Number of patients of a speciality in $\mathcal{K}_A$ surviving

Number of patients of a speciality in $\mathcal{K}_B$ surviving

$$g\left(Z_a, \tilde{Z}_a\right) = \sum_{p \in \mathcal{P}} \sum_{\alpha \in \mathcal{A}} \left(\sum_{k \in \mathcal{K}_A} w_k \; \lambda_{pk} \hat{\Psi}_{kpa} + \sum_{k \in \mathcal{K}_B} w_k \; \lambda_{pk} \Psi_{kpa} \right)$$

Expected number of patients surviving, given allocations Z_a and $\tilde{Z}_a$

Weights

Probability of surviving

Probability of that a *primary* vehicle is not busy

Probability all closer *primary* vehicles are busy

Probability of patient speciality k at location p being seen by a *primary* vehicle from station a and survivng

$$\Psi_{kpa} = s_k\left(b_{pa}\right) \left(1 - \pi_a^{Z_a}\right) \prod_{\alpha \in \mathcal{A}} \pi_\alpha^{\left(Z_\alpha \beta_{p\alpha a}\right)}$$

Probability of surviving

Probability of that a *secondary* vehicle is not busy

Probability all closer *secondary* vehicles are busy

Probability of patient speciality k at location p being seen by a vehicle from station a and survivng

Probability all closer *primary* vehicles are busy

$$\hat{\Psi}_{kpa} = s_k\left(\tilde{b}_{pa}\right) \left(1 - \tilde{\pi}_a^{\tilde{Z}_a}\right) \prod_{\alpha \in \mathcal{A}} \tilde{\pi}_\alpha^{\left(\tilde{Z}_\alpha \beta_{p\alpha a}\right)} \; \pi_\alpha^{\left(Z_\alpha R_{p\alpha a}\right)}$$
$$+ \; s_k\left(b_{pa}\right) \left(1 - \pi_a^{Z_a}\right) \prod_{\alpha \in \mathcal{A}} \pi_\alpha^{\left(Z_\alpha \beta_{p\alpha a}\right)} \; \tilde{\pi}_\alpha^{\left(\tilde{Z}_\alpha \left(1 - R_{p\alpha a}\right)\right)}$$

Probability all closer *secondary* vehicles are busy

Probability all closer *primary* vehicles are busy

Probability of that a *primary* vehicle is not busy

Probability of surviving