

Supplementary Tables

Table s1 Characteristics of patients who were invited to a Healthcheck compared to those who were not.

	Invite to health check (N=1579)	No. missing	Not invited to health check (N=2041)	No. missing	P-value	Effect size
Age (Years)	43.6 (7.4) CI: 29.1-58.1	0	43.2 (7.3) CI: 28.9-57.5	0	0.136	d = 0.1
Ethnicity N(%)		127		180	0.023	ϕ = 0.1
White	1196 (82.4, CI: 80.6-84.3)		1473 (79.2, CI: 77.4-80.9)			
Black	66 (4.5, CI: 2.8-6.4)		127 (6.8, CI: 5.1-8.6)			
Asian	72 (5.0, CI: 3.2-6.9)		109 (5.9, 4.1-7.6)			
Mixed/ Other	118 (8.1, CI: 6.3-10.0)		152 (8.2, CI: 6.4-9.9)			
Weight (kg)	81.5 (16.8) CI: 48.6-114.4	7	81.9 (17.0) CI: 48.6-115.2	18	0.492	d = 0.0
BMI	26.2 (5.9) CI: 14.6-37.7	14	26.3 (5.9) CI: 14.7-37.8	23	0.668	d = 0.0
Smoking status N(%)		33		42	0.024	ϕ <0.1
Smoker	1292 (83.6, CI: 81.8-85.4)		1726 (86.3, CI: 84.9-87.8)			
Non-smoker	254 (16.4, CI: 14.6-18.3)		273 (13.7, CI: 12.2-15.2)			
QRISK2 score N(%)		1		0	0.703	ϕ <0.1
<10	1416 (89.7, CI: 88.3-91.2)		1834 (89.9, CI: 88.6-91.1)			
10-<20	139 (8.8, CI: 7.4-10.3)		172 (8.3, CI: 7.2-9.7)			
20 or over	23 (1.5, CI: 0.1-2.9)		36 (1.8, CI: 0.5-3.0)			
Median (IQR)	3.32 (1.92-6.19)		3.22 (1.83-5.91)			
Alcohol consumption Median (IQR)	6.00 (3.00-12.00)	1038	6.00 (3.00-12.00)	1496	0.818	r <0.1
Sentence length (Years) N (%)		649		978	<0.001	- ϕ <0.1

Less than 1	441 (47.4, CI: 44.1-50.8)		626 (58.9, CI: 56.0-61.9)			-
1-<2	212 (22.8, CI: 19.5-26.1)		160 (15.1, CI: 21.1-18.0)			-
2-<3	77 (8.3, CI: 4.9-11.6)		73 (6.9, CI: 4.0-9.9)			-
3-<4	50 (5.4, CI: 2.0-8.7)		45 (4.2, 1.3-7.2)			-
4 or more	150 (16.1, CI: 12.8-19.5)		159 (15.0, CI: 12.0-17.9)			
Prison N (%)		0		0	<0.001	$\phi = 0.3$
HMP A	304 (57.1, CI: 52.8-61.5)		228 (42.9, CI: 38.5-47.2)			
HMP B	276 (44.2, CI: 40.2-48.3)		348 (55.8, CI: 51.8-59.8)			
HMP C	535 (45.8, CI: 42.9-48.9)		633 (54.2, CI: 51.3-57.2)			
HMP D	131 (27.2, CI: 23.2-31.2)		351 (72.8, CI: 68.9-76.9)			
HMP E	297 (63.3, CI: 59.1-68.0)		172 (36.7, CI: 32.4-41.3)			
HMP F	36 (10.4, CI: 7.5-13.6)		309 (89.6, 86.7-92.8)			

Percentages calculated vertically except for prison data.

Table s2: Characteristics of patients who received a Healthcheck compared to those who declined.

