

Epidemiology

Is there an association between socioeconomic status of General Practice population and postgraduate training practice accreditation? A cross-sectional analysis of Scottish General Practices

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Abstract

Background: Practice population socioeconomic status is associated with practice postgraduate training accreditation. General Practitioner recruitment to socioeconomically deprived areas is challenging, exposure during training may encourage recruitment.

Objectives: To determine the association of practice population socioeconomic deprivation score and training status, and if this has changed over time.

Methods: Cross-sectional study looking at socioeconomic deprivation and training status for all General Practices in Scotland ($n = 982$). Data from Information Services Division, from 2015, were combined with the Scottish Index of Multiple Deprivation to calculate weighted socioeconomic deprivation scores for every practice in Scotland. Scottish training body database identified training practices ($n = 330$). Mean deprivation score for training and non-training practices was calculated. Logistic regression was used to quantify the odds ratio of training status based on deprivation score, adjusted for practice list size, and compared with a similar 2009 analysis.

Results: Socioeconomic deprivation score is associated with training status, but is not significant when adjusted for practice list size [OR (adjusted) 0.87, 95% CI: 0.74–1.04]. In contrast, in 2009, adjusted deprivation score remained significant. Mean deprivation score in training and non-training practices remained similar at both time points [2015: 2.98 (SD 0.88) versus 3.17 (SD 0.81); 2009: 2.95 versus 3.19], with a more deprived mean score in non-training practices.

Conclusions: General practices in affluent areas remain more likely to train, although this association appears to be related to larger practice list sizes rather than socioeconomic factors. To ensure a variety of training environments training bodies should target, and support, smaller practices working in more socioeconomically deprived areas.

Key words: Academic Medicine, continuing medical education, Graduate Medical Education/Fellowship Training, health disparities, primary care, underserved populations

Key Messages

- GP training practices continue to be more likely to serve affluent populations.
- This is related to larger practice list sizes in these areas.
- Ensuring availability of a range of training environments should be a key target.

Background

There is evidence that the spread of General Practice speciality training (GPST) practices is unequally distributed, with training practices more likely to be situated in affluent areas, with less ethnic diversity (1–3). In Scotland, practices working in areas of high socioeconomic deprivation are relatively under-represented as GPST practices, with over a third of practices in the most affluent areas accredited as training practices, while just over one fifth in areas of high socioeconomic deprivation are accredited to train (3). In England, training practices are under-represented in ethnically diverse urban areas (2), and French training practices have fewer low-income patients than the national average (1).

Measures of socioeconomic deprivation vary internationally, recognizing the importance of multiple factors, not just low income. For the purposes of this paper, socioeconomic deprivation refers to multiple disadvantage across the domains of income, employment, education, health, access to services, crime and housing.

There are currently major issues with recruitment and retention in the UK, with a nationwide shortage of GPs, which is worse in areas of high socioeconomic deprivation (4). Within areas of high socioeconomic deprivation in Scotland, the average age of a GP is higher (5), suggesting that there will be proportionally more GPs retiring in these areas in the next few years. This will potentially worsen the shortage of GPs in areas that are already underserved and experience greater difficulty in recruiting staff (5).

This unequal distribution of training practices is important as there is evidence trainees are more likely to work in areas similar to where they train (6,7), and that experience in GP training affects future career choice (7).

Multimorbidity is more prevalent and starts at an earlier age in areas of high socioeconomic deprivation (8,9), with a higher burden of psychological co-morbidity (particularly in younger patients) (8–10). A recent review of GPST training recommended trainees are exposed to different types of general practice to gain additional wider skills (11) and experience of working in practices with populations experiencing socioeconomic deprivation seems likely to be of value to GP trainees. In addition, being a trainer is seen as a positive professional experience that can build resilience and job satisfaction and may help retention in practice (12,13), as well as increasing participation in research (14).

If training practices are unequally distributed across the social gradient, this may affect recruitment in under-represented areas in the future, and trainees are less likely to be exposed to issues associated with socioeconomic deprivation, and ethnically diverse inner-city areas. A study in 2009, looking at all Scottish General Practices, found that practice socioeconomic deprivation score (weighted measure based on proportion of patient postcodes (postal address) in each of the five socioeconomic deprivation quintiles) was associated with training status, even after adjusting for practice size (3). It is uncertain whether the unequal distribution of GP training practices remains. The objective of this paper is to describe the distribution of GP speciality training practices in Scotland in 2015, and the association between training status and practice population socioeconomic

status. It also compares the association in 2015 with the one from the 2009 study (3) to see whether it has changed over time.

