Severe mental illness and cardiovascular risk

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1 Purpose of document

This is a report for a study to describe patterns of cardiovascular risk in patients with severe mental illness registered with the three high secure hospitals, Broadmoor, Ashworth and Rampton, compared with a sample of patients with severe and enduring mental illness (SEMI) in a community setting using the QResearch database. The project was commissioned by Dr Alan Cohen from the West London Mental Health Trust on behalf of the three high secure hospitals and the National High Secure Commissioning Group. The project has been undertaken by Professor Julia Hippisley-Cox and Dr Carol Coupland on a consultancy basis via ClinRisk Ltd. The authors have a track record in relevant research in cardiovascular disease[1-6] and were principal investigators on the original research on health inequalities for patients with severe mental illness which were commissioned by the Disability Rights Commission[7-12]. In addition Professor Hippisley-Cox is co-founder of the QResearch database (wwww.qresearch.org) which has been used for the community sample.

2 Aim

To describe and understand the pattern of cardiovascular risk associated with long term admissions to high secure hospitals.

3 Objectives:

- To develop a combined anonymised database of the physical health records of patients in high secure hospitals
- To identify those patients who have a high cardiovascular risk using the database
- To describe the characteristics of those patients who have a high cardiovascular risk
- To compare the characteristics of those patients in high secure hospitals with those in the community with severe and enduring mental illness who have a high cardiovascular risk

4 Summary of recommendations

1. **Recommendation 1**: Levels of obesity within the hospital sites are particularly high and are likely to be related to the high levels of diabetes. We recommend that urgent consideration is given to commissioning services for enabling weight loss including reviews of diet, exercise and medication.

2. **Recommendation 2:** The prevalence of diabetes is particularly high (approximately 20%) in each of the hospital settings and remains significant after adjustment for age, sex and ethnicity. Given the health complications associated with obesity and diabetes, the hospitals should consider systematic interventions to reduce diabetes risk. The hospitals should continue the good level of screening for diabetes (as indicated by the generally high levels of blood glucose measurements). One hospital may need to investigate how fasting glucose is recorded on the system as the rates seem lower than expected

3. **Recommendation 3**: recording of risk factors (such as BMI, blood pressure, cholesterol and glucose) is higher for patients on the QOF mental register. Each hospital should endeavour to record at least one Read code for severe mental illness for each registered patient in order to take advantage of the inbuilt decision support and audit facility in the computer system related to QOF.

4. **Recommendation 4**: Consideration should be given as to whether each hospital could use the GP computer system for prescribing. The advantages would be (a) the computer system could then be used to identify patients at risk who require medication. For example, patients with a high CVD risk who might benefit from statins (b) availability of safety alerts, (c) the linked prescribing and morbidity data could also be useful for future research. For example, it could enable an analysis to determine the contribution of newer antipsychotic medication to rising levels of diabetes and obesity.

5. **Recommendation 5:** There may be some under recording of family history of coronary heart disease. This could be improved by the use of computer templates and alerts to prompt for this information to be recorded in a systematic way.

6. **Recommendation 6**: whilst one site had excellent completeness of ethnicity data, recording of ethnicity is much lower in the other two hospitals. Ethnicity is an important predictor of both cardiovascular risk and risk of diabetes and so we recommended that all patients have ethnicity recorded on the clinical computer system.

7. **Recommendation 7**: since smoking status is needed to accurately calculate CVD risk, we advise that the records of patients marked as current smokers are reviewed to ensure the information is up to date.

8. **Recommendation 8**: We recommend that a computer search is undertaken locally in each site to identify patients with a computer recorded abnormal fasting or random

glucose value but with no recorded diagnosis of diabetes to either confirm or rule out a diagnosis of diabetes.

5 Background

An extensive study, The Disability Rights Commission Formal Inquiry[13], described the poor physical health of people with a severe and enduring mental illness. Public health NICE guidelines PH15 Identifying and supporting people most at risk of dying prematurely[14] include the need to reduce health risks in people with all forms of mental disorder and disability and the need to apply NICE guidelines to the patient population. NICE guidelines[15] state how to identity and treat people with an increased risk of cardiovascular disease.

These three publications provide the evidence base and clinical background for understanding how to reduce cardiovascular risk associated with severe mental disorders in a high secure setting. However, the treatment options are based on community populations, and do not include the much smaller populations of patients with severe mental health problems that lead to continuing detention in a high secure hospital and frequently high dose psychotropic medication.

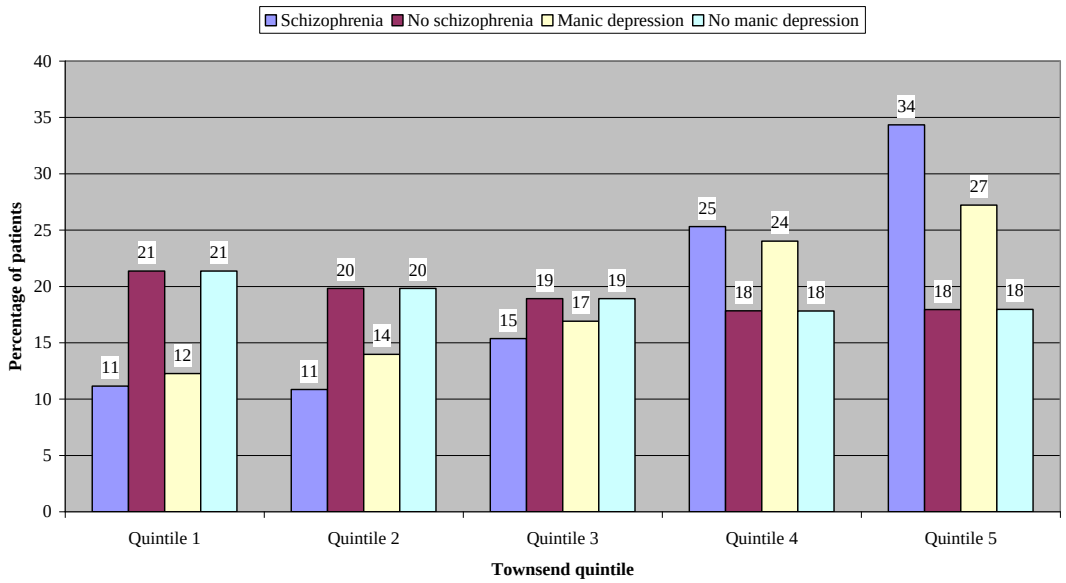
5.1 Disability Rights Commission:

The Disability Rights Commission (Formal Inquiry 2005)[13] reviewed the physical health needs of people with severe and enduring mental illness. Part of that review was a specific analysis of GP records using the QResearch database of over 3 million GP records to identify the cardiovascular risks of people with schizophrenia[7 9].

Their study identified that in the community setting, people with schizophrenia and bi-polar disorder are more likely to suffer from coronary heart disease (5% with bi-polar disorder, 4% with schizophrenia, 3% incidence in the community). Risk factors for coronary heart disease such as smoking, obesity, inactivity, high dietary fat, high alcohol intake and diabetes are all more prevalent in people with severe mental illness. The same group are also less likely to be offered health promotion interventions, less likely to actively report physical symptoms, and less likely to adhere to prescribed medication. They are also likely to have more frequent contact with primary care services, and are less likely to be offered physical health interventions such as routine blood pressure checks, and smoking cessation therapy.

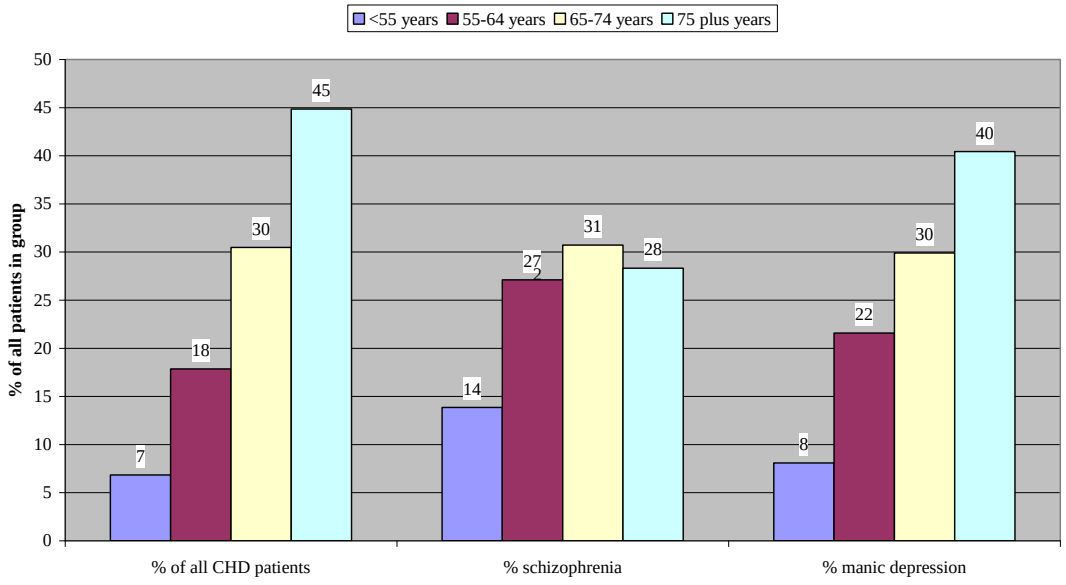
The study also looked at the association with deprivation, which demonstrates that 34% of people with schizophrenia (in the study population) lived in the most deprived areas, compared to just 18% of the patients without schizophrenia.

Percentage of CHD patients in each deprivation quintile (quintile 5 is deprived)



The age distribution of people with severe mental illness and coronary heart disease (CHD) is shown below. It shows that people with schizophrenia and CHD are more likely to be under 55 years (14% vs. 7%) and less likely to be over 75 years of age (28% vs. 45%) compared with CHD patients overall.

Age distibution for patients with CHD with and without mental illness



Finally the study undertook an analysis of whether patients with a severe mental illness were more or less likely to be prescribed statins (to reduce the amount of cholesterol in the

blood, and hence reduce cardiovascular risk) than other people not suffering from a mental illness.

Their key findings were:

- Coronary heart disease patients with schizophrenia are less likely to have cholesterol level recorded on computer GP records in the last 15 months, than patients without schizophrenia (88% vs. 95%)

- Coronary heart disease patients with schizophrenia are less likely to be prescribed statins than patients without schizophrenia (66% vs. 81%)

- However, patients with mental health problems (schizophrenia or manic depression) are as likely as those without mental health problems to have cholesterol values within the recorded range.

5.2 NICE Guidelines:

NICE Guidelines (2008, CG67) made recommendations for identifying people with increased cardiovascular risk, and treatment through modification of life style and lipid levels. The 2010 update to the NICE guideline recommended the use of a cardiovascular risk tool such as QRISK2[5] to identify people with a 20% or greater risk of suffering a cardiovascular event over 10 years. The guidelines were able to identify the quantifiable risk associated with family history, smoking and the presence of other disorders such as chronic renal disease, diabetes, rheumatoid arthritis, but whilst acknowledging that anti-psychotic medication did increase the cardiovascular risk, there was no data or evidence at the time of the quantifiable risk that antipsychotic medication presents to patients. A recent meta-analysis has since examined the effects of antipsychotic medication[16]

6 Methods

6.1 Study design:

This was a cross sectional study.

6.2 Data sources

This study used the pseudonymised electronic GP records from the four sites

1. Broadmoor Hospital
2. Rampton Hospital
3. Ashworth Hospital
4. QResearch database

6.3 Study population.

Eligible patients were those aged 18 -100 years registered on 01 Jan 2012 with each of three high secure hospitals or with the QResearch database. Patients registered with the QResearch database must have been registered with the practice for at least one year prior to the 01 Jan 2012 and have a recorded diagnosis of severe and enduring mental illness (SEMI) prior to the 01 Jan 2012 to be eligible for inclusion.

6.4 Definition of Severe and Enduring Mental Illness (SEMI)

6.4.1 High secure setting

All patients registered with the three high secure units were considered to have severe and enduring mental illness (SEMI) or a personality disorder.

6.4.2 QResearch database

Patients were included as SEMI if they had a diagnosis of schizophrenia or manic depression or were included on the QOF register for SEMI.

6.5 Data collection and storage

The pseudonymised data collection from each of the sites collected coded data on demographics (sex, year of birth, deprivation score, ethnicity), medical diagnoses, clinical

values (blood pressure, body mass index, lab values) and prescribed medication **where available.**

The data extraction software was undertaken by the system suppliers (EMIS, Vision and TPP) for each of the three units. The data were pseudonymised prior to extraction. No strong identifiers were extracted (ie no names, full dates of birth, postcodes, NHS numbers). Only coded data was extracted. The medical director of each site was asked to inspect the data files to confirm the data are pseudonymised.

