

SUPPLEMENTAL MATERIAL

Table S1. Prevalence of high QRS-voltage ECGs.

Prevalence % (95% CI)	Apparently healthy population N = 10,783	Ghanaian, males, <40 y n = 120	Turkish, females, ≥40 y n = 417
Original Sokolow-Lyon index (A)	4.49% (4.10%-4.88%)	36.67% (28.04%-45.29%)	0.48% (-0.18%-1.14%)
Original Sokolow-Lyon index without V6 (B)	4.45% (4.06%-4.84%)	36.67% (28.04%-45.29%)	0.48% (-0.18%-1.14%)
Modified Sokolow-Lyon index (B)	20.11% (19.36%-20.87%)	82.50% (75.70%-89.30%)	0.72% (-0.09%-01.53%)
Cornell voltage (A)	1.39% (1.17%-1.61%)	1.67% (-0.62%-3.96%)	0.48% (-0.18%-1.14%)
Cornell voltage duration product (B)	2.48% (2.18%-2.77%)	4.17% (0.59%-7.74%)	0.96% (0.02%-1.89%)
R aVL (A,B)	0.76% (0.60%-0.92%)	2.50% (-0.29%-5.29%)	0.48% (-0.18%-1.14%)
ESC hypertension guideline 2013: any of B	21.83% (21.05%-22.61%)	83.33% (76.67%-90.00%)	2.16% (0.76%-3.55%)
High QRS-voltage criteria used for this study: any of A	6.33% (5.87%-6.79%)	38.33% (29.63%-47.03%)	1.44% (0.30%-2.58%)

Prevalences of ECGs meeting one of the high QRS-voltage criteria in the apparently healthy population and the on age-, sex- and ethnicity based subgroups with respectively the highest and lowest prevalence of electrocardiographic LVH according to the criteria from the ESC hypertension guideline. Original Sokolow-Lyon index: $S V_1 + R V_5/V_6 > 3.5\text{mV}$; Original Sokolow-Lyon index without V6: $S V_1 + R V_5 > 3.5\text{mV}$; Modified Sokolow-Lyon index: any precordial S + any precordial R $> 3.5\text{mV}$. Cornell voltage: $R aVL + S V_3 > 2.8\text{mV}$ (males), 2.0mV (females); Cornell voltage duration product: $(R aVL + S V_3 \text{ (females} + 0.8\text{mV)}) \cdot \text{QRS-duration} > 244\text{mV}\cdot\text{ms}$; $R aVL > 1.1\text{mV}$.
y=years old.

Table S2. STE-ECG prevalence in the larger HELIUS population.

Prevalence % (95% CI)	Apparently healthy population N=10,783 Age: 38 (28-48)[18-71] Sex (M/F): 4,079/6,704	CVD-free population N=16,610 Age: 44 (32-53)[18-73] Sex (M/F): 6,643/9,967	Total HELIUS cohort N=20,789 Age: 45 (34-54)[18-73] Sex (M/F): 8,647/12,142
Sex-specific STEMI thresholds	3.43% (3.10%-3.79%)	3.05% (2.80%-3.33%)	2.95% (2.73%-3.19%)
Age- and sex-specific STEMI thresholds	2.76% (2.47%-3.09%)	2.52% (2.29%-2.77%)	2.46% (2.26%-2.68%)

Prevalences of STE-ECGs in the larger HELIUS population next to the apparently healthy subjects additionally including subjects with hypertension, CKD and/or diabetes (CVD-free population) and the total HELIUS cohort additionally including subjects with cardiovascular disease (see Figure 1).

CVD-free = without cardiovascular disease

Table S3. Logistic regression for the occurrence of a STE-ECG.

