

# Managers See the Problems Associated with Coding Clinical Data as a Technical Issue whilst Clinicians also See Cultural Barriers

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## Summary

**Objective:** In UK general practice, the coding of clinical data (Read Coding) is far from universal. This study set out to examine the barriers to recording structured information in computerised medical records; and to explore whether managers and clinicians had different perspectives in how these barriers should be overcome.

**Method:** A qualitative study, using semi-structured interviews of general practitioners, primary care nurses and practice managers. The interviews were recorded verbatim, and then underwent thematic analysis; additional interviews were conducted until thematic saturation was achieved.

**Results:** For clinicians the recording of structured data within a consultation is not a neutral activity, they are highly aware of diagnostic uncertainty and sensitive to the potential impact of both a correct and incorrect diagnostic label on their relationship with their patient. Clinicians accept that data has to be coded if they are to demonstrate that appropriate evidence based care has been provided to populations; but alongside this they require free-text as a more powerful reminder of the individual human encounter. Managers felt that they could encourage clinicians to code data for re-use as part of population data or as quality target indicators rather than as an enabler of the next consultation.

**Conclusions:** The primary care consultation is a complex social interaction, and coding of the medical diagnosis in itself imposes the bio-medical model, carries assumptions about certainty, and is perceived by clinicians to potentially jeopardise their relationships with their patient. Further research to elicit patients' views may help clarify the magnitude of this barrier.

## Keywords

Structured data, classification systems, computerised medical record, primary care, general practice, medical informatics

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## 1. Introduction

This study examines to what extent managers and clinicians see the obstacles to coding clinical data differently.

The majority of General Practices in the United Kingdom are now computerised [1]. Up to 1<sup>st</sup> April 1999 primary medical care was delivered by individual practitioners or by group practices. These individual practices usually have a practice manager, employed by the practitioners, who is responsible for the day to day running of the practice. In 1999 these were grouped together into Primary Care Groups, of roughly 100,000 patients. Then on 1<sup>st</sup> April 2002 these were again reorganised into larger Primary Care Trusts (PCTs). These Trusts must demonstrate that clinical standards are maintained in certain areas set out in National Service Frameworks (NSF) [2]. They will be unable to demonstrate that they have reached these standards without collecting data that confirms this from their constituent General Practices computer systems.

These general practice computer systems have scope for both structured (coded) data and narrative (free text) to be recorded. NHS rules require that for General Practitioners to receive reimbursement for their clinical system [3] they should use the Read Classification [4, 5] for the recording of structured data; and that this coded data must be searchable. There is no requirement for; nor tools provided, to enable the easy analysis of free text. It is widely recognised that despite the facility

to record structured data, coding of data is far from universal [6–8], with only a few exceptional practices holding high levels of valid data [9].

The stimulus for this study came from a questionnaire survey of a Primary Care Research Network [10] sent out to 133 practices or which 79 (59%) provided usable data. Participants were asked about their coding of clinical data. In addition to answering structured questions a free text comment could be added. Of the 79 practice managers 59 (75%) listed attempts to improve data quality; 46% of clinicians (108/256) made free text comments about the barriers to coding, and how to overcome them. The practice managers and clinicians had contrasting views. Three themes: the need for training, the need for a better interface and the standardising of Read Codes accounted between them for more than 95% of managers questionnaire responses. These are issues already identified by Teasdale [11]. Clinicians on the other hand saw the problem as one of how to reconcile the need to collect diagnostic data in the consultation in a way that makes it re-useable for other purposes [12], without damaging their relationships with their patients. This observation of contrasting viewpoints has not been previously reported. The purpose of this study is to explore this subject in depth.

## 2. Method

### 2.1 Method Overview

The study methodology is divided into three parts:

Firstly, grouping of the responses from the original questionnaire into themes. These themes gave the structure to the interviews.

