A man's blessing or a woman's curse? The family-earnings gap of doctors*

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Abstract

We examine the size and determinants of the family-earnings gap for Australian general practitioners (GPs). Female GPs with children earn over A\$30,000 less than comparable female GPs without children, while male GPs with children earn over A\$45,000 more than comparable male GPs without children. The main determinants of the family gap are differences in observable characteristics such as working hours, labor force attachment, and demographics, and additionally, for men, entrepreneurship and practice size. A fixed effects extension of the analysis confirms both the carer effect of children on female GPs and the breadwinner effect of children on male GPs.

JEL classification: J12, J16, J24.

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1 Introduction

Women constitute an increasingly large share of medical graduates and the physician workforce. In the US in 2010, women represented 48% of all graduates in medicine compared to less than 7% in 1965 (Leadley and Sloane, 2011). In the UK in 2010, 56% of all admissions into medical school were women. Today, 42% of all registered doctors are women, and Elston (2009) predicts that women will make up 55% of the workforce at some point between 2017 and 2022. In Australia, over 60% of medical graduates and 35.7% of practicing doctors are women (Australian Institute of Health and Welfare, 2011).

Despite the feminization of the medical workforce, significant wage differentials between men and women are surprisingly common in this high-skilled occupation. The gender-earnings gap for physicians in the US has been estimated to be up to 45% (Kehrer, 1976; Langwell, 1982; Ohsfeldt and Culler, 1986; Shih and Konrad, 2007; Weeks, Wallace and Wallace, 2009; Lo Sasso et al., 2011; Jagsi et al., 2012; Esteves-Sorenson and Snyder, 2012). Wide gaps of 32%, 24%, and 30% have also been reported in Austria (Theurl and Winner, 2011), Australia (Cheng et al., 2011), and England (Gravelle, Hole and Santos, 2011), respectively.

This paper begins from the observation that Australian female general practitioners (GPs) earn 24% less than male GPs of similar characteristics (Cheng et al., 2011). Such a large gap is surprising because Australia ranks relatively high in the economic participation and opportunity ranking of the latest Global Gender Gap Report 2013 (World Economic Forum, 2013). Many previous studies discuss the gender-earnings gap on GPs in the light of discrimination against female practitioners (e.g. Theurl and Winner, 2011; Gravelle, Hole and Santos, 2011; Sasser, 2005). From a theoretical perspective, gender discrimination among GPs is unlikely because of the high

share of women and self-employment. Chen and Chevalier (2012), based on US data, suggest that differences in working hours are the main reason for persisting gender-earnings gaps of doctors.

We contribute to the literature by exploring the hypothesis that the division of labor between men and women in managing family responsibilities drives the large gender-earnings gaps for doctors. Importantly, the division of labor has opposite effects on the labor supply of men and women. Female GPs who give birth are likely to reduce their labor supply at least in the first year following child birth, and often choose more flexible work hours to balance family and work life thereafter - a behavior we refer to as the ‘carer effect’ of having children. Family-earning gaps are particularly common among lawyers and MBA graduates, because these highly-educated women lose human capital during baby breaks (see, e.g. Anderson, Binder and Krause, 2002; Bertrand and Hallock, 2001; Bertrand, Goldin and Katz, 2010; Miller, 2011; Noonan, Corcoran and Courant, 2005; Waldfogel, 1997, 1998; Viitanen, 2012). Bertrand, Goldin and Katz (2010) show that women with children have an eight-months deficit in actual post-MBA experience and work 24% fewer weekly hours than female MBAs without children 15 years after finishing the MBA. Viitanen (2012) finds that the first child is associated with a wage penalty of up to 33% that may persist for 30 years. Yet, the medical labor supply literature pays little attention to the impact of children on female labor supply and earnings. One exception is Sasser (2005) who finds that the presence of children accounts for 39% of the male-female earnings gap and that a child reduces annual earnings among female GPs by almost 20% in the US.

While the carer-effect of children reduces female labor supply and therefore earnings, male GPs increase their labor supply and productivity as a response to children - a phenomenon we refer to as the ‘breadwinner effect’ of children. Since the presence of children increases the family’s demand for goods and services, fathers work longer hours and exert more effort per hour com-

pared to men without children to compensate for the reduction in household income, especially if mothers reduce their working hours to raise children (Hundley, 2000; Lundberg and Rose, 2000; Glauber, 2008; Bertrand, Goldin and Katz, 2010). These opposite labor supply responses by men and women increase the gender-earning gap of this highly qualified group during their prime working years.

In this study, we do not follow the general literature in comparing the earnings of men and women, but focus our analysis on within-gender comparisons. We do so, because of the inherent technical difficulty to separate gender-based discrimination from poorly observed productivity- or labor-force-attachment-related differences in earnings between male and female GPs. This strategy allows us to control for unobservable gender-differences in productivity, practice styles, and self-employment that could otherwise be mistakenly interpreted as gender discrimination.

To test for the presence of the carer and breadwinner effects, we exploit both the cross-sectional and longitudinal dimensions from four waves of the "Medicine in Australia: Balancing Employment and Life (MABEL)" longitudinal survey of Australian doctors. The MABEL survey is the only panel survey of all types of medical practitioners (junior doctors, GPs, and medical specialists) that has followed up respondents for more than two waves. The Community Physician Tracking Survey in the US followed up qualified physicians after two years, but there was only one follow up survey. There are other longitudinal surveys of medical graduate cohorts and doctors in training, but these include young doctors and do not include questions on earnings or family circumstances (Maisonneuve et al., 2014; British Medical Association, 2014).

These exceptionally rich data help us to control for practice settings and styles, personality, career interruptions since graduation, postgraduate qualifications, and partner's labor force status, which influence earnings (or labor supply) but may substantially differ across the sexes and

family status. It is especially important to control for the labor force status of the partner, because female GPs may reduce their labour supply not only because of child-rearing responsibilities, but due to their ability to afford not to work after marrying rich husbands (For evidence on MBA students Bertrand, Goldin and Katz, 2010). Due to the large sample size, we are able to decompose the differences in mean earnings of Australian GPs in the tradition of Oaxaca and Ransom (1994) within the sexes both by family status and age cohorts. In addition, similar to Sasser (2005), we exploit the panel dimension to aid the identification of a causal relationship between having children, earnings, and labour supply.

2 The institutional framework of remuneration of GPs in Australia

The institutions governing remuneration of Australian GPs provide an interesting contrast to the US (for an overview of the Australian system, see Duckett, 2007). GPs in Australia are able to charge patients what the market will bear through the fee-for-service system, and so can influence earnings through changes in both price and volume. The prices charged by US physicians, in contrast, are more likely to be regulated by the fee-schedule of the private or public insurer. GPs in Australia can choose to practise in any location, unless they are from overseas which requires them to practice in areas of workforce shortage. Patients can visit any GP of their choice, so that an entrepreneurial GP seeking to increase his or her patient stock needs to build up a good reputation to attract more patients.

GPs in Australia have complete discretion to set their own fees. The national tax-financed health insurance scheme, Medicare, provides fixed subsidies to patients for four basic types of consultation which increase according to their length and complexity, from Level A to Level D. If GPs choose to set their fees above the level of subsidy, then patients incur an out of pocket

cost. If GPs choose to set their fees at the same level as the subsidy, then patients incur no out of pocket cost. This is known as 'bulk-billing'. Around 82% of GP visits are bulk-billed, varying between 49% in the Australian Capital Territory, to 86% in New South Wales. GPs have discretion to bulk-bill some patients and not others. Higher subsidies are available if GPs bulk-bill children under the age of 16, concession card holders, patients in certain geographic area. Some practices have distinct practice styles and business models where they bulk-bill all of their patients (i.e., charge a lower price) but see a high volume of patients. Typically, these are in geographic areas of low socio-economic status where price elasticities are higher than in more affluent areas, and so revenue depends more on volume. This may also be for reasons of lower administrative costs as many bulk-billing practices are owned by commercial companies rather than by partnerships of GPs. Alternatively, practices may bulk-bill only a small proportion of their patients (i.e., charge higher prices) and see a lower number of patients, typically in more affluent areas (Gravelle et al., 2014).

