



**Final Report to the NHS Information Centre  
and Department of Health**

**Public Health Indicators Project  
Key Fact Reports**

**A summary of public health  
indicators using electronic  
data from primary care**

**September 2008**

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Acting as a 'one-stop-shop' for high quality,  
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# 1. Executive Summary

## What is this project?

The purpose of this project is to report on trends over recent years in the completeness of recording of selected public health indicators (obesity, smoking, blood pressures and cholesterol) within primary care electronic health records, and to report on estimated population levels of obesity, smoking, blood pressure and cholesterol.

## Who funded this work?

This project was jointly funded by The NHS Information Centre for health and social care (The NHS IC) and the Health Improvement and Protection Directorate, Department of Health and was undertaken by QRESEARCH (<http://www.qresearch.org>)

## What is QResearch?

QRESEARCH is a primary care consolidated database. The database contains health records from approximately 4 million patients currently registered with EMIS practices throughout the UK with data extending back over the last 17 years. QRESEARCH is a not-for-profit organisation jointly owned by the University of Nottingham and EMIS (the largest supplier of clinical systems to primary care, currently covering 60% of the UK population). The data have been validated and used extensively for research.

## Further Information

### Links

<http://www.ic.nhs.uk>

<http://www.qresearch.org>

<http://www.emis-online.com/>

<http://www.nottingham.ac.uk>

## 2. Introduction

The purpose of this project is to report on population trends in completeness of recording of selected public indicators (obesity, smoking, blood pressures and cholesterol) within primary care electronic health records and to report on estimated population levels of obesity, smoking, blood pressure and cholesterol.

### Aims of the project

The overall purpose of the national public health information (PHI&I) strategy primary care data work stream is to obtain accurate, timely, population-based information on disease risk factors, health behaviours and health promoting interventions at local (at least down to Primary Care Trust and Local Authority) and national levels from primary care information systems.

QRESEARCH is a recently established primary care consolidated database containing health records from over 4 million currently registered patients registered with over 530 EMIS practices through the UK (<http://www.qresearch.org>). EMIS is the largest supplier of clinical systems to primary care, currently covering 60% of the UK population. The QRESEARCH database is updated on a quarterly basis and has been validated in a series of studies commissioned by the Department of Health and others.

The aims of this project based on QRESEARCH are:

- To assess the trends in quality and completeness of primary care data on selected major cardio vascular disease risk factors as a proxy for actual population prevalence
- To assess the recording of preventive interventions associated with selected risk factors

This report was also intended to:

- Help further refine a set of national and local information and reporting requirements for this data
- Use the analyses, where possible, to inform health policy such as PCT Local Delivery Plans
- To determine the changes in trends in each indicator over the last 5 financial years.

### Objectives of the project

The analytical objectives of this work were

1. To report on population trends in completeness of recording of selected public health indicators (obesity, smoking, blood pressures and cholesterol) within primary care electronic health records.
2. To report on estimated population levels of obesity, smoking, blood pressure and cholesterol.
3. To determine how both recording and the values of each indicator vary by age, sex, material deprivation and government office region.
4. To determine the changes in trends in each indicator over the last 5 financial years.

## Background and benefits

Using data from primary care to monitor the health of the whole population is highlighted in *Securing Good Health For the Whole Population* (the "Wanless Report"), which states (Section 5.9):

*"To improve understanding and risk factor management, much greater use needs to be made of primary care data systems. The potential of the... electronic patient record, and of the new GMS contract to begin to collect this type of information and subsequently use the information to guide local activity must be fully realised".*

The recent "out of hospital" White Paper makes a number of references to improving primary care information about disease risks e.g. *"as the QOF evolves we intend that by 2008/09 it will include new measures which provide a clear focus on wider health and well-being outcomes"*. This will also require good baseline information and an understanding of its quality, validity, and potential. Primary care information systems have the potential to capture data not only on disease risk factors and interventions to change them delivered in primary care, but also (eventually) on self reported health status. The great majority of the population are registered with a GP, and the quality and completeness of data in GP systems has been improving dramatically in recent years. There is great future potential to make use of primary care clinical data. To further develop this data source, this project was identified as an important part of the primary care data workstream, with specific tasks and milestones.

## 3. Methods

### Database version

We used the QRESEARCH database (version 14) for this analysis. This is a consolidated database containing the electronic health records of over 10 million patients (4 million currently registered and 6 million patients who have died or left) from over 530 practices in the UK.

### Database description and validation

QRESEARCH contains information on patient demographics (year of birth, sex, socio-economic data derived from the UK 2001 census), characteristics (height, weight, smoking status), symptoms, clinical diagnoses, consultations, referrals, prescribed medication and results of investigations. The database has been validated by comparing birth rates, death rates, consultation rates, prevalence and mortality rates with other data sources including the General Household Survey and the General Practice Research Database. The age-sex structure of the population has been compared with that reported in the 2001 census. There was good correspondence for all of these measures, although our population is slightly older and our prevalence figures are marginally higher than less recent data. We have also compared practices taking part in regional research networks on these and other measures and found a good correspondence.

QRESEARCH, and related data sources, have been used for a wide variety of projects related to cardiovascular system diseases and its risk factors.

### Study period & study patients

The study period was the six financial years from 01 April 2001- 31 March 2007. Practices were included in the analysis of each year if they have complete data for the whole of the analysis year. This means that there were different numbers of practices in each of the analysis years.

All contributing practices in the UK were included rather than restricting this to England only.

