Primary Care Mental Health 2005;3:00–00

Development and policy

Health education and prevention for people with severe mental illness: a cross-sectional study of general practice computer records

Simon de Lusignan
Senior Lecturer, Primary Care Informatics, Division of Community Health Sciences, St George's, University of London, UK

Tom Chan
Director of Mental Health Services for Older People, Surrey and Borders Partnership NHS Trust, Lyne, Chertsey, Surrey, UK

Alan Cohen
Director of Primary Care, The Sainsbury Centre for Mental Health, London, UK

Lavanya Thana
Research Assistant

Neil Dhoul
Research Assistant

Nigel Hague
Research Fellow

Jeremy van Vlymen
Research Assistant

Primary Care Informatics, Division of Community Health Sciences, St George's, University of London, UK

ABSTRACT

Background Although UK general practice is highly computerised and data from it have been widely used for quality improvement and research in many diseases areas, most data about the prevalence and quality of management of mental illness come from secondary care-based studies. Many of these studies suggest that people with mental health problems have an excess of cardiovascular and respiratory disease.

Objective We carried out this study to determine whether routinely collected general practice data are of sufficient quality to be used for quality improvement, health service planning and research.

Setting Twelve computerised general practices in West Surrey with a combined list size of 117 000 patients.

Method Audit criteria were developed within a primary care research network. A data set was identified which would enable quality of care to be assessed. MIQUEST (Morbidity Information and Export Syntax – a Department of Health-sponsored data extraction application) was used to extract anonymised data, which was transferred to a relational database and then analysed using a statistical package.

Results The standardised prevalence of cardiovascular and respiratory disease for the population was 1.73%. Respiratory disease was more common in people with severe mental illness (SMI); 22.6% had respiratory illness, compared with 16.4%. Patients with SMI and coronary heart disease (CHD) were much less likely to have their

cholesterol measured. Low-density lipoprotein cholesterol (LDL) was measured about half as frequently in both groups, with no significant difference found. There was less use of lipid-lowering therapy where only 61.4% of people with SMI and CHD are taking a statin compared with 74.4% of those without (χ^2 = 0.01.) Mean systolic blood pressure (BP) in people with SMI was 133.6 mmHg. People with SMI and CHD were no more likely to be ex- or current smokers; the percentages of each group who were likely current or ex-smokers were 43.3% and 43.7% respectively.

Across all age groups people with SMI were recorded as receiving more health promotion advice than people without SMI – advice about smoking, alcohol, diet and exercise. Women with SMI were no more or less likely to have a cervical smear or mammogram performed than those without SMI.

Conclusions General practice data suggest that there may be higher levels of mental health problems than reported in other studies. People with mental health problems have higher levels of cardiovascular and respiratory disease. Although the levels of prevention and screening are lower, people with mental health problems are being advised more about smoking and lifestyle that other patients. Further studies are needed to explore whether people with mental health problems need new or additional interventions to improve lifestyle, as it appears that standard general practitioner (GP) interventions are failing them.

Keywords: to come

Introduction

Research, predominantly carried out in secondary care, report a prevalence of severe mental illness (SMI) of between 4 and 9 per 1000 population.[1–3] People with SMI have higher mortality from cardiovascular and respiratory disease.[4–8] They also are at increased risk of diabetes and obesity, especially with the newer atypical antipsychotics.[9–11] For people with mental health problems, smoking, obesity and a lack of exercise all contribute to ill-health and potentially lead to avoidable death.[12–14] Despite this, the literature suggests people who use psychiatric services are less likely to be offered health promotion interventions such as smoking cessation advice and blood pressure checks.[15–17]

The Primary Care Data Quality (PCDQ) programme is an audit-based educational intervention.[18] The PCDQ uses the feedback of routinely collected computer data to improve data quality and the quality of chronic disease management.[19,20] The programme is characterised by working in areas where there is an evidence base for an intervention, ideally supported by national guidance, and where we can focus on a realistic volume of change. Wherever possible the programme provides technical expertise and an educational framework to support a local lead.[21] The PCDQ programme has been used in a number of contexts: its largest study has been of cholesterol management in heart disease, which ran in 20 localities with a denominator of 2.4 million patients.[22] The programme has also looked at blood pressure recording and control,[23] stroke reduction in atrial fibrillation,[24] improving heart failure management,[25] finding patients with chronic kidney disease,[26] and identifying problems with data quality and recording in osteoporosis.[27] However, its methodology has not been applied in the domain of mental health.

We carried out this study to see if mental health data quality was sufficient to allow us to run a quality improvement programme, or use the data for health service planning or research. In addition, we wanted to know if routinely collected general practice computer data reflected the prevalence of SMI, the same associated diseases, and lack of prevention reported in other studies.

Methods

We carried out a literature review of major bibliographic databases to identify papers about the management of severe mental illness, psychosis, bipolar disorder and the quality of primary medical care.

Audit criteria were developed by the authors and members of a mental health research group set up within KSSnet (Kent, Surrey and Sussex – a Department of Health-funded Primary Care Research Network), see Box 1.[28] Members of the Primary Care Informatics (PCI) group then defined a dataset which should enable the research questions to be answered from general practitioner (GP) data, taking

Box 1 Audit criteria

- Demographic details: age, sex, ethnicity
- Diagnosis of psychosis or prescription of antipsychotic medication
- Referral to psychiatric services
- Diagnosis of heart disease
- Prevalence of SMI, defined as diagnosis of psychosis or bipolar mood disorder, or treatment
- Prevalence of people with CHD and SMI; recording of cholesterol, LDL or prescribed a statin
- Prevalence of diagnosis of diabetes in people with SMI; comparison of blood pressure recording, smoking status and obesity
- Prevalence of respiratory disease in people with SMI
- Frequency of blood pressure measurement and control in people with SMI
- Smoking status and smoking cessation advice of people with SMI and CHD
- Prevention, screening and health promotion provided to people with SMI compared with the general population

into account how these clinical concepts are likely to be coded by GPs.[29] Examples of the picking lists of codes presented when the clinician enters the terms 'Psychosis', and 'Schizophrenia' are shown in Figure 1.