The government supplies additional grants and payments to practices through the Practice Incentives Program, which includes incentive payments for managing diabetes and asthma, providing cervical screening, and being located in a rural area. GPs who practice in designated areas of workforce shortage, mainly remote and rural areas, are eligible for an additional range of grants and incentive payments. The government also periodically advertises capital infrastructure grants, and has introduced a grant scheme to fund practice nurses.

The vast majority of GPs, 76%, are not practice owners. These GPs work for GP principals and other types of practice owner, and can be paid using a range of methods including salary, a fixed payment per session, or an agreed percentage of billings (Kron, 2012). These GPs have less discretion to control their earnings and work hours.

3 Data

3.1 Samples

We use the first four waves (2008 to 2011) of the Medicine in Australia: Balancing Employment and Life (MABEL) panel survey of Australian doctors. MABEL studies the work and family life of all doctor types such as specialists, GPs, doctors in training and hospital-non-specialists. The survey provides exceptionally rich data on these doctors' qualifications, practice settings, personal characteristics, working conditions, job satisfaction, and family circumstances (Joyce et al., 2010). In 2008, a total of 54,570 doctors (representing the population of all doctors in Australia) across the four broad doctor groups were invited to participate. 10,498 doctors form the baseline cohort in the first wave, which includes 3,906 GPs (with 226 GP registrars), 4,597 specialists, 1,072 specialists-in-training and 924 hospital non-specialists. Subsequent waves included all doctors who had previously completed a survey, plus a new cohort of doctors new to clinical practice (e.g., new interns or doctors recently arrived from overseas) (Taylor et al., 2014).

Joyce et al (2010) find the 2008 cohort to be representative of the overall doctor population with respect to age, gender, geographic location and hours worked. Attrition of the 2008 cohort in 2011 was 34.1%, which is usual for doctor surveys (Potter, Sinclair and Williams, 2001). Attrition in the subsequent cohorts is higher (45%) as these samples largely consist of young doctors who enter the medical workforce and who are harder to follow up as they are geographically more mobile. There is limited evidence of attrition bias in earnings equations using MABEL data (Cheng and Trivedi, 2014).

Our analyses exploit both the cross-sectional and the longitudinal dimensions of MABEL. For the Oaxaca-Blinder decomposition analysis, we pool four waves of data to maximize sample size

in the sub-group analyses. To come closer to identifying a causal breadwinner effect for men and a carer effect for women, we closely follow Sasser (2005) and apply a fixed effects approach exploiting within-GP changes in family circumstances.

We restrict the sample to GPs who work between ten and 70 hours a week and trimmed the earnings distribution by removing the highest and lowest 1% of income earners. We also excluded GPs who work less than half of the year or if the reported number of working hours across different questions in the survey does not match the total number of hours worked. Our estimation sample includes 4,278 male GP-year observations (1,775 individual observations) and 3,860 female GP-year observations (1,657 individual observations). Out of a total of 3,432 individual-GP observations, 20% are present in all four waves, 25% in three waves, 27% in two waves, and 28% are only present in one wave. In the fixed-effects analyses, we have 397 female and 250 male GPs for whom we have complete data in waves 1 and 4.

3.2 Variable definitions

Our main measure of annual earnings is annual real gross earnings expressed in A\$2011. The survey asks GPs about their earnings as follows: “What are your (approximate) TOTAL personal earnings from ALL of the work you do as a doctor? (If possible, base this on your last personal income tax return or payslip) Please write in ONE COLUMN where you have the most accurate information and can best remember.”

Annual earnings is our preferred outcome measure, because hourly wages, which represent the more common measure of productivity, may underestimate the gender-earnings gap or may bias the decomposition (Bashaw and Heywood, 2001; Gravelle, Hole and Santos, 2011; Esteves-Sorenson and Snyder, 2012). These issues arise because hourly wages may decrease non-linearly

with hours worked and at different rates for men and women. Since women generally work fewer hours per week, their hourly wages should be relatively high in comparison to those of men. Figure 1 shows that we observe both phenomena in our data. The figure documents a non-linear decline of hourly wages for female GPs and a linear decline for male GPs. We observe no gender-wage gap at the lowest level of working hours (4-10 hours per week) and a very small gender wage gap for higher levels of hours worked (61-70 hours). Female GPs constitute 80% of all GPs who work between 4 and 30 hours per week. Taken together, using hourly wages as the dependent variable would underestimate the gender earnings gap.

Since we use the logarithm of gross annual earnings as the dependent variable, we include (log) annual hours worked as an explanatory variable to allow for the decreasing marginal return of labor supply (similar to Gravelle, Hole and Santos, 2011; Esteves-Sorenson and Snyder, 2012). We measure labor force attachment with actual years of experience (and its square), and whether the GP took more than one year off since graduation (=1 if yes). Actual work experience is defined as the number of years since graduation from medical school less time spent out of clinical practice.

Though GPs obtain similar training to qualify for registration, some GPs continue their postgraduate education. To capture these differences in human capital, we include the number of postgraduate qualifications, and whether the GP is a fellow of a college.

Differences in practice style have been shown to have an impact on the quality and quantity of consultations a GP provides per week (Bensing, van den Brink-Muinen and de Bakker, 1993). Female GPs tend to have longer consultations and thus treat fewer patients per hour than men (Langwell, 1982; Britt, Valenti and Miller, 2005), take more time per patient to explain medical terminology (Martin, Arnold and Parker, 1998), or are more likely to engage in patient-centred

communication styles (Roter and Hall, 2002, 2004). Sandhu et al. (2009) and Saultz and Lochner (2005) show that doctors with good interpersonal skills have more satisfied patients who comply better with treatment recommendations. Thus, good interpersonal skills may increase demand and earnings for such doctors.

We measure practice style by consultation length (minutes spent per patient) and being on-call. Separately, we proxy market demand for a doctor's services by the length of wait for an appointment with the doctor (number of days) and the fees charged for a standard consultation. The latter reflects at least the Medicare base rate, or any surcharge the patient is willing to pay. These market demand factors could potentially proxy patient discrimination against female doctors, although empirical evidence suggests that female doctors experience, if anything, positive discrimination by female patients (e.g. Godager, 2012; Reyes, 2008).

Interpersonal styles are proxied with a 15-item version of the Big-Five factor model that includes extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (John and Srivastava, 2001). For instance, conscientiousness has been shown to correlate with job performance across all occupations (e.g. Barrick, Mount and Judge, 2001, for a meta-analysis) and women generally tend to be more conscientious and agreeable (see Stake and Eisele, 2010, for an overview). The five scales on the Big Five factor model are composed by taking the average over three items per dimension. Each scale ranges from 1 to 7, with a high score indicating that the personality trait describes the individual very well. In our sample the internal validity of each dimension is comparable to the ones reported in Heineck and Anger (2010) and we treat these traits as exogenous (see Cobb-Clark and Schurer, 2012, for a justification).

To capture access to care, we control for the location in which the GP practises and distinguish between three categories, which use the Australian Standard Geographic Classification of

Rurality: major city, outer regional, inner regional and remote. To control for population needs, we include a measure of the density of GPs by the smallest statistical region available.

Further, we control for whether the GP is self-employed (i.e., principal or associate) or the type of employment contract (i.e., salaried, contracted, locum, or other) if not self-employed. Hundley (2000) shows that gender-earnings differentials are higher for the self-employed than for other occupations because men and women enter self-employment for different reasons: men seek to make money and women want a more flexible job to accommodate household responsibilities. Self-employed GPs are likely to have higher earnings since a portion of their earnings reflect returns to managerial responsibilities and risks taken. In a robustness check we conduct our analysis on employed GPs only to test whether self-employment drives the family gap in earnings.