For analyses of existing patients, patients were included if they have been registered on the first day of each financial year (i.e. 01 April) and have been registered for the preceding 12 months. For analyses of newly registered patients, patients were included if they are registered on the 01 April each year and had been registered for less than 12 months on this day (in other words, capture patients who were registered within the preceding 12 months).

Temporary residents were excluded from all analyses.

## Public health indicators

The full list of indicators and their definitions can be found on the website but are summarised briefly here:

- smoking
- obesity
- blood pressure
- cholesterol
- recording of ethnicity

We determined the proportion of patients who have each indicator recorded in the last 27 months and the last 5 years preceding the 01 April in each analysis year.

## Numerator, denominator and rate calculation

Where appropriate we calculated the rates per 100 registered patients. The numerator for each rate is the count of patients meeting the criteria with the numerator being a subset of the denominator population. The denominator for each rate is the count of patients eligible to meet the criteria (for example, this could be the total number of registered patients).

## Analytical breakdowns

We have presented the results for each indicator down by age, sex, region and deprivation as shown below:

- Financial year
- Financial year and age-sex band
- Financial year and government office region
- Financial year and government office region and age-sex band
- Financial year and quintile of deprivation
- Financial year, quintile of deprivation and age-sex band

## Material deprivation

Material deprivation was defined on the basis of the Townsend score associated with the output area of the patient's postcode using 2001. The Townsend score is a composite score based on unemployment, overcrowding, lack of car and non-owner occupations and is strongly related to morbidity. Higher scores indicate greater levels of deprivation.

Output areas generally consist of around 120 households and whilst they are 'area' data rather than individually assigned, the score is likely to be the best available measure of material deprivation. The cut offs for the quintiles will be based on the national distribution of Townsend scores derived from 2001 census.

## Agebands

The age bands used are the same as the Health Survey for England (HSE), 2003.

0-15; 16-24; 25-34; 35-44; 45-54; 55-64; 65-74; 75 plus

These age bands have been used to help comparisons between QRESEARCH and the HSE and also because any missing values which need to be imputed to calculate coronary risk may be derived from HSE published data.

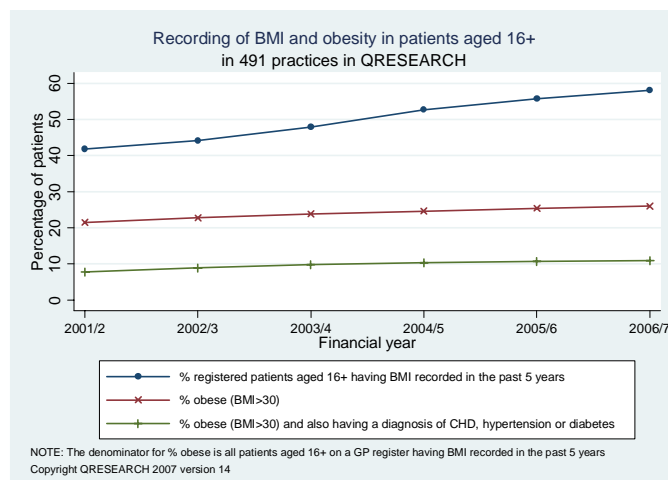
## Government Office Regions

There are currently 9 government office regions within England which are used as administrative units within the NHS according to the NHS organisational codes CD issued by Connecting for Health in Aug 2006. These are the North East, North West, Yorkshire and Humberside, East Midlands, West Midlands, East of England, London, South East, South West [Note these old government office regions almost approximate to the new SHA which came into operation in Oct 06].

# 4. Obesity in UK General Practice

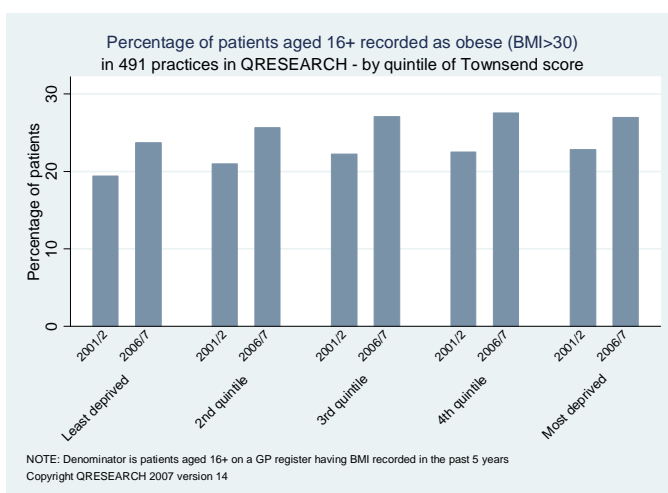
## What is obesity and how is it measured?

Body mass index (BMI) is a measure used by doctors to determine whether people are under weight, normal weight, overweight or obese. Obesity is defined as having a BMI of 30 or above. By the end of March 2007, 58% of registered patients aged 16+ had had their BMI recorded in the past 5 years. Of these 26% had BMI>30, and this includes 11% of registered patients who had BMI>30 AND a diagnosis of CHD, hypertension or diabetes.



## How does obesity vary with deprivation?

This graph shows a breakdown of the percentage of patients aged 16+ on a GP register with BMI recorded in the past 5 years who were recorded as having BMI>30. There is some suggestion that obesity was more common in patients from deprived areas (as defined by quintiles of the Townsend score). For example by the end of March 2007 27% of patients from the most deprived areas were obese compared with 24% from the most affluent areas.



