

Supplementary Appendix 1: Lifetable equations

The size of the MSM population of each age not previously diagnosed with HIV in each year was defined by the equation:

$$M_{a,t} = N_{a,t} * P_{msma} * Q_{a,t}$$

The proportion of the MSM population without an HIV diagnosis was defined by:

$$Q_{a,t+1} = Q_{a,t} * (1 - D_{a,t} / M_{a,t})$$

Where:

$M_{a,t}$ = Number MSM at risk in population of age a at year t

$N_{a,t}$ = Number of men age a at year t

P_{msma} = Proportion of men age a who are MSM

$Q_{a,t}$ = Probability of being free of HIV at age a and year t;

$Q_{a,t} = 1.0$ for all $a < 18$ and for all $t < 1982$

$D_{a,t}$ = Number of new HIV diagnoses at age a and year t

The model assumed that in- and out-migration of MSM from each area did not vary by HIV status.