

QCancer® -2013

Results Tables to accompany paper in British Journal General Practice Jan 2013

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Table 1 Baseline characteristics of women in the derivation and validation cohorts. Figures in the tables are counts (%) unless otherwise specified.

	Derivation women	*Validation women*
total	1240864	667603
mean age (SD)	50.3 (17.5)	50.1 (17.4)
BMI recorded	924268 (74.5)	480001 (71.9)
mean BMI (SD)	25.8 (4.9)	25.8 (4.9)
mean deprivation score	-.4 (3.3)	-.2 (3.5)
smoking status		
non smoker	640775 (51.6)	342137 (51.2)
ex-smoker	215060 (17.3)	105411 (15.8)
Current: amount not recorded	26749 (2.2)	14151 (2.1)
light (<10/day)	68059 (5.5)	35608 (5.3)
moderate (10-19/day)	92337 (7.4)	50146 (7.5)
heavy (20+/day)	50831 (4.1)	27711 (4.2)
smoking not recorded	147053 (11.9)	92439 (13.9)
alcohol intake		
non drinker	325730 (26.3)	169033 (25.3)
Trivial <1 unit/day	402453 (32.4)	203775 (30.5)
Light 1-2 units/day	192736 (15.5)	100051 (15.0)
Moderate 3+units/day	25003 (2.0)	13039 (2.0)
alcohol not recorded	294942 (23.8)	181705 (27.2)
medical and family history		
prior cancer	34324 (2.8)	17863 (2.7)
family history of breast cancer	45621 (3.7)	22043 (3.3)
family history of GI cancer	18759 (1.5)	8780 (1.3)
family history of ovarian cancer	2417 (0.2)	1192 (0.2)
benign breast disease	41728 (3.4)	20687 (3.1)
chronic pancreatitis	1042 (0.1)	539 (0.1)
COPD	21516 (1.7)	11358 (1.7)
type 1 diabetes	3523 (0.3)	1921 (0.3)
type 2 diabetes	37827 (3.0)	20372 (3.1)
endometriosis	13563 (1.1)	7153 (1.1)
endometrial hyperplasia or polyp	3235 (0.3)	1621 (0.2)
fibroids	18796 (1.5)	10291 (1.5)
polycystic ovarian disease	10756 (0.9)	5993 (0.9)
rheumatoid arthritis	13825 (1.1)	7153 (1.1)
SLE	1443 (0.1)	687 (0.1)
HIV or AIDS	4186 (0.3)	2907 (0.4)
oral contraceptive	120840 (9.7)	61830 (9.3)
HRT	26275 (2.1)	13402 (2.0)
anaemia	38804 (3.1)	19921 (3.0)

Table 2 Frequency of 'red flag' and recent general symptoms in women in the derivation and validation cohort. Numbers are frequencies (%).

	Derivation (%)		*Validation (%)*	
Red flag symptom				
abdominal distension	5080	(0.4)	2489	(0.4)
abdominal pain	133715	(10.8)	70703	(10.6)
appetite loss	6130	(0.5)	2793	(0.4)
breast lump	54664	(4.4)	28536	(4.3)
breast pain	31050	(2.5)	16264	(2.4)
breast skin/nipple changes	2102	(0.2)	1083	(0.2)
dysphagia	7225	(0.6)	3511	(0.5)
dyspareunia	7612	(0.6)	3837	(0.6)
haematemesis	5598	(0.5)	2798	(0.4)
haematuria	16749	(1.3)	8640	(1.3)
haemoptysis	4252	(0.3)	2117	(0.3)
heartburn	11981	(1.0)	5913	(0.9)
indigestion	45619	(3.7)	23275	(3.5)
inter-menstrual bleeding	13098	(1.1)	6454	(1.0)
neck lump	5743	(0.5)	2927	(0.4)
night sweats	3658	(0.3)	1830	(0.3)
post-coital bleeding	2705	(0.2)	1497	(0.2)
post-menopausal bleeding	16561	(1.3)	8578	(1.3)
rectal bleeding	24834	(2.0)	12436	(1.9)
venous thrombo-embolism	9605	(0.8)	4819	(0.7)
weight loss	13491	(1.1)	6874	(1.0)
Recent general symptoms				
back pain	47438	(3.8)	25090	(3.8)
bruising	2663	(0.2)	1166	(0.2)
change in bowel habit	3383	(0.3)	1539	(0.2)
constipation	17101	(1.4)	8708	(1.3)
cough	48677	(3.9)	25696	(3.8)
diarrhoea	22727	(1.8)	11705	(1.8)
dyspnoea	10574	(0.9)	5267	(0.8)
fever	4114	(0.3)	1788	(0.3)
headache	28145	(2.3)	14899	(2.2)
itching	3593	(0.3)	1975	(0.3)
tiredness	27006	(2.2)	13169	(2.0)
nausea	9477	(0.8)	4672	(0.7)
nocturia	1245	(0.1)	582	(0.1)
urgency	1532	(0.1)	627	(0.1)
urinary frequency	6961	(0.6)	3188	(0.5)
urinary retention	558	(0.0)	278	(0.0)
urinary incontinence	8977	(0.7)	4627	(0.7)
vaginal discharge	12285	(1.0)	6541	(1.0)