The datafiles were encrypted at source using standard encryption software. Once encrypted, the data files were transferred to the University of Nottingham and stored securely in the QResearch data centre. This data centre meets all security requirements for handling this type of research data. Access is tightly controlled and monitored and includes the use of 24 hour surveillance.

The data files were only accessed by Professor Hippisley-Cox for the purposes of this project. Once the project is completed, the data will be encrypted and archived for a minimum of 7 years to meet the requirements of research governance.

6.6 Data analysis

The following information were extracted from the pseudonymised database for each patient for the analysis

- Age on 01 Jan 2012
- Duration of registration (years)
- Sex (male/female)
- Self-assigned ethnicity (white; Indian; Pakistani; Bangladeshi; Other Asian; Black African; Black Caribbean; Chinese; Other)
- Smoking status
- Deprivation quintile based on Townsend score for home address (with quintile 5 being the most deprived) for QResearch patients
- Body mass index (most recent)
- Ratio of total serum cholesterol/HDL (most recent)
- Systolic blood pressure (mm Hg) (most recent)
- Diastolic blood pressure (mm Hg) (most recent)
- Details of SEMI (date of diagnosis and subtype)
- Rheumatoid arthritis (yes/no)
- Chronic renal disease (yes/no)
- Diabetes (none; type 1; type 2)
- Hypertension (yes/no)
- Coronary Heart Disease(yes/no)

- Stroke/TIA (yes/no)
- Cancer diagnoses
- Current use of Antihypertensive medication
- Current use of Antipsychotic medication
- Current use of Antidepressant medication
- Current use of Aspirin and other antiplatelets
- Current use of Warfarin

The data from all four sources was combined into a single datafile for analysis. Data from the three hospitals were combined and compared with the community sample from QResearch.

6.7 Cardiovascular risk

Ten year cardiovascular risk was calculated using the QRISK2 algorithm which can be found on www.qrisk.org . This algorithm calculates an absolute risk of developing cardiovascular disease over 10 years based on the patients age, sex, body mass index, deprivation, ethnicity, systolic blood pressure, cholesterol/HDL ratio, family history of coronary heart disease, rheumatoid arthritis, treated hypertension, atrial fibrillation, chronic renal disease and smoking status. Patients were banded into low (<10%); medium (10-19%) and high risk (20%+). Multiple imputation was used in the presence of missing data. For the deprivation score (Townsend score) the mean value for the QResearch (non-hospital) patients was used in the hospital patients. As information on prescribed medication was not available for the hospital patients, patients with a diagnosis of hypertension were assumed to be on treatment when calculating the QRISK2 scores. Where ethnic group was not recorded these were included in the "white" category.

6.8 Clinical indicators

For each patient we derived the following clinical indicators, some of which are included in the current QOF although unlike QOF, no age restrictions were applied

- Systolic blood pressure recorded in the last 15 months
- Blood glucose or HBA1c recorded in last 15 months
- Smoking status recorded in last 15 months
- Cholesterol/HDL ratio recorded in the last 15 months
- Systolic blood pressure <=150/90
- Cholesterol <5 mmol/l
- Treatment with statins, aspirin and anticoagulants where recorded

6.9 Statistical methods

This is a descriptive study which compared the characteristics of (a) patients with severe and enduring mental illness in the three secure hospitals with (b) patients with severe and enduring mental illness in a community setting (i.e. QResearch practices).

The focus of the analysis was on primary prevention so the populations were divided into two groups:

a. patients without pre-existing cardiovascular disease who represent the primary prevention population.
b. patients with existing cardiovascular disease for whom secondary prevention is appropriate

However, there were very few patients in the hospital setting with a diagnosis of cardiovascular disease so the main focus of the analysis is on patients without cardiovascular disease. The distribution of cardiovascular risk in each population was described using medians and interquartile ranges as well as the proportion of patients in each risk category (<10%; 10-19%; 20%+) based on the QRISK2 formula.

Variables such as sex, ethnic group and co-morbidities were described separately in the hospital and QResearch patients. Comparisons have been made between (a) hospital patients (combining all three sites) and QResearch patients as well as (b) directly between the three hospital sites for the achievement of clinical indicators (as above)

Univariate analysis of the clinical indicators was performed using logistic regression. Multivariate logistic regression was then used to adjust for the effects of age, sex, and ethnicity. When ethnic group was not recorded these patients were included in the white reference group. Multiple imputation was used to handle missing values for systolic blood pressure, cholesterol ratio, smoking and body mass index. Differences between groups were considered significant if the p value was < 0.01 (two tailed).

Medication is not routinely recorded on the GP computer systems for the high secure hospitals. This therefore limited some of the analyses which could be undertaken (and means it's not possible from this study to look at antipsychotic prescribing in detail though the recording levels will be assessed)

7 Results

7.1 Understanding the results section

Please note that the colour coding for the graphs for each group is consistent throughout the results section. So, green represents QResearch, Red represents hospital A, yellow represents hospital B and purple represents hospital C. The blue bar represents all three hospitals (A, B and C) combined.

Percentages have been used rather than counts in order to protect the identities of the individual hospitals while still allowing us to see variation between the various sites.

All the results which state a difference between settings were statistically significant at the 0.01 level despite adjustment for age, sex and ethnicity.

7.2 Study population

Overall we identified 43,711 patients with Read codes indicating severe and enduring mental illness from the QResearch database compared with 744 patients from across the three hospitals combined. 45% of the QResearch population were male compared with 95% of the hospital sample. This varied by site since only one hospital had women.

7.3 Clinical coding of severe mental illness and personality disorder

There was a marked difference between the three hospitals regarding the use of Read codes to denote severe mental illness and personality disorder.

Of all the patients registered with hospital A, 61% had a Read code for severe mental illness recorded on the clinical computer system compared with 1.4% for hospital B and 1.7% for hospital C.

Of patients registered with hospital A, 20% had a clinical code for personality disorder compared with <1% for hospital B and none in hospital C.

The use of clinical codes especially for severe and enduring mental illness is important since this is used to define the mental health register for the QOF searches for mental health. The automatic QOF searches supplied within the GP clinical computer systems alert clinicians to which patients need various checks and also the audit facility relies on the presence of these codes.

Recommendation: Each hospital should consider recording at least one Read code for severe mental illness for each registered patient in order to take advantage of the inbuilt decision support and audit facility in the computer system. The severe mental illness codes can be found in the Appendix.

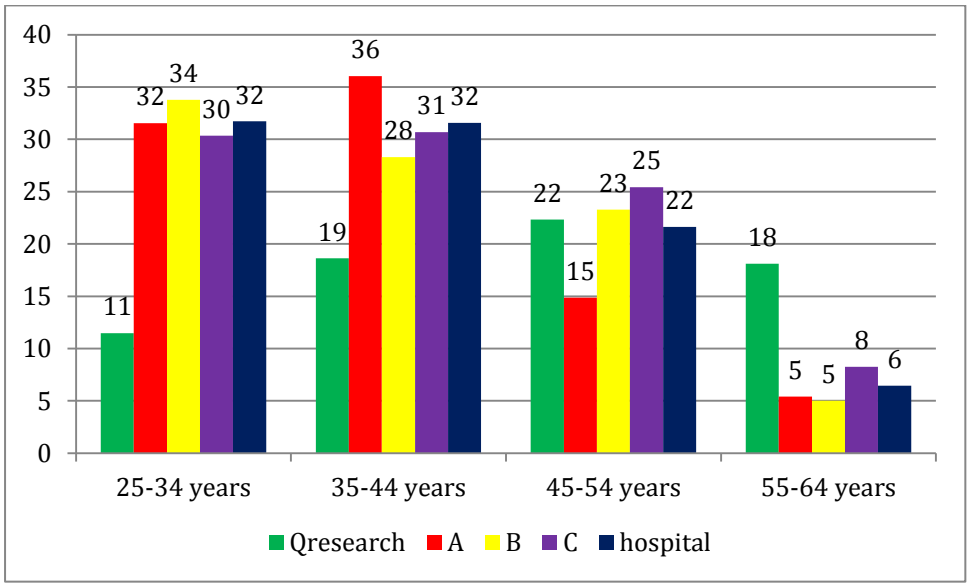
7.3.1 Age distribution

The QResearch sample tended to be older (mean age 53 years) compared with 37 years for hospital A, 38 years for hospital B and 40 years for hospital C.

The distribution of patients within each age band is shown in the following graph. For example, in the QResearch sample, 11% of patients were aged 25-34 years compared with 32% for the hospital sample.

In QResearch 19% of patients were aged 35-44 compared with 32% for the hospital sample.

Figure 1: percentage of patients by age band (25-65 years) in each setting.



Comment: the difference in age between the hospital and community patients is important in interpreting apparent differences in prevalence of chronic disease between the two groups, especially for conditions such as cardiovascular disease which is more common in older people. For this reason, comparisons between groups were adjusted for age and sex.

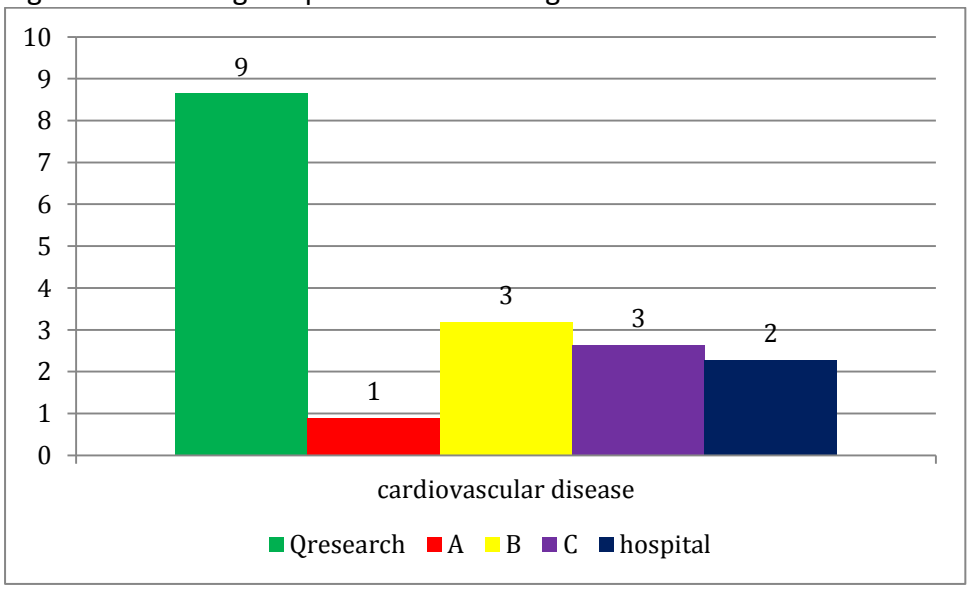
7.4 Cardiovascular disease

The next graph shows the percentage of patients with a recorded diagnosis of cardiovascular disease in each setting.

Cardiovascular disease appears to be 3-4 times more common in patients in QResearch compared with the hospitals. However after adjustment for age and sex, this difference is not statistically significant ie the difference is explained by the different age profile of the hospitals compared with QResearch.

There were too few hospital patients to conduct a meaningful analysis of indicators for patients with established cardiovascular disease.

Figure 2 Percentage of patients with a diagnosis of cardiovascular disease



7.5 Family history of coronary heart disease

The following Read codes (version 2) used to denote family history of coronary heart disease in QRISK2 are listed below

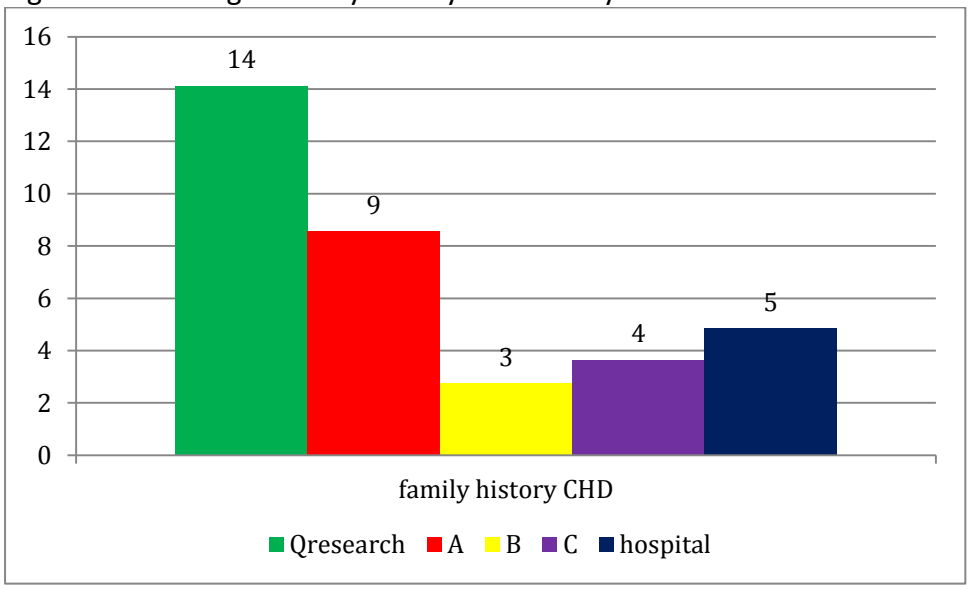
readterm	*description*
12C2	FH: Ischaemic heart dis. <60
12C2-1	FH: Myocardial infarction < 60
12C2-2	FH: MI- Myocardial infarct <60
12C2-3	FH: Angina < 60yrs
12CM	FH: Angina in 1st degree male relative <55 years
12CP	FH: Myocardial infarct in 1st degree male relative <55 years

There are no CTV3 codes which directly relate to the version 2 Read codes (ie include an age criterion) so the following codes were used as appropriate.

