Women's wage before and after live and non-live births

Alessandro Di Nallo[1]

[1]*Bocconi University and Carlo F. Dondena Centre for Research on Social Dynamics and Public Policy*

April 2023

Extended abstract

A pregnancy loss is a collective term used to identify a pregnancy that does not result in a live birth (Quenby et al. 2021, Flenady et al. 2016) and might occur any time during the pregnancy. According to the National Health Service (NHS) in the UK, it is termed "miscarriage" when it occurs before the 24th week of pregnancy, and "stillbirth" thereafter (Quenby et al. 2021). In high-income countries, 11 to 21% of clinically detected pregnancies result in miscarriage (Bruckner et al. 2016) while approximately 0.4-0.5 percent of pregnancy loss occur as stillbirths (ONS 2020).

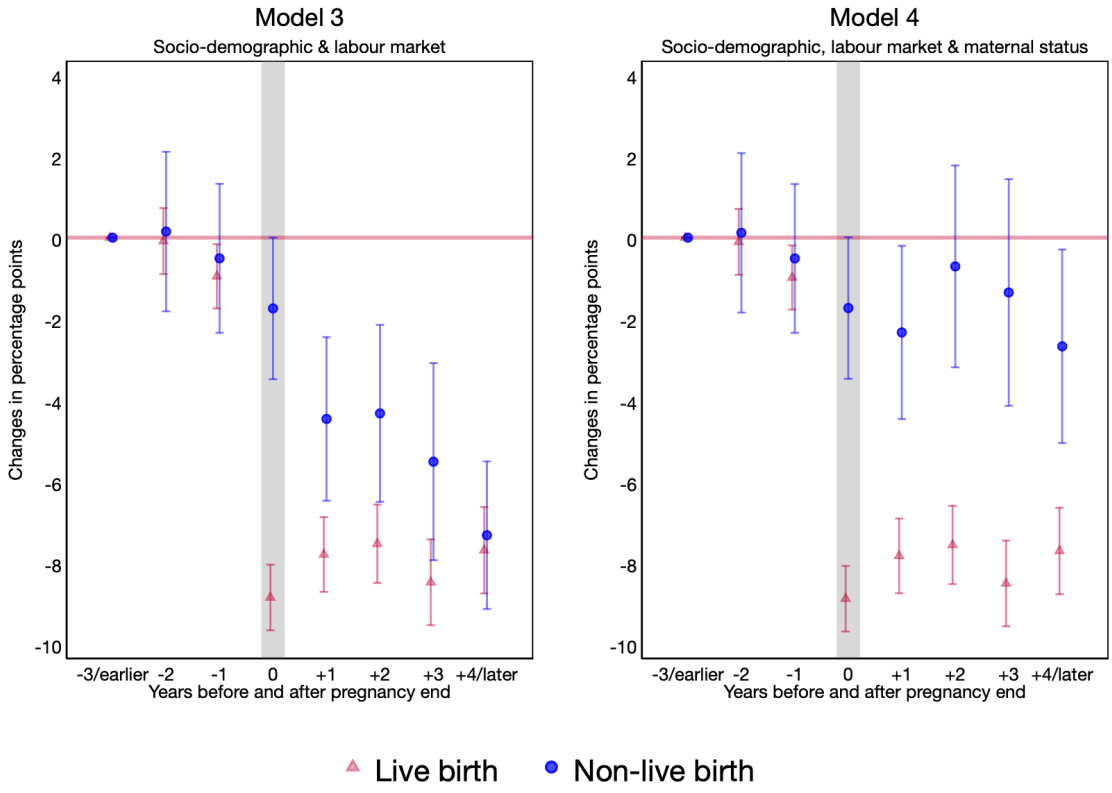
Pregnancy losses are costly for healthcare systems, as the yearly economic cost of miscarriages are estimated at £471 million in the UK (Quenby et al. 2021). While the official statistics on miscarriages are rare, more detailed information on stillbirths reveal that their incidence has remained relatively stable as compared with the improvements in mothers' death at delivery and neonatal mortality (Bruckner et al. 2016). In the United Kingdom, in the last 5 years, the number of stillbirths has steadily exceeded the number of liveborn infants who die before their first birthday (ONS 2020). Despite its social and economic relevance, pregnancy loss is still rarely discussed public health matter in private and public spheres (Bellhouse et al. 2018).

Existing research has explored how women's wages decline after a live birth (Gash 2009, Budig & England 2001, Oesch & von Ow 2017, Gangl & Ziefle 2009). However, past studies did not consider the effect of experiencing a pregnancy loss, which is a relevant gap in knowledge, given the prevalence of miscarriages and stillbirths, about 1 in 5 to 10 conceptions (Bruckner & Catalano 2018). Although the medical and psychological literature has addressed the impact of involuntary pregnancy interruptions on other women's outcomes, such as mental health, the association with labor market outcomes is overlooked. Therefore, the understanding of income pathways of this subgroup of the population in the pre- and post-pregnancy periods is substantially unknown. Moreover, relatively little attention has been devoted to some mechanisms that could explain the relationship between a pregnancy interruption and wage. In this study, I test if a live birth and a non-live birth differently affect women's scores of mental and physical health.

