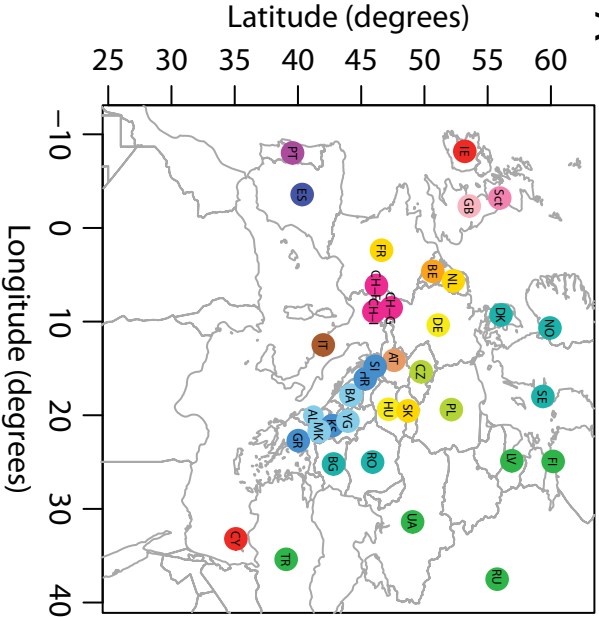
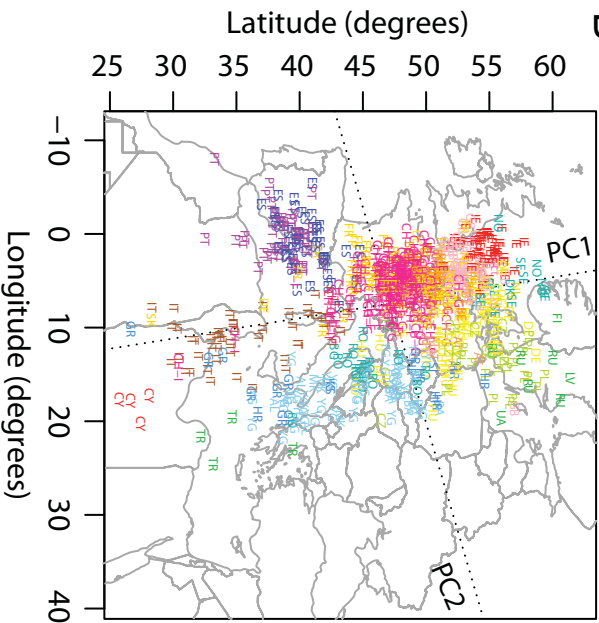
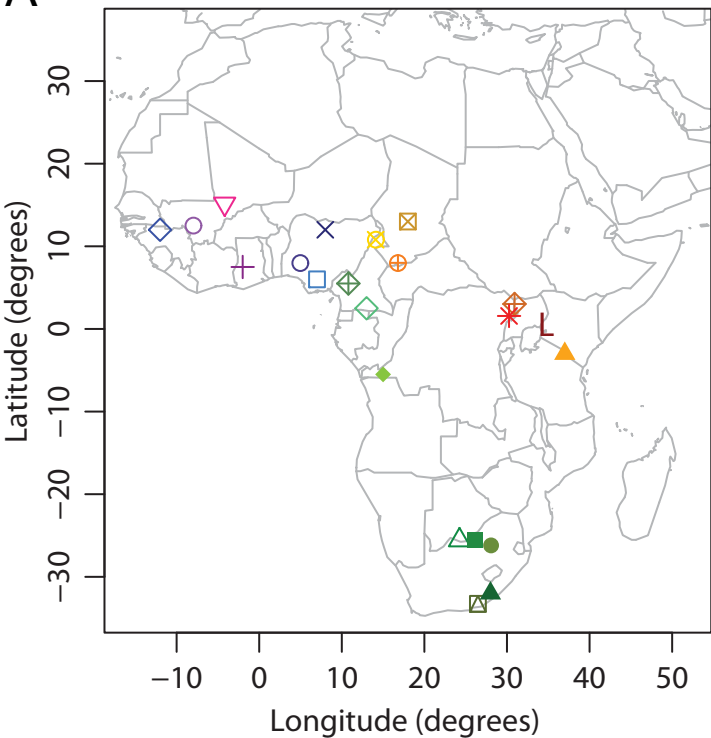
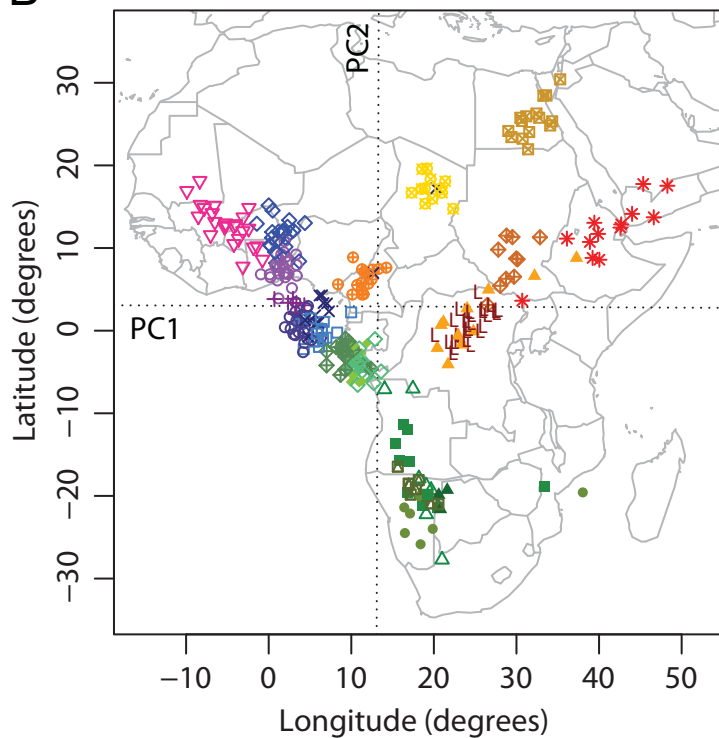


