

# The Inverse Care Law: Clinical Primary Care Encounters in Deprived and Affluent Areas of Scotland

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## ABSTRACT

**PURPOSE** The inverse care law states that the availability of good medical care tends to vary inversely with the need for it in the population served, but there is little research on how the inverse care law actually operates.

**METHODS** A questionnaire study was carried out on 3,044 National Health Service (NHS) patients attending 26 general practitioners (GPs); 16 in poor areas (most deprived) and 10 in affluent areas (least deprived) in the west of Scotland. Data were collected on demographic and socioeconomic factors, health variables, and a range of factors relating to quality of care.

**RESULTS** Compared with patients in least deprived areas, patients in the most deprived areas had a greater number of psychological problems, more long-term illness, more multimorbidity, and more chronic health problems. Access to care generally took longer, and satisfaction with access was significantly lower in the most deprived areas. Patients in the most deprived areas had more problems to discuss (especially psychosocial), yet clinical encounter length was generally shorter. GP stress was higher and patient enablement was lower in encounters dealing with psychosocial problems in the most deprived areas. Variation in patient enablement between GPs was related to both GP empathy and severity of deprivation.

**CONCLUSIONS** The increased burden of ill health and multimorbidity in poor communities results in high demands on clinical encounters in primary care. Poorer access, less time, higher GP stress, and lower patient enablement are some of the ways that the inverse care law continues to operate within the NHS and confounds attempts to narrow health inequalities.

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## INTRODUCTION

Scotland has the lowest life expectancy for women in Western Europe and the second lowest for men, with a widening gap between the health of the rich and the poor.<sup>1</sup> Twenty-one percent of the population in poorer areas have limiting long-term illnesses or disabilities, compared with only 8.5% in affluent areas.<sup>1</sup>

The bulk of health care in Scotland, as in the rest of the United Kingdom, is delivered through primary care, with fully trained family physicians—general practitioners (GPs)—practice nurses, and other allied health professionals accounting for almost 90% of the activity of the National Health Service (NHS). Clinical encounters are free at the point of use and accessible by 100% of the population. Since the inception of the NHS in 1948, however, the provision of primary care services has not been closely related to health needs in more socioeconomically deprived areas. The mismatch of need and supply has been termed the *inverse care law*,<sup>2,3</sup> which states that “the provision of good medical care tends to vary inversely with

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the need for it in the population served." In Scotland, despite the steep gradient in need, the distribution of GPs remains flat across socioeconomic indices.<sup>4</sup>

Although inequalities in health and health care are well recognized,<sup>5-7</sup> there is a lack of research on how the inverse care law actually operates. Whereas some studies have reported a lower quality of care in clinical encounters in more deprived areas,<sup>8</sup> others have not.<sup>9</sup> In this article, we report an in-depth characterization of primary care GP clinical encounters in deprived and affluent areas of the west of Scotland (where 80% of the most severely socioeconomically deprived population in Scotland live.<sup>3,4</sup>)

## METHODS

The study comprised a patient-completed, anonymous 2-part questionnaire on the organization of care, patients' needs, and measures of quality of clinical encounters with GPs. All medium-sized practices (3 to 4 GP principals) in the upper or lower quartile of deprivation (based on a multiple index-of-deprivation score used nationally) in 4 health board regions in the west of Scotland were mailed letters that explained the details of the study and asked the practice to nominate 1 GP to participate. We have combined the 4 geographical areas sampled into a single affluent area (least deprived) group and a single poor area (most deprived) group.

The study had ethical approval from local health boards' ethics committees.

### Data Collection

Consecutive, unselected patients of the participating practices were requested by reception staff to complete the questionnaire. Part 1 of the questionnaire was completed by patients before they saw the doctor, and part 2 was completed immediately afterward.

Part 1 included questions concerning scheduling time (and rating), reason for encounter, type of problem, number of problems, patient's expectation of a prescription, continuity, psychological health, and socioeconomic and demographic details.

Part 2 included questions on whether the patient was taken on time (and rating), whether the encounter was interrupted, whether the patient was able to discuss all his or her problems, the patient's perception of GP empathy, patient enablement, patient satisfaction, and general health.

The completed, anonymous questionnaires were collected in a sealed box at the reception area.