## How often is BMI recorded by GPs?

This table shows the percentage of patients having BMI recorded in the past 5 years and the past 27 months. By the end of March 2007, over half (58%) of registered patients aged 16+ in QRESEARCH had their BMI recorded in the preceding 5 years with 42% in the preceding 27 months.

Financial year	% patients with BMI recorded in the last 27 months	% patients with BMI recorded in the last 5 years
2001/2	26.3	41.9
2002/3	29.4	44.2
2003/4	33.4	47.9
2004/5	38.6	52.8
2005/6	41.0	55.7
2006/7	41.8	58.1

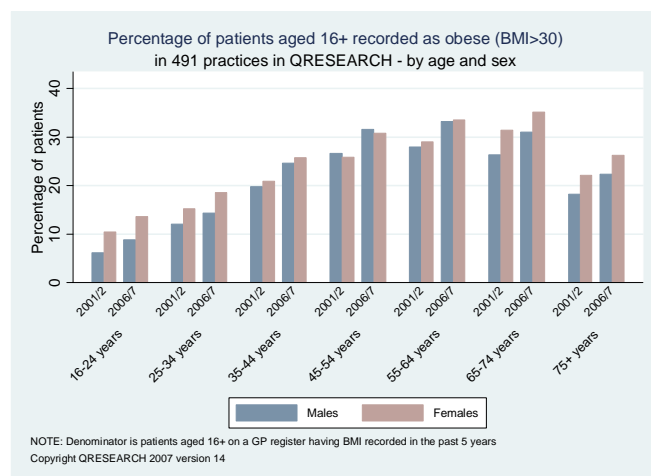
## How does obesity vary by region?

This table shows the percentage of patients aged 16+ on a GP register with BMI recorded in the past 5 years who were recorded as having BMI>30. In 2006/7 the highest proportion of obese patients was in Wales (31%) and the lowest was in London (22%).

Government Office Region	% with BMI > 30 recorded in the past 5 years	
	2001/2	2006/7
North East	23.9	27.9
North West	22.6	27.3
Yorkshire & Humberside	23.7	27.7
East Midlands	22.6	27.7
West Midlands	21.8	28.0
East of England	21.1	26.7
London	17.4	21.5
South East	19.4	23.2
South West	22.0	25.6
Wales	24.8	30.6
<b>England</b>	<b>21.3</b>	<b>25.9</b>
<b>UK</b>	<b>21.5</b>	<b>26.0</b>

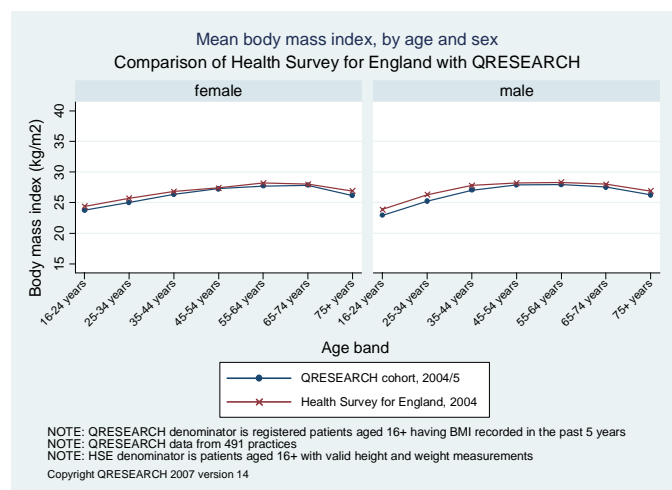
## How does obesity vary with age and sex?

This graph shows a breakdown of the percentage of patients aged 16+ on a GP register with BMI recorded in the past 5 years who were recorded as having BMI>30. Obesity tends to be more common among women than men and the highest rates are in patients aged 55 to 74 years.



## Comparison between QRESEARCH data and Health Survey for England data

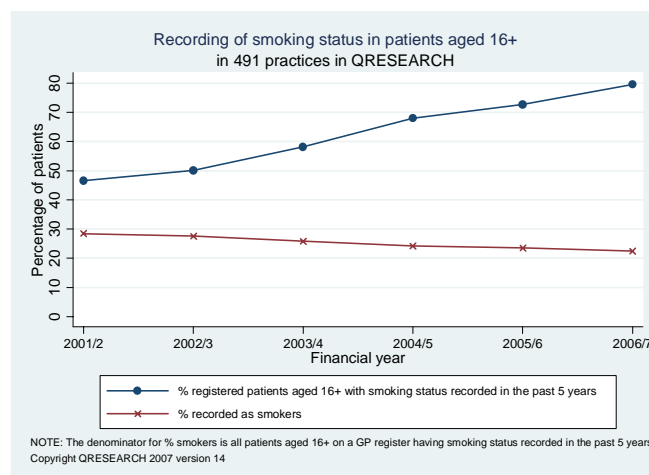
The next graph compares QRESEARCH data (2004/5) with Health Survey for England (2004). There is a similarity in the rates which suggests that QRESEARCH is representative of the population in Health Survey for England.