		Odds ratio (95% CI)	p-value
Ethnicity:			
	Ghanaian	5.71 (3.25-10.02)	<0.0001*
	African Surinamese	4.49 (2.66-7.57)	<0.0001*
	Dutch	2.18 (1.29-3.68)	0.0037
	Moroccan	2.12 (1.24-3.61)	0.0057
	South-Asian Surinamese	1.79 (0.97-3.30)	0.0619
	Turkish	reference	
Sex:			
	Male	4.06 (2.79-5.90)	<0.0001*
	Female	reference	
Age:			
	Years	0.97 (0.96-0.98)	<0.0001*
High QRS-voltage:			
	High QRS-voltages	2.80 (2.08-3.76)	<0.0001*
	No high QRS-voltages	reference	
ERP:			
	Inferior and antero-lateral (n = 532)	4.06 (2.85-5.80)	<0.0001*
	Antero-lateral (n = 478)	3.16 (2.11-4.72)	<0.0001*
	Lateral (n = 304)	2.80 (1.49-5.26)	0.0014
	Lateral and antero-lateral (n = 65)	1.33 (0.44-4.00)	0.6089
	Lateral, inferior and antero-lateral (n = 7)	0.00 (0.00-INF)	0.9791
	Inferior (n = 1,166)	1.08 (0.70-1.68)	0.7196
	Lateral and inferior (n = 3)	0.00 (0.00-INF)	0.9887
	No early repolarization pattern	reference	
QRS-duration:			
	milliseconds, IQR: 14 ms	1.06 (1.05-1.08)	<0.0001*
QTc-interval (Bazett):			
	milliseconds, IQR: 28 ms	0.98 (0.97-0.99)	<0.0001*

The reference category for the categorical variables was the subgroup with the lowest prevalence of a STE-ECG (age- and sex-specific STEMI thresholds): Turkish ethnicity, female, no high QRS-voltages, no ERP.

* = significant with a significance level of 0.001; IQR = interquartile range.

Table S4. Exclusions stratified per ethnicity.

n (%)	All	Afr. Sur.	Dutch	Ghan.	Moroc.	S.-Asian Sur.	Turkish
Initial inclusion	21,240 (100%)	4,060 (19%)	4,477 (21%)	2,309 (11%)	3,860 (18%)	2,981 (14%)	3,553 (17%)
Exclusion for STE-ECG analysis:							
Pre-excitation	44	8	5	5	9	10	7
QRS \geq 120ms	392	53	132	25	65	52	65
Ventricular rhythm/pacing	15	3	3	2	2	4	1
None of above:	20,789 (100%)	3,996 (19%)	4,337 (21%)	2,277 (11%)	3,784 (18%)	2,915 (14%)	3,480 (17%)
Cardiovascular exclusion:							
Arterial disease*	1,448	310	239	126	152	346	275
ECG abnormalities*	2,071	446	409	231	282	353	350
ECG-mod. medication*	1,353	211	337	79	220	214	292
None of above:	16,610 (100%)	3,178 (19%)	3,479 (21%)	1,882 (11%)	3,202 (19%)	2,167 (13%)	2,702 (16%)
Comorbidity exclusion:							
CKD*	22	7	1	1	3	6	4
DM*	1,577	357	85	230	326	340	239
Hypertension*	5,308	1,430	850	966	672	736	654
None of above:	10,783	1,660	2,603	870	2,384	1,318	1,948
Apparently healthy population	(100%)	(15%)	(24%)	(8%)	(22%)	(12%)	(18%)

S.-Asian Sur.=South-Asian Surinamese, Afr. Sur.=African Surinamese, Ghan.=Ghanaian, Moroc.=Moroccan, ECG-mod. med.=ECG-modulating medication, *=Categories may overlap.

Table S5. STE-ECG prevalence stratified per ethnicity, sex and age.

