

# How do Australian doctors respond to wage changes?

Terence C Cheng  
University of Melbourne

Kalb G, Kuehnle D, Scott A, Cheng TC, Jeon SH (2014) *Modelling physicians' labour supply: comparing a structural with a reduced form approach.*



# Motivation

- Physician labour supply is an important policy concern in Australia, particularly GPs in remote/rural areas.
- Decline in weekly hours worked from 48.2 in 1998 to 42.7 in 2008 (AIHW, 2012).
- Attributable to increasing feminisation of the medical workforce, changing age profile and expectations on worklife balance.
- Potential labour supply shortages.
- Objective: investigate pecuniary and non-pecuniary determinants of physician labour supply

# Aims

1. Develop a structural model to study labour supply by Australian doctors.
2. Estimate wage elasticities → Responsiveness of hours worked to changes in wages.
3. Heterogeneous effects by examining different subgroups
4. Simulate policy changes using the structural model
5. Methodological: compare implications of using structural vs reduced-form approach.

# A discrete choice model

- Doctors choose working hours to maximise utility given net income (net earnings + other household income)
- Quadratic utility function takes two arguments: household net income and hours worked
- Labour supply decision a discrete choice problem: Doctors choose from a set of combinations of income and working hours.
- We allow for 5, 10, and 13 choices of working hours (main results: 16, 20, 30, 40, 45, 50, 55, 60, 65, 70 hours per week).
- Multinomial logit models for GPs and specialists. Calculate net income using tax and transfers rules.

# Data

- Use Wave 1 data from the Medicine in Australia: Balancing Employment and Life (MABEL) survey.
- Study uses wave 1 data – 10,498
- Broadly representative of the population in terms of hours worked, age distribution, gender, geographical location and doctor type (Joyce et al 2010)
- Use both observed and imputed (estimated) wages.

