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The Representativeness of GP Practices contributing to the Royal College of Physicians Weekly Returns Service

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Background

A collaborative project between the Birmingham Research Unit of the Royal College of General Practitioners (RCGP), The West Midlands Communicable Disease Surveillance Centre (CDSC) and the West Midlands Health GIS Service.

The Birmingham Research Unit of the RCGP has since 1964 monitored GP consultations in certain 'Sentinel' GP practices across England & Wales. GP's in these practices provide a summary of each patient consultation on a weekly basis to the Weekly Returns Service (WRS). This summary is additional to the patient's medical record and consists of a working diagnosis and episode type (first time diagnosis, a new occurrence of previous diagnosis, or a follow-up consultation). Since 1999 this Sentinel practice data has been returned to the RCGP morbidity register by fully automated computer downloads which has facilitated automatic report generation and provided more capacity to interrogate the data.

The WRS produces from this data weekly, four weekly, quarterly and annual incidence rates per 100,000 population by age groups for many of the most common illnesses at national and supra-regional (Reporting Area) level. These regular reports form the basis for tracking the incidence of communicable disease across the country, identify impending 'epidemics' and inform the Department of Health on key rates of morbidity.

The recruitment of Sentinel practices has historically relied on 'willing volunteers' and the WRS has retained a loyal membership. Whilst this provides a valuable resource for time series analyses it has meant that there has been cursory regard to the representativeness of the population sample of these practices at a local or regional level. Nationally the populations are broadly similar in terms of demographics.

It is generally accepted that GP patient lists do not conform to any other health or administrative area. It has not therefore been possible to use other published data sources as surrogates for practice demographics and socio-economic profiles. This project aims to utilise Geographic Information Systems (GIS) to address the issue of representativeness of the Sentinel practices. This will be done by analysing the distribution of patients registered with each practice & comparing their known demographics with published demographic and socio-economic indicators.

Data Sources

1. Health data

Each NHS GP practice is required to maintain a current list of patients registered with its GP's. This GP patient list is regularly submitted to the NHS Information Authority (NHSIA) where it is collated into the Attribution Data Set (ADS). The ADS is used to allocate GP and Health Authority payments from the Department of Health (DoH). The ADS includes both confidential patient information and basic demographic details of each patient. The ADS is deemed to be confidential to the Health Authority.

This case study will use an extract of data from the ADS for April 2002 to obtain unit postcode level data for patients registered with each Sentinel practice by five-year age bands. In order to obtain this extract

consent was sought from the Cauldicott guardian of each of the 104 health authorities in England & Wales. Due to the nature of the GP practice lists it is not sufficient only to request consent from those Health authorities with a Sentinel practice; many patients live outside the Health Authority where they are registered with the GP.

2. Geographical Data

In order to use the data in GIS at a number of geographical levels it was necessary to assemble England & Wales boundary data for the following:

- i) Directorates of Health & Social Care 2002 (new sub-national health administrative areas - 2002).
- ii) NHS Executive Office Regions 1999 (health administrative regions up until October 2002).
- iii) Government Office for the Regions (GOR) (regional government administrative areas which will soon include a Public Health function under the lead of the Regional Directors of Public Health).
- iv) Strategic Health Authority Boundaries 2002 – currently available for the West Midlands only.
- v) Health Authority Boundaries 2001 – latest boundaries for the soon to be defunct health organisation.
- vi) Primary Care Trust Boundaries 2002 – currently available for West Midlands only.
- vii) Ward Boundaries 1991 & 1998.
- viii) NHS Postcode Directory 2002 enhanced to 10metre grid references.
- ix) Postcoded location of each of 86 Sentinel Practices taking part in the WRS, classified by Reporting Area to which they belong (North, Central, South).
- x) Postcoded GP patient lists derived from the ADS extract.

3. Socio-economic Data

To assess the level of representativeness the following demographic & socio-economic data was collected for England & Wales:

- i) Population profiles from 1991 Census enumeration districts by male/female five-year age bands.
- ii) Townsend scores for 1991 enumeration districts.
- iii) Ward level Population Estimates 1998 by male/female in three age bands.
- iv) Indices of Deprivation 2000 at ward level.

