The changing relationship between prescribing and unemployment at family health service authority level in England, 1983-92

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Abstract

Study objective—To investigate the relationship between unemployment and prescribing costs over time.

Design—This was a longitudinal study.

Setting—All 90 family health service authorities in England, 1983-92.

Participants—All general practices in England.

Main results—The strength of the relationship varied over the period, falling to a very low value during the last two years of the decade.

Conclusion—Unemployment rates are not suitable as a proxy for the determinants of prescribing costs.

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Most commentators would accept that demography has a large influence on prescribing. Forster and Frost¹ found that age and sex (proportion of males aged 75 years and over and proportion of females 65-74 years) explained 44% of the variation in cost per patient between family health service authorities (FHSA), the organisations responsible for the provision of primary care. However, it is clear that this is not the only influence. The pattern of local variations in morbidity may have an effect, but data on this is almost impossible to obtain for any other than the relatively small sample of practices in the national morbidity survey.² The 1991 census asked respondents about limiting long term illness, but this only measures illness of a severe and prolonged nature and so is only the tip of the morbidity iceberg. Limiting long term illness is also closely associated with age,³ and so is unsuitable where we wish to account separately for demography, and it is only available for 1991. Many authors have proposed the use of deprivation, however measured, as a proxy for morbidity.⁴⁻⁹ Many of the measures of deprivation that might be suitable are only available from the decennial census and so some authors have proposed using unemployment rates,^{10,11} which are available at frequent intervals. We considered that the relationship between unemployment and prescribing was not likely to be stable given the fact that the nature of unemployment has changed in recent years as traditionally affluent areas have experienced increasing levels of unemployment and many administrative changes have been made in the definitions used in the unemployment figures produced by the Department of Employment.¹² Accordingly, we

investigated the relationship between prescribing costs and unemployment rates for English FHSA's over a 10 year period.

Method

The figures on costs and number of patients for all ninety FHSA's in England were obtained from PD1 reports prepared by the Prescription Pricing Authority for the years 1983-92. Costs were used since the number of items can be affected by factors such as the duration of prescriptions. The cost we used is known as "basic cost" and excludes such things as container costs and dispensing fees. The PD1 reports relate only to items dispensed by a community pharmacist and so the number of patients used does not include dispensing patients. The numbers of dispensing patients are small compared with the number of non-dispensing patients (about 6% of the total) and so we did not feel concerned at their exclusion.

The unemployment rate used by the Department of Employment is defined only for self contained labour markets. These are usually "travel to work areas", defined by the department, or counties. The rate compares persons claiming unemployment benefit with the sum of these claimants and the number of employees as estimated by the department. Although the numbers of unemployed are available for all the authorities, only half of them meet the self containment criteria and have rates calculated by the Department of Employment. There are problems of interpretation if any attempt is made to use rates at a lower level.¹³ Rates calculated for areas that do not meet the self-containment criteria could be misleading. For example, the City of London district had a resident population of 4000 in 1989 but 310 900 persons were employed there and it is this figure on which the Department of Employment unemployment rate would be calculated.

While we were aware of the dangers mentioned above, to carry out an analysis for all 90 authorities it was necessary to calculate our own unemployment rate whether or not the area fulfilled the department's criteria. We used the numbers of unemployed as given by the department. The population bases we used were the mid-year estimates produced by the Office of Population Censuses and Surveys to give a figure approximating the population of working age (males 15-64, females 15-59). Since the data are supplied in 5 year age bands it was necessary to use 15 as the starting age

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Figure 1 Ratio of 1992 unemployment rate to 1989 unemployment rate for 90 family health services authorities against the 1989 unemployment rate.

