

random experiences. There is a continuing need for clinicians to reflect on their clinical experience in a systematic way that provides useful insights that lead to better doctor–patient understanding.

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## Improving cancer outcomes

With regard to earlier detection of cancer in primary care, I was surprised to see no discussion about the value of recording detailed smoking histories as a way of adding diagnostic information to patients' presenting symptoms. Although this was probably outside the remit of the editorial,<sup>1</sup> I have found detailed smoking history recording (total dose and duration of exposure) valuable in my everyday consultations.

Smoking is a major cause of preventable ill-health, especially cancer, and I believe it is vital to record smoking history on primary care computer systems in a way that is both easily visible and searchable. At present, such smoking recording seems to be based on traditional methods that were used in the pre-computer medical records era, and here I specifically refer to the iSoft Premiere software system. In this computer programme the health practitioner can record the type of smoker, an amount for cigarette smoking, and the date smoking stops. This type of data collection is inadequate for modern general practice as it fails to inform the GP of the smoking dose or exposure that an individual patient has received, and it is not computer searchable.

At our surgery, smoking exposure is recorded as 'smoking pack years' (smoking 20 cigarettes a day for 1 year is one 'pack year') on all ever-smokers with a freetext comment attached to the Read Code, for example, 15 cigarettes a year for 27 years. This has been our recording method for over 5 years and as a GP I find this smoking information useful in thinking

about patients' presenting symptoms and in intuitively assessing their cancer risk.

Thus in order to aid smoking-induced disease prediction, I propose that all UK general practice software systems should include 'smoking pack years' and 'duration of smoking' that should be highly visible and searchable.

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Rubin *et al*<sup>1</sup> make an interesting contribution to the complex issue of the role of primary care in improving cancer outcomes. However, they refer to survival rates from diagnosis as the benchmark of improvements in care. Unfortunately, survival rates from diagnosis are a relatively poor indicator of the efficacy of treatment as they obscure two major biases: (1) the lead-time bias; and (2) the over-diagnosis bias. Lead-time bias results in an apparent improvement in survival rates by diagnosing disease earlier but without affecting mortality. The over-diagnosis bias is the discovery of non-progressive disease, for example, many cases of prostate and breast cancer. Identification of non-progressive disease is highly likely to improve apparent outcomes as it means the disease that never would have caused death is included in outcome data and, therefore, results in a falsely favourable impression of the effect of intervention.

Mortality rates are a far better indicator of treatment effectiveness for cancer.<sup>2</sup> It is generally not understood that there is a lack of correlation between 5-year survival rates and mortality rates due to the operation of the biases mentioned above.<sup>3</sup> If we are going to compare outcomes of cancer treatment it is essential that we use measures that are replicable between healthcare systems: mortality rates achieve this, survival rates do not.

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## Validity of diagnoses in the General Practice Research Database

The article by Khan and colleagues<sup>1</sup> highlights the strength of the General Practice Research Database (GPRD) as a research-quality database providing accurate diagnostic data to researchers on a wide range of conditions, and for millions of patients. While the search strategy for this study was broad and inclusive of prescription data, procedures, and smoking in addition to diagnoses, the authors did not identify as many articles as expected.

We published a similar systematic review of the validity of diagnoses in the GPRD<sup>2</sup> and found over 200 relevant publications, compared to the 49 articles identified in this study. There are two explanations for this difference. First, many validations were not mentioned in the title, abstract, or keywords of the articles and we therefore broadened our search to all studies using GPRD data. Second, our review included studies that validated diagnoses using algorithms, manual review of electronic records, and sensitivity analysis in addition to those methods included by Khan *et al*. Despite these differences in scope, our results were broadly similar and showed high validity of GPRD diagnoses, with a median positive predictive value across diagnoses of 89% (range 24–100%).

While our study was larger, Khan and colleagues assessed one important aspect of validity that we did not: the accuracy in timing of diagnoses. For some research

questions this may be of little interest but in studies investigating triggers of acute conditions or assessing direct toxic effects of pharmacological agents, timing is important and inconsistencies in the accuracy of an event date could be cause for concern.

