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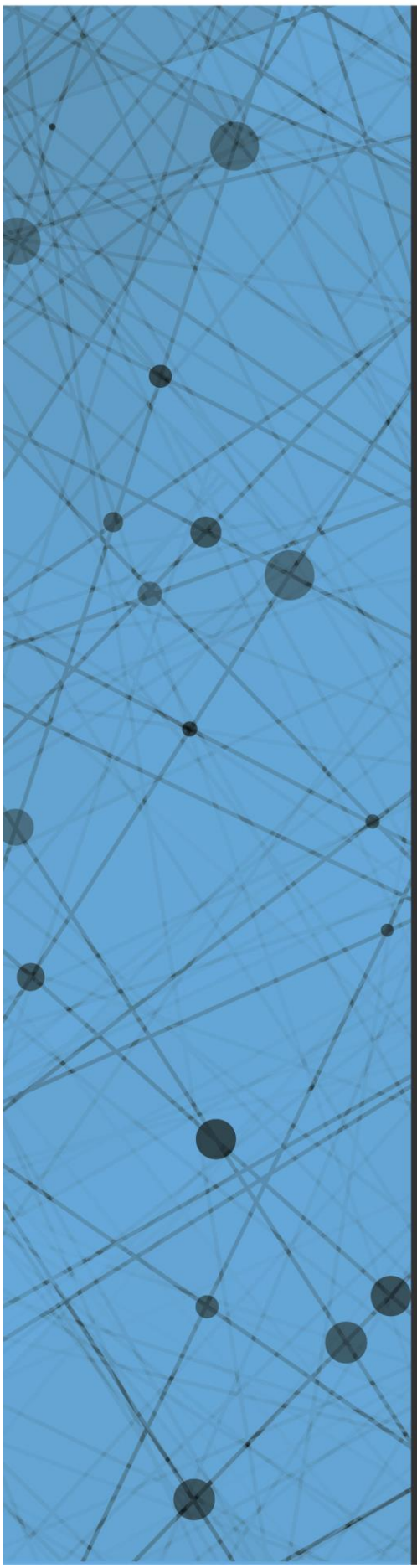

Is the pay of medical specialists in New Zealand gender biased?

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Disclaimer

The results in this report are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI), managed by Statistics New Zealand. The opinions, findings, recommendations, and conclusions expressed in this report are those of the authors, not Statistics NZ, Motu Economic and Public Policy Research, or the Association of Salaried Medical Specialists.

Access to the anonymised data used in this study was provided by Statistics NZ under the security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation, and the results in this report have been confidentialised to protect these groups from identification and to keep their data safe. Careful consideration has been given to the privacy, security, and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the Privacy impact assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

The results are based in part on tax data supplied by Inland Revenue to Statitsics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form, or provided to Inland Revenue for administrative or regulatory purposes.

Any person who has had access to the unit record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not to the data's ability to support Inland Revenue's core operational requirements.

Abstract

We use individual-level data from the 2013 New Zealand Census combined with administrative income data from the tax system to estimate the gender gap in hourly pay for the population of medical specialists employed in the New Zealand public health system. Unionisation of these doctors is 90 percent, and their union's MECA specifies their pay rates, which should limit the opportunities for a gender pay gap to arise. Nevertheless, we find that in their public health system employment female specialists earn an average of 12.5 percent less than their male counterparts of the same age, with the same specialty, and who work the same number of hours each week. This wage gap is larger for older ages, among those who work fewer hours each week, and for parents. Controlling for gender differences in experience at the same age decreases the estimated gender wage gap by no more than 20 percent. Our findings are consistent with male medical specialists being placed on higher salary steps than equally experienced female specialists, or males disproportionately receiving additional payments beyond the MECA minimum.

JEL codes

I11, J16, J31, J45, J52, J71

Keywords

gender wage gap, gender pay gap, gender inequality, medical specialists, doctors, District Health Boards, New Zealand, Association of Salaried Medical Specialists

Summary haiku

Despite union rules,
doctors' gender pay gap still
stark. No clear reason.

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1 Introduction

According to the OECD, in 2018 New Zealand's gender wage gap in median earnings for full-time employees was 7.9 percent, considerably below the 13.5 percent on average for OECD countries.[1] Statistics New Zealand defines the gender wage gap differently, including part-time as well as full-time workers, and calculated a slightly higher gender wage gap of 9.2 percent in 2018.[2] Both these estimates of the gender wage gap are raw in that they don't attempt to control for any characteristics of the individuals such as occupation, age, or level of education. Several recent New Zealand studies that estimate the wage gap between similar men and women find it remains sizeable even when controlling for characteristics of the individuals and their jobs.[3] Furthermore, these studies find a larger wage gap between men and women who are more skilled or higher up the earnings distribution.

In this paper we estimate the gender wage gap in New Zealand for doctors in their public health system employment, with a particular focus on the wage gap of specialists. The medical profession was historically male, and in New Zealand it remains dominated by men. However, this may be in the process of changing: women now outnumber men among doctors aged under 30 employed in the public health system.

Despite the increasing proportion of women in the medical profession, female doctors may still face greater challenges in some areas than their male colleagues. For instance, Chambers et al. (2018) finds women in the medical profession are more likely than men to self-report being bullied at work, and Mache et al. (2016) and Elmore et al. (2016) find they face greater work-life conflicts. Female doctors are expected to be more empathetic, approachable, and communicative,[4] yet receive less support in their jobs and are viewed more negatively by patients, peers, and medical students.[5] They are also less likely to be correctly identified as doctors, both by patients and other medical staff, which can increase the pressure they feel to perform.[6] International evidence is mixed as to whether male or female doctors are more likely to experience burnout however, research into burnout rates of New Zealand hospital-based specialists found a significantly higher rate of burnout in females.[7]

The medical profession is not typical of high-skill professions in New Zealand. In particular, unionisation among public system doctors is very high, and the pay and conditions negotiated by their union, the Association of Salaried Medical Specialists (ASMS), in their Multi Employer Collective Agreement (MECA) with the 20 District Health Boards (DHBs) are extended

[1] https://data.oecd.org/earnwage/gender-wage-gap.htm, accessed 13 November 2019.
[2] https://www.stats.govt.nz/news/gender-pay-gap-unchanged-since-2017, accessed 13 November 2019.
[3] Pacheco et al (2017), Sin et al (2017), and Sin et al. (2018).
[4] Kilminster et al. (2007), Prince et al. (2006), and Babaria et al. (2012).
[5] Chambers et al. (2018), Braun et al. (2017), and Hall et al. (2011).
[6] LaBonty and Becker (2001), Prince et al. (2006), and Houry et al. (2000).
[7] Baigent and Baigent (2018), Surgenor et al. (2009), and Chambers et al. (2016).

to publicly employed specialists who are not union members, subject to a few conditions. Among the conditions of the MECA are salary steps that specify minimum pay at each level of experience, and the stipulation that, except in exceptional circumstances, specialists move up a salary step with each year of experience until they reach the highest step. Those who are absent from work on parental leave for up to a year receive the same pay increase. These conditions might be expected to limit the potential for a gender pay gap to arise between equally experienced specialists.

We combine 2013 Census data on hours worked with administrative earnings data to calculate hourly earnings for essentially the full population of doctors employed by DHBs in March 2013.[8] In our main specification, we estimate the gender wage gap for specialists only by regressing the log of hourly wages in DHB employment on a dummy for being female, flexible age controls, weekly hours worked for the DHB categories, and specialty fixed effects. We find female specialists earn an average of 12.5 percent less than their male counterparts in the same specialty when we control flexibly for age and for categories of hours worked each week. The 95 percent confidence interval for this estimate is 9.9 percent to 15.1 percent, so we can convincingly reject equal pay of medical specialists by gender. When we also include Resident Medical Officers (RMOs) in the sample, we find a statistically significant gender wage gap of 11.0 percent. The gender wage gap is larger at older ages, for those who work fewer hours for a DHB each week, and between men and women who are parents. These differences cannot be explained by women entering the profession at older ages or taking more gaps in their employment.

Our findings suggest men may be placed on a higher starting step when they begin work as specialists, men who move between DHB employers mid-career may be placed on higher salary steps than equally experienced women, or men may disproportionately receive additional payments beyond the MECA minimum.

2 Literature review

This section reviews the literature on the gender pay inequality in the medical profession. Early research by Baker (1996) uses a survey of randomly selected US physicians and suggests that no gender wage gap exists in the United States among young doctors in the same specialty with the same characteristics, while gender wage gaps still exists among older physicians and specialists. Bashaw & Heywood (2001) use the same data as Baker and find significant gender wage gaps by applying a more refined earnings specification while still controlling for specialty.

[8] Section 4.1 describes the construction of our sample of doctors and the occupations (specialties) that we include. Throughout, we refer to this full sample as "doctors", and the sample that is the same except that it excludes resident medical officers as "specialists".

More recent international research suggests that a substantial wage gap still exists between male and female doctors. For young doctors averaged across specialities at the beginning of their careers in the US, the gender wage gap is 13% and grows as experience increases (Esteves-Sorenson & Snyder, 2012). A broad study of the determinants of doctors' earnings using a comprehensive survey of the population of doctors in Australia also identified that female GPs and specialists earn 17-23% less than their male counterparts (Cheng et al., 2012). Schurer et al. (2015) looks at the family gap in earnings of GPs in Australia using four waves of the same survey. They confirm both the breadwinner effect, as men with children earn more than those without, and the carer effect, as women with children earn less than those without. Similar earnings determinants research in the UK finds very little evidence for gender discrimination once hours worked are accounted for however their population of interest are self-employed GPs (Morris et al., 2008). Weak evidence of gender discrimination in the wages of GPs is found in later research with an 11% difference in wages between male and females. The use of the UK GP Worklife survey broadened the analysis to doctors that are not solely self-employed (Gravelle et al., 2011). Gender wage gaps also persist among medical specialists in Sweden, even after speciality is controlled for, and this gap increased between 1975 and 2007.

In New Zealand, to the best of our knowledge, no study has been done to specifically analyse the gender wage gap among physicians, GPs, or medical specialists. Furthermore, none of the international studies mentioned above have analysed physician remuneration in relation to collective employment agreements or public health sector employment.

3 Background

3.1 District Health Boards (DHBs)

New Zealand has a large public health system that provides free or subsidised health and disability services to the New Zealand population, mainly funded through general taxation.[9] The majority of funds managed by the Ministry of Health are allocated to the 20 District Health Boards (DHBs). These were established in January 2001 by the New Zealand Public Health and Disability Act 2000 to plan, purchase, and provide health services including public hospital services to the populations of their geographic areas. Publicly employed medical staff are employees of and paid by the DHBs. Instead of or in addition to DHB employment, medical specialists may work in the private health system, which operates alongside the public health system and caters to those with private insurance, among others. The majority of general practitioners operate in a private practice capacity, whereas private practice is less common for other specialists.

[9] Most of the information in this section was taken from the website of the Ministry of Health, https://www.health.govt.nz, accessed 14 November 2019.

3.2 Medical training and registration in New Zealand

A Bachelor of Medicine and Bachelor of Surgery ("medical degree") in New Zealand takes six years to complete, the final year of which is spent as a student intern. After successfully completing a medical degree in New Zealand or Australia, doctors may register with the Medical Council of New Zealand, which enables them to practise medicine in New Zealand.[10] Doctors must then spend two years in an internship programme as house officers, followed by at least three years as registrars (or at least four years for most specialties other than general practice) as they train in a specialty. House officers and registrars are both referred to as Resident Medical Officers (RMOs).[11] After successfully completing specialist training and passing the associated exams, doctors can apply for vocational registration, which allows them to work unsupervised in their field of specialty.

The pathway to New Zealand registration for International Medical Graduates (IMGs), doctors with overseas medical qualifications, depends on the country of training, but is more straightforward for graduates of Australia, the United Kingdom, and Ireland. Overseas-trained specialists who come to New Zealand can apply for vocational registration based on their overseas qualifications and training, and the relevant specialist medical college will assess their case on its merits. If they do not have a fellowship qualification that is recognised ("acceptable") by the Medical Council of New Zealand, they may receive provisional vocational registration, which allows them to practise in their specialty, but only under supervision. Additional assessments may be required before these doctors are able to gain full vocational registration and practise unsupervised.

According to the Medical Council of New Zealand, over 40 percent of the doctors currently registered for practise in New Zealand trained overseas.