I address these gaps by using a British longitudinal survey to analyze the hourly wage changes of childless women who transitioned to first parenthood and those who experienced a pregnancy loss. I control for unobserved time-invariant factors that could be correlated with labor market outcomes and fertility.

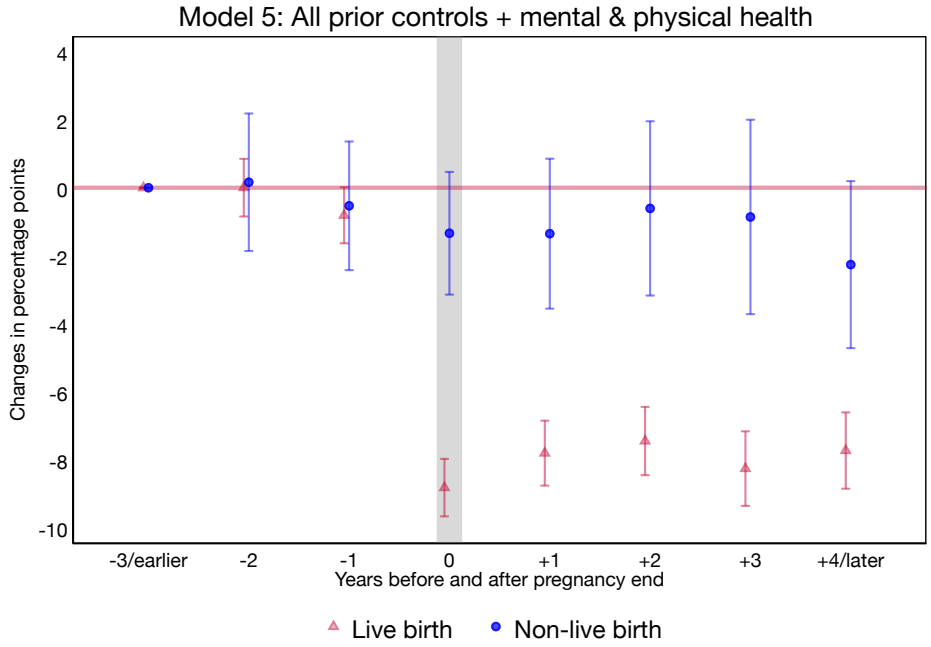
Thanks to fine grained information from 'Understanding Society' on conception, gestation, pregnancy outcomes and labour market events, it possible to track a woman's reproductive life along with her socio-economic conditions and her partner's job market situation on a monthly basis. This study explores the effect of a pregnancy loss on hourly labour income I identified 2,502 first-time pregnancies. Thanks to the UKHLS design, I can link women's reproductive status to labor market and demographic characteristics and follow them one year before and up to two years after the event of pregnancy loss.

Figure 1: Estimated changes in women's hourly net labour income around live and non-live birth. Estimates are from Model 3 (Socio-demographic controls & labour market patterns) and 4 (Model 3 + post-pregnancy loss transition to motherhood)



The results show that the hourly wage trends leading up to pregnancy and its aftermath markedly differ by pregnancy outcome (Figure 1). The women who had a child and those reporting a miscarriage or a stillbirth experienced different income patterns. The women who became mothers experienced a long-term decline in the hourly labor income after the birth, in line with previous evidence (Oesch & von Ow 2017, Budig & England