Table 3 numbers (%) women with cancer outcomes in the derivation and validation cohorts

	derivation		*Validation*	
	women	**%**	**women**	**%**
total patients	**1,240,864**		**667,603**	
no cancer	1,217,648	98.1	655,311	98.2
any cancer	23,216	1.9	12,292	1.8
cancer type				
lung cancer	2,043	8.8	1,107	9.0
colorectal cancer	2,607	11.2	1,356	11.0
gastro-oesophageal	1,065	4.6	551	4.5
pancreatic cancer	693	3.0	380	3.1
ovarian cancer	1,279	5.5	606	4.9
renal tract cancer	999	4.3	498	4.1
breast cancer	8,412	36.2	4,479	36.4
blood cancer	1,384	6.0	703	5.7
uterine cancer	1,015	4.4	523	4.3
cervical cancer	437	1.9	222	1.8
other cancer	3,282	14.1	1,867	15.2

Table 4 Mapping of clinical predictors to cancer type in the derivation cohort. + denotes a significant association on multivariate analysis

	blood	breast	cervix	colorectal	gastro	lung	other	ovarian	pancreas	renal	uterine	Total cancers associated with symptom
Abdominal distension				+			+	+				3
Abdominal pain	+		+	+	+		+	+	+	+	+	9
Anaemia	+		+	+	+	+	+	+		+		8
Appetite loss				+	+	+	+	+	+	+		7
Breast lump		+					+					2
Breast pain		+										1
Breast skin/nipple changes		+										1
Bruising	+											1
Change in bowel habit	+			+				+	+			4
Constipation				+			+					2
Cough						+						1
Dysphagia					+	+	+		+			4
Haematemesis					+		+		+			3
Haematuria	+		+				+	+		+	+	6
Haemoptysis						+						1
Heartburn					+							1
Indigestion					+	+	+	+	+	+		6
Inter-menstrual bleed			+								+	2
Neck lump	+					+	+					3
Night sweats	+											1
Post-coital bleeding			+									1
Post-menopausal bleeding	+	+	+				+	+		+	+	7
Rectal bleed				+								1
Venous thrombo-embolism	+	+	+	+	+	+	+	+	+		+	10
Weight loss	+			+	+	+	+	+	+	+		8
Total predictors per cancer	**10**	**5**	**7**	**9**	**9**	**9**	**4**	**0**	**8**	**7**	**5**	**n/a**

Table 5 adjusted risk ratios (95% CI) from the final model for clinical predictors for cancers in women in the derivation cohort. Model also included terms for age and body mass index for all cancers.

	factor	*Adjusted risk ratio*[1]
Breast cancer	non-drinker	1.00
	alcohol: Trivial <1 unit/day	1.06 (.997 to 1.12)
	alcohol: Light 1-2 unit/day	1.13 (1.06 to 1.21)
	alcohol: Moderate 3+units/day	1.20 (1.04 to 1.39)
	family history breast cancer	1.47 (1.34 to 1.62)
	breast lump	50.8 (48.4 to 53.3)
	breast pain	2.41 (2.12 to 2.73)
	breast skin or nipple changes	9.32 (7.21 to 12.0)
	post-menopausal bleeding	1.56 (1.30 to 1.87)
	venous thrombo-embolism	1.31 (1.04 to 1.67)
	Townsend score	.984 (.977 to .991)
Cervical cancer	non-smoker	1.00
	ex-smoker	1.38 (1.06 to 1.81)
	Light smoker (<10/day)	2.13 (1.49 to 3.03)
	moderate smoker(10-19/day)	2.11 (1.54 to 2.89)
	heavy smoker(20+/day)	1.88 (1.21 to 2.93)
	anaemia	3.39 (2.46 to 4.67)
	abdominal pain	2.06 (1.59 to 2.67)
	haematuria	5.02 (3.36 to 7.50)
	inter-menstrual bleeding	7.05 (4.48 to 11.1)
	post-menopausal bleeding	28.8 (22.8 to 36.4)
	post-coital bleeding	23.1 (13.8 to 38.7)
	venous thrombo-embolism	3.09 (1.63 to 5.85)
	Townsend score	1.06 (1.03 to 1.09)
Ovarian cancer	anaemia	3.91 (3.33 to 4.58)
	family history ovarian cancer	7.35 (4.34 to 12.4)
	abdominal distension	18.9 (15.3 to 23.3)
	abdominal pain	5.65 (5.03 to 6.34)
	appetite loss	2.89 (1.93 to 4.33)
	haematuria	1.64 (1.15 to 2.35)
	indigestion	1.47 (1.15 to 1.87)
	post-menopausal bleeding	4.89 (3.88 to 6.17)
	venous thrombo-embolism	5.39 (4.20 to 6.91)
	weight loss	1.61 (1.10 to 2.36)
	change in bowel habit	1.98 (1.25 to 3.15)
Uterine cancer	endometrial polyp/hyperplasia	2.40 (1.54 to 3.74)
	type 2 diabetes	1.30 (1.06 to 1.60)
	abdominal pain	1.99 (1.62 to 2.45)
	haematuria	5.36 (4.18 to 6.88)
	inter-menstrual bleeding	5.96 (2.88 to 12.3)
	post-menopausal bleeding	88.0 (76.6 to 101)
	venous thrombo-embolism	2.82 (1.88 to 4.24)

