

## ORIGINAL RESEARCH

# How do the working lives of general practitioners in rural areas compare with elsewhere in Scotland? Cross-sectional analysis of the Scottish School of Primary Care National GP Survey

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## ETHICS APPROVAL

The survey was assessed as not requiring ethical approval by the National Health Service (NHS) or the University of Glasgow MVLS College Ethics Committee.

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## ABSTRACT:

**Introduction:** Like many countries around the world, Scotland faces a shortage of general practitioners (GPs) due to both

recruitment and retention issues. Such workforce shortages are of particular concern in rural areas. There are many reasons why GPs are leaving general practice; however, satisfaction with working life is an important predictor of GP retention. It is important, therefore, to understand working life satisfaction of rural GPs. The purpose of this study was to compare the working lives and intentions to reduce work participation of rural GPs and GPs working elsewhere in Scotland.

**Methods:** This study was a quantitative analysis of survey data from the Scottish School of Primary Care national working lives survey. GPs were classified as working in 'non-rural' or 'rural' practices based on the Scottish Government's rural binary classification system, and were compared using univariate and multivariate statistical analysis on four domains of working lives: job satisfaction, job stressors, positive and negative job attributes, and four intentions to reduce work participation: reducing working hours, working abroad, leaving direct patient care and leaving medical work entirely.

**Results:** A total of 2465 GPs returned the survey, giving a response rate of 56%. Three-hundred and forty seven GPs who returned the survey worked in practices in rural areas (14.1%). Rural GPs were more likely to do out-of-hours work ( $p < 0.001$ ), to have worked in their practice for fewer years ( $p = 0.014$ ), to work in single-GP partnerships ( $p < 0.001$ ), and to work in practices with smaller list sizes ( $p < 0.001$ ), than GPs in non-rural settings.

Compared with GPs elsewhere, rural GPs reported higher mean job

**Keywords:** career intentions, gender, GP, job satisfaction, Scotland, working lives.

satisfaction (5.23 v 5.39, respectively;  $p < 0.005$ ), lower mean job stressors (3.58 v 3.29;  $p < 0.001$ ) and lower mean negative job attributes (4.08 vs 3.78;  $p < 0.001$ ). These differences remained highly significant after controlling for potential confounders (age, gender and the differences in work practices shown above). In regression analysis, a significant interaction was found between gender and rurality for job satisfaction ( $p = 0.008$ ), which indicated that rural female GPs' higher job satisfaction mainly accounted for rural GPs' increased job satisfaction. No significant interaction was found between gender and rurality for the other domains of working lives. Compared with GPs elsewhere, however, rural GPs were more likely to intend to work abroad (mean 1.39 v 1.55;  $p = 0.013$ ) and leave medical work entirely within 5 years (mean 2.15 v 2.36;  $p = 0.039$ ). These intentions remained significant after controlling for potential confounders. No significant interaction was found between gender and rurality for variables for intentions to reduce work participation.

**Conclusion:** Rural GPs in Scotland are more satisfied with their working lives than GPs working elsewhere in Scotland, which is mainly due to higher job satisfaction in female GPs in rural areas. Despite this, rural GPs as a whole have a higher intention to leave their job in the next 5 years than their non-rural counterparts. Although some of these differences are small, they may signal serious implications for the future care of patients in rural areas and require further research to understand the drivers of this.

## FULL ARTICLE:

### Introduction

In their landmark report *Primary health care – now more than ever*, WHO acknowledged the vital importance of primary care in tackling global health problems and urged significant investment in the health workforce<sup>1</sup>. Despite this, there is still a concerning shortage of primary care providers in both developed and developing countries around the world, particularly in rural areas<sup>2</sup>.

In the UK, general practitioner (GP) workload has grown in volume and complexity due to an increasing rate of multimorbidity, an ageing population and work being increasingly moved from hospitals to primary care<sup>3-5</sup>. This increased GP workload, combined with a shortage of GPs due to recruitment and retention issues, has caused a crisis in the general practice workforce<sup>6,7</sup>.