### Content of the Patient Questionnaire

The questionnaire recorded age, sex, marital status, number of children, employment status, educational

level, type of accommodation, ethnicity, and postal code. General health information included the General Health Questionnaire (GHQ-12), which is a widely-used, validated measure of psychological distress.<sup>10</sup> For the GHQ-12, caseness was defined using a cutoff score of 4 or more (based on the binary scoring system) as used in a previous large study in general practice in the United Kingdom.<sup>11</sup> Self-assessed general health during the previous 12 months and any long-term illness or health problem or disability were assessed according to the UK census.<sup>12</sup> The frequency of attendance and the number and type of chronic diseases were also recorded as described by Little et al.<sup>13</sup>

Measurements of access to care, including how long patients waited for their clinical encounter (scheduling time), whether they were taken on time for their appointment (waiting time), how long they spent with the doctor, how they rated these 3 aspects of care, overall satisfaction, and whether the patient would recommend the doctor to family and friends, were based on the General Practice Assessment Survey (GPAS).<sup>8</sup>

Reasons for the encounter (new problem, long-standing problem, or both new and old problems), the type of problem (physical, psychological, social, administrative), how many problems the patient wished to discuss, whether the patient hoped to receive a new prescription, how well the patient knew the doctor (a proxy for continuity of care), whether the encounter was interrupted (by reception staff or a telephone call), and whether the patient was able to discuss all his or her problems were measured as previously described.<sup>11</sup>

Patients' perceptions of the GP's empathy and communication were assessed using the Consultation and Relational Empathy (CARE) Measure, a 10-item process measure of the clinical encounter.<sup>14</sup> The outcome of encounters was measured using the 6-item patient enablement instrument (PEI),<sup>11</sup> which assesses the impact of the encounter on patients' ability to cope with and understand their health problems. A mean PEI score was calculated from the average item score. For each encounter, participating GPs also recorded the exact time of starting and finishing and their own stress level at the end of the encounter (on a scale from 0 to 10, where 0 = not at all, and 10 = very much so), based on earlier work in this field.<sup>15</sup>

### Data Analysis

Analysis was performed using SPSS, version 11.5 (SPSS, Inc, Chicago, Illinois). Differences between most and least deprived groups and complex/noncomplex consultations were assessed by independent *t* tests and nonparametric tests depending on the linearity of the data. In this article, we report analyses at the patient level (ie, at the level of the individual encoun-

ter, treating all patients as belonging to 1 of 2 groups: most deprived or least deprived depending on the practice they attended) and also at the doctor level (ie, aggregating patient scores for individual GPs). We have used correlation analysis (Pearsons' *r* and partial correlation controlling for other factors) at the doctor level to identify independent associations.

In the doctor-level analysis comparing patient enablement in encounters for physical and psychosocial problems, we have only included GPs with at least 25 patients in either group, because reliability analysis indicated that below this number of encounters, the reliability of the PEI was extremely low (Supplemental Appendix). The sample size was thus reduced from 26 to 21 (5 GPs were excluded from the affluent areas).

**RESULTS**

From 70 eligible practices approached, 26 GPs from 26 practices agreed to participate in the study, giving an overall recruitment rate of 37% (36% in the high-deprivation group and 38% in the low-deprivation group). The characteristics of the participating practices and GPs did not differ significantly between high- and low-deprivation groups in terms of practice size, age of GP, and documented workload.

A total of 3,044 patients of the 26 participating practices completed all of part of the study questionnaire. The patient response rate to the questionnaire was 70%, (70% high-deprivation group, 71% low-deprivation group). Full details have been reported previously<sup>14</sup> and are also shown in an online-only Supplemental Appendix to this article, available at <http://www.annfammed.org/cgi/content/full/5/6/503/DC1>.

**Age, Sex, Multimorbidity, and Socioeconomic Factors**

The mean age of attending patients was 43.4 years (SD 17.1 years; n = 1,746) in the most deprived group and 46.6 years (SD 17.6 years; n = 992) in the least deprived group (*P* < .001). Sixty-five percent and 61% of patients were female in the most and least deprived areas, respectively. Patients in the most deprived areas had markedly higher levels of psychological distress (as shown by mean the GHQ score and caseness), worse long-term health (general health

during the previous 12 months, where a high score reflects poorer health), more long-term illness/disability, and more multimorbidity (2 or more long-term conditions), as well as the expected disparities in housing and employment (Table 1). Psychological distress rose with multimorbidity in both groups, but it was more pronounced in the most deprived areas (Figure 1).