# 5. Smoking in UK General Practice

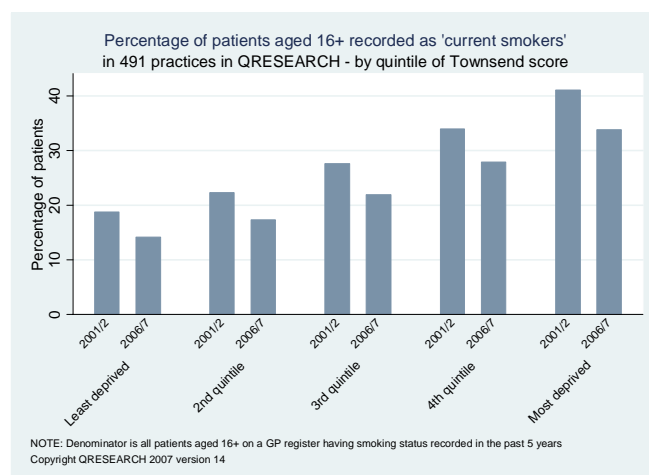
## How does smoking vary with time?

By the end of March 2007, 80% of registered patients aged 16+ had smoking information recorded within their electronic health record in the past 5 years, and 22% of these were recorded as being current smokers.



## How does smoking vary with deprivation?

This graph shows a breakdown of the percentage of patients aged 16+ on a GP register with smoking status recorded in the past 5 years who were recorded as current smokers. Smoking is more common among patients from the most deprived areas. For example by the end of March 2007, 34% of patients from the most deprived areas were current smokers compared with 14% of patients from the most affluent areas.



## How often is smoking status recorded by GPs?

This table shows the percentage of patients having smoking information recorded in the past 5 years and the past 27 months. By the end of March 2007 over three-quarters (80%) of registered patients aged 16+ in QRESEARCH had smoking status recorded in the last 5 years with just under two thirds (65%) in the preceding 27 months.

Financial year	% patients with smoking status recorded in the last 27 months	% patients with smoking status recorded in the last 5 years
2001/2	31.0	46.6
2002/3	34.9	50.0
2003/4	44.6	58.2
2004/5	56.3	67.9
2005/6	59.8	72.7
2006/7	65.2	79.5

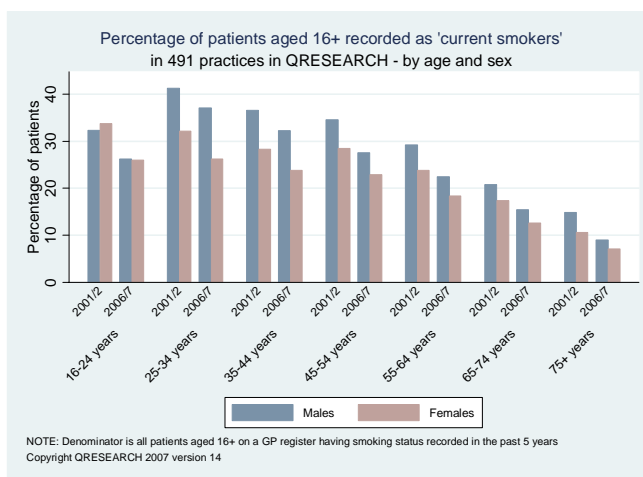
## How does smoking vary by region?

This table shows the percentage of patients aged 16+ on a GP register with smoking status recorded in the past 5 years who were recorded as current smokers. In 2006/7 the percentage of patients recorded as smokers in the past 5 years was highest in the north east and London (25%) and lowest in the south east and south west (20%).

Government Office Region	% recorded as smokers in the past 5 years	
	2001/2	2006/7
North East	30.3	25.0
North West	33.6	24.8
Yorkshire & Humberside	28.9	23.2
East Midlands	27.5	22.6
West Midlands	24.9	21.4
East of England	26.7	21.7
London	32.8	25.0
South East	26.9	20.2
South West	25.7	20.3
Wales	26.8	23.0
<b>England</b>	<b>28.4</b>	<b>22.4</b>

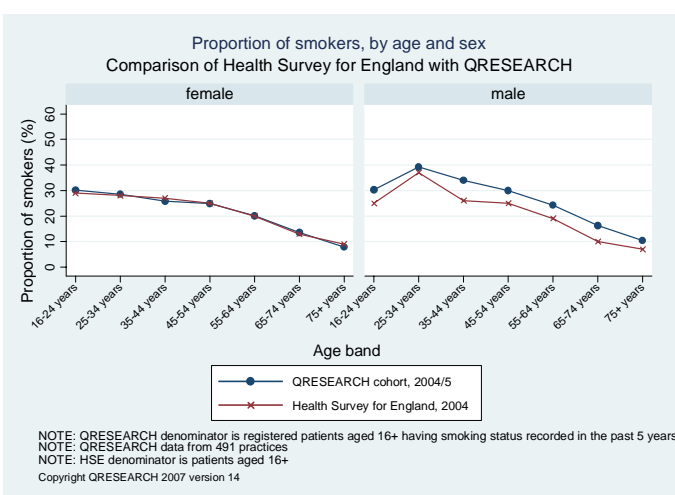
## How does smoking vary with age and sex?

The percentage of patients recorded in the past 5 years as current smokers was highest in the 25-44 year age bands, and then decreased with increasing age for both males and females.



