Distribution of risk factors and cardiovascular risk in QRESEARCH in 2007

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Report to the Department of Health

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There are large variations between practices in the proportion of patients at high risk varying from 2% to 15% of the population. There is also a significant variation in completeness of data with practices from deprived areas tending to have less complete data. Practices from deprived areas are likely to need additional resources to implement a primary prevention CVD programme.

3 Background

Cardiovascular disease is the leading cause of premature death and a major cause of disability in the UK[1]. Asymptomatic patients thought to be at high risk of cardiovascular disease need to be identified so they can be offered advice about lifestyle changes, such as smoking cessation, physical activity and diet and treatment to lower blood pressure, modify cholesterol and aspirin where appropriate.

In a major initiative to improve public health, the National Institute of Health and Clinical Excellence (NICE) has lowered the threshold for primary prevention with statins from a ten year cardiovascular disease risk of 40% to 20%[2 3]. Whilst the Framingham risk equations[4] have been the 'gold standard' for many years to predict risk in individual patients, they have significant limitations. The Framingham cohort is almost entirely white and recalibration may be needed in more ethnically diverse populations[5]. The Framingham risk equations over-estimate risk by up to 50% in contemporary Northern European populations and also under-estimate risk in some high risk subgroups such as patients from deprived areas potentially exacerbating health inequalities[6 7]. Lastly, Framingham does not include factors such as social deprivation, body mass index, family history and current treatment with anti-hypertensives. The evidence supporting the utility of cardiovascular risk scores for primary prevention in the UK is scarce[8].

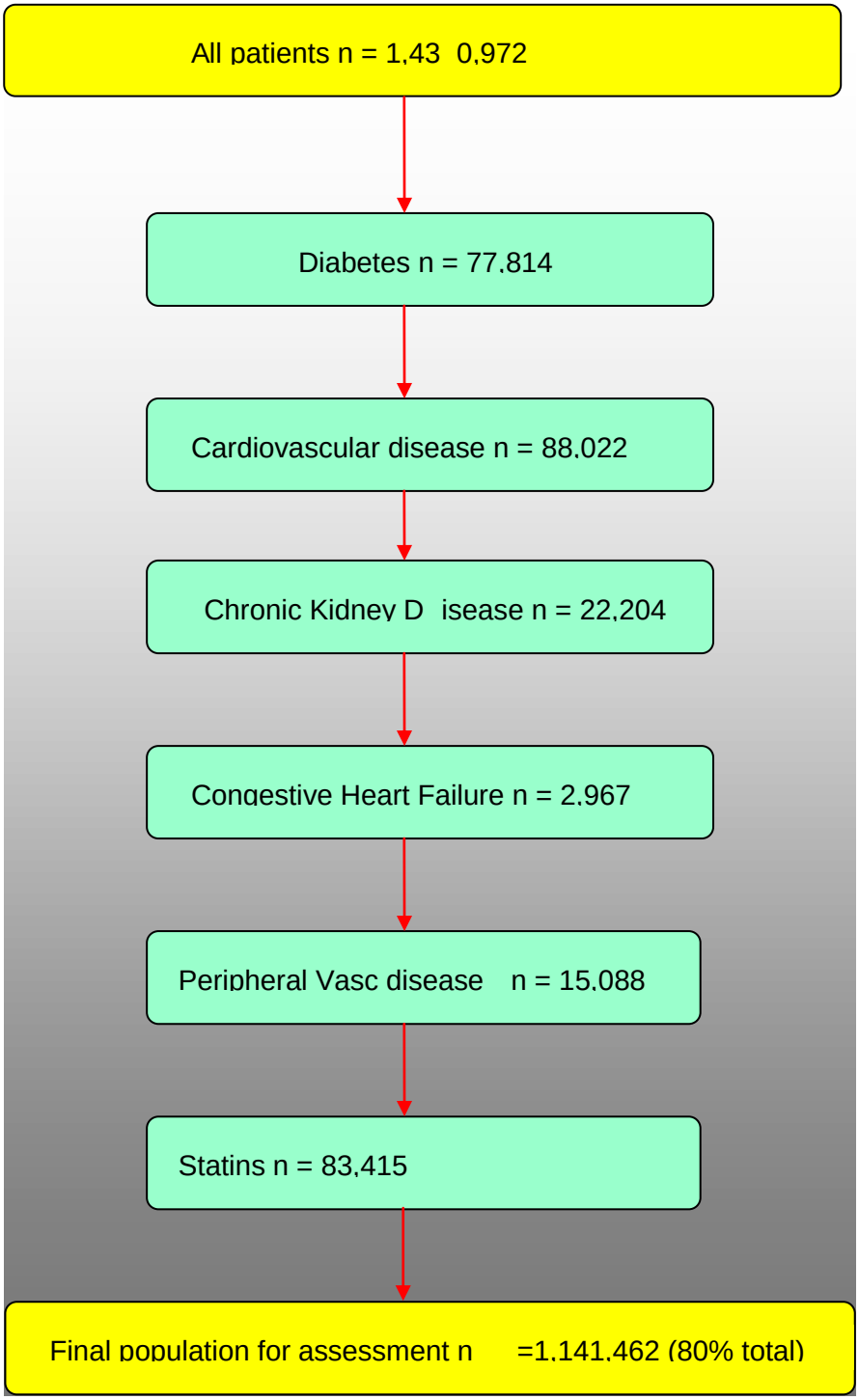
Any systematic over-estimation of risk will result in an excessive number of people being identified for treatment with an impact on prescribing costs and NHS resources supporting life long treatment. It is important this new public health programme includes social deprivation to reduce rather than exacerbate existing social inequalities in cardiovascular disease and target those at greatest risk[9] who have the most to gain.