Method

- Consent of Cauldicott Guardians in 104 Health Authorities were requested by CDSC in November 2001 with a reply date of 7th January 2002. Despite reminders to tardy Health Authorities by 22nd February 2002 only 78 consents had been received. The download by the NHSIA was completed for these consenting health authorities on 25th April 2002 and delivered to the West Midlands Health GIS Service as a comma delimited file.
- Sentinel practice locations were mapped in the GIS using practice postcodes to locate the surgeries identified by lead GP surname and WRS code.
- The GP practice locations were then considered in terms of the developing health geography of England & Wales to give the Birmingham Research Unit of the RCGP the opportunity to look forward to the way information might be reported for the future as well as illustrate how it is currently assessed.
- The distribution of health authority consents was mapped to determine the number of practices the GIS service could expect to receive data for.

- The extract of the ADS data was imported into an Access database to create aggregated tables of GP patient postcodes by 5-year age groups for future analysis. Each practice in the ADS is identified by the lead GP GNC code.
- A lookup table to match GNC code to WRS code was created to match the ADS extract to the surgery locations.
- ADS practice populations were computed and compared with WRS average weekly practice populations to assess the completeness of the ADS extract.
- Practice age-sex profiles were prepared for those practices with >90% population included in the extract. These are then compared with Health Authority, Region and Reporting Area profiles.
- The GP patient postcode file is geocoded and plotted for those practices where we could be confident of capturing the major part of the patient population.
- GIS is then used to relate patients to the ward and enumeration district geography and to extract population and deprivation profiles.
- Demographic profiles of practice patients attributed to ward and enumeration district are used to determine measures of socio-economic characteristics of each practice.
- Determination of socio-economic variables were carried out in two ways:
 - (i.) descriptive assessment of the number of practice patients living in wards/enumeration districts of particular characteristics.
 - (ii.) population weighted average of the ward/enumeration district score.