Secondly, a purposeful sampling frame was developed; and semi-structured interviews were conducted, recorded and transcribed. The study results were analysed by SEW, and SdeL. They were then imported into NUD\*IST (Non-numerical Unstructured Data Indexing Searching and Theor-

ising) version QSR N5 [13] software and analysed.

Finally, expert referees reviewed the findings.

### 2.2 Developing Themes from Responses to the STaRNet Questionnaire

Two different questionnaires had been sent to the network practices. One questionnaire was to be filled in by the practice manager. The other was to be completed by as many primary care professionals as possible that worked at the practice. The man-

agers were asked to indicate if they had made any efforts to improve data quality, and if so to write in free text what they had tried. Clinicians were asked what factors hindered them recording coded data, and what should be done to overcome the problem. These responses were collected, subject to thematic analysis, as a group activity within STaRNet, and formed the basis of the interview guide.

### 2.3 The Sampling Frame

The next step was to establish a purposeful sampling reference frame [14]. This took into account the following:

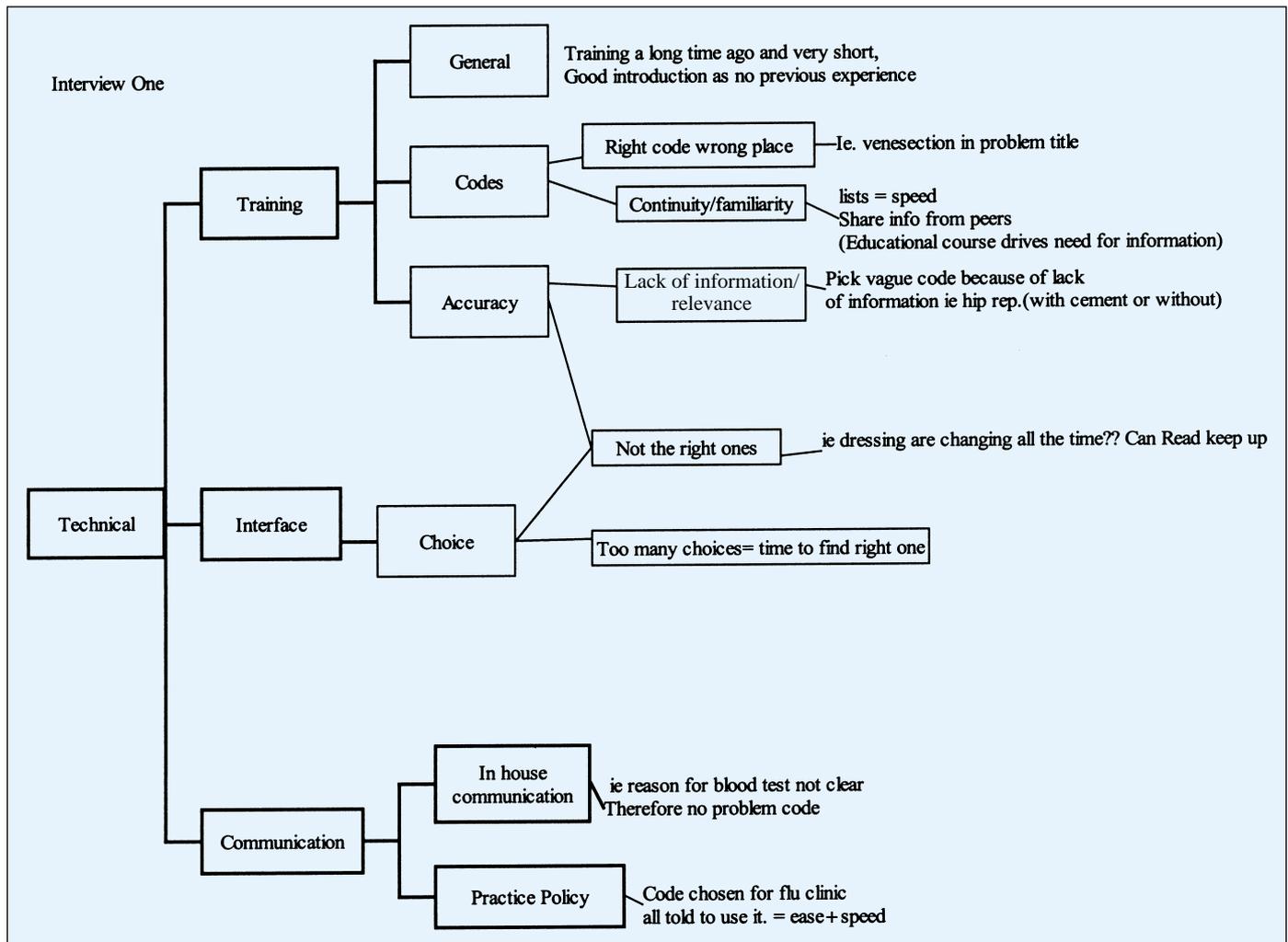


Fig 1 An example of the technical themes from one interview, the "paper" analysis

- 1) Different primary care professions: nurse, doctor and practice manager.
- 2) Age of interviewees.
- 3) Single handed and group practice were represented within the sample.
- 4) A mix of GP computer systems.
- 5) Attempts were made to include those known to be non-coders as well as enthusiasts for clinical coding.

The subjects were contacted by e-mail or telephone and invited to be interviewed.

## 2.4 The Semi-structured Interview

The interviews took place in the interviewees' primary care location, where possible. This was done so that the interviewee could show the researcher the Read Coding interface that they used. Following the first interview, the interviewee was asked to code two problems on their clinical system. They were asked to code an "easy" and a "hard" problem. The former was a definite diagnosis of COPD (Chronic Obstructive Pulmonary Disease) and the latter a patient with the physical diagnosis of head-

