ANNALS OF FAMILY MEDICINE

Online Supplementary Material

Supplemental Appendix. Sample Frame and Reliability of CARE Measure and PEI

Sampling Frame

A database containing the mean deprivation scores measured by the Arbuthnott index[1] of all GP practices in the west of Scotland was made available by the Information and Statistics Division of NHS Scotland (Scotland's National Health Service). This index, considered to be the most accurate postcode sector measure of the factors that influence health care needs in Scotland at the time of the study, is based on mortality rates for persons younger than 65 years, unemployment rates, percentage of elderly claiming income support, and percentage of households with 2 or more indicators of deprivation. A high score represents high deprivation (ie, higher poverty score). Deprivation data were extracted on practices in 4 health board regions in the west of Scotland; Greater Glasgow, Argyll and Clyde, Lanarkshire, and Ayr and Arran. Ethical approval for the study was obtained from each of the 4 health boards. The low-deprivation (affluent) group of practices invited to participate in the study were selected from practices in the lower quartile of deprivation scores for the 4 regions combined. In the high-deprivation groupings, practices were selected from those in the upper quartile of the combined deprivation scores of practices in the 3 health board regions outside Greater Glasgow, and those in the upper quartile of deprivation scores within Greater Glasgow. This grouping was necessary because of the concentration of severe deprivation within Greater Glasgow.

Because patient enablement scores have been shown to be influenced by practice size,[2] the sampling frame was limited to medium-sized practices (3 to 4 partners). Only nontraining practices (ie, those that are not accredited for training GP registrars) were included. Practices meeting these criteria were contacted by mail with a letter that explained the details of the study and asked them to nominate 1 GP to participate. This strategy was used to minimize possible cluster effects. Of the 70 eligible practices approached across the 4 health board areas, 26 GPs from 26 practices agreed to participate in the study, giving an overall recruitment rate of 37% (36% in the high-deprivation groups and 38% in the low-deprivation groups). The mean deprivation scores of the eligible practices, the participating practices, and the patients who participated are shown below.

Supplemental Appendix, Table 1. Mean Deprivation Scores of Eligible and Participating Practices and Participating Patients			
Practices and Patients	**High Deprivation Greater Glasgow**	**High Deprivation Rest of WOS**	**Low Deprivation (GG+WOS)**
All eligible practices	7.7 (range 6.4 to 10.5)	2.9 (range 2.0 to 7.4)	-2.4 (range −0.03 to −4.9)
Participating practices	7.8 (range 6.4 to 9.1)	2.7 (range 2.0 to 3.3)	-2.0 (range −0.03 to −4.4)
Participating patients	7.6	2.7	-1.8
GG = Greater Glasgow; WOS = west of Scotland.			

The mean practice list sizes of the 2 groupings were 5,118 patients in the high-deprivation group and 5,090 in the low-deprivation group. The characteristics of the participating GPs did not differ significantly

between high- and low-deprivation groups in terms of age and documented workload (number of sessions per week, number of patients seen per week, hours per week spent consulting, length of booked consultations, and number of house visits per week; results not shown). There were relatively more female GPs in the high-deprivation group (9/16; 56%) than in the low-deprivation group (4/10; 40%).

Patients

Consecutive patients of the participating GPs were asked by the reception staff whether they would be willing to complete a questionnaire when they arrived for their consultations. The patient response rate to the questionnaire overall was 70%, (70% high-deprivation group, 71% low-deprivation group). Although data were not collected on the 30% of consulting patients who chose not to participate in the study, we examined the distribution of participating patients per practice as a percentage of the distribution of deprivation (in quartiles) of all patients registered with that practice. The mean distributions of participating patients across the quartiles (least deprived to most deprived) were 3.1%, 2.3%,1.6%, and 2.4% for Greater Glasgow high-deprivation practices; 4.5%, 2.1%, 2.6% and 2.1% for rest of the west of Scotland high-deprivation practices; and 1.6%, 1.7%, 2.4%, and 3.0% for the low-deprivation practices (Greater Glasgow and west of Scotland combined). Thus there was a reasonably equitable spread of deprivation scores of participating patients, suggesting that the patients who declined to participate were not substantially skewed toward the most deprived end of the spectrum.

Reliability of CARE Measure and Patient Enablement Instrument

In our analysis of variation between doctors (doctor-level analysis), an important consideration is reliability (the number of patients required to reliably discriminate between doctors). Although this number is usually in the region of 40-50, as has been reported for the Consultation and Relational (CARE) Measure[1] it has not been reported for the patient enablement instrument (PEI) (although 50 patients per GP has been suggested as the minimum acceptable.)[2] The present study had an average of 122 patients per doctor in the high-deprivation areas (range 54-157) and 107 per doctor in the affluent areas (range 54-165) and thus results at doctor level are in general likely to be highly reliable. We also wanted to analysis to analyze differences in CARE Measure and PEI scores between doctors in encounters for physical problems only and for psychosocial problems (ie, subgroups analysis). It is thus important to know the minimum number of patients required to give a reliable estimate for these measures for these 2 subgroups of patients. The calculation of number of questionnaires per GP to obtain a reliable mean score for the CARE Measure and the PEI was based on generalizability theory. According to this theory, the reliability of the mean of a sample of scores can be measured by the intra-GP correlation coefficient (ICC), defined as:

$$ICC = \frac{\sigma_{GP}^2}{\sigma_{GP}^2 + \sigma_P^2}$$

where σ_{GP}^2 is the variance in mean measure scores between GPs, and σ_P^2 is the variance that is due to random variation between samples of patients. If the size of the sample of patients in n, then:

$$\sigma_P^2 = \frac{\sigma^2}{n}$$

where σ^2 is the variance of measure scores between individual patients. The table below shows the ICC scores for the CARE Measure and the PEI for patient encounters overall, and for those for physical problems or psychosocial problems.

Supplemental Appendix, Table 2. GP Intraclass Correlation Coefficient Scores for the CARE Measure and Patient Enablement Scores

Sample Size	Intra-GP Correlation Coefficient (%)					
	CARE			PEI		
	All	Physical	Psychosocial	All	Physical	Psychosocial
10	56.6	66.0	54.5	9.5	25.1	8.6
15	66.2	74.4	64.2	13.6	33.5	12.3
20	72.3	79.5	70.6	17.4	40.2	15.8
25	76.5	82.9	75.0	20.8	45.6	19.0
30	79.6	85.3	78.2	24.0	50.2	21.9
40	83.9	88.6	82.7	29.6	57.3	27.2
50	86.7	90.7	85.7	34.5	62.7	31.9
100	92.9	95.1	92.3	51.3	77.1	48.3
200	96.3	97.5	96.0	67.8	87.0	65.2
500	98.5	99.0	98.4	84.0	94.4	82.4

GP = general practitioner; CARE = Consultation and Relational Empathy (CARE) Measure; PEI = patient enablement instrument.

As can be seen, the CARE Measure has a high reliability even with low numbers of patients in any category. However, the PEI shows lower reliability, especially in consultations for physical problems. Thus we have excluded any GP with less than 25 patients in either type of encounter.

References

1. Mercer SW, McConnachie A, Maxwell M, Heaney DH, Watt GCM. Relevance and performance of the Consultation and Relational Empathy (CARE) Measure in general practice. *Fam Pract*. 2005;22(3):328-334.

2. Howie JGR, Heaney DJ, Maxwell M, Walker JJ, Freeman GK, Rai H. Quality at general practice consultations: cross-sectional survey. *BMJ*. 1999;319(7212):738-743.