3.3 Unionisation of medical specialists

The Association of Medical Specialists (ASMS), formed in 1989, is the professional association and union of senior medical and dental staff in New Zealand.[12] Membership is open to "any salaried specialist or senior medical or dental officer employed in New Zealand's public hospital system" and "other senior medical officers who work in Hospices, private specialist practices, Union Health Services, rural-based Community Health Trusts and the Family Planning Association."[13] About 90 percent of those who fall into the former category are members. RMOs are able to join their own union.

[10] Most of the information in this section was taken from the website of the Medical Council of New Zealand, https://www.mcnz.org.nz, accessed 14 Nov
[11] In some countries RMOs are referred to as "junior doctors".
[12] Most of the information in this section was sourced from the webpage of the ASMS, https://www.asms.org.nz/, accessed 14 November 2019.
[13] https://www.asms.org.nz/membership/eligibility-and-subscription/, accessed 14 November 2019.

One of the roles of the ASMS is to negotiate collective employment agreements with the employers of its members. In particular, since 2003 it has negotiated a national collective agreement, or multi employer collective agreement (MECA), that covers the employment of its members with all 20 DHBs. The pay and conditions specified in the MECA extend to specialists employed by DHBs who are not ASMS members under certain conditions, which include payment of a bargaining fee to ASMS.

Among other conditions of employment, the MECA specifies minimum salary levels for medical specialists at each level of experience and progression through them. Appendix B: Salary steps of specialists in March 2013 gives the salary for each band or "step" as of March 2013, the date of our data. The salaries given for each step are based on 40 ordinary hours of work each week; those employed for fewer or more hours each week receive proportionately adjusted actual annual salaries.

Specialists are assigned to a step when they take up employment with a DHB. This could be the first step if they are newly qualified, or could be negotiated between the employee and employer based on past experience and qualification level. Each year, specialists progress up a step in the schedule if they have fulfilled their duties and responsibilities. In the experience of ASMS, overwhelmingly members advance a step each year until they reach the top step.[14] Those on approved unpaid leave for up to a period of six months, or on parental leave for up to twelve months, are still eligible for these regular pay increases.

In addition to base pay, the MECA specifies that a DHB may pay additional "recruitment and retention benefits" to address actual or potential recruitment problems, and "special contributions benefits" to recognise special skills or responsibilities.[15] Furthermore, it should be noted the MECA sets out minimum pay and conditions for specialists, and individuals or groups may negotiate more favourable additional conditions with their employer.

Nonetheless, the salary minima for each step and regular progression through the steps are expected to reduce the scope for a wage gap to arise between equally skilled and experienced men and women who are employed as medical specialists by DHBs.

4 Data

Our source of data is the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand. The IDI brings together administrative data for the full population of New Zealand and selected survey data from a wide range of sources, and links records for individuals between different data sources. The two main data sources in the IDI we use are the 2013 Census of Population and Dwellings, which provides data on occupation (specialty) and weekly hours

[14] Multi Employer Collective Agreement for ASMS Members Employed by New Zealand District Health Boards: 1 July 2017 - 31 March 2020, in the Guide to the MECA.
[15] Multi Employer Collective Agreement for ASMS Members Employed by New Zealand District Health Boards: 1 July 2017 - 31 March 2020.

worked along with a multitude of other personal and employer characteristics, and the employer monthly schedule (EMS) from Inland Revenue, which records wages paid each month by each employer to each employee in the country. This combination of data sources provides the most recent data currently available on earnings and hours worked for the full population of DHB-employed medical specialists. In addition, we use the Ministry of Education's tertiary qualifications data to construct the dates individuals received their medical degrees, and data on working proprietor relationships constructed by Fabling and Maré (2015) to account for jobs, such as private practice, for which medical specialists might not be paid wages.

4.1 Population of interest

Our conceptual population of interest is resident medical officers (RMOs) and medical specialists, jointly referred to as doctors, who were employed for wages or a salary in a medical capacity by a DHB at the time of the March 2013 Census. We include dentists and dental specialists because the ASMS MECA also covers dental specialists. This includes individuals for whom this DHB job is the only or main job, and also those for whom it is a secondary job.

Our sample is all individuals who state their occupation in the Census as RMO or a medical specialty (see Appendix A: Included specialties for the list of included specialties), and who are shown in the EMS to have received wages from a DHB in March 2013, the month of the Census. However, we drop individuals who meet these criteria but are observed in the Ministry of Education data to receive a Bachelor of Medicine and Bachelor of Surgery (medical degree) from a New Zealand institution after the year 2013. This yields an overall sample of 6,804 doctors, or 4,041 specialists.[16] Much of our analysis we repeat on two samples: the full sample of doctors as described, and the sample of specialists (that excludes RMOs).

We note that medical officers, doctors with specialist training but who have not passed specialist exams and so do not have vocational registration, cannot be separately identified in our data. They are likely to appear listed against the specialties in which they work. Although medical officers are on a lower pay scale than medical specialists, their inclusion is unlikely to affect our estimates of the gender pay gap much, assuming the gender balance among medical officers is comparable to that among specialists.

According to ASMS records derived from DHB reporting of their employees, in July 2013 DHBs employed 4022 specialists and 520 medical officers.[17] Comparison with our sample of 4,041 specialists (including medical officers) suggests that we have very good, though not universal, coverage of DHB-employed specialists.

[16] These numbers, and all other population counts in this paper, have been randomly rounded to base three for confidentiality reasons.
[17] ASMS, "Salary Survey: Senior Medical and Dental Officers", 1 July 2013, https://www.asms.org.nz/wp-content/uploads/2014/07/Salary-Survey-2013-Analysis.pdf, accessed 20 November 2019.

4.2 Main outcome variable: Hourly wages in main DHB job

Our primary wage outcome of interest is the individual's hourly wage earnings in his or her largest DHB job. We calculate this variable as monthly wages paid by highest-paying DHB employer divided by weekly hours worked in DHB job reported in the census, times (7/31).

This calculation is complicated by the necessity of matching census jobs (the source of hours worked) with EMS jobs (the source of earnings) and the way hours worked is asked in the census. The census collects most information about the "main job", defined as the job in which the individual worked the greatest number of hours. Statistics New Zealand processes the information and provides data on industry and sector of employer for main job. Industry and sector are also available for the employer in the EMS data. We apply a number of criteria sequentially to determine which EMS job (if any) is the main census job. First, we consider an EMS job to be the main job if it fully matches the main census job in terms of sector and detailed industry. If two or more EMS jobs meet this criterion, the one paying the highest wages is considered the main job. Second, if the sector matches and the industry matches at only the 2-digit level (aggregate industry classification) we call the EMS job the main census job. Again, multiple matches are dealt with by choosing the EMS job with higher wages. If no EMS jobs match the sector and aggregate industry of the main census job, we do not allocate an EMS job to be the main census job. Inability to identify the main job in the EMS data causes us to lose some observations from our hourly wage data set.

The census collects two hours worked variables: hours worked in main job and hours worked in all other jobs.[18] If the DHB job is the individual's main job or only job other than their main job, the answers to these questions allow us to identify how many hours they work for the DHB. We lose from the hourly wage data set the observations for individuals with three or more jobs for whom the DHB job is not the main job. We also lose observations where the individual did not complete the census questions on hours worked, and we drop the small number of cases for which our calculation yields wages below $15 an hour.[19]

We similarly calculate average hourly wages in all jobs from total wage earnings in all jobs in March 2013 from the EMS table and weekly hours worked in all jobs from Census. Some medical specialists with private practices (working proprietors) may pay themselves zero or low wages, but compensate themselves for their work via non-wage payments. Where this is the case, and assuming such individuals report hours worked in their own practices as part of their total hours worked in the Census, average hourly wages from all jobs will be an underestimate of earnings per hour for these individuals.

[18] In both cases, the wording of the question is "How many hours, to the nearest hour, do you usually work each week?" We can only speculate on how individual specialists interpret this question, but it seems plausible that many will include on call hours in the number they report.

[19] Our preferred estimate of the overall gender wage gap for specialists falls from 12.5 percent to 11.6 percent when we instead use a cut-off of $20. However, using this larger cutoff disproportionately drops (low-paid) women from the sample, so is likely to underestimate the gender wage gap.

This process leaves us with 6,021 observations of hourly wages in main DHB job for all doctors, which is 88.5 percent of our desired population. In the sample of specialists, we have hourly wages for 3,513 individuals, or 86.9 percent of the total population.

4.3 Other variables

One dimension of particular interest is whether an individual gained his or her medical degree in New Zealand or overseas. We construct a binary measure of an individual being overseas trained (also known as an International Medical Graduate, or IMG) from Ministry of Education Qualifications data and Census data on country of birth and years in New Zealand. We are unable to perfectly observe individuals who gained their medical degrees in New Zealand because the Ministry of Education's tertiary qualifications data in the IDI go back only to 1994. We consider an individual to be NZ-trained if she was observed to receive a medical degree in New Zealand (since 1994), was born in New Zealand, or was born overseas but migrated to New Zealand when aged 23 or younger. The rationale for this cut-off is that 24 years old is both the modal and median age for receiving a medical degree in New Zealand since 1994.

We use the census question on self-employment income to categorise specialists as self-employed or not.[20] Although we are unable to determine the precise nature of specialists' self-employment work, it is likely that in the majority of cases it is private practice.

5 Methodology and results

We begin this section by describing our data and comparing raw characteristics and outcomes of men and women. We next estimate the gender gap in hourly wages between doctors of the same age, and show the extent to which this gap is explained by the specialties in which men and women work and the number of hours they work each week. We then explore how the gender wage gap varies with age and weekly hours, and test the extent to which it can be explained by differential work experience at the same age. In Section 5.3 we show how the estimated gender wage gap varies across DHBs and by DHB size. Finally in Section 5.4 we show how the gender wage gap differs with parenthood status, country of birth, country of qualification, specialty type, partnership status, and self-employment.

5.1 Descriptive statistics

Table 1 presents descriptive statistics for the work outcomes and main controls we use in the regression analysis. In his or her DHB job, the average doctor in 2013 earns $13,069 per month from working 46 hours each week for an hourly wage of $71. The average specialist earns

[20] The question asks, "Mark as many spaces as you need to show all the ways you yourself got income in the 12 months ending today," and the second option offered is, "self-employment, or business I own and work in". Individuals who mark this income source are classed as self-employed.

$14,408 from working 44 hours each week for an hourly wage of $82. In both cases, earnings have a high variance. For doctors, the standard deviation of hourly wages is $61, and for specialists it is $58. Thirty-two percent of doctors and 37 percent of specialists are women, and their average ages are 41 and 44 respectively. For most of our covariates, the characteristics of all doctors and specialists are relatively similar. Specialists on average have just over one child, 56 percent were born overseas but only 41 percent trained overseas, 26 percent report any ethnicity other than European, with 18 percent reporting Asian ethnicity, 83 percent are currently partnered, 36 percent have an honours or Master's degree and 28 percent a doctorate, 90 percent live in a main urban area, and the majority work for a DHB that employs 500 or more doctors. Among all doctors, 11 percent have a medical specialty, 9 percent a surgical specialty, 19 percent are GPs, 42 percent are RMOs, and 20 percent have other specialties.

Table 2 summarises the employment characteristics of the medical specialists in our data set by gender and additionally broken down by age group, number of jobs, country of birth, country of qualification, and self-employment status. Appendix Table 1 replicates this table for the sample that includes RMOs as well as specialists. In both samples, men are less likely than women to work for a DHB as their main job (81 compared with 86 percent in the specialists sample), are more likely to receive wages from more than one job (14 percent compared with 10 percent among specialists), and are more than twice as likely to be self-employed (44 compared with 21 percent of specialists). The percentages of male specialists and female specialists able to be captured in our hourly earnings data are very similar, at 87 percent of men and 88 percent of women. Among the sample including RMOs, our hourly earnings data capture 88 percent of men and 89 percent of women.

Both men and women show distinctive differences in employment by age group, with the importance of the DHB job declining with age, the number of jobs worked increasing with age, and self-employment increasing substantially beyond the age of 40, especially for men. For male specialists, self-employment reaches a maximum of 61 percent at age 50 to 59. Female specialists also have the highest rate of self-employment at this age, though their maximum is much lower at only 34 percent.

Both male and female specialists who work in at least two jobs (either for wages or as working proprietors) are very likely to be self-employed in one of their jobs (80 percent of men and 64 percent of women). This is also true in the sample that includes RMOs, though the percentages are somewhat lower.