Poor retention of GPs is a complex problem. Recent data in Scotland show the number of full-time equivalent (FTE) GPs decreased by 160 in just a few years, from 3735 in 2013 to 3575 in 2017<sup>8</sup>. GP numbers are declining as more GPs are leaving to take career breaks, work abroad or retire early<sup>9</sup>. Although there are many reasons why GPs are leaving general practice, including the increasing workload, financial issues and fears of litigation, job satisfaction is considered the main predictor of GP retention<sup>9-11</sup>.

Many individual factors are associated with increased GP job

satisfaction including variety of work, workplace autonomy, satisfaction with colleagues and recognition for work<sup>12,13</sup>. Certain practice characteristics have been linked to increased job satisfaction, including a good workplace culture and coordination with secondary care<sup>14,15</sup>. Many factors are associated with decreased GP job satisfaction, including remuneration, hours of work, administrative tasks and poor physical working conditions<sup>15,16</sup>. Job stress is associated with decreased job satisfaction, and poor physical and mental health of physicians<sup>12,17</sup>. This in turn makes GPs more likely to provide suboptimal patient care, reduce their workload and leave general practice<sup>9,11,18</sup>.

Scotland is the most rural nation in the UK, with 17.2% of its population living in either accessible rural, remote rural or very remote rural areas<sup>19</sup>. Many challenges are associated with rural general practice, which are well described in the literature<sup>20</sup>. These challenges have caused many rural areas in Scotland to have the steepest declines in full-time equivalent GP numbers<sup>8</sup>.

After a poll of GPs in 2017, a new General Medical Services (GMS) contract was introduced in Scotland in 2018<sup>21</sup>. In rural areas, concerns were raised in terms of it negatively impacting primary care services, shared by both patients and doctors alike<sup>22</sup>. The contract confirmed the removal of the Quality and Outcomes Framework and introduced GP 'clusters': professional groupings of

practices, which work together to drive improvement. The new contract also seeks to expand the multidisciplinary primary care team to help reduce GPs' workload and it introduced a new funding formula, which aimed to better reflect practice workload and to ensure practice income stability<sup>21</sup>.

It is vital to understand what affects the job satisfaction of rural Scottish GPs and how this differs with non-rural GPs, to maximise the effectiveness of strategies to improve GP retention across the whole of Scotland. This article's aim is to compare job satisfaction, job stressors, job attributes and intentions to reduce work participation between rural and non-rural Scottish GPs.

## Methods

### *Design and setting*

Data for both rural and non-rural GPs were taken from the Scottish School of Primary Care National GP survey, using validated measures of job satisfaction, stressors and attributes<sup>23</sup>.

### *Participants*

The Scottish School of Primary Care survey was posted to all 4371 Scottish GPs in July 2018, with two follow-up reminder mailings with extra copies of the questionnaire sent in August and September 2018. The initial mailing in July included the option of completing the survey online, and two additional email reminders with the link to the online survey were sent in August. A total of 2465 GPs responded, giving a 56% response rate and a nationally representative sample of Scottish GPs<sup>23</sup>.

Each GP was asked to give their practice code or name. This then allowed each GP's rurality to be defined from the practice location using the Scottish Government Urban Rural Classification on a scale of 1–8<sup>24</sup>. Classes 1–5 represent settlements with populations of >3000; classes 6, 7 and 8 represent accessible rural areas, remote rural areas and very remote rural areas, respectively, all of which are areas with a population of <3000. This eight-fold classification can be simplified to six-fold, three-fold and two-fold classifications<sup>24</sup>. For this study, the two-fold classification system would be used, as a binary grouping is much less complicated in the analysis and subdividing classes 6–8 would have reduced the sample size for the rural groupings. As per the two-fold classification, GPs who worked in a practice in classes 6–8 were categorised as rural GPs, and GPs working in practices in classes 1–5 were categorised as non-rural GPs<sup>24</sup>.