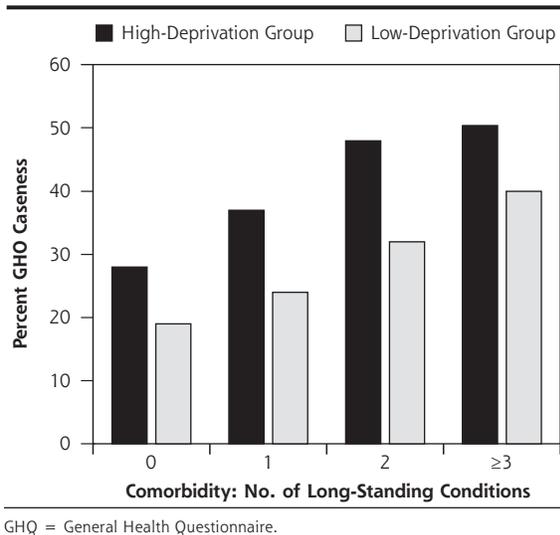
The characteristics of patients shown in Table 1 were similar when analyzed at the doctor level (results not shown). Psychological distress (GHQ caseness) of patients remained significantly higher (*P* < .001) in the practices in the most deprived (41.6%) areas compared with patients in practices in the least deprived (28.1%) areas, and the mean general health of patients during the last 12 months was significantly (*P* < .001) worse in the most deprived than in the least deprived areas. The percentage of patients with 3 or more chronic conditions was also significantly higher (30.8% vs 24.0%, *P* = .023).

**Table 1. Characteristics of Patients Visiting General Practitioners in Poor and Affluent Areas of Scotland**

Characteristics	Most Deprived Areas n (%)	Least Deprived Areas n (%)	P Value
Emotional distress			
Caseness*	652 (41.3)	273 (28.6)	<.001
Comorbidity: No. of chronic conditions			.008
0	485 (24.7)	271 (25.2)	
1	491 (25.0)	320 (29.7)	
2	387 (19.7)	223 (20.7)	
3 or more	599 (30.5)	262 (24.3)	
General health			<.001
Very good	206 (11.3)	166 (16.1)	
Good	471 (25.9)	375 (36.5)	
Fair	665 (36.6)	339 (33.0)	
Bad	383 (21.1)	122 (11.9)	
Very bad	94 (5.2)	26 (2.5)	
Long-term illness			
Yes	975 (53.7)	432 (42.1)	<.001
Job status			<.001
Employed	651 (37.9)	516 (51.8)	
Unemployed (looking)	115 (6.7)	36 (3.6)	
Unemployed (unable)	434 (25.3)	103 (10.3)	
School or full-time equivalent	76 (4.4)	63 (6.3)	
Retired	247 (14.4)	209 (21.0)	
Caring for home/family	170 (9.9)	61 (6.1)	
Home			<.001
Owner occupier	732 (40.6)	833 (81.3)	
Rented	981 (54.2)	140 (13.6)	
Other	92 (5.1)	51 (5.0)	

\* A measure of psychological distress on the General Health Questionnaire – 12,11 with a score of 4 or more.

**Figure 1. Relationship between psychological distress and comorbidity in high- and low-deprivation areas.**



**Access**

More patients were seen in open (ie, walk-in) clinics or fitted in that day in the most deprived compared with the least deprived areas (Table 2). Scheduled access to encounters took significantly longer, and patient satisfaction with access was significantly lower in the most deprived areas (Table 2).

At the doctor level, the mean percentage of patients waiting more than 3 days was 60% in the most deprived and 50% in the least deprived areas ( $P = .220$ ). Access varied widely, however, between GPs in both the most deprived (range 34% to 84% longer than 3 days) and least deprived areas (range 12% to 72% longer than 3 days) areas. Mean patient satisfaction with access was significantly lower ( $P = .011$ ) in the most deprived areas (results not shown).

**Reasons for Encounter**

The number of problems that patients wanted to discuss in the clinical encounter was significantly higher in the most deprived compared with the least deprived areas (Table 3). The nature of the problems also differed significantly, with more encounters for psychological and social problems (either with or without a physical problem) in the most deprived areas (Table 3).

The percentage of patients wishing to discuss 3 or more problems remained significantly higher ( $P = .002$ ) in the most deprived compared with the least deprived areas when analyzed at the doctor level

(results not shown), as did the percentage wishing to discuss a psychosocial problems (33% vs 21% in most vs least deprived areas, respectively,  $P < .001$ ).

**Length of Clinical Encounters**

The mean duration of the clinical encounter was slightly shorter in the most deprived than in the least deprived group (8.2 vs 8.6 minutes;  $P = .034$ ), which was reflected in a different distribution patterns (Figure 2). Patient satisfaction with encounter duration was also significantly lower ( $P < .001$ ) in the most deprived areas (results not shown).