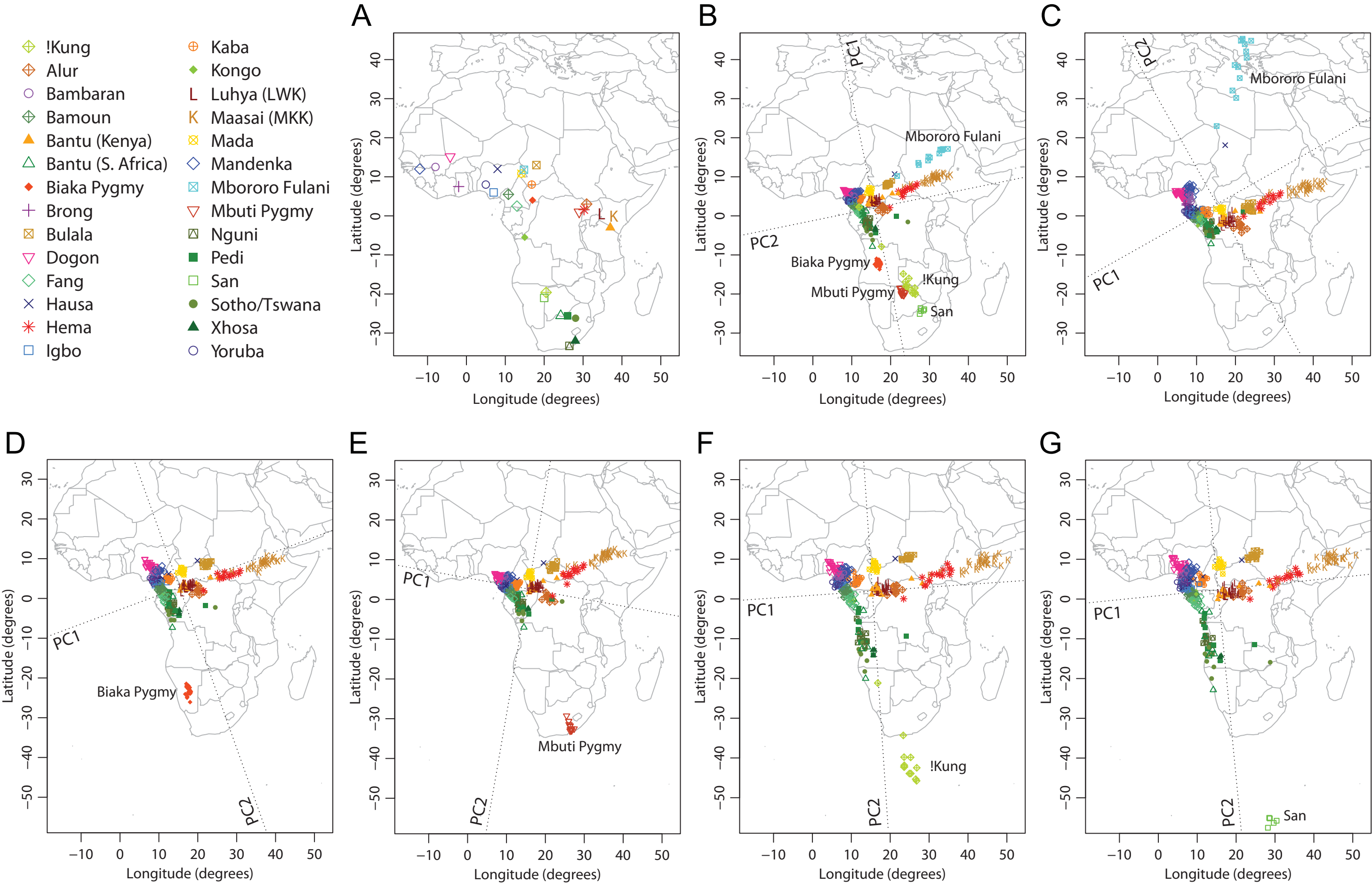
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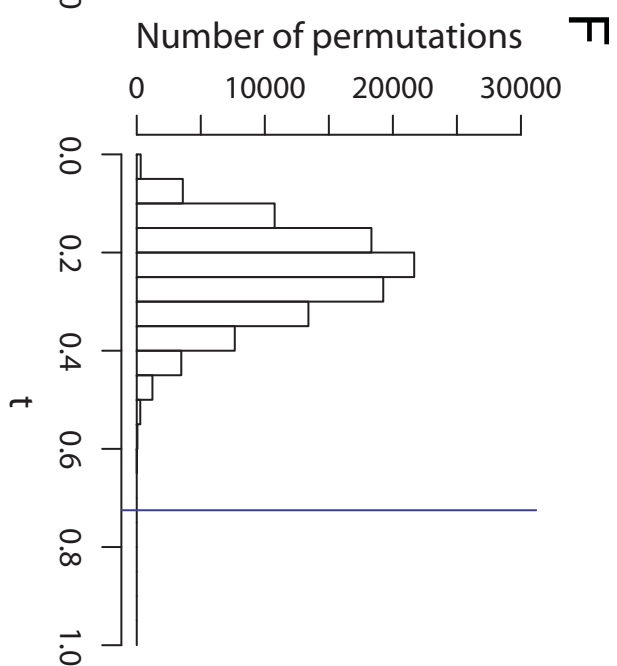
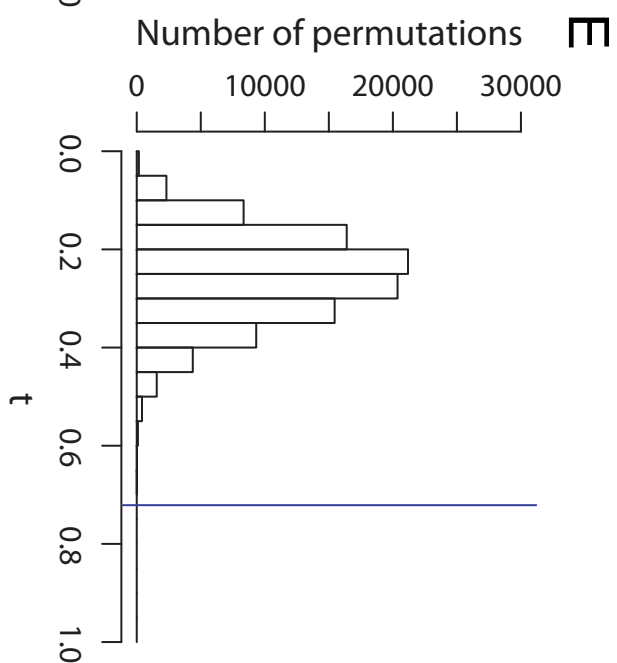
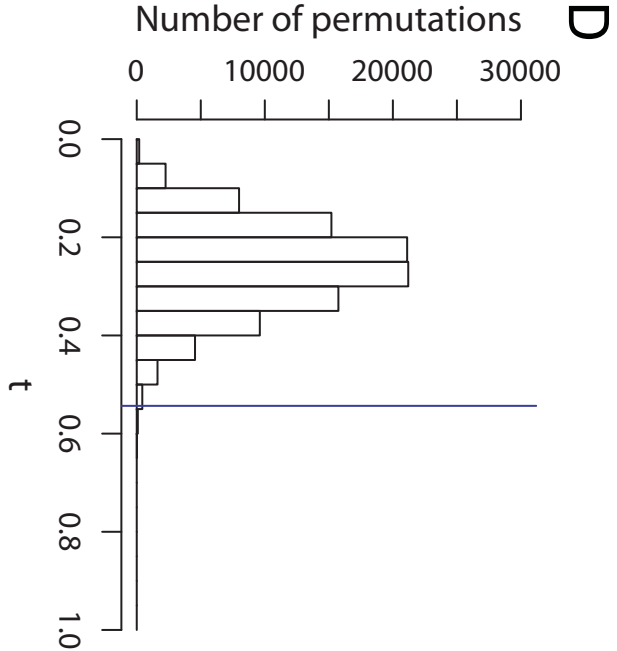
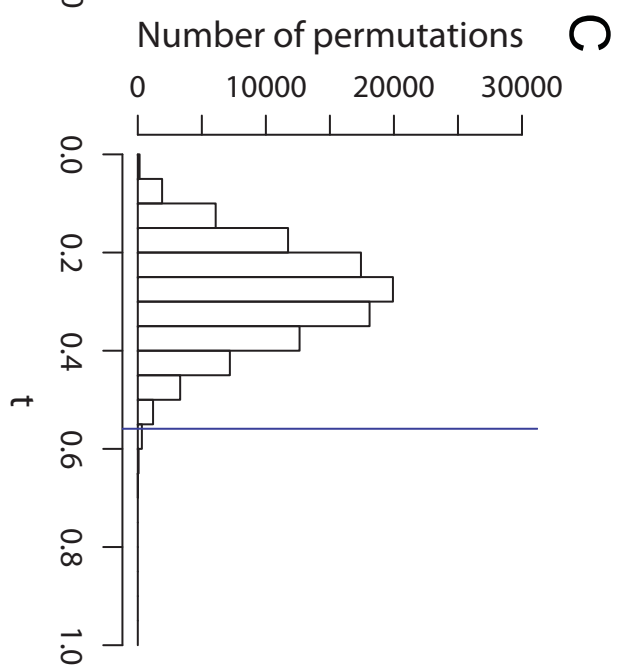
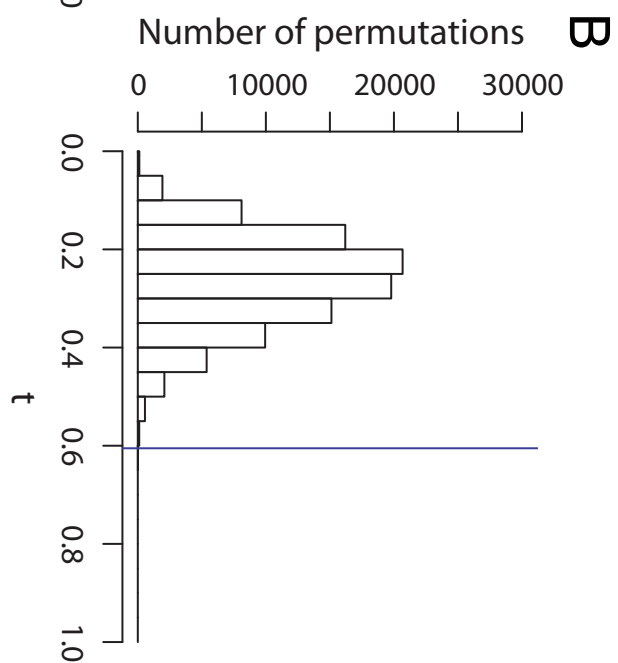
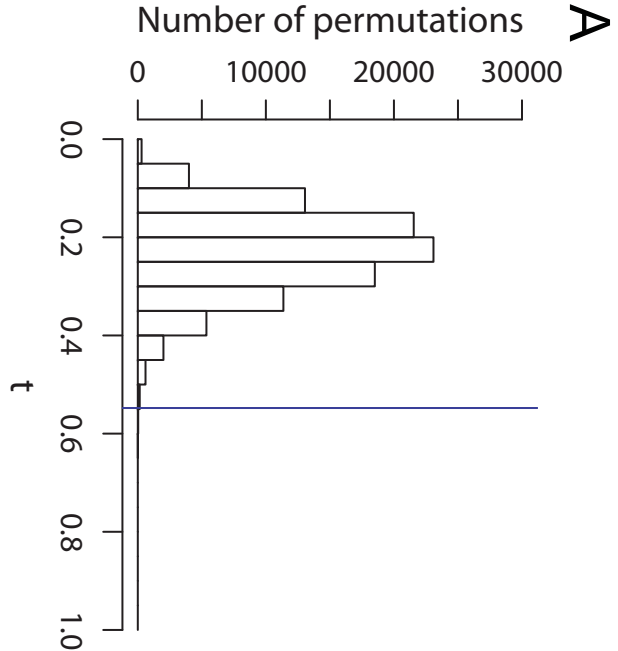