Methods

We used population data, combined with general practice data to describe the distribution of training practices in Scotland and to examine the association between practice population socioeconomic status and practice training status. Data from the NHS Scotland Information Services Division, which covers all Scottish General Practices, from 2015, were used as the core data. The study population included 5,606,894 people, covering 982 practices, representing a complete national data set of GP surgeries and registered patients across Scotland.

The Scottish Index of Multiple Deprivation (SIMD) 2012 (15) was used to measure socioeconomic deprivation. The SIMD is a well-established, consistent measure of relative socioeconomic deprivation across Scotland and covers the entire Scottish population. It measures multiple domains (income, employment, education, health, access to services, crime and housing) and so is a wider, more accurate, measure than just low income.

It splits Scotland into 6796 data zones (each one including 760 people) and ranks each data zone from most socioeconomically deprived (ranked 1) to least socioeconomically deprived (ranked 6,976) and divides these zones into quintiles.

Information Services Division (ISD) (16) links the Community Health Index (a unique patient identifier) of every patient in each general practice in Scotland to their postcode (postal address). Each patient is then mapped to the relevant SIMD data zone based on the postcode they reside in. ISD are then able to match each patient to a socioeconomic deprivation quintile. The number of patients in each quintile in every practice is displayed annually by ISD and is publicly available. The number of patients ISD were unable to match to a socioeconomic deprivation quintile WAS very small: 0.003% of the 2015 population (not available for 2009). Due to the low level of missing data, our analysis was carried out as complete case analyses. Previous work (3) used the proportion of a practice's patients in each quintile to create a weighted socioeconomic deprivation score for that practice. This was a continuous variable and ranged from 1 (most socioeconomically affluent) to 5 (most socioeconomically deprived). This process was repeated with the current data, giving each practice in Scotland a current socioeconomic deprivation score. The socioeconomic deprivation scores were ranked before splitting the practices in Scotland into four quartiles dependent on their socioeconomic deprivation score. This was done in the original 2009 paper and repeated with the 2015 data to allow us to compare our results with the original paper (3). As the original data set from 2009 was not available, comparison can only be made with published results.

Data from the NHS Education for Scotland (NES) GP speciality training database were used to identify all training practices from the academic year 2015–2016. The mean practice size, and standard deviation, in each quartile was calculated and presented alongside

the data from the 2009 paper (3). The mean socioeconomic deprivation score in training and non-training practices was calculated and presented along with the values from the previously published paper to allow comparison. Logistic regression analysis was used to assess the odds of training status based on socioeconomic deprivation score. Socioeconomic deprivation score and practice list size were treated as continuous variables for the analysis. Two models were fitted: unadjusted to quantify odds ratio of training status, based on socioeconomic deprivation score, and then adjusted for practice size, as size is known to be a significant predictor of practice participation in optional activities (17). The data were analysed using R statistical software version 3.4.1.

Results

The overall number of training practices increased from 310 to 330 between 2009 and 2015. Table 1 summarizes the changes in numbers and list size of practices (all and training practices) between 2009 and 2015.

A comparison between the number and proportion of practices training in each socioeconomic deprivation quartile is displayed in Table 2. The proportion of practices training increased in the second and fourth quartiles but stayed relatively static in the first and third.

Table 3 shows the mean practice list size in each of the quartiles in 2009 and 2015. Overall the number of practices in Scotland dropped from 1014 in 2009 to 982 in 2015 with a slight increase in the mean practice size, across all four socioeconomic deprivation quartiles.

The mean socioeconomic deprivation score in 2015 (2.98 training, 3.17 non-training) had changed little from 2009 (2.95 training, 3.19 non-training). Mean deprivation score and size, with standard deviation, is summarized in Table 3. On average, more patients in training practices live in less deprived areas than in practices that do not train.

Practices whose patient population had a higher socioeconomic deprivation score were less likely to be training practices [OR 0.77 (95% CI: 0.65–0.90)]. However, when practice list size was adjusted for, socioeconomic deprivation score was no longer significantly associated with training status [OR 0.87 (0.74–1.04)]. In this model, greater practice list size was associated with training status [OR 1.25

(1.21, 1.32) per 1000 patient increase]. These results are summarized in Table 4. This is in contrast to the 2009 analysis, in which socioeconomic deprivation remained significantly associated with training status after adjustment for practice list size.

Discussion

Summary

In this study, of all the general practices across Scotland, our findings show that practices whose patient population had a higher socioeconomic deprivation score were less likely to be training practices (OR 0.77, 0.65–0.9), as were practices with smaller list sizes. The average socioeconomic deprivation score of training and non-training practices has not changed, over these 6 years, and remains lower (i.e. more affluent), in training practices. However, there has been an increase in the proportion of practices training in both the second and fourth deprivation quartile. Although the mean deprivation score has not changed because of similar proportional increase in both these quartiles, it is likely the increase in the most deprived quartile is one of the reasons deprivation score is no longer significantly associated with training practice once adjusted for practice size.

