

Table S1: Genotypes and frequencies of the allele for AS-STRs transmitted by the deceased father.

Case 1	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	D5S818	FGA	Penta E	Penta D	LPL	F13B	FESFPS	F13A01
Mother	12-13	28-29	10-12	12-12	18-18	6-6	11-12	12-13	19-23	14-15	16-18	11-11	13-15	9-13	22-27	5-11	10-10	9-12	9-10	10-11	6-7
Daughter	11-12	28-28	10-10	11-12	14-18	6-8	11-11	12-13	23-24	14-15	15-18	9-11	13-15	9-12	25-27	7-11	10-14	9-10	10-10	10-11	6-6
Putative Grandmother	13-14	28-29	9-10	10-12	14-15	7-9.3	11-12	11-11	19-20	13-15	15-16	9-10	14-18	10-12	21-25	10-13	13-14	11-12	6-10	11-12	7-14
Putative Uncle	13-14	29-30	9-10	9-12	15-15	6-9.3	9-11	11-11	16-19	13-14	15-16	9-12	17-18	12-12	20-25	5-13	10-13	11-12	10-10	12-12	3.2-14
FAF	0,060	0,144	0,310	0,279	0,082	0,146	0,282	0,246 0,139	0,081	0,286 0,150	0,133	0,125	0,098 0,174	0,335	0,099	0,096	0,055	0,428	0,317	0,234 0,415	0,194

Case 2	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	D5S818	FGA	Penta E	Penta D	LPL	F13B	FESFPS	F13A01
Daughter	13-14	29-30.2	10-12	10-12	13-16	7-9.3	11-12	11-11	19-19	15-15	17-17	8-8	13-17	11-12	24-25	7-14	9-13	10-12	9-10	11-12	3.2-5
Putative Grandmother	13-14	28-29	11-12	11-13	14-16	9-9	8-12	11-11	18-24	12-13.2	14-17	8-8	17-17	11-12	24-24	5-12	10-13	10-12	8-9	8-12	3.2-7
Putative Grandfather	12-14	32.2-34	9-11	12-12	14-15	7-9.3	9-13	10-11	17-19	14-15	15-18	8-8	17-18	11-12	19-22	7-12	10-12	9-12	6-10	11-13	5-6
FAF	0,265 0,256	0,241	0,150	0,316	0,283	0,279 0,21	0,323	0,312	0,118	0,150	0,247	0,460	0,173	0,336 0,335	0,156	0,096	0,1675	0,428 0,227	0,273 0,317	0,415 0,213	0,132 0,259

Case 3	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	D5S818	FGA	Penta E	Penta D	LPL	F13B	FESFPS	F13A01	SE33
Mother	13-14	32.2-32.2	10-12	11-12	14-17	6-6	12-13	10-11	17-20	12-13.2	14-16	8-11	12-14	12-13	21-23	8-12	9-12	10-10	9-10	12-12	6-7	17-23.2
Daughter	11-13	29-32.2	11-12	12-12	14-16	6-7	11-12	10-11	17-23	12-13	14-16	8-11	12-20	12-13	21-22	8-17	12-16	10-10	9-9	12-12	7-7	17-18
Putative Grandmother	12-14	28-28	8-11	11-12	15-16	7-9	11-11	9-13	17-23	14-14.2	17-18	8-8	15-20	13-14	23-24	12-13	11-11	10-10	9-10	12-12	6-7	14-18
Putative Half-sister 1	14-16	28-30	11-12	12-12	15-16	7-7	11-11	9-13	18-23	13-15.2	18-19	8-11	14-20	12-13	20-22	12-17	11-13	10-11	10-10	12-12	6-6	15-17
Putative Half-sister 2	12-14	29-29	12-12	11-11	14-15	7-9.3	11-12	10-11	17-22	13-14.2	16-17	8-11	15-17	12-12	22-26	13-15	8-11	9-10	9-9	10-12	6-6	14-18
Mother of Putative Half-sister 2	12-13	29-31.2	10-12	11-12	14-16	9-9.3	9-12	10-12	17-18	14-14.2	17-17	11-11	14-17	11-12	24-26	15-15	8-12	9-10	9-10	10-11	6-7	17-18
RPPF	14-?	28-29	12-(8 or 11)	11-12	15-?	7-?	11-?	11-(9 or 13)	22-23	13-(14 or 14.2)	16-18	8-?	15-(14 or 20)	12-(13 or 14)	22-(23 or 24)	13-(12 or 17)	11-?	10-?	9-10	12-?	6-?	14-15 or 17
FAF	0,060	0,241	0,232	0,316	0,283	0,279	0,282	0,117 0,312	0,099	0,234	0,087 0,257	0,460 0,247	0,033	0,335 0,177	0,164	0,055	0,030	0,428	0,273	0,213	0,250	NA