ache, psychological diagnosis of stress, and the social diagnosis of poor social circumstances. This grounded the interviewee into their real world of coding, rather than the abstract world of what should happen. All interviews were conducted by SEW. The structure of the interviews evolved as the early interviews were analysed. At the end the interviewee was given a card that enabled them to make contact should any other thoughts occur to them.

## 2.5 Analysis of Data – Thematic

The analysis of the data was thematic, using both paper and software. The themes were noted initially recorded down paper and grouped together under common headings as more themes emerged. The interviews were read and re-read until it was felt that theme saturation had been reached [14]. The transcripts were subsequently imported into NUD\*IST [13] and further analysis carried out there. Passages of the transcripts were coded according to themes and the coded information stored in "nodes". These themes were laid out in a tree-like

structure. An example of one of the paper analyses is shown in Fig 1.

## 2.6 Analysis by Informatics Experts

The issues identified from the interviews were also sent for review by an expert panel. These reviews were organised or conducted by NH and KT. This was done to triangulate the first two analyses of the data.

# 3. Results

## 3.1 Results Overview

The main results presented are derived from the analysis of the semi-structured interviews.

Fifteen semi-structured interviews were carried out. The professional groups interviewed were: practice managers (n=5) and clinicians; general practitioners (n=5) and primary care nurses (n=5). The interviewees were a mix of male and female and fell into ten-year age bands from 20-60 years. Interviews were carried in a range of practices including, teaching practices, multi-site practices and standard general practices. Just under half of these (7/15) were part of a primary care research network. The computer systems used by the interviewees were In-Practice, Torex and EMIS. The largest proportion was EMIS. The sampling frame is set out in Fig. 2.

The results of the interviews are reported by theme, interlaced with comments drawn from the questionnaire and the comments of the expert group.