	Received health check (N=1191)	No. missing	Declined health check (N=388)	No. missing	P-value	Cohen's d statistic
Age (Years)	43.58 (7.4) CI: 29.1-58.1	0	43.51 (7.4) CI: 29.0-58.0	0	0.864	d = 0.0
Ethnicity N(%)		104		23	0.008	$\phi = 0.1$
White	914 (84.1, CI: 82.1-86.1)		282 (77.3, CI: 73.4-81.5)			
Black	40 (3.7, CI: 1.7-5.7)		26 (7.0, CI: 3.3-11.4)			
Asian	53 (5.0, 2.9-6.9)		19 (5.2, CI: 1.4-9.5)			
Mixed/ Other	80 (7.4, CI: 5.3-9.4)		38 (10.4, CI: 6.6-14.7)			
Weight (kg)	81.71 (17.0) CI: 48.4-115.0	6	80.79 (16.3) CI: 48.8-112.7	1	0.334	d = 0.0
BMI	26.22 (6.1) CI: 14.3-38.2	10	26.06 (5.1) CI: 16.1-36.1	4	0.611	d = 0.0
Smoking status N(%)		25		8	0.155	$\phi < 0.1$
Smoker	965 (82.8, CI: 80.7-85.0)		327 (86.1, CI: 82.9-89.6)			-
Non-smoker	201 (17.2, CI: 15.2-19.5)		53 (14.0, CI: 10.8-17.5)			-
QRISK2 score		0		0	0.372	$\phi < 0.1$
<10	1066 (89.6, CI: 87.9-91.3)		350 (90.2, 87.6-93.1)			
10-<20	109 (9.2, CI: 7.6-10.9)		30 (7.7, CI: 5.2-10.6)			
20 or over	15 (1.3, CI: 0.0-3.0)		8 (2.1, CI: 0.0-5.0)			
Median (IQR)	3.29 (1.91-6.19)	1	3.35 (2.02-6.17)	0		
Alcohol consumption Median (IQR)	6.00 (3.00-12.00)	760	7.00 (3.00-12.00)	278	0.960	r < 0.1
Sentence length (Years) N (%)		473		165	0.313	$\phi = 0.1$

<1	222 (30.9, CI: 27.2-34.9)		75 (33.6, CI: 26.9-40.4)			-
-1-<2	144 (20.1, CI: 16.3-24.0)		50 (22.4, CI: 15.7-29.2)			-
2-<3	76 (10.6, CI: 6.8-14.5)		28 (12.6, CI: 5.8-19.4)			-
3-<4	55 (7.7, CI: 3.9-11.6)		18 (8.1, CI: 1.3-14.9)			-
4 or more	221 (30.8, CI: 27.0-34.7)		52 (23.3, CI: 16.6-30.1)			-
Prison		0		0	<0.001	$\phi = 0.3$
HMP A	283 (93.1, CI: 90.8-96.0)		21 (6.9, CI: 4.6-9.8)			-
HMP B	190 (68.8, CI: 63.4-74.4)		86 (31.2, CI: 25.7-36.7)			-
HMP C	345 (64.5, CI: 60.4-68.7)		190 (35.5, CI: 31.4-39.7)			-
HMP D	99 (75.6, CI: 68.7-83.0)		32 (24.4, CI: 17.6-31.9)			-
HMP E	247 (83.2, CI: 79.1-87.3)		50 (16.8, CI: 12.8-21.0)			-
HMP F	27 (75.0, CI: 63.9-90.2)		9 (25.0, CI: 13.9-40.2)			-

Percentages calculated vertically except for prison data

16 prisoners received a Healthcheck but their baseline data was not available in full and so they did not contribute to the analysis in this Table

Table s3. Categories of deprivation score for prisoners who received Healthcheck (n=1207)

IMD score category	N(%)
1-2	340 (28.9, CI 26.0-32.0)
3-4	207 (17.6, CI: 14.6-20.7)
5-6	84 (7.2, CI: 4.2-10.2)
7-8	94 (8.0, CI: 5.0-11.0)
9-10	38 (3.2, CI: 0.3-6.3)
No fixed address (No IMD score)	412 (35.1, CI: 32.1-38.1)

32 prisoners had missing information on IMD score

Supplementary Table s4. Multiple logistic regression results with consented / declined healthcheck the outcome variable, with age, ethnicity, prison, length of sentence, smoking status and BMI included in the model.