MIQUEST (Morbidity Information and Export Syntax) a Department of Health-sponsored data extraction tool was then used to extract data from two pilot practices.[30] The pilot output was presented to the study group and modifications made to the MIQUEST data extraction queries; the final dataset arrived at is shown in Box 2.

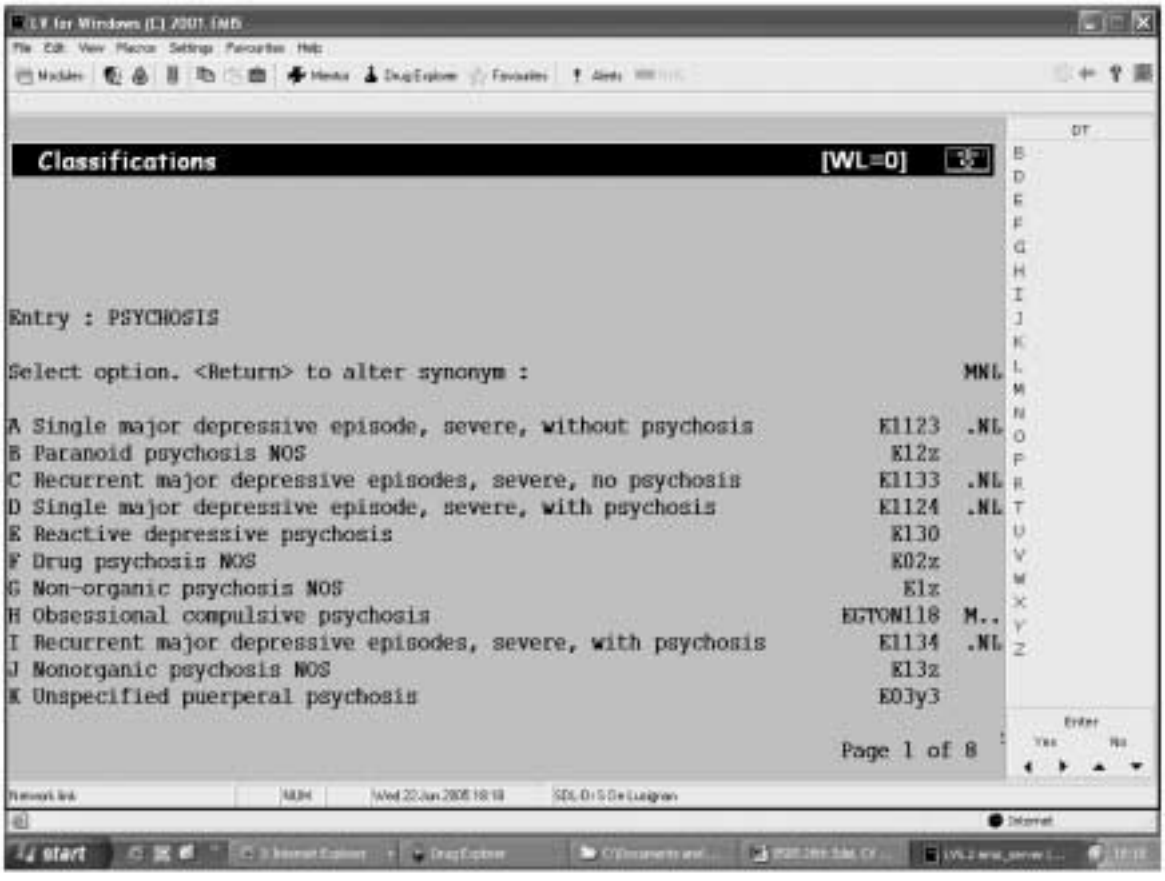
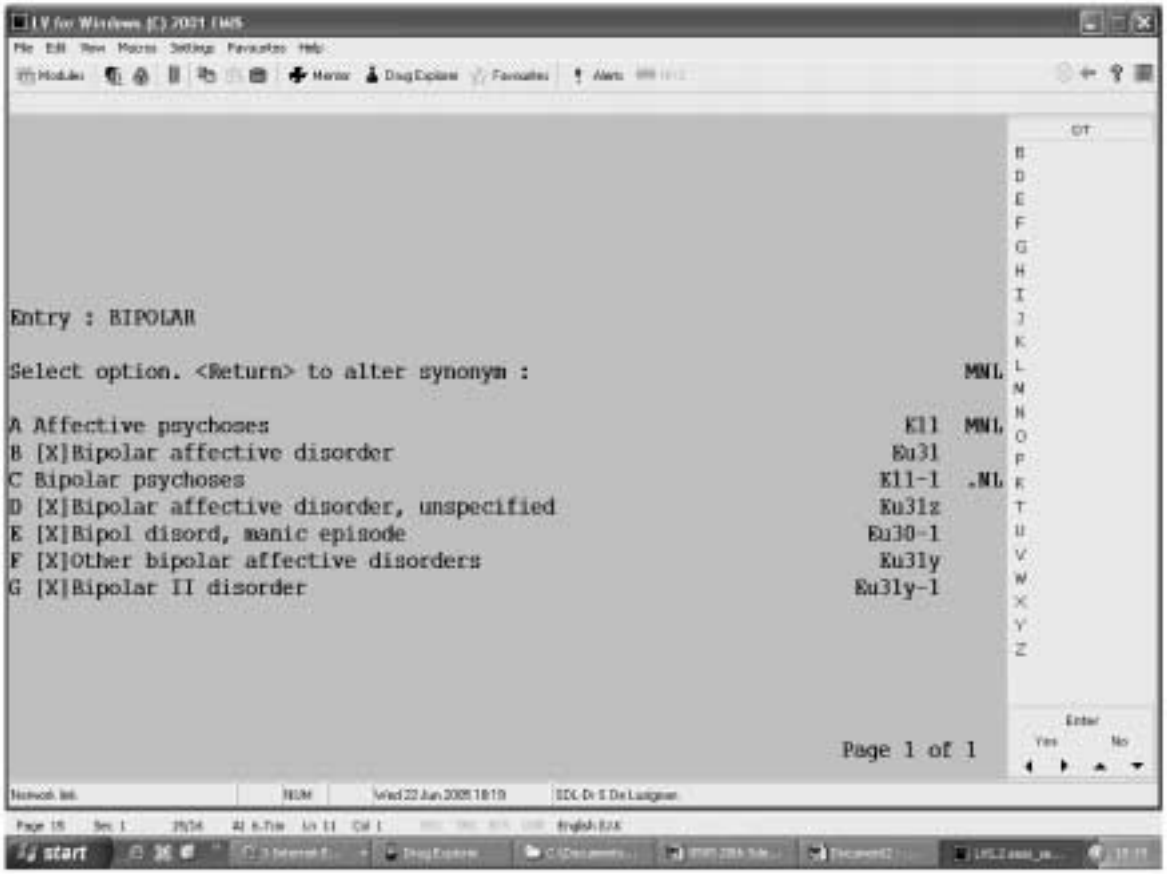