Table 1 Correlation between the Department of Employment unemployment rates and the authors' definition for the 45 family health services authorities which are counties and the adjusted percentage variance in basic cost/patient explained by the authors' definition of unemployment rate for all 90 authorities

Year	Correlation	% explained
1983	0.83	7
1984	0.87	8
1985	0.89	9
1986	0.89	11
1987	0.91	12
1988	0.93	12
1989	0.95	13
1990	0.95	8
1991	0.92	0
1992	0.89	0

rather than 16. Our base population is somewhat larger than that used by the Department of Employment as it includes everyone, regardless of economic status, and the proportion of economically inactive adults (who should ideally be excluded) may vary between authorities. To check the validity of our measure we took the 1991 census measure of unemployment (percentage of economically act-

ive residents of working age who describe themselves as unemployed) and correlated it with our measure for 1991. We also examined the correlation between our definition and the Department of Employment's definition for the 45 FHSAs where this was possible for each year.

We also examined the stability of cost per patient over time by examining the correlation of each year's figure with the value for the following year. This gave us some idea of how much this figure was changing in relation to changes in possible drivers.

Results

The correlation between our definition of unemployment for 1991 and the value in the 1991 census was 0.98. The correlations year by year of our definition with the Department of Employment's figures are shown in table 1 and show a significant association for each of the 10 years studied (p<0.005).

Table 1 also shows the adjusted percentage of variance in basic cost per patient explained by our definition of unemployment in the 90 authorities for each year. In all years except 1991 and 1992 the unemployment rate is significantly correlated with basic cost per patient (p<0.005).

For each year from 1984-92 we found over 98% of the variation in basic cost per patient was explained by the figure for the previous year.

Discussion

These significant correlations found suggest that our measure is well correlated with both the Department of Employment measure and the census (which use very different definitions of unemployment) and suggest that any error in our measure caused by the slight mismatch in age groups and the impossibility of excluding

KEY POINTS

- There are serious methodological problems in using Department of Employment unemployment rates at family health service level.
- Unemployment (as measured by Department of Employment rates) has shown marked changes in its relationship to prescribing costs over the period 1983-92.
- Because of these changes it is not a suitable explanatory variable for differences in prescribing cost.
- There seems to be remarkable stability from year to year in costs suggesting that any differences are due to factors which are very slow to change.

the economically inactive was not a serious problem.

The link between unemployment and cost per patient is not strong. Even when there was a significant correlation, unemployment explained only a limited amount of the variation. The decline in the strength of the association from 1989 onwards was associated with increasing unemployment in areas which had traditionally had low levels of unemployment. Figure 1 shows that the increase, as measured by the ratio of the unemployment rate in 1992 to the unemployment rate in 1989, was much greater in areas of low unemployment than in areas of high unemployment. It has been suggested that the fear of impending unemployment is as great a factor as actual unemployment¹⁴ in influencing prescribing costs and so actual rates may be a poor indicator when employment is rising.

Pringle and Morton-Jones¹⁰ found a correlation of 0.524 between cost per person and the unemployment rate for 1989, while we found the correlation to be only 0.36. There are several differences in the data used in their study and our own. They took the *net ingredient cost* for the financial year 1989/90 and divided it by the number of persons estimated by the Office of Population Censuses and Surveys to be resident in the area. We took the basic *non-dispensing cost* for the calendar year 1989 and divided it by the number of registered non-dispensing patients. They obtained the numbers of unemployed from *Regional Trends* which gives the numbers of unemployed in January, while we took the figure for June as being midway through the calendar year. Since our figures are consistently defined for the period considered we feel that these differences do not change our central conclusion, which is that the link between unemployment and cost of prescribing changed so substantially after 1990 that unemployment cannot be regarded as a valid proxy for prescribing need.

We found a high degree of stability in cost per patient between one year and the next. Since this figure differs widely between authorities it seems clear that each has an individual character which largely determines the value. The 1983 cost per patient explained 76% of the variation in the 1992 figure, again emphasising the stability in the relative costs of the authorities. This casts doubt on the

ability of any measure which changes rapidly to explain these differences.

CONCLUSION

During the period 1983–92 unemployment has been an indifferent predictor of differences between FHSA's prescribing costs. What success it had in the early and middle years was probably due to its acting as a marker of more fundamental differences between areas. However, more recent changes in the nature of unemployment (or in the way in which it is measured¹²) have made it less useful. The high correlation between costs year upon year suggests that any variable which is linked to differences between authorities must possess a good degree of stability.

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