Mean encounter duration at the doctor level was 8.3 minutes in the most deprived and 9.0 in the least deprived areas ( $P = .077$ ) (results not shown). Mean encounter duration varied considerably between GPs in both the most deprived (range 6.6 to 10.3 minutes) and least deprived (range 5.5 to 10.9 minutes) areas.

**Comparing Clinical Encounters in Poor and Affluent Areas for Physical or Psychosocial Problems**

Comparisons between encounters in the most and least deprived areas for physical problems alone or psychosocial problems (with or without a physical problem) are displayed in Table 4. The biggest differences between the most deprived and least deprived areas were found in the psychosocial encounters. The distribution of encounter duration was similar to the overall pattern shown in Figure 2; 27% of psychosocial encounters in the least deprived areas lasted for 15 minutes or more, compared with 16% in the most deprived areas. The GP stress level in the encounter was significantly higher in the most deprived areas. This difference was particularly apparent in longer encounters (Figure 3). Patient enablement was significantly lower in encounters for psychosocial problems in the most

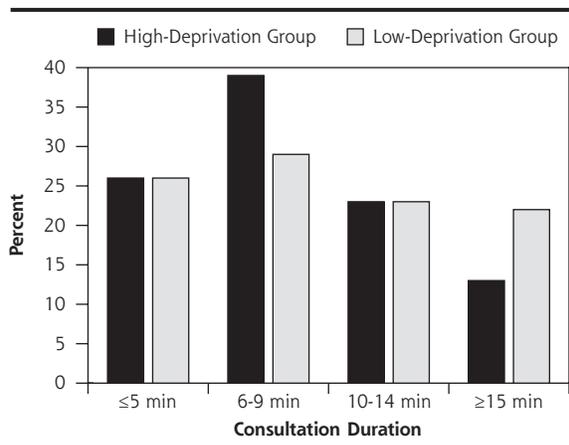
**Table 2. Clinical Encounter Characteristics: Patient Access to a General Practitioner**

Characteristics	Most Deprived Areas n (%)	Least Deprived Areas n (%)	P Value
Scheduled encounter	1,612 (83.2)	968 (90.6)	<.001
Access, days			<.001
0-3	491 (34.0)	487 (48.3)	
>3	1,146 (66.0)	521 (51.7)	
Rating			<.001
Very poor	106 (6.2)	17 (1.8)	
Poor	241 (14.2)	76 (8.0)	
Fair	461 (27.1)	202 (21.2)	
Good	398 (23.4)	242 (25.4)	
Very good	290 (17.1)	219 (23.0)	
Excellent	203 (11.9)	198 (20.8)	

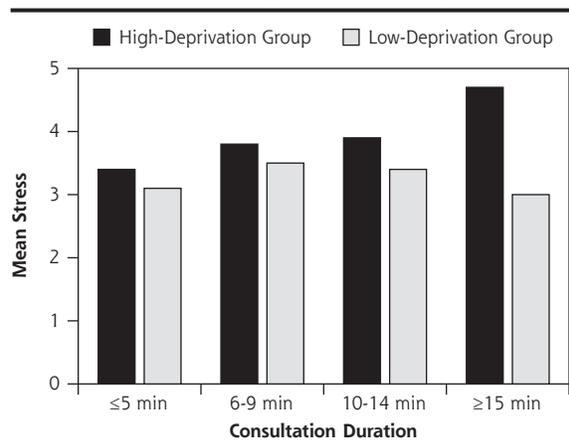
**Table 3. Number of Problems to Discuss or Reason for Visiting a General Practitioner**

Problem Characteristics	Most Deprived Areas n (%)	Least Deprived Areas n (%)	P Value
No. of problems			<.001
1	712 (47.7)	545 (59.0)	
2	559 (37.5)	309 (33.4)	
>2	221 (14.8)	224 (7.5)	
Acute or chronic			.093
New problem	451 (29.3)	304 (29.4)	
Long-standing	612 (33.2)	393 (38.0)	
Both	691 (37.5)	336 (32.5)	
Nature of problem			<.001
Physical	1127 (65.9)	780 (78.2)	
Psychosocial	295 (17.3)	101 (10.1)	
Physical + psychosocial	222 (13.0)	94 (9.4)	
Administrative	66 (3.9)	23 (2.3)	

**Figure 2. Distribution of clinical encounter duration in areas of high- and low-deprivation.**



**Figure 3. GP stress by clinical encounter duration in areas of high- and low-deprivation.**



deprived areas (Table 4). This difference in enablement between groups was apparent across all encounter durations beyond 5 minutes (Figure 4).