To allow for the impact of economies of scale and scope, we control for the practice size (solo practice versus 2-3 GPs, 4-5 GPs, 6-9 GPs, 10 plus more GPs). Finally, we control for the gender-mix of the practice by including a variable that indicates whether the respondent works in a mixed or a single sex practice. If discrimination against women is mainly driven by male employers restricting the earnings and promotion opportunities of female doctors, rather than locking out female doctors from high earnings practices, then it can only occur in mixed-gender practices (Gravelle, Hole and Santos, 2011). Since female labor supply is not only driven by fertility decisions, we also control for the labor force status of the husband (e.g. Bertrand, Goldin and Katz, 2010). We include these variables alongside the visa status of a GP, as a proxy for nationality, in the category demographics. See Table 1 for a description of variables contained in each category.

4 Estimation strategy

We first estimate a model of (log) annual gross earnings for the full sample, separately by gender and pooling all age-groups, and then estimate the same model separately by family status and age cohort. Following Oaxaca and Ransom (1994), we then separately decompose earnings for two narrowly defined comparison groups: (1) women with and without children; and (2) men with and without children. For each comparison, we additionally separate the sample into younger (ages ≤ 40) and older (ages > 40) groups to test whether earnings differ by cohorts or over the life cycle. We then assess the contribution of differences in observable characteristics ("explained contribution") and differences in the effects of these characteristics ("unexplained contribution") to the earnings gap.

To decompose the earnings gaps, let $\bar{X}^1 - \bar{X}^2$ be the mean differences in observable characteristics between group 1 and group 2, and $\hat{\beta}^1 - \hat{\beta}^*$ and $\hat{\beta}^* - \hat{\beta}^2$ be the differences in returns to these characteristics (Oaxaca and Ransom, 1994). Thus, the contribution to the difference in average, logarithmatised earnings for group 1 ($\ln \bar{Y}^1$) and group 2 ($\ln \bar{Y}^2$) is:

$$\ln \bar{Y}^1 - \ln \bar{Y}^2 = \overbrace{(\bar{X}^1 - \bar{X}^2)' \hat{\beta}^*}^{\text{Explained contribution}} + \overbrace{[\bar{X}'^1 (\hat{\beta}^1 - \hat{\beta}^*) + \bar{X}'^2 (\hat{\beta}^* - \hat{\beta}^2)]}_{\text{Unexplained contribution}}, \quad (1)$$

In equation (1), the explained contribution captures differences in observed characteristics, whereas the unexplained contribution captures differences in returns to these characteristics and differences in the constant. Assuming that all productivity-related factors are observed, the unexplained contribution contains all unobserved factors that are not productivity-related and is sometimes interpreted as 'discrimination' or as unobserved heterogeneity (Fortin, Lemieux and

Firpo, 2011).

One crucial question is which values to choose for $\hat{\beta}^*$, the coefficient vector of the counterfactual group. Possible candidates are the coefficient vector of the higher-earnings group, of the lower-earnings group, or of a mixed group, which takes the coefficients $\hat{\beta}^*$ from a pooled regression. Using the coefficients of the higher-earnings group assumes that the lower-earnings group is negatively discriminated against. Using the coefficients of the lower-earnings group assumes that the higher-paid group is positively favoured in the labor market. Neither of these two assumptions appear compelling in our context. Since we compare men (or women) with and without children, we cannot a priori assume that one group or the other is discriminated against or favoured on the basis of having a child. Using the lower-income group coefficients usually underestimates the explained part of the decomposition (e.g. Bertrand and Hallock, 2001), which is also true in our empirical setting. We therefore follow the literature and use the mixed group counterfactual assuming no discrimination (Albrecht, Bjorklund and Vroman, 2003; Boden and Galizzi, 2003; Gittleman and Wolff, 2004). To avoid biasing the estimated coefficients of β^* , that could overestimate the explained differences in earnings, we include a group dummy in the pooled regression (see Elder, Goddeeris and Haider, 2010). Further, to make the decomposition results invariant to the choice of the omitted base category of the dummy variable indicators, we apply the deviation-contrast transform (Gardeazabal and Ugidos, 2004; Yun, 2005*a,b*). Since we pool four waves of data in the decomposition analysis, we apply clustered standard errors in all estimation models and control for year fixed effects.

Using annual earnings as the outcome measure and controlling for hours is only valid under the strong assumption that hours of work are exogenous. Following Gravelle, Hole and Santos (2011), we formally test this assumption and also find that it is valid for men, but not for women

(test results are available upon request). We find no convincing identification strategy to solve the concern for women. The standard available instrument for hours worked, i.e. age of youngest dependent child (e.g. Gravelle, Hole and Santos, 2011), may not necessarily be valid, although it appears to be a very strong instrument in our data (F-test statistics are 76.3 for women and 36 for men). To be a valid instrument, we would need to convincingly argue that the presence of a young child only influences work hours, but that it has no independent effect on the earnings (potential), e.g. through productivity. In addition, the instrument is unsuitable for our sub-group analysis because these groups are identified on the basis of family status, leaving no variation in our instrument for childless GPs. The best we can do is to test the sensitivity of our benchmark results from the pooled model to the assumption of exogeneity in hours worked. Reassuringly, the proportions of the explained and unexplained parts do not change in the instrumental variables approach (results provided upon request). This finding is consistent with the argument that the decomposition results remain valid if the distribution of unobservable factors is the same in the groups considered, even in the presence of endogeneity in hours worked (Fortin, Lemieux and Firpo, 2011).

However, we find that both assumptions are too strong to be made, and therefore complement our decomposition with a fixed effects approach that brings our analysis closer to identifying a causal effect of family factors on the earnings of male and female GPs. We estimate a fixed effects model (Eq. (2)) that exploits the within-individual variations in both earnings (and hours worked) and family status over a four-year window:

$$Y_{i,4} - Y_{i,1} = \beta'(X_{i,4} - X_{i,1}) + (u_{i,4} - u_{i,1}) \quad (2)$$

In this specification, β can be interpreted as causal, as long as all relevant omitted variables that determine both the self-selection into having a family and the earnings potential are of a time-invariant nature. Since we control in detail for a large number of productivity-related factors, including interpersonal styles, the only remaining unobserved factors are innate cognitive ability, which is generally accepted to be of a time-invariant nature. We estimate Eq. (2) separately for male and female GPs who are younger than 45 years of age and who have no children in wave 1. We consider both annual gross earnings and annual hours worked (both log-transformed) as outcome variables. The covariate vector X_i includes all variables from Eq. (1) that are time-variant. Closely aligned to the specification of Sasser (2005), we report only the estimated coefficients on the two dummy variables of main interest: having a child between wave 1 and 4, and having two or more children between wave 1 and 4.

5 Results

5.1 Descriptive analysis

The overall gender-earnings gap in the raw data is A\$92,642, but this average varies substantially depending on the life cycle or family status. According to Figure 2(a), the earnings gap is only A\$41,000 between younger men and women (22%) and A\$49,000 between older men and women GPs (24%) without children. In stark contrast, the gender-earnings gap is A\$118,000 (52%) and A\$109,000 (43%) among younger and older GPs, respectively, with children. We observe a family gap in earnings for both men and women, but in opposite directions (Figure 2(b)). For younger female GPs, the family-earnings gap amounts to A\$31,000 (22%), but the gap halves to A\$14,000 (9%) at later stages of the life cycle. In contrast, we find a family-earnings premium for both

younger and older male GPs. Male GPs with children earn A\$46,000 (20%) more than male GPs without children, independent of the stage of the life cycle. All reported mean differences are statistically significant at the 5% level or better. In the subsequent analysis we focus on the family-earnings gaps within the sexes.

To better understand what factors may explain the family-earnings gap, we present the differences in observed characteristics between GPs with and without children within the sexes (Tables 2 and 3). It is straightforward to understand why young female GPs with children earn less than young female GPs without children: they work almost 3 weeks and 610 hours less per year (11 hours less per week); they see 21 patients less per week in their private consulting rooms; they take three more weeks off work due to parental leave, and are twice as likely to have taken one or more years off work than female GPs without children (all significant at the 1% level). They are also 5 percentage points (pp) less likely to be a principal (practice owner). However, there are no obvious differences in practice size, practice styles, market factor constraints, or in the type of employment, apart from self-employment.

