

# More equitable systems for allocating general practice deprivation payments: financial consequences

D O'REILLY

K STEELE

## SUMMARY

**Background.** *The allocation of general practitioner (GP) deprivation payments has been a controversial topic since they were first proposed. It has recently been suggested that the current system could be made more equitable if the payments were allocated at enumeration districts and if there was a more graded relationship between Jarman score and funding. However, the implications of these changes on the distribution of deprivation payments have not been worked out.*

**Aim.** *To explore the resource implications of the proposed changes to the methods of allocating GP deprivation payments within Northern Ireland, one of the few places in the United Kingdom (UK) where this can be done.*

**Method.** *Three alternatives to the present system, incorporating the proposed changes, were modelled. The reallocation of deprivation payments between areas was determined.*

**Results.** *The proportion of population attracting GP deprivation payments depends on the scheme chosen. A system that entails a lower threshold Jarman score and more payment bands will bring between two and three times more areas and people within the scheme. Each of the three alternatives would redirect funds away from areas within the current payment bands towards those that previously failed to attract any deprivation payments. The loss would be greatest for those areas within the present 'low' payment band and least for those in the 'high' payment band.*

**Conclusions.** *More equitable alternatives for allocating GP deprivation payments are feasible, although they will lead to significant movements of funds between areas. This may necessitate the introduction of further transitional payments.*

*Keywords: deprivation scores; Jarman index; general practice.*

## Introduction

THE 1990 contract for general practitioners (GPs) makes allowance for a deprivation payment to be made to practices.<sup>1</sup> It is based upon the Jarman Underprivileged Area (UPA8) index.<sup>2</sup> The exact function of the payment was unclear from the outset: whether to remunerate GPs for the additional workload associated with deprived areas or to act as an incentive to attract GPs to work in deprived areas. Uncertainty and debate<sup>3,4</sup> have followed it ever since.

Originally, the debate surrounding GP deprivation payments centred on the validity of the Jarman UPA index (Jarman score) as an indicator of GP workload.<sup>5,6</sup> More recently, attention has shifted to the process of the allocation of deprivation payments. A *British Medical Journal* editorial<sup>7</sup> indicated that the equity of the system remains a problem. It was suggested that this could be improved if deprivation payments were allocated at a smaller geographical level and with finer gradients of payment bands, which started at a lower entry Jarman score. These amendments to the current system were supported by a series of letters early this year, again in the *British Medical Journal*,<sup>8</sup> including one from Professor Jarman himself.<sup>9</sup>

Although these changes have been advocated as ways of rendering the current system more equitable, there have been no published studies quantifying the likely impact these changes might have upon the status quo. In part this may be because it is difficult to calculate Jarman scores at enumeration district level in England. Only 10% of the 1991 census records were coded for occupation,<sup>10</sup> thus making an estimation of the 'unskilled' variable in the Jarman score unreliable at very small geographical levels.

In England and in Northern Ireland, Jarman scores are presently calculated at electoral ward level, and there are three levels for payment: 'low' (Jarman score >30), 'medium' (Jarman score >40), and 'high' (Jarman score >50). In Northern Ireland, the equivalent cut-off scores (>27.5, >37.5, and >47.5) are lower because of differences in the understanding of the ethnic minority question in the 1991 census.

In Northern Ireland, 100% of census records were coded, and it is possible to calculate Jarman scores at enumeration district levels. It is therefore an ideal place to model the proposed changes. This paper examines the consequences of three alternative systems of allocation in terms of the distribution and proportion of the population eligible to attract GP deprivation payments and the subsequent redistribution of GP deprivation payment allocations. The overarching principle here was to assume that the total funding available would remain the same. The three alternative scenarios are detailed and compared with the present system in Table 1.

## Method

A Jarman score was calculated for each of the 566 electoral wards and 3729 enumeration districts in Northern Ireland, and the three alternative means of dividing up the allocation for general practice deprivation payments were constructed as follows.

### *Alternative 1, electoral ward based, 10 bands*

There is no empirical evidence to draw upon which defines the relationship between Jarman score and workload, so the choice of entry point for payment and the differences between bands is of necessity arbitrary. In this scheme, the entry level for the proposed system would be a Jarman score of 12.5. There would be 10 payment bands, and a new band at every five Jarman points.

D O'Reilly, MRCP, MFPHM, deputy director, Health and Health Care Research Unit, and K Steele, MD, MICGP, FRCGP, senior lecturer, Department of General Practice, Queen's University of Belfast, Belfast, Northern Ireland.

Submitted: 18 September 1997; accepted: 23 December 1997.

© *British Journal of General Practice*, 1998, 48, 1405-1407.

**Table 1.** Methods of allocating GP deprivation payments: present system and three possible alternatives.

	Geographical unit	Number of payment bands	Threshold Jarman score
Present system (Northern Ireland)	Electoral Ward	3	27.50
Alternative 1	Electoral Ward	10	12.50
Alternative 2	Enumeration District	3	32.50
Alternative 3	Enumeration District	10	15.00

The lowest band would attract £0.50 per patient, the next £1.50, the next £2.50 up to a maximum of £9.50.