In acute conditions (for example, myocardial infarction) with definite event dates, differences between the electronic record and the GP's own notes have a straightforward interpretation of simple errors in the recording of the date. However, when validating the timing of non-acute conditions the authors of validation studies should state whether the GP was asked to provide the date when the index of suspicion was first raised or the date of a definite diagnosis, to enable interpretation of any differences.

The relative lack of data on this aspect of validation and the resulting uncertainty in the timing of acute events highlight the benefits of linkage of the GPRD with other datasets. As discussed in both of our papers, linkage to disease registries could bring additional information with which to validate the diagnosis and its timing. For some conditions this may negate the need to obtain additional information from the GPs that, as we both point out, is expensive and limits the number of patients validated to a selected and potentially unrepresentative group.

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## GPs at the Deep End

I am a GP working in a deprived urban area in Ireland. I would like to express my enormous appreciation of the Deep End series that has been running in the Journal since January. I would describe it as having been thrown a lifeline, if that's not overstating the analogy. To see one's experience named and, indeed, validated in this way has been very liberating. It must be a bit like a patient with an uncommon illness finding a support group. One of the many insights of the work has been to point out that it is not just governments who do not appreciate the issues, but our own unions, colleges, and indeed GP colleagues.

This was eloquently demonstrated by the letter from Steven and Jackson in the April Journal.<sup>1</sup> This is a critical time for general practice in both the UK and Ireland as funding mechanisms come under review. Here in Ireland the average capitation payment in newer deprived suburban areas is 60% of the norm, because it is based on age (despite the greater than twofold mortality). It would be good to have some tools we could use to accurately describe and quantify the nature of the work, as opposed to the health outcomes that are well documented.

We need to persuade the sources of funding, and society as a whole, that it makes sense to address not just health inequality, but inequality of health service provision.

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## GPs' views in five European countries of interventions to promote prudent antibiotic use

The paper by Tonkin-Crine *et al* illustrates

the views of GPs regarding interventions to promote prudent antibiotic use.<sup>1</sup> It was demonstrated that GPs preferred educational meetings where comparison with colleagues reassured them that prudent antibiotic prescribing was possible, and appreciated having evidence-based guidelines to follow.

To follow on from this, if one were to look at the quarter of the population visiting their GP with respiratory tract infections each year, it becomes apparent why a large proportion of antibiotic prescribing is in primary care. Despite guidelines advising against their routine use, in 2000 antibiotics were prescribed to 49% of those with an upper respiratory tract infection (URTI).<sup>2</sup>

The natural history of an untreated sore throat is resolution by day 3 in 40%, and by day 7 in 85%. Antibiotics reduce the duration of symptoms by just 16 hours, while the number needed to treat to prevent one sore throat at day 3 was fewer than six, at week 1 it was 21.<sup>2</sup> There is no benefit of antibiotics for the common cold and although there is a protective effect against serious complications<sup>3</sup>, over 4000 courses are needed to prevent one complication.<sup>4</sup> In addition, antibiotics cause many side effects, and communities build resistance to them.<sup>5</sup> Therefore, with insufficient evidence of the benefit to warrant the use of antibiotics, why do GPs continue to prescribe them for the common and uncomplicated URTI?

Possible explanations for varied GP prescribing behaviour is the GPs' own fear of complications developing, along with their lack of certainty in their decision to prescribe.<sup>6</sup> As patients expect to receive antibiotics,<sup>7</sup> supported by Tonkin-Crine *et al*, along with 85% of patients believing that antibiotics relieve symptoms,<sup>8</sup> a further explanation could be that GPs are unwilling to challenge patient health beliefs. As suggested by the GPs involved in Tonkin-Crine *et al*'s article, the use of educational materials for patients with public campaigns could reduce demand.

Therefore, is it ethical to prescribe antibiotics for URTIs? If a GP is concerned about complications developing, prescribing antibiotics is aimed to manage the fear within the doctor, rather than to treat the patient. This will expose the patient to unwanted side effects where they ultimately feel worse. In addition, by prescribing antibiotics GPs are increasing patient attendance rates and are using up scarce resources in an already financially stricken NHS, on balance doing more