Blood cancers	anaemia	5.49 (4.77 to 6.33)
	abdominal pain	1.46 (1.25 to 1.7)
	haematuria	1.50 (1.09 to 2.08)
	neck lump	19.2 (15.6 to 23.6)
	night sweats	3.97 (2.41 to 6.53)
	post-menopausal bleeding	1.60 (1.13 to 2.25)
	venous thrombo-embolism	1.83 (1.33 to 2.51)
	weight loss	2.45 (1.88 to 3.19)
	change in bowel habit	2.07 (1.24 to 3.47)
	bruising	2.79 (1.66 to 4.68)
Colorectal cancer	anaemia	4.37 (3.94 to 4.86)
	family history GI cancer	1.50 (1.15 to 1.96)
	alcohol: non-drinker	1.00
	alcohol: Trivial <1 unit/day	1.27 (1.16 to 1.4)
	alcohol: Light 1-2 unit/day	1.27 (1.12 to 1.43)
	alcohol: Moderate 3+units/day	1.59 (1.24 to 2.03)
	abdominal distension	1.94 (1.28 to 2.93)
	abdominal pain	4.48 (4.10 to 4.89)
	appetite loss	1.66 (1.19 to 2.31)
	rectal bleeding	15.6 (14.2 to 17.2)
	venous thrombo-embolism	2.03 (1.57 to 2.62)
	weight loss	2.89 (2.30 to 3.41)
	change in bowel habit	2.15 (1.62 to 2.86)
	constipation	1.40 (1.18 to 1.67)
Gastro-oesoph	anaemia	3.48 (2.95 to 4.12)
	Non-smoker	1.00
	ex-smoker	1.23 (1.06 to 1.44)
	light (<10/day)	1.49 (1.08 to 2.07)
	moderate (10-19/day)	2.34 (1.87 to 2.93)
	heavy (20+/day)	3.01 (2.27 to 4.00)
	abdominal pain	2.19 (1.84 to 2.60)
	appetite loss	1.92 (1.27 to 2.91)
	dysphagia	43.6 (37.9 to 50.2)
	haematemesis	4.16 (3.05 to 5.68)
	heartburn	2.27 (1.46 to 3.52)
	indigestion	4.48 (3.75 to 5.35)
	venous thrombo-embolism	2.05 (1.37 to 3.07)
	weight loss	3.42 (2.65 to 4.41)
Lung cancer	COPD	2.21 (1.96 to 2.49)
	anaemia	2.37 (2.04 to 2.75)
	Non-smoker	1.00
	ex-smoker	3.82 (3.33 to 4.37)
	light (<10/day)	7.03 (5.88 to 8.4)
	moderate (10-19/day)	8.92 (7.63 to 10.4)
	heavy (20+/day)	12.0 (10.1 to 14.2)
	appetite loss	2.05 (1.54 to 2.73)