Compared with foreign-born specialists of the same gender, NZ born specialists, and NZ born doctors more broadly, are more likely to have multiple jobs and are much more likely to be self-employed. Male specialists who were born in New Zealand in particular differ from the other groups. Only 75.5 percent of them work for a DHB as their main job, compared with 85 to 87 percent for the other groups, 81 percent of them have only one job, compared with 88 to 92

percent, and 55 percent of them are self-employed, compared with 17 to 36 percent. Similarly, specialists who were trained in New Zealand have more jobs and are more likely to be self-employed than their overseas-trained peers of the same gender.

Unsurprisingly, men and women who are self-employed are less likely to work for a DHB in their main job, and are more likely to earn wages in multiple jobs.

Table 3 restricts the sample to specialists with non-missing hourly wages in their DHB job, and describes the hours worked and earnings in the DHB job and in all jobs of the subpopulations described in Table 2. Appendix Table 2 replicates Table 3 for the sample of all doctors.

Table 3 shows that female specialists have 34 percent lower median monthly earnings in their DHB employment than do male specialists. However, they also work fewer hours, with a median of 40 hours per week as opposed to 45 hours for men. These translate into female specialists earning median hourly wages that are 20 percent lower than those of male specialists. Hours and earnings gaps in all jobs show a similar pattern. Among all doctors, the difference in median hourly earnings in DHB employment is even greater, at 37 percent.

Perhaps surprisingly, we also see that for nearly every subpopulation median hourly earnings in the DHB job are higher than median hourly earnings across all jobs. This is likely to reflect the limitation that doctors in private practice may pay themselves by means other than wages, so hourly earnings calculated from wage data underestimate the financial rewards from private practice.

When we break down the population by age group, we see men and women under age 30 are very similar in terms of median monthly earnings, weekly hours worked, and hourly earnings. This remains true whether we limit the sample to specialists only or include all doctors. However, from the age group 30 to 39 differences begin to open up in monthly earnings, hours worked, and hourly earnings. These gaps never close.

For both genders, specialists with multiple jobs earn higher median hourly wages in the DHB employment; much of this difference is likely to be the result of those with multiple jobs tending to be older and thus more experienced.

Median hourly earnings in DHB employment are very similar for NZ born and foreign born specialists of the same gender. However, those trained overseas have higher median hourly earnings, especially among women. Finally, both male and female specialists who are self-employed work fewer hours in their DHB job and earn substantially higher hourly wages.

The two panels of Figure 1 show how mean hourly wage in the DHB job, unadjusted for any characteristics, changes with age for each gender for medical specialists (Panel A) and all doctors (Panel B). For both genders, hourly wages increase gradually to the age of about 30, increase rapidly over the next 10 or 15 years, and then tend to flatten out. This is roughly the age at which specialists who gain their medical degrees at age 24 might be expected to reach the top salary step specified in the MECA that was in force in March 2013. The gender pay gap in

average hourly earnings is small and fairly constant until age 40, but beyond that increases rapidly to give men a wage advantage over women.

5.2 Gender wage gap in hourly wage

In this section we estimate the gender wage gap in hourly wage earned in specialists' main DHB jobs by regressing at the individual level the log of hourly earnings on a dummy variable for female and various other controls. Because Figure 1 and Table 2 show a strong increase in the hourly wage with age, our most basic regression also includes controls for the age categories under 30, 40 to 49, 50 to 59, and 60 or over, with 30 to 39 being the omitted category. Columns (1) and (4) of Table 4 present the results of this regression for all doctors and specialists respectively. They show that in the doctors sample women earn 9.4 percent less than men of the same age, and in the specialists sample women earn 11.0 percent less than men of the same age.[21] That there exists a gender wage gap between medical specialists of the same age shows that the lower hourly wages of female specialists relative to male specialists is not the result of the female specialists being younger on average.

In columns (2) and (5) of this table we interact female with the two age categories "under 30 years" and "40 years and over" to estimate how the gender wage gap differs by age. We find, as suggested by Figure 1, that the gender wage gap increases sharply with age. In the under 30 age group, the gap is 3.1 percent for all doctors and 2.4 percent for specialists[22] (both values are statistically indistinguishable from zero), for ages 30 to 39, these gaps are 7.7 percent and 10.0 percent, both statistically significant, and for ages 40 and over they are 13.7 percent and 13.2 percent. However, in the specifications that limit the sample to specialists we have limited statistical power, and difference in the gender wage gap between the age groups 30 to 39 and 40 and over is not statistically significant.

One possible driver of the larger gap in the older age group is cohort effects. Because our data are all from 2013, each individual is observed only at one age, and those in the older age group may have trained and worked in a cultural environment that was less conducive to gender equality than is the environment of today. We are unable to say based on our data whether, when the current under-30 cohort reaches the age of 40, their gender wage gap will be smaller than the 13.2 to 13.7 percent we observe here.

These wage gaps are between male and female specialists in the same age group, but the men and women we are comparing may differ on average in other ways. In particular, it may be that the women tend to work in lower-paying specialties. Thus in columns (3) and (6) of Table 4 we add specialty fixed effects so we are estimating the average within-specialty gender wage gap for each age group. Specialties are specific, for example, "neurologist" and "cardiothoracic

[21] 1 - exp(0.099) = 9.4 percent and 1 - exp(-0.116) = 11.0 percent.
[22] Most of the youngest specialists are GPs.

surgeon". The full list of specialties can be found in Appendix A. The wage gaps within specialty are very similar to the overall wage gaps: for the under 30 age group, the gap in the full population is 3.0 percent and the gap in the population excluding RMOs is 2.5 percent; for the 30 to 39 age group, the gaps are 6.7 percent and 9.1 percent; and for the 40 and over age group the gaps are 12.3 percent and 12.2 percent. That is, among the two samples and different age groups, the specialties in which men and women work explain between none of the wage gap and 13.0 percent of the wage gap. Although above the age of 30 differences in specialty do contribute to the raw gender wage gap, the extent to which women work in lower-paying specialties is limited.

Another potential explanation for the gender wage gap is that female specialists are more likely to work part time, and part-time employees might earn lower hourly wages than full-time employees. In Table 5 we investigate whether this phenomenon contributes to the within-specialty gender wage gap found above. We regress log hourly wages in the DHB job on a female dummy, flexible age controls,[23] and specialty fixed effects, and look at how the coefficient on female changes when we add controls for weekly hours worked in the DHB job (30 or fewer hours, 31 to 40 hours, 51 to 60 hours, and over 60 hours, with 41 to 50 hours as the omitted category). We replicate this analysis for the full sample of doctors (columns (1) and (2)) and the specialists sample (columns (5) and (6)). We find in both cases that hourly wages are in fact higher for specialists who work fewer hours each week for their DHB, and controlling for hours worked increases the estimated wage gap from 9.2 percent to 12.5 percent (with a 95 percent confidence interval of 9.9 percent to 15.1 percent) for specialists, and a comparable amount for doctors overall. The interpretation of these results is that specialists who work fewer weekly hours earn higher hourly wages than their colleagues of the same gender and age in the same specialty who work more hours each week, and female specialists tend to work fewer hours than male specialists. Combined, these two facts cause the average with-specialty gender wage gap between men and women who work the same number of hours to be larger than the average gender wage gap not controlling for hours worked.

We next interact the female dummy with the hours worked categories to estimate a separate gender wage gap for each hours worked category. Again we control flexibly for age and include specialty fixed effects, so all comparisons are for men and women of the same age in the same specialty. Columns (3) and (7) of Table 5 present the results of these regressions. We find the gender wage gap is larger among specialists who work fewer hours. For specialists, the gender wage gap is 22.9 percent among those who work up to 30 hours per week, but falls to 5.4

[23] Specifically, here and subsequently we use an age spline of order 4, which mimics closely the shape shown in Figure 1. This better captures the exact way in which wages change with age, though it doesn't lend itself to calculating different wage gaps for different age groups that are straightforward to interpret, as did the age category controls we used in Table 4.

percent for those who work over 60 hours. The differences between categories are comparable, though marginally smaller, in the full sample of doctors.

If DHBs of different sizes pay hourly wages that vary differently with hours worked and female specialists are more likely to work for DHBs of particular sizes, this could explain why men's wages fall faster with hours worked than do women's. In columns (4) and (8) of Table 5 we explore this possibility by regressing log hourly wages on a female dummy, age and specialty controls, linear weekly hours worked and its interaction with female, dummy variables for small DHBs and large DHBs, and the interactions of the DHB size dummies with linear weekly hours worked. We find that DHB size is not significantly related to the slope of the relationship between hours worked and hourly wages, and in these regressions the gradient of hourly wages with respect to hours worked is still significantly flatter for female specialists than for male specialists. That is, this explanation is not an important contributor to the gender wage gap.

However, it is very likely that male and female specialists choose to work part time for different reasons. Male specialists are more likely to work part time for a DHB because they are combining this job with another job, particularly private practice. Female specialists are more likely to work part time for a DHB because they are combining paid work with unpaid family responsibilities such as childcare. These differences could mean that the male specialists who work part time tend to be more ambitious than the female specialists who work similar hours, but could also mean part-time male specialists have higher bargaining power in wage negotiations than do part-time female specialists.

One way to capture such differences in negotiating power is by controlling for weekly hours worked in other jobs. When we do so in

Appendix Table 3, we find working in additional jobs is associated with higher hourly wages in the DHB job, especially if the specialist works over 40 hours a week in other jobs. Adding these controls, the average within-specialty gender wage gap for specialists of the same age and weekly hours falls from 12.5 percent to 11.2 percent. Additionally controlling for whether they are self-employed does not affect the estimated wage gap.

5.2.1 The role of differential gaps in experience in the gender wage gap

In the previous section we control flexibly for age to capture the experience of specialists, allowing us to estimate the gender wage gap between similarly-experienced men and women. However, age may not perfectly capture experience for two main reasons. First, if women tend to enter the profession at an older age than do men, women will tend to have less experience than men of the same age. Second, women may have more gaps in their experience if they take time away from work for childbearing.

In this section we explore alternative ways to capture experience and assess the extent to which differential experience at the same age is likely to contribute to the gender wage gap we estimated previously. We are able to observe the year in which the medical degree was obtained

only for those who received this qualification in New Zealand in 1994 or later. Our first analysis here thus limits to this sample of individuals. For comparison, columns (1) and (6) of Table 6 regress for this sample the log of hourly earnings on a female dummy, specialty fixed effects, hours worked categories, fixed effects for highest qualification, DHB size category controls, and a dummy for being self-employed, and use flexible age controls as previously to capture experience. We find a statistically significant wage gap of 4.9 percent for all doctors and 6.1 percent for specialists. These gaps are smaller than previously because those who were qualified in New Zealand in 1994 or later tend to be younger, and the wage gap is smaller at younger ages.

In the next two columns of the table we replace the age spline with a spline in years since gaining medical qualification. In both the all doctors sample and the specialists sample, this decreases the wage gap somewhat. It falls to a 4.0 percent in the doctors sample and to 5.4 percent in the specialists sample, the latter being a decrease of 10.8 percent. That is, among specialists who were qualified in New Zealand in 1994 or more recently, women entering the profession at older ages explains 10.8 percent of the within-specialty wage gap between men and women of the same age.

In columns (3) and (8) of Table 6 we additionally attempt to account for time taken away for work for parental responsibilities. We run separate regressions (not shown) and estimate that having a child reduces the months in which a woman works by 5 months on average, whereas men do not decrease their months worked when they have children.[24] We thus calculate an adjusted years of experience variable that is equal to years since gaining medical degree for men, and years since gaining medical degree minus five months for every live child given birth to for women.[25] Flexibly controlling for this adjusted experience instead of unadjusted experience further reduces the gender wage gap among those observed gaining their medical degree in NZ since 1994 to 3.5 percent for all doctors and 4.9 percent for specialists, though both wage gaps remain statistically significant at the 95 percent level. Thus for specialists who were qualified in New Zealand in 1994 or later, accounting for differences in age entering the profession and average breaks for parental responsibilities explains only 20 percent of the gender wage gap. However, the ASMS MECA specifies that those on parental leave for up to a year receive the same pay increases as if they were working, so in some senses this is an over-adjustment and represents an underestimate of the gender wage gap.