Figure 1 Screen shots from EMIS and ISoft GP computer systems showing the Read code picking lists revealed when the term 'Psychosis' is entered



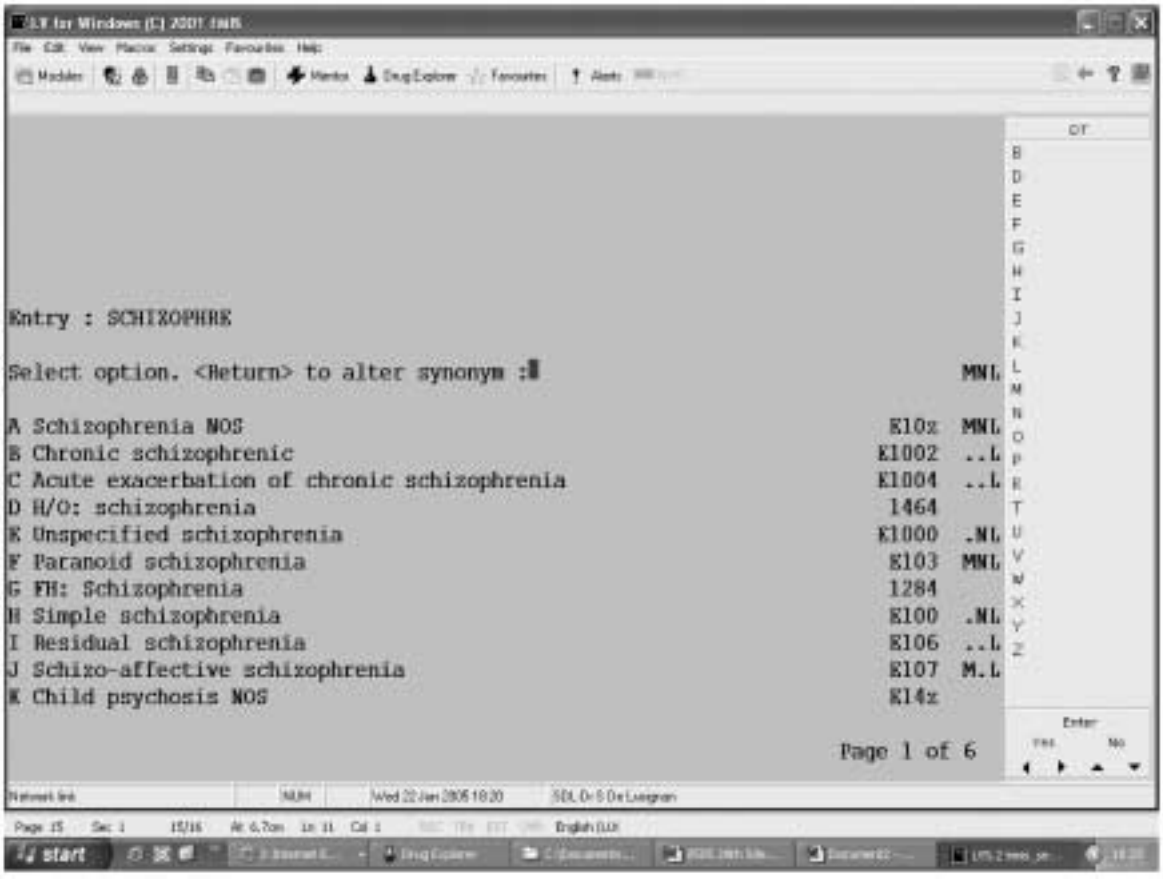


Figure 1 Continued

Box 2 Study dataset

Patient identifiers/demographics

1 MIQUEST unique ID
2 YoB (Year of Birth)
3 Sex
4 First part of post code (to link to socio-economic data)
5 Ethnicity (very poor levels of recording)

Read-coded variables

1 Diagnoses
   a ischaemic heart disease
   b diabetes mellitus
   c psychotic disorders
   d respiratory system diseases

2 Psychotropic medication
   a antipsychotics depo and non-depo (latest two scripts, date and value)
   b antidepressants (latest two scripts, date and value)
   c antimanic drugs (latest two scripts, date and value)
   d hypnotics and anxiolytics (latest two scripts, date and value)
   e anti-addiction therapy drugs (latest script, date and value)

3 Prevention and screening
   a systolic BP (latest, value, + date recorded)
   b diastolic BP (latest, value, + date recorded)
   c height, weight and body mass index (BMI) (latest, value, + date recorded)
   d psychiatric and psychologist referrals (latest + date recorded)
   e viral hepatitis and HIV (latest + date recorded)
   f tetanus and influenza vaccination (latest + date recorded)
   g cervical smear and mammogram (latest + date recorded)
   h urinalysis (latest + date recorded)
   i statins (latest script date, and value
   j serum cholesterol (latest date and value)
   k smoking code that implies current smoker (+ date given)
   l smoking code that implies non-smoker (+ date given)
   m smoking code NEVER smoked (+ date recorded)
   n exercise, diet, smoking and alcoholism advice (+ date recorded)

Data were processed using a five-step procedure derived from an error reduction approach proposed by Berndt *et al*.[31,32] These stages are:

1 migration of the data into a data repository
2 integration of the data with data from other practices
3 data cleaning
4 data processing
5 transfer of data into an appropriate statistical package for analysis.