## 3.2 Technical Barriers to Coding and how to Overcome them

There was consensus between the results of the questionnaire and those interviewed that there are a number of technical problems with using the coding interface as well as a lack of basic keyboard skills. These problems were common to all the different computer systems used.

| Sample Frame |     |   |       |       |       |       |            |    |    |   |          |      |   |             |        |         |
|--------------|-----|---|-------|-------|-------|-------|------------|----|----|---|----------|------|---|-------------|--------|---------|
| No           | Sex |   | Age   |       |       |       | Profession |    |    |   | Practice |      |   |             | System | Starnet |
|              | M   | F | 20-30 | 31-40 | 41-50 | 51-60 | GP         | PN | DN | M | T        | M, S | S |             |        |         |
| 1            |     | • |       |       | •     |       |            |    | •  |   | •        |      |   | EMIS        | •      |         |
| 2            |     | • |       |       | •     |       |            | •  |    |   |          | •    |   | Meditel     |        |         |
| 3            |     | • | •     |       |       |       |            |    | •  |   |          | •    |   | Many        | •      |         |
| 4            |     | • |       |       | •     |       | •          |    |    |   |          |      | • | In-Practice | •      |         |
| 5            | •   |   |       | •     |       |       | •          |    |    |   |          | •    |   | Torex       |        |         |
| 6            |     | • |       | •     |       |       | •          |    |    |   | •        |      |   | EMIS        | •      |         |
| 7            |     | • |       | •     |       |       |            |    | •  | • |          |      |   | EMIS        | •      |         |
| 8            |     | • | •     |       |       |       |            |    | •  | • |          |      |   | EMIS        | •      |         |
| 9            |     | • |       |       | •     |       |            | •  |    |   |          | •    |   | EMIS        |        |         |
| 10           | •   |   |       |       |       | •     | •          |    |    |   | •        |      |   | EMIS        | •      |         |
| 11           |     | • |       |       | •     |       |            |    |    | • |          |      | • | EMIS        |        |         |
| 12           |     | • |       |       |       | •     |            |    |    | • | •        |      |   | EMIS        |        |         |
| 13           | •   |   |       |       | •     |       | •          |    |    |   | •        | •    |   | EMIS        |        |         |
| 14           |     | • |       |       | •     |       |            | •  |    |   |          |      |   | EMIS        |        |         |
| 15           |     | • |       | •     |       |       |            |    | •  |   |          |      |   | EMIS        |        |         |

|                   |                        |                 |              |
|-------------------|------------------------|-----------------|--------------|
| <u>Profession</u> |                        | <u>Practice</u> |              |
| GP                | = General Practitioner | T               | = Teaching   |
| PN                | = Practice Nurse       | M,S             | = Multi-Site |
| DN                | = District Nurse       | S               | = Standard   |
| M                 | = Manager              |                 |              |

Fig 2 The sampling frame for the interviews

Long and complex picking lists from which to choose the appropriate code is clearly a problem.

“Can’t just have hip replacement you have to have with cement or without cement – how do I know?” – *Clinician*

“I don’t think they’ve got the time to spend trawling through the Read codes” – *Manager*

“So I don’t think James Read is that brilliant, because there are too many options.” – *Manager*

The confused nature of the picking lists also meant that some coding did not take place for fear of assigning the wrong diagnostic label.

“...and the code just does not present itself, and I get so rattled by frustration and not being able to find what seems like an appropriate diagnosis, that I actually back off,” – *Clinician*

“If I was in doubt I wouldn’t do it, in case I put the wrong thing.” – *Manager*

Some felt the coding interface wasn’t too bad.

“...the computer is quite nice because it is prompting you in a sense.” – *Clinician*

“I’m not so sure the Read system itself, once you get to understand it, is so complicated.” – *Manager*

As a way solving the technical problem of data entry, templates were welcomed as a structured means of entering data.

“Templates are useful tool,” – *Clinician*

“All the nurses use templates when they are entering in data.” – *Manager*

Other memory joggers, such as lists of key codes to use were also considered helpful.

The managers also saw the training of their support-staff so they could code a diagnosis or other clinical data highlighted in a hospital letter or other document.