	dysphagia	1.96 (1.44 to 2.67)
	haemoptysis	18.7 (16.1 to 21.7)
	indigestion	1.44 (1.20 to 1.73)
	neck lump	3.35 (2.28 to 4.94)
	venous thrombo-embolism	2.44 (1.92 to 3.1)
	weight loss	3.12 (2.64 to 3.69)
	cough	1.90 (1.65 to 2.2)
	Townsend score	1.04 (1.03 to 1.06)
Other cancers	COPD	1.33 (1.14 to 1.54)
	anaemia	2.85 (2.55 to 3.19)
	alcohol: non-drinker	1.00
	alcohol: Trivial <1 unit/day	1.12 (1.03 to 1.22)
	alcohol: Light 1-2 unit/day	1.15 (1.03 to 1.28)
	alcohol: Moderate 3+units/day	1.41 (1.14 to 1.75)
	Non-smoker	1.00
	ex-smoker	1.07 (.975 to 1.17)
	light (<10/day)	1.21 (1.02 to 1.43)
	moderate (10-19/day)	1.46 (1.27 to 1.67)
	heavy (20+/day)	1.65 (1.37 to 1.98)
	abdominal distension	2.62 (1.9 to 3.61)
	abdominal pain	2.3 (2.11 to 2.51)
	appetite loss	2.33 (1.82 to 2.98)
	breast lump	2.83 (2.45 to 3.26)
	dysphagia	2.44 (1.91 to 3.11)
	haematemesis	1.47 (1.10 to 1.97)
	haematuria	1.85 (1.51 to 2.27)
	indigestion	1.28 (1.09 to 1.50)
	neck lump	8.73 (7.14 to 10.7)
	post-menopausal bleeding	1.52 (1.20 to 1.94)
	venous thrombo-embolism	2.90 (2.39 to 3.51)
	weight loss	3.02 (2.57 to 3.55)
	constipation	1.46 (1.22 to 1.74)
Pancreatic cancer	chronic pancreatitis	3.3 (1.36 to 8.05)
	type2 diabetes	2.21 (1.78 to 2.75)
	Non-smoker	1.00
	ex-smoker	.939 (.762 to 1.16)
	light (<10/day)	1.42 (.998 to 2.03)
	moderate (10-19/day)	2.04 (1.56 to 2.68)
	heavy (20+/day)	2.24 (1.59 to 3.15)
	abdominal pain	6.84 (5.86 to 7.99)
	appetite loss	4.58 (3.16 to 6.64)
	dysphagia	2.75 (1.69 to 4.47)
	haematemesis	2.54 (1.54 to 4.20)
	indigestion	3.04 (2.38 to 3.89)
	venous thrombo-embolism	4.26 (2.95 to 6.15)
	weight loss	4.85 (3.68 to 6.39)

	change in bowel habit	2.55 (1.49 to 4.36)
Renal tract	anaemia	3.55 (2.95 to 4.26)
	ex-smoker	1.32 (1.13 to 1.54)
	light (<10/day)	1.73 (1.31 to 2.29)
	moderate (10-19/day)	1.92 (1.51 to 2.44)
	heavy (20+/day)	2.47 (1.86 to 3.28)
	abdominal pain	1.85 (1.52 to 2.25)
	appetite loss	1.98 (1.14 to 3.43)
	haematuria	65.3 (57.3 to 74.5)
	indigestion	1.77 (1.3 to 2.39)
	post-menopausal bleeding	3.50 (2.56 to 4.8)
	weight loss	2.16 (1.49 to 3.14)

[1]Risk ratios adjusted for the following fractional polynomial terms age^{-2}, age^{-2} ln(age) and bmi^{-2}, bmi^{-2} ln(bmi) and for the other terms in the table for each cancer.

Table 6 ROC statistics (95% CI) for the multinomial prediction algorithms in women aged 25-89 in the validation cohort. The individual model values refer to the published QCancer models developed using individual cancer outcomes[4-9]

	women (multinomial model)	*women (individual models)*
any cancer	0.847(0.844 to 0.850)	n/a
lung	0.906(0.897 to 0.914)	0.92 (0.91 to 0.93)
colorectal	0.892(0.884 to 0.901)	0.89 (0.88 to 0.90)
gastro	0.904(0.890 to 0.917)	0.89 (0.87 to 0.91)
pancreas	0.871(0.853 to 0.889)	0.84 (0.82 to 0.86)
ovary	0.839(0.823 to 0.855)	0.84 (0.83 to 0.86)
renal	0.904(0.888 to 0.919)	0.91 (0.90 to 0.93)
breast	0.877(0.872 to 0.883)	n/a
blood	0.787(0.771 to 0.804)	n/a
uterus	0.912(0.896 to 0.929)	n/a
cervix	0.730(0.695 to 0.765)	n/a
other	0.821(0.81 to 0.832)	n/a