	Odds ratio	P-value
Age (years)	0.99 (0.97-1.02)	0.719
Ethnicity		
Black	2.74 (1.27-5.88)	0.004
Asian	1.40 (0.56-3.22)	0.447
Mixed \ other	1.02 (0.49-2.01)	0.957
Prison		
Prison C	6.41 (3.35-13.39)	<0.001
Prison B	5.27 (2.76-10.99)	<0.001
Prison E	2.53 (1.18-5.77)	0.021
Length of sentence (years)		
1-<2	0.90 (0.58-1.38)	0.626
2-<3	0.99 (0.51-1.87)	0.982
3-<4	0.58 (0.21-1.42)	0.265
4 or more	0.47 (0.21-0.94)	0.040
Smoking status		
Smoker	1.07 (0.65-1.79)	0.802
BMI	1.03 (0.99-1.06)	0.167

Note that due to the model being fitted only on those prisoners with complete data for all variables included, Prisons D and F do not feature in the model, as they were missing data on other variables. Prison A is the reference prison

Table s5. QRISK2 score by prison for entire eligible population (n=3620)

QRISK 2 category N (%)	HMP A	HMP B	HMP C	HMP D	HMP E	HMP F
N	532	624	1167	482	469	345
Under 10	481 (90.4, CI: 88.2-92.8)	590 (94.6, CI: 92.9-96.2)	1073 (92.0, CI: 90.5-93.4)	451 (93.4, CI: 91.7-95.7)	376 (80.2, CI: 76.8-83.8)	278 (80.6, CI: 76.8-84.8)
10-<20	43 (8.1, CI: 5.8-10.5)	31 (5.1, CI: 3.4-6.6)	80 (6.9, CI: 5.4-8.3)	28 (5.8, CI: 3.9-8.0)	78 (16.6, CI: 13.2-20.2)	51 (14.8, CI: 11.0-19.0)
20 or more	8 (1.5, CI: 0.0-3.9)	3 (0.5, CI: 0.0-2.2)	14 (1.2, CI: 0.0-2.7)	3 (0.6, 0.0-2.8)	15 (3.2, CI: 0.0-6.8)	16 (4.6, CI: 0.9-8.9)
Median (IQR)	3.1 (1.9-5.6)	3.0 (1.8-5.1)	3.1 (1.9-5.4)	2.8 (1.6-4.9)	5.2 (2.3-8.9)	4.5 (2.4-8.0)
Type of prison	Cat B R and S	Cat C S	Cat B R and S	Cat B T	Cat C Sx	Cat B S

All values are N (%) unless otherwise specified. One missing value

Prison: Cat=security Category and Type R= Remand, S=Sentenced, Sx=sexual offences, T= Training

Table s6. Prevalence of cardiovascular comorbidity by sentence length of less than 2 years and 2 years or greater, in patients who received a healthcheck

	Length of sentence < 2 years (N=371)	Missing	Length of sentence ≥ 2 years (N=353)	Missing	P-value	Effect size
eGFR		282		142	-	-
<60	0 (0.00)		1 (0.5)			
>60	89 (100.0)		210 (99.5)			
HbA1c		313		184	0.270	$\phi = 0.1$
<42 (normal)	54 (93.1, CI: 87.9-98.5)		160 (94.7, CI: 92.3-98.2)			
42-47 (pre-diabetes)	2 (3.5, CI: 0.00-8.8)		8 (4.7, CI: 2.4-8.2)			
48+ (diabetes)	2 (3.5, CI: 0.00-8.8)		1 (0.6, CI: 0.0-4.1)			
QRISK score (%)				0	0.238	$\phi = 0.1$
<10	335 (90.3, CI: 87.6-93.4)		308 (87.3, CI: 84.1-90.8)			
≥10	36 (9.7, CI: 7.0-12.6)		45 (12.8, CI: 9.6-16.3)			
Total PHQ-9		1		0	0.009	$\phi = 0.2$
<10	218 (58.9, CI: 53.8-64.1)		242 (68.6, CI: 63.7-73.5)			
≥10	152 (41.1, CI: 35.9-46.2)		111 (31.4, CI: 26.6-36.4)			
GAD-7		1			0.001	$\phi = 0.2$
<10	241 (65.1, CI: 60.3-70.2)		269 (76.2, CI: 72.0-80.8)			
≥10	129 (34.9, CI: 30.0-39.9)		84 (23.8, CI: 19.5-28.4)			

Table s7. Number of prisoners in each QRISK2 category, HbA1c levels, Chronic Kidney Disease and Depression (PHQ-9) and Anxiety (GAD-7) categories