CTV code	*description*
XE0oF	FH: Cardiovascular disease
XM1Jw	FH: Angina
XE0oI	FH: Myocardial infarction
Xa6aj	Family history of ischaemic heart disease
XaIA5	FH angina female first degree age unknown

The next graph shows recording of family history of coronary heart disease. In QResearch, 14% of patients had a positive family history compared with 9% for hospital A, 3% for hospital B and 4% for hospital C. This is a significant difference despite adjustment for age, sex and ethnicity.

Figure 3 recording of family history of coronary heart disease



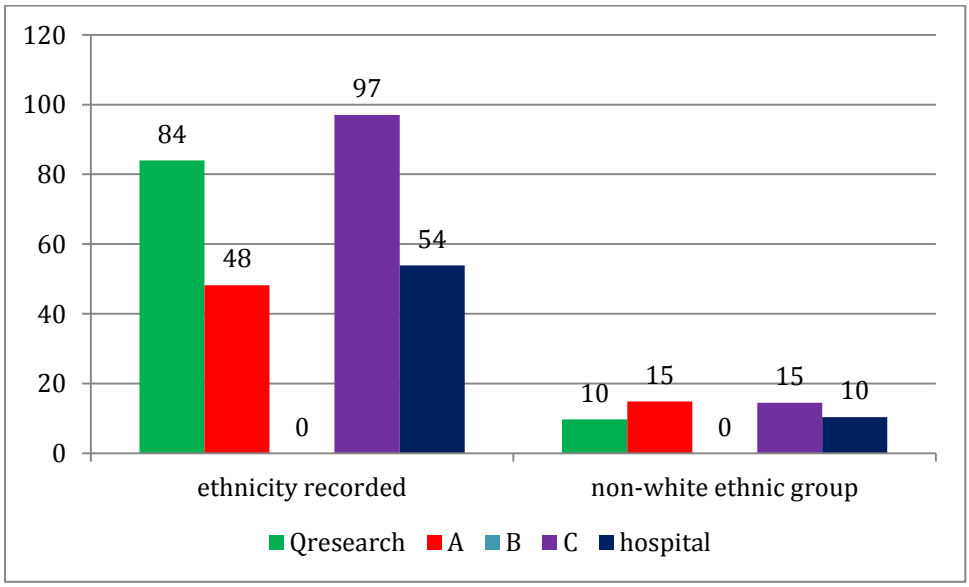
Recommendation: There may be some under recording of family history of coronary heart disease. This could be improved by the use of computer templates and alerts to prompt for this information to be recorded in a systematic way.

7.6 Ethnicity recording

The next graph shows the percentage of patients in each site with self-assigned ethnicity recorded. In QResearch, 84% of patients had ethnicity recorded compared with 54% of the hospital population. However there was a variation between the three hospitals with one site not having any information on self-assigned ethnicity recorded on the computer (site B) whilst another (hospital C) had 97% of patients with ethnicity recorded.

The graph also shows the % of patients who were from a non-white ethnic group. 10% of all QResearch patients were not white compared with 15% in hospital A and 15% in hospital C.

Figure 4: percentage of patients with ethnicity recorded.



Recommendation: whilst one site had excellent completeness of ethnicity data, it is much lower in the other two. Ethnicity is an important predictor of both cardiovascular risk and risk of diabetes and so we recommend that all patients have ethnicity recorded on the clinical computer system.

7.7 Smoking status

The next graph shows the completeness of recording for smoking data. In QResearch, 99% of patients have smoking status recorded compared with 88% for the three hospitals overall. However there is a small variation between the three hospitals with hospital A with 84%, hospital B with 74% and hospital C with 100%.

Figure 5 completeness of smoking status recording

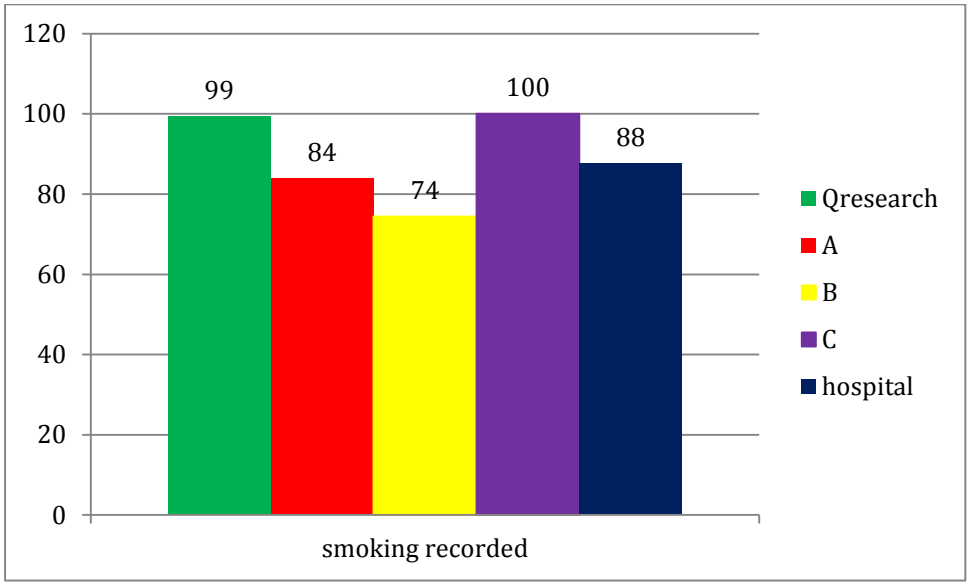
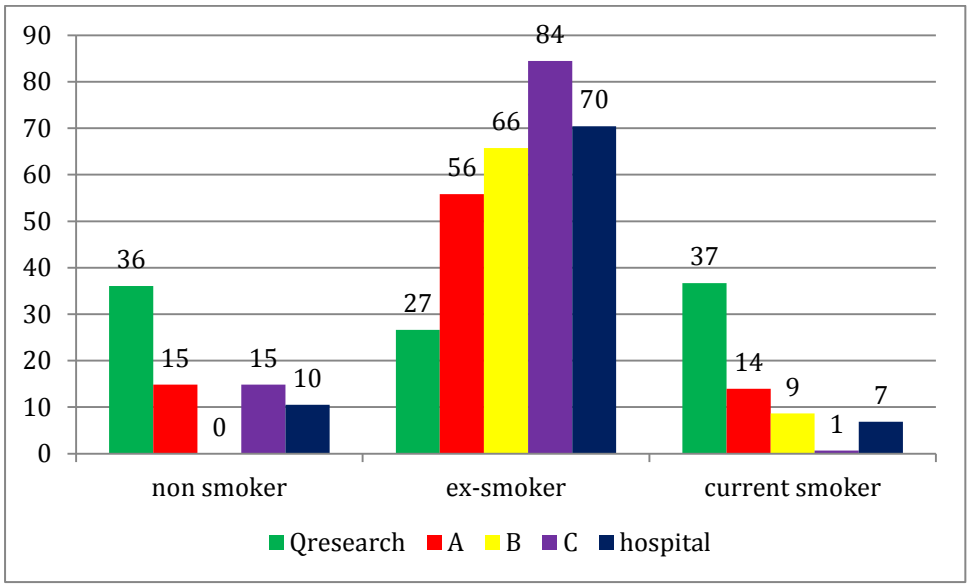


Figure 6 smoking status



Overall 27% of the QResearch patients are ex-smokers compared with 70% of the hospital patients. There is a high proportion of ex-smokers in the hospital setting with 84% for hospital C, 66% for hospital B and 56% for hospital A. Given the very high prevalence of

smoking among patients with mental health problems, the high levels of patients who have stopped smoking in the hospital setting is commendable.

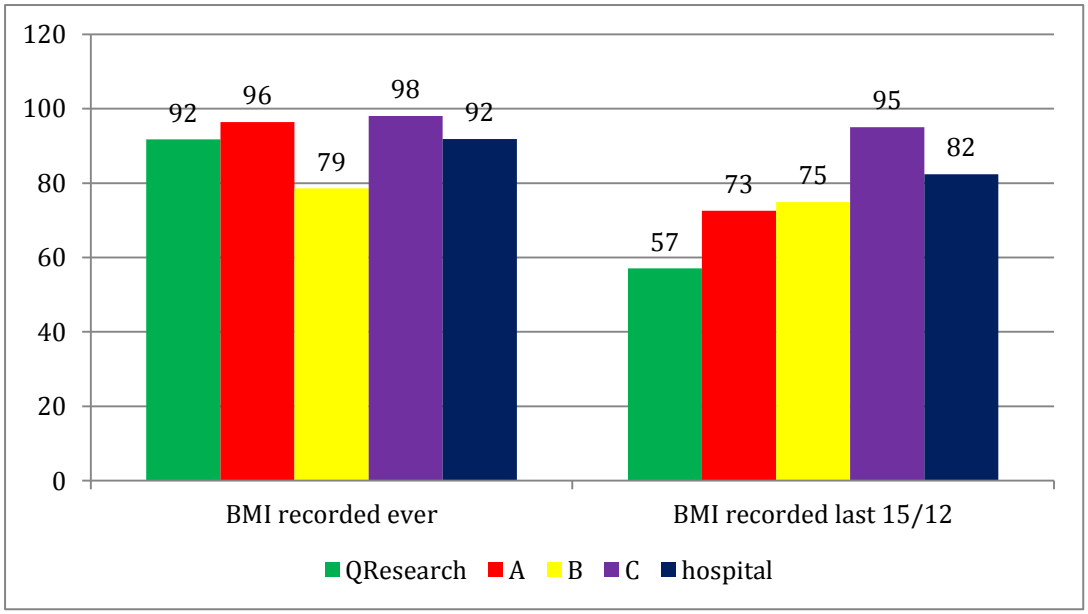
Since all three hospitals are non-smoking sites, it seems highly likely that some patients still have computer codes which reflect their smoking status on entry to the hospital rather than during their hospital stay.

Recommendation: since smoking status is needed to accurately calculate CVD risk, we advise that the records of patients marked as current smokers are reviewed to ensure the information is up to date.

7.8 Recording of body mass index

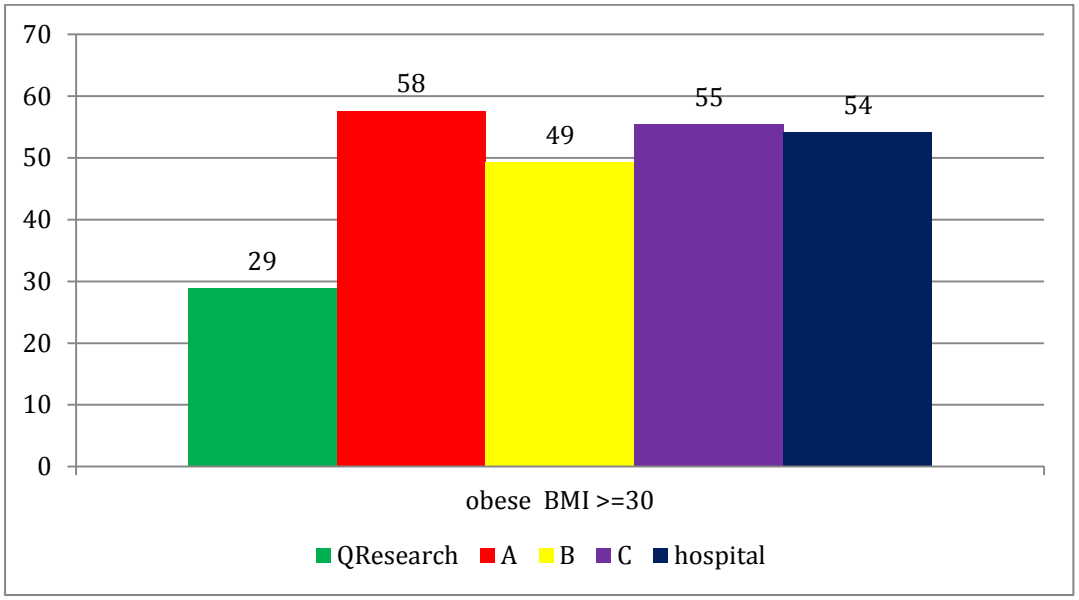
Overall, 92% in the QResearch sample and 92% in the hospital population have a recorded BMI value at some point. In the GP quality and outcomes framework (QOF), patients with severe and enduring mental illness should have body mass index recorded every 15 months (indicator MH12). For the hospital patients this indicator is achieved for 82% which is substantially higher than that for QResearch (57%). However there is some variation between the three hospitals with 73% for hospital A, 75% for hospital B and 95% for hospital C.