Prevalence (95% CI)	All	Afr. Sur.	Dutch	Ghan.	Moroc.	S.-Asian Sur.	Turkish
All	2.76% (2.47%-3.09%) N=10,783	4.76% (3.84%-5.89%) n=1,660	2.31% (1.79%-2.96%) n=2,603	7.01% (5.50%-8.90%) n=870	2.18% (1.67%-2.85%) n=2,384	1.90% (1.29%-2.79%) n=1,318	1.08% (0.71%-1.64%) n=1,948
M	6.15% (5.46%-6.93%) n=4,079	11.11% (8.84%-13.87%) n=603	4.66% (3.53%-6.12%) n=1,030	17.52% (13.48%-22.46%) n=274	5.70% (4.30%-7.52%) n=807	4.14% (2.77%-6.13%) n=556	2.35% (1.51%-3.64%) n=809
F	0.70% (0.53%-0.93%) n=6,704	1.14% (0.65%-1.97%) n=1,057	0.76% (0.44%-1.33%) n=1,573	2.18% (1.28%-3.70%) n=596	0.38% (0.17%-0.83%) n=1,577	0.26% (0.07%-0.95%) n=762	0.18% (0.05%-0.64%) n=1,139
<40y	3.45% (3.01%-3.95%) n=5,776	6.36% (4.82%-8.35%) n=739	3.64% (2.72%-4.85%) n=1,209	8.01% (5.81%-10.94%) n=437	2.56% (1.87%-3.49%) n=1487	2.38% (1.49%-3.79%) n=713	1.51% (0.96%-2.38%) n=1,191
≥40y	1.98% (1.63%-2.40%) n=5,007	3.47% (2.47%-4.86%) n=921	1.15% (0.71%-1.86%) n=1,394	6.00% (4.13%-8.65%) n=433	1.56% (0.93%-2.60%) n=897	1.32% (0.67%-2.59%) n=605	0.40% (0.13%-1.16%) n=757
M, <40y	7.71% (6.65%-8.92%) n=2,127	14.77% (11.00%-19.56%) n=264	7.20% (5.22%-9.85%) n=486	21.67% (15.24%-29.85%) n=120	6.82% (4.87%-9.47%) n=469	5.02% (3.11%-7.99%) n=319	3.41% (2.11%-5.47%) n=469
M, ≥40y	4.46% (3.63%-5.47%) n=1,952	8.26% (5.78%-11.68%) n=339	2.39% (1.40%-4.05%) n=544	14.29% (9.63%-20.68%) n=154	4.14% (2.48%-6.83%) n=338	2.95% (1.44%-5.97%) n=237	0.88% (0.30%-2.56%) n=340
F, <40y	0.96% (0.69%-1.33%) n=3,649	1.68% (0.86%-3.29%) n=475	1.24% (0.66%-2.35%) n=723	2.84% (1.50%-5.31%) n=317	0.59% (0.27%-1.28%) n=1,018	0.25% (0.01%-1.42%) n=394	0.28% (0.08%-1.00%) n=722
F, ≥40y	0.39% (0.22%-0.69%) n=3,055	0.69% (0.27%-1.75%) n=582	0.35% (0.12%-1.03%) n=850	1.43% (0.56%-3.63%) n=279	0.00% (0.00%-0.68%) n=559	0.27% (0.01%-1.52%) n=368	0.00% (-.00%-0.91%) n=417

Prevalences of STE-ECGs (age- and sex- specific STEMI thresholds) stratified per ethnicity, sex and age group.

Table S6. Electrocardiographic locations of STE-ECGs stratified per ethnicity.

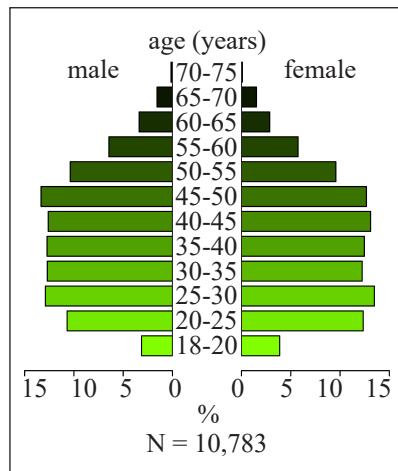
ECG lead combination	All	Afr. Sur.	Dutch	Ghan.	Moroc.	S.-Asian Sur.	Turkish
prevalence	N=10,783	n=1,660	n=2,603	n=870	n=2,384	n=1,318	n=1,948
aVL&I	0.02%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%
I&-aVR	0.03%	0.00%	0.00%	0.11%	0.04%	0.00%	0.05%
-aVR&II	0.07%	0.24%	0.04%	0.11%	0.08%	0.00%	0.00%
II&aVF	0.18%	0.30%	0.23%	0.23%	0.08%	0.15%	0.10%
aVF&III	0.07%	0.06%	0.15%	0.00%	0.04%	0.08%	0.05%
V1&V2	0.19%	0.42%	0.04%	0.80%	0.17%	0.00%	0.05%
V2&V3	0.45%	0.66%	0.31%	2.07%	0.34%	0.30%	0.00%
V3&V4	0.93%	1.99%	0.65%	3.45%	0.46%	0.46%	0.15%
V4&V5	1.96%	3.31%	1.77%	4.71%	1.59%	1.21%	0.77%
V5&V6	0.26%	0.48%	0.15%	0.46%	0.25%	0.30%	0.10%
STE-ECG: One or more of above							
prevalence	2.76%	4.76%	2.31%	7.01%	2.18%	1.90%	1.08%
(95% CI)	(2.47%-3.09%)	(3.84%-5.89%)	(1.79%-2.96%)	(5.50%-8.90%)	(1.67%-2.85%)	(1.29%-2.79%)	(0.71%-1.64%)
Involvement of lead V4							
% (95% CI)	88.93% (84.86%-92.01%)	89.87% (81.27%-94.78%)	91.67% (81.93%-96.39%)	91.80% (82.21%-96.45%)	84.62% (72.48%-91.99%)	84.00% (65.35%-93.60%)	85.71% (65.36%-95.02%)