Wider issues emerged about the lack of consistency in coding.

“The partners in this practice vary from one extreme to another in how they apply the label asthma, especially in wheezy children.” – *Clinician*

“Coding “Cholesterol normal” is worse than useless. We are now treating the normal of two years ago.” – *Clinician*

This effect is taken to the extreme when a code is allocated to justify the treatment given.

“...when someone comes along in the flu season, and they’ve got a viral type infection, and it may be viral, but you think because they are coughing, coloured sputum, you’ll give them some antibiotics, so you’re kind of ...

There’s a bit of you that says this is probably viral, so I ought to really code it as virus infection, don’t know what virus but that doesn’t matter, but because they’ve got a yellow coloured sputum, you say oh well, that sounds like a bacterial thing and I’m giving them antibiotics, so I’ll call it bronchitis. So I actually put down acute bronchitis. So yes, in a sense, you are altering diagnoses. Well, actually I would say there was virtually no significance in that and no one is ever going to be harmed by it, but it is playing a kind of a game in a sense for the doctor to justify what he has done, depending upon the decision he came up with.” – *Doctor*

Clinicians within questionnaire and in the interviews also raised the issue of how to deal with an emerging diagnosis. Patients in general practice often present with vague diagnoses, and strange collections of symptoms, which were hard to code because the appropriate labels were not in the coding system. The pragmatic solution adopted by clinicians was to use free text instead.

Free text was of enormous value to clinicians. It could be used when diagnosis was uncertain or needed qualification, when rich contextual reminders were needed, and also when something easier than the Read Classification picking list was desired.

“I’d put the diagnosis on, in the Read code, and then I might put in free text something like... ..stressed at home.” – *Clinician*

“It helps to have fairly full descriptions on the computer, particularly for mental health type problems.” – *Clinician*

“Just that its much easier.” – *Clinician*  
 “Oh, I mean, nearly all the time. I mean, the vast majority, 95% of everything I put on the computer is free text by choice.” – *Clinician*

This failure to code anything other than what the clinician saw as important was a source of frustration to managers:

“They just didn’t see it. I really couldn’t believe that they didn’t see it.” – *Manager*

In summary the clinicians found coding hard because the classification had too many too detailed options, and because there was no definite meaning ascribed to a code. Free text was a pragmatic alternative. Managers looked to provide training for clinicians and support staff to overcome the problems. Both professional groups found templates and lists of codes useful ways of limiting the coding options.

### 3.3 Socio-cultural Barriers to Coding and how to Overcome them

General practice problems often don’t fit neatly into the biomedical model, and coding clinical data appears to belong there.

“I guess it’s easier, the harder the diagnosis, and the kind of softer, fluffier sort of gut intuitive feeling kind of situation is more difficult to Read Code.” – *Clinician*

Primary Care clinicians often use time to see if a problem is self-limiting, or a diagnosis emerges. This approach makes producing diagnostic labels that can be coded hard.

“Perhaps one of the main things is not actually knowing quite what the diagnosis is in the first place” – *Doctor*

There were also concerns, again expressed only by clinicians, about the stigmatising patients when the diagnosis is not definite.

“If I’m confident of the diagnosis, then yes. If I’m not confident...” – *Clinician*  
 “It is like assigning a bad credit rating” – *Clinician’s questionnaire*

A nurse reported an actual incident:

“I remember one code about “*Having problems in marriage*”, and I can remember a patient coming in, who’d obviously spent some time with a colleague and obviously had talked about the marriage and this Read code was put up, there was nothing else put there. She saw it on the screen, and she was very distressed, because, to her, that meant more than perhaps it would mean to us as professionals, and she felt that we thought her marriage was in trouble.”  
– *Nurse*

There was a subtle difference in the way doctors and nurses shared concerns about diagnosis. The doctors focus was that diagnosis the nurses was on the meaning and interpretation of the coding by the patients and the anxiety this may cause.