## Comparison between QRESEARCH data and Health Survey for England data

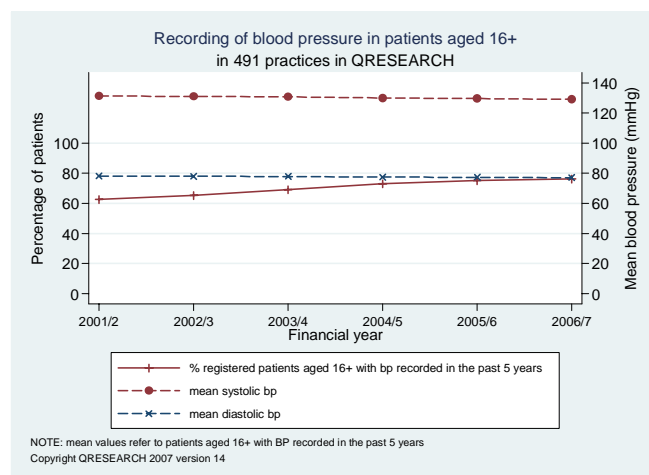
The proportions of males recorded as smokers in QRESEARCH (2004/5) were higher in each age band than the proportions reported in the Health Survey for England (2004) data, but for females the proportions are very similar in the two sets of data.



# 6. Blood pressure in UK General Practice

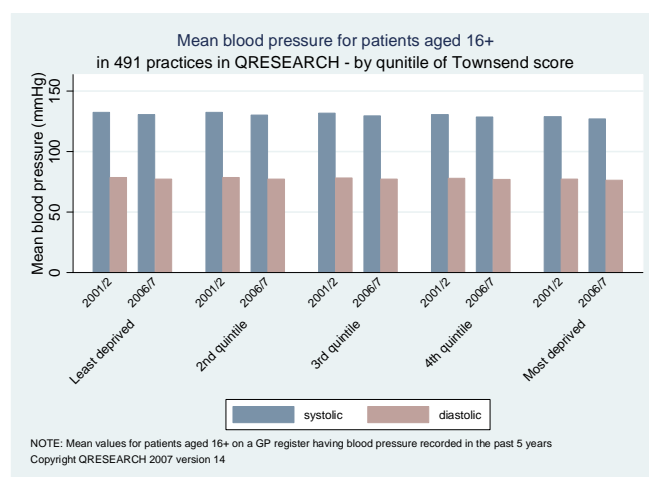
## How does blood pressure vary with time?

The recording of blood pressure has increased from 2001/2 to 2006/7. For example, by the end of March 2007 76% of registered patients aged 16+ had blood pressure recorded in the preceding 5 years. The mean systolic/diastolic blood pressure remained fairly steady and in 2006/7 was 129/77 (mmHg).



## How does blood pressure vary with deprivation?

This graph shows a breakdown of mean blood pressure for patients aged 16+ on a GP register with blood pressure recorded in the past 5 years. Mean systolic and diastolic blood pressures in 2006/7 did not vary with level of deprivation and this was also the case in 2001/2.



## How often is blood pressure recorded by GPs?

This table shows the percentage of patients having blood pressure recorded in the past 5 years and the past 27 months. By the end of March 2007 over three quarters (76%) of registered patients aged 16+ in QRESEARCH had blood pressure recorded in the past 5 years with just under two thirds (62%) in the preceding 27 months.

Financial year	% patients with BP recorded in past 27 months	% patients with BP recorded in the past 5 years
2001/2	49.0	62.7
2002/3	52.3	65.3
2003/4	56.5	69.1
2004/5	60.8	73.1
2005/6	62.4	75.2
2006/7	61.7	76.2

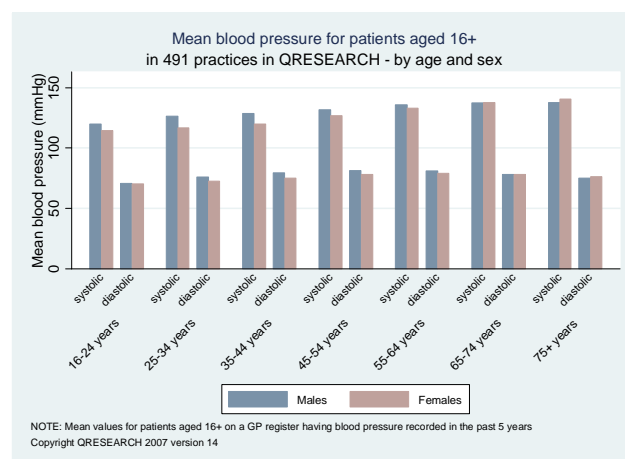
## How does blood pressure vary by region?

This table shows mean blood pressure for patients aged 16+ on a GP register with blood pressure recorded in the past 5 years. In 2006/7 the highest mean blood pressure was in the west midlands (131/78 mmHg), but there was very little variation between the regions.

Government Office Region	Mean BP for patients with BP recorded in the past 5 years	
	systolic	diastolic
North East	129	76
North West	129	77
Yorkshire & Humberside	130	77
East Midlands	129	77
West Midlands	131	78
East of England	129	77
London	125	76
South East	129	77
South West	130	77
Wales	130	77
<b>England</b>	<b>129</b>	<b>77</b>

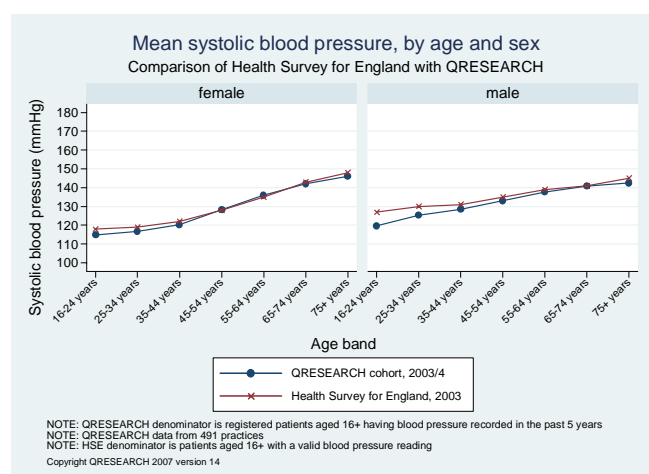
## How does blood pressure vary with age and sex?