#### *Alternative 2, enumeration district based, three bands*

A Jarman score was calculated for all 3729 enumeration districts in Northern Ireland. These were then assigned to high, medium, low, or no-payment bands. However, in order to maintain the same proportion of the population in each band, and therefore the same division of deprivation payments allocated to each, slightly different cut-off values had to be used to define the bands for this enumeration district-based allocation system. The equivalent Jarman scores were low (>32.50), middle (>42.92), and high (>55.70).

#### *Alternative 3, enumeration district based, 10 bands*

This is essentially a combination of alternatives 1 and 2. As in alternative 1, there would be 10 bands at intervals of five Jarman points apart, starting at a threshold Jarman score of 15.00. Again, in order to keep the total budget constant, the entry point and payment increments would be different. The lowest level would attract £0.25 per patient, the rest £1.25, and so on, up to a maximum of £8.25 per patient.

The total amount of money attracted to an area would be dependent on the resident population and the deprivation band of that area. The 1991 census population was taken as the resident patient population, and all calculations were based on the payment levels operating at April 1996 in Northern Ireland. The amount of money each area would attract under each of the three alternatives was calculated and compared with its present allocation. These differences were aggregated up along the original payment band groupings to demonstrate overall patterns in the movement of moneys. The proportion of deprivation payment funds going to each district council (local government district) under the three alternatives was compared with the amount each attracts currently. Owing to the discrete populations in electoral wards and enumeration districts, it was not possible to get the total spend in all three alternatives to match exactly, so all figures were rescaled to make the totals the same (typical adjustment less than 1%).

## Results

The proportion of the population that attracts GP deprivation payments depends on the scheme chosen (Table 2). Alternative 2 would be very similar to the current system in terms of the numbers and proportion of the population attracting payments. A system based at either electoral wards or enumeration districts, which entails a lower threshold and more payment bands, will make between two and three times as many areas and people eligible to attract GP deprivation payments. The eligible population would be larger under an electoral ward-based scheme than under an enumeration district-based scheme.

Each of the three alternative means of allocating GP deprivation payments would produce shifts in the distribution of money between the current bands (Table 3). Under all three scenarios, those areas that do well within the current system would lose out as deprivation payment funds are redistributed to those areas that did not receive any funds previously. The latter areas would be the greatest beneficiaries under all three alternatives. Alternative 2 (a three-band enumeration district-based system) would produce a larger effect than one based on electoral wards but with a lower threshold for entry and 10 bands (alternative 1). In all three alternatives, the effect of the redistribution is greatest in the 'low' band and least in the 'high' band; for example, under alternative 3, GP deprivation payments to patients in the present 'high' band would be reduced by 38.8%, whereas those to patients in the 'low' band would be reduced by 52.2%. Under alternative 3, 44.5% of GP deprivation payment funds would go to areas that currently do not attract any additional funding.

Under the present system, seven of the 26 local government districts do not attract any GP deprivation payments. However, each of the proposed alternatives would result in some areas of each being recognized as deprived and requiring funding. The fortunes of individual local government districts could not easily have been predicted in advance and would vary with the scheme chosen. In only half would the effects of a move towards an enumeration district-based system and more bands have been synergistic. Belfast District Council currently attracts 52.6% of the Northern Ireland allocation for GP deprivation payments. This would fall to 38.1% under alternative 3. On the other hand, Derry, the second largest city, would increase its share from 10.5% to 11.8%.

## Discussion

In this paper, three alternative means of allocating general practice deprivation payments are described along with the consequences in terms of the portions of the population and the country that would be eligible to attract additional funding. These are not the only possible alternatives, but they do encapsulate the themes that have been advocated in recent papers and letters, namely a change towards an enumeration district-based system and a finer tuning of the association between Jarman score and funding. Decisions about the threshold level for funding were, of necessity, arbitrary but they correspond with the thresholds suggested by others.<sup>8,9</sup> The present system has been criticized for the magnitude of the financial differences between those just outside the 'low' payment band and those just inside, a consequence that is disproportionate to the differences in Jarman scores. Thus, in the two scenarios that incorporated more bands and lower threshold Jarman scores, the entry level per capita payments were kept at a modest level (£0.50 and £0.25 for the electoral ward-based system and enumeration district-based system respectively).

The ideal change to the present system would be one closely related to alternative 3, namely a lower entry Jarman score, more payment bands, and use of enumeration districts rather than electoral wards as the areal unit. There are additional reasons for wishing to use enumeration districts as the basis for allocation. If enumeration districts rather than electoral wards had been used to calculate Jarman scores, the changes in deprivation payments to practices, which occur every 10 years with the new census values, would not be as precipitous or unpredictable.<sup>11</sup> It has been reported that one practice suffered a 15% shift in income after changes in electoral ward boundaries.<sup>12</sup> This would have been avoided if enumeration districts rather than wards had been used. It has also been suggested that, although an enumeration district-based system would be more equitable, caution should be exercised when interpreting census data at this level, and it may be

**Table 2.** Number (%) of electoral wards (EWs) and enumeration districts (EDs) and population attracting deprivation payments under the present system and three proposed alternatives.