### *Outcome variables*

The Scottish School of Primary Care survey featured questions on four related domains of working lives: job satisfaction, job stressors, positive job attributes and negative job attributes, as well as questions on intentions to reduce work participation.

**Domains of working lives:** Job satisfaction was measured using questions about satisfaction with 10 different aspects of work, each of which were rated on a seven-point scale: 1 ('extremely dissatisfied') to 7 ('extremely satisfied')<sup>25</sup>. The answers were

averaged to give a mean job satisfaction score in the range of 1–7.

Job stressors were measured after asking participants about pressure they experienced from 13 different job stressors. Pressure from each job stressor was rated on a five-point scale: 1 ('no pressure'), 2 ('slight pressure'), 3 (neutral), 4 ('considerable pressure') and 5 ('high pressure'). The answers were averaged to give a mean job stressor score in the range of 1–5.

Positive job attributes were measured by asking participants to rate how strongly they agreed with nine statements relating to desirable job aspects. Similarly, negative job attributes were measured by asking participants to rate how strongly they agreed with four statements relating to undesirable job aspects. Each job attribute was rated on a five-point scale, where 1 is 'strongly disagree', 2 is 'disagree', 3 is 'neutral', 4 is 'agree' and 5 is 'strongly agree'. The answers were averaged to give mean positive and negative job attribute scores in the range of 1–5.

**Intentions to reduce work participation:** GPs' intentions to reduce work participation were measured using four questions asking how likely they were in the next 5 years to reduce their work hours, leave medical work entirely, leave direct patient care or to continue medical work but outside the UK (to work abroad). All four questions are considered separate outcomes and were measured on a five-point scale where 1 is 'none', 2 is 'slight', 3 is 'moderate', 4 is 'considerable' and 5 is 'high'.

The details of the domains of working lives and intention to reduce work participation are also stated by Hayes et al<sup>23</sup> in their article, which compared data from the Scottish School of Primary Care survey to data from a similar survey of GPs in England.

### *Statistical analysis*

Frequencies were run on all variables to check the data were clean and coded correctly. Differences in characteristics between rural and non-rural GPs were analysed using the  $\chi^2$  test of association. This test was used because it tests whether there is a relationship between two variables, which each consist of two or more independent, categorical groups. Mean average scores for the domains of working lives were calculated and the independent samples *t*-tests were used to compare these between rural and non-rural GP groups because the mean average scores for the domains of working lives were continuous variables with normal distribution. The Mann–Whitney *U*-test was used to compare scores for the intention to reduce work participation questions between rural and non-rural GP groups because the variables for intention to reduce work participation were ordinal with a non-parametric distribution.

Linear regression analysis was conducted on the mean domain of working lives scores and intention to reduce work participation scores to test if GP age, GP gender and any differences found between the two groups in terms of GP demographics had any effect. In this article, the criteria for a result (dependent variable) to be considered significant was  $p < 0.05$ . The regression analysis included any demographic variables significant at the  $p < 0.1$  level,

to ensure all potential independent predictors were controlled for<sup>26</sup>. The enter method was used for the linear regression because there were a small number of predictors, and it was not known which independent predictor would create the best prediction equation. An interaction variable between gender and rurality was added to the regression analysis to see if gender affected the association between rurality and working lives and intentions to reduce work participation. All analyses were conducted using the Statistical Package for the Social Science v25 (IBM; <https://www.ibm.com/docs/en/spss-statistics/25.0.0>).

## Results

### GP and practice characteristics

Out of the 2465 GPs who responded, 2432 (95%) gave information that allowed the classification of their practice. Out of these 2432 GPs, 2085 (85.7%) were classified as non-rural GPs and 347 (14.3%) were classified as rural GPs, according to the Scottish Government's binary classification. Table 1 shows that, among GPs from rural and non-rural practices, there were no significant differences in the age, gender or proportion of GPs who are GP practice partners. Compared to non-rural GPs, rural GPs were significantly more likely to have been at their practice for fewer years, to work in smaller practices and to do out-of-hours work, and less likely to work in a multiple GP partnership (Table 1).