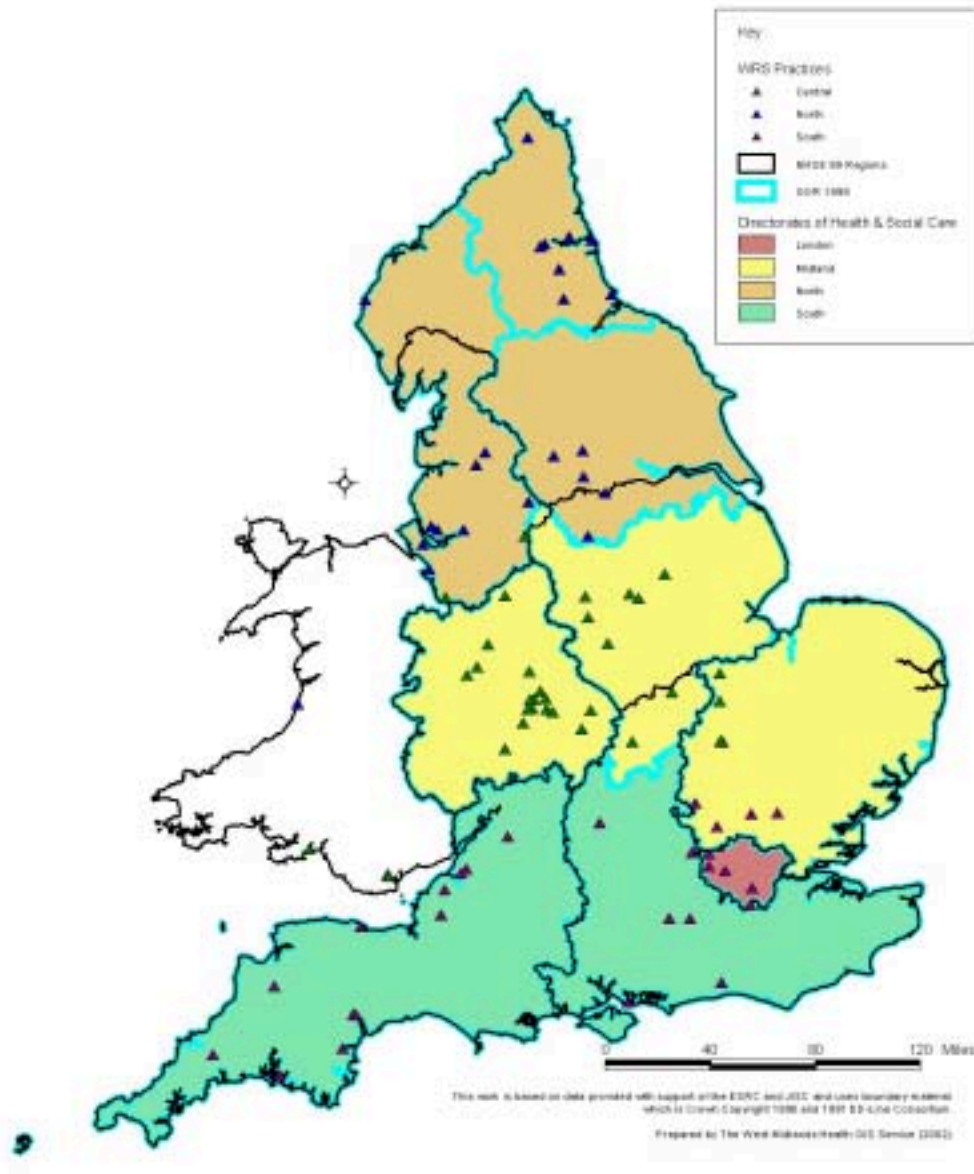
Results

1. Relationships between Sentinel practices and Health Geography

The 86 Sentinel practices included in the WRS returns were geocoded from their surgery postcode and examined to consider the relationship between the WRS Reporting Areas classification and the forthcoming sub-national Directorates of Health & Social Care (DHSC). Several practice allocations to Reporting Areas were found to be at odds with new NHS organisations - 4 coded South will be in Midland DHSC, 5 coded South will be in London DHSC, 2 coded Central will be in North DHSC.

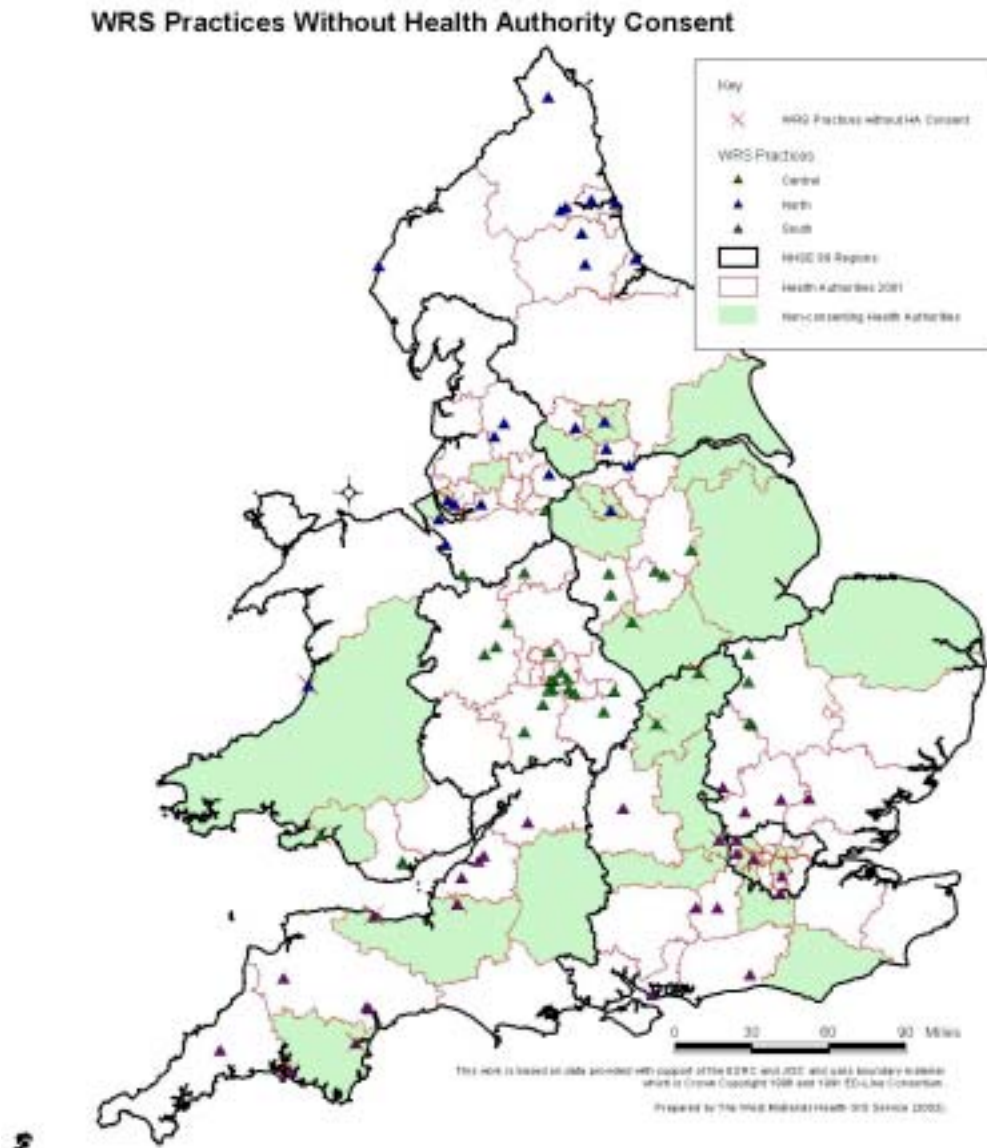
Similarly whilst the Government Office for the Regions do not in themselves correspond to DHSC boundaries neither do the WRS classifications conform to GOR boundaries - within the Anglia region there are 4 practices coded to Central Reporting Area and four coded South and in North West GOR there are 2 practices coded to Central the remainder are North.