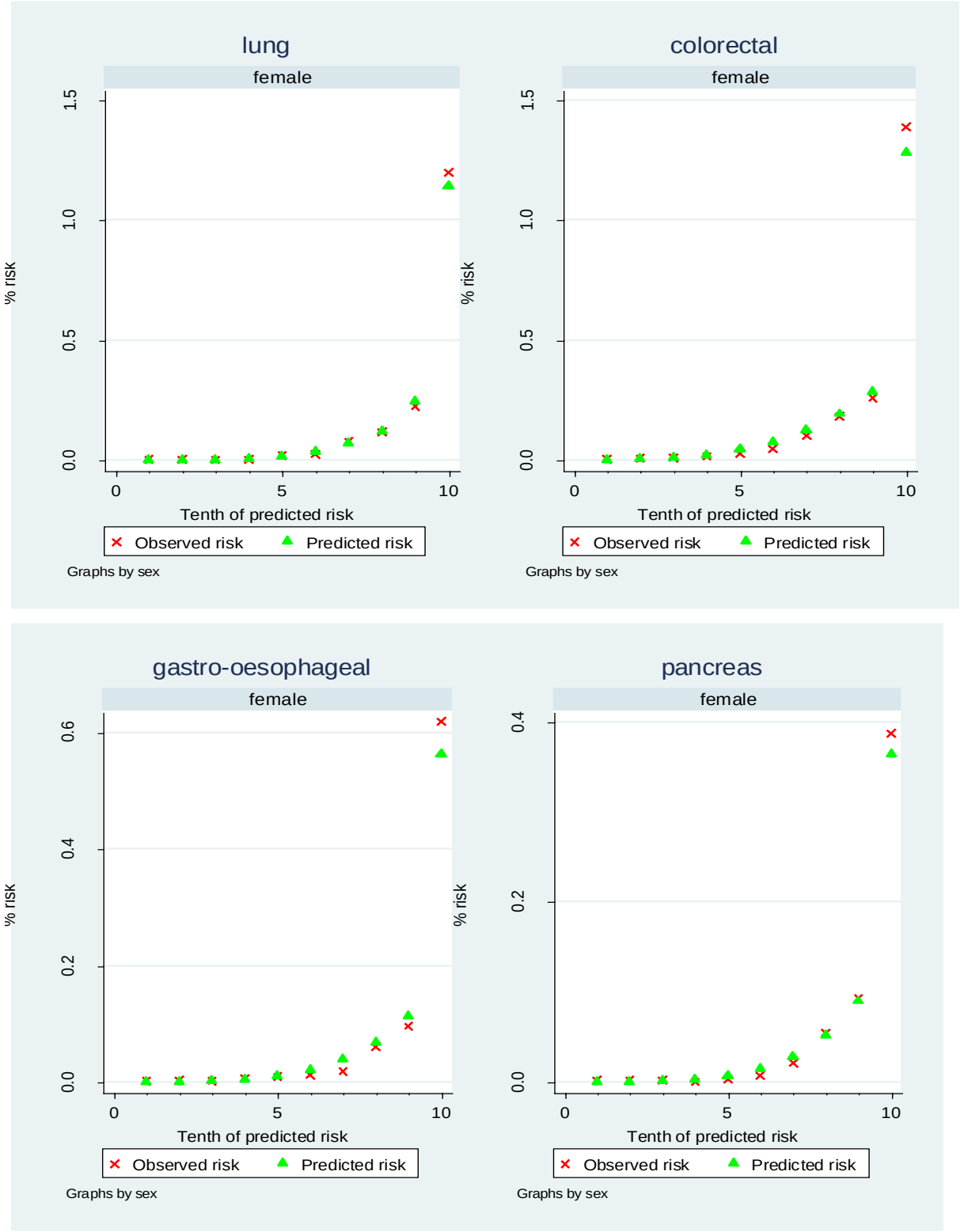
Table 7:comparison of strategies to identify women at risk of having a diagnosis of any cancer based on the validation cohort.