The mean results at the doctor level showed trends similar to those shown at the patient level, though differences generally did not reach statistical significance (results not shown). Mean GP stress score in the encounter at the doctor level was 3.8 in the most deprived and 3.2 in the least deprived areas ( $P = .390$ ). Mean encounter stress scores varied considerably among GPs in both the most deprived (range 1.0 to 7.0) and least deprived (range 2.1 to 4.9) areas. Mean GP patient enablement in clinical encounters for psychosocial

problems remained significantly lower ( $P = .005$ ) in the most deprived (mean PEI score 3.3) compared with the least deprived (mean PEI score 4.5) areas. Although there was considerable variation among GPs, a significant ( $P = .002$ ) negative correlation was found between mean patient deprivation score per GP and patient enablement in encounters for psychosocial problems ( $r = -0.644$ ). There was a significant ( $P = .008$ ) positive correlation between empathy and enablement scores in encounters for psychosocial problems ( $r = 0.563$ ). This relationship remained significant after controlling for the deprivation score ( $r = 0.456$ ;  $P = .044$ ), suggesting that deprivation and doctors' empathy are independent explanatory factors in enablement in such encounters.

## DISCUSSION

In this study we have carried out an in-depth characterization of clinical encounters in primary care in the most and least deprived areas of Scotland. The increased burden of ill health and multimorbidity in socioeconomically deprived areas results in high demands on primary care and is associated with poorer access to care, less time spent with the doctor, higher GP stress, and lower patient enablement in encounters for psychosocial problems.

### Relationship With Published Literature

In visits to their GPs, more women than men report major psychological distress, and psychological distress is substantially more common in the most deprived than in the least deprived areas.<sup>16</sup> In addition, we found a striking association between low socioeconomic status, multimorbidity (number of long-term

**Table 4. Characteristics of Clinical Encounters With a General Practitioner (GP) in the Most Deprived and Least Deprived Areas of Scotland, by Type of Consultation**

Characteristic	Consultations for Physical Problems			Consultations for Psychosocial Problems		
	Most Deprived Areas Mean (SD)	Least Deprived Areas Mean (SD)	P Value	Most Deprived Areas Mean (SD)	Least Deprived Areas Mean (SD)	P Value
Age, years	45.4 (17.9)	47.5 (17.9)	.015	39.5 (14.0)	43.7 (14.8)	.003
General health score*	2.7 (1.0)	2.4 (1.0)	<.001	3.22 (1.0)	2.8 (1.0)	<.001
No. of problems	1.6 (0.9)	1.5 (0.7)	<.001	2.0 (0.9)	1.7 (0.7)	.003
Knows doctor†	3.6 (1.4)	3.5 (1.3)	.285	3.8 (1.3)	3.6 (1.2)	.127
GP empathy score‡	41.1 (0.9)	40.6 (0.9)	.300	40.9 (9.1)	42.2 (8.6)	.156
Consultation duration, minutes	8.0 (4.0)	8.4 (4.5)	.045	8.9 (4.3)	9.6 (4.9)	.076
Patient enablement score§	4.0 (3.8)	3.9 (3.5)	.555	3.3 (3.4)	4.1 (3.5)	.023
GP stress index	3.8 (2.4)	3.3 (1.6)	<.001	3.9 (2.3)	3.3 (1.5)	<.001

\* Based on the General Health Questionnaire-12 caseness cutoff score of 4 or more.

† Rated on a scale from 1 to 5, in which 1 = not at all, 5 = very well.

‡ Rated on a scale of 1 to 10, in which higher scores indicate higher empathy.

§ Rated on a scale of 1 to 6, in which higher scores indicate more enablement.

|| Rated on a scale from 0 to 10, in which 0 = no stress and 10 = very much stress.

conditions), and psychological distress. Although associations between mental illness and chronic diseases are well recognized,<sup>17</sup> the possible synergistic influence of multimorbidity and poverty on psychological distress is less well documented.<sup>18,19</sup>

Almost one-third (30%) of patients in the most deprived areas wanted to discuss psychosocial problems, and almost two-thirds (65%) of these patients expected to discuss more than 1 problem. Interventions aimed at increasing the number of problems voiced by patients<sup>20</sup> need to take account of the substantial increases in physician time that would be likely be required to meet such demands in the most deprived areas.

