S1 Methods. Unbiasedness of growth rate.

Denote our estimator for growth rate of the type-\(i\) clone \(\hat{r}_i\), with true parameter value \(r_i\). The type-\(i\) population has size \(X_i(t)\) at time \(t\). Then,

\[
\text{bias}(\hat{r}_i) = \mathbb{E}(\hat{r}_i) - r_i
\]

\[
= \frac{1}{\Delta} \mathbb{E} \log \left( \frac{X_i(t_{dx} + \Delta)}{X_i(t_{dx})} \right) - r_i
\]

\[
\approx \frac{1}{\Delta} \left( r_i \Delta + \mathbb{E} \log U - \mathbb{E} \log V \right) - r_i
\]

\[
= \frac{1}{\Delta} (r_i \Delta + (\gamma + \log r_i) - (\gamma + \log r_i)) - r_i
\]

\[
= 0
\]

where \(U\) and \(V\) are i.i.d. \(\text{Exp}(r_i/b_i)\), and \(t_{dx}\) is the time of diagnosis.