[24] To do this, we construct a sample of doctor-years for doctors in our sample for the years 2000 to 2017, dropping those yet to complete their medical degree in New Zealand, migrants working an incomplete first year in New Zealand, and anyone outside the age range 24 to 64. We count the number of months each individual earned wage income from any New Zealand employer each year. We then regress separately for men and women the number of months worked in the year on a set of dummy variables for individual years of age, a dummy for whether they had a child that year (from the Department of Internal Affairs' births records), and dummies for whether they had a child each of the two preceding years. We add up the coefficients on the last three dummy variables and interpret this sum as how a man or woman changes his or her lifetime months of employment due to having a child. Results are very similar for NZ-trained doctors and IMGs, so we pool them in the regressions.

[25] We use this approximation because we are not able to observe actual months worked prior to April 1999.

For those qualified before 1994 or who gained their medical degrees overseas, we are not able to calculate years since they gained their qualifications. We therefore run a specification for the full sample in which we assume everyone became qualified at age 24 (the median and modal age in the sample we do observe), and flexibly control for years since age 24 (columns (4) and (9) of Table 6). To better control for the proportion of time individuals have spent not working since age 24, we calculate a work "intensity" for each individual. This is equal to the fraction of total months in which they earned a wage in New Zealand since the latest of: a) April 1999 when our monthly wage data begin, b) the year they gained their medical degree in New Zealand, and c) the first month not before they gained their medical degree in which they are observed being paid wages by a DHB. We then estimate effective experience as years since age 24 multiplied by work intensity, and flexibly control for effective experience in our regressions (columns (4) and (9) of Table 6). Women have slightly lower average intensities than men, and replacing the controls for years since age 24 with effective experience controls decreases the estimated gender wage gap from 10.1 percent to 9.5 percent for all doctors, and from 11.9 percent to 11.3 percent for specialists.

Overall, these regressions with improved experience controls show that, although better accounting for actual work experience decreases our estimates of the wage gap slightly, gender differences in work experience can explain no more than a fifth of the overall average gender wage gap of 12.5 percent. It is not entirely surprising that accounting better for gender differences in experience does little to reduce the gender wage gap, given hourly wages show little growth beyond about age 45 for either gender.

5.3 Gender wage gap by DHB

In this section we investigate how the gender wage gap varies by DHB, though for confidentiality reasons we do not name specific DHBs. We estimate a separate gender wage gap within specialty for each DHB, controlling for age, hours worked, being foreign trained, and being self-employed. The two panels of Figure 2 show the distribution of estimated gender wage gaps for specialists (Panel A) and all doctors (Panel B). In the sample that includes all doctors, the three most unequal DHBs have women earning between 70 and 80 percent of what similar men in their specialty earn, and in ten DHBs women earn less than 90 percent of what similar men earn. In no DHBs do we estimate a wage advantage to women. Due to the relatively small number of doctors working in some DHBs, these wage gaps are not precisely estimated. However, in 14 of the DHBs we can rule out a zero gender wage gap at the 95 percent confidence level.

When we exclude RMOs, the most unequal DHBs look even more unequal: in the most unequal DHB, we estimate women earn hourly wages between 55 and 60 percent of what similar men in their specialty earn. In only six DHBs do women earn at least 90 percent of what

similar men earn, and in none do women have a wage advantage. Here, in eleven of the DHBs we can rule out a zero gender wage gap at the 95 percent confidence level.

To better understand which DHBs have greater pay inequality, we next group DHBs into three size categories based on the number of doctors they employed in March 2013: fewer than 200, 200 to 499, and 500 and over. Eight DHBs fall into the smallest category and six fall into each of the other two categories. We estimate a gender wage gap for DHBs in each size category. Figure 3 shows the estimates of the wage gap for DHBs in each size category for the sample of specialists and the sample of all doctors. In both samples we see the gender wage gap is largest in the small DHBs and smallest in the intermediate-sized DHBs. For specialists, the wage gap is an estimated 18.9 percent in the small DHBs (with a 95 percent confidence interval of 11.9 to 25.3 percent), 9.2 percent in the medium-sized DHBs (95 percent confidence interval 4.2 to 13.8 percent), and 12.0 percent in the large DHBs (95 percent confidence interval 9.0 to 14.9 percent).

5.4 Heterogeneity in the gender wage gap by personal characteristics

Section 5.2.1 above shows that accounting for the time women take off work when they have children decreases our estimate of the gender wage gap slightly. In this section we further explore the relationship between parenthood and the gender wage gap, and also explore the heterogeneity of the gender wage gap along other dimensions.

For comparison, columns (1) and (5) of Table 7 present the results of regressions of log hourly wages on a female dummy, hours worked categories, flexible age controls, and specialty fixed effects for doctors overall and specialists. The next two columns add controls for being part of a family that has one child, being part of a family that has two or more children, and the interactions of female with each of these dummies. This discussion gives the results for specialists sample, though the doctors sample gives a qualitatively similar story. We find in column (6) that the wage gap between men and women with no children in their families is 9.2 percent, between those in one-child families is 13.6 percent, and between those in two-child families is 17.2 percent. The gap in the no-children case is statistically significantly smaller than the gap in the two-child case, but not the gap in the one-child case.

Some older women may have had their careers affected by parenthood, but their children could have grown up and left home by 2013, in which case they would be classified as part of a no-child family. In columns (3) and (7) we thus use number of live children to whom women have given birth as an alternative measure of motherhood. These regressions suggest an even larger wage gap between mothers and fathers, though the interpretation of the coefficients is less clear because number of live births is not defined for men. However, in this regression the wage gap between men in families with no children and similar women in families with no

children who have never given birth to a live child falls to 5.4 percent, though remains statistically significantly different to zero.

The gender wage gaps among parents are much larger than can easily be explained by women taking parental leave when they have children, especially in light of the stipulation of the ASMS's MECA that specialists on parental leave for up to a year receive the same pay increases as they would if they were not on leave.

In the final column of Table 7 we again estimate separate wage gaps for specialists in families with different numbers of children, and add controls for various other personal characteristics that may be associated with different earnings. In particular, we add controls for level of highest qualification, being foreign born, being overseas trained, ethnicity, social marital status, DHB size, living in a main urban area, working in multiple jobs, being self-employed, and the geographical region of the job. Including these controls has minimal impact on the estimated gender wage gaps. We find having a doctorate is associated with 9.5 percent higher hourly wages compared with having only a bachelor's degree, small DHBs pay higher hourly wages than medium-sized DHBs, and specialists who are self-employed earn 4.7 percent higher hourly wages in their DHB jobs than those who are not.

We next explore how the gender wage gap differs with various other personal characteristics. Because statistical power is limited, we use the all doctors sample for this analysis. In each case we are comparing men and women of the same age, in the same specialty, who work the same number of hours, and who have the same level of highest qualification. We also control for being overseas trained or not, DHB size, and being self-employed. We find no evidence that foreign-born doctors have a gender wage gap that is statistically different to the gender wage gap of New Zealand born doctors (column (1) of Table 8 although the point estimate suggests a smaller wage gap among foreign-born doctors. Similarly, we find no evidence of a different gender wage gap for IMGs (column (2) of Table 8). We find the largest gender wage gap among those in medical specialties (14.3 percent), though the differences between the gap in these specialties relative to in surgical specialties, among RMOs, among GPs, and among other specialties are largely statistically insignificant (column (3)).[26] Among those without children in their families, unpartnered females earn a statistically significant 3.8 percent less than unpartnered males, whereas partnered females earn 7.3 percent less than partnered males (column (4)). However, the difference between the two is not statistically significant. Finally, we find no evidence that self-employed doctors have a gender wage gap that is statistically different to non self-employed doctors (column (5)).

On a similar vein, in Table 9 we estimate the gender wage gap for two particular subpopulations, Māori and recent immigrants. Again we use the sample of all doctors. Running separate regressions for these two groups allows the coefficients on all the controls to vary for

[26] See Appendix A: Included specialties for how individual specialties are classified in this analysis.

them relative to others in the full sample. The total number of doctors who identify as Māori (alone or in combination with other ethnicities) is low, at just 195.[27] We estimate the wage gap for Māori to be 11.7 percent, compared with 10.2 percent for the full sample. However, the small Māori sample size means these gaps are not statistically distinguishable. In column (4) of the table we estimate a separate wage gap for each parental status in the Māori population, but low statistical power means none of the differences are statistically significant.

We next estimate wage gaps for immigrants who arrived in New Zealand in March 2012 or later, and thus who had been in the country for no more than a year at the time of the 2013 Census. Seven hundred and forty-one doctors meet this criterion. We estimate their gender wage gap to be 12.9 percent, but again this is imprecisely estimated and not statistically different to the gap for the comparable full population. When we allow the gender wage gap for immigrants to differ by number of children, we find very large (though imprecisely estimated) gaps for parents: 29.0 percent between parents with one child, and 19.5 percent between parents with two or more children.

6 Conclusions and discussion

In this paper we estimate the gender gap in hourly wages earned by medical specialists in their main jobs working for DHBs in New Zealand at the time of the 2013 Census. Despite specialist salaries being specified by the MECA negotiated by the Association of Salaried Medical Specialists, we find male specialists earn a large and statistically significant premium over their female colleagues. When we compare male and female specialists of the same age, in the same specialty, who work the same number of hours each week, we find female specialists earn on average 12.5 percent lower hourly wages than their male counterparts in their DHB employment, with a 95 percent confidence interval of 9.9 to 15.1 percent.

For specialists without children, there is a smaller but still statistically significant gender wage gap of 9.2 percent. This gender wage gap rises to 13.6 percent for those with one child and to 17.2 percent for those with two or more children. Given the average female medical specialist reduces her lifetime months worked by on average five months for each child she bears, and the ASMS MECA specifies that specialists on parental leave for up to 12 months will receive the same regular pay increases as they would receive were they not on leave, these wage gaps for parents cannot be explained by time out of the paid workforce for parental leave alone.

As well as being larger among parents, we find the wage gap increases with age and is higher for specialists who work fewer hours each week in their DHB job, reaching 22.9 percent for those who work 30 or fewer hours. There is weak evidence that the gap is larger in medical

[27] Due to the small size of this sample even when RMOs are included, we did not repeat this analysis for the sample excluding RMOs.

specialties than in surgical specialties, in specialties that are neither medical nor surgical, and among GPs.

When we estimate a separate wage gap for each DHB, for eleven of the 20 DHBs we can rule out gender pay equality at the 95 percent confidence level. Small DHBs, defined as those that employ fewer than 200 doctors[28], have the largest wage gaps, averaging 18.9 percent. Large DHBs employing 500 or more doctors have smaller average wage gaps of 12.0 percent, and DHBs of intermediate size have the smallest average wage gaps of 9.2 percent. For all three DHB sizes we can reject gender pay equality at the 95 percent confidence level.

These wage gaps flexibly account for age, so are not driven by female specialists being younger on average than male specialists. They compare men and women in the same specialty, so are not driven by female specialists choosing to work in lower-paying specialties. Finally, they control for weekly hours worked, so are not driven by female specialists being more likely to work part-time and part-time employees earning lower hourly wages than full-time employees. In fact, although female specialists are more likely to work part-time in their DHB job, part-time specialists, especially men, tend to earn an hourly wage premium over full-time specialists.

We conduct a number of robustness tests to determine whether gender differences in effective experience at the same age, driven by entering the profession at different ages or having different gaps in work experience, could explain the wage gap. Our results suggest that, at most, 20 percent of the 12.5 percent wage gap, or 2.5 percentage points, can be explained by differences in experience. Furthermore, the data show that hourly earnings are relatively stable for men and women beyond approximately 45 years of age, which suggests that beyond a certain level of seniority hourly wages are determined almost entirely by factors other than experience.

In the context of the MECA that governs the earnings of DHB-employed medical specialists, the gender wage gap we estimate could arise from one of two places. First, men with the same experience could be placed in higher steps on the salary scale on recruitment. This has greater potential to occur for specialists who work in New Zealand after gaining experience overseas than for New Zealand-trained specialists who have worked only in New Zealand, who enter the pay scale on the lowest rung and deterministically progress up a step each year. Second, men could receive larger payments over and above the MECA minimum, which could include recruitment and retention benefits or special contributions benefits.

Although we do not find direct evidence that male specialists who migrate to New Zealand are initially placed on a higher pay step than similar female specialists, we do find a substantial gender pay gap among new immigrants, and are unable to rule out that such unequal treatment occurs. Our data do not allow us to distinguish base salary as specified by the MECA from the various additional payments, but our results are consistent with male specialists

[28] "Doctors" here include both specialists and Resident Medical Officers (RMOs).

disproportionately receiving additional payments beyond the MECA minimum for their salary step.

The broader literature on gender pay equality proposes employer discrimination and more successful salary negotiation on the part of men as two potential explanations for a gender wage gap such as that observed here. It is possible that both play a role in the gender wage gap for medical specialists.