At later stages of the life cycle, many of the differences in labor supply between female GPs with and without children disappear, but the differences in earnings persist. The difference in work hours falls from 610 to 227 annual hours, and the gap in patients seen per week falls to 10. Older female GPs with children are 5pp less likely to work as solo GPs, 6pp less likely to do on-call work, and almost 10pp more likely to work in larger practices (6-9 doctors). Surprisingly, both groups interrupt their careers on average by about two years since graduation, suggesting that women interrupt their careers also for reasons unrelated to family responsibilities.

The main difference for male doctors (Table 3) is that male GPs with children are 11pp more likely to have their own medical practice (principal), are 15pp less likely to work as a contracted

GP, and experience a higher demand for their services (3.5 versus 2.3 days wait for a first appointment). While younger male GPs with and without children do not differ in their annual work hours, notable differences emerge for the older cohort. Compared to their childless comparison group, older male GPs with children work an additional 328 annual hours, or over six hours per week, see 14 more patients per week, are by 12pp more likely to do on-call work, and are by 9pp less likely to work as a solo GP. Last, young male GPs with children also tend to be slightly more conscientious, which is an indicator for dependability and effectiveness with high returns in the labor market (Heineck and Anger, 2010).

5.2 Decomposition analysis

So far, we have shown that substantial family-earnings gaps persist within the sexes, whereby male GPs experience a family premium that increases over the life cycle, while female GPs experience a family penalty that shrinks over the life cycle. This section examines how observable factors contribute to the family-earning gaps and present the factors that are the top contributors.

We start out by estimating an earnings model that pools all age and household-composition groups separately for male and female GPs. The dependent variable is the logarithm of gross annual earnings (expressed in 2011 A\$) and the model includes all covariates described in Table 1. Full estimation results are presented in column (1) of Tables A.1 and A.2 for women and men, respectively. Overall, the models explain 28% of the variation in earnings for men and 46% of the variation in earnings for women. The larger explained variation in earnings for women may stem from the fact that men are more homogenous than women. Women show more variation in their hours of work and labor market attachments than men.

Table 4 reports the family gap by gender and age-cohort, expressed as the difference in the

logarithm of mean earnings, the contributions to observable ("Difference characteristics") and unobservable characteristics ("Difference returns"), and the main observable factors contributing to the family gap. The family gap among young, female GPs (log difference of 0.333, or 28%) is almost entirely explained by observable characteristics (90%). The observable factors account for almost 113% of the overall gap, while the unobservable factors constitute -13%, which states that if young, female GPs with children had the same returns on observable characteristics as young, female GPs without children, they would earn 13% less. In contrast, young, female GPs with children would earn 113% more if they had the same observable characteristics as young, female GPs without children. Table A.1 in the Appendix shows that the returns to hours worked are much higher for young, female GPs with children than for young female GPs without children: a doubling of annual work hours is associated with a 105% increase in earnings for young female GPs with children and a 58% increase for young female GPs without children. Last, the smaller family gap in earnings (log difference of 0.104, or 10%) among older, female GPs is also predominantly explained by differences in observable characteristics (182% versus -82%).

Similarly, the large family premium on earnings (log difference of -0.253, or -22%) for older, male GPs is almost entirely explained by differences in observable characteristics (84%). The only exception is that for young, male GPs the differences in log earnings due to family status is only partially explained by differences in observable characteristics (48%). If young, male GPs without children had the same returns on observable characteristics as young, male GPs with children, they would earn almost 52% more. This difference in returns is due to a substantial difference in the estimated constants between the two groups, and not due to a difference in returns to e.g. hours worked or the business type (See Table A.2 in the Appendix).

The most important factor to explain the family penalty of female GPs is working hours,

which contributes positively 105% and 101% to the gap of young and older female GPs, respectively. The remaining top-four contributing factors for the younger cohort of female GPs are in order of magnitude: labor force attachment (14%), postgraduate qualifications (-13%), demographic factors (12%), and business type (-5%). The only difference in the top-contributing factors to the earnings gap for older, female GPs is that demographic factors, most importantly the labor force status of the partner, is the second strongest factor (75%) and that labor force attachment other than work hours plays no role in explaining the earnings gap.

A different pattern emerges for male GPs, with differences in actual working hours contributing less to the family gap (2.8% for younger male GPs, not significant, 51% for older male GPs). Generally, the family premium for young, male GPs is poorly explained by observable characteristics. Except for postgraduate qualifications (11%), no other factors contribute in a statistically significant way. In contrast, the family premium for the older, male GPs is mainly explained by differences in working hours (51%), demographic factors (15%, not significant), practice size (7.3%), business type (7%), and location (2%). Older male GPs without children would earn more if had the demographic situation, worked in larger practices, were more likely to be self-employed, and worked in more favorable locations.

In a robustness check, in which we restrict the sample to employed GPs (i.e., salaried, contracted, or working as a locum), we obtain almost identical results. By excluding the self-employed GPs (i.e., principals and associates), we ensure that unobservable factors determining self-employment do not exclusively drive our decomposition results. Table 5 shows that for both cohorts of female GPs and for the older male GPs the family gap is even larger, and that observable characteristics explain the major proportions of the earnings gap for all group comparisons. One explanation for widening gaps among the employed GPs is that these GPs have less control over their hours and

productivity and over what they can take as salary from the business (or profits) in comparison to self-employed GPs who can compensate any potential earnings shortfalls if they have children.

5.3 Fixed effects estimation

So far, we have shown evidence of both a breadwinner effect of children on male GPs' and a carer effect of children on female GPs' earnings, but we are not able to interpret the decomposition results as causal. In this section, we replicate the analysis of Sasser (2005) by exploiting within-individual variations in both labor market outcomes and family status to control for all time-invariant, unobserved factors that may influence both the decision to have a family, and the earnings potential.

Table 6 reports the estimated coefficients on the two dummy variables 'having one child' or 'more children' during 2008 and 2011 on two different outcomes: (log) annual earnings, and (log) annual work hours. We restrict the sample to GPs younger than 45 years in 2008. In total, out of a sample of 397 female GPs, 53 (13%) had a child, and 253 (63.4%) had two or more children by 2011. Out of a sample of 250 male GPs, 41 (16.4%) had one child, and 168 (67.2%) had two or more children by 2011. We report both fixed effects (FE) and linear regression (OLS) results for comparison.

Both male and female GPs' annual earnings change substantially as a response to having children. For male GPs, having two or more children within four years results in 42% higher annual earnings. However, as shown in the second panel of Table 6, the breadwinner effect does not result from an increase in working hours. While for men the breadwinner effect is entirely driven by multiple children, we observe the carer effect for female GPs in both having one child, or multiple children. Female GPs who did not have a child in 2008, but who have

one in 2011, experience a reduction in annual earnings by 72%. The earnings response is largest for women who have at least two or more children: they reduce their annual earnings by 100%, which suggests that these female GPs stop working almost entirely. The earnings shortfall is accompanied by an equivalent drop in work hours, a fall of 83% for one child, and a 86% fall for two or more children.

6 Discussion and conclusion

This paper examines the role of family factors in explaining the large earnings gaps between female and male GPs using data from a unique Australian longitudinal survey of doctors. We conduct the analysis of the family gap within the sexes to avoid gender-specific unobserved factors that determine both work hours and earnings. The evidence for gender and family gaps is compelling: the size of the gender-earnings gap is more than twice as large for GPs with children compared to GPs without children, and significant family earnings gaps also emerge within the sexes.

Female GPs with children work fewer hours and are less attached to the labor force than their female counterparts without children, whereas male GPs with children have substantially higher earnings, work more hours, treat more patients, and are more likely to be self-employed than comparable GPs without children. Exploiting within-GP changes over four years, we are able to separate out the true carer- and breadwinner effect from self-selection into having families. Although male GPs do not significantly increase their labor supply as a form of behavioral change to provide for their children, their earnings increase dramatically when having two or more children, a pattern also observed in Petersen, Penner and Hogsnes (2011). The carer-effect of children has a similarly large, but opposite, effect on the earnings of female GPs who have children, and

it is mainly explained by a substantial reduction in work hours.