This contrasts with the 2009 data where socioeconomic deprivation was significantly associated with training status even when size was taken into account (3).

GP practices are incentivized to undertake speciality training in several ways. Firstly, through a payment made to the practice to reimburse the training of GPs. Secondly, each GP trainer is also given an annual financial allowance to recognize their own continuous professional development time that is spent in relation to their role as a GP educator. Thirdly, although GPSTs remain 'supernumerary', there is an expectation that a competent trainee will in their final year of training provide the practice with an additional service commitment over and above that which could be provided by the practice alone.

Although practices in the UK vary in their employees, those with larger list sizes tend to have more GPs, and other members of the primary care team, and are likely to have a larger administration team. The increased rate of participation in voluntary activities (including training) in larger practices may be due to an increased level of flexibility within larger practices who are likely to have more GPs and relevant practice staff to accommodate training needs and requirements.

The reason for smaller practice size in areas of high socioeconomic deprivation is not known but is likely multi-factorial. Potential reasons include practices adapting to the extra workload caused by increased multimorbidity (presence of two or more long term health conditions) and social complexity by reducing the number of patients they see and keeping their list sizes smaller. This increased workload may also contribute to the decision not to train.

Table 1. Number and list size for all, and training, practices in 2009 and 2015

	Number of GP Practices	Number (proportion) of training practices	Mean list size of practices	Mean list size training practices
2009	1014	310 (30.6)	5400	7394
2015	982	330 (33.6)	5714	7503

Table 2. Numbers, and proportions, of practices training and mean list practice list size in each socioeconomic deprivation quartile in Scotland in 2009 and 2015

Socioeconomic Deprivation quartile	Numbers of training practice per quartile 2009	Proportion in this quartile training 2009	Mean list size (SD) in each quartile 2009	Numbers of training practices per quartile 2015	Proportion in this quartile training 2015	Mean list size (SD) in each quartile 2015
1 (most affluent)	100	39.4	6171 (3671)	94	38.2	6484 (3773)
2	83	32.8	5075 (3575)	97	39.6	5425 (3996)
3	78	27.7	5820 (2984)	70	28.5	6055 (3081)
4 (most deprived)	58	22.8	4537 (3091)	69	28.0	4870 (3121)

Table 3. Mean size and socioeconomic deprivation score of training and non-training practices in 2009 and 2015

	Mean list size 2009	Mean list size (SD) 2015	Mean deprivation score 2009	Mean deprivation (SD) score 2015
Training practice	7394	7503 (3705)	2.95	2.98(0.88)
Non-training practice	4519	4142 (3119)	3.19	3.17(0.81)

As training practices remain proportionately over-represented in affluent areas, at a population level trainees may be disproportionately exposed to a more affluent social demographic. This may affect career choice in the future. Additionally practices in areas of high socioeconomic deprivation are less likely to benefit from the potential positive aspects of training, including building resilience and job satisfaction (12,13), which may be particularly important in this context.

Despite this over the last 6 years, the proportions of practices training in the most socioeconomically deprived quartile have increased. One potential explanation is the introduction, in the UK, of the Quality and Outcomes Framework (QOF) in 2004 which led to many practices updating their administration and practice systems—issues that were previously considered a barrier to achieving training status (18,19). It may be that the increase in practice training numbers represents a lag effect from when QOF was introduced: as the majority of practices were now much closer to achieving the standards for training it made the process of becoming a training practice easier to achieve. The lag could be further exacerbated by the several years it takes to become an approved trainer and training practice.

Another potential contributor to the change is the introduction of a national accreditation programme for trainers in Scotland (SPESC). This ensured a fair and consistent approach to all GPs interested in undertaking speciality training: one of the categories of practices given priority were new training practices, particularly in areas of identified need.

Thirdly, in 2009 a national initiative called ‘the GPs at the Deep End’ project started (20). This was a working group that brought together many of the 100 most socioeconomically deprived practices in Scotland to discuss common experiences and difficulties experienced by practices that worked in areas of high socioeconomic deprivation. The project has grown, engaging with multiple practices and has developed several key projects and initiatives (21). By doing so, it has developed an advocacy role, both in Scotland and beyond (22–24), allowing practitioners from these areas to share a collective voice and to spearhead new projects. It may be that this increased collective voice and confidence could also have encouraged practices in these areas to consider training.