“I didn’t really want to use the word “asthma”, it creates a lot of stress, and because it may just be a one off wheeze”  
– *Doctor*

“I think sometimes the patient says something that you put, maybe, not in the language that they would use, they look at it and say Oh, I didn’t know I had that.” – *Nurse*

These concerns contribute to a belief that the use of a classification that applies definite labels is damaging to the doctor-patient (clinician-patient) relationship.

“It’s intrusive.” – *Clinician*

“They do take away your attention from the patient.” – *Clinician*

The pragmatic solution that clinicians have come up with to avoid this problem is to avoid coding data in the consultation!

“Having to find the code that you are looking for, and if you can’t hit on it quickly, then it may be better to do it after the patient has left.” – *Clinician*

Only one manager recognised coding as a barrier and shared the same pragmatic solution.

“You shouldn’t code during a consultation because it creates a barrier.”  
– *Manager*

However, the computer record will inevitably be read by the patient in subsequent consultations, as the “*Having problems in marriage*” example above illustrates, this tactic does not offer any kind of long-term solution.

Practice managers however appear frustrated at their employers lack of motivation, and seemed to lack insight as to the barriers to coding.

“They (clinicians) don’t see it as important to them.” – *Manager*

“People can’t convince them there is a need to do it.” – *Manager*

Three motivators to code more were identified. The first of these is the needs of the practice to report about progress towards national targets.

“Because Primary Care groups are forcing them to report, they are starting to think in terms of we’d better make sure our figures are okay.” – *Manager*

The second issue was money. This appeared to be a powerful motivator to change.

“I think it’s the money. I mean that’s the practice bible.” – *Manager*

“Yes, well, we had a hiccup last month because we suddenly discovered we weren’t getting paid our immunisation targets, and then we found that one of the nurses hadn’t been told about the correct codes to use for child immunisations, and so we had to run around and do a bit of emergency re-entry of that data.” – *Clinician*

The third is the use of audit and feedback to demonstrate quality of care was considered to be an important motivating factor.

Some broader issues were raised, which may also be barriers to coding.

“The cumulative effect of multiple additional tasks that were hard to prioritise. Yet another thing to do.” – *Expert referee clinician*

Better structured electronic records were seen as a mechanism whereby it would be easier to criticise clinicians, because their practice could be accurately monitored for the first time; one manager felt that structured records could be the end of the

practice based service as it made the information it held entirely portable. The clinician who “falsified” the diagnosis to fit the treatment may already be adjusting to a scenario within which big-brother is watching... One of the expert referees also touched upon this issue of loss of autonomy.

“Resentment about the loss of autonomy and over regulation of professional life. Why should I?” – *Expert referee academic*

In summary, the coding system is perceived to impose an inappropriate biomedical model onto the consultation; there are fears of stigmatising patients by the use of diagnostic labels (whether correct or not) and these add together to potentially jeopardise the clinician-patient relationship and contribute to the lack of motivation of clinicians to code. These issues are almost entirely raised by clinicians. Managers seem to have rather different views, expressing frustration at clinicians’ lack of motivation unless as a result of national targets or financial incentives. One final idea that arose was a “conspiracy theory”. Coding is all part of the undermining of traditional primary care.

### 3.4 Analysis of Expert Referees

The expert referees agreed that the objections, concerns and problems reported from clinicians seem reasonable representations of statements and attitudes encountered elsewhere. Similar attitudes and statements were found in a large pragmatic and data quality project [15]. Soft issues clearly present the most important perceived and actual problems for clinicians.

The consultation remains a personal, shared, caring experience.

Donabedian [16] states there are three aspects of health care evaluation: Structure, process and outcomes. Coded data is ultimately used to evaluate/understand one or more of these aspects of the health care process. Professional boundaries seem to result in focus on differing aspects. Managers may be inclined to focus on structure and process while clinicians focus on the

outcomes. This hypothesis may explain some of the differences in the different professional group responses.