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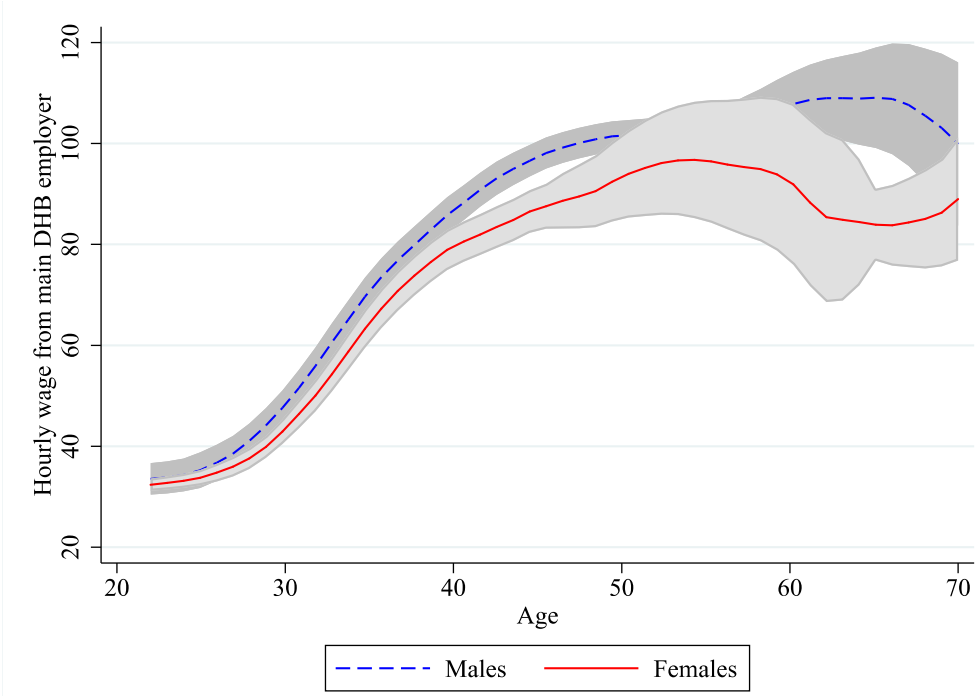
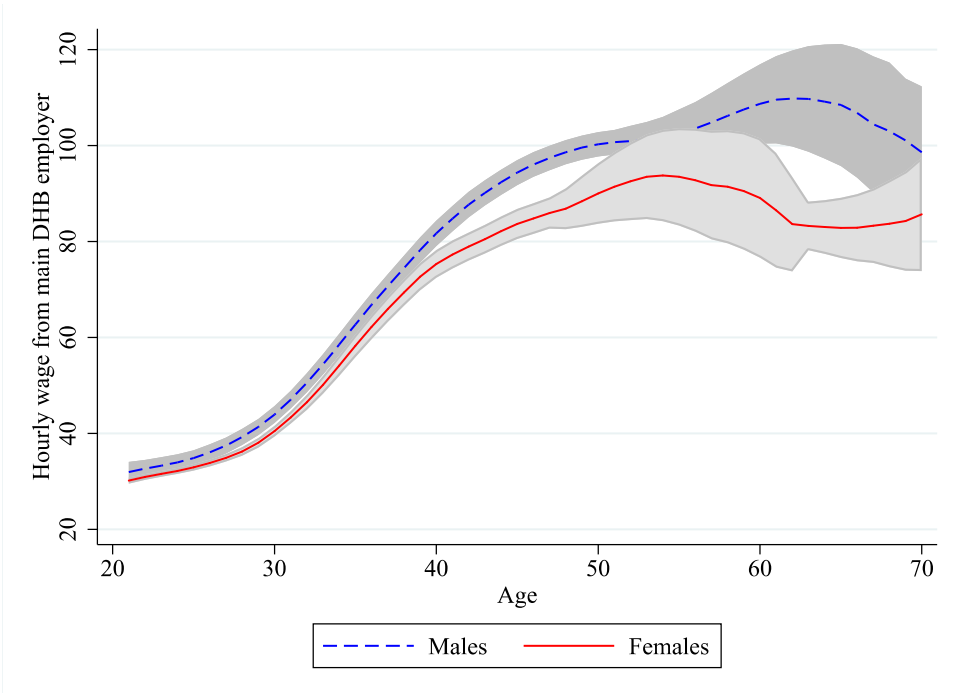
Figure 1: Raw hourly wage in main DHB job by age and gender

Panel A: Medical specialists



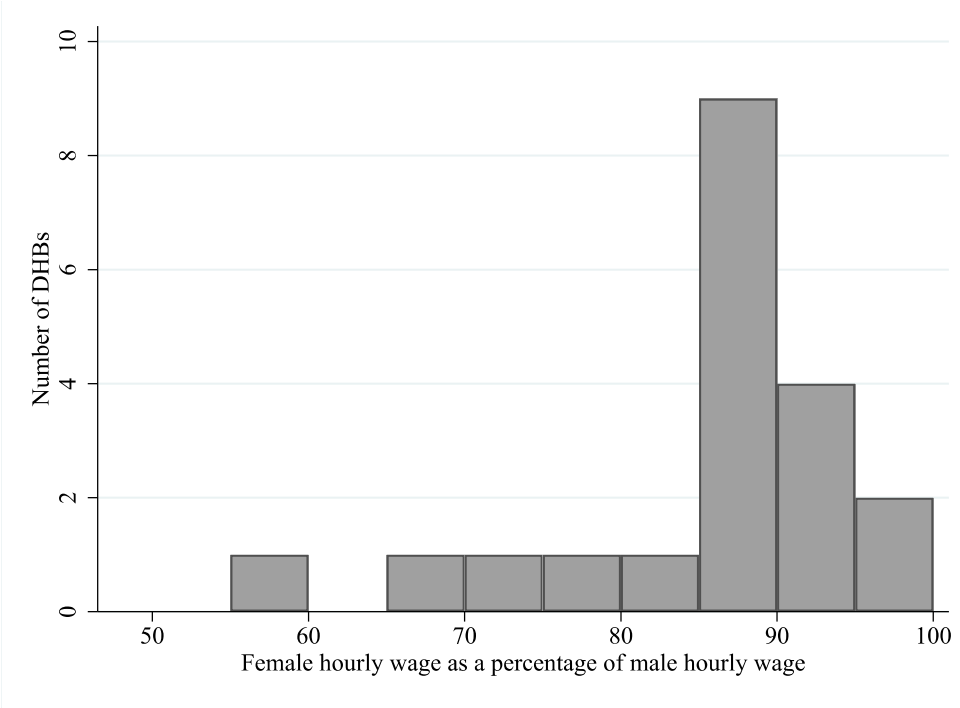
Panel B: All doctors



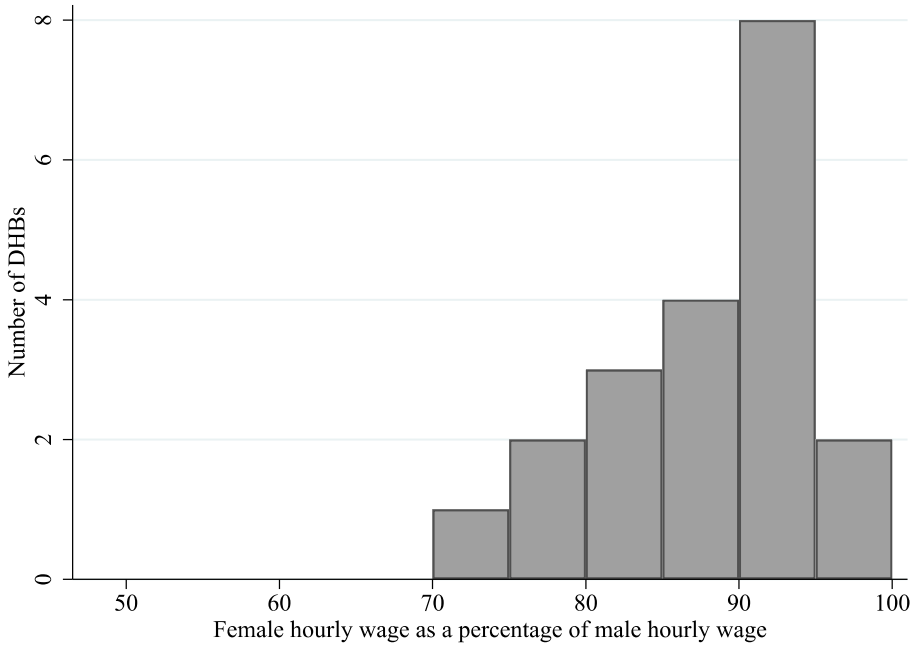
Notes: Figure shows mean hourly wage and 95% confidence interval.

Figure 2: Distribution across DHBs of gender wage gap within specialty

Panel A: Medical specialists



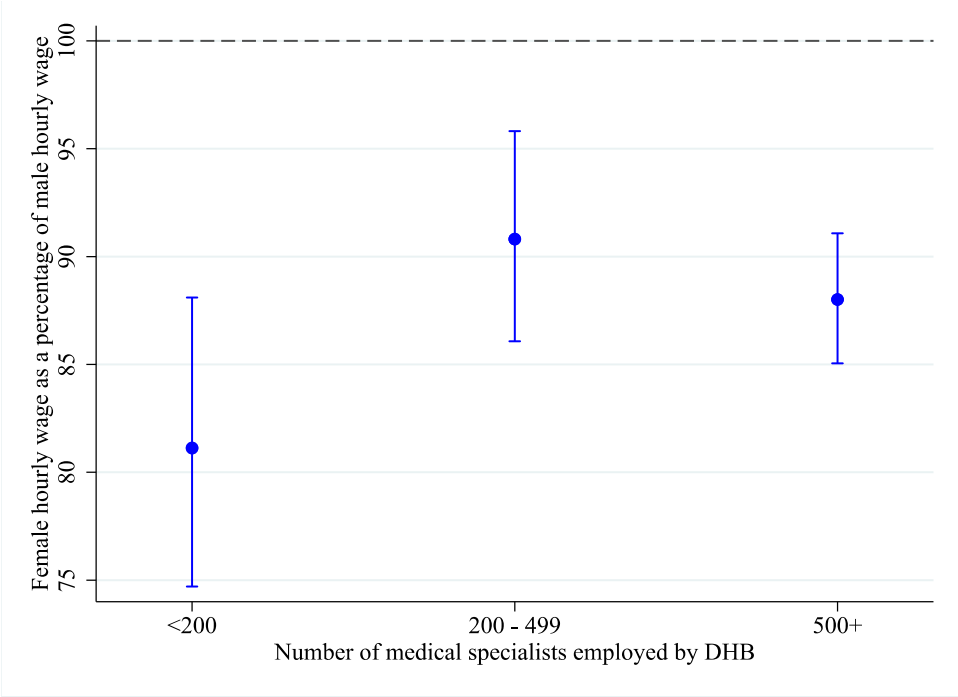
Panel B: All doctors



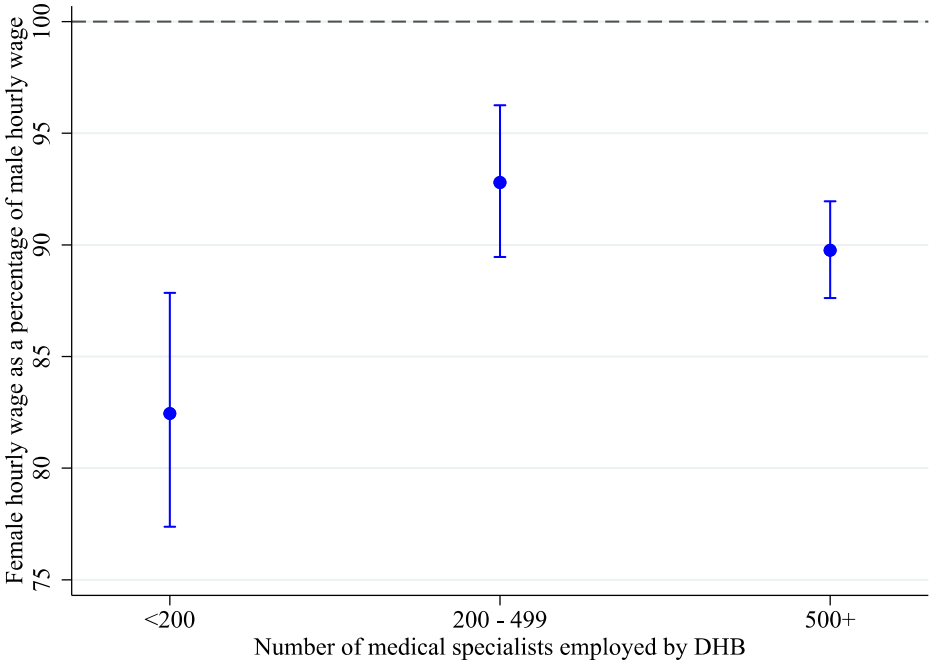
Notes: The panels of this figure are histograms of the estimated gender wage gaps in each of the 20 DHBs. The gaps are estimated using regressions that include specialty fixed effects and flexible age controls, and also control for hours worked categories, being foreign trained, and being self-employed.