Figure 7 percentage of patients with a body mass index recorded ever and in the last 15 months



Levels of obesity, as defined by a body mass index of ≥30 kg/m^2 are particularly high in the hospital populations (54%) compared with QResearch (29%). Hospital A has the highest level of obesity affecting 58% of all patients. Hospital B had marginally lower levels of obesity but this might reflect lower recording of body mass index.

Figure 8 percentage of patients with obesity

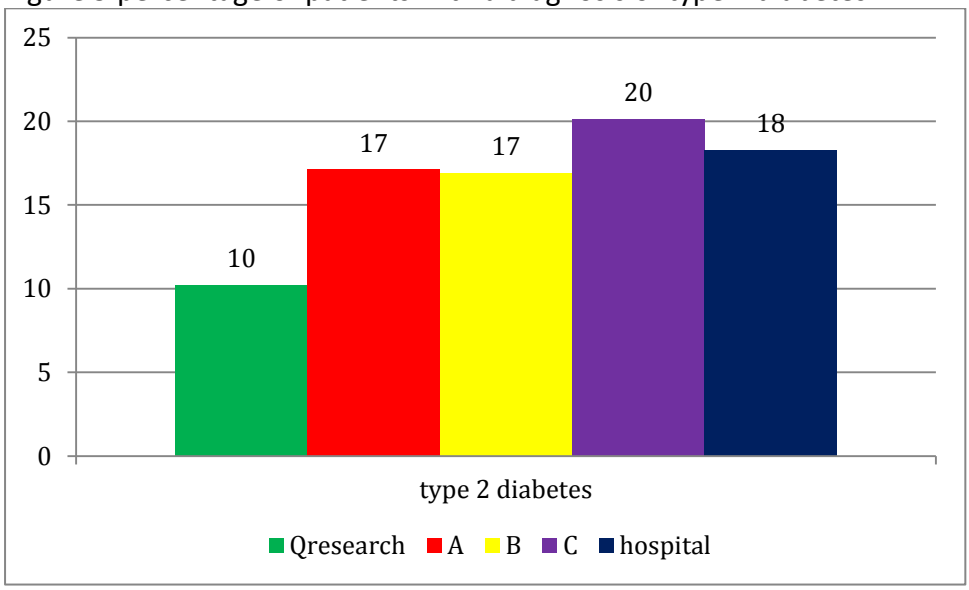


Levels of obesity within the hospital sites are particularly high and are likely to be related to the high levels of diabetes (see below). We recommend that strong consideration is given to interventions for enabling weight loss including reviews of diet, exercise and medication.

7.9 Diabetes

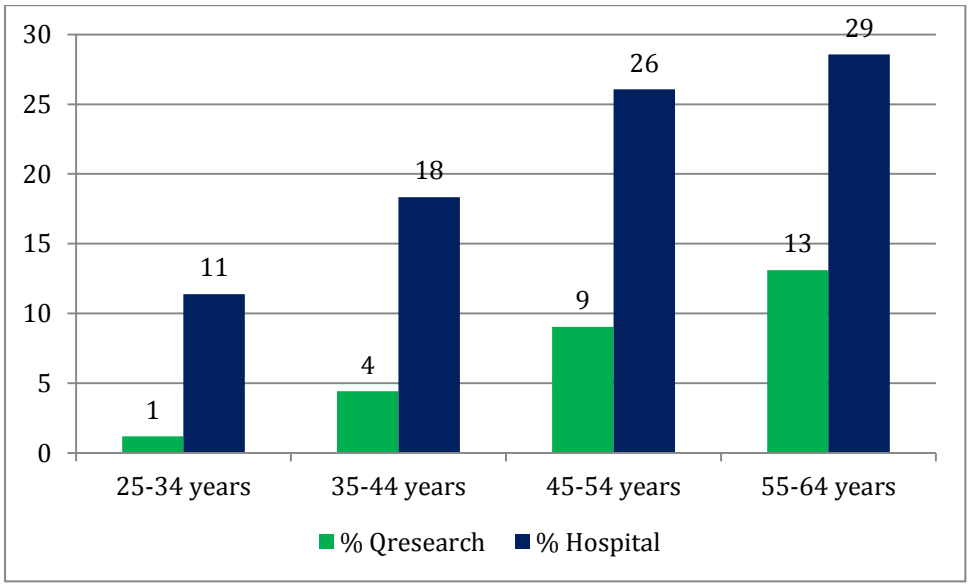
The next graph shows the percentage of patients with a computer recorded diagnosis of type 2 diabetes. All three hospitals have high rates of diabetes –with 17% for hospitals A and B and 20% for hospital C. In contrast, 10% of patients from QResearch have diabetes (which is lower than the hospital rates but still more than twice the prevalence of diabetes in the general population).

Figure 9 percentage of patients with a diagnosis of type 2 diabetes



Diabetes is more common in hospital patients than QResearch patients at every age. For example, for patients aged 25-34 years, 1% of patients in QResearch have type 2 diabetes compared with 11% of the hospital patients; for patients aged 55-64, 13% of QResearch patients have diabetes compared with 29% of hospital patients.

Figure 10 percentage of patients with a diagnosis of type 2 diabetes by age.



7.10 Glucose measurements

In QOF, there is an indicator for having blood glucose recorded in the last 15 months for all patients for all patients on the metal health register (MH15). The next two graphs show recording levels for (a) random glucose, (b) fasting glucose and (c) either random or fasting glucose for all patients. In summary, looking at recording in the last 15 months, then

- recording of random glucose values in hospital settings is higher than in QResearch
- recording of fasting glucose is higher in hospital settings A and B than in QResearch but not in hospital C which has lower levels (7%). Hospital B has particularly high levels (82%)
- recording of any blood glucose (either fasting or random) is higher in hospital settings than in QResearch.

Figure 11 percentage of patients with random glucose recorded ever and in the last 15 months

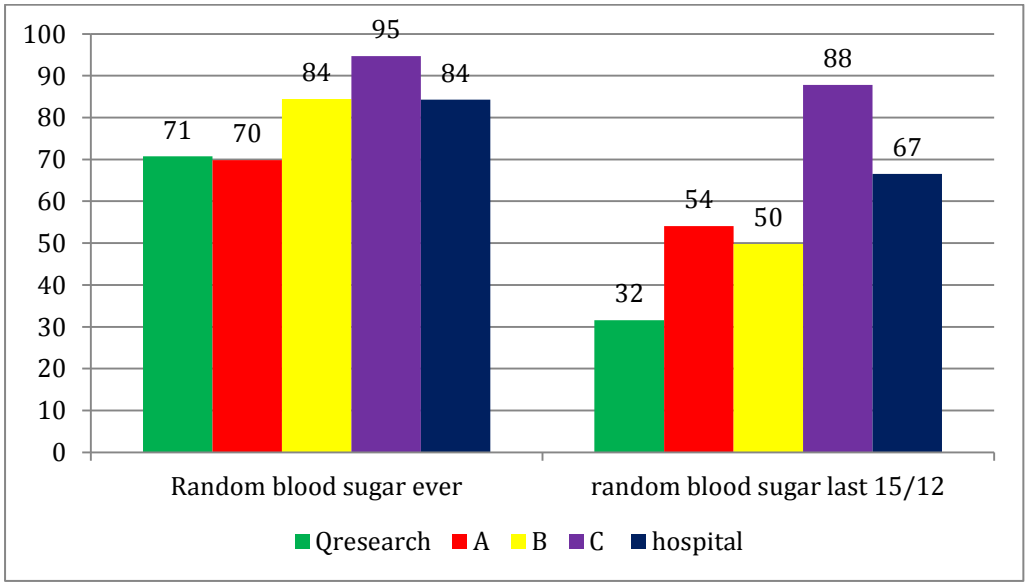


Figure 12 percentage of patients with fasting glucose recorded ever and in the last 15 months

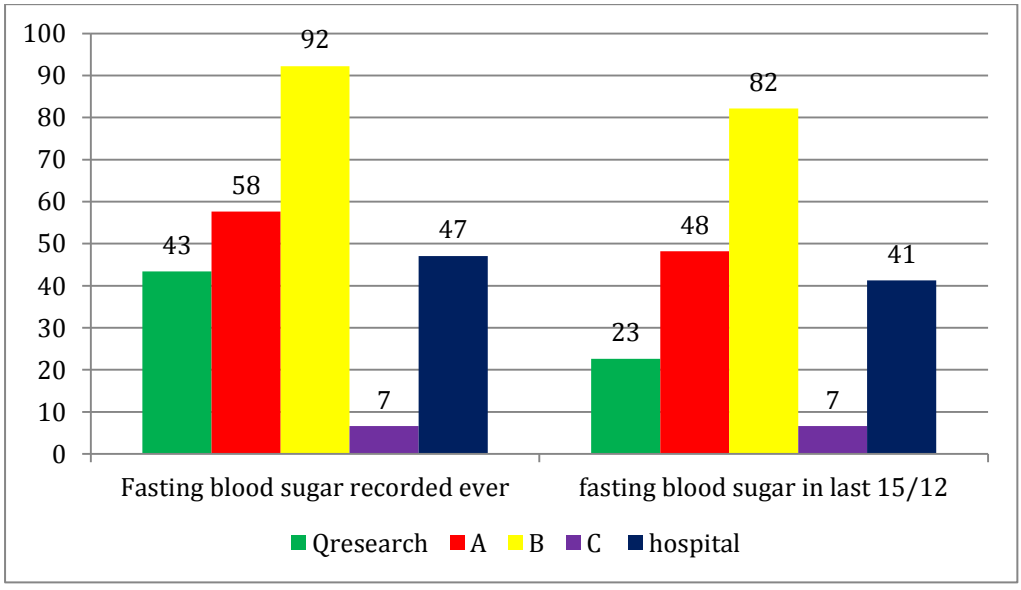
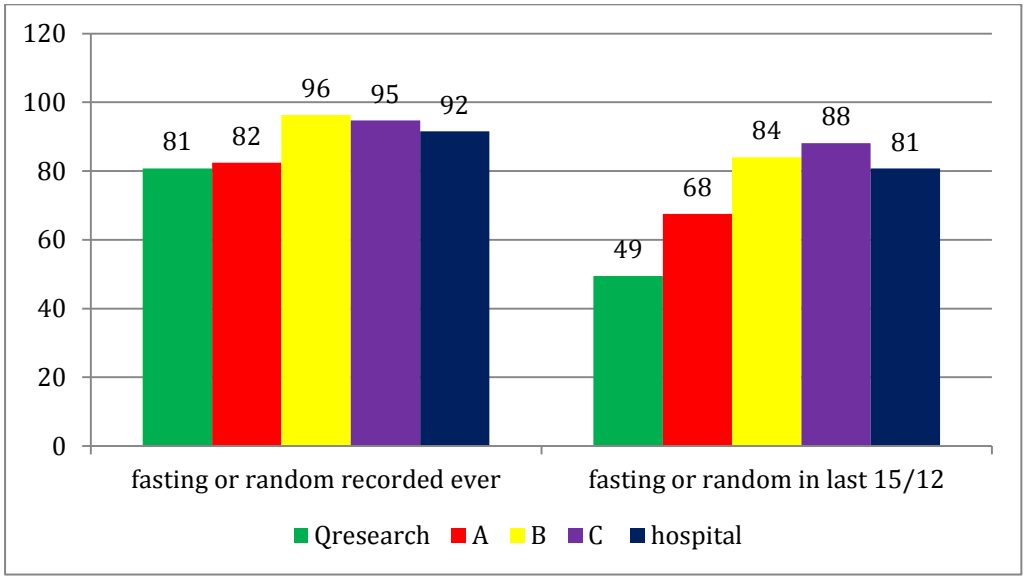


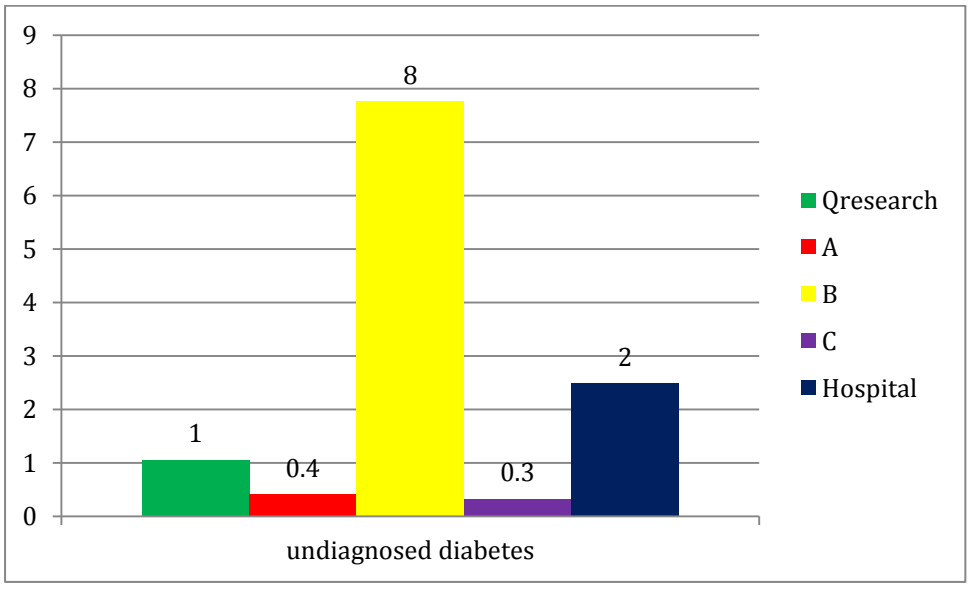
Figure 13 percentage of patients with either random or fasting glucose recorded ever and in the last 15 months



We identified several patients in each setting with a latest fasting glucose of more than 7 mmol/l or a random glucose of more than 11mmol/l but who didn't have a Read coded diagnosis for diabetes. The next graph shows that hospital B may have a number of patients with diabetes but without a coded diagnosis.