NICE is currently evaluating a new CVD risk equation called QRISK. This includes deprivation in the estimation of cardiovascular disease risk. This is a significant step in supporting national initiatives to reduce health inequalities in cardiovascular disease[10] and likely to be an improvement on Framingham which tends to over-estimate risk in affluent areas and under-estimate risk in deprived areas[6]. Also, a weighting for social deprivation might help minimise health inequalities, which may increase when new interventions are introduced because of the inverse equity hypothesis[11]. The QRISK CVD algorithm was developed using a two thirds of the QRESEARCH database with the remaining third acting as a validation sample[12 13]. This algorithm has now been externally validated using the THIN database and has improved performance compared with Framingham[14]. QRISK was published while the NICE guideline was out for consultation and a decision regarding this is expected early in 2008.

6.2 Exclusions

Overall, of the 1,430,972 patients aged 40 to 74 years, 289,510 (20.2%) were excluded because of at least one co-existing conditions specified by the Dept of Health (DH) as shown in the flow chart below

Figure 1: exclusions from study (categories are mutually exclusive)



6.3 Patients meeting exclusion criteria by age and sex

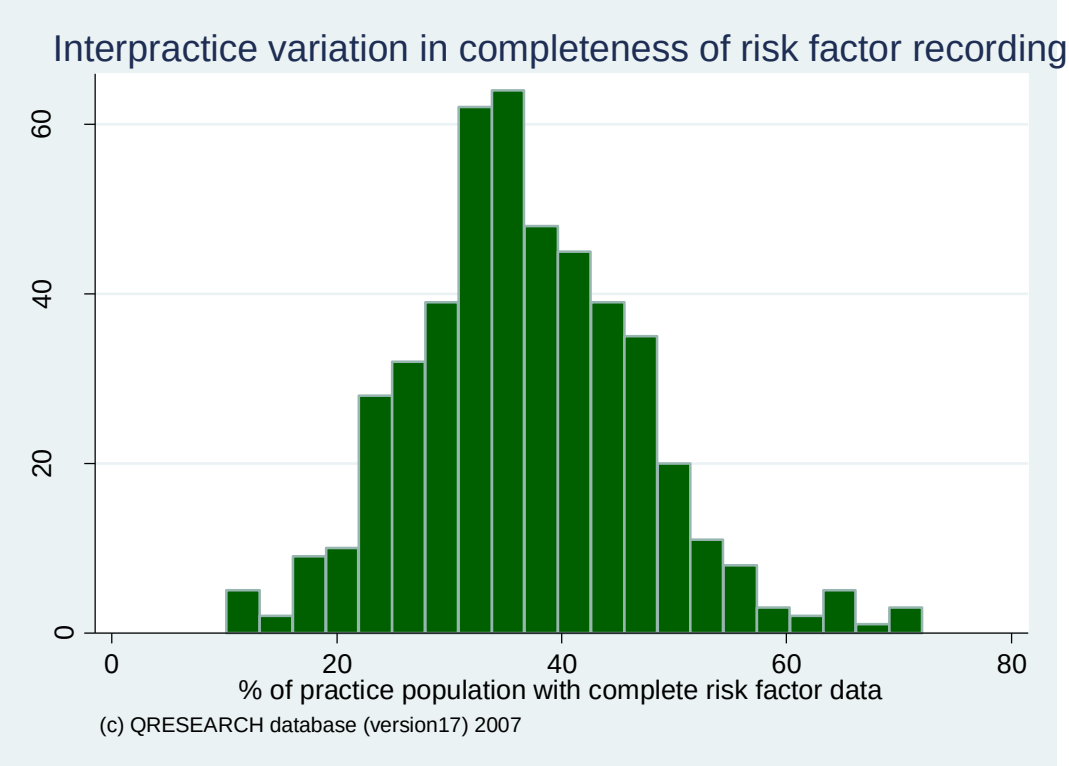
The age-sex breakdown of exclusions specified by DH is shown in the table below. It is important to note that each of the columns are mutually exclusive ie patients are first excluded if they have diabetes. Then patients are excluded if they have cardiovascular disease (having excluded those with diabetes) and so on.

Table 3: Numbers of patients excluded by age and sex (note the exclusions are mutually exclusive)

		All patients	diabetes	CVD no DM	CKD no DM or CVD	HF no DM or CVD or CKD	PVD no DM or CVD or CKD or HF	Statins no disease
Females	40-44 years	136,027	2,370	668	344	39	1,203	981
Females	45-49 years	117,526	3,039	1,224	562	35	1,245	1,930
Females	50-54 years	103,630	3,849	2,006	943	71	1,235	3,502
Females	55-59 years	108,918	5,048	3,776	1,785	138	1,388	6,691
Females	60-64 years	96,764	5,919	5,780	2,722	196	1,298	8,880
Females	65-69 years	76,907	6,522	7,623	3,727	326	1,117	8,369
Females	70-74 years	69,286	6,912	10,148	5,024	424	956	7,675
Males	40-44 years	143,936	3,200	1,194	216	73	479	2,181
Males	45-49 years	125,497	4,551	2,655	323	102	598	3,698
Males	50-54 years	106,781	5,493	4,432	440	135	760	5,500
Males	55-59 years	110,984	7,223	8,094	850	221	1,144	8,232
Males	60-64 years	97,509	7,986	11,550	1,219	328	1,373	10,016
Males	65-69 years	74,309	7,990	13,339	1,679	395	1,217	8,681
Males	70-74 years	62,898	7,712	15,533	2,370	484	1,075	7,079
total		**1,430,972**	**77,814**	**88,022**	**22,204**	**2,967**	**15,088**	**83,415**