**Table 1: Characteristics of rural GPs compared to non-rural GPs in Scotland (n=2465)**

GP/practice characteristic <sup>†</sup>	Non-rural (n (%))	Rural (n (%))	p <sup>‡</sup>
Age, years (n=2275, missing=190)			0.302
≤40	603 (30.9)	92 (28.6)	
41–50	649 (33.2)	100 (31.1)	
>50	701 (35.9)	130 (40.4)	
Gender (n=2424, missing=41)			0.947
Male	864 (41.6)	145 (41.8)	
Female	1213 (58.4)	202 (58.2)	
Ethnicity (n=2374, missing=91)			0.089
White Caucasian	1892 (92.6)	314 (95.2)	
Other	152 (7.4)	16 (4.8)	
GP position (n=2413, missing=52)			0.276
Practice partner	1750 (84.6)	284 (82.3)	
Other	318 (15.4)	61 (17.7)	
Years at current practice (n=2432, missing=33)			0.014
≤5	692 (33.2)	128 (36.9)	
5.5–10	299 (14.3)	68 (19.6)	
10.5–15	302 (14.5)	43 (12.4)	
15.5–20	285 (13.7)	45 (13.0)	
>20	507 (24.3)	63 (18.2)	
Sessions worked per week (n=2419, missing=46)			0.091
<7	920 (44.4)	171 (49.3)	
≥7	1152 (55.6)	176 (50.7)	
Practice list size (n=2432, missing=33)			<0.001
<5000	398 (19.1)	242 (69.7)	
5000–10 000	1153 (55.3)	94 (27.1)	
>10 000	534 (25.6)	11 (3.2)	
Does out-of-hours work (n=224, missing=41)			<0.001
Yes	462 (22.2)	109 (31.5)	
No	116 (77.8)	237 (68.5)	
Practice type (n=2425, missing=40)			<0.001
Multiple-GP partnership	1905 (91.6)	285 (82.4)	
Single-GP partnership	103 (5.0)	37 (10.7)	
Other	71 (3.4)	24 (7.0)	

<sup>†</sup> Percentages of missing data were broadly similar (missing=1.3–7.7%).

<sup>‡</sup> Values from  $\chi^2$  test of association.  
GP, general practitioner.

### Comparison of working lives between rural and non-rural GPs

In unadjusted (univariate) analysis, rural GPs in Scotland reported significantly higher mean job satisfaction than non-rural GPs (Table 2); rural GPs were significantly more satisfied with the amount of free choice ( $p=0.008$ ), recognition ( $p<0.001$ ) and responsibility they get in their jobs ( $p=0.018$ ) (Fig1). Rural GPs were also significantly more satisfied than non-rural GPs with remuneration ( $p=0.002$ ), variation ( $p<0.001$ ) and opportunities available in their jobs ( $p<0.001$ ) (Fig1).

Rural GPs reported significantly lower mean job stressors than non-rural GPs (Table 2), with significantly less pressure from job stressors relating to patient demands ( $p<0.001$ ), time ( $p<0.001$ ), administrative tasks ( $p<0.001$ ), earlier hospital discharges

( $p<0.001$ ), unrealistically high expectations by others ( $p<0.001$ ), and adverse publicity from the media ( $p<0.001$ ) (Fig1).

Overall, both groups reported similar mean positive job attribute statements (Table 2). However, compared to non-rural GPs, rural GPs had significantly better scores relating to variety and autonomy: 'My job provides me with a variety of interesting things' ( $p=0.002$ ), 'I have a choice in deciding how I do my job', ( $p=0.003$ ) and 'I have a choice in deciding what I do at work' ( $p=0.006$ ) (Fig1).

Rural GPs also reported lower mean negative job attributes than non-rural GPs (Table 2) and agreed significantly less with each of the four negative job attribute statements ( $p<0.001$ ) (Fig1).