B

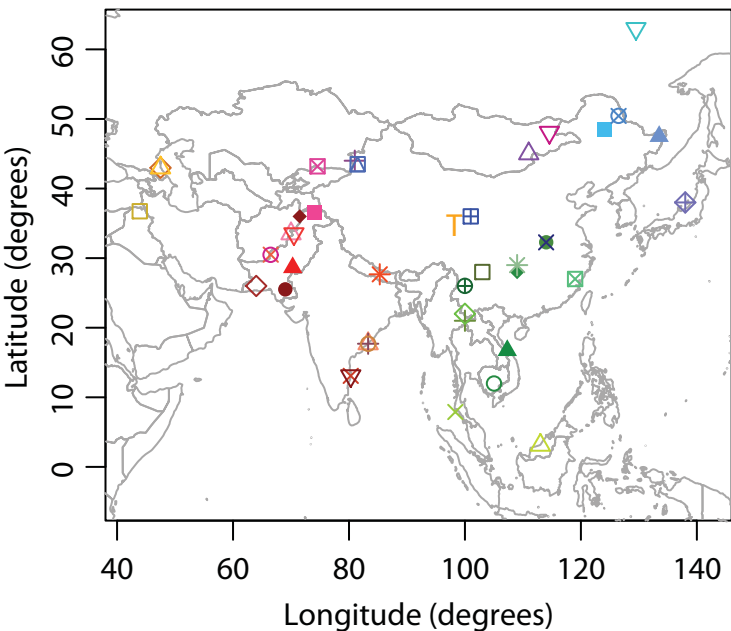


A**B**



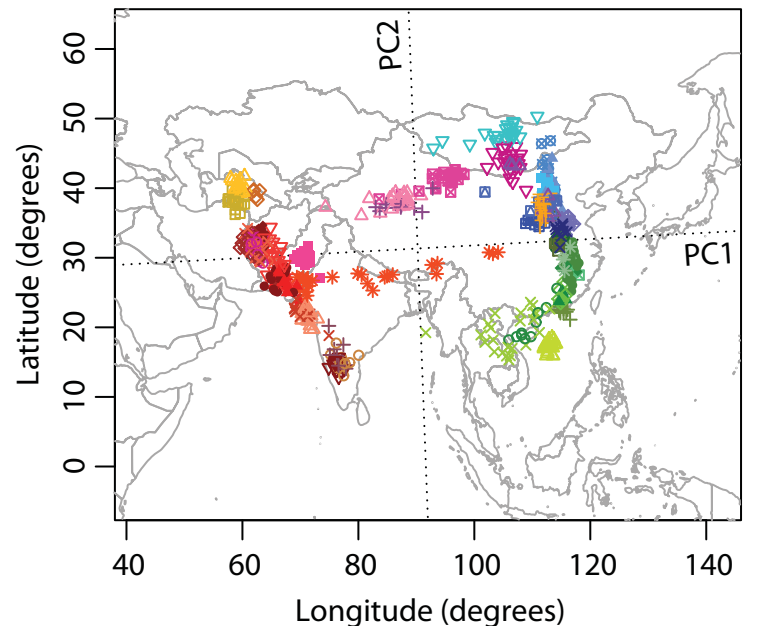


A



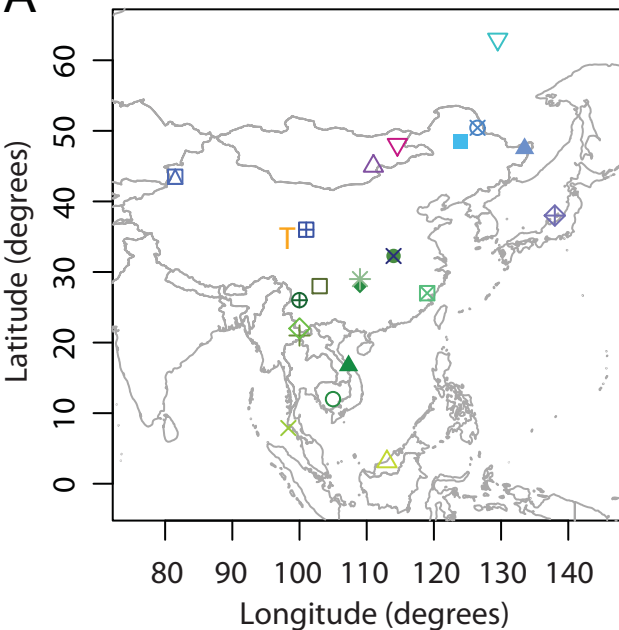
- | | | |
|----------------|------------------|---------------|
| △ A.P. Brahmin | ○ Cambodian | △ Iban |
| + A.P. Madiga | + Dai | □ Iraqi Kurd |
| ○ A.P. Mala | ■ Daur | ◇ Japanese |
| × Balochi | ● Han | ◆ Kalash |
| ○ Brahui | × Han (N. China) | ⊠ Kyrgyzstani |
| ■ Burusho | △ Hazara | ◇ Lahu |
| ▽ Buryat | ▲ Hezhen | ◇ Makrani |

B

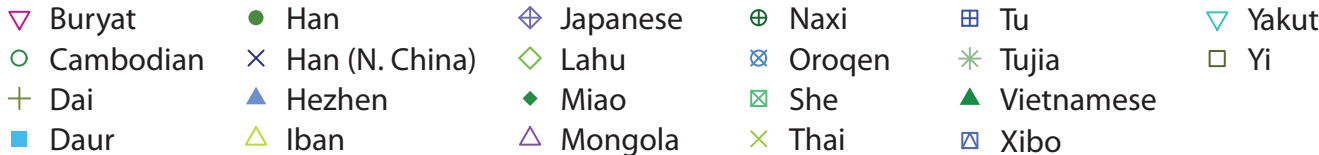
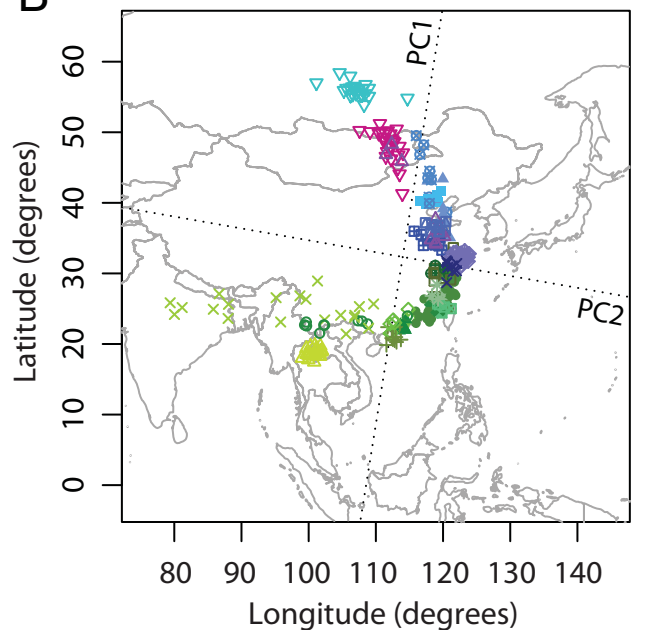