The large family earnings gaps in Australia are the result of the combination of two factors. On the one hand, the returns to every additional hour of work are substantially higher in Australia compared to the US or the UK. For instance, in our study, the returns range between 0.73 (men) and 0.86 (women), whereas in Gravelle, Hole and Santos (2011) and Bashaw and Heywood (2001) these range between 0.28 (men) and 0.62 (women) and 0.25 (men) and 0.44 (women), respectively. On the other hand, female GPs in Australia tend to work substantially fewer hours than male GPs, independent of having children, reflecting a general trend in the availability of flexible work arrangements and cultural acceptance of part-time work, which has been observed elsewhere (Chen and Chevalier, 2012; Esteves-Sorenson and Snyder, 2012).

The presence of a carer-effect still does not tell us whether female GPs with children have a preference over working less and caring for the children, or whether this is a necessary evil in the absence of all-day-round and/or high-quality child-care services. Although all-day child-care in Australia is available for newborns from four months onwards, waiting times range between 18-24 months, and opening hours do not cater for the often unpredictable hours that doctors have to work. In addition, highly-qualified mothers are likely to be married to equally highly-qualified fathers, who often do not have the time to take over some child care responsibilities.

Due to the presence of both a carer- and a breadwinner-effect, the earnings gap is the largest between male and female GPs with children, with a difference of over 53%. If the gender-pay gap is a result of the choice to prepare for, or having started, a family, in which the division of labor leaves the mother to opt for the traditional role of the main carer, while the father opts for the role of the main breadwinner, then the gap is likely to persist on aggregate and change over time only in line with changes in fertility. If this is the case, medical workforce policy should be designed

to manage the cost and productivity implications of these demographic changes in the working population rather than designing pay legislation or equal opportunity frameworks to reduce discrimination. This is particularly the case in medicine, where an ever increasing proportion of physicians are women. In professions with an increasing share of women, public policy would have to acknowledge the economic benefits of reducing the costs of career interruptions, for instance by supporting more flexible training and working hours (e.g. Bertrand, Goldin and Katz, 2010).

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Figure 1: Hourly wage versus hours worked

Table 1: Variables used in subcategories of decomposition analysis

	Included variables
Working hours	Total annual hours worked (log)
Labour force attachment	Annual weeks worked Actual years of experience, squared, and dummy - if missing Dummy - if GP took more than one year off
Qualifications	Number of postgraduate qualifications Dummy - if Fellowship of Royal College of General Practitioners (FRAGP)
Practice style	Minutes spent per patient Dummy - if minutes spent per patient missing Dummy - if doing on-call services
Market conditions	Fee charged for standard consultation Length of wait for an appointment with doctor (days)
Location	Remoteness categories (Major city, inner regional, remote)
Population needs	GP density (Std.)
Personality	Big Five personality traits Extraversion, Agreeableness, Openness to Experience, Neuroticism, Conscientiousness
Business type	Dummy - if doctor is an associate, salaried, contracted, locum, or other relative to principal (practice owner)
Practice size	Dummy - if doctor works in practice with 2-3 doctors, 4-6 doctors, 6-9 doctors, 10 or more doctors relative to solo practice relative to solo practice
Practice mix	Dummy - if mixed gender practice
Demographics	Dummy - if cohabiting with partner, temporary resident visa Dummy - if partner is employed, unemployed, out of the labour force number of dependent children
Year of survey	Dummy if the observation is from year 2008, 2009, or 2010 relative to base year 2011

(a) By gender

(b) By having children

Figure 2: Gender- and family-earnings gaps, by age-cohorts

Table 2: Summary statistics of main variables for women, by family status and age cohorts

	Age < 40			Age 40+		
	No child	Child	p-value	No child	Child	p-value
Age	33.67	36.70	0.00	55.84	48.87	0.00
Real earnings in 2011 AUD\$	142080.36	111007.18	0.00	156681.78	142288.41	0.03
Hourly gross earnings	71.71	80.99	0.00	82.91	83.35	0.88
Annual hours worked	1935.57	1325.47	0.00	1856.14	1629.79	0.00
Total weekly hours	37.26	26.68	0.00	35.73	31.39	0.00
Weeks worked per year	51.94	49.23	0.00	51.95	51.90	0.12
Fellowship of Colleges	0.50	0.69	0.00	0.45	0.61	0.00
Number of other postgraduate qualifications	0.37	0.48	0.10	0.59	0.54	0.38
Number of patients seen in private rooms	91.44	70.56	0.00	92.23	81.67	0.00
Fee for standard consultation	49.03	49.46	0.81	48.93	51.25	0.10
Length of wait for appointment (days)	3.37	4.50	0.05	5.19	5.69	0.33
Fee for standard consultation	47.63	46.79	0.65	43.94	47.45	0.02
Fee for standard consultation missing	0.03	0.05	0.06	0.10	0.07	0.04
Minutes per patient (imputed)	21.90	21.52	0.73	21.89	22.35	0.68
Minutes per patient missing	0.06	0.04	0.09	0.06	0.05	0.44
GP does after hours and on-call work	0.34	0.36	0.60	0.36	0.30	0.06
Experience	7.81	9.99	0.00	26.73	21.25	0.00
Experience missing	0.04	0.05	0.84	0.06	0.03	0.09
If GP took more than one year off	0.21	0.44	0.00	0.42	0.55	0.00
Weeks of parental/maternity leave taken	0.06	2.77	0.00	0.04	0.10	0.07
Total weeks of holidays and/or leave	4.29	6.35	0.00	4.96	4.81	0.38
Years not practiced since graduation	0.98	1.71	0.00	2.07	2.35	0.09
Practice Size: Solo	0.02	0.02	0.90	0.09	0.04	0.00
Practice Size: 2-3 doctors	0.13	0.14	0.68	0.19	0.19	0.90
Practice Size: 4-6 doctors	0.24	0.23	0.92	0.28	0.24	0.12
Practice Size: 6-9 doctors	0.42	0.41	0.78	0.28	0.37	0.00
Practice Size: 10 or more doctors	0.19	0.19	0.90	0.16	0.16	0.91
Mixed gender practice	0.93	0.91	0.46	0.81	0.86	0.02
Employment type: Principal or partner	0.03	0.08	0.00	0.24	0.20	0.21
Employment type: Associate	0.05	0.07	0.29	0.11	0.10	0.60
Employment type: Salaried employee	0.17	0.13	0.19	0.08	0.09	0.40
Employment type: Contracted employee	0.73	0.70	0.33	0.53	0.59	0.07
Employment type: Locum	0.01	0.01	0.81	0.03	0.01	0.02
Employment type: other	0.01	0.00	0.56	0.01	0.01	0.70
ASGC: Major city	0.75	0.71	0.21	0.80	0.79	0.86
ASGC: Inner regional	0.15	0.20	0.07	0.14	0.14	0.95
ASGC: Others	0.10	0.09	0.62	0.07	0.07	0.83
Temporary resident visa	0.05	0.06	0.62	0.01	0.02	0.29
Number of dependent children	0.08	2.03	0.00	0.35	2.25	0.00
Spouse not in labour force	0.05	0.11	0.01	0.14	0.07	0.00
Spouse unemployed	0.03	0.02	0.37	0.01	0.04	0.00
Spouse part-time employed	0.05	0.14	0.00	0.12	0.12	0.72
Spouse full-time employed	0.50	0.74	0.00	0.31	0.76	0.00
No spouse	0.37	0.00	0.00	0.42	0.01	0.00
GP density	0.08	-0.04	0.16	0.18	0.11	0.36
Openness to Experience	-0.05	-0.25	0.02	-0.04	-0.09	0.46
Agreeableness	-0.02	0.06	0.34	-0.01	0.06	0.22
Conscientiousness	0.02	0.06	0.62	0.07	0.07	0.99
Extraversion	0.15	0.21	0.56	0.03	0.12	0.17
Neuroticism	0.45	0.23	0.01	0.02	0.14	0.09
N	502	651		931	1777	

Note: Descriptive statistics are based on all observations over the waves 2008-2011. Sample weights are applied to construct group means. The p-values refer to the z-test statistic of the null hypothesis of equality of means between the two groups considered.