Data were analysed using SPSS (Statistical Package for Social Sciences) Version 12. The study population was standardised; using the original study (which had an age–sex profile close to the England and Wales national average).[33,34] Statistical methods used were: mean, standard deviation (SD) and standard error (SE) to describe normally distributed variables; median, and interquartile ranges to describe non-parametric variables. Independent sample *t* tests were used to compare normally distributed continuous variables. Pearson's Chi-square test ($\div^2$) were used to test whether the proportion with a condition, on a therapy, or at a target were significantly different.

Approval for the study was given by the local medical ethics committees in West Surrey.

Results

The study population consisted of 117 461 patients drawn from 12 practices in West Surrey. The median list size was 10 525 (range 2412 to 14 951.) The population has an excess of people of working age, fewer younger elderly and a similar number of elderly over age 85 years as the national population (Figure 2). Ethnicity data were only recorded for 5.8% of the population; with the largest group 5.3% (6267/117 461) recorded as White, 0.2% Asian, 0.1% Black, the rest as 'others'.

The crude prevalence of SMI, defined as people with a diagnosis of psychosis or bipolar mood disorder, was 1.7%, and for the population over 16 years 2.2%. The median practice prevalence was 1.75%, with individual practice prevalence varying from 1% to 3.6%. The standardised prevalence for the population was 1.73%.

The standardised prevalence of SMI, is greater in males up until the age of 45 years, thereafter, women have a higher occurrence. The disparity between the two sexes appears to increase with age. The age–sex distribution of people with SMI is shown in Figure 3.

For the whole population, across all age bands up to age 85 years, approximately 15–20% of people taking a psychotropic drug have a psychiatric diagnosis recorded in their clinical records. Over 85 years this dramatically changes with only 5% of those between 85 and 94 years of age who are prescribed antipsychotic medication having a psychiatric diagnosis; over 95 years of age the proportion with a diagnosis falls to 3%. In females alone the proportions were similar, although the proportion with a diagnosis between 85 and 94 years was 6% (see Table 1).

Just under 2000 patients were referred to a psychiatrist; 487 (24.4%) had an indicator of SMI whereas 1510 (75.6%) did not ($\div^2$ <0.001), indicating three times as many without an indication of SMI needed referral.

People with SMI were more likely to have CHD: 6.8% of the population with SMI had CHD compared

Figure 2 Population pyramid comparing the sample population with the 2001 census population for England

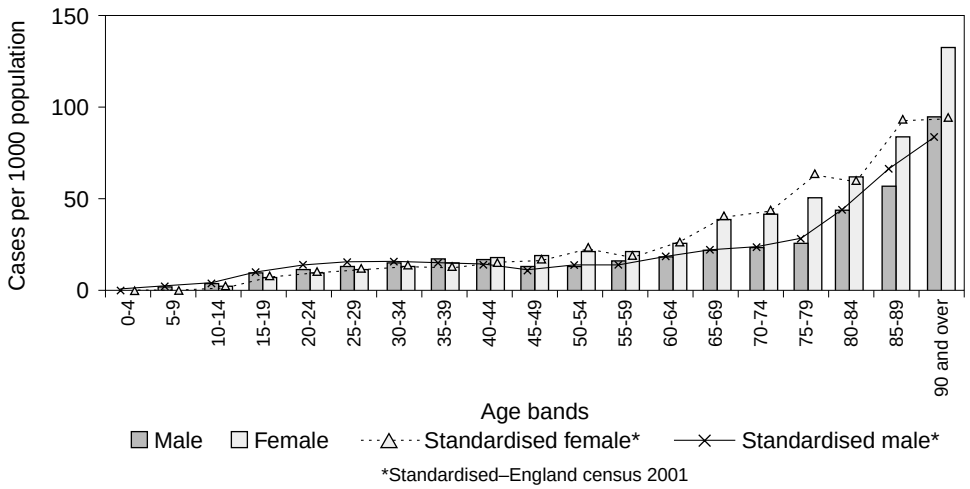


Figure 3 Age–sex distribution of people with a diagnosis or treatment for SMI

Table 1 Age-sex profile of SMI diagnosis versus those on a prescription

Age bands (years)	Pyschosis diagnosed		Taking antipsychotic medication		Total population (psychosis **or** treatment)
	n	% of total population	*n*	% of total population	*n*
All					
0–24	18	15.9	111	98.2	113
25–34	51	22.1	225	97.4	231
35–44	65	18.6	340	97.4	349
45–54	58	20.0	283	97.6	290
55–64	56	19.6	276	96.8	285
65–74	58	21.1	264	96.0	275
75–84	44	15.9	267	96.4	277
85–94	9	5.1	170	96.6	176
95+	1	2.8	36	100.0	36
Total	360	17.7	1972	97.0	2032
Females					
0–24	1	2.2	44	97.8	45
25–34	12	11.5	102	98.1	104
35–44	19	11.4	165	99.4	166
45–54	25	15.7	156	98.1	159
55–64	28	18.1	149	96.1	155
65–74	39	22.4	168	96.6	174
75–84	35	17.9	188	96.4	195
85–94	8	5.9	130	95.6	136
95+	1	3.1	32	100.0	32
Total	168	14.4	1134	97.3	1166
Males					
0–24	17	25.0	67	98.5	68
25–34	39	30.7	123	96.9	127
35–44	46	25.1	175	95.6	183
45–54	33	25.2	127	96.9	131
55–64	28	21.5	127	97.7	130
65–74	19	18.8	96	95.0	101
75–84	9	11.0	79	96.3	82
85–94	1	2.5	40	100.0	40
95+	0	0.0	4	100.0	4
Total	192	22.2	838	96.8	866

