

**Table S11. Empirical false positive rate. Population sub-structure** with two sub-populations, split time  $t = 1$  in the past and sampling scheme  $n_1 = 180$ ,  $n_2 = 20$ . 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	0.00197	0.0014	0.01377	0.02399	0.01993	0.05616	0.1894
0.0020	0.00198	0.00152	0.01423	0.02445	0.02137	0.05811	0.1893
0.0030	0.0015	0.00143	0.01323	0.02343	0.01992	0.05627	0.1841
0.0040	0.00191	0.00162	0.01447	0.02497	0.02086	0.05828	0.1803
0.0050	0.00176	0.00156	0.01443	0.02441	0.02026	0.05765	0.1866
0.0060	0.00177	0.00142	0.0141	0.02396	0.02012	0.05781	0.1886
0.0070	0.0019	0.00166	0.01463	0.02406	0.02048	0.05678	0.1863
0.0080	0.00164	0.00126	0.01411	0.02339	0.01971	0.05825	0.1847
0.0090	0.00183	0.0015	0.01455	0.02446	0.0207	0.05646	0.1835
0.01	0.00157	0.0015	0.01428	0.0235	0.02051	0.05809	0.1857
0.02	0.0015	0.00143	0.01422	0.02477	0.01939	0.05741	0.1746
0.03	0.00174	0.0014	0.01425	0.02284	0.01987	0.05649	0.1833
0.04	0.00175	0.00139	0.01452	0.02404	0.02058	0.05852	0.1791
0.05	0.00168	0.00143	0.01365	0.0231	0.01938	0.05487	0.1765
0.06	0.00182	0.0015	0.01403	0.02267	0.01933	0.05672	0.1837
0.07	0.00183	0.00146	0.01434	0.02358	0.02012	0.05625	0.1786
0.08	0.00161	0.00155	0.01359	0.02304	0.01943	0.05567	0.1748
0.09	0.00177	0.00137	0.01342	0.02359	0.01949	0.05539	0.1787
0.1	0.00162	0.00125	0.01383	0.02223	0.01878	0.05529	0.1821
0.2	0.00146	0.00131	0.01368	0.02134	0.01845	0.05454	0.1701
0.3	0.00144	0.00119	0.01298	0.02022	0.01743	0.05323	0.1611
0.4	0.00132	0.00125	0.01351	0.01995	0.01781	0.05164	0.1595
0.5	0.00136	0.00137	0.0129	0.01873	0.0165	0.05076	0.1534
0.6	0.00123	0.00112	0.01309	0.01836	0.01675	0.05062	0.1522
0.7	0.00117	0.00119	0.01252	0.0174	0.01535	0.04955	0.1365
0.8	0.00104	0.00106	0.01208	0.01715	0.01513	0.04755	0.1409
0.9	0.00112	0.00124	0.01232	0.01678	0.01547	0.04723	0.1400
1.0	0.00085	0.00087	0.0121	0.01571	0.01395	0.04523	0.1322
1.5	0.00074	0.00087	0.01134	0.01334	0.01257	0.04351	0.1184
2.0	0.00087	0.00083	0.01077	0.01259	0.01147	0.03993	0.1040
4.0	0.00039	0.00065	0.00913	0.01035	0.00903	0.03572	0.0880
6.0	0.00035	0.00054	0.0086	0.0084	0.00766	0.03228	0.0818
8.0	0.00028	0.00045	0.0082	0.00804	0.00755	0.03158	0.0755
10.0	0.00042	0.00037	0.00809	0.00761	0.00674	0.0304	0.0705

\* SKD-test from [37]