Table 3: Summary statistics of main variables for men, by family status and age cohorts

	Age < 40			Age 40+		
	No child	Child	p-value	No child	Child	p-value
Age	34.07	36.77	0.00	62.20	51.76	0.00
Real earnings in 2011 AUSD	182600.16	229077.45	0.00	205395.52	251193.58	0.00
Hourly gross earnings	77.21	98.08	0.00	96.79	101.25	0.06
Annual hours worked	2269.40	2251.37	0.77	2084.83	2413.00	0.00
Total weekly hours	43.71	43.68	0.98	40.14	46.44	0.00
Weeks worked per year	51.93	51.49	0.00	51.95	51.95	0.95
Fellowship of Colleges	0.53	0.65	0.06	0.41	0.54	0.00
Number of other postgraduate qualifications	0.31	0.40	0.32	0.43	0.57	0.00
Number of patients seen in private rooms	123.66	123.71	0.99	120.49	134.69	0.00
Fee for standard consultation	46.91	42.01	0.08	44.86	47.66	0.02
Length of wait for appointment (days)	2.23	3.42	0.01	3.84	5.12	0.00
Fee for standard consultation	44.80	39.78	0.08	42.50	45.28	0.02
Fee for standard consultation missing	0.04	0.05	0.68	0.05	0.05	0.74
Minutes per patient (imputed)	20.01	20.85	0.57	19.50	20.99	0.16
Minutes per patient missing	0.04	0.06	0.22	0.07	0.06	0.41
GP does after hours and on-call work	0.42	0.52	0.07	0.46	0.58	0.00
Experience	8.33	10.30	0.00	32.96	23.40	0.00
Experience missing	0.04	0.04	0.82	0.08	0.08	0.81
If GP took more than one year off	0.15	0.15	0.98	0.18	0.21	0.15
Weeks of parental/maternity leave taken	0.05	0.51	0.00	0.04	0.03	0.70
Total weeks of holidays and/or leave	4.34	4.20	0.65	5.30	4.50	0.00
Years not practiced since graduation	0.69	0.85	0.20	1.29	1.30	0.94
Practice Size: Solo	0.03	0.04	0.26	0.18	0.09	0.00
Practice Size: 2-3 doctors	0.20	0.19	0.93	0.19	0.20	0.58
Practice Size: 4-6 doctors	0.25	0.22	0.62	0.20	0.22	0.31
Practice Size: 6-9 doctors	0.38	0.35	0.64	0.28	0.31	0.17
Practice Size: 10 or more doctors	0.15	0.18	0.42	0.15	0.18	0.15
Mixed gender practice	0.88	0.81	0.09	0.72	0.79	0.00
Employment type: Principal or partner	0.09	0.20	0.01	0.43	0.46	0.29
Employment type: Associate	0.03	0.10	0.00	0.10	0.13	0.01
Employment type: Salaried employee	0.16	0.14	0.51	0.04	0.04	0.54
Employment type: Contracted employee	0.70	0.55	0.00	0.38	0.35	0.21
Employment type: Locum	0.00	0.00	0.79	0.04	0.02	0.00
Employment type: other	0.01	0.01	0.89	0.01	0.00	0.24
ASGC: Major city	0.67	0.60	0.19	0.76	0.68	0.00
ASGC: Inner regional	0.21	0.24	0.47	0.16	0.24	0.00
ASGC: Others	0.12	0.16	0.21	0.08	0.09	0.38
Temporary resident visa	0.14	0.09	0.19	0.02	0.05	0.00
Number of dependent children	0.09	2.05	0.00	0.09	2.25	0.00
Doctor has partner	0.53	0.99	0.00	0.85	0.98	0.00
Spouse not in labour force	0.07	0.44	0.00	0.28	0.23	0.02
Spouse unemployed	0.03	0.04	0.70	0.01	0.02	0.01
Spouse part-time employed	0.11	0.38	0.00	0.32	0.51	0.00
Spouse full-time employed	0.42	0.13	0.00	0.16	0.21	0.01
No spouse	0.37	0.01	0.00	0.23	0.02	0.00
GP density	-0.05	-0.12	0.51	0.00	-0.06	0.20
Openness to Experience	0.06	-0.03	0.47	0.08	-0.05	0.02
Agreeableness	-0.21	-0.08	0.37	-0.10	-0.01	0.16
Conscientiousness	-0.41	-0.12	0.02	-0.13	-0.09	0.45
Extraversion	-0.27	-0.16	0.43	-0.14	-0.18	0.47
Neuroticism	-0.05	-0.17	0.34	-0.14	-0.09	0.42
N	209	434		1504	2133	

Note: Descriptive statistics are based on all observations over the waves 2008-2011. Sample weights are applied to construct group means. The p-values refer to the z-test statistic of the null hypothesis of equality of means between the two groups considered.

Table 4: Decomposition results for men and women

	Women						Men					
	Age < 40			Age 40+			Age < 40			Age 40+		
	Diff	z-stat	%	Diff	z-stat	%	Diff	z-stat	%	Diff	z-stat	%
Main decomposition												
No children	11.769	482.339		11.794	436.159		12.001	303.192		12.065	513.177	
Children	11.439	340.215		11.689	539.665		12.209	371.773		12.318	776.094	
Log difference	0.330	8.005		0.104	3.063		-0.208	-4.063		-0.253	-9.256	
Difference characteristics	0.373	6.132	112.867	0.191	4.521	182.855	-0.100	-1.148	48.198	-0.218	-5.792	85.949
Difference returns	-0.042	-0.761	-12.867	-0.086	-2.045	-82.855	-0.108	-1.149	51.802	-0.036	-0.902	14.051
Due to differences in observable characteristics												
Working hours	0.356	11.387	107.823	0.106	5.153	101.738	-0.006	-0.339	2.868	-0.130	-9.090	51.364
Personality	-0.007	-1.082	-2.202	0.005	1.161	5.048	-0.008	-0.849	4.026	-0.002	-0.462	0.649
Business Type	-0.016	-2.292	-4.813	0.003	0.507	2.843	-0.020	-1.300	9.712	-0.018	-3.308	7.288
Qualifications	-0.043	-3.539	-12.988	-0.006	-1.368	-5.784	-0.023	-1.934	10.965	0.002	0.694	-0.959
Location	0.002	0.586	0.746	-0.000	-0.300	-0.437	-0.004	-0.803	1.765	-0.006	-1.902	2.387
Population needs	0.001	0.231	0.190	0.000	0.309	0.390	-0.009	-1.200	4.180	-0.002	-1.182	0.858
Mixed practice	0.001	0.451	0.160	-0.005	-1.826	-4.936	0.001	0.341	-0.598	0.005	1.763	-2.121
Market conditions	-0.004	-1.320	-1.253	0.004	1.311	3.612	-0.006	-0.741	2.784	-0.003	-1.250	1.304
Practice style	-0.001	-0.308	-0.371	0.002	0.839	1.794	-0.002	-0.320	0.966	0.000	0.102	-0.143
Practice size	-0.002	-0.403	-0.499	0.003	0.669	2.828	-0.001	-0.125	0.386	-0.018	-2.941	7.301
Labor force attachment	0.046	2.338	13.845	-0.001	-0.047	-0.598	-0.014	-0.992	6.710	-0.006	-0.386	2.551
Demographics	0.041	0.851	12.333	0.078	2.199	75.189	-0.008	-0.100	3.972	-0.039	-1.156	15.355
Years	-0.000	-0.213	-0.103	0.001	1.299	1.170	-0.001	-0.341	0.462	-0.000	-0.258	0.116

Note: Omitted are the contributions of estimated returns to observable characteristics to the earnings gap.