	N (%)
QRISK 2 Score (%)	
<10	1082 (89.6, CI: 89.6-88.1)
≥10	125 (10.4, CI: 8.8-12.1)
Missing	0
HbA1c (mmols/mol)	
<42 (normal)	365 (92.6, CI: 90.4-95.1)
42-47 (pre-diabetes)	24 (6.1, CI: 3.8-8.5)
48+ (diabetes)	5 (1.3, CI: 0.0-3.7)
Missing	813
eGFR	
<60	1 (0.2, CI: 0.0-0.5)
>60	507 (99.8, CI: 99.6-1.0)
Missing	699
Total PHQ-9 score	
<10	752 (62.4, CI: 59.6-65.2)
≥10	453 (37.6, CI: 34.8-40.4)
Missing	2
Total GAD-7 Score	
<10	827 (68.6, CI: 66.0-71.3)
≥10	378 (31.4, CI: 28.7-34.1)
Missing	2

Table s8a. Number of prisoners in each age bracket with QRISK2 score for those that received a Healthcheck (n=1207)

QRISK2 score	Age bands							
	35 - 39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
<10	430 (99.8, CI: 99.5- 100.0)	312 (99.7, CI: 99.4- 100.0)	203 (94.4, CI: 92.1- 97.6)	106 (80.9, CI: 74.8- 87.7)	30 (46.2, CI: 35.4- 59.5)	1 (3.5, CI: 0.0- 9.3)	0 (0.0, CI: 0.0- 26.8)	0 (0.0, CI: 0.0- 27.4)
10-20	0 (0.0, CI: 0.0- 0.0)	1 (0.3, CI: 0.0- 0.9)	12 (5.6, CI: 3.3- 8.7)	25 (19.1, CI: 13.0- 25.8)	35 (53.9, CI: 43.1- 67.2)	28 (96.6, CI: 93.1- 100.0)	9 (52.9, CI: 35.3- 79.7)	0 (0.0, CI: 0.0- 27.4)
20 or more	1 (0.2, CI: 0.0- 0.6)	0 (0.0, CI: 0.0- 0.5)	0 (0.0, CI: 0.0- 3.2)	0 (0.0, CI: 0.0- 6.8)	0 (0.0, CI: 0.0- 13.3)	0 (0.0, CI: 0.0- 5.8)	8 (47.1, CI: 29.4- 73.8)	6 (100.0, CI: 100.0- 100.0)

P-value <0.001. No missing values. V = 0.7

Table s8b Number of prisoners in each age bracket with QRISK2 score for those that were eligible for a Healthcheck (n=3620)

QRISK2 score	Age bands							
	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
<10	1398 (99.9, CI: 99.9- 100.0)	901 (98.6, CI: 97.9- 99.3)	582 (94.3, CI: 92.7- 96.1)	289 (78.3, CI: 74.3- 82.5)	68 (37.4, CI: 30.2- 44.8)	11 (13.9, CI: 6.3- 23.1)	0 (0.0, CI: 0.0- 15.1)	0 (0.0, CI: 0.0- 16.5)
10-20	1 (0.1, 0.0-0.2)	11 (1.2, CI: 0.5- 1.9)	31 (5.0, CI: 3.4- 6.8)	76 (20.6, CI: 16.5- 24.8)	106 (58.2, CI: 51.1- 65.7)	62 (78.5, CI: 70.9- 87.7)	22 (53.7, CI: 39.0- 68.8)	2 (11.1, 5.6- 27.6)
20 or more	0 (0.0, 0.0-0.1)	2 (0.2, CI: 0.0- 0.9)	4 (0.7, CI: 0.0- 2.4)	4 (1.1, CI: 0.0- 5.3)	8 (4.4, 0.0- 11.9)	6 (7.6, CI: 0.0- 16.8)	19 (46.3, CI: 31.7- 61.4)	16 (88.9, CI: 83.3- 100.0)

P-value <0.001. 165 missing values. V=0.6

Table s8c. Number (%) of prisoners from each age group who have QRISK2 score of 10% or above and 20% and above for participants (n=1207)

Age (years)	QRISK2 score 10% or over n=125 N(%)	QRISK2 score 20% or over N(%)
35-39	1 (0.2%)	1 (0.2%)
40-49	13 (2.5%)	0 (0.0%)
50-59	60 (30.6%)	0 (0.0%)
60-69	45 (97.8%)	8 (17.4%)
70-74	6 (100.0%)	6 (100.0%)

Table s9. Effect of actual values on QRISK2 estimates based on missing values.

	QRISK2 score (Estimated cholesterol)	Non-estimated QRISK2 score (actual Cholesterol)
Median (IQR)	3.2 (1.84-6.14)	4.3 (2.11-8.13)

P=0.043 r=0.1