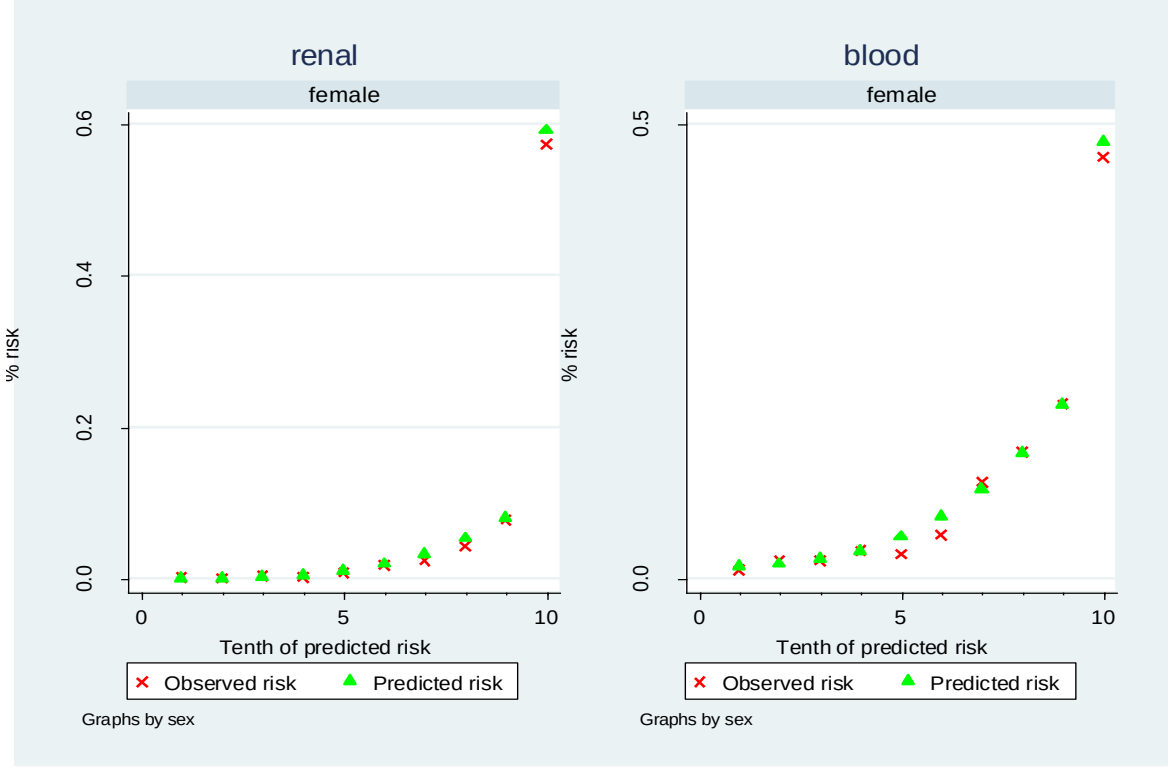
	Risk threshold %	true negative	false negative	false positive	True positive	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
anaemia	Not applicable	636,649	11,033	18,662	1,259	10.2	97.2	6.3	98.3
abdominal distension	Not applicable	652,914	12,200	2,397	92	0.7	99.6	3.7	98.2
abdominal pain	Not applicable	586,595	10,305	68,716	1,987	16.2	89.5	2.8	98.3
appetite loss	Not applicable	652,650	12,160	2,661	132	1.1	99.6	4.7	98.2
breast lump	Not applicable	629,798	9,269	25,513	3,023	24.6	96.1	10.6	98.5
breast pain	Not applicable	639,272	12,067	16,039	225	1.8	97.6	1.4	98.1
breast skin/nipple changes	Not applicable	654,269	12,251	1,042	41	0.3	99.8	3.8	98.2
bruising	Not applicable	654,171	12,266	1,140	26	0.2	99.8	2.2	98.2
change in bowel habit	Not applicable	653,865	12,199	1,446	93	0.8	99.8	6.0	98.2
constipation	Not applicable	647,003	11,892	8,308	400	3.3	98.7	4.6	98.2
cough	Not applicable	630,263	11,644	25,048	648	5.3	96.2	2.5	98.2
dysphagia	Not applicable	652,062	12,030	3,249	262	2.1	99.5	7.5	98.2
haematemesis	Not applicable	652,657	12,148	2,654	144	1.2	99.6	5.1	98.2
haematuria	Not applicable	647,153	11,810	8,158	482	3.9	98.8	5.6	98.2
haemoptysis	Not applicable	653,370	12,116	1,941	176	1.4	99.7	8.3	98.2
heartburn	Not applicable	649,495	12,195	5,816	97	0.8	99.1	1.6	98.2
indigestion	Not applicable	632,627	11,701	22,684	591	4.8	96.5	2.5	98.2
inter-menstrual bleeding	Not applicable	648,905	12,244	6,406	48	0.4	99.0	0.7	98.1
neck lump	Not applicable	652,548	12,128	2,763	164	1.3	99.6	5.6	98.2
night sweats	Not applicable	653,511	12,262	1,800	30	0.2	99.7	1.6	98.2
post-menopausal bleeding	Not applicable	647,359	11,666	7,952	626	5.1	98.8	7.3	98.2
post-coital bleeding	Not applicable	653,827	12,279	1,484	13	0.1	99.8	0.9	98.2
rectal bleeding	Not applicable	643,431	11,736	11,880	556	4.5	98.2	4.5	98.2
Venous thrombosis	Not applicable	650,752	12,032	4,559	260	2.1	99.3	5.4	98.2
weight loss	Not applicable	648,858	11,871	6,453	421	3.4	99.0	6.1	98.2
Top 10% of risk	4.1	595,237	5,606	60,074	6,686	54.4	90.8	10.0	99.1
Top 5% of risk	6.8	626,666	7,557	28,645	4,735	38.5	95.6	14.2	98.8
top 1%	19.2	650,437	10,490	4,874	1,802	14.7	99.3	27.0	98.4