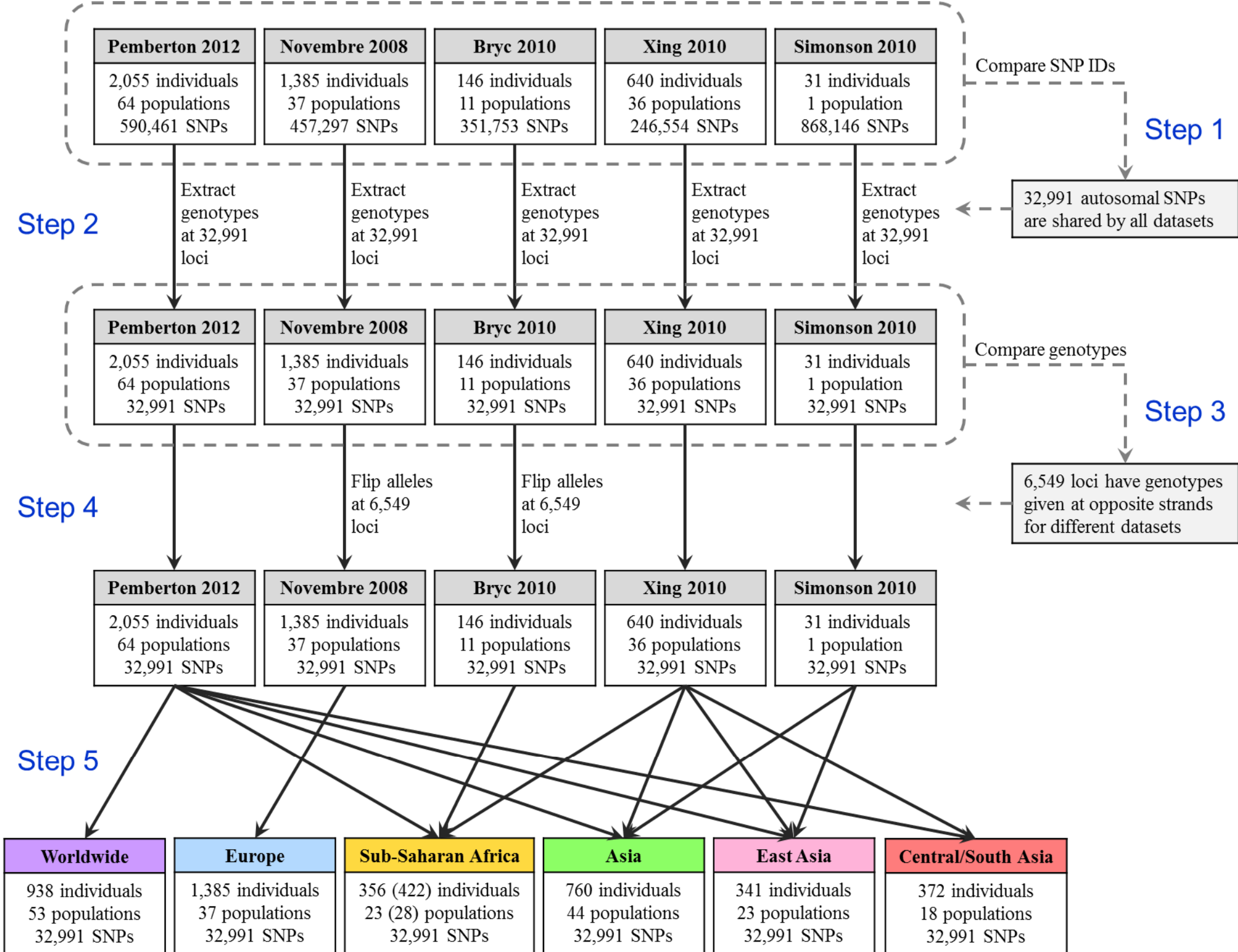
- | | | |
|-------------|----------------|--------------|
| ◆ Miao | ⊠ She | ⊠ Tu |
| △ Mongola | ● Sindhi | * Tujia |
| ⊕ Naxi | ◇ Stalskoe | △ Urkarah |
| * Nepalese | × T.N. Brahmin | + Uyghur |
| × Oroqen | ▽ T.N. Dalit | ▲ Vietnamese |
| ▲ Pakistani | × Thai | ⊠ Xibo |
| ▽ Pathan | T Tibetan | ▽ Yakut |
| | | □ Yi |