Geography of WRS Practices



2. Pattern of Health Authority Consent

Looking at the pattern of consent by health authorities across the country 78 of 104 health authorities gave consent to obtain the download from the ADS, a further 4 refused on the basis of the potential breach in patient confidentiality afforded by postcoded data in sparsely populated areas. The best response rate was in West Midlands, the worst response rate came from health authorities in Trent where 5 of 11 Health authorities did not respond. Elsewhere approximately one third of health authorities remained excluded from the study e.g. London (5 non-consents out of 14), South East (5 out of 13), South West (3 out of 8) and Wales (2 out of 5), Northern & Yorkshire (3 out of 13) and North West (3 out of 16).



Map 2 shows that 17 practices included in the WRS are situated in non-consenting Health authorities and should not therefore be include in the ADS extract. 69 practice lists should be received from NHSIA.

3. The ADS extract

Patient postcoded data was obtained from NHSIA for 73 Sentinel practices in England & Wales in 449,697 records. This amounted to a total practice population of 522,932 persons (264,599 females & 258,333 males). Of this practice population 1,482 live at 'unknown' postcodes and must be discounted from analysis in the study. The extract however included more practices than expected and was found to include patients who lived outside the health authority of their registered practice and are included because they live in a health authority that gave consent.

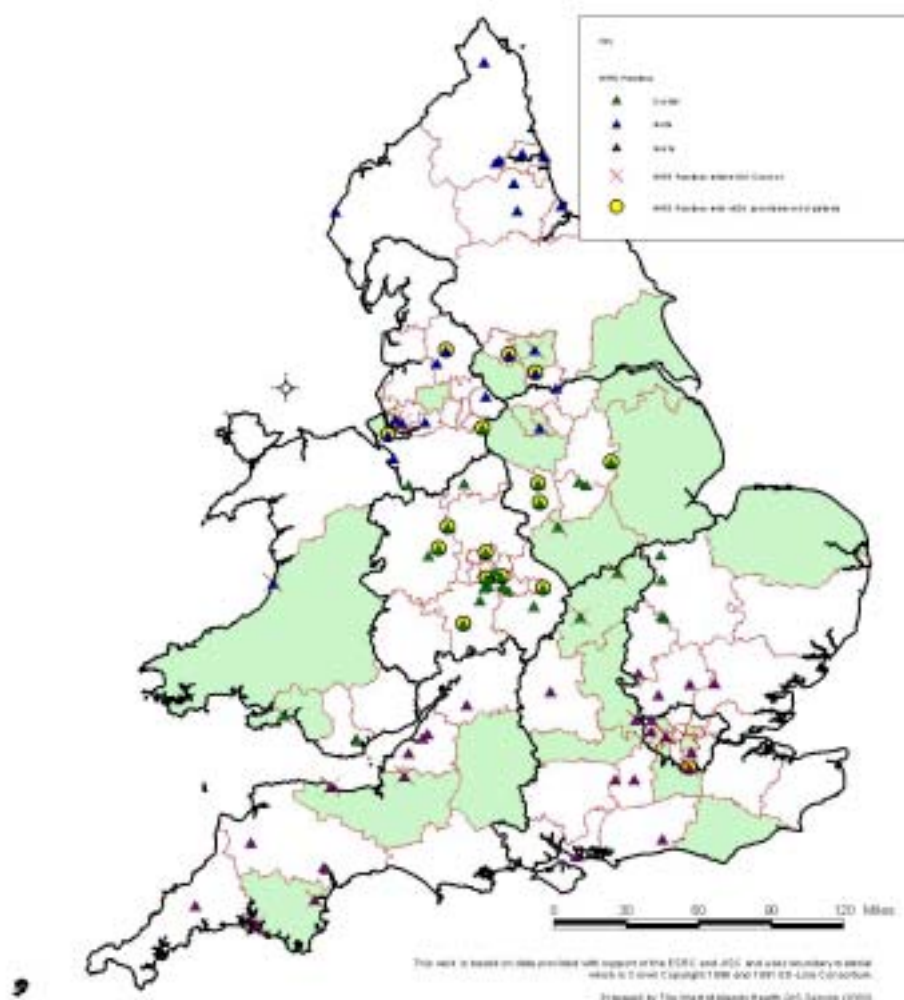
4. Relationship between health authority consent & practice populations