Strengths/limitations

One of the key strengths of this study is that the data used covered the entire Scottish population. While pertinent to Scotland the existing literature (1–3) suggests that the results will be similar in other similar populations, and that training practices are more likely to serve socioeconomically affluent populations. It also allowed direct comparison with previous work as it followed the same methodology (17), and so was able to demonstrate change in practice distribution over time.

The main limitation of this study is that the raw data from the original study are unavailable meaning that direct comparison could only be made with the published results. This means we cannot look

Table 4. Table of unadjusted odds ratios of association between socioeconomic deprivation score with practice training status, and odds ratio of practice training status with socioeconomic deprivation score and practice adjusted for each variable

	Odds Ratio of practice training status (95% CI)	
	Unadjusted	Adjusted
Socioeconomic Deprivation Score	0.77 (0.65, 0.9)	0.87 (0.74, 1.04)
Practice list size	–	1.26 (1.21, 1.32)

further at characteristics of individual practices that have started or stopped training over this period, which may have been valuable.

Another limitation is that the only two variables measured were practice size and socioeconomic deprivation score, it is likely that there are other significant factors that will affect postgraduate training status. Practice list size does not account for factors such as the numbers of patients for every full-time GP, personal enthusiasm for training within a practice or other activities practices carry out that may also affect training status.

The mean socioeconomic deprivation score is a nationally derived mean, it may be that across different geographical training programmes the difference in socioeconomic deprivation score between training and non-training practices will vary. In areas where socioeconomic deprivation is more prevalent, for example, there may be less of a difference in mean socioeconomic deprivation score between training and non-training practices.

Comparison with existing literature

Practice size remains a significant predictor of training status, consistent with previous research (3,17). It is likely there are several reasons for the lower participation rates of practices in socioeconomically deprived areas in undertaking GP speciality training. It is not clear whether this is related to the generic barriers to undertaking GP training identified in the literature (such as time, workload, and finance) (25–33), or whether there are specific factors that influence the decision to train in areas of high socioeconomic deprivation. There is a paucity of literature that examines the views of GPs working in areas of high socioeconomic deprivation on training. Early exploratory qualitative work carried out alongside this work (34) suggests that lack of time and overwhelming workload are key issues why practices in areas of high socioeconomic deprivation choose not to train, although support to develop a training culture may enable some to do so.

It is interesting that patients rate GP attitudes highly in training practices, but also in practices with smaller list sizes (35). It may be that trainees could benefit from exposure to practices with smaller list size during their training. Targeting practices in more socioeconomically deprived areas may be one way to ensure GP trainees can get exposure to a wide variety of environments.

Implications and further research

Although socioeconomic deprivation is now not a significant predictor of training once practice size is accounted for, the mean socioeconomic deprivation score remained relatively static: the average socioeconomic deprivation score for training practices remains significantly more affluent than for non-training practices. This suggests that the majority of training practices serve relatively socioeconomically affluent areas so that trainees remain less likely to get exposure to populations living in areas of high socioeconomic

deprivation in their training. The lack of availability of training placements in areas of high socioeconomic deprivation for GP speciality trainees may limit educational exposure, knowledge and skills in dealing with a significant proportion of the national population.

These results should inform how GP placements are best organized to ensure appropriate exposure, and identify local gaps in individual programmes, important for future workforce planning, particularly when demand for GPs outstrips supply. This could involve redesigning training programmes to ensure all trainees get some time in areas of high socioeconomic deprivation. Further research looking at how organisations responsible for GP training can best support smaller practices (particularly in under-represented areas) who are keen to train, may also be of value. New models of training could also be considered: for example, smaller practices who feel they do not have capacity to support a trainee full time may be able to provide valuable clinical experience via a hub and spoke model with a larger training practice (36).

There has been an increase in the proportion of the most socioeconomically deprived quartile of practices training over the study period. It is unclear the extent to which policies or practical initiatives, such as 'GPs at the Deep End' or the SPESC programme, have driven this change, but there are encouraging signs from the Scottish experience that a difference can be made in the distribution of training practices, and in improving representation in under-served areas. Further investment in initiatives such as 'GPs at the Deep End', and SPESC may be worthwhile.

There is little literature looking at why GPs in areas of high socioeconomic deprivation choose to train and further research to better understand this may allow training bodies to more effectively improve participation rates.

Conclusion

GP practices in socioeconomically affluent areas remain more likely to train, which is related to larger practice list sizes in these areas. To ensure a wide variety of training environments, training bodies should target, and support, smaller practices working in more socioeconomically deprived areas

Declaration

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Ethical approval: As this was an evaluation of an educational service, the authors considered formal ethical approval was not required. This was confirmed by advice from the NHS Research Ethics Committee.

Conflict of interest: MM is a member of the steering group for the GPs at the Deep End group in Scotland.

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