Univariate analysis also revealed that rural female GPs reported

higher mean job satisfaction than male rural GPs (mean difference=0.43,  $p<0.001$ ). Rural male GPs had very similar mean job satisfaction scores to non-rural male GPs (means=5.15, 5.19) (Table 4).

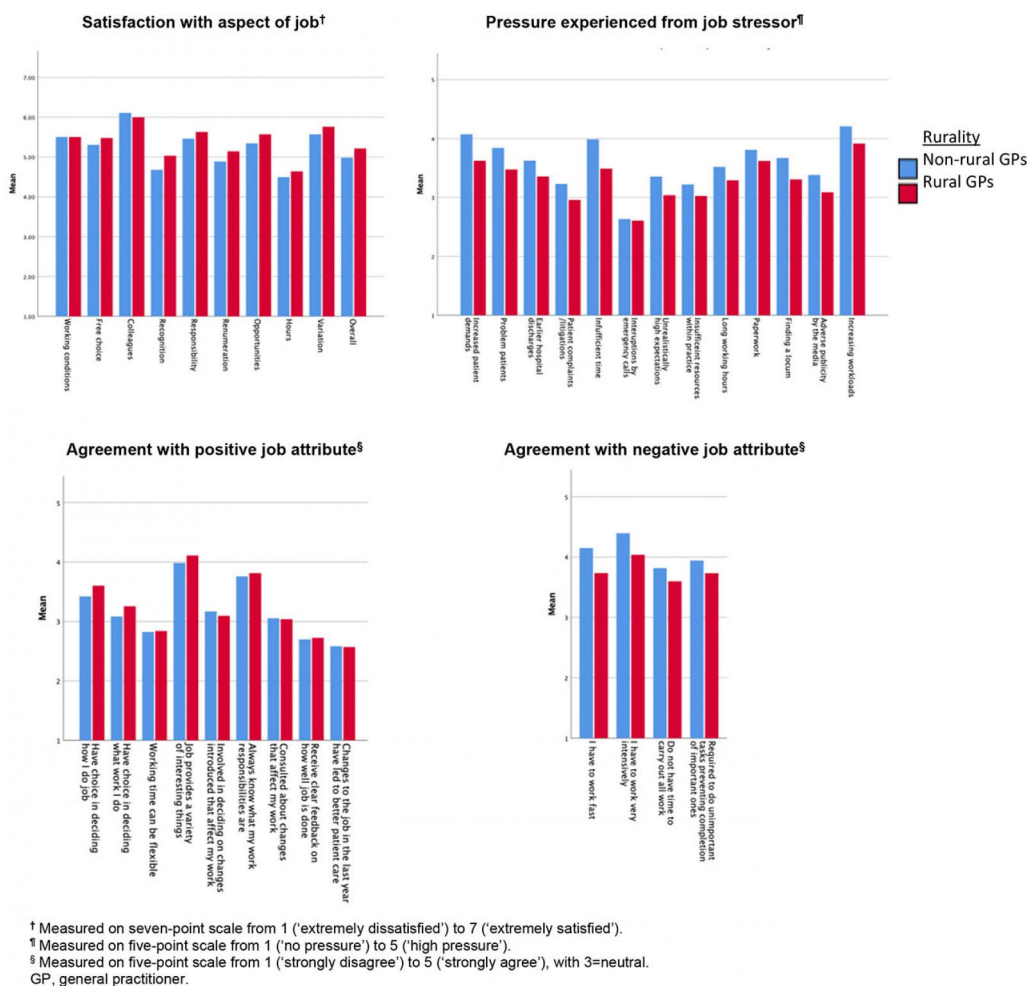
These apparent differences between the two groups of GPs found in the univariate analyses were explored in adjusted (multivariate) analysis, to control for potentially confounding factors between GPs in rural and non-rural areas. Adjusted analysis revealed that

compared with GPs in non-rural settings, GPs in rural areas had higher mean job satisfaction ( $p=0.003$ ), (Supplementary table 1). An interaction variable between gender and rurality was added into the regression model, which showed a significant interaction between GP gender and rurality in mean job satisfaction ( $\beta=0.093$ ,  $p=0.008$ ). No significant interactions were found between GP gender and rurality for the other three domains of working lives (job stressors,  $p=0.113$ ; positive job attributes,  $p=0.090$ ) and negative job attributes,  $p=0.053$ ).