The repercussions of non-consenting health authorities goes further than simply limiting the number of practices for which data could be downloaded from the ADS. As GP patient lists are not confined to health authority boundaries, the extent of the practice populations which is drawn from adjacent health authorities further affects the viability of using ADS data alone to test the representativeness of practice populations. It was therefore necessary to compare the downloaded ADS practice population with the WRS average weekly list size. Once this was done only 51 practices are seen to have an ADS patient list size of more than 90% of WRS sizes. 2 practices have less than 50% and 3 practices have an ascertainment of between 70% and 85%.

However the most worrying are 3 practices with health authority consent which have no patients.

Map 3

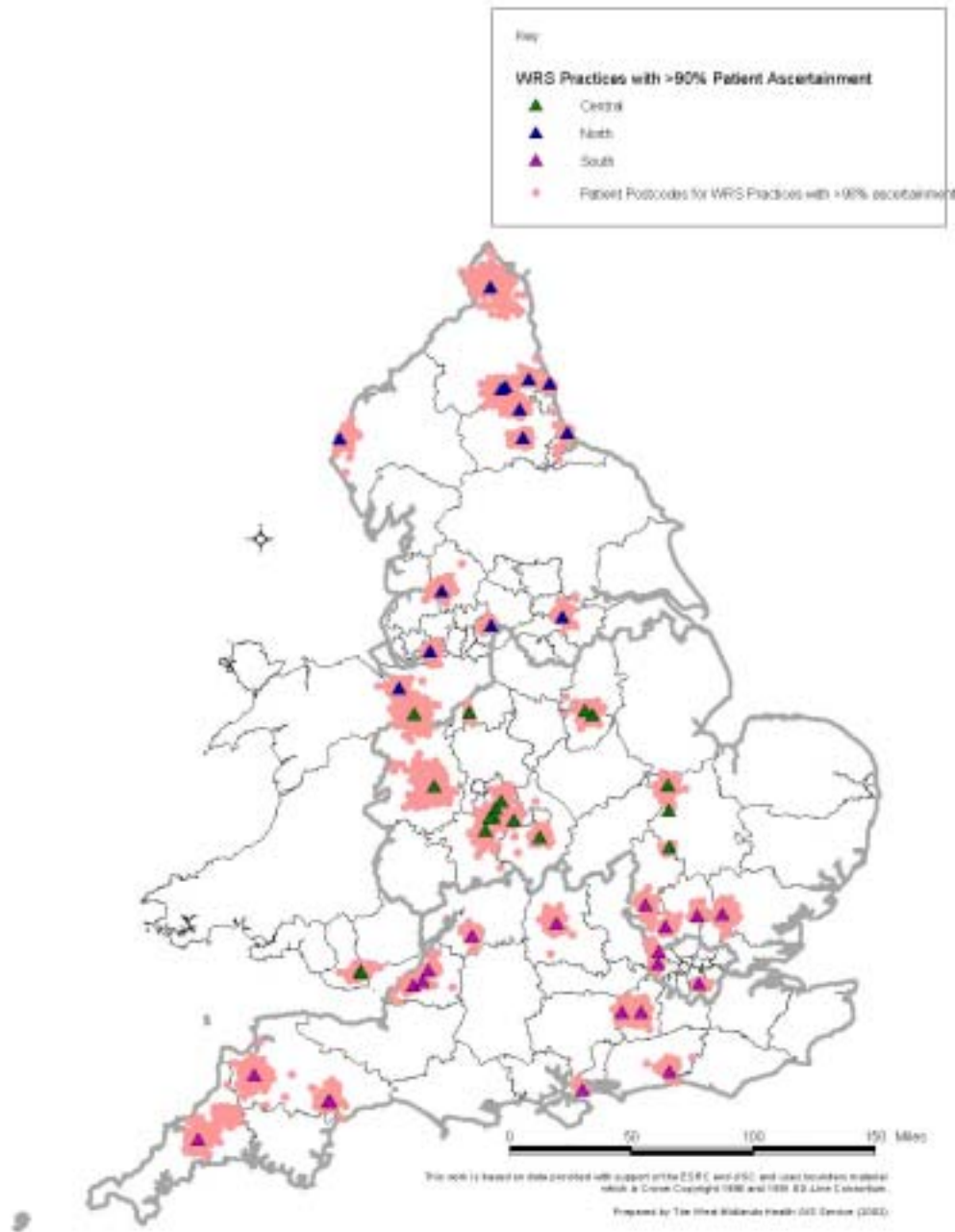
WRS Practices with Less Than 90 % patient ascertainment in ADS



