

	$N_i \bar{c}_i$	
X_{ij}		
$N_j \bar{c}_j$	$N \bar{c}$	

Expected value of X_{ij} : $E(X_{ij}) = \frac{N_i \bar{c}_i \times N_j \bar{c}_j}{N \bar{c}}$ under independence, can separate into

2 components: $\frac{N_i \bar{c}_i}{N}$ and $\frac{\bar{c}_j \bar{c}_j}{\bar{c}}$

Parameter α_{ij} allows us to modify contact as the population structure changes.

We model this term: $\log(\alpha_{ij}) = \lambda + \lambda_i + \lambda_j + \lambda_{ij}$ — allow for different (non-random) mixing

λ_{ij} can plug into the infection rate

If we preserve the odds ratio, $\frac{N_i \bar{c}_i}{N}$ will be treated as an offset