**Table 2: Domains of working lives mean scores for non-rural GPs v rural GPs in Scotland (n=2465)**

Domain <sup>†</sup>	Non-rural GPs (mean (SD))	Rural GPs (mean (SD))	$p^{\ddagger}$
Job satisfaction (n=2373, missing=92) <sup>¶</sup>	5.23 (0.97)	5.39 (1.06)	0.005
Job stressors (n=2370, missing=95) <sup>§</sup>	3.58 (0.75)	3.29 (0.74)	<0.001
Positive job attributes (n=2387, missing=78) <sup>‡</sup>	3.18 (0.58)	3.23 (0.56)	0.119
Negative job attributes (n=2373, missing=92) <sup>‡</sup>	4.08 (0.62)	3.78 (0.71)	<0.001

<sup>†</sup> Missing data account for 3.2–3.9% of all data.  
<sup>¶</sup> Measured on seven-point scale from 1 ('extremely dissatisfied') to 7 ('extremely satisfied').  
<sup>§</sup> Measured on five-point scale from 1 ('no pressure') to 5 ('high pressure').  
<sup>‡</sup> Measured on five-point scale from 1 ('strongly disagree') to 5 ('strongly agree'), with 3=neutral.  
<sup>¶¶</sup> Values from independent sample t-tests, comparing the difference in mean scores of non-rural and rural GPs.  
 GP, general practitioner. SD, standard deviation.



**Figure 1: Scottish GPs' mean scores for individual questions on the domains of working lives in rural and non-rural settings.**

**Intentions to reduce work participation**

In unadjusted (univariate) analysis, rural GPs were more likely to anticipate that they would work abroad or leave medical work

entirely in the next 5 years than non-rural GPs. There were no significant differences between rural and non-rural GPs for intentions to reduce their work hours or leave direct patient care in the next 5 years (Table 3). Univariate analysis also found male GPs

were more likely than female GPs to reduce their hours, work abroad and leave direct patient care in the next 5 years in both rural groups ( $p=0.048, 0.018, 0.008$ , respectively) and non-rural groups ( $p<0.001$ ) (Table 4).

After controlling for other potential independent predictors in adjusted (multivariate) analysis, working in a rural area remained

positively associated with likelihood to work abroad and to leave medical work entirely in the next 5 years (Supplementary table 2).

However, no significant interaction was found between GP gender and rurality for intentions to reduce work participation by reducing work hours, working abroad, leaving direct patient care or leaving medical work entirely ( $p=0.552, 0.154, 0.742, 0.927$ , respectively).

**Table 3: Intentions to reduce work participation of non-rural GPs v rural GPs in Scotland**

Intention to reduce work participation <sup>†</sup>	Non-rural GPs (mean (SD))	Rural GPs (mean (SD))	$p^{\ddagger}$
Likelihood to reduce your work hours in next 5 years (n=2378, missing=87)	2.80 (1.56)	2.86 (1.62)	0.644
Likelihood to work abroad in next 5 years (n=2355, missing=110)	1.39 (0.81)	1.55 (1.01)	0.013
Likelihood to leave direct patient care in next 5 years (n=2383, missing=82)	2.26 (1.52)	2.41 (1.58)	0.098
Likelihood to leave medical work entirely in next 5 years (n=2395, missing=70)	2.15 (1.52)	2.36 (1.59)	0.009

<sup>†</sup> Measured on five-point scale from 1 (none) to 5 (high). Missing data account for 2.8–4.5% of data.