with 3.8% of the population without ($\div^2$ <0.001). Patients with SMI and CHD were much less likely to have their cholesterol measured: 79.5% of the 127 patients with CHD and SMI had a cholesterol measure compared with 93% of the 3257 people without ($\div^2$ <0.001). The mean cholesterol in people with SMI and CHD was also significantly higher: mean 5.01 mmol/l (SE = 0.126 mmol/l) for people with SMI compared to 4.68 mmol/l (SE = 0.018 mmol/l; $P = 0.02$ – independent samples *t* test.) LDL was measured about half as frequently in both groups, with no significant difference found. This picture is mirrored by less use of lipid-lowering therapy, where only 61.4% of people with SMI and CHD are taking a statin compared with 74.4% of those without ($\div^2 = 0.01$.) However, blood pressure measurement was much more commonly carried out – again it was more often carried out in those without SMI: 99.1% compared with 96.1% (Pearson $\div^2 = 0.01$.) However, blood pressure control was marginally better in people with SMI: systolic BP mean was 133.6 mmHg ($n = 127$; SE = 1.6 mmHg) compared with 137mmHg ($n = 3494$; SE 0.3 mmHg). This difference is just significant (independent samples *t* test $P = 0.029$). Mean diastolic BP was numerically slightly less but the difference was not significant. Interestingly people with SMI and CHD were no more likely to be ex- or current smokers: the percentages of each group who were likely current or ex-smokers were 43.3% and 43.7% respectively. There were also similar proportions of men and women with SMI and IHD.

The converse observations were found for people without CHD:

- in the general population cholesterol was more commonly measured in people with SMI: 36.1% ($n = 690$) compared with those without 25.6% ($n = 28\,449$). There was no significant difference in the value between the two groups (5.18 mmol/l in SMI, compared with 5.12 mmol/l.) LDL changes mirrored those for total cholesterol (data not shown)
- a higher proportion of people with SMI were prescribed a lipid-lowering therapy: 10.2% ($n = 195$) compared with 6.3% ($n = 7046$; $\div^2$ <0.001)
- people with SMI were more likely to have their BP recorded: 83.2% ($n = 1590$) compared with 65.1% ($n = 72\,286$; $\div^2$ <0.001). Across the whole population with SMI, systolic and diastolic blood pressures were statistically significantly higher (130.2 mmHg compared with 128 mmHg; and 78.3 mmHg and 77.3 mmHg respectively (independent samples *t* test $P < 0.001$))
- smoking was generally much more prevalent in people with SMI: 37% ($n = 752$) were coded current smokers or ex-smokers compared with 22.1% ($n = 24\,503$; $\div^2$ <0.001). Men were much more likely to be smokers or ex-smokers than women: 43.6% (378/886) compared with 32.1% (374/1166; $\div^2$ <0.001).

People with SMI were twice as likely to have diabetes: 2.8% (3206/115 419) of people without SMI had diabetes compared with 6.2% (136/2032) of those whose records showed a diagnosis or treatment for SMI. Those with diabetes and SMI had no difference in their blood pressure or prevalence of smoking than people without SMI. Interestingly, although in general people with SMI were more obese than those without (26.3 kg/m^2 compared with 25.7 kg/m^2 – SE 0.16 and 0.02 respectively; $P < 0.001$ *t* test), neither the proportion nor the mean difference in those with diabetes and SMI were significantly higher than in diabetics without SMI. Similarly people with SMI taking the new 'atypical' therapies were no more likely to be obese or have diabetes. However, people with SMI had significantly worse cholesterol control: mean cholesterol for those with SMI was 5.1mmo/l (SE = 0.11 mmol/l), compared with 4.8 mmol/l (SE = 0.02 mmol/l; independent samples *t* test $P < 0.001$). A lower proportion of those with SMI were taking a statin: 44.1% (56/126) compared with 53.1% (1701/3206), though these proportions were not statistically significant ($\div^2 P = 0.69$).

Respiratory disease was more common in people with SMI: 22.6% (460/2032) had respiratory illness, compared with 16.4% (18 948/115 429; $\div^2 P < 0.001$). Pneumonia, lower respiratory infections, and bronchitis were more prevalent in people with SMI; influenza and emphysema about equal; and, asthma was much less prevalent. Unlike with heart disease, people with SMI and respiratory disease were much more likely to smoke or be ex-smokers: 31% (233/752) were smokers compared to 17.7% (227/1280; $\div^2 P < 0.001$).

Across all age-groups people with SMI were recorded as receiving more health promotion advice than people without SMI – this is true for health education advice about smoking, alcohol, diet and exercise ($\div^2 P < 0.001$), see Table 2. However, in every area where advice was given to people without SMI a greater proportion was given to females than males. However in SMI the converse was true. Indeed women with SMI did not receive a statistically greater level of diet and exercise advice than the general population.

A similar pattern emerges when looking at other areas of prevention. Use or recommendation of nicotine replacement or other active smoking interventions, advice about addictive drugs, urine analysis and tetanus vaccination were all provided to a statistically significantly greater proportion of those with SMI ($\div^2 P < 0.001$), see Table 3. This same