Recommendation: We recommend that a computer search is undertaken locally in each site to identify patients with abnormal fasting or random glucose values to either confirm or rule out a diagnosis of diabetes.

Figure 14 percentage of patients with high random or fasting glucose values but without a coded diagnosis of diabetes.

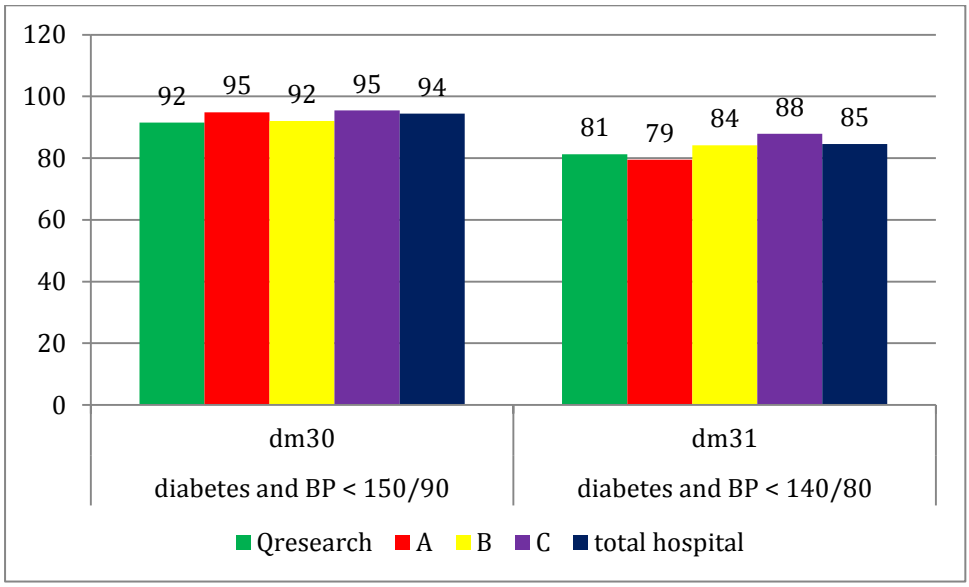


7.11 Blood pressure control in patients with diabetes

The next graph shows levels of blood pressure control among patients with diabetes.

We found no statistically significant differences between sites in the percentages of patients with diabetes who had blood pressure controlled both at the 150/90 level and also at the 140/80 level. For example, 94% of hospital patients with diabetes had blood pressure < 150/90 mmHg compared with 92% for QResearch patients with diabetes.

Figure 15 blood pressure control in patients with diabetes.

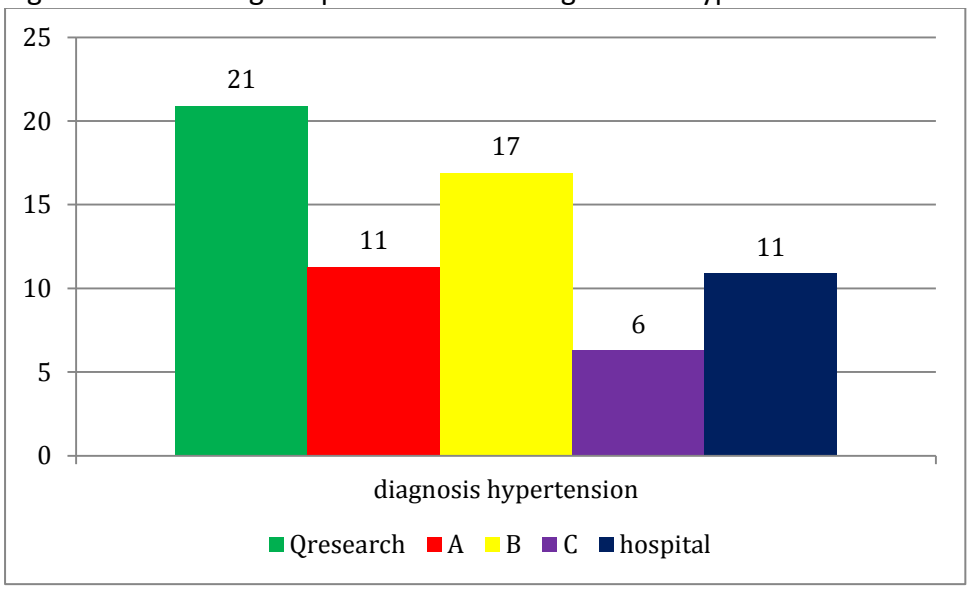


Comment: Blood pressure control in patients with diabetes appears to be very good in all three hospitals and comparable with the results from QResearch.

7.12 Hypertension

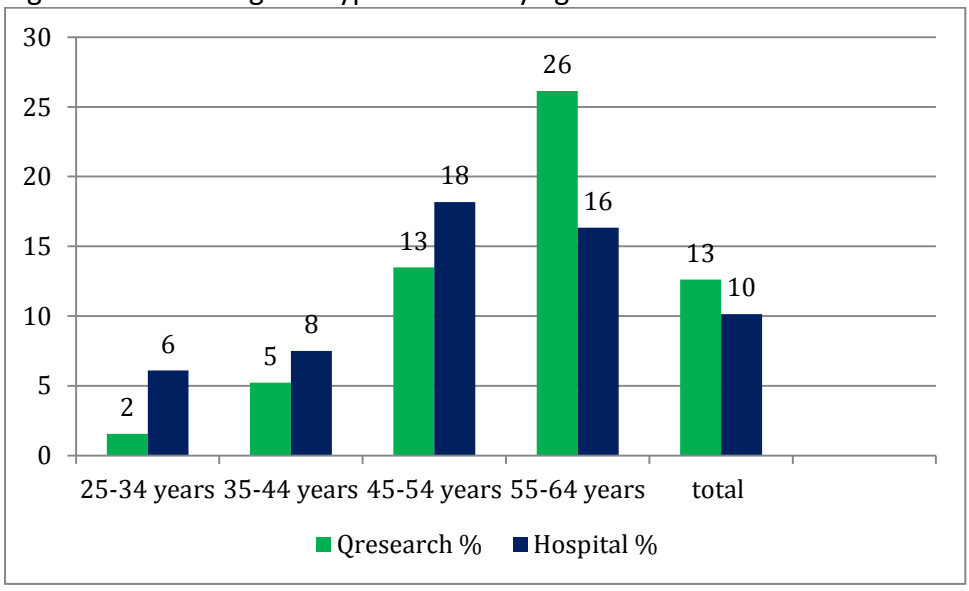
The next graph shows the percentage of patients with a computer recorded diagnosis of hypertension. Overall hypertension is more common in the QResearch population (21%) compared with 11% in the hospital patients overall. There was nearly a three-fold variation between the three hospitals with hospital B having the highest rate (17%) and hospital C having the lowest rate (6%). This difference remained statistically significant after adjustment for age, sex and ethnicity.

Figure 16 Percentage of patients with a diagnosis of hypertension



The next graph shows the percentage of patients with hypertension by age – for younger patients under 55 years, hypertension is more common in hospital patients than in QResearch patients. For older patients over 55 however, the pattern reverses as hypertension is more common in QResearch patients than hospital patients.

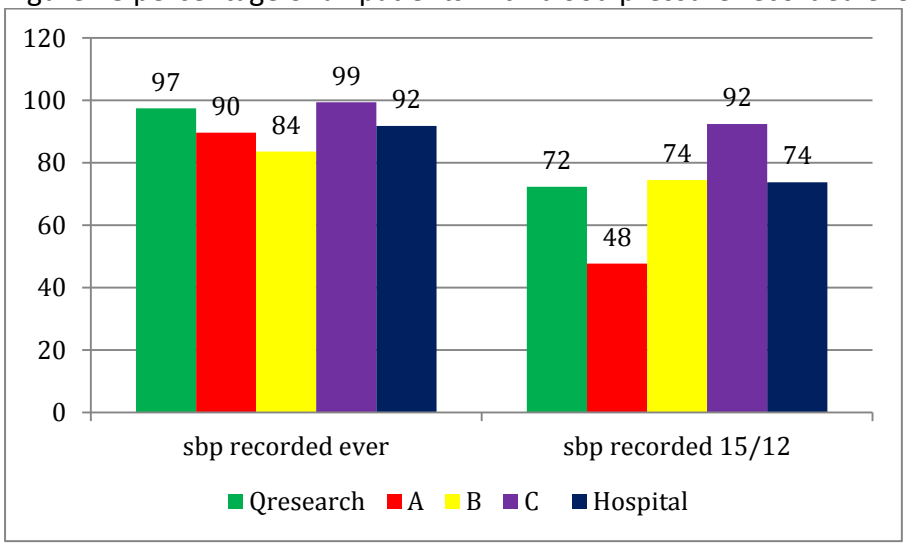
Figure 17 Percentage of hypertension by age band



7.13 Blood pressure

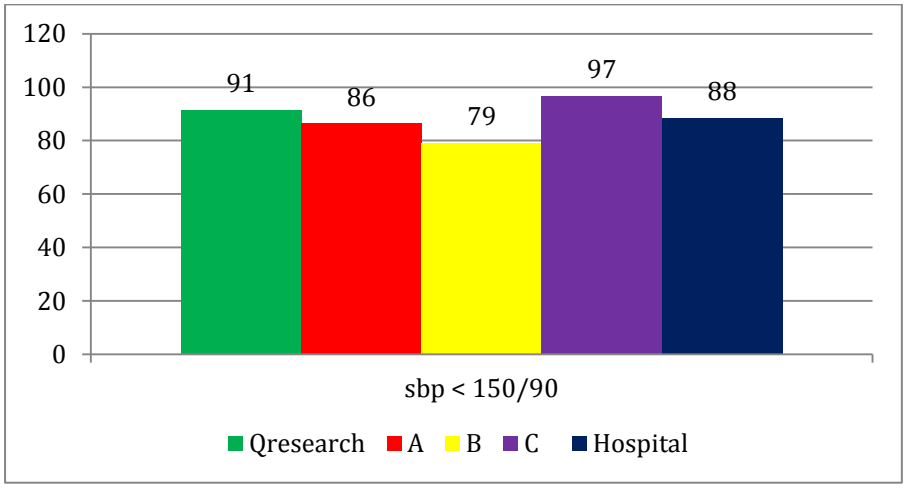
One of the QOF indicators (MH13) is blood pressure recording within the last 15 months. The following graph shows the percentage of all patients with a blood pressure value recorded ever and those with a value recorded in the last 15 months (regardless of whether they are on the mental illness register). 92% of hospital patients have a recorded value at some point compared with 97% for QResearch patients although this difference was not significant after adjustment for age, sex and ethnicity. 72% of patients in QResearch and 74% of hospital patients had a value recorded in the last 15 months. However we did find a statistically significant variation in blood pressure recorded in the last 15 months between hospitals with 48% for hospital A, 74% for hospital B and 92% for hospital C.

Figure 18 percentage of all patients with blood pressure recorded ever and in last 15/12



The next graph shows the percentage of patients with a last recorded blood pressure of under 150/90 mmHg. The differences between the hospital sites were statistically significant after adjustment for age, sex and ethnicity. Lowest levels were in hospital B and highest levels in hospital C.