Figure 3: Gender wage gap within specialty by DHB size

Panel A: Medical specialists



Panel B: All doctors



Notes: The panels of this figure show the estimated gender wage gaps in the DHBs of different sizes. Eight DHBs fall into the smallest size category, and six fall into each of the other two size categories. The gaps are estimated using regressions that include specialty fixed effects, DHB fixed effects, flexible age controls, and dummies for hours worked categories, being foreign trained, and being self-employed.

Table 1: Descriptive statistics

	All doctors		Specialists	
Variable	**Mean**	**Standard deviation**	**Mean**	**Standard deviation**
Monthly wage earnings in DHB job	$13,069	$6,946	$14,408	$7,188
Weekly hours worked in DHB job	46.2	13.9	43.7	14.2
Hourly wage in DHB job	$71	$61	$82	$58
Female	0.419		0.370	
Age	40.7	12.0	44.3	11.7
Number of children in family	0.93	1.16	1.08	1.22
Number of live children borne (women only)	0.88	1.16	1.15	1.24
Foreign born	0.577		0.561	
Overseas trained (IMG)	0.399		0.411	
Any non-European ethnicity	0.314		0.255	
Asian ethnicity	0.226		0.182	
Currently partnered	0.772		0.826	
Previously partnered	0.035		0.039	
Never partnered	0.193		0.135	
Bachelor's degree	0.412		0.365	
Honours or Master's degree	0.383		0.357	
Doctorate	0.203		0.276	
Lives in a main urban area	0.913		0.903	
Medical specialty	0.105		0.180	
Surgical specialty	0.091		0.156	
General practitioner	0.185		0.317	
Resident medical officer	0.417			
Other specialty	0.202		0.346	
Small DHB	0.101		0.108	
Medium-sized DHB	0.225		0.227	
Large DHB	0.675		0.664	

Notes: This table presents the means and standard deviations of outcomes of interest and control variables for the sample of all doctors (left hand side) and specialists (right hand side) with non-missing DHB hourly wage earnings.

Table 2: Job characteristics by subpopulation for specialists

Subpopulation	Total number of medical specialists	Percentage whose main job is for a DHB	Percentage working number of jobs for wages			Percentage self-employed	Percentage with non-missing hourly wage in largest DHB job
			One	Two	Three +		
Men	2,556	81.2%	85.8%	13.3%	0.9%	44.4%	86.5%
Women	1,485	86.3%	89.9%	9.5%	0.6%	20.8%	87.7%
Age categories							
Men under 30	237	92.4%	93.7%	6.3%	S	2.5%	89.9%
Women under 30	285	89.5%	91.6%	7.4%	S	S	87.4%
Men aged 30 to 39	495	89.1%	92.7%	6.7%	S	23.6%	90.9%
Women aged 30 to 39	396	87.1%	91.7%	8.3%	S	12.1%	86.4%
Men aged 40 to 49	768	80.1%	83.6%	16.4%	S	54.3%	86.3%
Women aged 40 to 49	426	88.0%	89.4%	9.9%	S	32.4%	90.8%
Men aged 50 to 59	684	75.4%	80.3%	18.4%	1.8%	61.0%	85.1%
Women aged 50 to 59	297	79.8%	86.9%	12.1%	S	34.3%	85.9%
Men aged 60 plus	369	76.4%	87.0%	11.4%	1.6%	48.0%	81.3%
Women aged 60 plus	84	82.1%	82.1%	14.3%	S	25.0%	78.6%
Number of jobs (including working proprietor jobs)							
Men with one job	1,392	92.2%	100.0%	S	S	14.0%	90.9%
Women with one job	1,104	91.3%	100.0%	S	S	6.0%	90.5%
Men with multiple jobs	1,164	68.0%	68.8%	29.1%	2.1%	80.4%	80.9%
Women with multiple jobs	381	70.9%	60.6%	37.0%	2.4%	63.8%	78.7%

Subpopulation	Total number of medical specialists	Percentage whose main job is for a DHB	Percentage working number of jobs for wages			Percentage self-employed	Percentage with non-missing hourly wage in largest DHB job
			One	Two	Three +		
Country of birth							
Men born in NZ	1,140	75.5%	81.3%	17.1%	1.3%	55.0%	84.5%
Women born in NZ	654	85.3%	87.6%	12.4%	S	25.7%	87.2%
Men born overseas	1,407	85.9%	89.6%	10.0%	S	35.8%	88.1%
Women born overseas	825	87.3%	91.6%	7.3%	1.1%	17.1%	88.4%
Country of qualification							
Men trained in NZ	1,482	77.3%	82.6%	16.0%	1.2%	50.6%	85.2%
Women trained in NZ	924	85.4%	88.3%	11.0%	S	22.4%	87.0%
Men trained overseas	1,071	86.8%	90.5%	9.5%	S	35.9%	88.2%
Women trained overseas	561	87.2%	92.0%	7.5%	S	18.7%	88.8%
Self-employment							
Men self-employed	1,134	69.8%	80.4%	18.5%	1.1%	100.0%	82.3%
Women self-employed	309	72.8%	83.5%	15.5%	S	100.0%	83.5%
Men not self-employed	1,419	90.5%	90.3%	9.1%	0.6%		89.9%
Women not self-employed	1,176	89.5%	91.6%	7.9%	0.8%		89.0%

Notes: The population considered is all medical specialists (excludig RMOs) who were employed by a DHB in March 2013. S denotes values that are too low to meet Statistics New Zealand's confidentiality requirements for release. All population counts and counts used to calculate percentages have been randomly rounded to base 3 for confidentiality reasons.

Table 3: Hours worked and earnings by subpopulation for specialists

Subpopulation	Number with non-missing hourly wage in largest DHB job	Largest DHB job			All jobs		
		Median monthly wage earnings	Median weekly hours worked	Median hourly wage	Median monthly wage earnings	Median weekly hours worked	Median average hourly wage
Men	2,211	$ 15,662	45	$ 86.12	$ 16,582	50	$ 77.15
Women	1,302	$ 10,320	40	$ 68.66	$ 10,657	45	$ 63.53
Age categories							
Men under 30	213	$ 7,823	55	$ 33.20	$ 7,914	55	$ 33.28
Women under 30	249	$ 7,649	55	$ 32.33	$ 7,771	55	$ 33.15
Men aged 30 to 39	450	$ 12,355	50	$ 61.83	$ 13,084	50	$ 55.64
Women aged 30 to 39	342	$ 10,177	45	$ 53.14	$ 10,266	45	$ 52.24
Men aged 40 to 49	663	$ 17,449	45	$ 91.29	$ 18,461	50	$ 82.02
Women aged 40 to 49	387	$ 12,774	40	$ 83.02	$ 13,632	40	$ 78.24
Men aged 50 to 59	582	$ 18,309	45	$ 97.59	$ 19,618	50	$ 87.85
Women aged 50 to 59	255	$ 14,065	40	$ 88.10	$ 14,708	40	$ 81.37
Men aged 60 plus	300	$ 16,610	40	$ 95.95	$ 17,914	47	$ 89.30
Women aged 60 plus	66	$ 13,297	40	$ 88.53	$ 14,496	40	$ 87.34
Number of jobs (including working proprietor jobs)							
Men with one job	1,266	$ 15,483	50	$ 78.16	$ 15,483	50	$ 75.49
Women with one job	999	$ 10,052	45	$ 60.60	$ 10,052	45	$ 58.62
Men with multiple jobs	942	$ 15,837	40	$ 93.59	$ 17,746	50	$ 77.86
Women with multiple jobs	300	$ 12,421	40	$ 83.02	$ 13,897	45	$ 70.39

Subpopulation		Number with non-missing hourly wage in largest DHB job	Largest DHB job			All jobs		
			Median monthly wage earnings	Median weekly hours worked	Median hourly wage	Median monthly wage earnings	Median weekly hours worked	Median average hourly wage
Country of birth								
	Men born in NZ	963	$ 15,278	45	$ 87.57	$ 16,422	50	$ 74.67
	Women born in NZ	570	$ 10,062	40	$ 68.83	$ 10,290	45	$ 62.73
	Men born overseas	1,239	$ 16,078	45	$ 85.37	$ 16,688	50	$ 78.36
	Women born overseas	729	$ 10,631	42	$ 68.20	$ 10,884	45	$ 63.86
Country of qualification								
	Men trained in NZ	1,263	$ 14,706	45	$ 83.65	$ 15,662	50	$ 71.52
	Women trained in NZ	804	$ 9,517	45	$ 64.00	$ 9,852	45	$ 56.92
	Men trained overseas	945	$ 17,104	45	$ 88.77	$ 17,674	50	$ 82.16
	Women trained overseas	498	$ 12,023	40	$ 74.71	$ 12,425	41	$ 70.31
Self-employment								
	Men self-employed	933	$ 16,483	40	$ 94.69	$ 17,887	52	$ 77.38
	Women self-employed	258	$ 12,688	35	$ 86.40	$ 13,639	45	$ 68.60
	Men not self-employed	1,275	$ 14,929	50	$ 76.02	$ 15,447	50	$ 76.81
	Women not self-employed	1,047	$ 9,897	45	$ 59.85	$ 10,177	45	$ 59.85

Notes: The population considered is all medical specialists (i.e. excluding RMOs) who were employed by a DHB in March 2013 for whom we have non-missing hourly wages in their largest DHB job. All population counts have been randomly rounded to base 3 for confidentiality reasons.

Table 4: Gender wage gaps by age

Dependent variable: Hourly wages in main DHB job (ln)

	All doctors			**Specialists**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Female	-0.099***	-0.080***	-0.069***	-0.116***	-0.105***	-0.095***
	(0.011)	(0.023)	(0.023)	(0.015)	(0.034)	(0.034)
Age categories (omitted 30-39)						
Aged under 30	-0.472***	-0.502***	-0.456***	-0.557***	-0.602***	-0.536***
	(0.014)	(0.019)	(0.019)	(0.021)	(0.028)	(0.029)
Aged 40-49	0.451***	0.478***	0.440***	0.380***	0.395***	0.382***
	(0.016)	(0.020)	(0.019)	(0.021)	(0.026)	(0.025)
Aged 50-59	0.544***	0.567***	0.524***	0.451***	0.464***	0.454***
	(0.017)	(0.020)	(0.020)	(0.022)	(0.026)	(0.026)
Aged 60+	0.532***	0.550***	0.506***	0.428***	0.437***	0.431***
	(0.025)	(0.027)	(0.028)	(0.029)	(0.032)	(0.032)
Aged under 30 * Female		0.049*	0.039		0.081**	0.070*
		(0.027)	(0.027)		(0.041)	(0.041)
Aged 40+ * Female		-0.067**	-0.062**		-0.037	-0.035
		(0.029)	(0.028)		(0.039)	(0.038)
Specialty fixed effects			Yes			Yes
R-Squared	*0.506*	*0.507*	*0.530*	*0.428*	*0.429*	*0.454*
Observations	*6,021*	*6,021*	*6,021*	*3,510*	*3,510*	*3,510*

Notes: Each column presents results from an OLS regression with dependent variable log hourly wage in main DHB job. All observation counts have been randomly rounded to base 3. Robust standard errors are in parentheses. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

Table 5: Gender wage gaps within specialty by hours worked

Dependent variable: Hourly wages in main DHB job (ln)

