

Supporting Information

File S4. EM sensitivity to parameter discretization

In Figure S3, we show EM estimates of a constant population size from 1000 local genealogies of 100 individuals. We show that different discretizations result in different estimates. We note that confidence intervals perform poorly in terms of coverage. The performance statistics corresponding to the three estimations displayed in Figure S3 are shown in Table S1.

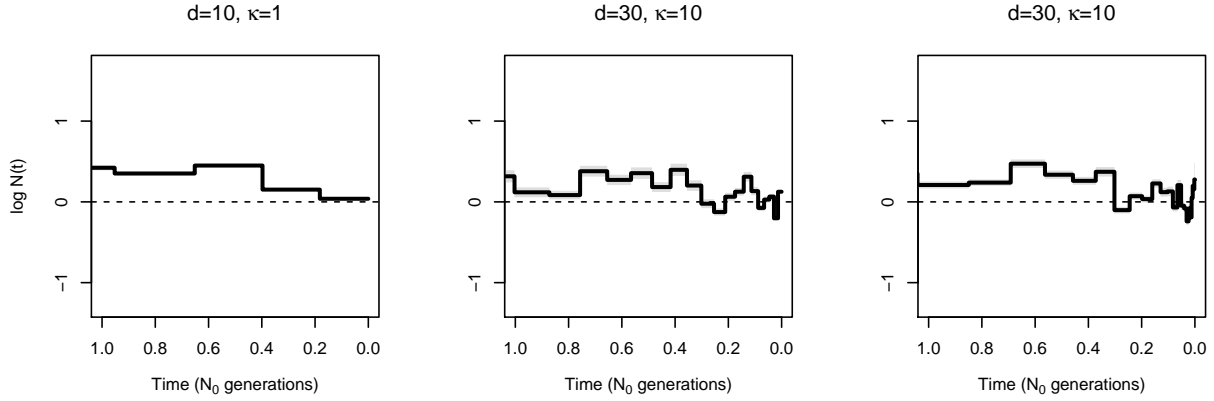


Figure S3: **EM sensitivity to parameter discretization.** Comparison of population size trajectories estimated from 1000 simulated genealogies ($m = 1000$) of 100 individuals with a constant population size. EM inference with different discretizations varying the parameters in Equation 15.

Table S1: *Summary of simulation results depicted in Figure S3. SRE is the sum of relative errors (Equation 24), MRW is the mean relative width of the 95% BCI (Equation 25), and ENV (Equation 26).*

	SRE	MRW	ENV
EM $d = 10, \kappa = 10$	43.41	0.99	48.6%
EM $d = 30, \kappa = 10$	34.25	0.76	42.6%
EM $d = 30, \kappa = 100$	43.96	0.99	46.0%