This graph shows a breakdown of mean blood pressure for patients aged 16+ on a GP register with blood pressure recorded in the past 5 years. Systolic and diastolic blood pressures in 2006/7 tended to be slightly higher in the older age bands, with mean systolic blood pressure reaching a peak in the over 75s. Blood pressure was generally higher in males than females up to age 64.



## Comparison between QRESEARCH data and Health Survey for England data

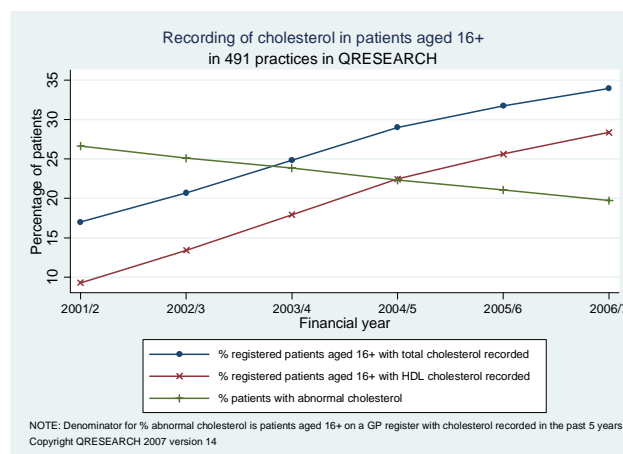
This graph compares QRESEARCH (2003/4) with Health Survey for England (2003). There is a similarity in the rates which suggests that QRESEARCH is representative of the population in Health Survey for England. However in the younger age bands the QRESEARCH mean values were somewhat lower than HSE, particularly for males



# 7. Cholesterol in UK General Practice

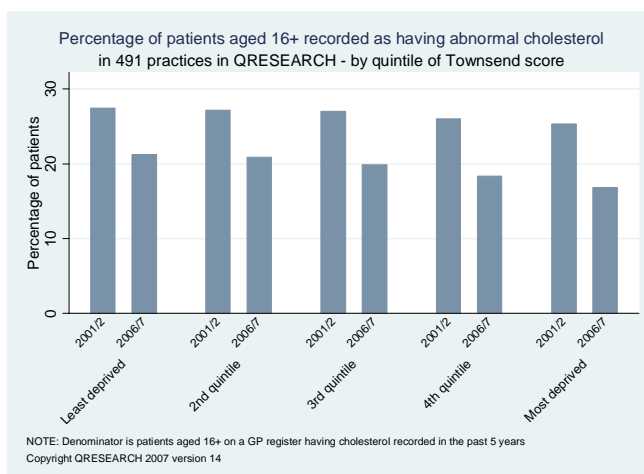
## How does cholesterol vary with time?

There are two measures for cholesterol: total serum cholesterol and high density lipoprotein (HDL). A patient having total cholesterol > 6.0mmol/l is considered as having an abnormal cholesterol level. By the end of March 2007 34% of registered patients aged 16+ had total cholesterol recorded within the past 5 years and 28% had HDL recorded. Of the patients with both total and HDL cholesterol recorded 20% had abnormal total cholesterol levels.



## How does cholesterol vary with deprivation?

This graph shows a breakdown of the percentage of patients aged 16+ on a GP register with cholesterol recorded in the past 5 years recorded as having abnormal cholesterol. Abnormal cholesterol tends to be more common in patients from affluent areas. For example by the end of March 2007 21% of patients from the most affluent areas had abnormal cholesterol compared with 17% from the most deprived areas.



## How often is total serum cholesterol recorded by GPs?

This table shows the percentage of patients having total cholesterol recorded in the past 5 years and the past 27 months. By the end of March 2007, one third (34%) of patients aged 16+ in QRESEARCH had total serum cholesterol recorded in the last 5 years with over one quarter (28%) in the last 27 months.

Financial year	% patients with total cholesterol recorded in the last 27 months	% patients with total cholesterol recorded in the last 5 years
2001/2	14.1	17.0
2002/3	17.3	20.7
2003/4	20.8	24.8
2004/5	24.6	29.0
2005/6	26.8	31.7
2006/7	28.0	33.9

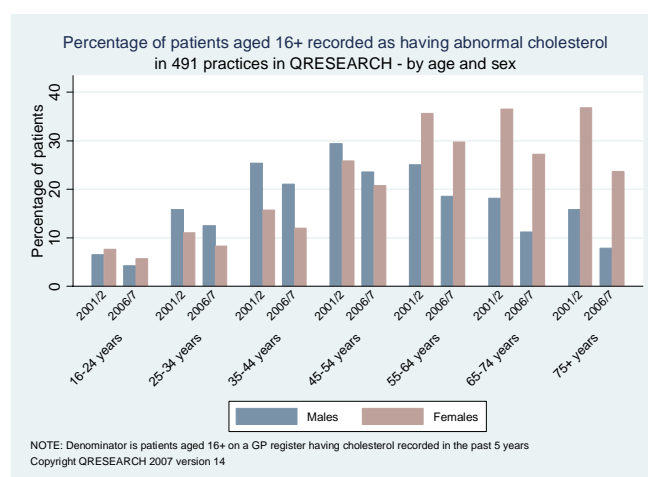
## How does cholesterol vary by region?