	All doctors				**Specialists**			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Female	-0.080***	-0.117***	-0.075***	-0.274***	-0.097***	-0.134***	-0.080***	-0.305***
	(0.011)	(0.010)	(0.015)	(0.047)	(0.015)	(0.015)	(0.021)	(0.059)
Hours worked in main DHB job (omitted 41-50 hours)								
30 or fewer hours		0.234***	0.316***			0.230***	0.304***	
		(0.021)	(0.030)			(0.024)	(0.031)	
31-40 hours		0.049***	0.069***			0.044***	0.060***	
		(0.013)	(0.016)			(0.017)	(0.019)	
51-60 hours		-0.151***	-0.142***			-0.149***	-0.139***	
		(0.011)	(0.014)			(0.015)	(0.018)	
Over 60 hours		-0.303***	-0.308***			-0.288***	-0.295***	
		(0.015)	(0.020)			(0.022)	(0.027)	
Hours worked in main DHB job * Female (omitted 41-50 hours)								
30 or fewer hours * Female			-0.168***				-0.180***	
			(0.039)				(0.046)	
31-40 hours * Female			-0.055**				-0.059*	
			(0.027)				(0.036)	
51-60 hours * Female			-0.025				-0.029	
			(0.021)				(0.032)	
Over 60 hours * Female			0.010				0.024	
			(0.029)				(0.043)	

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	All doctors				Specialists			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Hours worked in main DHB job				-0.012***				-0.012***
				(0.001)				(0.001)
Hours worked in main DHB job * Female				0.003***				0.004***
				(0.001)				(0.001)
Small DHB (employs <200 medical specialists)				0.185*				0.082
				(0.095)				(0.096)
Large DHB (employs >=500 medical specialists)				0.087				0.103
				(0.056)				(0.069)
Hours worked in main DHB job * Small DHB				-0.003				-0.000
				(0.002)				(0.002)
Hours worked in main DHB job * Large DHB				-0.002				-0.001
				(0.001)				(0.001)
Flexible age controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specialty fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	*0.561*	*0.612*	*0.614*	*0.625*	*0.480*	*0.535*	*0.538*	*0.551*
Observations	*6,021*	*6,021*	*6,021*	*6,021*	*3,510*	*3,510*	*3,510*	*3,510*

Notes: Each column presents results from an OLS regression with dependent variable log hourly wage in main DHB job. Flexible age controls are an age spline of order 4. All observation counts have been randomly rounded to base 3. Robust standard errors are in parentheses. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

Table 6: Gender wage gaps within specialty with improved controls for experience

Dependent variable: Hourly wages in main DHB job (ln)

	All doctors					Specialists				
	Trained in NZ since 1994			All		Trained in NZ since 1994			All	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	-0.050***	-0.041***	-0.036***	-0.107***	-0.100***	-0.063**	-0.056**	-0.050**	-0.127***	-0.120***
	(0.014)	(0.013)	(0.013)	(0.010)	(0.010)	(0.025)	(0.024)	(0.024)	(0.015)	(0.015)
Age spline	Yes					Yes				
Years since qualification spline		Yes					Yes			
Years since qualification with child adjustment spline			Yes					Yes		
Years since age 24 spline				Yes					Yes	
Years since age 24 adjusted for work intensity spline					Yes					Yes
Specialty fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Overseas trained				Yes	Yes				Yes	Yes
R-Squared	0.598	0.652	0.654	0.620	0.609	0.627	0.662	0.665	0.545	0.532
Observations	1,929	1,929	1,929	6,006	6,006	765	765	765	3,501	3,501

Notes: Each column presents results from an OLS regression with dependent variable log hourly wage in main DHB job. Other controls include hours worked categories, highest qualification, DHB size, and self-employed. All observation counts have been randomly rounded to base 3. Robust standard errors are in parentheses. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

Table 7: Gender wage gaps within specialty by parenthood status

Dependent variable: Hourly wages in main DHB job (ln)

	All doctors				**Specialists**			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Female	-0.119***	-0.070***	-0.049***	-0.069***	-0.137***	-0.096***	-0.056***	-0.094***
	(0.011)	(0.013)	(0.013)	(0.013)	(0.015)	(0.020)	(0.020)	(0.020)
Hours worked in main DHB job (omitted 41-50 hours)								
30 or fewer hours	0.238***	0.253***	0.261***	0.239***	0.234***	0.245***	0.252***	0.240***
	(0.021)	(0.022)	(0.022)	(0.022)	(0.024)	(0.025)	(0.025)	(0.026)
31-40 hours	0.049***	0.054***	0.057***	0.050***	0.046***	0.049***	0.053***	0.047***
	(0.013)	(0.014)	(0.013)	(0.013)	(0.017)	(0.017)	(0.017)	(0.017)
51-60 hours	-0.149***	-0.148***	-0.147***	-0.146***	-0.149***	-0.148***	-0.149***	-0.148***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.016)	(0.016)	(0.016)	(0.016)
Over 60 hours	-0.302***	-0.298***	-0.299***	-0.300***	-0.286***	-0.280***	-0.279***	-0.279***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.022)	(0.022)	(0.022)	(0.022)
One-child family		0.017	0.012	0.013		0.038	0.036	0.028
		(0.019)	(0.017)	(0.019)		(0.025)	(0.022)	(0.025)
Two or more-child family		0.070***	0.062***	0.061***		0.037*	0.043**	0.030
		(0.016)	(0.015)	(0.016)		(0.020)	(0.020)	(0.020)
One-child family * Female		-0.061**		-0.050*		-0.050		-0.035
		(0.029)		(0.029)		(0.041)		(0.041)
Two or more-child family * Female		-0.127***		-0.116***		-0.093***		-0.089***
		(0.024)		(0.024)		(0.032)		(0.032)
Female who has had one live birth			-0.080***				-0.073*	
			(0.030)				(0.042)	
Female who has had two or more live births			-0.161***				-0.156***	
			(0.022)				(0.030)	

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	All doctors				Specialists			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Highest qualification (omitted bachelor's degree/level 7)								
Honours and Master's				0.018				0.026
				(0.011)				(0.016)
Doctorate				0.091***				0.091***
				(0.015)				(0.018)
Foreign born				-0.007				-0.014
				(0.014)				(0.020)
Overseas trained				0.026*				0.032
				(0.015)				(0.021)
Reports any non-European ethnicity				-0.030*				-0.014
				(0.016)				(0.024)
Reports Asian ethnicity				0.007				-0.007
				(0.018)				(0.027)
Social marital status (omitted non-partnered, never married or in civil union)								
Partnered				0.020				0.018
				(0.013)				(0.022)
Previously partnered				-0.012				-0.049
				(0.034)				(0.048)
Small DHB (employs <200 medical specialists)				0.066**				0.088***
				(0.026)				(0.034)
Large DHB (employs >=500 medical specialists)				0.045*				0.053
				(0.024)				(0.032)
Lives in main urban area				-0.026				-0.014
				(0.021)				(0.028)

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	All doctors				Specialists			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Works in multiple jobs				-0.012				-0.014
				(0.015)				(0.018)
Self-employed				0.069***				0.046**
				(0.016)				(0.019)
Flexible age controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specialty fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects				Yes				Yes
R-Squared	*0.613*	*0.616*	*0.618*	*0.626*	*0.537*	*0.538*	*0.541*	*0.550*
Observations	*5,676*	*5,676*	*5,676*	*5,676*	*3,339*	*3,339*	*3,339*	*3,339*

Notes: Each column presents results from an OLS regression with dependent variable log hourly wage in main DHB job. Flexible age controls are an age spline of order 4. Multiple jobs including working proprietor jobs for which no wage are paid. All observation counts have been randomly rounded to base 3. Robust standard errors are in parentheses. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

Table 8: Gender wage gap within specialty by personal characteristics for all doctors

Dependent variable: Hourly wages in main DHB job (ln)

	All doctors				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Female	-0.114***	-0.104***	-0.154***	-0.039**	-0.104***
	(0.015)	(0.013)	(0.033)	(0.018)	(0.011)
Foreign born * Female	0.012				
	(0.019)				
Overseas trained * Female		-0.007			
		(0.019)			
Specialty * Female (omitted medical specialty - RACP)					
Surgical specialty (RACS) * Female			0.061		
			(0.062)		
Resident Medical Officer * Female			0.061*		
			(0.035)		
General practitioner * Female			0.030		
			(0.039)		
Other specialty * Female			0.049		
			(0.040)		
Partnered * Female				-0.037	
				(0.025)	
Self-employed * Female					-0.019
					(0.029)
Overseas trained	0.035**	0.026**	0.023**	0.058***	0.023**
	(0.014)	(0.013)	(0.010)	(0.014)	(0.010)
Small DHB (employs <200 medical specialists)	0.061***	0.062***	0.063***	0.041*	0.063***
	(0.017)	(0.017)	(0.017)	(0.023)	(0.017)
Large DHB (employs >=500 medical specialists)	0.012	0.013	0.013	-0.016	0.013
	(0.011)	(0.011)	(0.011)	(0.013)	(0.011)
Self-employed	0.072***	0.074***	0.073***	0.069***	0.079***
	(0.014)	(0.014)	(0.014)	(0.025)	(0.016)
Foreign born	-0.022				
	(0.015)				
Partnered				0.051***	
				(0.019)	
Hours worked category fixed effects	Yes	Yes	Yes	Yes	Yes
Highest qualification fixed effects	Yes	Yes	Yes	Yes	Yes
Flexible age controls	Yes	Yes	Yes	Yes	Yes
Specialty fixed effects	Yes	Yes	Yes	Yes	Yes
R-Squared	*0.620*	*0.620*	*0.620*	*0.663*	*0.620*
Observations	*5,988*	*6,006*	*6,006*	*3,162*	*6,006*

Notes: Each column presents results from an OLS regression with dependent variable log hourly wage in main DHB job. Flexible age controls are an age spline of order 4. Column (4) excludes specialists with children in their families. All observation counts have been randomly rounded to base 3. Robust standard errors are in parentheses. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

Table 9: Gender wage gap within specialty for subpopulations for all doctors

Dependent variable: Hourly wages in main DHB job (ln)

	Full sample		**Māori**		**Recent migrants**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Female	-0.108***	-0.065***	-0.124**	-0.102*	-0.138***	-0.080**
	(0.010)	(0.012)	(0.061)	(0.059)	(0.031)	(0.034)
One-child family * Female		-0.051*		0.203		-0.263***
		(0.029)		(0.137)		(0.095)
Two or more-child family * Female		-0.121***		-0.189		-0.137**
		(0.023)		(0.162)		(0.069)
One-child family		0.013		-0.123		0.110*
		(0.019)		(0.095)		(0.061)
Two or more-child family		0.068***		0.048		0.061
		(0.015)		(0.115)		(0.044)
Hours worked in main DHB job (omitted 41-50 hours)						
30 or fewer hours	0.217***	0.232***	0.213	0.199	0.308***	0.337***
	(0.021)	(0.022)	(0.150)	(0.160)	(0.084)	(0.089)
31-40 hours	0.052***	0.057***	0.134	0.124	0.163***	0.166***
	(0.013)	(0.013)	(0.117)	(0.117)	(0.033)	(0.033)
51-60 hours	-0.148***	-0.147***	-0.119*	-0.127**	-0.159***	-0.161***
	(0.011)	(0.011)	(0.062)	(0.060)	(0.028)	(0.028)
Over 60 hours	-0.301***	-0.299***	-0.275***	-0.275***	-0.307***	-0.308***
	(0.015)	(0.015)	(0.073)	(0.079)	(0.046)	(0.045)
Highest qualification (omitted bachelor's degree/level 7)						
Honours and Master's	0.015	0.015	-0.001	-0.010	0.019	0.020
	(0.011)	(0.011)	(0.065)	(0.065)	(0.027)	(0.027)
Doctorate	0.084***	0.084***	0.152	0.122	0.080*	0.087*
	(0.015)	(0.015)	(0.149)	(0.140)	(0.044)	(0.045)
Small DHB (employs <200 medical specialists)	0.063***	0.063***	0.029	0.032	0.040	0.034
	(0.017)	(0.017)	(0.151)	(0.152)	(0.045)	(0.045)
Large DHB (employs >=500 medical specialists)	0.010	0.011	0.008	0.033	-0.001	-0.000
	(0.011)	(0.011)	(0.089)	(0.091)	(0.028)	(0.028)
Self-employed	0.070***	0.063***	0.189	0.170	0.121**	0.108**
	(0.014)	(0.014)	(0.189)	(0.179)	(0.049)	(0.050)
Flexible age controls	Yes	Yes	Yes	Yes	Yes	Yes
Specialty fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	*0.619*	*0.622*	*0.669*	*0.681*	*0.649*	*0.654*
Observations	*6,006*	*6,006*	*195*	*195*	*741*	*741*

Notes: Each column presents results from an OLS regression with dependent variable log hourly wage in main DHB job. Flexible age controls are an age spline of order 4. The sample in columns (1) and (2) is all medical specialists, in (3) and (4) is medical specialists who report Maori ethnicity, and in (5) and (6) is medical specialists who migrated to New Zealand in March 2012 or later. All observation counts have been randomly rounded to base 3. Robust standard errors are in parentheses. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

Appendix

Appendix A: Included specialties

This table lists the level 5 ANZSCO occupation codes and occupation descriptions of the medical specialties included in the analysis. The classification column gives the aggregation used in Table 8. Occupation 253112, Resident Medical Officer, is included in the analysis of all doctors but excluded from the analysis of specialists.