Case 4	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	D5S818	FGA	Penta E	Penta D	LPL	F13B	FESFPS	F13A01
Mother	12-13	30-31	9-9	12-12	18-18	6-9.3	11-13	9-13	18-22	12.2-14	16-16	11-11	12-16	10-12	21-24	12-19	10-12	10-12	6-6	11-12	5-16
Daughter	13-14	30-31	9-11	10-12	15-18	9.3-9.3	12-13	12-13	18-22	12.2-14	14-16	8-11	16-17	12-13	21-23	9-19	10-12	10-12	6-6	10-11	5-6
Putative Half-sister	11-13	28-30.2	10-11	9-10	15-15	7-9.3	8-12	12-12	17-18	12.2-13.2	16-17	8-11	12-19	11-13	23-26	10-16	5-10	10-11	6-10	10-11	3.2-7
Mother of Putative Half-sister	13-13	28-30	10-10	9-13	15-15	6-7	8-11	11-12	17-25	13-13.2	14-17	8-11	12-12	13-13	21-26	10-14	5-9	10-11	9-10	11-11	3.2-7
RPPF	11-?	30.2-?	11-?	10-?	15-?	9.3-?	12-?	12-?	18-?	12.2-?	16-?	(8 or 11)-	19-?	11-?	23-?	16-?	10-?	10 or 11-?	6-?	10-?	3,2 or 7-?
FADF	0,256	0,206 0,084	0,232	0,255	0,314	0,212	0,323	0,246	0,058 0,094	0,030 0,286	0,087	0,460 f11=0,247	0,173	0,177	0,151	0,030	0,155 0,193	0,428 0,227	0,178	0,234	0,194

RPPF – reconstructed profile of putative father

FAF- frequencies of allele (or possible alleles) transmitted by the father

Table S2 - Formulas to calculate PI considering the profile configurations depicted with AS STRs, in case 1.

Mother	Daughter	Putative Grandmother	Putative Uncle	Formulas
AA	AB	AC	AD	
AB	BC	AD	AD	$(c/4)/c$
AB	BC	AD or DE	AE	
AB	AA	AB	BC	
AB	AA	AC	AC	$((1+a)/4)/a$
AB	AA	AB	AC	
AA	AB	BC	AC or CC	
AA	AB	BC	BD	$((1+b)/4)/b$
AB	BC	AC	AC	
AB	BC	CD	CE	$((1+c)/4)/c$
AA	AB	CD	AD	$(b/4)/b$
AB	AB	CC	CC	
AB	AB	CD	DE	$((a+b)/4)/(a+b)$
AB	AB	BC	AC	$((2+a+b)/4)/(a+b)$
AB	AC	CD	CC	
AB	BB	BC	BB	$((2+c)/4)/c$
AB	AB	BC	CC	$((1+a+b)/4)/(a+b)$
AB	AA	BC	CD	$(a/4)/a$

Table S3 - Formulas to calculate PI considering the profile configurations depicted with AS STRs, in case 2.

Daughter	Putative Grandmother	Putative Grandfather	Formulas
AB	AB	BC	$(a+2b)/8ab$
AB	AC	CD or DE	$1/8a$
AB	BB	CD	$1/4b$
AB	BC	CD or DE	$1/8b$
AB	AB	CC	$(a+b)/8ab$
AB	BC	AD or BD	
AA	AA	AB	$3/4a$
AA	BC	AD	$1/4a$
AA	AA	AA	$1/a$
AB	BB	BC	$3/8b$
AB	AB	AB	$(a+b)/4ab$

Table S4 - Formulas to calculate PI considering the profile configurations depicted with AS STRs, in case 3.

Mother	Daughter	Putative Grandmother	Putative Half-sister 1	Putative Half-sister 2	Mother of Putative Half-sister 2	Formulas
AB	AC	BD	BE	BD	AD	
AB	BC	CD	CD	BD	BC	$c/2c$
AB	BC	DD	DE	DF	BF	
AA	AB	CC	CD	BB	BE	
AB	BB	AB	BB	AA	AB	$1/2b$
AB	BB	AB	AA	BB	AB	
AB	BC	CD	BC	BB	AB	$(1/2)/2c$
AA	AB	BC	BB	BD	CD	$(1+b)/2b$
AB	BC	CC	CC	BC	BD	$(1+c)/2c$
AB	AB	CD	CD	AB	AE	$1/2ab$
AB	AB	CD	DE	BC	CC	
AB	BC	BC	CD	BE	BD	
AB	BC	DE	FG	EF	DE	$1/2c$
AB	BC	AD	CE	CF	DF	
AB	AB	AA	AB	AB	BB	$(1+a+b)/((2(a+b)))$
AB	BC	CD	AC	DE	AE	$((c/(a+c))/2c$
AB	AB	BC	AB	AA	AD	$1,5/2ab$
AB	BC	AD	AC	DE	EE	$((c/(a+c))/2c$
AA	AA	AA	AB	AC	AC	$(1+a)/2a$
AA	AA	AA	AA	AB	BC	
AB	BB	AB	AA	AA	AB	$b/2b$

Table S5 - Formulas to calculate PI considering the profile configurations depicted with AS STRs, in case 4.