# Hours worked

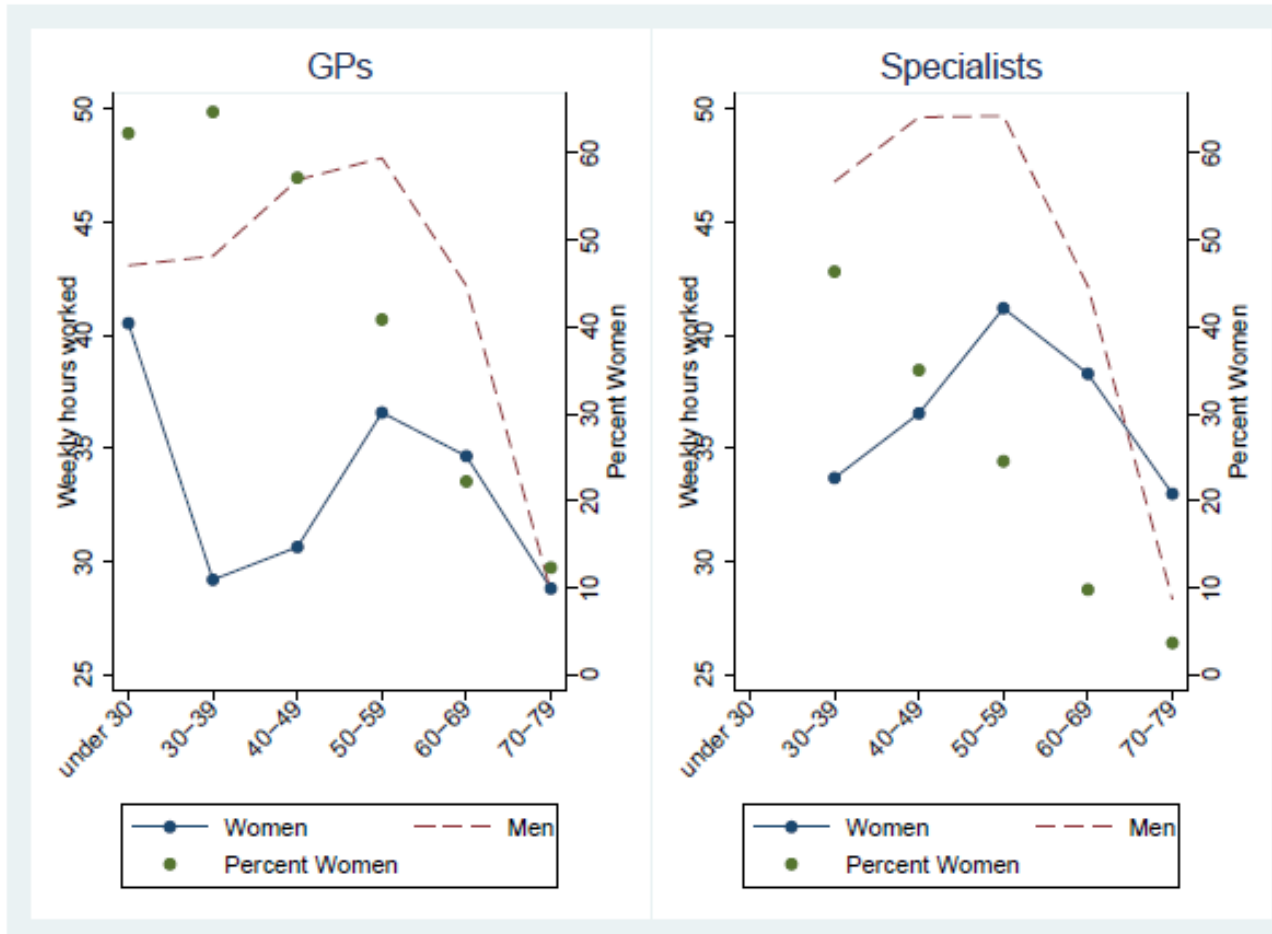


Figure 1: Distribution of hours worked by age group and doctor type

# Effects on hours worked

Table 1: The effects of explanatory variables on hours worked by gender and type

	Female GPs	Female Spec	Male GPs	Male Spec
Age of youngest child (ref. group: no dependent children)				
0-4	-12.07*	-11.11*	-4.00*	-1.73*
5-9	-9.32*	-6.49*	-2.98*	-1.48
10-15	-4.59*	-1.62	-2.45*	-0.59
Nr of children	-1.46*	-1.01	2.44*	1.82*
Age	-0.15*	-0.02	-0.16*	-0.18*
Partnership status (ref. group: single)				
Full-time	-1.89*	-3.14*	2.42*	0.15
Part-time	0.32	-1.14	0.60	-0.40
Not employed	1.72	4.03*	0.39	-0.53
Self-employed	7.58*	5.30*	7.45*	3.54*
Location (ref. group: urban )				
Inner regional	2.53*	1.76	1.88*	-0.50
Remote	7.15*	1.03	4.20*	-0.18

# Wage elasticities

Table 2: Estimated wage elasticities - observed and imputed wages

	Women		Men	
	GPs	Specialists	GPs	Specialists
<i>Using observed wage</i>				
5 mid-points	-0.081*	-0.112*	-0.085*	-0.112*
10 mid-points	-0.094*	-0.117*	-0.090*	-0.126*
13 mid-points	-0.104*	-0.115*	-0.096*	-0.133*
<i>Using imputed wages</i>				
5 mid-points	-0.037	-0.102*	-0.173*	-0.076*
10 mid-points	-0.119	-0.070	-0.181*	-0.092*
13 mid-points	-0.103	-0.076	-0.207*	-0.097*
<i>reduced-form results</i>				
Observed wage	-0.105**	-0.103**	-0.113**	-0.134**
Imputed wage <sup>b</sup>	-0.052	-0.070	-0.202**	-0.087**

*Note: \* and \*\* denote statistical significance at the 10%- and 5%-levels, respectively.*

*Interpretation: % change in working hours from a 1% increase in wage*



# Wage elasticities

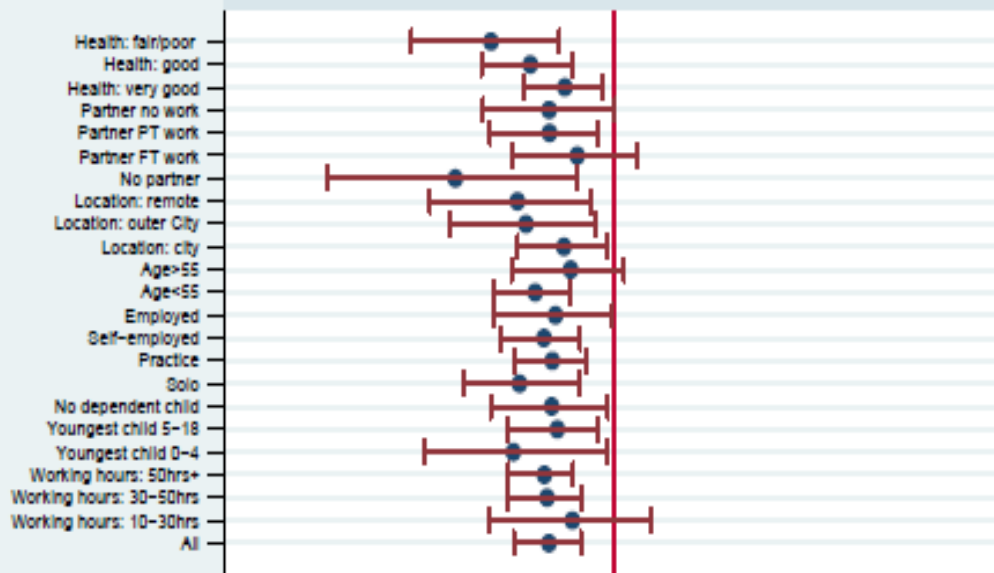
Table 3: Estimated wage elasticities - structural vs reduced form.