Code	Description	Classification
252311	Dental Specialist	Other
252312	Dentist	Other
253111	General Practitioner	GP
253112	Resident Medical Officer	RMO
253211	Anaesthetist	Other
253311	Specialist Physician (General Medicine)	Medical specialty
253312	Cardiologist	Medical specialty
253313	Clinical Haematologist	Medical specialty
253314	Medical Oncologist	Other
253315	Endocrinologist	Medical specialty
253316	Gastroenterologist	Medical specialty
253317	Intensive Care Specialist	Medical specialty
253318	Neurologist	Medical specialty
253321	Paediatrician	Medical specialty
253322	Renal Medicine Specialist	Medical specialty
253323	Rheumatologist	Medical specialty
253324	Thoracic Medicine Specialist	Surgical specialty
253399	Specialist Physicians not elsewhere classified	Medical specialty
253411	Psychiatrist	Other
253511	Surgeon (General)	Surgical specialty
253512	Cardiothoracic Surgeon	Surgical specialty
253513	Neurosurgeon	Surgical specialty
253514	Orthopaedic Surgeon	Surgical specialty
253515	Otorhinolaryngologist	Surgical specialty
253516	Paediatric Surgeon	Surgical specialty
253517	Plastic and Reconstructive Surgeon	Surgical specialty
253518	Urologist	Surgical specialty
253521	Vascular Surgeon	Surgical specialty
253911	Dermatologist	Other
253912	Emergency Medicine Specialist	Other
253913	Obstetrician and Gynaecologist	Other
253914	Ophthalmologist	Surgical specialty
253915	Pathologist	Other
253917	Diagnostic and Interventional Radiologist	Other
253918	Radiation Oncologist	Other
253999	Medical Practitioners not elsewhere classified	Other

Appendix B: Salary steps of specialists in March 2013

Step	***Annual salary***
12	*206,000*
11	*199,500*
10	*194,250*
9	189,000
8	184,000
7	178,750
6	173,500
5	168,250
4	163,750
3	159,000
2	154,500
1	149,750

Source: New Zealand District Health Boards Senior Medical and Dental Officers Collective Agreement: 1 July 2013 until 30 June 2016

Appendix Table 1: Job characteristics by subpopulation for all doctors

Subpopulation	Total number of medical specialists	Percentage whose main job is for a DHB	Percentage working number of jobs for wages			Percentage self-employed	Percentage with non-missing hourly wage in largest DHB job
			One	Two	Three +		
Men	3,975	84.9%	88.0%	11.4%	0.7%	34.3%	88.0%
Women	2,829	89.2%	91.3%	8.1%	0.5%	13.8%	89.2%
Age categories							
Men under 30	672	92.9%	92.4%	7.6%	S	1.8%	90.6%
Women under 30	864	93.4%	93.4%	6.3%	S	1.4%	91.7%
Men aged 30 to 39	966	89.8%	93.5%	6.2%	S	16.5%	90.7%
Women aged 30 to 39	840	88.9%	92.9%	6.8%	S	7.9%	87.5%
Men aged 40 to 49	1,020	82.6%	85.3%	14.1%	S	48.5%	87.1%
Women aged 40 to 49	642	89.7%	89.7%	9.8%	S	25.7%	90.7%
Men aged 50 to 59	879	78.5%	81.9%	16.4%	1.4%	56.3%	86.3%
Women aged 50 to 59	378	81.0%	87.3%	11.1%	S	32.5%	85.7%
Men aged 60 plus	438	79.5%	87.0%	11.0%	2.1%	47.3%	84.2%
Women aged 60 plus	105	85.7%	85.7%	11.4%	S	22.9%	82.9%
Number of jobs (including working proprietor jobs)							
Men with one job	2,520	92.5%	100.0%	S	S	10.4%	91.3%
Women with one job	2,283	92.6%	100.0%	S	S	3.9%	91.2%
Men with multiple jobs	1,455	72.0%	67.2%	31.1%	1.9%	76.1%	82.5%
Women with multiple jobs	543	75.1%	55.2%	42.0%	2.8%	55.2%	80.7%
Country of birth							
Men born in NZ	1,638	80.4%	83.9%	14.8%	1.1%	45.2%	86.4%
Women born in NZ	1,248	88.5%	89.9%	9.9%	0.5%	16.6%	88.7%

Men born overseas	2,316	88.2%	90.8%	8.9%	0.4%	26.7%	89.1%
Women born overseas	1,572	89.9%	92.6%	6.9%	0.6%	11.8%	89.7%
Country of qualification							
Men trained in NZ	2,307	82.4%	85.4%	13.5%	1.0%	38.5%	87.3%
Women trained in NZ	1,815	88.6%	90.7%	8.8%	0.5%	14.0%	88.6%
Men trained overseas	1,671	88.3%	91.6%	8.3%	S	28.7%	88.9%
Women trained overseas	1,014	90.2%	92.3%	6.8%	0.6%	13.0%	90.2%
Self-employment							
Men self-employed	1,365	73.4%	81.3%	17.8%	1.1%	100.0%	84.0%
Women self-employed	390	75.4%	83.1%	15.4%	S	100.0%	83.1%
Men not self-employed	2,607	91.0%	91.6%	8.1%	0.5%		90.3%
Women not self-employed	2,439	91.4%	92.6%	6.9%	0.5%		90.2%

Notes: This table replicates Table 2, but also includes RMOs. The population considered is all RMOs and medical specialists who were employed by a DHB in March 2013. S denotes values that are too low to meet Statistics New Zealand's confidentiality requirements for release. All population counts and counts used to calculate percentages have been randomly rounded to base 3 for confidentiality reasons.

Appendix Table 2: Hours worked and earnings by subpopulation for all doctors

Subpopulation	Number with non-missing hourly wage in largest DHB job	Largest DHB job			All jobs		
		Median monthly wage earnings	Median weekly hours worked	Median hourly wage	Median monthly wage earnings	Median weekly hours worked	Median average hourly wage
Men	3,498	$ 13,852	50	$ 75.00	$ 14,703	50	$ 67.66
Women	2,523	$ 9,159	47	$ 47.58	$ 9,316	48	$ 46.53
Age categories							
Men under 30	609	$ 7,698	55	$ 32.21	$ 7,731	55	$ 32.50
Women under 30	792	$ 7,461	55	$ 31.57	$ 7,608	55	$ 31.99
Men aged 30 to 39	876	$ 11,208	50	$ 49.97	$ 11,486	50	$ 49.51
Women aged 30 to 39	735	$ 9,590	50	$ 46.37	$ 9,776	50	$ 46.34
Men aged 40 to 49	888	$ 17,381	45	$ 89.17	$ 18,216	50	$ 80.96
Women aged 40 to 49	582	$ 12,485	40	$ 79.82	$ 12,963	40	$ 76.22
Men aged 50 to 59	759	$ 18,619	45	$ 97.30	$ 19,670	50	$ 88.38
Women aged 50 to 59	324	$ 14,041	40	$ 87.19	$ 14,711	40	$ 80.37
Men aged 60 plus	369	$ 16,513	40	$ 93.64	$ 17,498	45	$ 89.20
Women aged 60 plus	87	$ 12,805	40	$ 86.38	$ 14,619	40	$ 83.07
Number of jobs (including working proprietor jobs)							
Men with one job	2,301	$ 12,321	50	$ 57.82	$ 12,321	50	$ 55.79
Women with one job	2,082	$ 8,921	50	$ 42.86	$ 8,921	50	$ 42.59
Men with multiple jobs	1,200	$ 15,732	40	$ 91.64	$ 17,538	50	$ 77.52
Women with multiple jobs	438	$ 10,734	40	$ 75.12	$ 12,939	45	$ 66.14

Subpopulation	Number with non-missing hourly wage in largest DHB job	Largest DHB job			All jobs		
		Median monthly wage earnings	Median weekly hours worked	Median hourly wage	Median monthly wage earnings	Median weekly hours worked	Median average hourly wage
Country of birth							
Men born in NZ	1,416	$ 13,786	50	$ 78.46	$ 14,890	51	$ 67.42
Women born in NZ	1,107	$ 8,847	50	$ 46.34	$ 8,980	50	$ 44.21
Men born overseas	2,064	$ 13,894	50	$ 72.60	$ 14,499	50	$ 67.67
Women born overseas	1,410	$ 9,324	45	$ 48.13	$ 9,435	47	$ 47.55
Country of qualification							
Men trained in NZ	2,013	$ 12,172	50	$ 67.81	$ 13,086	52	$ 57.28
Women trained in NZ	1,608	$ 8,590	50	$ 40.87	$ 8,711	50	$ 40.64
Men trained overseas	1,485	$ 15,759	46	$ 82.64	$ 16,134	50	$ 77.41
Women trained overseas	915	$ 10,302	43	$ 60.40	$ 10,493	45	$ 56.47
Self-employment							
Men self-employed	1,146	$ 16,531	40	$ 94.21	$ 17,878	52	$ 77.42
Women self-employed	324	$ 12,515	35	$ 85.06	$ 13,297	45	$ 66.87
Men not self-employed	2,355	$ 11,971	50	$ 55.16	$ 12,301	50	$ 55.74
Women not self-employed	2,199	$ 8,863	50	$ 42.85	$ 8,983	50	$ 43.11

Notes: This Table replicates Table 3, but also includes RMOs. The population considered is all RMOs and medical specialists who were employed by a DHB in March 2013 for whom we have non-missing hourly wages in their largest DHB job. All population counts have been randomly rounded to base 3 for confidentiality reasons.

Appendix Table 3: Gender wage gap within specialty controlling for hours worked in other jobs

Dependent variable: Hourly wages in main DHB job (ln)

	All doctors			**Specialists**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Female	-0.117***	-0.104***	-0.102***	-0.134***	-0.119***	-0.119***
	(0.010)	(0.010)	(0.010)	(0.015)	(0.015)	(0.015)
Hours worked in main DHB job (omitted 41-50 hours)						
30 or fewer hours	0.234***	0.195***	0.194***	0.229***	0.195***	0.195***
	(0.021)	(0.022)	(0.022)	(0.024)	(0.027)	(0.027)
31-40 hours	0.048***	0.045***	0.046***	0.041**	0.040**	0.040**
	(0.013)	(0.013)	(0.013)	(0.017)	(0.017)	(0.017)
51-60 hours	-0.151***	-0.147***	-0.147***	-0.148***	-0.141***	-0.141***
	(0.011)	(0.011)	(0.011)	(0.016)	(0.016)	(0.016)
Over 60 hours	-0.302***	-0.301***	-0.301***	-0.288***	-0.284***	-0.284***
	(0.015)	(0.015)	(0.015)	(0.022)	(0.022)	(0.022)
Hours worked in other jobs (omitted 0 hours)						
1-10 hours		0.103***	0.083***		0.097***	0.099***
		(0.016)	(0.019)		(0.018)	(0.022)
11-25 hours		0.049**	0.029		0.039	0.041
		(0.022)	(0.024)		(0.025)	(0.028)
26-40 hours		0.176***	0.156***		0.132***	0.134***
		(0.045)	(0.046)		(0.047)	(0.048)
Over 40 hours		0.197***	0.181***		0.220***	0.222***
		(0.055)	(0.055)		(0.067)	(0.067)
Self-employed			0.032*			-0.003
			(0.017)			(0.020)
Flexible age controls	Yes	Yes	Yes	Yes	Yes	Yes
Specialty fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	*0.612*	*0.617*	*0.618*	*0.534*	*0.541*	*0.541*
Observations	*6,000*	*6,000*	*6,000*	*3,498*	*3,498*	*3,498*

Notes: Each column presents results from an OLS regression with dependent variable log hourly wage in main DHB job. Flexible age controls are an age spline of order 4. All observation counts have been randomly rounded to base 3. Robust standard errors are in parentheses. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

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