A

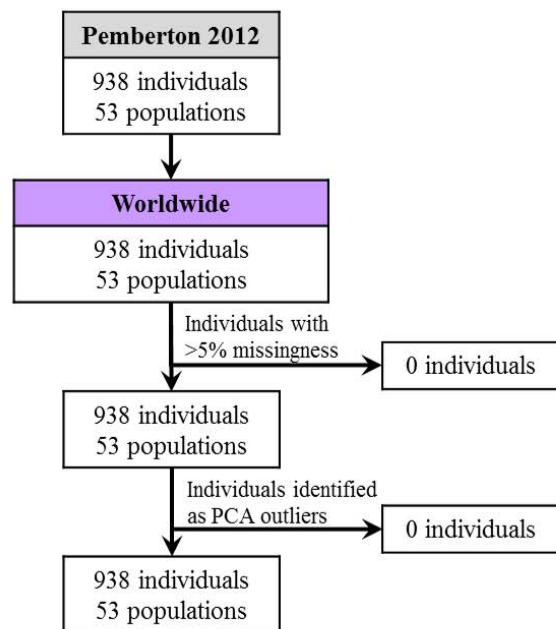


B

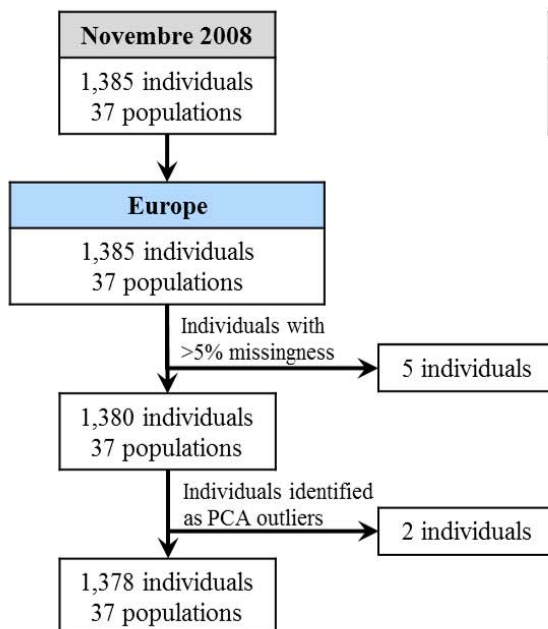




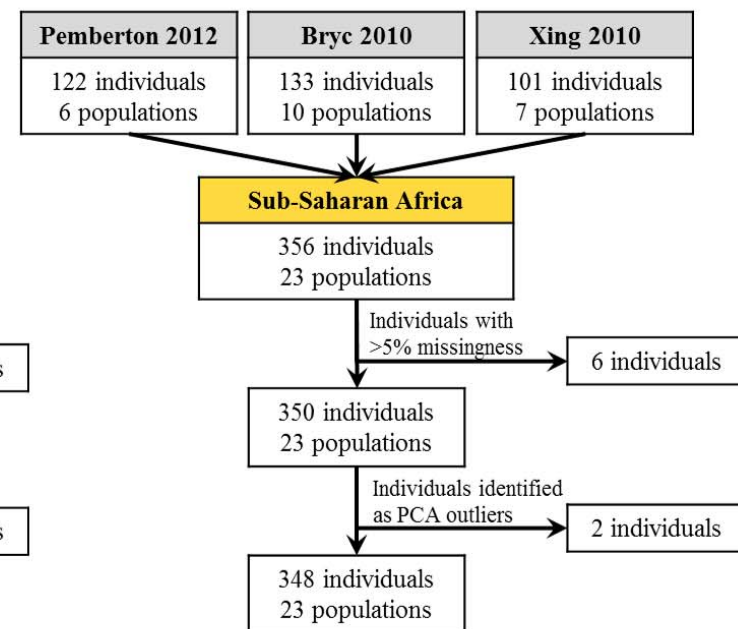
A



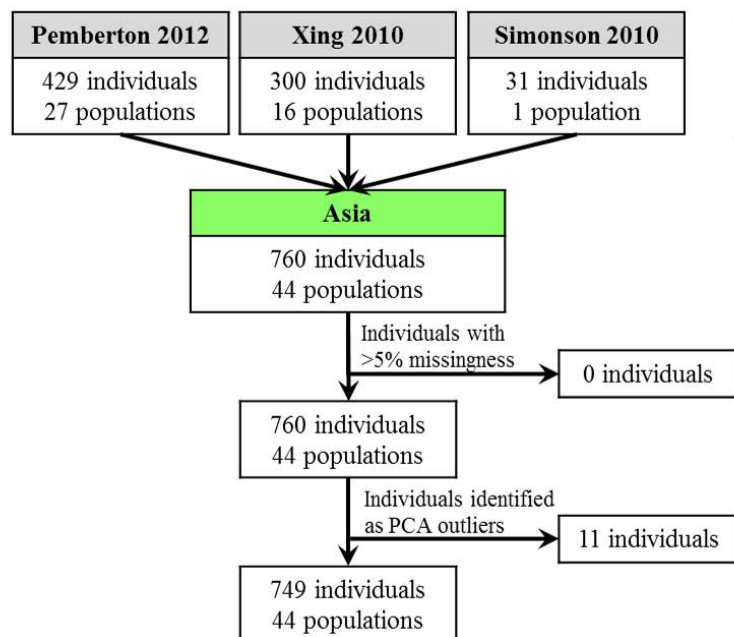
B



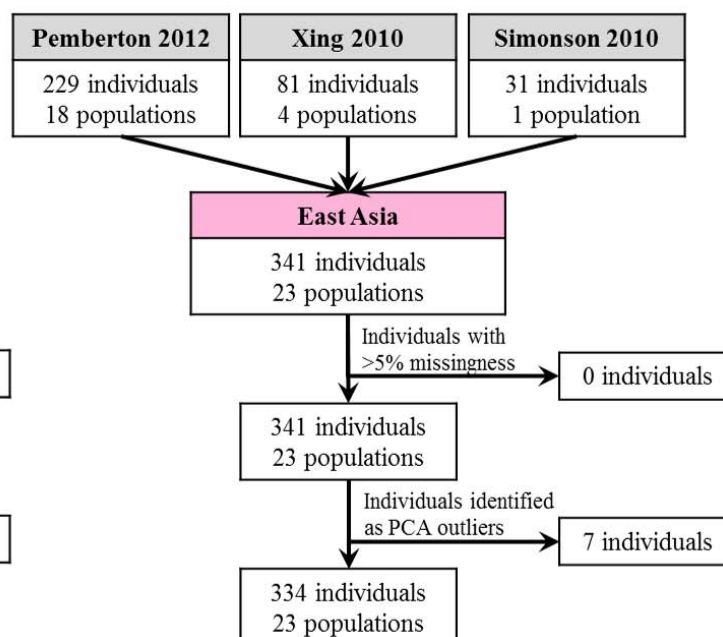
C



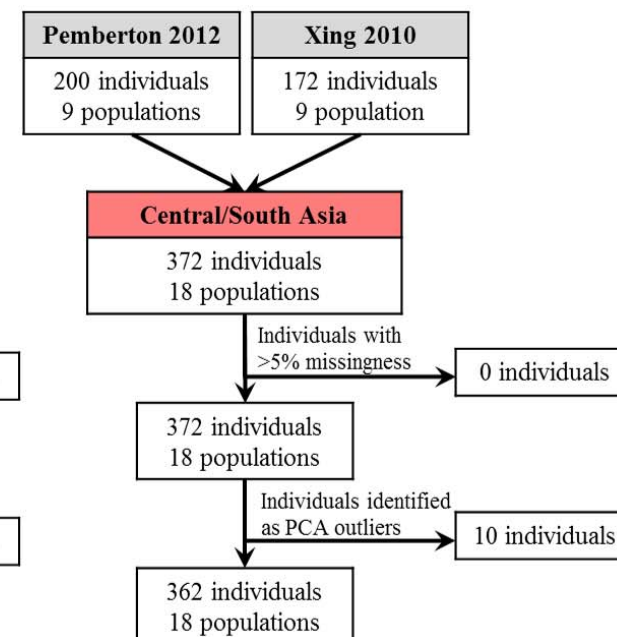
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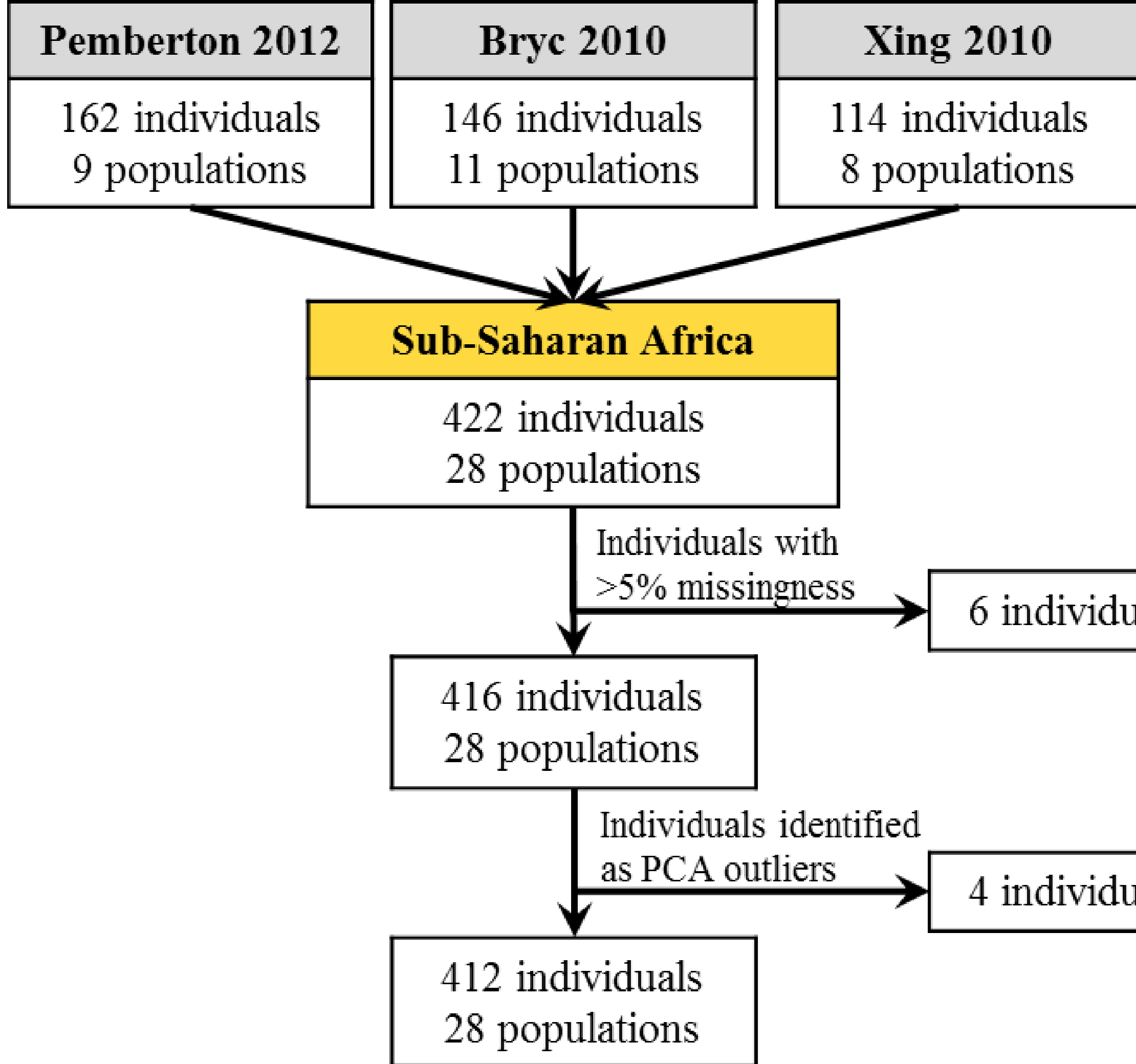


E



F





Population	Latitude (degrees)	Longitude (degrees)	Source of coordinates	Sample size	High-missing- data samples	Genotyping platform	Source of SNP data	Datasets in which the population is included					
								World	Europe	Africa	Asia	E. Asia	C.S. Asia
Adygei	44	39	[45]	17	0	Illumina 650K	[31]	X					
Balochi	30.5	66.5	[45]	24	0	Illumina 650K	[31]	X			X		
Bantu (Kenya)	-3	37	[45]	11	0	Illumina 650K	[31]	X		X			
Bantu (S. Africa)	-25.6	24.3	[45]	8	0	Illumina 650K	[31]	X		X			
Basque	43	0	[45]	24	0	Illumina 650K	[31]	X					
Bedouin	31	35	[45]	45	0	Illumina 650K	[31]	X					
Biaka Pygmy	4	17	[45]	22	0	Illumina 650K	[31]	X		X			
Brahui	30.5	66.5	[45]	25	0	Illumina 650K	[31]	X		X			
Burusho	36.5	74	[45]	25	0	Illumina 650K	[31]	X		X			
Cambodian	12	105	[45]	10	0	Illumina 650K	[31]	X		X			
Colombian	3	-68	[45]	7	0	Illumina 650K	[31]	X		X			
Dai	21	100	[45]	10	0	Illumina 650K	[31]	X		X			
Daur	48.5	124	[45]	9	0	Illumina 650K	[31]	X		X			
Druze	32	35	[45]	42	0	Illumina 650K	[31]	X		X			
French	46	2	[45]	28	0	Illumina 650K	[31]	X		X			
Han	32.3	114	[45]	34	0	Illumina 650K	[31]	X		X			
Han (N. China)	32.3	114	[45]	10	0	Illumina 650K	[31]	X		X			X
Hazara	33.5	70	[45]	22	0	Illumina 650K	[31]	X		X			
Hezhen	47.5	133.5	[45]	9	0	Illumina 650K	[31]	X		X			
Italian	46	10	[45]	12	0	Illumina 650K	[31]	X		X			
Japanese	38	138	[45]	28	0	Illumina 650K	[31]	X		X			
Kalash	36.0	71.5	[45]	23	0	Illumina 650K	[31]	X		X			X
Karitiana	-10	-63	[45]	13	0	Illumina 650K	[31]	X		X			
Lahu	22	100	[45]	8	0	Illumina 650K	[31]	X		X			X
Makrani	26	64	[45]	25	0	Illumina 650K	[31]	X		X			
Mandenka	12	-12	[45]	22	0	Illumina 650K	[31]	X		X			
Maya	19	-91	[45]	21	0	Illumina 650K	[31]	X		X			
Mbuti Pygmy	1	29	[45]	13	0	Illumina 650K	[31]	X		X			
Melanesian	-6	155	[45]	11	0	Illumina 650K	[31]	X					
Miao	28	109	[45]	10	0	Illumina 650K	[31]	X		X		X	
Mongola	45	111	[45]	10	0	Illumina 650K	[31]	X		X		X	
Mozabite	32	3	[45]	27	0	Illumina 650K	[31]	X		X		X	
Naxi	26	100	[45]	8	0	Illumina 650K	[31]	X		X		X	
Ocadian	59	-3	[45]	15	0	Illumina 650K	[31]	X		X		X	
Oroqen	50.4	126.5	[45]	9	0	Illumina 650K	[31]	X		X		X	
Palestinian	32	35	[45]	46	0	Illumina 650K	[31]	X		X		X	
Papuan	-4	143	[45]	17	0	Illumina 650K	[31]	X					
Pathan	33.5	70.5	[45]	22	0	Illumina 650K	[31]	X					
Pima	29	-108	[45]	14	0	Illumina 650K	[31]	X					
Russian	61	40	[45]	25	0	Illumina 650K	[31]	X		X			
San	-21	20	[45]	5	0	Illumina 650K	[31]	X					
Sardinian	40	9	[45]	28	0	Illumina 650K	[31]	X				X	
She	27	119	[45]	10	0	Illumina 650K	[31]	X				X	
Sindhi	25.5	69	[45]	24	0	Illumina 650K	[31]	X		X		X	
Surui	-11	-62	[45]	8	0	Illumina 650K	[31]	X					X