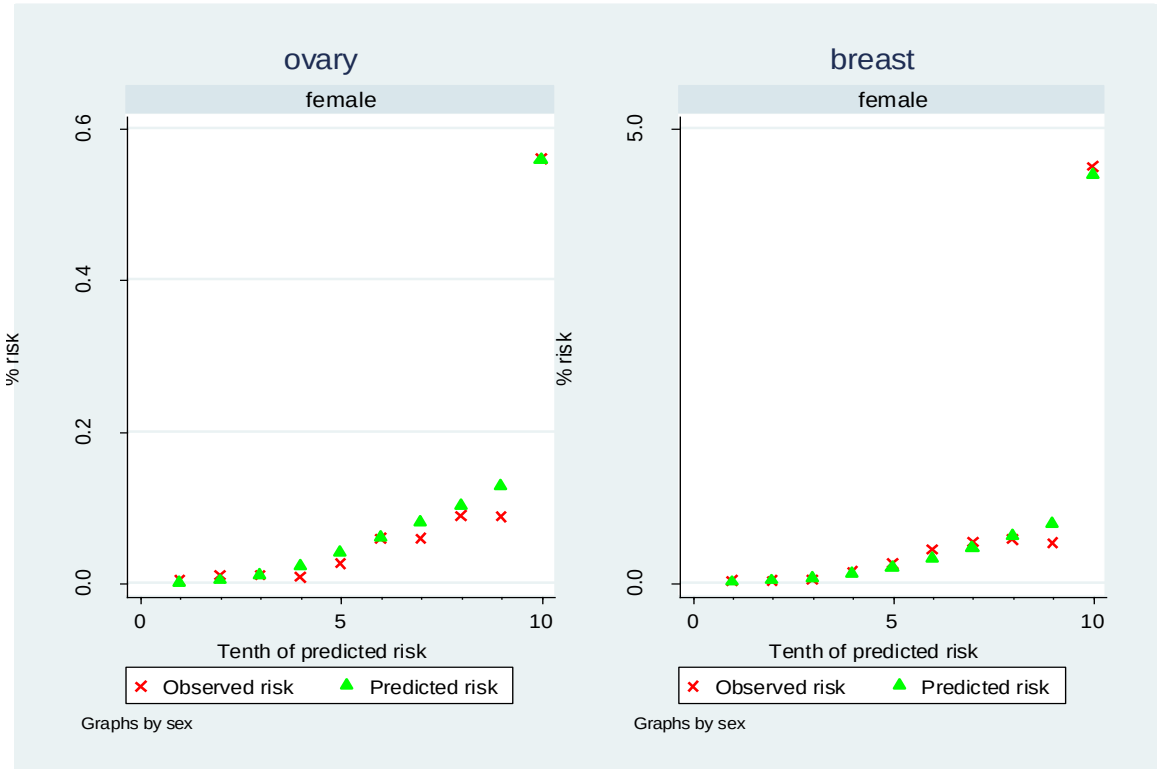
Table 8:comparison of strategies to identify women at risk of having a diagnosis of different types of cancer based on the top 10% at highest risk for each cancer in the validation cohort.

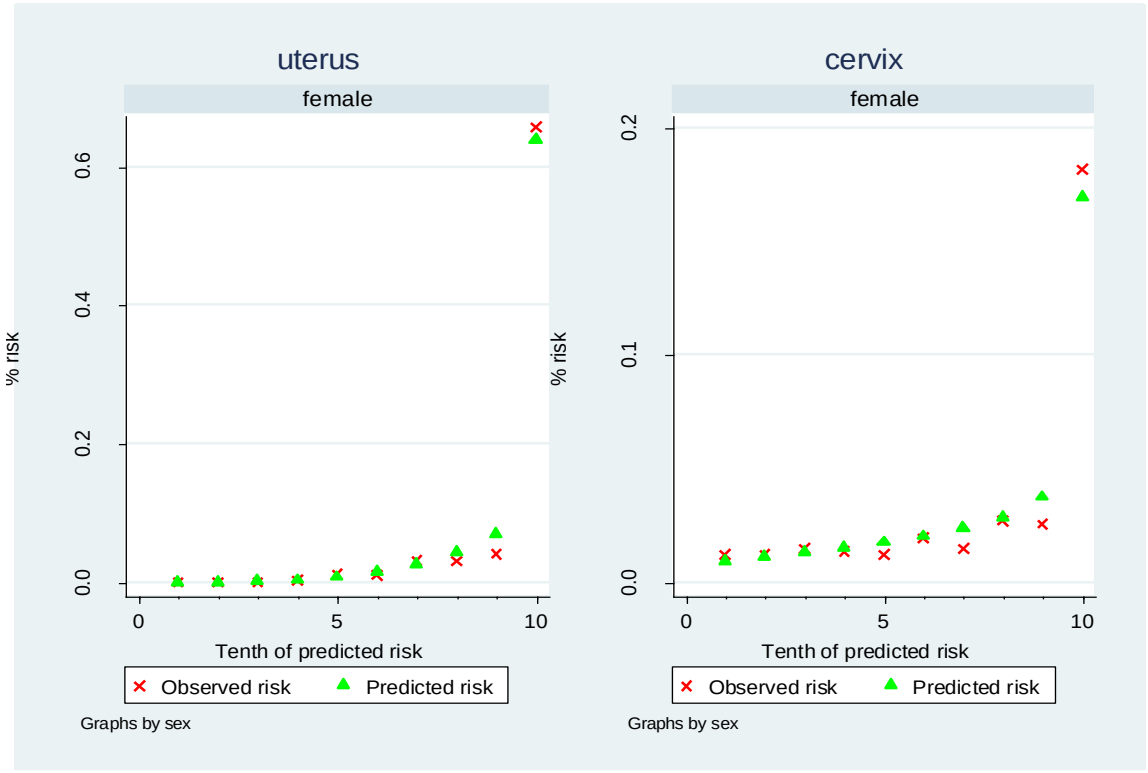
	Risk threshold %	true negative	false negative	false positive	True positive	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
top 10% risk lung cancer	0.38	600,534	309	65,962	798	72.1	90.1	1.2	99.9
top 10% risk colorectal cancer	0.35	600,412	431	65,835	925	68.2	90.1	1.4	99.9
top 10% risk gastro-oesophageal cancer	0.14	600,705	138	66,347	413	75.0	90.1	0.6	100.0
top 10% risk pancreas cancer	0.12	600,721	122	66,502	258	67.9	90.0	0.4	100.0
top 10% risk ovarian cancer	0.18	600,610	233	66,387	373	61.6	90.0	0.6	100.0
top 10% risk renal cancer	0.1	600,727	116	66,378	382	76.7	90.0	0.6	100.0
top 10% risk breast cancer	0.72	599,414	1,429	63,710	3,050	68.1	90.4	4.6	99.8
top 10% risk blood cancer	0.22	600,449	394	66,451	309	44.0	90.0	0.5	99.9
top 10% risk uterine cancer	0.1	600,758	85	66,322	438	83.7	90.1	0.7	100.0
top 10% risk cervical cancer	0.05	600,742	101	66,639	121	54.5	90.0	0.2	100.0
top 10% risk other cancer	0.55	600,590	253	66,699	61	19.4	90.0	0.1	100.0