Table 2 Health education advice given to people with SMI

Age bands (years)	Population				Smoking advice				Alcohol advice				Diet advice				Exercise advice			
	No SMI	SMI	%	Total	No SMI	%	SMI	%	No SMI	%	SMI	%	No SMI	%	SMI	%	No SMI	%	SMI	%
Females																				
0–24	16225	45	0.3	16270	750	4.6	6	13.3	165	1.0	2	4.44	1547	9.5	6	13.3	1429	8.8	9	20.0
25–34	7956	104	1.3	8060	1308	16.4	21	20.2	552	6.9	12	11.5	2952	37.1	41	39.4	3978	50.0	47	45.2
35–44	9606	166	1.7	9772	1728	18.0	52	31.3	1107	11.5	36	21.7	3889	40.5	74	44.6	4855	50.5	84	50.6
45–54	7425	159	2.1	7584	1317	17.7	41	25.8	904	12.2	33	20.8	3026	40.8	64	40.3	3673	49.5	80	50.3
55–64	6621	155	2.3	6776	1193	18.0	35	22.6	857	12.9	21	13.5	3031	45.8	66	42.6	3365	50.8	74	47.7
65–74	4596	174	3.6	4770	763	16.6	30	17.2	565	12.3	25	14.4	2246	48.9	73	42.0	2368	51.5	73	42.0
75–84	3295	195	5.6	3490	435	13.2	20	10.3	344	10.4	14	7.18	1402	42.5	54	27.7	1482	45.0	67	34.4
85+	1479	168	10.2	1647	126	8.5	10	6.0	94	6.4	10	5.95	412	27.9	22	13.1	413	27.9	23	13.7
>25	40978	1121	2.7	42099	6870	16.8	209	18.6	4423	10.8	151	13.5	16958	41.4	394	35.1	20134	49.1	448	40.0
Total	57203	1166	2.0	58369	7620	13.3	215	18.4	4588	8.0	153	13.1	18505	32.3	400	34.3	21563	37.7	457	39.2
Chi-square							P < 0.001				*P* < 0.001				*P* = 0.158				*P* = 0.296	
Males																				
0–24	16920	68	0.4	16988	453	2.7	7	10.3	122	0.7	6	8.82	1103	6.5	10	14.7	895	5.3	11	16.2
25–34	8114	127	1.5	8241	883	10.9	23	18.1	350	4.3	9	7.09	1867	23.0	26	20.5	2844	35.1	42	33.1
35–44	10338	183	1.7	10521	1250	12.1	41	22.4	692	6.7	30	16.4	2718	26.3	59	32.2	3832	37.1	82	44.8
45–54	8255	131	1.6	8386	1146	13.9	29	22.1	762	9.2	23	17.6	2528	30.6	57	43.5	3234	39.2	63	48.1
55–64	6952	130	1.8	7082	1132	16.3	37	28.5	868	12.5	25	19.2	2761	39.7	64	49.2	3085	44.4	63	48.5
65–74	4584	101	2.2	4685	786	17.1	22	21.8	694	15.1	17	16.8	2217	48.4	50	49.5	2374	51.8	55	54.5
75–84	2479	82	3.2	2561	404	16.3	10	12.2	384	15.5	5	6.1	1115	45.0	25	30.5	1240	50.0	28	34.1
85+	584	44	7.0	628	66	11.3	4	9.1	52	8.9	2	4.55	199	34.1	9	20.5	216	37.0	6	13.6
>25	41306	798	1.9	42104	5667	13.7	166	20.8	3802	9.2	111	13.9	13405	32.5	290	36.3	16825	40.7	339	42.5
Total	58226	866	1.5	59092	6120	10.5	173	20.0	3924	6.7	117	13.5	14508	24.9	300	34.6	17720	30.4	350	40.4
Chi-square							*P* < 0.001				*P* < 0.001				*P* < 0.001				*P* < 0.001	

Table 3 Prevention provided to people with SMI

Age band (years)	Smoking interventions				Addictive drugs advice				Urine analysis done				Tetanus vaccination				Flu vaccination			
	No SMI	%	SMI	%	No SMI	%	SMI	%	No SMI	%	SMI	%	No SMI	%	SMI	%	No SMI	%	SMI	%
Females																				
0–24	81	0.5	7	15.6	1	0.01	0	0.0	3259	20.1	24	53.3	436	2.7	1	2.2	447	2.8	7	15.6
25–34	251	3.2	19	18.3	5	0.06	0	0.0	4166	52.4	61	58.7	2101	26.4	38	36.5	442	5.6	11	10.6
35–44	358	3.7	27	16.3	5	0.05	1	0.6	5025	52.3	80	48.2	3352	34.9	84	50.6	816	8.5	28	16.9
45–54	278	3.7	20	12.6	1	0.00	0	0.0	3283	44.2	75	47.2	3385	45.6	79	49.7	996	13.4	41	25.8
55–64	267	4.0	20	12.9	0	0.00	0	0.0	3269	49.4	82	52.9	3506	53.0	75	48.4	1725	26.1	59	38.1
65–74	128	2.8	8	4.6	0	0.00	0	0.0	2442	53.1	85	48.9	2470	53.7	79	45.4	3210	69.8	132	75.9
75–84	30	0.9	0	0.0	1	1.00	0	0.0	1802	54.7	80	41.0	1638	49.7	61	31.3	2622	79.6	146	74.9
85+	1	0.1	0	0.0	0	0.00	0	0.0	707	47.8	54	32.1	550	37.2	29	17.3	1119	75.7	131	78.0
>25	1313	3.2	94	8.4	12	0.03	1	0.1	20694	50.5	517	46.1	17002	41.5	445	39.7	10930	26.7	548	48.9
Total	1394	2.4	101	8.7	13	0.02	1	0.1	23953	41.9	541	46.4	17438	30.5	446	38.3	11377	19.9	555	47.6
Chi-square			$P<0.001$				$P=0.169$				$P=0.02$				$P<0.001$				$P<0.001$	
Males																				
0–24	64	0.4	2	2.9	5	0.03	0	0.0	2155	12.7	10	14.7	458	2.7	5	7.4	499	2.9	3	4.4
25–34	201	2.5	21	16.5	11	0.14	6	4.7	2169	26.7	33	26.0	2026	25.0	44	34.6	337	4.2	14	11.0
35–44	309	3.0	28	15.3	9	0.00	1	0.5	2986	28.9	67	36.6	3184	30.8	65	35.5	605	5.9	33	18.0
45–54	281	3.4	22	16.8	1	0.00	0	0.0	2726	33.0	57	43.5	2852	34.5	62	47.3	854	10.3	25	19.1
55–64	220	3.2	26	20.0	0	0.00	0	0.0	2897	41.7	51	39.2	2842	40.9	66	50.8	1402	20.2	50	38.5
65–74	139	3.0	6	5.9		2.00	0	0.0	2340	51.0	53	52.5	2148	46.9	45	44.6	3035	66.2	77	76.2
75–84	34	1.4	0	0.0	0	0.00	0	0.0	1378	55.6	37	45.1	1233	49.7	32	39.0	2028	81.8	66	80.5
85+		0.0	0	0.0	0	0.00	0	0.0	323	55.3	15	34.1	255	43.7	6	13.6	453	77.6	32	72.7
>25	1184	2.9	103	12.9	21	0.05	7	0.9	14819	35.9	313	39.2	14540	35.2	320	40.1	8714	21.1	297	37.2
Total	1248	2.1	105	12.1	26	0.04	7	0.8	16974	29.2	323	37.3	14998	25.8	325	37.5	9213	15.8	300	34.6
Chi-square			$P<0.001$				$P<0.001$				$P<0.001$				$P<0.001$				$P<0.001$	

pattern with health education was repeated in prevention, with males with SMI receiving proportionally more input in each category. Females with SMI did not receive significantly more advice about drug addiction, or urine analysis, than their peers without SMI, although there were very small numbers of females receiving advice about drug addiction. Proportionally more women with SMI received tetanus vaccination and flu immunisation.