Table S1: Populations included in this study (Part I).

Population	Latitude (degrees)	Longitude (degrees)	Source of coordinates	Sample size	High-missing- data samples	Genotyping platform	Source of SNP data	Datasets in which the population is included				
								World	Europe	Africa	Asia	C.S. Asia
Tu	36	101	[45]	10	0	Illumina 650K	[31]	X			X	X
Tujia	29	109	[45]	10	0	Illumina 650K	[31]	X			X	X
Tuscan	43	11	[45]	7	0	Illumina 650K	[31]	X				
Uygur	44	81	[45]	10	0	Illumina 650K	[31]	X			X	
Xibo	43.5	81.5	[45]	9	0	Illumina 650K	[31]	X			X	X
Yakut	63.0	129.5	[45]	25	0	Illumina 650K	[31]	X			X	X
Yi	28	103	[45]	10	0	Illumina 650K	[31]	X			X	X
Yoruba	8	5	[45]	21	0	Illumina 650K	[31]		X			
Luhya (LWK)	0.6	34.8	[33]	30	0	HapMap3 rel2	[31]		X			
Maasai (MKK)	0	37.9	[33]	30	0	HapMap3 rel2	[31]		X			
Albania (AL)	41.2	20.1	[9]	3	0	Affymetrix 500K	[9]		X			
Austria (AT)	47.6	14.1	[9]	14	0	Affymetrix 500K	[9]		X			
Bosnia-Herzegovina (BA)	44.2	17.9	[9]	9	0	Affymetrix 500K	[9]		X			
Belgium (BE)	50.7	4.61	[9]	43	1	Affymetrix 500K	[9]		X			
Bulgaria (BG)	42.8	25.2	[9]	2	0	Affymetrix 500K	[9]		X			
Swiss-French (CH-F)	46.2	6.15	[9]	125	0	Affymetrix 500K	[9]		X			
Swiss-German (CH-G)	47.4	8.55	[9]	84	2	Affymetrix 500K	[9]		X			
Swiss-Italian (CH-I)	46	8.95	[9]	13	0	Affymetrix 500K	[9]		X			
Cyprus (CY)	35.1	33.2	[9]	4	0	Affymetrix 500K	[9]		X			
Czech Republic (CZ)	49.7	15.4	[9]	11	0	Affymetrix 500K	[9]		X			
Germany (DE)	51.1	10.4	[9]	71	2	Affymetrix 500K	[9]		X			
Denmark (DK)	56.1	9.25	[9]	1	0	Affymetrix 500K	[9]		X			
Spain (ES)	40.3	-3.57	[9]	136	0	Affymetrix 500K	[9]		X			
Finland (FI)	60.2	24.9	[9]	1	0	Affymetrix 500K	[9]		X			
France (FR)	46.6	2.39	[9]	89	0	Affymetrix 500K	[9]		X			
United Kingdom (GB)	53.5	-2.33	[9]	200	1	Affymetrix 500K	[9]		X			
Greece (GR)	40	22.7	[9]	8	0	Affymetrix 500K	[9]		X			
Croatia (HR)	45.3	16.1	[9]	8	0	Affymetrix 500K	[9]		X			
Hungary (HU)	47.2	19.4	[9]	19	0	Affymetrix 500K	[9]		X			
Ireland (IE)	53.2	-8.18	[9]	61	1	Affymetrix 500K	[9]		X			
Italy (IT)	42	12.5	[9]	219	0	Affymetrix 500K	[9]		X			
Kosovo (KS)	42.7	21.1	[9]	2	0	Affymetrix 500K	[9]		X			
Latvia (LV)	56.9	24.9	[9]	1	0	Affymetrix 500K	[9]		X			
Macedonia (MK)	41.7	21.7	[9]	4	0	Affymetrix 500K	[9]		X			
Netherlands (NL)	52.3	5.67	[9]	17	0	Affymetrix 500K	[9]		X			
Norway (NO)	59.9	10.7	[9]	3	0	Affymetrix 500K	[9]		X			
Poland (PL)	52.1	19.4	[9]	22	0	Affymetrix 500K	[9]		X			
Portugal (PT)	39.6	-8.02	[9]	128	0	Affymetrix 500K	[9]		X			
Romania (RO)	45.9	25	[9]	14	0	Affymetrix 500K	[9]		X			
Russia (RU)	55.8	37.5	[9]	6	0	Affymetrix 500K	[9]		X			
Scotland (Sc)	56	-3.2	[9]	5	0	Affymetrix 500K	[9]		X			
Sweden (SE)	59.4	18	[9]	10	0	Affymetrix 500K	[9]		X			
Slovenia (SI)	46.1	14.8	[9]	2	0	Affymetrix 500K	[9]		X			
Slovakia (SK)	48.7	19.5	[9]	1	0	Affymetrix 500K	[9]		X			
Turkey (TR)	39.1	35.4	[9]	4	0	Affymetrix 500K	[9]		X			

Table S2: Populations included in this study (Part II).

Population	Latitude (degrees)	Longitude (degrees)	Source of coordinates	Sample size	High-missing- data samples	Genotyping platform	Source of SNP data	Datasets in which the population is included					
								World	Europe	Africa	Asia	E. Asia	C.S. Asia
Ukraine (UA)	49.1	31.4	[9]	1	0	Affymetrix 500K	[9]		X				
Serbia-Montenegro (YG)	43.9	20.6	[9]	44	0	Affymetrix 500K	[9]		X				
	5.5	10.8	[37]	20	2	Affymetrix 500K	[26]			X			
Bamoun	7.5	-2.0	[37]	8	1	Affymetrix 500K	[26]			X			
Brong	13.0	18.0	[37]	15	0	Affymetrix 500K	[26]			X			
Bulala	2.5	13.0	[37]	18	1	Affymetrix 500K	[26]			X			
Fang	12.0	8.0	[37]	13	2	Affymetrix 500K	[26]			X			
Hausa	6.0	7.0	[37]	17	4	Affymetrix 500K	[26]			X			
Igbo	8.0	16.8	[37]	16	0	Affymetrix 500K	[26]			X			
Kaba	-5.5	15.0	[37]	9	0	Affymetrix 500K	[26]			X			
Kongo	11.8	14.8	[37]	13	2	Affymetrix 500K	[26]			X			
Mbororo Fulani	10.8	14.1	[37]	12	0	Affymetrix 500K	[26]			X			
Mada	-32.0	28.0	[37]	5	2	Affymetrix 500K	[26]			X			
Xhosa	-19.6	20.5	J. Xing	13	0	Affymetrix Nspl 250K	[23]			X			
!Kung	-3.0	30.9	J. Xing	10	0	Affymetrix Nspl 250K	[23]			X			
Alur	17.7	83.3	J. Xing	25	0	Affymetrix Nspl 250K	[23]			X			X
A.P. Brahmin	17.7	83.3	J. Xing	10	0	Affymetrix Nspl 250K	[23]			X			X
A.P. Madiga	17.7	83.3	J. Xing	11	0	Affymetrix Nspl 250K	[23]			X			X
A.P. Mala	12.5	-8.0	J. Xing	25	0	Affymetrix Nspl 250K	[23]			X			
Bambaran	48.1	114.6	J. Xing	25	0	Affymetrix 6.0	[23]			X			
Buryat	15.1	-4.2	J. Xing	24	0	Affymetrix 6.0	[23]			X			
Dogon	1.6	30.3	J. Xing	15	0	Affymetrix 6.0	[23]			X			
Hema	3.1	113.0	J. Xing	25	0	Affymetrix Nspl 250K	[23]			X			
Iraqi Kurd	36.7	43.9	J. Xing	24	0	Affymetrix Nspl 250K	[23]			X			X
Irula	13.1	80.3	J. Xing	24	0	Affymetrix 6.0	[23]			X			
Kyrgyzstani	43.2	74.6	J. Xing	25	0	Affymetrix Nspl 250K	[23]			X			X
Nepalese	27.7	85.3	J. Xing	25	0	Affymetrix 6.0	[23]			X			X
Nguni	-33.3	26.5	J. Xing	9	0	Affymetrix Nspl 250K	[23]			X			
Pakistani	28.6	70.3	J. Xing	25	0	Affymetrix 6.0	[23]			X			
Pedi	-25.5	26.1	J. Xing	10	0	Affymetrix Nspl 250K	[23]			X			X
Sotho/Tswana	-26.2	28.1	J. Xing	8	0	Affymetrix Nspl 250K	[23]			X			
Stalskoe	43.0	47.5	J. Xing	5	0	Affymetrix Nspl 250K	[23]			X			
Thai	7.9	98.3	J. Xing	24	0	Affymetrix 6.0	[23]			X		X	
T.N. Brahmin	13.1	80.3	J. Xing	14	0	Affymetrix Nspl 250K	[23]			X			X
T.N. Dalit	13.1	80.3	J. Xing	13	0	Affymetrix 6.0	[23]			X			X
Urkarah	43.0	47.5	J. Xing	18	0	Affymetrix Nspl 250K	[23]			X			
Vietnamese	16.7	107.3	J. Xing	7	0	Affymetrix Nspl 250K	[23]			X		X	
Tibetan	34.9	98.2	[32]	31	0	Affymetrix 6.0	[32]			X		X	