<sup>‡</sup> Mann-Whitney U-tests comparing scores of non-rural and rural GPs.

GP, general practitioner. SD, standard deviation.

**Table 4: Domains of working lives and intention to reduce work participation mean scores of male and female GPs working in non-rural and rural areas of Scotland**

	Domain	Rurality (n)	Male GPs (mean (SD))	Female GPs (mean (SD))	$p^{\text{¶}}$
Domain of working lives	Job satisfaction <sup>†</sup>	Non-rural (2024)	5.19 (1.00)	5.27 (0.94)	0.088
		Rural (341)	5.15 (1.18)	5.58 (0.92)	<0.001
	Job stressors <sup>‡</sup>	Non-rural (2023)	3.56 (0.77)	3.60 (0.74)	0.253
		Rural (339)	3.33 (0.77)	3.26 (0.72)	0.392
	Positive job attributes <sup>§</sup>	Non-rural (2035)	3.21 (0.59)	3.15 (0.56)	0.026
		Rural (344)	3.20 (0.58)	3.25 (0.54)	0.444
Negative job attributes <sup>§</sup>	Non-rural (2055)	4.04 (0.66)	4.10 (0.59)	0.057	
	Rural (344)	3.82 (0.73)	3.75 (0.69)	0.067	
Intention to reduce work participation <sup>‡</sup>	Likelihood to reduce your work hours in the next 5 years	Non-rural (2035)	3.14 (1.59)	2.56 (1.49)	<0.001
		Rural (337)	3.07 (1.64)	2.71 (1.60)	0.048
	Likelihood to work abroad in the next 5 years	Non-rural (2012)	1.47 (0.90)	1.33 (0.74)	<0.001
		Rural (337)	1.71 (1.13)	1.44 (0.89)	0.018
	Likelihood to leave direct patient care in the next 5 years	Non-rural (2038)	2.50 (1.61)	2.07 (1.43)	<0.001
		Rural (339)	2.66 (1.63)	2.22 (1.52)	0.008
	Likelihood to leave medical work entirely in the next 5 years	Non-rural (2045)	2.36 (1.62)	1.98 (1.41)	<0.001
		Rural (344)	2.56 (1.66)	2.23 (1.52)	0.060

<sup>†</sup> Measured on seven-point scale from 1 ('extremely dissatisfied') to 7 ('extremely satisfied').

<sup>‡</sup> Measured on five-point scale from 1 ('no pressure') to 5 ('high pressure').

<sup>§</sup> Measured on five-point scale from 1 ('strongly disagree') to 5 ('strongly agree').

<sup>‡</sup> Measured on five-point scale from 1 (none) to 5 (high).

<sup>¶</sup> Values comparing the difference in scores of the male and female non-rural or rural GPs.

GP, general practitioner. SD, standard deviation.

## Discussion

In a large and nationally representative survey of GPs' working lives in Scotland the authors found important differences between GPs working in rural and non-rural settings. GPs in rural areas reported significantly higher job satisfaction, lower job stressors and lower negative job attributes compared with GPs in non-rural settings. However, this overall higher job satisfaction was due to rural female GPs' high job satisfaction scores. Rural GPs were, however, more likely to intend to work abroad and leave medical work entirely within 5 years than non-rural GPs, and this was not related to gender.

The reasons behind this surprising finding that higher job satisfaction was linked to a higher intention to move or quit in

rural areas can only be surmised. GPs in rural areas were significantly more satisfied with their remuneration than those in non-rural areas, and it is possible that rural GPs have higher earnings and/or the cost of living is lower than in more non-rural settings, and thus they can financially afford to retire earlier. According to various media reports, many rural GPs also had concerns over the new Scottish General Medical Services (GMS) contract when it was first introduced which perhaps made them more likely to consider early retirement. Other possible reasons may be unrelated to work per se, such as family life and geographical isolation.