	Present system	Alternative 1 EW: graded	Alternative 2 ED: 3 bands	Alternative 3 ED: graded
Allocation unit	Wards	Wards	Enumeration districts	Enumeration districts
Total number in Northern Ireland	566	566	3729	3729
Number of payment bands	3	10	3	10
EWs/EDs attracting payments	71 (12.5)	217 (38.3)	450 (12.1)	1106 (27.9)
Population attracting payments	222 684 (14.1)	627 881 (39.8)	222 276 (14.1)	529 427 (33.6)

**Table 3.** Effect of the three alternatives on the distribution of deprivation payments according to present payment bands.

Payment band	Alternative systems							
	Present allocation		EW 10 bands		ED 3 bands		ED 10 bands	
	£	%	£	%	£	%	£	%
High	479 773	27.9	363 879	21.1	356 186	20.7	293 436	17.0
Medium	599 765	34.8	431 357	25.1	423 965	24.8	355 376	20.6
Low	642 004	37.3	404 029	23.5	324 036	18.8	306 626	17.8
None	0	0.0	522 286	30.3	617 355	35.9	766 104	44.5
Total	1 721 542		1 721 542		1 721 542		1 721 542	

necessary to retain some local discretion.<sup>13,14</sup> In these circumstances, alternative 1 would be the preferred option, although the effects on the redistribution of funds between bands and local government districts would not be exactly the same as under alternative 3. At present, the acknowledged difficulties in calculating Jarman scores at enumeration district level in England and Wales, because of the incomplete coding of the 1991 census,<sup>10</sup> would favour an extension of the electoral ward-based system. However, it may be possible to derive a very close approximation to the exact enumeration district-based Jarman scores by using seven of the eight variables that are available at this level and some proxy for the 'unskilled' variable.

The allocation of general practice deprivation payments due to practices is likely to change under any of the three proposed alternative systems. It is anticipated that the changes at practice level would not be as large as indicated in this paper. This is because practice populations are formed by an aggregation of smaller populations, and the process of aggregation tends to 'average out' the differences seen at lower levels. Nevertheless, the loss of revenue may cause financial difficulties for some practices. Similar problems were faced at the transition from a 1981 to 1991 census-based system. This necessitated a period of transitional payments to ease the burden on those practices that would lose out under the new arrangements. A similar scheme would need to be in place to cover the transitional period during which the new system for allocating payments is being introduced. This additional administrative burden should not become a reason for delaying the introduction of changes that would make the allocation of general practice deprivation payments more closely aligned to need and, therefore, more equitable.

## References

1. Department of Health and the Welsh Office. *General practice in the National Health Service: a new contract*. London: HMSO, 1989.
2. Jarman B. Identification of underprivileged areas. *BMJ* 1983; **312**: 1705-1709.
3. Carr Hill RA, Sheldon T. Designing a deprivation payment for general practitioners: the UPA (8) wonderland. *BMJ* 1991; **302**: 393-396.

4. Smith GD. Second thoughts on the Jarman Index. *BMJ* 1991; **302**: 359-360.
5. Charlton JRH, Laklani A. Is the Jarman underprivileged areas score valid? *BMJ* 1985; **290**: 1714-1716.
6. Leavey R, Wood J. Does the underprivileged area index work? *BMJ* 1985; **291**: 709-711.
7. Hobbs R, Cole T. Deprivation payments revisited (again). *BMJ* 1996; **313**: 641-642.
8. Oliver M. New group has been formed to try to bring about change. *BMJ* 1997; **314**: 229.
9. Jarman B. Scores should be based on enumeration districts and payments should be phased in gradually. *BMJ* 1997; **314**: 228-229.
10. Dale A, Marsh C. *The 1991 census user's guide*. London: HMSO, 1993.
11. Crawford T, Shanks J, Bajekal U, Langford S. Analysis from inner London of deprivation payments based on enumeration districts rather than wards. *BMJ* 1995; **311**: 787-788.
12. Hastings A. Deprivation payments should be based on enumeration districts. *BMJ* 1996; **312**: 183-184.
13. Majeed FA, Cook DG, Poloniecki J, Martin D. Using data from the 1991 census. *BMJ* 1995; **310**: 1511-1514.
14. Majeed FA, Martin D, Crawford T. Deprivation payments to general practitioners: limitations of census data. *BMJ* 1996; **313**: 669-670.

## Address for correspondence

Dr D O'Reilly, Health and Health Care Research Unit, Mulhouse Building, Grosvenor Road, Belfast BT12 6BJ. Email: d.oreilly@qub.ac.uk