This table shows the percentage of patients aged 16+ on a GP register with total cholesterol recorded in the past 5 years who were recorded as having abnormal cholesterol. By the end of March 2007 the percentage of patients with abnormal cholesterol ranged from 16% in London to 22% in the south west.

Government Office Region	% patients with abnormal cholesterol recorded in the past 5 years	
	2001/2	2006/7
North East	28.2	20.6
North West	25.6	18.7
Yorkshire & Humberside	27.7	20.6
East Midlands	27.6	20.6
West Midlands	26.9	20.3
East of England	25.9	19.0
London	25.1	16.0
South East	25.9	19.5
South West	27.5	21.6
Wales	28.0	20.4
<b>England</b>	<b>26.7</b>	<b>19.7</b>

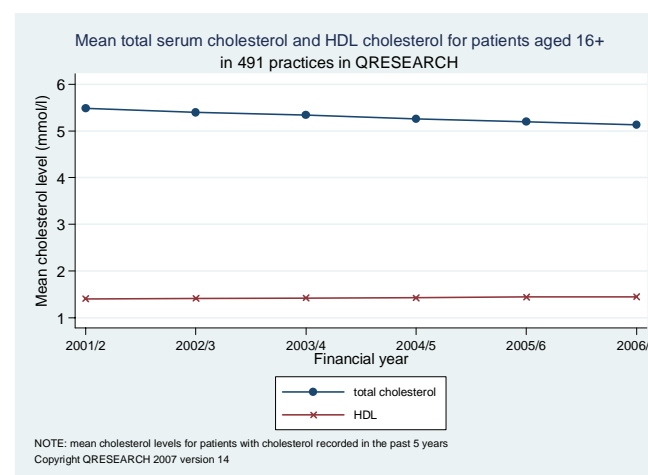
## How does cholesterol vary with age and sex?

This graph shows a breakdown of the percentage of patients aged 16+ on a GP register with total cholesterol recorded in the past 5 years recorded as having abnormal cholesterol. The percentage of patients with abnormal cholesterol increases with age. Abnormal cholesterol is more common in males than females between 25 and 54 years, and more common in females than males from age 55.



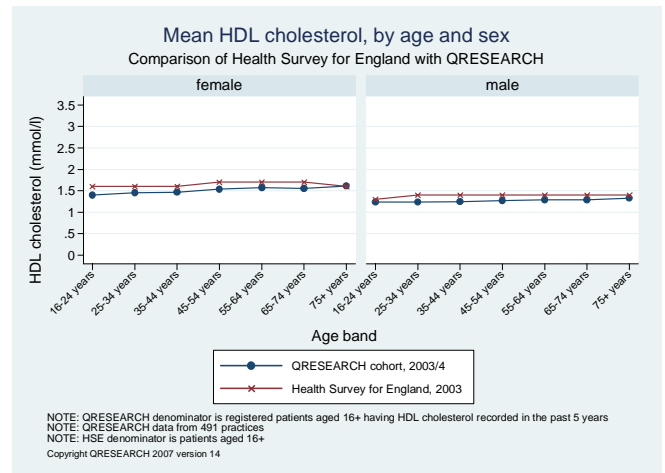
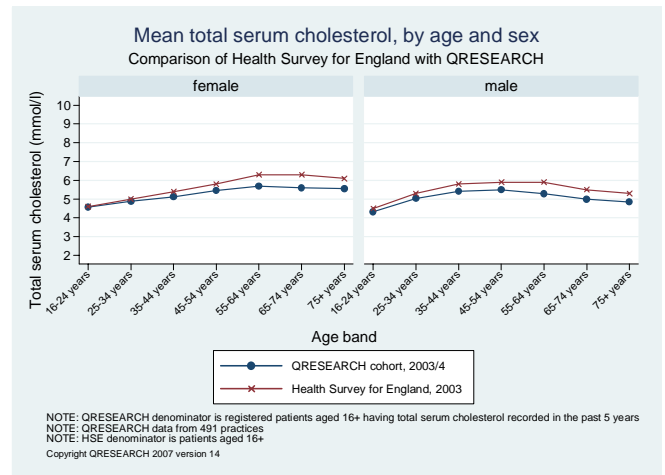
## Change in mean cholesterol levels

Mean HDL cholesterol has remained steady at 1.4mmol/l since 2001/2. By the end of March 2007 mean total serum cholesterol had decreased slightly to 5.1mmol/l.



## Comparison between QRESEARCH data and Health Survey for England data

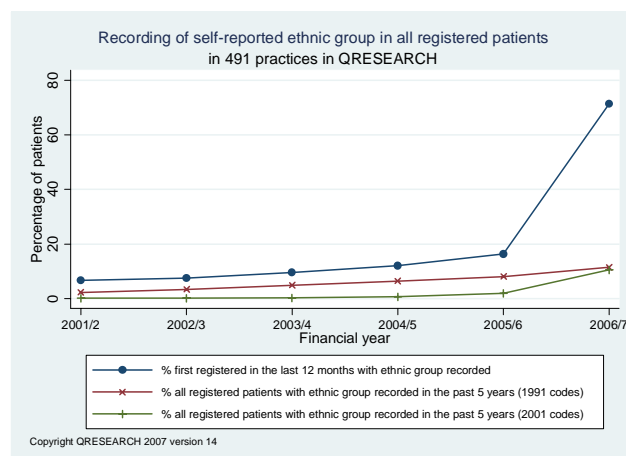
These two graphs compare QRESEARCH (2003/4) with Health Survey for England (2003). There is a similarity in the rates which suggests that QRESEARCH is representative of the population in Health Survey for England. However the QRESEARCH mean values were slightly lower than HSE, particularly for total serum cholesterol in patients aged 55 and over.