In common with several other areas of prevention, women with SMI were no more or less likely to have a cervical smear or mammogram performed than those without SMI. Any slight differences shown in Table 4 are not statistically significant. There was also no difference in the proportion of abnormal mammograms, where these data were recorded.

Discussion

Principal findings

This study reports a higher prevalence of SMI (based on diagnosis or prescription of antipsychotics) than previous studies; though much of this is accounted for by the use of antipsychotic medication in older women. People with SMI were twice as likely to have cardiovascular and respiratory disease and to suffer from diabetes. We did not find increased levels of current or past smoking in those with heart disease, though we did in those with SMI and respiratory disease. People with diabetes and SMI were no more obese than others with diabetes but without SMI.

General practice appears to have a need for psychiatric referral beyond the needs of people with SMI.

Across the whole range of health promotional and preventive activities performed in practice, people with SMI were more likely to be getting health education or other interventions than the rest of the general practice population. Much of the extra effort was focused on men. However, despite this, people with SMI smoked more, were more likely to have the diseases listed above, and those with ischaemic heart disease had lower standards of monitoring and cholesterol control.

Implications for practice

The implications for practice are that standard interventions used in general practice may not be effective in people with SMI, and women need more input. It would appear that although general practice is already targeting people with SMI this has not, as yet, been successful. It is possible that new interventions or specially trained practice staff may be required to close the quality gap identified.

Although across people with SMI as a whole cardiovascular risk was being addressed, it was disappointing that high-risk groups, such as those with heart disease, had less frequent measure and less good control of their cholesterol. Better targeting of interventions is required.

Table 4 Cervical cytology and mammography in females with SMI

Age band (years)	Population		Cervical smear				Mammography			
	Not SMI	SMI	Not SMI	%	SMI	%	Not SMI	%	SMI	%
0–24	16225	45	1532	9.4	14	31.1	7	0.04	0	0
25–34	7956	104	6278	78.9	82	78.8	43	0.5	1	0.96
35–44	9606	166	8824	91.9	148	89.2	249	2.6	6	3.6
45–54	7425	159	6852	92.3	140	88.1	1421	19.1	23	14.5
55–64	6621	155	5604	84.6	118	76.1	4238	64.0	88	56.8
65–74	4596	174	3382	73.6	116	66.7	2629	57.2	68	39.1
75–84	3295	195	1366	41.5	58	29.7	409	12.4	8	4.1
85+	1479	168	83	5.6	3	1.8	29	2.0	4	2.4
Total	57203	1166	33921	59.3	679	58.2	9025	15.8	198	17.0

Limitations of the study

Computer searches of this sort only look at 'structured' or coded data. Data which are recorded as free-text or in letters will not be included. Ethnicity was poorly recorded in GP computer systems, which limited our ability to use this data. The lumping together of diagnosis and therapy to produce a single 'indications of SMI' group may have weaknesses, as we can't be certain that the medication is being used to treat psychiatric disease. This was needed to overcome problems with poor diagnostic data quality. This is a single point of time cross-sectional study, and the extra effort apparently being made in general practice might be causing an effect which only a second round of data collection would answer.

Comparison with the literature

Although our prevalence of SMI was higher than that reported in many other studies it is less than one which found 5.5% of the population to have to at least one symptom of psychosis.[35] However, our study did find associations between cardiovascular and respiratory disease, and diabetes – as found in other studies.[1–8] We found no association between diabetes and obesity and taking the new 'atypical' antipsychotics in people with SMI.[9–11] Nor did we find evidence that people with SMI were receiving less health promotion.[15–17]

Call for further research

A data validation exercise, looking at around 500 records would provide some insight into whether the computer record reflects the quality of care. Studies to see what interventions make a difference and reduce smoking, and monitoring and management of other risk factors need to be conducted; but maybe after the effect of the current rounds of NHS reforms are know. The UK is shortly to have a new quality-based GP contract introduced. It will be important to see if this intervention closes the management gap for people with SMI, or whether they get excluded from quality targets.

Conclusions

People with SMI have more heart disease, respiratory disease and diabetes. Examination of clinical computer records suggests that this excess morbidity occurs despite extra input from general practice. If this trend is still found to be present after the introduction of the new quality-based general practice contract, research will be needed to create more effective interventions for people with SMI.

ACKNOWLEDGEMENTS

KSSnet (Kent, Surrey and Sussex, Department of Health funded Primary care research network) provided a grant towards the data collection for this study.

SdeL, TC and AC conceived the study. SdeL and TC wrote the protocol with input from AC and submitted it to ethics. NH developed the dataset and wrote the MIQUEST queries. NH and ND tested the queries. JvV developed the system to aggregate the data, and performed some of the analysis. LT co-ordinated the study and recruited the practices. TC, SdeL, JvV, LT, and ND all contributed to the analysis. SdeL wrote the first draft of the paper, with input from all authors.

