

# A healthy disposition? The use and limitations of the characteristics approach to general practice research

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## SUMMARY

*A range of easily identifiable characteristics is often used by researchers and general practitioners to categorise primary care practices. In the United Kingdom, for example, practices can be defined as dispensing, single-handed or training. The availability of routinely collected data has led to a growing research literature that links practice characteristics to their workload, performance and costs. This paper examines the use and limitations of this 'characteristics approach' and argues that this type of research is often undertaken because it is easy to perform rather than because it is the most appropriate way to study primary care.*

*Using this approach may lead to failure to do the following: to account for the environmental factors that determine the effects particular characteristics manifest; to identify the true relationships between the observed characteristics; to control for changes in the effects of characteristics over time; to differentiate between the behaviour of individual members of a group with the same characteristic and that of the group as a whole; to assign the correct causality to relationships between practice characteristics, workloads, performance, and costs. The characteristics approach should be used with great caution by general practice researchers.*

**Keywords:** health services research; research techniques.

## Introduction

FOR research purposes, practices are often categorised by easily identifiable characteristics. For example, they can be defined as dispensing,<sup>1</sup> single-handed<sup>2,3</sup> or training.<sup>4,5</sup> During the 1990s, Conservative government policy encouraged the categorisation of practices into members or non-members of the fundholding scheme.<sup>6-8</sup>

The increasing availability of routinely collected data has led to a growing research literature that links practice characteristics with their workloads, performance, and costs. Characteristics can be assigned to a practice to improve understanding of the operation of general practice or to inform the policy-making process. However, there are many more ways to describe a practice than merely in terms of its characteristics. For example, a dispensing practice can also be described in terms of its organisational structure, the needs of its patients, or the level of funding it receives.

It appears that researchers commonly perform characteristics research because it is often the easiest method with which to study general practice — not necessarily because it is the most appropriate. Flaws in this approach mean that researchers who perform analysis of this type may fail to improve our knowledge of how primary care works, and their research may be of no use to National Health Service (NHS) policy makers. Researchers and the publishers of journals should be cautious about disseminating research that naïvely claims that a particular characteristic has something important to show regarding the nature or behaviour of a group of practices within NHS primary care.

## The characteristics approach

At the core of the characteristics approach is the assumption that all practices with the same characteristic are homogeneous or similar in one or more respects, although in reality practices may differ greatly.

## Categories and dispositions

Using this approach, practices are divided into those that have and those that do not have a particular characteristic. In philosophical terms a division of this sort is referred to as 'categorical'.<sup>9</sup> An important feature of this approach is that the division into groups implies nothing about the nature, behaviour or associations of whatever is being studied. For example, there is no fundamental difference implied between practices categorised as single-handed and those which are not single-handed.

Alternatively, a 'dispositional' characteristic may be imparted to a group of practices which, in particular circum-

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stances, will have a propensity, tendency or inclination to consistently behave in a particular manner or to secure particular outcomes. To give an example, training practices may be disposed to spend more per patient on drugs than non-training practices, as they possess more up-to-date information on the most appropriate treatments.

Given the differences between them, the categorical and dispositional approaches may conflict, as the former does not imply a tendency to act in a certain manner, while the latter does.

### *Reductionism and holism*

The characteristics approach implies that the organisation of general practice can be reduced to a small number of readily identifiable characteristics. However, in this type of 'reductionist' analysis it is not always stated whether a characteristic is correlated with a range of other factors that a particular group of practices possess, or whether it was the characteristic itself that causes the observed behaviour of the labelled practices. For example, it has not been conclusively established whether it is the organisational structure of fundholding practices, or the fundholding status itself, which led to the behaviour and outcomes commonly associated with the scheme.<sup>10</sup>

If a characteristic is simply a proxy for a range of other factors, the influence of the factors themselves should be directly measured and the characteristic excluded from the analysis. If a characteristic has an effect not produced by other influential factors associated with a particular practice, then a holistic perspective should be adopted and the characteristic and other factors should be analysed together.<sup>11</sup> Problems may arise if factors that are clearly influential are ignored. For example, it may be more appropriate to examine the internal structure of training and non-training practices than simply to analyse this one characteristic on its own.<sup>12</sup>

### *Hypothesis testing and data mining*

The use of the characteristics approach often involves the analysis of routinely collected NHS data to establish links between a range of characteristics and an outcome of interest. Two main approaches to the statistical analysis of such data can be adopted.<sup>13</sup> A hypothesis that a particular characteristic is linked to a particular outcome may be stated, and data collected and tested for evidence of such a relationship. Alternatively, a set of data collected for another purpose (for example, to pay local doctors for the provision of general medical services) may be searched for correlations between the variables that it contains, with no prior hypotheses of the types of relationships which may be found. The latter approach is commonly known as 'data mining'.

These two approaches to the analysis of characteristics data have advantages and disadvantages. The hypothesis testing approach has the advantage that it requires the prior stating of a relationship between a particular outcome and characteristic. In consequence, research is only undertaken into relationships that are suggested by theory or intuition. However, this approach is limited by the requirement that there is some prior knowledge or belief about the functioning of the system being studied. Searching an existing set of

data for correlations between characteristics and practice outcomes can be useful if the research community has no prior knowledge of the operation of a particular area of primary care. However, the results of such an analysis should only be seen as exploratory or as hypothesis generating. As discussed below, they should not be taken as evidence that an important and previously unknown relationship can be said to exist.

### **Limitations of the approach**

The characteristics approach is often employed because of a lack of evidence on how practices with a common characteristic behave in particular circumstances. However, as pointed out below, caution should be exercised before attributing a particular disposition to practices with common characteristics, even when statistical analysis suggests that a relationship may exist.