Table S3: Populations included in this study (Part III).

Population excluded	Number of individuals excluded	Similarity to original PCA t'	Similarity to geography t''	$t'' - t_0$
Han	34	1.000	0.715	0.010
Maya	21	1.000	0.713	0.008
Karitiana	13	1.000	0.710	0.005
Xibo	9	1.000	0.710	0.005
Dai	10	1.000	0.708	0.003
Yi	10	1.000	0.708	0.003
Tujia	10	1.000	0.708	0.003
Miao	10	1.000	0.708	0.003
Tu	10	1.000	0.707	0.002
Naxi	8	1.000	0.707	0.002
Lahu	8	1.000	0.707	0.002
Surui	8	1.000	0.707	0.002
Sindhi	24	1.000	0.707	0.002
Makrani	25	1.000	0.707	0.002
Mongola	10	1.000	0.707	0.002
Yakut	25	1.000	0.707	0.002
Han (N. China)	10	1.000	0.707	0.002
She	10	1.000	0.707	0.002
Hazara	22	1.000	0.707	0.002
Brahui	25	1.000	0.707	0.002
Cambodian	10	1.000	0.707	0.002
Papuan	17	1.000	0.707	0.002
Japanese	28	1.000	0.707	0.002
Balochi	24	1.000	0.707	0.002
Daur	9	1.000	0.706	0.001
Colombian	7	1.000	0.706	0.001
Oroqen	9	1.000	0.706	0.001
Melanesian	11	1.000	0.706	0.001
Pathan	22	1.000	0.706	0.001
Kalash	23	1.000	0.706	0.001
Hezhen	9	1.000	0.706	0.001
Mandenka	22	1.000	0.705	0.000
Uygur	10	1.000	0.705	0.000
Burusho	25	1.000	0.705	0.000
Yoruba	21	1.000	0.704	-0.001
Tuscan	7	1.000	0.704	-0.001
Druze	42	1.000	0.704	-0.001
Adygei	17	1.000	0.704	-0.001
Biaka Pygmy	22	1.000	0.703	-0.002
Italian	12	1.000	0.703	-0.002
Mbuti Pygmy	13	1.000	0.703	-0.002
Orcadian	15	1.000	0.703	-0.002
Basque	24	1.000	0.702	-0.003
Russian	25	1.000	0.702	-0.003
French	28	1.000	0.702	-0.003
Palestinian	46	1.000	0.701	-0.004
Bantu (Kenya)	11	1.000	0.701	-0.004
Bedouin	45	1.000	0.701	-0.004
Sardinian	28	1.000	0.701	-0.004
San	5	1.000	0.700	-0.005
Pima	14	1.000	0.700	-0.005
Mozabite	27	1.000	0.699	-0.006
Bantu (S. Africa)	8	1.000	0.697	-0.008

Table S4: Change of the Procrustes similarity when excluding one population from the worldwide example. The Procrustes similarity between genetic coordinates and geographic coordinates is $t_0 = 0.705$ in the original analysis (Fig. 1).

Population excluded	Number of individuals excluded	Similarity to original PCA t'	Similarity to geography t''	$t'' - t_0$
Italy (IT)	219	0.986	0.810	0.030
Russia (RU)	6	1.000	0.788	0.008
Swiss-French (CH-F)	125	1.000	0.785	0.005
Swiss-German (CH-G)	84	1.000	0.785	0.005
Germany (DE)	69	1.000	0.783	0.003
France (FR)	89	1.000	0.783	0.003
Sweden (SE)	10	1.000	0.782	0.002
Swiss-Italian (CH-I)	13	1.000	0.781	0.001
Austria (AT)	14	1.000	0.781	0.001
Slovakia (SK)	1	1.000	0.780	0.000
Hungary (HU)	19	1.000	0.780	0.000
Romania (RO)	14	1.000	0.780	0.000
Finland (FI)	1	1.000	0.780	0.000
Ukraine (UA)	1	1.000	0.780	0.000
Bulgaria (BG)	2	1.000	0.780	0.000
Slovenia (SI)	2	1.000	0.779	-0.001
Denmark (DK)	1	1.000	0.779	-0.001
Latvia (LV)	1	1.000	0.779	-0.001
Norway (NO)	3	1.000	0.779	-0.001
Poland (PL)	22	0.999	0.779	-0.001
Turkey (TR)	4	1.000	0.779	-0.001
Croatia (HR)	8	1.000	0.779	-0.001
Kosovo (KS)	2	1.000	0.779	-0.001
Belgium (BE)	42	1.000	0.779	-0.001
Czech Republic (CZ)	11	1.000	0.779	-0.001
Cyprus (CY)	4	1.000	0.779	-0.001
Scotland (Sct)	5	1.000	0.779	-0.001
Netherlands (NL)	17	1.000	0.779	-0.001
Macedonia (MK)	4	1.000	0.779	-0.001
Albania (AL)	3	1.000	0.779	-0.001
Bosnia-Herzegovina (BA)	9	1.000	0.779	-0.001
Greece (GR)	8	1.000	0.778	-0.002
Ireland (IE)	60	0.999	0.776	-0.004
Serbia-Montenegro (YG)	44	0.998	0.772	-0.008
Spain (ES)	136	0.994	0.770	-0.010
Portugal (PT)	126	0.990	0.769	-0.011
United Kingdom (GB)	199	0.998	0.764	-0.016

Table S5: Change of the Procrustes similarity when excluding one population from the European example. The Procrustes similarity between genetic coordinates and geographic coordinates is $t_0 = 0.780$ in the original analysis (Fig. 2).

Population excluded	Number of individuals excluded	Similarity to original PCA t'	Similarity to geography t''	$t'' - t_0$
Maasai (MKK)	30	0.980	0.832	0.042
Luhya (LWK)	30	0.999	0.808	0.018
Bamoun	18	1.000	0.797	0.007
Bantu (Kenya)	11	1.000	0.797	0.007
Fang	17	1.000	0.796	0.006
Mandenka	22	0.999	0.795	0.005
Kaba	16	1.000	0.794	0.004
Hausa	13	1.000	0.794	0.004
Igbo	17	1.000	0.791	0.001
Kongo	9	1.000	0.791	0.001
Yoruba	21	1.000	0.791	0.001
Alur	10	1.000	0.789	-0.001
Brong	7	1.000	0.788	-0.002
Dogon	24	0.995	0.788	-0.002
Bambaran	25	0.999	0.786	-0.004
Mada	12	1.000	0.785	-0.005
Hema	13	1.000	0.784	-0.006
Xhosa	3	1.000	0.783	-0.007
Bantu (S. Africa)	8	0.999	0.781	-0.009
Bulala	15	0.999	0.780	-0.010
Pedi	10	0.998	0.775	-0.015
Nguni	9	0.998	0.774	-0.016
Sotho/Tswana	8	0.997	0.768	-0.022

Table S6: Change of the Procrustes similarity when excluding one population from the Sub-Saharan African example. The Procrustes similarity between genetic coordinates and geographic coordinates is $t_0 = 0.790$ in the original analysis (Fig. 3).