Table 5: Decomposition results for men and women, employed only

	Women						Men					
	Age < 40			Age 40+			Age < 40			Age 40+		
	Diff	z-stat	%	Diff	z-stat	%	Diff	z-stat	%	Diff	z-stat	%
Main decomposition												
No children	11.807	469.694		11.709	360.437		12.008	288.615		11.887	365.963	
Children	11.395	301.877		11.550	481.486		12.112	346.085		12.214	552.754	
Log difference	0.412	9.117		0.159	4.003		-0.104	-1.921		-0.327	-8.612	
Difference characteristics	0.425	6.075	103.201	0.194	3.896	121.833	-0.084	-1.012	80.978	-0.296	-5.437	90.538
Difference returns	-0.013	-0.203	-3.201	-0.035	-0.706	-21.833	-0.020	-0.223	19.022	-0.031	-0.535	9.462
Due to differences in observable characteristics												
Working hours	0.396	10.819	96.183	0.121	4.692	76.185	0.024	1.059	-22.667	-0.184	-8.180	56.263
Personality	-0.002	-0.272	-0.418	0.004	0.574	2.214	-0.000	-0.025	0.335	-0.000	-0.049	0.085
Business Type	0.001	0.240	0.245	-0.007	-1.293	-4.714	0.014	1.291	-13.484	-0.021	-2.385	6.541
Qualifications	-0.038	-2.937	-9.120	-0.011	-1.925	-6.896	-0.008	-0.736	7.742	0.003	0.673	-0.767
Location	0.000	0.089	0.116	-0.001	-0.404	-0.403	-0.003	-0.440	3.257	-0.002	-0.596	0.624
Population needs	-0.000	-0.004	-0.003	-0.000	-0.101	-0.094	-0.013	-1.310	12.683	-0.001	-0.462	0.328
Mixed practice	0.000	0.223	0.039	-0.001	-0.504	-0.645	0.001	0.301	-0.955	0.001	0.280	-0.237
Market conditions	-0.003	-0.985	-0.758	0.006	1.335	3.559	0.006	0.577	-5.644	-0.001	-0.563	0.403
Practice style	-0.000	-0.063	-0.049	-0.001	-0.562	-0.880	-0.003	-0.349	2.823	-0.004	-0.808	1.156
Practice size	-0.001	-0.267	-0.335	0.001	0.256	0.408	0.004	0.597	-3.705	-0.004	-0.768	1.123
Labor force attachment	0.076	3.697	18.332	0.004	0.217	2.272	-0.023	-1.558	22.246	-0.015	-0.629	4.463
Demographics	-0.006	-0.104	-1.396	0.079	1.937	49.694	-0.082	-1.152	78.855	-0.070	-1.430	21.524
Years	0.001	0.685	0.364	0.002	1.192	1.132	0.001	0.258	-0.509	0.003	1.555	-0.968

Note: Omitted are the contributions of estimated returns to observable characteristics to the earnings gap.

Table 6: Fixed effects estimation: effect of children on annual earnings and work hours, by gender

	Men		Women	
	OLS	FE	OLS	FE
	(1)	(2)	(3)	(4)
Dependent variable: log annual earnings				
One child	-0.062 (0.123)	0.023 (0.123)	-0.318** (0.111)	-0.717** (0.225)
More than one child	0.048 (0.095)	0.419** (0.146)	-0.330*** (0.083)	-1.006*** (0.286)
Dependent variable: log annual hours				
One child	-0.091 (0.066)	-0.053 (0.104)	-0.494*** (0.094)	-0.827*** (0.126)
More than one child	-0.072 (0.055)	-0.055 (0.136)	-0.421*** (0.064)	-0.864*** (0.182)
N	250	250	397	397

Note: All models are estimated with a first-difference fixed effects model using data from Wave 1 and Wave 4. The samples are restricted to GPs for whom complete data are available in both waves and who are younger than 45 years of age in 2008. For male and female GPs, 16 and 13%, respectively have one child in 2011, and 64 and 67% will have two or more children in 2011.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Table A.1: Wage regression results for women, by family status and age-groups

	Pooled	Age < 40		Age 40+	
	OLS	No child	Children	No child	Children
	(1)	(2)	(3)	(4)	(5)
Openness to Experience	-0.007 (0.010)	0.027 (0.021)	0.002 (0.019)	0.014 (0.021)	-0.021 (0.015)
Agreeableness	-0.019 (0.011)	-0.033 (0.023)	-0.026 (0.022)	0.009 (0.024)	-0.021 (0.017)
Conscientiousness	0.009 (0.011)	0.027 (0.024)	0.048* (0.023)	-0.023 (0.026)	-0.001 (0.016)
Extraversion	0.007 (0.012)	0.006 (0.022)	0.013 (0.023)	-0.026 (0.025)	0.018 (0.016)
Neuroticism	-0.044*** (0.011)	-0.020 (0.020)	-0.056* (0.023)	-0.065** (0.023)	-0.041** (0.015)
Fellowship of Colleges	0.086*** (0.022)	0.170*** (0.049)	0.237*** (0.055)	0.051 (0.044)	0.036 (0.033)
Number of other postgraduate qualifications	-0.010 (0.013)	-0.023 (0.028)	0.008 (0.026)	-0.020 (0.026)	-0.009 (0.023)
ASGC: Inner regional (Excl: Maj City)	-0.002 (0.027)	-0.079 (0.050)	0.021 (0.057)	-0.017 (0.056)	0.026 (0.043)
ASGC: Others	0.084** (0.032)	0.071 (0.064)	0.117 (0.067)	0.015 (0.068)	0.082 (0.050)
GP density	0.005 (0.010)	-0.005 (0.021)	-0.009 (0.022)	0.033 (0.021)	0.001 (0.013)
GP density missing	-0.234** (0.088)	-0.344 (0.261)	-0.395* (0.165)	-0.143 (0.241)	-0.104 (0.096)
Mixed gender practice	0.094** (0.030)	0.253* (0.106)	-0.101 (0.072)	0.038 (0.061)	0.139*** (0.042)
Length of wait for appointment (days)	-0.000 (0.002)	0.005* (0.002)	0.000 (0.003)	-0.002 (0.003)	-0.001 (0.003)
Fee for standard consultation	-0.001* (0.000)	0.000 (0.001)	0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Fee for standard consultation missing	-0.040 (0.038)	0.091 (0.119)	0.065 (0.086)	-0.034 (0.070)	-0.066 (0.056)
Minutes per patient (imputed)	-0.001 (0.001)	0.000 (0.001)	-0.004* (0.002)	-0.004*** (0.001)	-0.001 (0.001)
GP does after hours and on-call work	0.042* (0.020)	0.043 (0.039)	0.025 (0.048)	0.079 (0.042)	0.043 (0.030)
Practice Size: 2-3 doctors (Excl: Solo)	-0.058 (0.069)	-0.057 (0.250)	0.265 (0.160)	-0.004 (0.096)	-0.209 (0.119)
Practice Size: 4-6 doctors	-0.026 (0.070)	-0.000 (0.250)	0.184 (0.162)	0.038 (0.100)	-0.158 (0.120)
Practice Size: 6-9 doctors	-0.071 (0.071)	-0.100 (0.247)	0.085 (0.166)	0.030 (0.096)	-0.187 (0.123)
Practice Size: 10 or more doctors	-0.037 (0.074)	-0.135 (0.250)	0.102 (0.176)	0.035 (0.109)	-0.117 (0.127)
Log of total hours	0.866*** (0.027)	0.581*** (0.093)	1.047*** (0.060)	0.818*** (0.058)	0.874*** (0.041)
Weeks worked per year	0.022*** (0.003)	-0.025 (0.014)	0.020*** (0.004)	0.014 (0.033)	0.014 (0.021)
Experience	0.017*** (0.004)	0.107*** (0.030)	0.037 (0.026)	0.012 (0.011)	0.030* (0.014)
Experience squared	-0.000*** (0.000)	-0.006*** (0.002)	-0.002 (0.001)	-0.000 (0.000)	-0.001* (0.000)
If GP took more than one year off	-0.045* (0.021)	0.011 (0.067)	-0.086 (0.045)	-0.046 (0.041)	-0.045 (0.032)
Employment type: Associate (Excl: Principal)	0.055 (0.040)	-0.375* (0.179)	0.070 (0.084)	0.182* (0.072)	0.018 (0.057)
Employment type: Salaried employee	-0.269*** (0.040)	-0.542*** (0.152)	-0.133 (0.089)	-0.102 (0.082)	-0.333*** (0.057)
Employment type: Contracted employee	-0.093** (0.033)	-0.367* (0.148)	-0.081 (0.073)	0.011 (0.067)	-0.142*** (0.042)
Employment type: Locum	-0.217** (0.071)	-0.619** (0.202)	-0.030 (0.094)	-0.199 (0.111)	-0.344* (0.160)
Employment type: other	-0.321** (0.123)	-0.373 (0.290)	-0.761 (0.565)	-0.304 (0.155)	-0.189* (0.083)
Temporary resident visa	0.037 (0.048)	0.063 (0.079)	-0.043 (0.088)	0.251* (0.120)	-0.076 (0.090)
Doctor has partner	0.063 (0.047)	0.076 (0.077)	0.520* (0.225)	0.082 (0.075)	0.059 (0.100)
Spouse not in labour force (Excl: No partner)	-0.035 (0.052)	-0.003 (0.098)	0.678 (0.567)	-0.115 (0.078)	-0.016 (0.170)
Spouse unemployed	-0.138* (0.063)	-0.142 (0.121)	0.769 (0.571)	-0.229 (0.154)	-0.162 (0.178)
Spouse part-time employed	-0.067 (0.053)	-0.093 (0.130)	0.802 (0.569)	-0.213** (0.078)	-0.080 (0.173)
Spouse full-time employed	-0.151** (0.047)	-0.059 (0.078)	0.690 (0.565)	-0.184* (0.072)	-0.200 (0.170)
Number of dependent children	0.008 (0.009)	-0.111 (0.064)	-0.025 (0.024)	0.029 (0.031)	-0.003 (0.015)
Constant	7.598*** (0.209)	10.727*** (0.864)	5.668*** (0.686)	8.194*** (1.732)	8.061*** (1.118)
N	3861	502	651	931	1777
R-squared	0.455	0.312	0.591	0.362	0.463