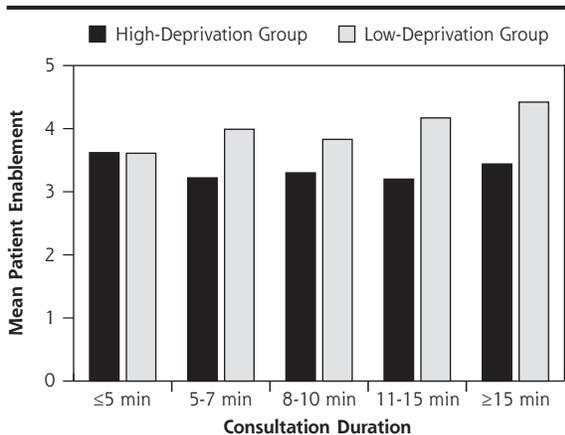
In terms of access, the longer scheduling time to see a doctor in the most deprived areas (and the

resulting lower satisfaction) is similar to findings of a previous study in England.<sup>8</sup> It should be noted that the data in these studies were collected before the recent introduction of the 48-hour access target set by the UK Government; the effect of this policy initiative on access in deprived areas is not yet known.<sup>21,22</sup> Many patients with chronic and complex problems, however, would rather see their trusted doctor than be seen quickly by any doctor,<sup>23</sup> and for such patients, advanced access may improve quality of care only if personal continuity is enhanced.<sup>24</sup>

The average duration of the clinical encounter in the present study is similar to that previously reported in Glasgow<sup>16</sup> and the United Kingdom.<sup>11</sup> The shorter encounters in the most deprived areas are also in line with previous work.<sup>8,16</sup> Duration of clinical encounter in primary care is shorter in the United Kingdom than in many other developed countries.<sup>25</sup> Although robust evidence of benefits from longer encounter time is limited,<sup>26</sup> observational studies show a positive association with patient enablement.<sup>11</sup> The disparity between the most and least deprived areas in the provision of longer encounters (15 minutes or more) in the present study has also been reported in Australia.<sup>27</sup>

Other markers of encounter quality in this study included continuity, perceived empathy, and patient enablement.<sup>28</sup> Compared with previous reports using the same measures,<sup>11</sup> high levels of continuity (seeing a usual doctor and knowing the doctor well) were found in the most and least deprived groups. In clinical encounters where psychosocial issues needed to be discussed, patient enablement was lower in the most deprived areas. At the doctor level patient enablement was significantly related to the severity of deprivation

**Figure 4. Patient enablement by clinical encounter duration in complex encounters in areas of high- and low-deprivation.**



in the consulting population; yet even in the most impoverished areas, marked variations in mean enablement by individual GPs were found in association with differences in GP empathy. These are important new findings, especially because empathy has been found to be a prerequisite for enablement, and both may be important predictors of health gain.<sup>29-31</sup>

GPs working in the most deprived areas were more stressed in encounters than those working in the least deprived areas, which is in agreement with the views of GPs on stress in consultations in Scotland.<sup>32</sup>

### Strengths and Weaknesses

A major strength of this study is that it achieved a good response rate in both types of area. We have shown previously that even the most socioeconomically deprived patients within the poorest areas were represented in the study sample.<sup>14</sup> The study was comprehensive in its scope, linking patients' socioeconomic and demographic factors, need, demand, expectations, access, and process and outcome of clinical encounters.

The study also has limitations. Firstly, although participating patients were representative of the populations of the practices,<sup>14</sup> we cannot conclude that GPs who took part in the study are representative of GPs working in such localities. The scores for time, continuity, and enablement, however, are similar to those across the United Kingdom,<sup>11</sup> and the finding of higher GP stress in clinical encounters in the most deprived areas is also in line with a national survey of GPs in Scotland. Second, the study did not attempt to measure technical quality of care or clinical outcomes. Third, although we have analyzed the data separately at the patient level and the doctor level to document the effects of the doctor on the encounter, a more detailed multilevel modeling approach on a larger number of doctors and patients would have been desirable.

### Future Research

The benefits of providing longer clinical encounters for patients with psychosocial problems in the most deprived areas needs to be examined, and work is in progress on this issue. Further understanding of GP stress, as well as of ways of managing stress, may also be important in terms of burnout and workforce retention in deprived areas.

In conclusion, our study findings have shown that the increased burden of ill health and multimorbidity in socioeconomically deprived communities in Scotland results in multiple demands on clinical encounters in primary care. Policies seeking to address public health inequalities must do so at the front-line of primary care if the inverse care law is to be reversed.

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