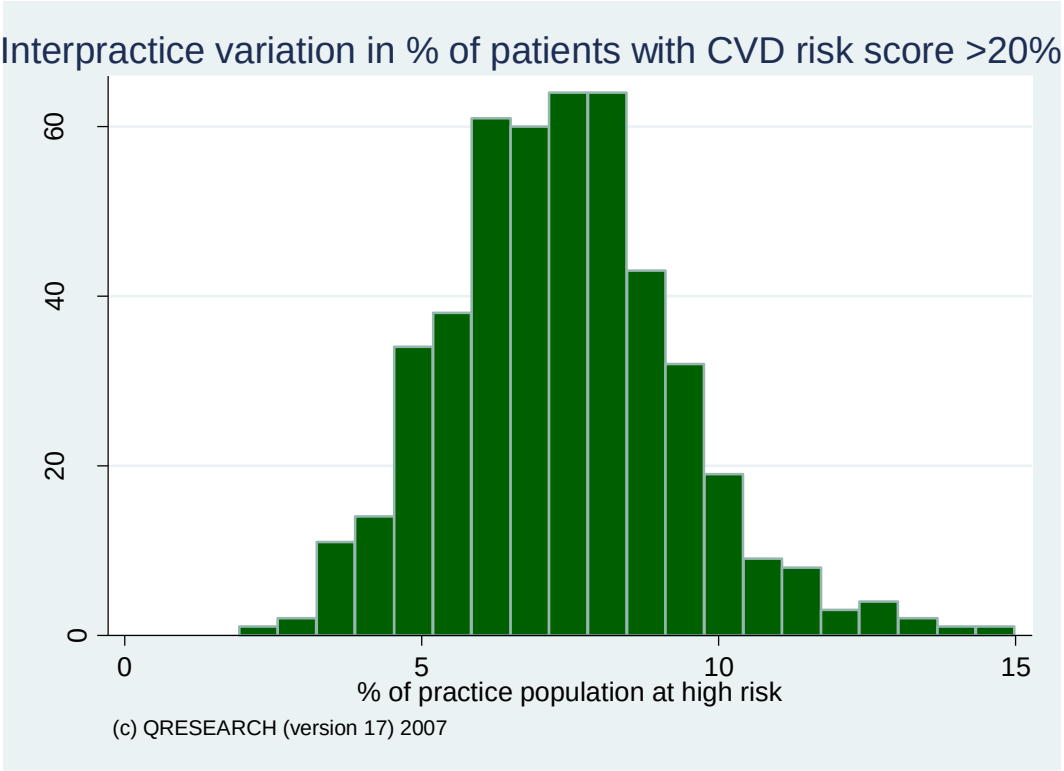
6.9 Inter practice variation in CVD risk and risk factor recording

The next graph shows how practices vary with respect to completeness of risk factor recording (smoking, BMI, systolic blood pressure and cholesterol/HDL ratio all need to be present for the record to be deemed complete) using all the available data recorded on the computer system rather than limiting it to data in the last 5 years. The median is 36% but the range is 10% to 72% - a seven fold variation.



As expected, practices in the most deprived areas also tend to have less complete data than those in more affluent areas (median 31% in deprived compared with 37% in affluent) and hence are likely to need additional resources to cover the additional workload needed to assess patients. At patient level, for example, patients from deprived areas are almost 20% less likely to have a systolic blood pressure record after adjustment for age and sex.

The next graph is a histogram which shows the proportion of patients in a practice with a QRISK score of 20% or more. The median proportion of patients at high risk is 7.35% but there is more than a seven fold variation across all practices - some practices have just 2% of patients with a QRISK score of 20% or more whilst others have up to 15%.



As expected, practices in the most deprived areas tend to have a higher proportion of patients with a QRISK CVD risk 20%. For example, the median percentage of patients at high CVD risk in practices in the most affluent quintile is 6.5% compared with 7.5% in the most deprived. The differences are less marked than would have been expected since QRISK already includes a measure of social deprivation.

At patient level, a higher proportion of patients from deprived areas have a CVD risk of 20% or more. The gradient is more marked among women than men (6.8% of women in the most deprived quintile have a high risk compared with 2.6% in the most affluent quintile). For men, the comparable figures are 11.4% and 9.8%

Table 9: Proportion of patients with a high CVD risk by deprivation quintile in 2007

sex	Townsend Quintile	population	patients with 20% or more risk	% of total at high risk
female	Townsend Q1 (most affluent)	165,274	4,355	2.6
female	Townsend Q2	137,263	4,626	3.4
female	Townsend Q3	118,990	5,084	4.3
female	Townsend Q4	98,073	5,457	5.6
female	Townsend Q5 (most deprived)	79,768	5,404	6.8
male	Townsend Q1 (most affluent)	148,954	14,555	9.8
male	Townsend Q2	125,226	13,086	10.4
male	Townsend Q3	111,253	12,227	11.0
male	Townsend Q4	96,901	10,886	11.2
male	Townsend Q5 (most deprived)	87,206	9,971	11.4

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