	Women		Men	
	GPs	Specialists	GPs	Specialists
<i>Using observed wage</i>				
5 mid-points	-0.081*	-0.112*	-0.085*	-0.112*
10 mid-points	-0.094*	-0.117*	-0.090*	-0.126*
13 mid-points	-0.104*	-0.115*	-0.096*	-0.133*
<i>Using imputed wages</i>				
5 mid-points	-0.037	-0.102*	-0.173*	-0.076*
10 mid-points	-0.119	-0.070	-0.181*	-0.092*
13 mid-points	-0.103	-0.076	-0.207*	-0.097*
<i>reduced-form results</i>				
Observed wage	-0.105**	-0.103**	-0.113**	-0.134**
Imputed wage	-0.052	-0.070	-0.202**	-0.087**

Note: \* and \*\* denote statistical significance at the 10%- and 5%-levels, respectively.

Interpretation: % change in working hours from a 1% increase in wage

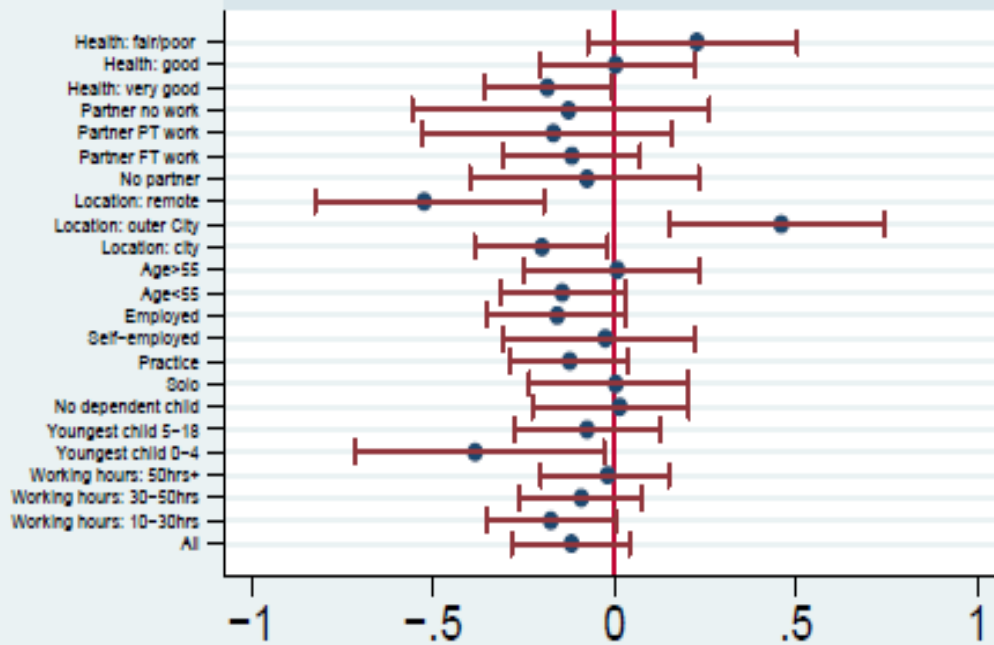
### Male, GPs



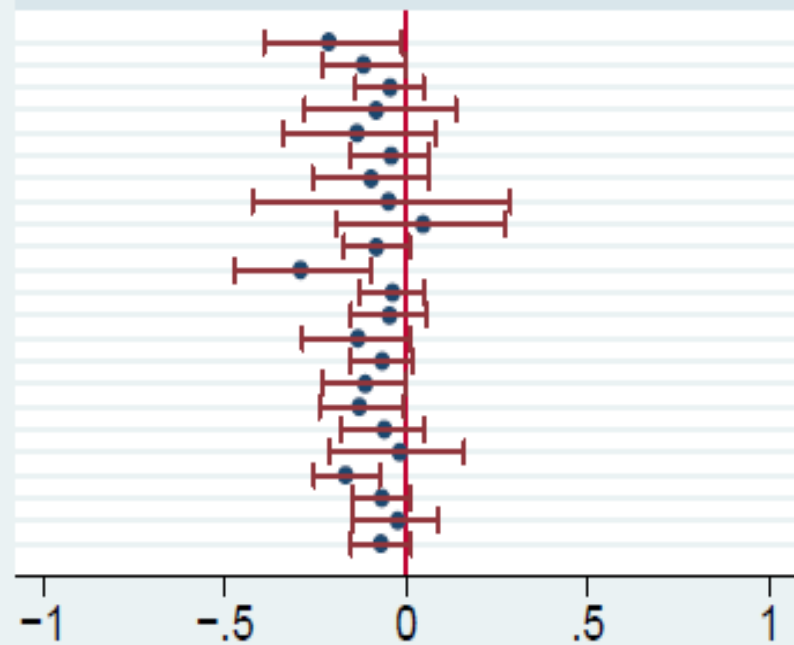
### Male, Specialists



### Female, GPs




### Female, Specialists



# Main findings

- We find small negative wage elasticities for all groups of doctors ( $-0.070$  to  $-0.181\%$ )
- Magnitude of elasticities similar for different subgroups; some differences by family status and working hours
- Policy simulations show a reduction in total labour supply following an increase in wages. Male labour supply more responsive than females.
- Results robust to different specifications, definitions of income.



Kalb G, Kuehnle D, Scott A, Cheng TC, Jeon SH (2014)  
Modelling physicians' labour supply: comparing a  
structural with a reduced form approach. *Forthcoming  
working paper.*