

**Table S12. Empirical false positive rate. Population sub-structure** with two sub-populations, split time  $t = 1$  in the past and sampling scheme  $n_1 = 150$ ,  $n_2 = 50$ . Varying migration rate  $m$  per generation per  $4N$  individuals. Significance levels  $\alpha$  are based on theoretical formulae according to eqs (7) and (8).

$m$	$\alpha = 0.01$			$\alpha = 0.05$			SKD*
	$T_2^{(\text{sum})}$	$T_2^{(\text{product})}$	$T_0^{(\text{dist})}$	$T_2^{(\text{sum})}$	$T_2^{(\text{product})}$	$T_0^{(\text{dist})}$	
0.0010	0.00037	0.00034	0.00646	0.00971	0.00696	0.02802	0.0960
0.0020	0.00034	0.00034	0.00648	0.00955	0.00696	0.02831	0.1007
0.0030	0.00038	0.00033	0.00684	0.00922	0.00691	0.02932	0.1014
0.0040	0.0004	0.00042	0.00689	0.01001	0.00745	0.02877	0.1060
0.0050	0.00036	0.00031	0.00644	0.00942	0.00667	0.02811	0.1008
0.0060	0.00038	0.00028	0.00613	0.00972	0.00699	0.02753	0.0940
0.0070	0.00028	0.00033	0.0063	0.00964	0.00686	0.02915	0.0975
0.0080	0.00043	0.00042	0.00687	0.00957	0.00736	0.02924	0.1052
0.0090	0.00031	0.00029	0.00669	0.00995	0.00747	0.02911	0.1029
0.01	0.00036	0.00033	0.00677	0.00919	0.00707	0.02839	0.0996
0.02	0.00035	0.00038	0.00664	0.00935	0.00699	0.02837	0.1029
0.03	0.00031	0.00036	0.00654	0.0095	0.00701	0.02894	0.1021
0.04	0.00037	0.00037	0.00644	0.01004	0.00743	0.02807	0.1063
0.05	0.00031	0.00032	0.007	0.00953	0.00694	0.02816	0.0976
0.06	0.00041	0.00038	0.00701	0.00982	0.00719	0.02869	0.1018
0.07	0.00025	0.00021	0.00629	0.00989	0.007	0.02872	0.0990
0.08	0.00043	0.00044	0.00688	0.00977	0.00733	0.02924	0.1043
0.09	0.00034	0.00033	0.00694	0.00973	0.00744	0.02865	0.0990
0.1	0.00033	0.00031	0.0067	0.00934	0.00715	0.02896	0.0972
0.2	0.00027	0.00033	0.00721	0.00951	0.00681	0.02946	0.0972
0.3	0.00021	0.00031	0.00663	0.0086	0.00643	0.0286	0.0913
0.4	0.00033	0.00038	0.00668	0.00896	0.00699	0.02856	0.0917
0.5	0.00033	0.00042	0.00686	0.00953	0.00689	0.02883	0.0911
0.6	0.00032	0.00035	0.0071	0.00885	0.00654	0.02862	0.0874
0.7	0.00032	0.00036	0.00672	0.00828	0.00659	0.02913	0.0838
0.8	0.00045	0.0004	0.00646	0.00846	0.00689	0.0277	0.0872
0.9	0.00038	0.00045	0.00668	0.00871	0.00716	0.02889	0.0832
1.0	0.00034	0.00041	0.00639	0.00881	0.00694	0.02835	0.0774
1.5	0.00038	0.00021	0.00668	0.00797	0.00635	0.02848	0.0818
2.0	0.00029	0.00034	0.0066	0.00812	0.00644	0.02843	0.0692
4.0	0.00029	0.00031	0.00641	0.00738	0.00611	0.02779	0.0650
6.0	0.00033	0.00027	0.00629	0.00745	0.00647	0.02716	0.0583
8.0	0.00026	0.00022	0.0068	0.00671	0.00575	0.02824	0.0536
10.0	0.00022	0.0003	0.00633	0.00666	0.00537	0.02645	0.0514

\* SKD-test from [37]