REFERENCES

1 Meltzer H, Gahward R, Goodman R and Ford T. *The Mental Health of Children and Adolescents in Great Britain*. London: Office for National Statistics, 2000.
2 Jenkins R, Lewis G, Bebbington P *et al*. The National Psychiatric Morbidity surveys of Great Britain – initial findings from the household survey. *Psychological Medicine* 1997;27:775–89.
3 Singleton N, Meltzer H and Jenkins R. Building a picture of psychiatric morbidity in a nation: a decade of epidemiological surveys in Great Britain. *International Review of Psychiatry* 2003;15:19–28.
4 Harris EC and Barraclough B. Excess mortality of mental disorder. *British Journal of Psychiatry* 1998; 173;11–53.
5 Brown S, Inskip H and Barraclough B. Causes of the excess mortality of schizophrenia. *British Journal of Psychiatry* 2000;177;212–17.
6 Joukamaa M, Heliovaara M, Knekt P *et al*. Mental disorders and cause-specific mortality. *British Journal of Psychiatry* 2001;179:498–502.
7 Davidson M. Risk of cardiovascular disease and sudden death in schizophrenia. *Journal of Clinical Psychiatry* 2002;63 (suppl 9):5–11.
8 Phelan M, Stradins L and Morrison S. Physical health of people with severe mental illness. *British Medical Journal* 2001;322:443–4.
9 Mukherjee S, Decina P, Bocola V *et al*. Diabetes mellitus in schizophrenic patients. *Comprehensive Psychiatry* 1996;37:68–73.
10 Koro CE, Fedder DO, L'Italien GJ *et al*. Assessment of independent effect of olanzapine and risperidone on risk of diabetes among patients with schizophrenia: population based nested case-control study. *British Medical Journal* 2002;325:243–5.
11 Sernyak MJ, Leslie DL, Alarcon RD, Losonczy MF and Rosenheck R. Association of diabetes mellitus with use of atypical neuroleptics in the treatment of

schizophrenia. *American Journal of Psychiatry* 2002; 159:561–6.
12 Brown S, Inskip H and Barraclough B. Causes of the excess mortality of schizophrenia. *British Journal of Psychiatry* 2000;177:212–17.
13 Friedli L and Dardis C. Smoke gets in their eyes. *Mental Health Today* 2002;January:18–21.
14 Phelan M, Stradins L and Morrison S. Physical health of people with severe mental illness. *British Medical Journal* 2001;322:443–4.
15 Burns T and Cohen A. Item of service payments for general practitioner care of severely mentally ill patients: does the money matter? *British Journal of General Practice* 1998;48:1415–16.
16 Brown S, Birtwistle J, Roe L *et al*. The unhealthy lifestyle of people with schizophrenia. *Psychological Medicine* 1999;29:697–701.
17 Cohen A and Hove M (2001) *Physical Health of the Severe and Enduring Mentally Ill. A training pack for GP educators*. London: Sainsbury Centre for Mental Health, 2001. www.scmh.org.uk/8025694D00337EF1/vWeb/fsCPIR4PDJ8T (accessed 9 December 2005).
18 de Lusignan S and Hague NJ. The PCDQ (Primary Care Data Quality) Programme. *Bandolier* January 2001. www.jr2.ox.ac.uk/Bandolier/booth/mgmt/PCDQ. html (accessed 9 December 2005).
19 de Lusignan S, Hague N, Brown A and Majeed A. An educational intervention to improve data recording in the management of ischaemic heart disease in primary care. *Journal of Public Health* 2004;28:34–7.
20 de Lusignan S. Using the feedback of routinely collected computer data to improve the quality of chronic disease management in UK primary care. *Acta Informatica Medica* 2005;13:59–63.
21 de Lusignan S, Hague N, Yates C and Harvey M. A case study from a Sussex Primary Care Group: improving secondary prevention in coronary heart disease using an educational intervention. *British Journal of Cardiology* 2002;9:362–8.
22 de Lusignan S, Dzregah B, Hague N and Chan T. Cholesterol management in patients with ischaemic heart disease: an audit-based appraisal of progress towards clinical targets in primary care. *British Journal of Cardiology* 2003;10:223–8.
23 de Lusignan S, Belsey J, Hague N and Dzregah B. End digit preference in blood pressure recordings of patients with ischaemic heart disease in primary care. *Journal of Human Hypertension* 2004;18:261–5.
24 de Lusignan S, van Vlymen J, Hague N *et al*. Preventing stroke in people with atrial fibrillation: a cross-sectional study. *Journal of Public Health* 2005;27:85–92.
25 Majeed A, Williams J, de Lusignan S and Chan T. Management of heart failure in primary care after implementation of the National Service Framework for Coronary Heart Disease: a cross-sectional study. *Public Health* 2005;119:105–11.
26 de Lusignan S, Chan T, Stevens P *et al*. Identifying patients with undiagnosed kidney disease from general practitioner computer records. *Family Practice* 2005;22:234–41.
27 de Lusignan S, Chan T, Wood O *et al*. Quality and variability of osteoporosis data in general practice computer records: Implications for disease registers. *Public Health* 2004;119:771–80.
28 KSSnet (Kent, Surrey and Sussex Primary Care Research Network). http://judas.sgul.ac.uk/kssnet (accessed 9 December 2005).
29 St George's – University of London. *Primary Care Informatics (PCI)*. URL: www.gpinformatics.org (accessed 9 December 2005).
30 St George's – University of London. *PCDQ (Primary Care Data Quality) programme. What is MIQUEST?* www.pcdq.org/miquest.htm (accessed 9 December 2005).
31 van Vlymen J, de Lusignan S, Hague N, Chan T and Dzregah B. Ensuring the quality of aggregated general practice data: lessons from the Primary Care Data Quality Programme (PCDQ). *Studies in Health Technology and Informatics* 2005;116:1010–15.
32 Berndt DJ, Fisher JW, Hevner AR and Studinicki J. Healthcare data warehousing and quality assurance. *IEEE Computer* 2001;34(12):56–65.
33 NHS Public Health Network. *Directly Age Standardised Rates*. www.avon.nhs.uk/phnet/methods/directly_age_standardised_rates.htm (accessed 9 December 2005).
34 National Statistics. *Population Trends*. 2003;113 (Autumn):45 (Table 1.4). www.statistics.gov.uk/downloads/theme_population/PT113.pdf (accessed 9 December 2005).
35 Johns LC, Cannon M, Singleton N *et al*. Prevalence and correlates of self-reported psychotic symptoms in the British population. *British Journal of Psychiatry* 2004;185:298–305.

CONFLICTS OF INTEREST

None.

ADDRESS FOR CORRESPONDENCE

Simon de Lusignan, Senior Lecturer, Primary Care Informatics, Division of Community Health Sciences, St George's, University of London, London SW17 0RE, UK. Tel: +44 (0)20 8725 5661; fax: +44 (0)20 8767 7697; email: slusigna@sgul.ac.uk

Received
Accepted