Recent research has found that patients in rural areas of Scotland are more satisfied with their GP practice than patients in non-rural

areas, and this trend has stayed consistent for over a decade<sup>27</sup>. Patients in rural areas were more satisfied with their practice in terms of continuity of care and aspects of patient-centred care, particularly the amount of time they were given when seeing their GP<sup>27</sup>. This higher patient satisfaction in rural areas may also contribute to rural GPs' increased job satisfaction. Alternatively it might suggest that rural patients are generally less demanding, which is supported by the present study's finding that, compared to other GPs, rural GPs experience significantly less pressure from increased demands from patients.

Some 20 years ago, Simoens et al<sup>16</sup> analysed survey data from 802 GPs in Scotland using the same measures of job satisfaction and similar measures of job stressors and intentions to quit as the present study used. GPs appeared to be more satisfied across the measures of job satisfaction in 2018 than they were in 2001. However, research suggests GP job satisfaction increases after the introduction of a new contract<sup>28</sup>, and the current survey was conducted soon after the introduction of the new GMS contract in April 2018. Simoens et al found no difference in job satisfaction or stressors between rural and urban GPs<sup>16</sup>; however, comparisons are limited due to the differences in sample size and the classification of rurality used in the two studies.

Research across many western countries has found GPs who work in rural areas are often more satisfied than their urban counterparts, and some research has attributed rural GPs' increased job satisfaction to them carrying out a larger range of activities than urban GPs<sup>12,15,29,30</sup>. The present study's findings corroborate these previous findings. Research by Ulmer and Harris<sup>30</sup> found that rural GPs in Australia were more satisfied than urban GPs using the same measures of job satisfaction as the present study. Research in Australia by Gardiner et al<sup>31</sup> found 52.7% of rural GPs surveyed had seriously considered leaving rural general practice in the previous 2 years. In comparison, only 26.7% of rural GPs in the Scottish School of Primary Care survey reported the likelihood of them leaving medical work entirely in the next 5 years as 'considerable' or 'high', suggesting the rural GP retention rate may be higher in Scotland than in Australia.

The strengths of the present study include the relatively high survey response rate of 56% of all GPs in Scotland, which is higher than most previous studies. Given the respondents were nationally representative in terms of age, gender and practice deprivation,

the findings may be generalisable to the Scottish GP workforce. Another strength is the use of validated measures for the domains of working lives. The main weakness of this article is that the cross-sectional design of the survey means causal inferences should only be drawn with great caution. A second potential weakness is that data relating to some factors, such as GPs' mental health, remuneration and relationships with patients, were not gathered, and these may have influenced the findings if they had been included in the survey, especially as these have been found in previous work to affect GP job satisfaction<sup>12,13,32</sup>. Finally, statistical significance does not necessarily equate with meaningful differences, and many of the differences in mean scores were of a rather small magnitude. However, job stressors and negative job attributes showed differences of moderate magnitude (a third to almost a half of standard deviation), and thus are likely to be meaningful in practice.

The COVID-19 pandemic has profoundly changed the way GPs and patients interact together, with many more phone, video and email consultations now being held<sup>33</sup>. The data used in this article were collected before the COVID-19 pandemic began, so future research is needed to explore how the COVID-19 pandemic has affected the working lives of Scottish GPs, and whether it has affected rural and non-rural GPs differently.

## Conclusion

This study identified significant differences in working lives between rural and non-rural GPs in Scotland. After controlling for these differences, rural GPs were more satisfied, experienced less pressure from job stressors and were happier with most of the aspects of their job compared to non-rural GPs; yet rural GPs were more likely to intend to leave medical work entirely in the next 5 years. Further analysis showed rural GPs' increased job satisfaction can be attributed to female rural GPs' increased job satisfaction. Although some of these differences are small, they may signal serious implications for the future care of patients in rural areas. These findings also corroborate research conducted across the world finding that rural GPs are more satisfied despite the challenges of rural general practice. Future research should explore why rural GPs are more likely to leave despite higher job satisfaction and how the new GMS contract and COVID-19 has affected the working lives of GPs in Scotland.

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