The force of infections are

$$\lambda_G = (1-\phi_G)\beta_I S_G \frac{I_G}{N_G} \tag{1}$$

$$\lambda_F = \omega\beta_I S_F \frac{F_T}{F_T + N_F} \tag{2}$$

$$\lambda_W = (1-\phi_W)\beta_W S_W \frac{I_W + I_{WE} + I_{GE}}{N_W + I_{GE}} \tag{3}$$

The other rates are

$$\gamma_{FG} = (1-\theta)(1-p_G)\delta_G\gamma_D \tag{4}$$

$$\gamma_{DG} = (1-\theta)p_G\delta_G\gamma_D \tag{5}$$

$$\gamma_{RG} = (1-\theta)(1-\delta_G)\gamma_R \tag{6}$$

$$\gamma_{FH} = (1-p_H)\delta_H\gamma_{DH} \tag{7}$$

$$\bar{\gamma}_{DH} = p_H\delta_H\gamma_{DH} \tag{8}$$

$$\bar{\gamma}_{RH} = (1-\delta_H)\gamma_{RH} \tag{9}$$

and general community attends funeral with a rate of

$$f_{GF} = M_F \left[\frac{N_D}{E} + (1-\theta)(1-p_G)\delta_G\gamma_D I_G + (1-p_H)\delta_H\gamma_{DH}(I_{GE} + I_{WE}) \right] \frac{S_G}{N_G - S_F} \tag{10}$$