# Hour-glass ceilings: Work-hour thresholds, gendered health inequities 

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## A R T I C L E I N F O

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#### Abstract

Long workhours erode health, which the setting of maximum weekly hours aims to avert. This 48-h limit, and the evidence base to support it, has evolved from a workforce that was largely male, whose time in the labour force was enabled by women's domestic work and care giving. The gender composition of the workforce has now changed, and many women (as well as some men) combine care-giving with paid work, a change viewed as fundamental for gender equality. However, it raises questions on the suitability of the work time limit and the extent it is protective of health. We estimate workhour-mental health thresholds, testing if they vary for men and women due to gendered workloads and constraints on and off the job. Using six waves of data from a nationally representative sample of Australian adults (24-65 years), surveyed in the Household Income Labour Dynamics of Australia Survey ( $\mathrm{N}=3828$ men; 4062 women), our study uses a longitudinal, simultaneous equation approach to address endogeneity. Averaging over the sample, we find an overall threshold of 39 h per week beyond which mental health declines. Separate curves then estimate thresholds for men and women, by high or low care and domestic time constraints, using stratified and pooled samples. We find gendered workhour-health limits ( 43.5 for men, 38 for women) which widen further once differences in resources on and off the job are considered. Only when time is 'unencumbered' and similar time constraints and contexts are assumed, do gender gaps narrow and thresholds approximate the $48-\mathrm{h}$ limit. Our study reveals limits to contemporary workhour regulation which may be systematically disadvantaging women's health.


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## 1. Introduction

In 1930 the International Labour Organisation (ILO) set the maximum working week to 48 h . This remains the current hour limit beyond which, according to the ILO, no worker should exceed because of the potential health and safety risk (Lee et al., 2007; Spurgeon, 2003). These limits were set for a workforce that was once largely male, at a time when gender divisions were normative and paid work and caregiving separate endeavours. Now, in developed economies such as Australia, nearly two thirds of working-age women are in the labour force (one third in 1961, one fifth in 1947 Strachan and Burgess, 2002; Wilkins and Wooden, 2014). Work time expectations are also changing. Economies are

[^0]digital, business communicates globally, and paid work can and does happen outside a standard eight hour day. For large segments of the labour force this is extending the working week, even while the gender composition is changing.

It is therefore not known if the maximum hour limit protects women's health, or the health of any employee who combines employment with caregiving. Men work more hours than women do in most developed countries ( 10 h per week averaged over 18 OECD countries, Landivar, 2015), but are able to do so because of their unequal involvement in child care or domestic work (OECD, 2016). Such inequalities in non-work time drive inequalities in the labor market, creating gender gaps in opportunities, income, participation and pay, what we term the hour-glass ceiling (Cha, 2010; Cha and Weeden, 2014; Jacobs and Gerson, 2006). We investigate if they also generate gender gaps in mental health, a leading cause of disability and disease burden worldwide (Whiteford et al., 2013). We seek to identify workhour - mental health thresholds taking into account men's and women's gendered resources on and off the job, especially their time.

### 1.1. Changing times

For more than two centuries, workhours have generally been falling, yet recently this trend has reversed. Gershuny (2011) shows that since the 1980s workhours are rising in the UK, US, Canada and Australia, although the increase is not dramatic. The average, however, hides the way labour markets are polarising in terms of hours, with a significant group of people who are working long and another working short hours. For example, in 1980, 9\% of Americans worked longer than 50 h each week, by 2000 it was $14 \%$ (Cha and Weeden, 2014). Similar changes are observed in Australia where $13 \%$ of employees worked 50 h or more in $1978,19 \%$ in 2000 (Australian Bureau of Statistics, 2010). Meanwhile rates of underemployment and low hour jobs are increasing - in Australia from $15 \%$ in 1978 to $29 \%$ in 2004 (Australian Bureau of Statistics, 2005), in the US from 18\% in 1976 to 20\% in 2013 (Valletta and Bengali, 2013). It is likely that both long and short hours are linked to poorer health in workers, that is, there are thresholds whereby working at least some hours is health supportive, but only up to a point (Kleiner and Pavalko, 2010). This possibility would explain why research on social inclusion and participation shows that some time spent in work generally improves mental health (Dooley and Prause, 2009).

However, few studies have identified what the turning point might be. Prospective studies and systematic reviews have shown there are detrimental impacts of long hours on mental health as well as a wide range of other health disorders, (e.g. Sparks et al., 1997), but use predefined, often arbitrary definitions of long workhours, ranging from 40 to 60 h per week (e.g. Liu and Tanaka, 2002; Milner et al., 2015), or more than 12 h per day (e.g. Dembe et al., 2005). There is some evidence of a dose-response relationship, however few have modelled workhour limits to capture curvilinear relationships, nor adjust for the complex interplay between income, workhours and health that underlie it. Our first hypothesis is that there will be curvilinear workhour and health relationships.