The following quotes encapsulate the paradigm within which our expert reviewers chose to report on the paper and its findings:

“The challenge is to accept that coding is here to stay, (and brings enormous potential benefits,) but that primary care clinicians need to be enabled to see these benefits.”

“The requisite intervention needs to be educational, present good coding as self evidently relevant. It must also encompass logistical issues, (accessibility of templates and Read code lists,) acceptable cultural solutions (when and how data can be entered in uncertain or delicate situations) and needs to directly imply better patient care, easing of the work involved in providing obligatory data and reassurance that little extra time is needed.”

## 4. Discussion

This study confirmed the questionnaire findings that managers see the barriers to coding clinical as technical; and that the best way to overcome them would be from within their own managerial domain. On the other hand their clinical colleagues see more socio-cultural factors. The managers see the greatest obstruction to clinicians' coding as cultural, but do not identify the same cultural issues as the clinicians themselves. They believe clinicians are motivated either by good reasons for collecting the data or by money. By way of contrast primary care clinicians think that definite diagnosis is often an anathema in primary care, and that it can also stigmatise patients or damage relationships. The value to the clinician of free-text emerged: as a tool for information that would effectively become time expired, cues to remind them about that person, as well as to conceptualise the moment of that consultation. Training for clinicians (in hardware, software and Read coding) is important but is not the primary issue. Indeed the take up and application of

training is likely to follow easily, even without financial incentives, if ‘hearts and minds’ are won first.

Denied the opportunity for interpretation that could be gleaned from handwriting in the written medical record; moving to the entirely structured clinical record is a step too far.

The implications of these findings are that there remains a conflict between the need to collect data for re-use later and the nature of the clinical consultation [18]. This needs to be overcome if data collected at the point of care is ever to be used to derive effective management data. The message from this study is that overcoming clinicians' motivational problems and other socio-cultural reservations, is needed in addition to technical training and system improvement.

Not everyone agrees that primary care diagnosis needs remain woolly. Recently, Summerton [17] has concluded that pursuing a rigorous diagnostic research agenda would render diagnosis reliable and useful. Our findings would suggest that in clinical areas where practitioners are motivated to code they do so; but achieving this globally may be over ambitious. Our expert review group clearly shared Summerton's view, that the obstacles to Read Coding could be overcome.

The sample from which the study population was drawn was not entirely representative. The distribution of the computer systems in the group did not represent the national picture; there was a predominance of EMIS systems. Seven of the 15 interviews in the study were carried out within a practice belonging to STaRNet. These practices include a higher than average number of teaching and University linked practices.

Further research is needed to develop a deeper understanding of the nature of the clash between giving a definite diagnostic label, and the nature of General Practice. Careful consideration also needs to be given as to what is the right level of granularity for use in primary care. Another primary care classification system, the International Classification for Primary Care, in use across Europe [19] has less detail and in-built definitions. A comparative study to explore these issues is needed.

What patients think needs to be explored, as many of the fears expressed by clinicians were on behalf of their patients. It could be that patients are less concerned that clinicians feel they are; and if so knowing this may reassure.

Training should be provided within a research setting to explore whether provision of technical skill truly overcomes the coding barrier, or whether the real issue is socio-cultural.

## 5. Conclusions

How to address the problem of clinicians not coding data cannot be left to practice managers, even though they feel that they can incentivise and motivate clinicians; or substitute clerks doing data entry.

More research is needed into what motivates a clinician to see clinical data as worth coding, and to what level of detail. Motivation to code appears to be related to perceived importance and coding systems that offer the wrong level of granularity may generate their own barriers to use. Free text is a vital constituent of the computerised medical record and should not be excluded.

Clinicians need to know whether patients really do fear stigmatisation, and if the wrong label is harmful or not?

The primary care consultation is a complex social interaction not easily reduced to a single label derived from the “medical model”.

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