# 8. Ethnicity in UK General Practice

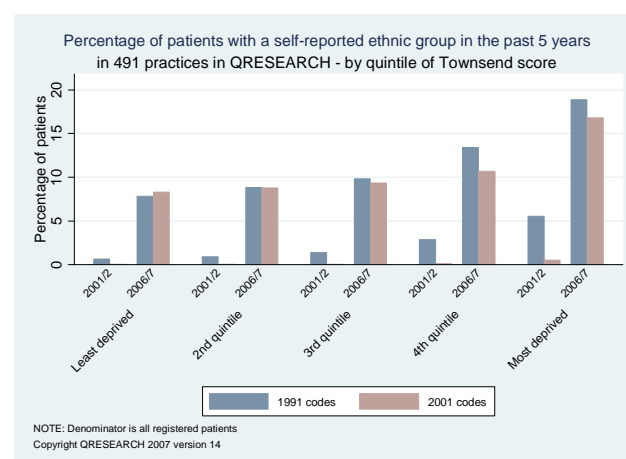
## How does recording of ethnic group vary with time?

The following graph shows how the recording of self reported ethnicity has increased over the past 5 years, both using computer codes relating to the definition of ethnicity from the 1991 census and that from the 2001 census



## How does recording of ethnic group vary with deprivation?

This graph shows a breakdown of the percentage of all patients on a GP register having ethnic group recorded in the past 5 years. In 2006/7 a higher percentage of patients from the more deprived areas had ethnicity recorded in the past 5 years. This is true for 1991 codes and 2001 codes.



## How often is ethnic group recorded by GPs?

By the end of March 2007 12% of all registered patients in QRESEARCH practices had ethnicity recorded in the preceding 5 years with 8% in the preceding 27 months (based on 1991 census codes). The corresponding figures for 2001 census codes were 11% and 10%. By July 2008, 40% of patients on the QResearch database (version 19) had self assigned ethnicity recorded.

Financial year	% patients with valid ethnic group in the past 27 months		% patients with valid ethnic group in the past 5 years	
	1991 codes	2001 codes	1991 codes	2001 codes
2001/2	1.7	0.1	2.2	0.1
2002/3	2.6	0.1	3.4	0.2
2003/4	3.5	0.2	4.9	0.3
2004/5	4.2	0.6	6.4	0.7
2005/6	4.9	1.8	8.1	1.9
2006/7	7.5	10.2	11.5	10.6

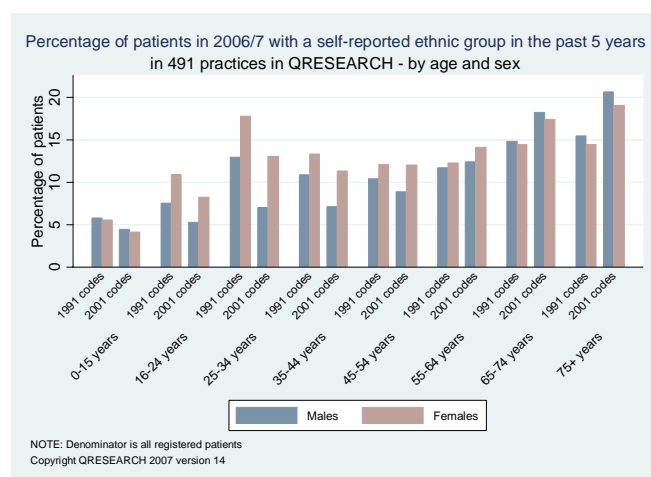
## How does recording of ethnic group vary by region?

By the end of March 2007 the highest recording rates were in London, where 25% of patients had ethnicity recorded in the past 5 years based on 1991 codes and 24% based on 2001 codes.

Government Office Region	% patients with valid ethnic group recorded in the past 5 years			
	1991 codes		2001 codes	
	2001/2	2006/7	2001/2	2006/7
North East	0.4	12.7	0.0	8.7
North West	0.5	11.1	0.0	7.2
Yorkshire & Humberside	1.9	5.2	0.0	6.7
East Midlands	2.1	9.1	0.0	8.8
West Midlands	3.7	17.4	0.0	12.9
East of England	1.2	13.0	0.0	8.2
London	10.0	25.4	1.0	23.9
South East	0.6	9.8	0.0	9.1
South West	0.3	5.0	0.0	5.3
Wales	0.0	4.5	0.0	23.9
<b>England</b>	<b>2.3</b>	<b>11.7</b>	<b>0.1</b>	<b>10.1</b>
<b>UK</b>	<b>2.2</b>	<b>11.5</b>	<b>0.1</b>	<b>10.6</b>

## How does recording of ethnic group vary with age and sex?

By the end of March 2007 the proportion of patients with ethnic group recorded increased across the age bands for both males and females, apart from a relatively high rate among patients aged 25-34 years.



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