Populations added	Panel in Fig. S3	Number of populations	Number of individuals collected	Number of individuals in the analysis	Variance explained by PC1 (%)	Variance explained by PC2 (%)	Rotation angle θ ($^{\circ}$)	Procrustes similarity t_0	P -value of t_0	F_{ST} (%)
All	B	28	422	412	1.68	1.21	-78.47	0.548	0.00040	2.567
Mbororo Fulani	C	24	369	361	1.40	0.84	29.25	0.605	0.00005	1.518
Biaka Pygmy	D	24	378	369	1.26	1.03	20.01	0.559	0.00278	1.652
Mbuti Pygmy	E	24	369	359	1.27	1.19	-10.05	0.543	0.00120	1.781
!Kung	F	24	369	361	1.29	1.04	3.89	0.721	$< 10^{-5}$	1.616
San	G	24	361	354	1.31	0.92	5.66	0.725	$< 10^{-5}$	1.578

Table S7: Summary of the results for Sub-Saharan Africa when all or one of five additional African populations are included (corresponding to Fig. S3). θ is the rotation angle for the PCA map that optimizes the Procrustes similarity with the geographic map, and it is measured in degrees counterclockwise. P -values are obtained from 100,000 permutations of population labels.

Population excluded	Number of individuals excluded	Similarity to original PCA t'	Similarity to geography t''	$t'' - t_0$
Irula	24	0.993	0.871	0.022
Xibo	9	1.000	0.857	0.008
Tibetan	31	1.000	0.854	0.005
Kyrgyzstani	25	1.000	0.854	0.005
A.P. Brahmin	25	1.000	0.854	0.005
Nepalese	25	1.000	0.853	0.004
Yakut	25	0.999	0.853	0.004
T.N. Dalit	13	1.000	0.853	0.004
A.P. Mala	11	1.000	0.852	0.003
Hazara	22	1.000	0.852	0.003
A.P. Madiga	10	1.000	0.852	0.003
Naxi	8	1.000	0.852	0.003
T.N. Brahmin	14	1.000	0.851	0.002
Lahu	8	1.000	0.851	0.002
Yi	10	1.000	0.851	0.002
Dai	10	1.000	0.850	0.001
Tu	10	1.000	0.850	0.001
Thai	24	1.000	0.850	0.001
Uygur	10	1.000	0.849	0.000
Vietnamese	7	1.000	0.849	0.000
Tujia	10	1.000	0.849	0.000
Miao	10	1.000	0.849	0.000
Kalash	23	1.000	0.849	0.000
Stalskoe	5	1.000	0.849	0.000
Burusho	25	1.000	0.848	-0.001
Han (N. China)	10	1.000	0.848	-0.001
Iban	25	0.999	0.848	-0.001
Cambodian	10	1.000	0.848	-0.001
Pathan	22	1.000	0.847	-0.002
Hezhen	9	1.000	0.847	-0.002
She	10	1.000	0.847	-0.002
Mongola	10	1.000	0.847	-0.002
Makrani	20	1.000	0.847	-0.002
Balochi	22	1.000	0.847	-0.002
Japanese	28	1.000	0.847	-0.002
Brahui	23	1.000	0.847	-0.002
Daur	9	1.000	0.846	-0.003
Pakistani	25	1.000	0.846	-0.003
Sindhi	22	1.000	0.846	-0.003
Oroqen	9	1.000	0.846	-0.003
Urkarah	18	1.000	0.845	-0.004
Iraqi Kurd	24	1.000	0.845	-0.004
Han	34	1.000	0.844	-0.005
Buryat	25	1.000	0.839	-0.010

Table S8: Change of the Procrustes similarity when excluding one population from the Asian example. The Procrustes similarity between genetic coordinates and geographic coordinates is $t_0 = 0.849$ in the original analysis (Fig. 4).

Population excluded	Number of individuals excluded	Similarity to original PCA t'	Similarity to geography t''	$t'' - t_0$
Japanese	28	0.999	0.755	0.115
Thai	20	0.994	0.691	0.051
Han	34	0.999	0.673	0.033
Xibo	8	1.000	0.655	0.015
Tibetan	31	0.996	0.655	0.015
She	10	1.000	0.654	0.014
Hezhen	9	1.000	0.645	0.005
Han (N. China)	10	1.000	0.645	0.005
Miao	10	1.000	0.642	0.002
Tujia	10	1.000	0.642	0.002
Mongola	10	1.000	0.640	0.000
Dai	10	1.000	0.637	-0.003
Vietnamese	7	1.000	0.637	-0.003
Tu	10	1.000	0.637	-0.003
Lahu	8	1.000	0.636	-0.004
Daur	9	1.000	0.636	-0.004
Cambodian	10	1.000	0.635	-0.005
Buryat	25	0.999	0.635	-0.005
Naxi	8	1.000	0.634	-0.006
Yi	10	1.000	0.631	-0.009
Oroqen	9	1.000	0.631	-0.009
Yakut	23	0.988	0.577	-0.063
Iban	25	0.993	0.561	-0.079

Table S9: Change of the Procrustes similarity when excluding one population from the East Asian example. The Procrustes similarity between genetic coordinates and geographic coordinates is $t_0 = 0.640$ in the original analysis (Fig. 5).

Population excluded	Number of individuals excluded	Similarity to original PCA t'	Similarity to geography t''	$t'' - t_0$
Hazara	22	1.000	0.769	0.032
Kalash	23	1.000	0.754	0.017
A.P. Brahmin	25	1.000	0.749	0.012
T.N. Brahmin	14	1.000	0.748	0.011
Nepalese	25	1.000	0.747	0.010
Burusho	25	1.000	0.747	0.010
Pathan	22	1.000	0.740	0.003
Pakistani	25	1.000	0.736	-0.001
Sindhi	22	1.000	0.732	-0.005
A.P. Madiga	10	1.000	0.724	-0.013
Uygur	10	1.000	0.723	-0.014
A.P. Mala	11	1.000	0.721	-0.016
Kyrgyzstani	25	0.992	0.720	-0.017
Balochi	23	0.999	0.720	-0.017
T.N. Dalit	13	0.999	0.720	-0.017
Brahui	23	0.999	0.718	-0.019
Makrani	20	0.999	0.718	-0.019
Irula	24	0.979	0.717	-0.020

Table S10: Change of the Procrustes similarity when excluding one population from the Central/South Asian example. The Procrustes similarity between genetic coordinates and geographic coordinates is $t_0 = 0.737$ in the original analysis (Fig. 6).

Analysis	Region	Number of PCA outliers	Sample ID of PCA outliers	Population
Fig. 1	Worldwide	0	-	-
Fig. 2	Europe	2	POPR26466 POPR48136	Portugal (PT) Portugal (PT)
Fig. 3	Sub-Saharan Africa	2	AFH7 AFH10	Hema Hema
Fig. 4	Asia	11	HGDP00057 HGDP00060 HGDP00013 HGDP00029 HGDP00130 HGDP00139 HGDP00150 HGDP00154 HGDP00157 HGDP00173 HGDP00175	Balochi Balochi Brahui Brahui Makrani Makrani Makrani Makrani Makrani Sindhi Sindhi
Fig. 5	East Asia	7	F066579 F066599 F066607 F066612 HGDP01243 HGDP00949 HGDP00953	Thai Thai Thai Thai Xibo Yakut Yakut
Fig. 6	Central/South Asia	10	HGDP00057 HGDP00013 HGDP00029 HGDP00130 HGDP00150 HGDP00151 HGDP00154 HGDP00157 HGDP00173 HGDP00175	Balochi Brahui Brahui Makrani Makrani Makrani Makrani Makrani Sindhi Sindhi
Fig. S3B	Sub-Saharan Africa	4	AFH7 AFH10 NA21417 NA21596	Hema Hema Maasai (MKK) Maasai (MKK)
Fig. S3C	Sub-Saharan Africa	2	AFH7 AFH10	Hema Hema
Fig. S3D	Sub-Saharan Africa	3	AFH7 AFH10 NA21417	Hema Hema Maasai (MKK)
Fig. S3E	Sub-Saharan Africa	4	AFH7 AFH10 NA21417 NA21596	Hema Hema Maasai (MKK) Maasai (MKK)
Fig. S3F	Sub-Saharan Africa	2	NA21417 TSW25	Maasai (MKK) Sotho/Tswana
Fig. S3G	Sub-Saharan Africa	1	NA21417	Maasai (MKK)

Table S11: Samples identified as PCA outliers in the analyses for different geographic regions. Note that AFH7 and AFH10, which appeared as PCA outliers in most of the Sub-Saharan African examples, are likely to be relatives based on allele-sharing analysis (results not shown).