Having identified only 51 practices which we were confident to include in our study the ADS patient postcodes were geocoded and plotted on a map of England & Wales to begin to assess the distribution of the Sentinel Practice populations. The national picture looks rosy - most patients cluster nicely about the surgery!

Map 4

Available WRS Practices & their Patient Distributions



However the local pattern of patient distributions around individual practices are as to be expected highly variable often linked to the recent history of the practice, whether it is a small single-handed practice or a larger multi-handed practice. Some practices have an even distribution of patients across the surrounding area, others seem to be concentrated into certain parts of the settlement, still more are dispersed across wider areas.

Conclusions

Our study of the representativeness of Sentinel Practices has been facilitated by the use of GIS which has allowed us to visualise the relationships between various local and sub-national health organisations. GIS has helped to communicate the distribution of GP practices in terms of other organisational boundaries and to highlight where non-consenting health authorities was likely to cause most problems. At a more detailed level GIS alerted us to reasons why we had been given data for practices we had not expected and raised our suspicions to the fact that some practices were not achieving a true patient population.

The ability to map patient postcodes and attribute their population to census and ward geography could not be done satisfactorily without reference to GIS. Yet by working in collaboration with others the GIS allowed us to pool resources and expertise and share some of the data processing operations to others. Being able to visualise the distribution of practice populations at a local level allows us to make even more interesting comparisons between practices and share them with our colleagues.

This study has also raised a number of issues in relation to the gaining access to health data, sharing data across organisations and partnership working.

First there is the issue of getting access to anonymised health data extracted from 'confidential' data sets. Despite the fact that all parties to this study work within the NHS and are all governed by the same laws of confidentiality we have to carry out complex, labour intensive procedures to gain access to the data we need to carry out work to inform health service planning. GP practices compile their practice lists and share them with the NHSIA for health authority activities. The RCGP WRS receives weekly electronic downloads of practice returns to analyse for the WRS reports. Both CDSC & West Midlands Health GIS Service have within their organisations access to patient identifiable data yet to work collectively we are not able to access a major NHS-wide resource without following complex consenting procedures.

Secondly the NHS community is by its very nature composed of numerous organisations yet the fact that some 75% health authorities interpreted national guidelines in our favour and the others abstained from making a decision shows how inconsistently these guidelines can be applied to the lesser good of service delivery. The fact that West Midlands Health authorities gave consent unanimously I hope indicates they are confident of our ethics but others are clearly more reticent.

Whilst recognising that the health authority Cauldicott Guardians are responsible for ensuring security of confidential information within their organisation, is it good practice to give them ultimate power of veto over a national resource. More difficult to understand is why health authorities individually should be controlling access to a national data set when the data they are controlling has been derived from sources outside of the immediate health authority. Is it possible to make this data more widely available throughout the NHS if it is extracted in such a way as to remove individual detail?

The reasons for non-response by health authority Cauldicott guardians can only be postulated. At a time of significant change in the NHS there are no doubt many pressing data transfer issues to be considered by Cauldicott guardians. Could it be that as health authorities will cease to exist in April 2003 the guardians are seeking to avoid any potential repercussions from disclosing data which they will soon cease to be custodian of.

The aim of our study to better inform the understanding & reporting of morbidity statistics for primary care, to make better use of resources is made doubly difficult by 'over-protection' of NHS data resources. This project has lost 40% of its potential sample due to non-response of a minority of health authorities. This could invalidate the whole study if we find that those practices are in some way atypical of their local population.

References:

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Haynes,R.M., Lovett, A.A., Gale, S.H., Brainard, J.S., "Evaluation of methods for calculating census health indicators for GP Practices" Public Health. 1995 No.109.