### *Background conditions*

Some philosophers argue that dispositions do not always manifest themselves because of a need for a particular set of background or environmental conditions to exist.<sup>14</sup> For example, practices that provide vocational training may not meet the standards required of them if they do not have adequate staff. Practices may not develop a disposition usually associated with a particular characteristic if they are prevented from doing so. For example, a practice may be located too far away from a training centre or there may not be the time to invest in becoming a training practice. Despite these drawbacks, practices outside the scheme may still work hard to improve the quality of the services they offer, and may provide better quality services than many practices in the scheme.

It should not be assumed that practices which appear to lack particular dispositions do not, or could not, have them. General practice research should not focus solely on current practice behaviour, but should consider the conditions under which there could be improvement.

### *Relationships between characteristics*

Because of the structure of NHS general practice, characteristics often correlate with each other. For example, because of the necessity of having relatively large lists to gain entry into the scheme, early wave fundholders were more likely to be training practices and less likely to be single-handed.<sup>10</sup> However, the existence of both positive and negative correlations between practices with common characteristics causes conceptual and statistical difficulties. In relation to the former, it is not always possible to determine which characteristics are linked to which outcomes. In relation to the latter, the existence of significant correlations between characteristics implies that certain forms of statistical analysis (such as multivariate regression analysis) are invalid.<sup>15</sup> In response, there is often the need to drop some characteristics from the analysis to test the relationship between the remaining characteristics and a particular outcome. However, by ignoring some characteristics, it may be incorrectly suggested that it is the remaining characteristics that produce the observed results.

### Stability over time

Dispensing doctors located in rural areas have often been vilified because of the apparent dispositions of their practices. During the late 1950s, the Hinchliffe Committee criticised dispensing practices because the capitation system used to reimburse their pharmaceutical expenditures encouraged them to spend less than the national average on medicines.<sup>16</sup> During the 1990s, however, practices in the scheme were criticised because of evidence that suggested that, with the introduction of a new reimbursement system, they tended to spend more than the national average on drugs.<sup>17</sup> In a similar vein, a study of early wave fundholders in the Oxford region found that initially they did, and then did not, exhibit a disposition to exert a greater control over their average drug costs.<sup>18,19</sup> As these examples illustrate, a group of practices may be labelled with the same characteristic, but their dispositions may change over time.

### Attribution from the average to the particular

Statistical analysis is often used to establish the significance of relationships between particular characteristics and an outcome of interest. While the statistical approach tests the significance of observed differences at the mean, it does not imply that each member of the group under examination exhibits a particular relationship to the same extent. Indeed, very few practices will exhibit the average value of a relationship held by their group, with the majority being distributed around the mean and a minority being outliers. It would be inappropriate to claim, from a comparison of means alone, that all practices with the same characteristics exhibit a particular disposition to the same degree. For this claim to be valid the group would have to be homogenous in the respect under examination.

### Causality and selection bias

Even when statistical analysis suggests that a particular group of practices exhibits a disposition, this does not imply that the observed relationship is causal. For instance, while a national study suggested that first wave fundholders had lower than average drugs costs per patient between 1991 and 1992 and between 1995 and 1996, it also found that they had lower expenditure levels prior to the introduction of the scheme.<sup>20</sup> As a result, it may be inappropriate to claim a causal relationship between first wave fundholding status and lower costs, although such practices appear to spend less than average per head on drugs. As this example illustrates, there should be care to differentiate between effects caused by the types of practices attracted to a particular characteristic and those caused by the characteristic itself.<sup>21</sup> Moreover, it is important to be aware that the dispositions exhibited by a particular group may change over time, as other practices adopt their shared characteristic. For instance, evidence has suggested that the ability of fundholders to control costs and to improve patient services has diminished as less able practices have joined the scheme.<sup>10</sup>

### Implications for research and policy

When using the characteristics approach a 'positive' rather than a 'normative' method is often adopted when analysing general practice data, i.e. there is an attempt to measure 'what is' rather than a statement of 'what should be'.<sup>22</sup> In this paper, it has been argued that much of the positive analysis of the relationships between practice characteristics and outcomes is extremely limited. In particular, work of this type is frequently flawed because it inappropriately concludes that particular forms of behaviour are caused by certain practice characteristics. To improve the robustness of their conclusions, researchers should consider adopting a hypothesis testing approach to data analysis, reporting distributions as well as averages in their papers, and examining the conditions under which practices may or may not exhibit particular dispositions.

Although it may help to address some of the limitations commonly associated with the characteristics approach, qualitative research may also fall foul of the problems encountered in this area if there is the assumption that all practices with the same characteristic are the same.

In the absence of reliable research on the relationship between particular characteristics and practice behaviour, a form of 'folk psychology' (commonly held beliefs about the dispositions associated with a practice's characteristics which are not based upon scientific evidence) often develops.<sup>23</sup> For example, fundholding practices were criticised for putting financial consideration before the needs of patients and for promoting inequalities in the provision of patient services. In response, the scheme was abolished by the Labour government in April 1999.<sup>24</sup> However, before abolition no clear evidence was collected on whether all fundholding practices behaved in the same way or produced inequalities for local patients.<sup>25</sup> To promote evidence-based policy in the future, general practice researchers should either consider ways in which they could improve their characteristics research or stop performing analyses of this type.

### Conclusion

Given its limitations, the characteristics approach should be used with great caution when undertaking general practice research and before disseminating research which may naïvely claim that a particular characteristic has something important to demonstrate regarding the nature or behaviour of a group of practices within NHS primary care.

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