Figure S1. Migration history of the HELIUS ethnicities.



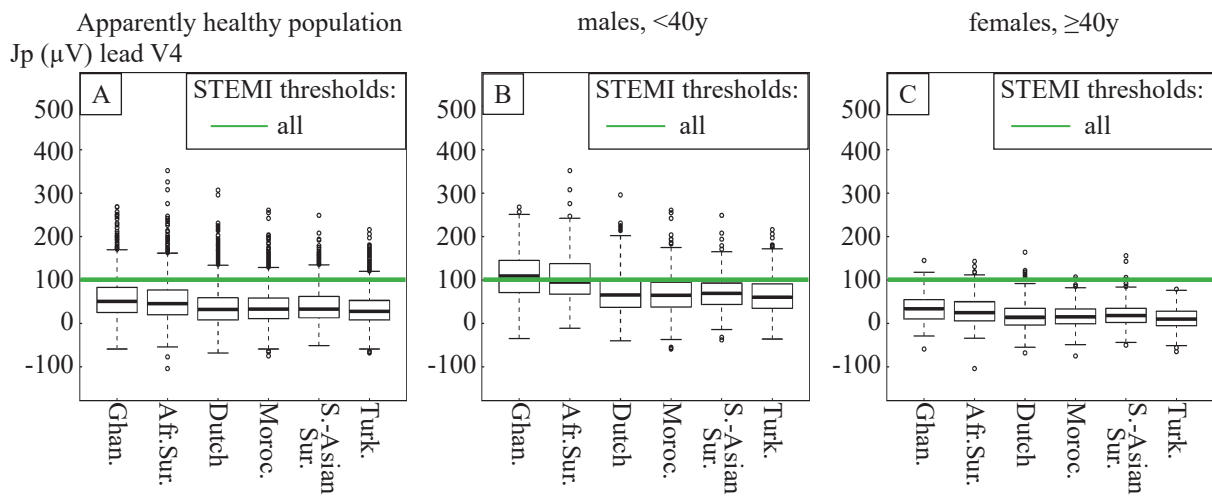
In the second half of the 20th century, descendants of West-African slaves (African Surinamese) and descendants of laborers from the Indian subcontinent (South-Asian Surinamese) migrated to the Netherlands. Dutch inhabitants of Turkish and Moroccan ethnic origin have a labor migration background and came in the sixties and seventies. Ghanaians migrated to the Netherlands in the eighties for multiple motives.

Figure S2. Population pyramid.



Age distribution separated by sex. Note the relatively high prevalence of younger subjects. Suriname is a former colony of the Netherlands. In the second half of the 20th century, descendants of West-African slaves (African Surinamese) and descendants of laborers from the Indian subcontinent (South-Asian Surinamese) migrated to the Netherlands.

Figure S3. J-point amplitude of lead V4.



A: Boxplots of the J-point amplitudes of the 12 ECG leads in the apparently healthy population (N=10,783). B: Age and sex based subgroup with the highest STE-ECG prevalence (7.71%): males aged younger than 40 (n=2,127). C: Age and sex based subgroup with the lowest STE-ECG prevalence (0.39%): females 40 years or older (n=3055). The green line represents the current STEMI threshold. Ethnicities are ranked from the highest STE-ECG prevalence (left) to the lowest (right). Afr. Sur.=African Surinamese; F=female; Ghan.=Ghanaian; Jp=J-point; M=male; Maroc.=Moroccan; S.-Asian Sur.=South-Asian Surinamese; Turk.=Turkish ethnicity; y=years old.