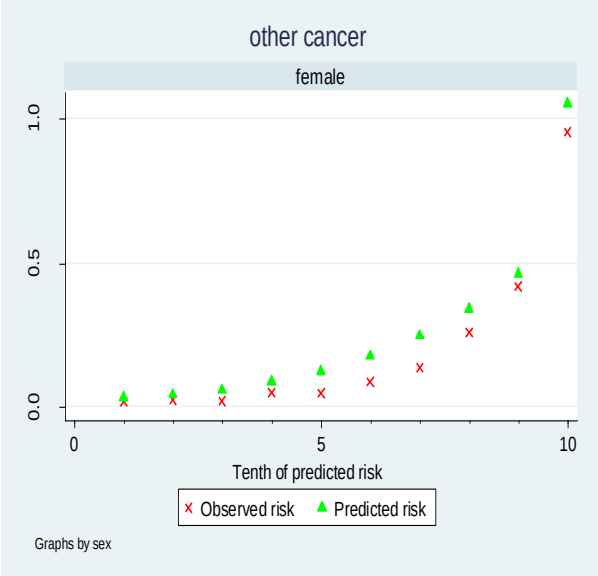
Figure 1 Mean predicted risk and observed risk of each cancer in the validation cohort




renal
female
% risk
0.0
0.2
0.4
0.6
0
5
10
Tenth of predicted risk
Observed risk
Predicted risk
Graphs by sex
blood
female
% risk
0.0
0.5
0
5
10
Tenth of predicted risk
Observed risk
Predicted risk
Graphs by sex


ovary
female
% risk
0.0
0.2
0.4
0.6
0
5
10
Tenth of predicted risk
Observed risk
Predicted risk
Graphs by sex
breast
female
% risk
0.0
5.0
0
5
10
Tenth of predicted risk
Observed risk
Predicted risk
Graphs by sex


uterus
female
% risk
0.0
0.2
0.4
0.6
0
5
10
Tenth of predicted risk
Observed risk
Predicted risk
Graphs by sex
cervix
female
% risk
0.0
0.1
0.2
0
5
10
Tenth of predicted risk
Observed risk
Predicted risk
Graphs by sex


other cancer
female
0.0
0.5
1.0
0
5
10
Tenth of predicted risk
Observed risk
Predicted risk
Graphs by sex

Box 1 clinical examples of individual risk assessment

Here are some examples of the prediction algorithms applied to individual women.

1. 69 year old woman who is a light drinker and an ex-smoker. She has a breast lump and nipple discharge or breast skin changes. Her overall cancer risk is 73.9% of which 73.3% is due to risk of breast cancer.

2. 50 year old woman, non-drinker, non-smoker with haematuria and post-menopausal bleeding has an 11.4% overall cancer risk of which uterus (5.7%), renal (2.6%), cervix (2.0%), ovary (0.4%), other cancer (0.3%).

3. 68 year old woman, non-drinker, non-smoker with anaemia, abdominal distension, abdominal pain and recent constipation has an overall cancer risk of 37.7% risk of which ovary (25.8%), colorectal (5.6%), other cancer (4.3%), blood (0.8%), gastro-oesophageal (0.3%), renal (0.2%), breast (0.3%), pancreas (0.2%), lung(0.1%), uterus (0.1%), cervix (0.1%)

4. 70 year old woman, heavy-smoker, trivial drinker, with family history of gastro-intestinal cancer, night sweats, a lump in the neck has a 18.2% risk of any cancer of which blood (10.1%), lung (3.0%), 'other cancer (4.0%), breast (0.5%), colorectal (0.3%), gastro-oesophageal (0.2%), renal tract (0.1%), ovary (0.1%), pancreas (0.1%).

5. 32 year old woman, non-smoker, heavy drinker with loss of appetite and abdominal pain has a 0.4% risk of any cancer and a 99.6% risk of no cancer.