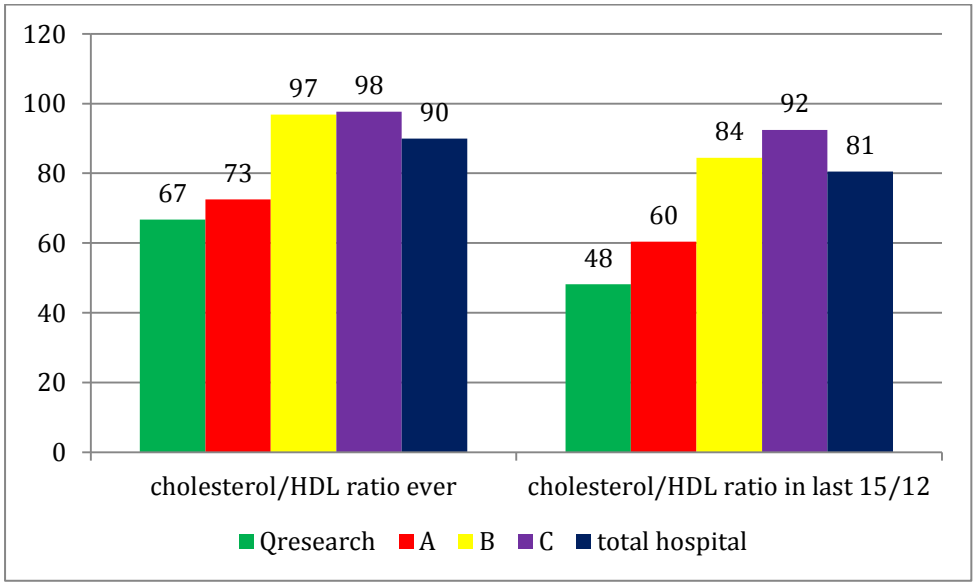
Figure 19 percentage of all patients with last recorded systolic blood pressure under 150/90.



7.14 Cholesterol

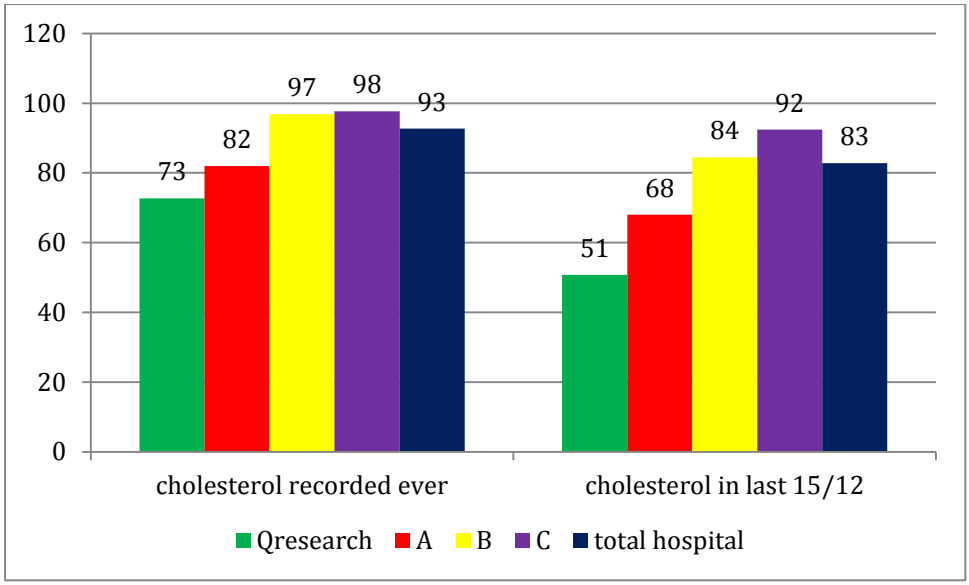
MH14 is the QOF indicator for having a recorded cholesterol/HDL value in the last 15 months for patients. The next graph shows this indicator for all patients registered with each hospital and for the QResearch patients. Overall, recording levels for cholesterol/HDL values are higher in the hospitals than QResearch - this is both for values recorded at any time and those recorded in the last 15 months. There is a statistically significant variation between hospital sites which persists despite adjustment for age, sex and ethnicity with hospital C having the highest values.

Figure 20 percentage of all patients with cholesterol/HDL ratio recorded ever and in the last 15 months



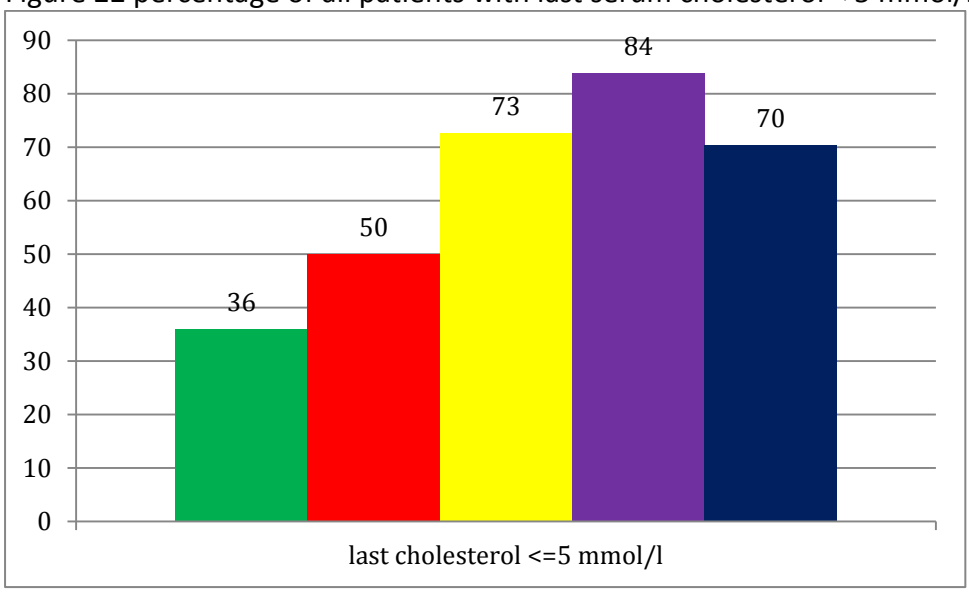
Generally recording for total serum cholesterol (as distinct from the ratio) is higher in all hospital settings compared with QResearch as can be seen from the next graph.

Figure 21 percentage of all patients with cholesterol recorded ever and in the last 15 months



The next graph shows the percentage of all patients whose last total serum cholesterol was 5 mmol/l or less. Levels of achievement in all hospital settings were significantly higher than in QResearch. Hospital C had the highest values with 84% of all patients having a value in the target range.

Figure 22 percentage of all patients with last serum cholesterol < 5 mmol/l

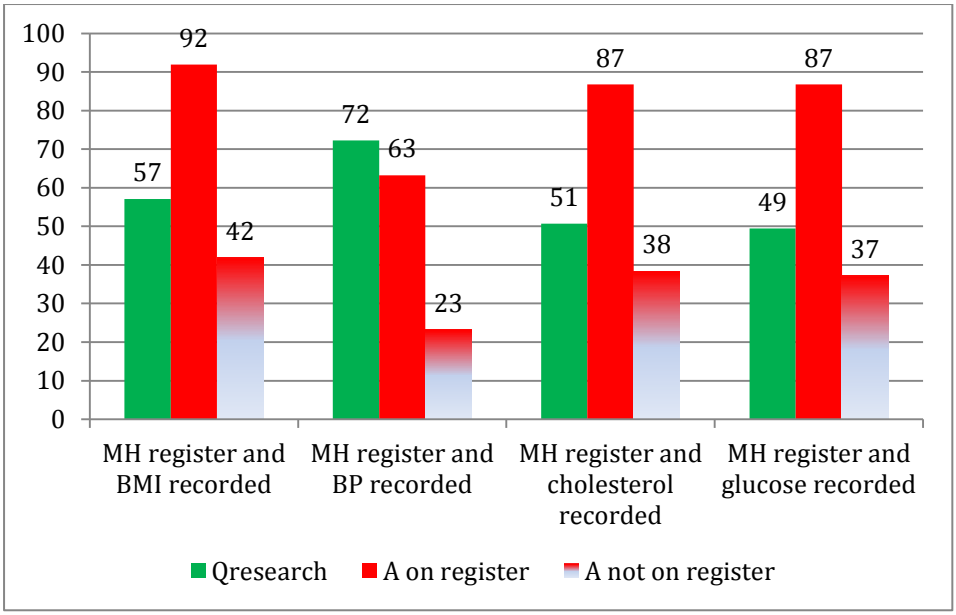


7.15 Subgroup analysis restricted to patients on mental health register

Hospital A had approximately 60% of its patients on the QOF mental illness register i.e. they had a computer recorded Read code to denote severe mental illness. Hospitals B and C had very few patients on the mental illness register so were not included in this analysis. We therefore undertook a subgroup analysis to compare achievement of four indicators in (a) hospital A patients who were on the mental health register compared with (b) hospital A patients not on the mental health register.

The results are shown in the graph below. For all indicators, achievement levels were much higher within hospital A for patients on the mental health register compared with hospital patients not on the mental health register. For example for body mass index (MH12), 92% of patients on the register achieved the indicator compared with 42% of those not on the register. For blood pressure recording the 63% of patients on the register achieved the indicator compared with 23% of patients not on the register.

Figure 23 comparison of four key indicators for hospital A patients on and off the mental health register compared and for QResearch patients



Recommendation: this analysis shows that patients in hospital A on the QOF mental health register have much high levels of achievement of these indicators compared with patients in the same hospital but not on the mental health register. One explanation could be the automatic alerts and prompts which are built into the computer system for QOF. We recommend that all patients in each of the hospitals are included on the QOF mental health register to help improve recording of these key indicators and that this is then re-audited to assess improvement.

7.16 QRISK2 10 year risk of cardiovascular disease.

The table below shows the distribution of QRISK2 10 year cardiovascular risk scores in each population. For this analysis, we compared five populations

- Hospital A
- Hospital B
- Hospital C
- QResearch patients with SEMI
- QResearch patients without SEMI

We restricted the analyses to patients under the age of 60 to enable more direct comparisons. We calculated the QRISK2 scores for each patient based on the latest information recorded. Where information was missing (eg ethnicity in hospital B) we assumed patients were white or used multiple imputation as described in the methods. This may have tended to under-estimate the CVD risk in patients from non-white ethnic groups in hospital B.

Distribution of QRISK scores in each of the five settings: figures are percentages

	QResearch no SEMI	QResearch SEMI	Hospital A	Hospital B	Hospital C
<10% risk	91.2	83.8	80.8	81.3	87.0
10-19.9% risk	7.1	12.2	13.5	12.0	10.9
20%+ risk	**1.7**	**4.0**	**5.8**	**6.7**	**2.1**
Total	100.0	100.0	100.0	100.0	100.0

There was a significant difference between the three hospitals in the proportion of patients at high risk with 6.7% of patients in hospital B having a QRISK2 score of more than 20% compared with 5.8% in hospital A and 2.1% in hospital C.

We also compared the proportion of patient at high risk in (a) three hospitals combined with (b) QResearch patients with SEMI and (c) QResearch patients without SEMI as shown in the table below.

Distribution of QRISK scores in hospital vs community settings: figures are percentages

	QResearch no SEMI	QResearch SEMI	Hospital
<10% risk	91.2	83.8	83.5
10-19.9% risk	7.1	12.2	12.0
20%+ risk	1.7	4.0	4.6
Total	100.0	100.0	100.0

Overall, in hospital patients 4.6% of patients had a particularly high CVD risk with a QRISK2 score of more than 20%. This was higher than the 4% of SEMI patient in QResearch with a high QRISk2 score (4%) and the 1.7% of non- SEMI patients in QResearch with a risk score of >=20%. This difference persisted after adjustment for age and sex.

The next table shows the odds ratios for the difference in the percentage of patients at high risk in the hospital populations compared with patients with and without SEMI in QResearch after adjustment for age and sex

Odds ratio for having a QRISK2 core of > 20% adjusted for age and sex

	Adjusted Odds Ratio	*Lower confidence interval*	*Upper confidence interval*	*P value*
QResearch without SEMI				
QResearch with SEMI	2.1	2.0	2.3	< 0.001
Hospital patients with SEMI	2.2	1.5	3.2	<0.001

Hospital patients were more than twice as likely to have a high CVD risk score, as measured by QRISK2 10 year risk score, compared with patients in the community sample without SEMI (adjusted odds ratio 2.2, 95% CI 1.5 to 2.2). Similarly SEMI patients in QResearch were more than twice as likely to be at high risk compared with patients without SEMI. In summary, patients with SEMI, therefore, whether in community or hospital settings have higher risk of CVD compared with patients without SEMI and this is not explained by differences in age and sex between the populations. We also found a three-fold variation in the proportion of patients at high risk between the three hospitals.

