

CSE 6730, Group 37

Description of parameters governing testing, natural recovery and transmission probability

1 Assumptions

- Only unprotected acts modeled in this analysis
- No age mixing input preference
- Partner notification is stratified by sex and age, however in the absence of data on changes in this prevention strategy, the parameters are kept time invariant
- Only heterosexual partnerships.
- Treatment ensued immediately following identification of infection, although this may not always happen in practice.

Parameter/Variable	Description	Distribution
Population size	Population size for each age group	Uniformly distributed
Time step	Time step implemented in the model	A day
High risk	Fraction of the population defined as high risk	10% (Assumption)
Low risk	Fraction of the population defined as low risk	90% (Assumption)
Testing symptomatic individuals		
Women	Testing of symptomatic women	$1/(52*(0.079+0.072*\text{Beta}(4,4)))$
Men	Testing of symptomatic men	$1/(52*(0.079+0.072*\text{Beta}(4,4)))$
Casual partners		
High risk(HR)	Single, 65-79 HR	Beta(3,60)
	Single, 80-95 HR	Beta(3,400)
Low risk(LR)	Single, 65-79 LR	Beta(1,160)
	Single, 80-95 LR	Beta(1,160)
Among paired		
High risk(HR)	Single, 65-79 HR	Beta(10,70)
Low risk(LR)	Single, 80-95 LR	Beta(10,100)
Transmission		
Transmission probability	Per act probability	Beta(5.5, 50))
With condom protection	condom effect parameter estimate is 1.6	Beta(5.5,50) ^{1.6}
Natural recovery		
Women		$1/(52*(1.13+0.5*\text{Beta}(4,4.969)))$
Men		$1/(52*(1.13+0.5*\text{Beta}(4,4.969)))$
Treatment Success		
Efficiency of antibiotics		Beta(190,8))
Partner Notification		
Women	Age65-79	Beta(4,3)
	Age80-95	Beta(4,3)
Men	Age65-79	Beta(4,3)
	Age80-95	Beta(4,3)
Condom Use		
Casual partners	Weighted prevalence	0.131
Paired	Weighted prevalence	0.368

Table 1: Description of parameters governing testing, natural recovery and transmission probability

we chose to fix the fraction of the population defined as high risk at constant 10%, but accommodate uncertainty in levels of risk behavior by varying the partner change rates by relationship states and age, in each of the risk groups. Defining a set proportion of the population to belong to a risk group and varying partner change rates is a modeling convention