Mother	Daughter	Putative Half-sister	Mother of Putative Half-sister	Formulas
AB	BC	BD	BB	
AB	BC	AD	AA	
AB	BC	CD	CC	$c/2c$
AB	BC	DE	DF	
AB	AB	CD	AC	$(a+b)/2(a+b)$
AA	AB	BC	CC or CD	
AA	AB	BB	BB	$(1+b)/2b$
AB	BB	BC	AC	
AB	BC	CD	AD or BD	
AB	BC	CC	CD	$(1+c)/2c$
AB	BC	BC	BB	
AB	AB	AC	CD	$(1+a+b)/2(a+b)$
AA	AB	AC	BC	$b/2b$
AA	AB	AB	AB	$((b/(a+b))+b)/2b$
AB	AB	AC	AC	$((a/a+c)+(a+b))/2(a+b)$
AA	AA	AB	BC	$(1+a)/2a$

Table S6: Genotypes and frequencies of the allele for X-linked STRs transmitted by the deceased father.

Case 1	DXS8378	DXS9898	DXS7133	GATA31E08	GATA172D05	DSX7423	DXS6809	DXS7132	DXS9902	DXS6789
Mother	11-12	12-13	9-9	13-13	9-10	14-15	30-33	13-14	11-12	20-20
Daughter	11-12	13-13	9-10	13-13	6-10	14-14	30-33	14-14	11-12	20-21
Putative Grandmother	11-12	12-13	9-10	11-13	6-11	13-14	32-33	14-16.3	11-13	21-21
FADF	0,322 0,266	0,235	0,162	0,244	0,147	0,322	0,039 0,302	0,329	0,360 0,351	0,244
Case 2	DXS8378	DXS9898	DXS7133	GATA31E08	GATA172D05	DSX7423	DXS6809	DXS7132	DXS9902	DXS6789
Daughter	11-12	8.3-13	9-11	9-13	8-11	14-14	32-35	11-14	11-13	15-20
Putative Grandmother	10-12	12-13	9-9	12-13	8-8	14-15	32-34	13-14	11-11	20-23
FADF	0,266	0,235	0,453	0,244	0,166	0,322	0,169	0,329	0,360	0,402
Case 3	DXS8378	DXS9898	DXS7133	GATA31E08	GATA172D05	DSX7423	DXS6809	DXS7132	DXS9902	DXS6789
Mother	10-12	8.3-13	10-11	11-12	9-12	14-15	33-33	15-16	12-13	21-22
Daughter	10-12	12-13	11-11	11-12	8-12	15-15	33-34	15-15	12-13	21-21
Putative Grandmother	10-11	12-12	11-11	11-12	8-10	14-15	34-35	15-15	12-13	21-21
Putative Half sister 1	10-12	12-13	11-12	11-12	8-10	14-15	30-34	15-15	12-14	21-26
Putative Half sister 2	10-11	12-14	9-11	9-12	8-11	14-15	33-34	15-15	12-13	20-21
Mother of Half sister 2	11-11	11-14	9-11	9-13	6-11	13-14	32-33	15-15	11-13	20-22
RAPF	10	12	11	12	8	15	34	15	12	21
FADF	0,366 0,266	0,305	0,323	0,254	0,166	0,395	0,195	0,221	0,351 0,208	0,244
Case 4	DXS8378	DXS9898	DXS7133	GATA31E08	GATA172D05	DSX7423	DXS6809	DXS7132	DXS9902	DXS6789
Mother	12-12	13-13	9-11	12-12	11-12	14-15	33-36	12-15	11-12	21-23
Daughter	12-12	13-13	9-11	12-15	11-12	15-15	33-36	12-17.3	11-13	22-23
Putative Half sister	10-12	13-13	9-9	9-15	11-11	14-15	33-34	16-17.3	12-13	21-22
Mother of Half sister	10-12	8.3-13	9-10	9-11	10-11	14-15	34-37	15-16	12-12.1	21-22
RAPF	10 or 12	13	9	15	11	14 or 15	33	17.3	13	21 or 22
FADF	0,266	0,235	0,453 0,323	0,030	0,225 0,101	0,395	0,302 0,030	0,030	0,208	0,130

RAPF – reconstructed allele of putative father

FAF- frequencies of allele transmitted by the father