate parameter |
|   | Fraction of the male population that is circumcised before starting sexual activity (traditional circumcision) |
|  | Rate of progression from acute HIV infection stage to latent stage |
|  | Rate of progression from latent HIV infection stage to late stage |
|  | Rate of AIDS disease mortality |
|  | Natural death rate |
|   | Transition rate from one age group to the next age group |
|   | Average rate at which non-circumcised males are being circumcised as part of a voluntary medical male circumcision intervention |
|  | HIV force of infection experienced by each susceptible population |