### 1.2. Gendered time inequality

There are gender differences in who works long or short hours, and this is due to different time demands off the job. In both the US and Australia long hours are predominantly worked by men, especially those in high skilled, well paid occupations (Cha and Weeden, 2014; Wilkins and Wooden, 2014). These are the 'good jobs' which deliver the highest pay and prestige. In contrast, women and low skilled workers predominate in low paid, lower hour jobs (Valletta and Bengali, 2013; Wilkins and Wooden, 2014). Women's over-representation in shorter hour jobs is usually because of the care work they shoulder, thus women compete for good jobs and wages while facing greater constraints on their time, a time imbalance apparent not just in Australia but across the OECD (Craig and Mullan, 2010; O'Neill and O'Reilly, 2010; OECD, 2016). Women therefore add paid work time to a greater unpaid time load, a time inequality that has become a core indicator of gender inequality (European Institute for Gender Equality, 2015). The widespread existence of a gendered time inequality raises the possibility that workhour-health thresholds are also gendered.

So far, the evidence for gendered workhour-health thresholds is mixed. O'Reilly and Rosato (2013) find that working longer than 55 h per week increased mortality risk for men but not women over an 8 year follow-up, however women were only a fraction of the long hour group. Similarly, working 51 or more hours per week was associated with higher odds for five of six health outcomes among men, and with only two of six health outcomes among women. Gradients were also observed (working over 41 h ), again only for men (Artazcoz et al., 2009). When long hours are classified in a less
extreme way, such as working 40 or more hours a week, greater health risks for women have been observed relative to men, suggesting that detection of health impacts is highly sensitive to hour cut points (Artazcoz et al., 2007; Virtanen et al., 2011). Only two studies have considered how non-work time constraints temper the workhour-health relationship for men and women. Artazcoz et al. (2007) show that high domestic workloads ( $>20 \mathrm{~h}$ a week) interact with long work hours ( $>40 \mathrm{~h}$ per week) for both men (increasing odds for smoking and poor sleep) and women (increasing odds for physical inactivity). They further find that high domestic workloads constrain women's capability to work long hours (2009).

## 2. Gender on and off the job

There are other inequalities - both on and off the job - that could widen gender gaps in workhour-health thresholds (Read and Gorman, 2010). Women's jobs tend to be poorer quality, offering them less autonomy, flexibility and security (Charlesworth et al., 2011). Women also tend to work in different occupations relative to men, and in all countries where it is measured women receive less pay and rewards for their work effort (World Economic Forum, 2015). The gender wage-gap - a form of structural discrimination partially explains gendered disparities in mood disorders in the US (Platt et al., 2016). Such gendered disadvantage in the labour market is paralleled by disadvantage outside of it. Although women may have wider social support networks (beneficial to mental health), employment-linked constraints generate other hardships, affecting women's access to financial resources, housing security and safe neighbourhoods (Read and Gorman, 2010). Women's experience of leisure is also different to men's, it is more fractured and combined with other tasks (Chatzitheochari and Arber, 2012). In fact, women and men's care time can also be different in quality as well as quantity, with, for example, men more likely to do more of the enjoyable aspects (such as playing with children) and less of the routine physical care (Craig and Mullen, 2010; Mattingly and Sayer, 2003). Thus, even while combining work with care lowers workhour-health thresholds for every person, men and women experience systematic differences in the quality of their time, as well as other determinants of health, which could widen gendered workhour-health thresholds.

## 3. Endogeneity in the workhour-health relationship

Disentangling the health influence of workhours is complex because health and how long people work mutually influence each other, that is, health is endogenously determined by work time. Thus healthy people are much more likely to work long hours and earn better wages, while unhealthy people curtail their hours or leave the labour market altogether. This creates countervailing influences between work time, wages and health (both mental and physical) which few studies systematically address. Grossman and Benham (1974) argue that the simultaneous estimation of three variables - workhours, wages and health - is needed to estimate robust workhour-health thresholds. This has not, to our knowledge, been undertaken; two studies have used simultaneous estimation techniques but did not control for reciprocal effects of workhours (Grossman and Benham, 1974) and wages (Haveman et al., 1994) on health. We estimate our three-equation system using longitudinal data to capture the time-dependent relationships among the variables, modelling workhours in the quadratic form to identify tipping points.

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