7.17 Prescribing data

None of the three hospitals use the GP clinical computer system for issuing prescriptions so no analyses of indicators requiring prescribing data in the hospital settings have been undertaken in this report.

We recommend that consideration should be given as to whether each hospital could use the GP computer system for prescribing.

The advantages would be

- The computer system could then be used to identify patients at risk who require medication. Eg patients with a high CVD risk who might benefit from statins
- The linked prescribing and morbidity data could also be useful for future research. For example, it could enable an analysis to determine the contribution of newer antipsychotic medication to rising levels of diabetes and obesity.

8 Summary

This next table summarises the above results and also includes whether the results reached statistical significance after adjustment for age, sex and ethnicity. Figures are percentages unless otherwise stated. P values are adjusted for age, sex and ethnicity

	QR	*A*	*B*	*C*	*hospital*	*P value QR vs hospitals*	*P value between hospitals*
cardiovascular disease	9	1	3	3	2	ns	ns
family history of CHD	14	9	3	4	5	<0.001	<0.001
ethnicity recorded	84	48	0	97	54	<0.001	<0.001
smoking status recorded	99	84	74	100	88	<0.001	<0.001
Ex-smoker	27	56	66	84	70	<0.001	<0.001
BMI recorded ever	92	96	79	98	92	ns	<0.001
BMI recorded in last 15/12	57	73	75	95	82	<0.001	<0.001
obese	29	58	49	55	54	<0.001	<0.001
type 1 diabetes	1	0	0	2	1	ns	ns
type 2 diabetes	10	17	17	20	18	<0.001	<0.001
random glucose ever	71	70	84	95	84	<0.001	<0.001
random glucose last 15/12	32	54	50	88	67	<0.001	<0.001
fasting glucose ever	43	58	92	7	47	<0.001	<0.001
fasting glucose last 15/12	23	48	82	7	41	<0.001	<0.001
blood glucose ever	81	82	96	95	92	<0.001	<0.001
blood glucose last 15/12	49	68	84	88	81	<0.001	<0.001
undiagnosed diabetes	1	0	8	0	3	<0.001	<0.001
hypertension	21	11	17	6	11	0.04	0.01
blood pressure recorded	97	90	84	99	92	ns	<0.001
Blood pressure in last 15/12	72	48	74	92	74	ns	<0.001
last BP < 150/90	91	86	79	97	88	<0.001	<0.001
cholesterol/HDl recorded ever	67	73	97	98	90	<0.001	<0.001
cholesterol/HDL in last 15/12	48	60	84	92	81	<0.001	<0.001
total cholesterol ever	73	82	97	98	93	<0.001	<0.001
total cholesterol last 15/12	51	68	84	92	83	<0.001	<0.001
last cholesterol <=5 mmo/l	36	50	73	84	70	<0.001	<0.001
patients with diabetes	11	18	17	22	19	ns	ns
BP < 150/90	92	95	92	95	94	ns	ns
BP < 140/80	81	79	84	88	85	ns	ns

9 Discussion

This is the first study to compare cardiovascular risk in patients with severe mental illness in the community with patients admitted to three high secure hospitals in England (Rampton, Broadmoor and Ashworth). It is commendable that the hospitals have chosen to commission this analysis and the report is aimed at making suggestions to help the hospitals build on current good practice and identify areas for further work.

The three hospitals all use GP clinical computer systems for recording diagnoses, laboratory values and demographic data. Whilst each hospital uses a different computer system (EMIS, TPP and Vision), the data can be analysed in a standard way enabling valid comparisons. None of the three hospitals use the computer for recording prescribed medication which has limited the scope of the analyses which can be included in this analysis. Details of individual indicators have been made in the previous section. In this section, we highlight some issues for further consideration before summarising our recommendations.

9.1 Patients at high risk of cardiovascular disease

Hospital patients were more than twice as likely to have a high CVD risk score, as measured by QRISK2 10 year risk score, compared with patients in the community sample without SEMI (adjusted odds ratio 2.2, 95% CI 1.5 to 2.2). Similarly SEMI patients in QResearch were more than twice as likely to be at high risk compared with patients without SEMI. In summary, patients with SEMI, therefore, whether in community or hospital settings have higher risk of CVD compared with patients without SEMI and this is not explained by differences in age and sex between the populations. We also found a three-fold variation in the proportion of patients at high risk between the three hospitals.

9.2 Obesity and diabetes

There are two particularly striking findings which deserve particular attention. First is the high prevalence of obesity in each of the three hospitals with more than half of patients having a body mass index of more than 30 kg/m^2. Levels of obesity are almost twice as high as in the community sample of patients with severe and enduring mental illness and this difference is not explained by age, sex or ethnicity. Recording levels of recent body mass index within the hospital setting are better than in the community sample (82% vs 57%) which is important given the prevalence of obesity.

The other striking finding is the high prevalence of type two diabetes affecting 18% of the hospital sample. This is twice as high as the prevalence of diabetes in the community sample. The levels of diabetes are similar across all three hospitals. It is likely that the high level of diabetes is related to the high levels of obesity. It is also possible that it is due to better ascertainment of patients with diabetes in the hospital setting based on the higher levels of testing for fasting and random glucose in the hospital sample. Or put the other

way, there may be more patients in the community sample with diabetes which haven't been tested or diagnosed yet.

We are otherwise unable to tell from the data on the GP computer system what the underlying causes are for the increased prevalence of obesity and diabetes in the hospital patients. This could be dietary related or due to a lack of exercise or both. Alternatively, it could be related to differences in prescribing of antipsychotic medication in the hospital setting as the newer agents are known to be associated with an increased risk of obesity and diabetes. Further research on this is needed and would be helped by more information on prescribed medication being recorded on the computer system.

9.3 Cardiovascular disease and hypertension

The apparent lower levels of diagnosed cardiovascular disease and hypertension in the hospital patients are largely explained by differences in age and sex between the hospital and community sample. Within the hospitals, one hospital (hospital C) has a significantly lower prevalence of diagnosed hypertension. Hospital C has high levels of blood pressure recording and good levels of blood pressure control so this difference is unlikely to be explained by a recording or ascertainment bias.

9.4 Blood pressure recording and control

Recording for blood pressure in the last 15 months were similar for the hospital sample and the QResearch sample (72% vs 74% respectively). However we found a significant difference between the three hospitals both for levels of recording and for achievement of blood pressure in the desired range (<150/90 mmHg) ranging from 79-97%.

The subgroup analysis for hospital A showed that when the patients on the mental health register are selected, then the achievement of blood pressure recording in the last 15 months is substantially higher than for patients not on the mental health register (63% vs 23%). We recommend that all hospitals consider adding patients to the mental health register (by including a relevant Read code in the electronic record) so that the automated computer alerts can prompt clinicians to record the relevant values for blood pressure, body mass index and cholesterol.

10 Summary of recommendations

9. **Recommendation 1**: Levels of obesity within the hospital sites are particularly high and are likely to be related to the high levels of diabetes. We recommend that urgent consideration is given to commissioning services for enabling weight loss including reviews of diet, exercise and medication.

10. **Recommendation 2:** The prevalence of diabetes is particularly high (approximately 20%) in each of the hospital settings and remains significant after adjustment for age, sex and ethnicity. Given the health complications associated with obesity and diabetes, the hospitals should consider systematic interventions to reduce diabetes risk. The hospitals should continue the good level of screening for diabetes (as indicated by the generally high levels of blood glucose measurements). One hospital may need to investigate how fasting glucose is recorded on the system as the rates seem lower than expected

11. **Recommendation 3**: recording of risk factors (such as BMI, blood pressure, cholesterol and glucose) is higher for patients on the QOF mental register. Each hospital should endeavour to record at least one Read code for severe mental illness for each registered patient in order to take advantage of the inbuilt decision support and audit facility in the computer system related to QOF.

12. **Recommendation 4**: Consideration should be given as to whether each hospital could use the GP computer system for prescribing. The advantages would be (a) the computer system could then be used to identify patients at risk who require medication. For example, patients with a high CVD risk who might benefit from statins (b) availability of safety alerts, (c) the linked prescribing and morbidity data could also be useful for future research. For example, it could enable an analysis to determine the contribution of newer antipsychotic medication to rising levels of diabetes and obesity.

13. **Recommendation 5:** There may be some under recording of family history of coronary heart disease. This could be improved by the use of computer templates and alerts to prompt for this information to be recorded in a systematic way.

14. **Recommendation 6**: whilst one site had excellent completeness of ethnicity data, recording of ethnicity is much lower in the other two hospitals. Ethnicity is an important predictor of both cardiovascular risk and risk of diabetes and so we recommended that all patients have ethnicity recorded on the clinical computer system.

15. **Recommendation 7**: since smoking status is needed to accurately calculate CVD risk, we advise that the records of patients marked as current smokers are reviewed to ensure the information is up to date.

16. **Recommendation 8**: We recommend that a computer search is undertaken locally in each site to identify patients with a computer recorded abnormal fasting or random

glucose value but with no recorded diagnosis of diabetes to either confirm or rule out a diagnosis of diabetes.

11 Appendix

11.1 Severe mental illness codes

readterm	*description*
146D	H/O: manic depressive disorder
E10	Schizophrenic disorders
E10-98	Schizophrenic psychoses NOS
E10-99	Schizophrenic psychoses
E100	Simple schizophrenia
E100-1	Schizophrenia simplex
E1000	Unspecified schizophrenia
E1001	Subchronic schizophrenia
E1002	Chronic schizophrenic
E1003	Acute exacerbation of subchronic schizophrenia
E1004	Acute exacerbation of chronic schizophrenia
E1005	Schizophrenia in remission
E100z	Simple schizophrenia NOS
E101	Hebephrenic schizophrenia
E1010	Unspecified hebephrenic schizophrenia
E1011	Subchronic hebephrenic schizophrenia
E1012	Chronic hebephrenic schizophrenia
E1013	Acute exacerbation of subchronic hebephrenic schizophrenia
E1014	Acute exacerbation of chronic hebephrenic schizophrenia
E1015	Hebephrenic schizophrenia in remission
E101z	Hebephrenic schizophrenia NOS
E102	Catatonic schizophrenia
E1020	Unspecified catatonic schizophrenia
E1021	Subchronic catatonic schizophrenia
E1022	Chronic catatonic schizophrenia
E1023	Acute exacerbation of subchronic catatonic schizophrenia
E1024	Acute exacerbation of chronic catatonic schizophrenia
E1025	Catatonic schizophrenia in remission
E102z	Catatonic schizophrenia NOS
E103	Paranoid schizophrenia
E1030	Unspecified paranoid schizophrenia
E1031	Subchronic paranoid schizophrenia
E1032	Chronic paranoid schizophrenia
E1033	Acute exacerbation of subchronic paranoid schizophrenia
E1034	Acute exacerbation of chronic paranoid schizophrenia
E1035	Paranoid schizophrenia in remission
E103z	Paranoid schizophrenia NOS
E104	Acute schizophrenic episode
E104-1	Oneirophrenia
E105	Latent schizophrenia
E1050	Unspecified latent schizophrenia
E1051	Subchronic latent schizophrenia

E1052	Chronic latent schizophrenia
E1053	Acute exacerbation of subchronic latent schizophrenia
E1054	Acute exacerbation of chronic latent schizophrenia
E1055	Latent schizophrenia in remission
E105z	Latent schizophrenia NOS
E106	Residual schizophrenia
E106-1	Restzustand - schizophrenia
E107	Schizo-affective schizophrenia
E107-1	Cyclic schizophrenia
E107-99	Acute schizo affective psychosis
E1070	Unspecified schizo-affective schizophrenia
E1071	Subchronic schizo-affective schizophrenia
E1072	Chronic schizo-affective schizophrenia
E1073	Acute exacerbation subchronic schizo-affective schizophrenia
E1074	Acute exacerbation of chronic schizo-affective schizophrenia
E1075	Schizo-affective schizophrenia in remission
E107z	Schizo-affective schizophrenia NOS
E10y	Other schizophrenia
E10y-1	Cenesthopathic schizophrenia
E10y0	Atypical schizophrenia
E10y1	Coenesthopathic schizophrenia
E10yz	Other schizophrenia NOS
E10z	Schizophrenia NOS
E11	Affective psychoses
E11-1	Bipolar psychoses
E11-3	Manic psychoses
E11-99	Manic-depressive psychoses
E110	Manic disorder, single episode
E110-1	Hypomanic psychoses
E110-99	Mania/hypomania
E1100	Single manic episode, unspecified
E1101	Single manic episode, mild
E1102	Single manic episode, moderate
E1103	Single manic episode, severe without mention of psychosis
E1104	Single manic episode, severe, with psychosis
E1105	Single manic episode in partial or unspecified remission
E1106	Single manic episode in full remission
E110z	Manic disorder, single episode NOS
E111	Recurrent manic episodes
E1110	Recurrent manic episodes, unspecified
E1111	Recurrent manic episodes, mild
E1112	Recurrent manic episodes, moderate
E1113	Recurrent manic episodes, severe without mention psychosis
E1114	Recurrent manic episodes, severe, with psychosis
E1115	Recurrent manic episodes, partial or unspecified remission
E1116	Recurrent manic episodes, in full remission
E111z	Recurrent manic episode NOS