Note: All models are estimated with OLS, clustered standard errors (at the individual level) are in parentheses. Coefficients for time fixed effects and indicators for missing data are omitted.

* p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.2: Wage regression results for men, by family status and age-groups

	Pooled	Age < 40		Age 40+	
	OLS	No child	Children	No child	Children
	(1)	(2)	(3)	(4)	(5)
Openness to Experience	-0.029* (0.012)	-0.035 (0.042)	-0.027 (0.026)	-0.036 (0.021)	-0.016 (0.017)
Agreeableness	-0.035** (0.011)	0.035 (0.037)	-0.025 (0.031)	-0.042* (0.019)	-0.033* (0.015)
Conscientiousness	0.033** (0.011)	-0.033 (0.034)	-0.001 (0.023)	0.041* (0.018)	0.035* (0.016)
Extraversion	0.008 (0.012)	-0.058 (0.049)	-0.018 (0.028)	-0.008 (0.020)	0.023 (0.016)
Neuroticism	-0.027* (0.012)	-0.028 (0.034)	-0.077** (0.028)	-0.026 (0.021)	-0.020 (0.017)
Fellowship of Colleges	-0.009 (0.023)	0.112 (0.079)	0.164** (0.058)	-0.097* (0.040)	-0.005 (0.031)
Number of other postgraduate qualifications	0.020 (0.014)	-0.130* (0.061)	0.057 (0.038)	0.039 (0.023)	0.013 (0.019)
ASGC: Inner regional (Excl: Maj City)	0.029 (0.026)	-0.000 (0.088)	-0.043 (0.065)	0.008 (0.046)	0.061 (0.034)
ASGC: Others	0.103** (0.033)	-0.007 (0.105)	0.056 (0.066)	0.111 (0.061)	0.110* (0.046)
GP density	-0.036** (0.012)	0.046 (0.032)	-0.096** (0.034)	-0.056** (0.019)	-0.014 (0.015)
Mixed gender practice	-0.094** (0.033)	-0.006 (0.124)	0.044 (0.063)	-0.076 (0.064)	-0.144** (0.044)
Length of wait for appointment (days)	0.002 (0.001)	0.005 (0.011)	0.005 (0.005)	0.003 (0.003)	0.001 (0.002)
Fee for standard consultation	0.000 (0.000)	-0.001 (0.002)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)
Minutes per patient (imputed)	-0.001** (0.000)	0.002 (0.003)	-0.001 (0.001)	-0.002 (0.001)	-0.001* (0.000)
GP does after hours and on-call work	0.007 (0.022)	0.205** (0.071)	-0.051 (0.054)	0.023 (0.036)	0.003 (0.030)
Practice Size: 2-3 doctors (Excl: Solo)	0.156** (0.048)	-0.126 (0.204)	-0.011 (0.097)	0.192* (0.082)	0.150* (0.063)
Practice Size: 4-6 doctors	0.201*** (0.051)	-0.283 (0.217)	-0.110 (0.106)	0.201* (0.089)	0.270*** (0.069)
Practice Size: 6-9 doctors	0.265*** (0.053)	-0.133 (0.222)	0.006 (0.101)	0.284** (0.094)	0.311*** (0.071)
Practice Size: 10 or more doctors	0.278*** (0.056)	-0.163 (0.257)	0.018 (0.102)	0.292** (0.099)	0.328*** (0.075)
Log of total hours	0.732*** (0.039)	0.684*** (0.144)	0.673*** (0.145)	0.794*** (0.052)	0.623*** (0.064)
Weeks worked per year	-0.003 (0.007)	0.031 (0.022)	0.013 (0.011)	0.001 (0.025)	-0.019 (0.011)
Experience	0.008* (0.004)	0.065 (0.040)	0.014 (0.016)	-0.003 (0.009)	0.009 (0.009)
Experience squared	-0.000 (0.000)	-0.003 (0.002)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
If GP took more than one year off	-0.045 (0.036)	-0.068 (0.118)	0.021 (0.095)	-0.050 (0.070)	-0.053 (0.041)
Employment type: Associate (Excl: Principal)	0.006 (0.032)	-0.667* (0.319)	-0.105 (0.110)	-0.044 (0.053)	0.064 (0.041)
Employment type: Salaried employee	-0.257*** (0.040)	-0.503*** (0.137)	-0.355** (0.108)	-0.210** (0.071)	-0.232*** (0.064)
Employment type: Contracted employee	-0.083** (0.025)	-0.295* (0.121)	-0.152 (0.094)	-0.095* (0.046)	-0.057 (0.033)
Employment type: Locum	-0.514*** (0.113)	0.359 (0.277)	-0.399 (0.391)	-0.689*** (0.130)	-0.185 (0.129)
Employment type: other	-0.083 (0.118)	-0.141 (0.197)	-0.181 (0.251)	0.002 (0.269)	-0.049 (0.092)
Temporary resident visa	-0.057 (0.041)	-0.062 (0.109)	-0.017 (0.080)	0.084 (0.099)	-0.115* (0.058)
Doctor has partner	0.052 (0.044)	0.062 (0.121)	-0.536 (0.436)	0.094 (0.072)	-0.099 (0.066)
Spouse not in labour force (Excl: No partner)	0.026 (0.043)	0.146 (0.168)	-0.095 (0.174)	0.024 (0.062)	-0.033 (0.085)
Spouse unemployed	-0.019 (0.068)	-0.133 (0.197)	-0.040 (0.193)	-0.067 (0.176)	-0.072 (0.107)
Spouse part-time employed	0.014 (0.044)	0.011 (0.165)	-0.106 (0.168)	0.038 (0.067)	-0.077 (0.084)
Spouse full-time employed	0.016 (0.045)	-0.047 (0.131)	-0.150 (0.180)	0.055 (0.072)	-0.070 (0.086)
Number of dependent children	0.027** (0.009)	0.070 (0.084)	-0.003 (0.031)	0.051 (0.037)	0.013 (0.016)
Constant	9.316*** (0.418)	7.955*** (1.320)	9.615*** (0.879)	8.981*** (1.352)	10.829*** (0.612)
N	4280	209	434	1504	2133
R-squared	0.277	0.298	0.280	0.356	0.149

Note: All models are estimated with OLS, clustered standard errors (at the individual level) are in parentheses. Coefficients for time fixed effects and indicators for missing data are omitted.

* p < 0.1, ** p < 0.05, *** p < 0.01.

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