



**Figure S10:** IBD sharing in an admixture pulse model. (A) Simulations were carried out for the admixture pulse model as described in the Supplementary text (File S1). The mean and the standard deviation (SD) of the total fraction of IBD sharing are plotted. Symbols correspond to simulations (triangles: mean, circles/squares: SD). Solid lines correspond to the main text Eq. (42) for the mean sharing and dashed lines to the main text Eq. (43) for the SD. Blue and red symbols/lines correspond to  $G_a = 5$  and  $G_a = 10$ , respectively. The magenta dashed line corresponds to the theoretical mean sharing if admixture has just occurred,  $G_a = 0$ . (B) P-values for the admixture test. We simulated the admixture pulse model with population size of  $N = 10000$ ,  $L = 150\text{cM}$ ,  $m = 1\text{cM}$ ,  $G_a$  equals 5 or 10, and various values of  $\alpha$ . For each  $G_a$  and  $\alpha$ , the (true) IBD shared segments were extracted and the population size was inferred as  $\hat{N} = 100/(m\overline{f_T}) - 75/m$ , where  $\overline{f_T}$  is the average fraction of sharing over all pairs. Then, 500 populations were simulated with constant size  $\hat{N}$ , and the SD of the cohort-averaged sharing was calculated. The P-value is the fraction of times the SD in the simulations was higher than the one in the admixed population.