E1123	Single major depressive episode, severe, without psychosis
E1124	Single major depressive episode, severe, with psychosis
E114	Bipolar affective disorder, currently manic
E114-1	Manic-depressive - now manic
E1140	Bipolar affective disorder, currently manic, unspecified
E1141	Bipolar affective disorder, currently manic, mild
E1142	Bipolar affective disorder, currently manic, moderate
E1143	Bipolar affect disord, currently manic, severe, no psychosis
E1144	Bipolar affect disord, currently manic,severe with psychosis
E1145	Bipolar affect disord,currently manic, part/unspec remission
E1146	Bipolar affective disorder, currently manic, full remission
E114z	Bipolar affective disorder, currently manic, NOS
E115	Bipolar affective disorder, currently depressed
E115-1	Manic-depressive - now depressed
E1150	Bipolar affective disorder, currently depressed, unspecified
E1151	Bipolar affective disorder, currently depressed, mild
E1152	Bipolar affective disorder, currently depressed, moderate
E1153	Bipolar affect disord, now depressed, severe, no psychosis
E1154	Bipolar affect disord, now depressed, severe with psychosis
E1155	Bipolar affect disord, now depressed, part/unspec remission
E1156	Bipolar affective disorder, now depressed, in full remission
E115z	Bipolar affective disorder, currently depressed, NOS
E116	Mixed bipolar affective disorder
E1160	Mixed bipolar affective disorder, unspecified
E1161	Mixed bipolar affective disorder, mild
E1162	Mixed bipolar affective disorder, moderate
E1163	Mixed bipolar affective disorder, severe, without psychosis
E1164	Mixed bipolar affective disorder, severe, with psychosis
E1165	Mixed bipolar affective disorder, partial/unspec remission
E1166	Mixed bipolar affective disorder, in full remission
E116z	Mixed bipolar affective disorder, NOS
E117	Unspecified bipolar affective disorder
E1170	Unspecified bipolar affective disorder, unspecified
E1171	Unspecified bipolar affective disorder, mild
E1172	Unspecified bipolar affective disorder, moderate
E1173	Unspecified bipolar affective disorder, severe, no psychosis
E1174	Unspecified bipolar affective disorder,severe with psychosis
E1175	Unspecified bipolar affect disord, partial/unspec remission
E1176	Unspecified bipolar affective disorder, in full remission
E117z	Unspecified bipolar affective disorder, NOS
E11y	Other and unspecified manic-depressive psychoses
E11y0	Unspecified manic-depressive psychoses
E11y1	Atypical manic disorder
E11y2	Atypical depressive disorder
E11y3	Other mixed manic-depressive psychoses
E11yz	Other and unspecified manic-depressive psychoses NOS
E11z	Other and unspecified affective psychoses

E11z0	Unspecified affective psychoses NOS
E11zz	Other affective psychosis NOS
E12	Paranoid states
E12-99	Paranoia
E120	Simple paranoid state
E121	Chronic paranoid psychosis
E121-1	Sander's disease
E122	Paraphrenia
E123	Shared paranoid disorder
E123-1	Folie a deux
E12y	Other paranoid states
E12y0	Paranoia querulans
E12yz	Other paranoid states NOS
E12z	Paranoid psychosis NOS
E13	Other nonorganic psychoses
E13-1	Reactive psychoses
E130	Reactive depressive psychosis
E130-1	Psychotic reactive depression
E131	Acute hysterical psychosis
E132	Reactive confusion
E133	Acute paranoid reaction
E133-1	Bouffee delirante
E134	Psychogenic paranoid psychosis
E13y	Other reactive psychoses
E13y0	Psychogenic stupor
E13y1	Brief reactive psychosis
E13yz	Other reactive psychoses NOS
E13z	Nonorganic psychosis NOS
E13z-1	Psychotic episode NOS
E212	Schizoid personality disorder
E2120	Unspecified schizoid personality disorder
E2121	Introverted personality
E2122	Schizotypal personality
E212z	Schizoid personality disorder NOS
Eu	[X]Mental and behavioural disorders
Eu2	[X]Schizophrenia, schizotypal and delusional disorders
Eu20	[X]Schizophrenia
Eu200	[X]Paranoid schizophrenia
Eu200-1	[X]Paraphrenic schizophrenia
Eu201	[X]Hebephrenic schizophrenia
Eu201-1	[X]Disorganised schizophrenia
Eu202	[X]Catatonic schizophrenia
Eu202-1	[X]Catatonic stupor
Eu202-2	[X]Schizophrenic catalepsy
Eu202-3	[X]Schizophrenic catatonia
Eu202-4	[X]Schizophrenic flexibilatis cerea
Eu203	[X]Undifferentiated schizophrenia

Eu203-1	[X]Atypical schizophrenia
Eu204	[X]Post-schizophrenic depression
Eu205	[X]Residual schizophrenia
Eu205-1	[X]Chronic undifferentiated schizophrenia
Eu205-2	[X]Restzustand schizophrenic
Eu206	[X]Simple schizophrenia
Eu20y	[X]Other schizophrenia
Eu20y-1	[X]Cenesthopathic schizophrenia
Eu20y-2	[X]Schizophreniform disord NOS
Eu20y-3	[X]Schizophrenifrm psychos NOS
Eu20z	[X]Schizophrenia, unspecified
Eu21	[X]Schizotypal disorder
Eu21-1	[X]Latent schizophrenic reaction
Eu21-2	[X]Borderline schizophrenia
Eu21-3	[X]Latent schizophrenia
Eu21-4	[X]Prepsychotic schizophrenia
Eu21-5	[X]Prodromal schizophrenia
Eu21-6	[X]Pseudoneurotic schizophrenia
Eu21-7	[X]Pseudopsychopathic schizophrenia
Eu21-8	[X]Schizotypal personality disorder
Eu22	[X]Persistent delusional disorders
Eu220	[X]Delusional disorder
Eu220-1	[X]Paranoid psychosis
Eu220-2	[X]Paranoid state
Eu220-3	[X]Paraphrenia - late
Eu220-4	[X]Sensitiver Beziehungswahn
Eu220-5	[X]Paranoia
Eu221	[X]Delusional misidentification syndrome
Eu221-1	[X]Capgras syndrome
Eu222	[X]Cotard syndrome
Eu223	[X]Paranoid state in remission
Eu22y	[X]Other persistent delusional disorders
Eu22y-1	[X]Delusional dysmorphophobia
Eu22y-2	[X]Involutional paranoid state
Eu22y-3	[X]Paranoia querulans
Eu22z	[X]Persistent delusional disorder, unspecified
Eu23	[X]Acute and transient psychotic disorders
Eu230	[X]Acute polymorphic psychot disord without symp of schizoph
Eu230-1	[X]Bouffee delirante
Eu230-2	[X]Cycloid psychosis
Eu231	[X]Acute polymorphic psychot disord with symp of schizophren
Eu231-1	[X]Bouffee delirante with symptoms of schizophrenia
Eu231-2	[X]Cycloid psychosis with symptoms of schizophrenia
Eu232	[X]Acute schizophrenia-like psychotic disorder
Eu232-1	[X]Brief schizophreniform disorder
Eu232-2	[X]Brief schizophrenifrm psych
Eu232-3	[X]Oneirophrenia

Eu232-4	[X]Schizophrenic reaction
Eu233	[X]Other acute predominantly delusional psychotic disorders
Eu233-2	[X]Psychogenic paranoid psychosis
Eu23y	[X]Other acute and transient psychotic disorders
Eu23z	[X]Acute and transient psychotic disorder, unspecified
Eu23z-1	[X]Brief reactive psychosis NOS
Eu23z-2	[X]Reactive psychosis
Eu24	[X]Induced delusional disorder
Eu24-1	[X]Folie a deux
Eu24-2	[X]Induced paranoid disorder
Eu24-3	[X]Induced psychotic disorder
Eu25	[X]Schizoaffective disorders
Eu250	[X]Schizoaffective disorder, manic type
Eu250-1	[X]Schizoaffective psychosis, manic type
Eu250-2	[X]Schizophreniform psychosis, manic type
Eu251	[X]Schizoaffective disorder, depressive type
Eu251-1	[X]Schizoaffective psychosis, depressive type
Eu251-2	[X]Schizophreniform psychosis, depressive type
Eu252	[X]Schizoaffective disorder, mixed type
Eu252-1	[X]Cyclic schizophrenia
Eu252-2	[X]Mixed schizophrenic and affective psychosis
Eu25y	[X]Other schizoaffective disorders
Eu25z	[X]Schizoaffective disorder, unspecified
Eu25z-1	[X]Schizoaffective psychosis NOS
Eu26	[X]Nonorganic psychosis in remission
Eu2y	[X]Other nonorganic psychotic disorders
Eu2y-1	[X]Chronic hallucinatory psychosis
Eu2z	[X]Unspecified nonorganic psychosis
Eu2z-1	[X]Psychosis NOS
Eu30	[X]Manic episode
Eu30-1	[X]Bipolar disorder, single manic episode
Eu300	[X]Hypomania
Eu301	[X]Mania without psychotic symptoms
Eu302	[X]Mania with psychotic symptoms
Eu302-1	[X]Mania with mood-congruent psychotic symptoms
Eu302-2	[X]Mania with mood-incongruent psychotic symptoms
Eu302-3	[X]Manic stupor
Eu30y	[X]Other manic episodes
Eu30z	[X]Manic episode, unspecified
Eu30z-1	[X]Mania NOS
Eu31	[X]Bipolar affective disorder
Eu31-1	[X]Manic-depressive illness
Eu31-2	[X]Manic-depressive psychosis
Eu31-3	[X]Manic-depressive reaction
Eu310	[X]Bipolar affective disorder, current episode hypomanic
Eu311	[X]Bipolar affect disorder cur epi manic wout psychotic symp
Eu312	[X]Bipolar affect disorder cur epi manic with psychotic symp

Eu313	[X]Bipolar affect disorder cur epi mild or moderate depressn
Eu314	[X]Bipol aff disord, curr epis sev depress, no psychot symp
Eu315	[X]Bipolar affect dis cur epi severe depres with psyc symp
Eu316	[X]Bipolar affective disorder, current episode mixed
Eu317	[X]Bipolar affective disorder, currently in remission
Eu318	[X]Bipolar affective disorder type I
Eu319	[X]Bipolar affective disorder type II
Eu319-1	[X]Bipolar II disorder
Eu31y	[X]Other bipolar affective disorders
Eu31y-1	[X]Bipolar II disorder
Eu31y-2	[X]Recurrent manic episodes
Eu31z	[X]Bipolar affective disorder, unspecified
Eu323	[X]Severe depressive episode with psychotic symptoms
Eu323-1	[X]Single episode of major depression and psychotic symptoms
Eu323-2	[X]Single episode of psychogenic depressive psychosis
Eu323-3	[X]Single episode of psychotic depression
Eu323-4	[X]Single episode of reactive depressive psychosis
Eu33	[X]Recurrent depressive disorder
Eu330	[X]Recurrent depressive disorder, current episode mild
Eu331	[X]Recurrent depressive disorder, current episode moderate
Eu332	[X]Recurr depress disorder cur epi severe without psyc sympt
Eu332-1	[X]Endogenous depression without psychotic symptoms
Eu332-2	[X]Major depression, recurrent without psychotic symptoms
Eu332-3	[X]Manic-depress psychosis,depressd,no psychotic symptoms
Eu332-4	[X]Vital depression, recurrent without psychotic symptoms
Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp
Eu333-1	[X]Endogenous depression with psychotic symptoms
Eu333-2	[X]Manic-depress psychosis,depressed type+psychotic symptoms
Eu333-3	[X]Recurr severe episodes/major depression+psychotic symptom
Eu333-4	[X]Recurr severe episodes/psychogenic depressive psychosis
Eu333-5	[X]Recurrent severe episodes of psychotic depression
Eu333-6	[X]Recurrent severe episodes/reactive depressive psychosis
Eu334	[X]Recurrent depressive disorder, currently in remission
Eu33y	[X]Other recurrent depressive disorders
Eu33z	[X]Recurrent depressive disorder, unspecified
Eu33z-1	[X]Monopolar depression NOS
ZV110	[V]Personal history of schizophrenia
ZV111-1	[V]Personal history of manic-depressive psychosis
ZV111-2	[V]Personal history of manic-depressive psychosis
NULL	NULL

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