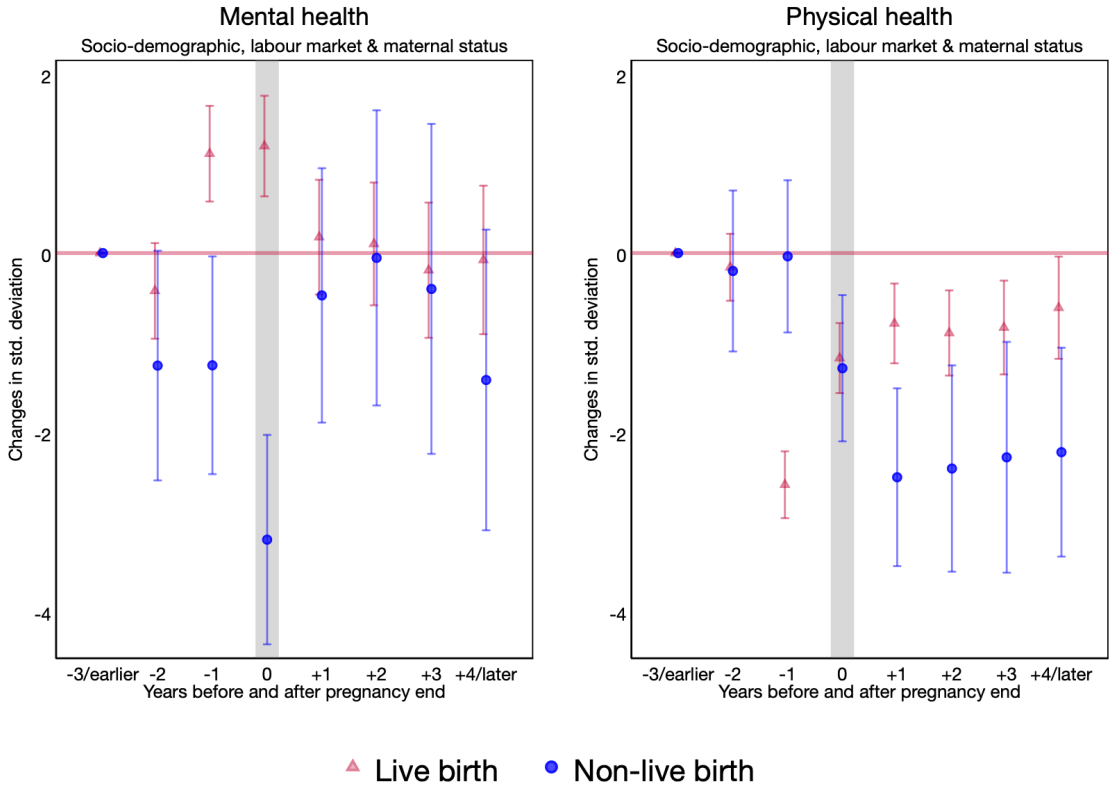
Figure 2: Estimated changes in women's hourly net labour income around live and non-live birth. Estimates are from Model 5 (Model 4 + mental & physical health)



2001). The women who had a pregnancy loss suffered from a more moderate decline in hourly wages in the year of the involuntary interruption and in the following ones. This drop is limited in magnitude (2.5 percentage points in t_1) but it seems persistent over time (t_4 or later) after some fluctuations in non-significant territory in the mid-term (t_2 and t_3). The declining trend of women's wages is discounted for any live birth that might occur after the pregnancy loss. About 36% of women whose first pregnancy ends involuntarily in a miscarriage or stillbirth, have a child within 2 years. The transition to motherhood for women experiencing a pregnancy disruption beforehand largely explains the decline in hourly income after t_0. However, some negative effect seems to persist in the long run, also after accounting for maternal status. Nevertheless, it is further attenuated when accounting for the standardised indicators of mental and physical health, which women reported on a yearly basis in the survey (Figure 2). In other words, the hourly wages of women reporting a non-live birth do not return to previous baseline levels either because some of them successfully gave birth, and borne the burden of the "motherhood penalty", or because they experienced the psychological and physical burden of a non-live birth, which may have hampered their productivity on the labour market.

The combination of these findings suggests that women who transition to motherhood earn less per hour because of the combination of decreasing productivity and, possibly, statistical discrimination, in line with prior evidence (e.g., Gangl and Ziefle 2009). Women who lose a child during the gestation also tend to earn slightly less than their pre-pregnancy years, although the decline in hourly wage is more moderate. However, the statistical discrimination is not a credible explanation for the wage decline for the latter

Figure 3: Estimated changes in women's mental and physical health around live and non-live birth



group, as this trend is not completely cancelled when the model accounts for the transition to motherhood. Conversely, the decreasing productivity is a more persuasive channel. To have suggestive evidence of this, I applied the research design to two intermediate outcomes: the scores of mental and physical health.

These analyses show no anticipation effect in the pre-pregnancy period and a significant decrease in working working hours, mental and physical well-being for women who become mothers. On the contrary, women who had a non-live birth reported a systematic decrease in their mental health in the year of pregnancy loss. When it comes to the physical health score, the negative effect of pregnancy persisted in the long run with both groups of women faring relatively worse than their baseline level. Surprisingly, the non-live birth seems to have a persistently negative toll on women's physical health, which is larger in magnitude compared to the post-pregnancy effect of women who successfully delivered.

The analyses of these two intermediate outcomes (Figure 3) suggest that the fall in post-pregnancy loss in hourly wage may be compatible with the fall in the mental and physical health in the short term (t_0 and t_1). Also, it cannot be ruled out that the sharp and persistent decline in physical health may play a role in the mid- and long-term decay

of hourly wage.

References

Bellhouse, C., Temple-Smith, M. J. & Bilardi, J. E. (2018), '"it's just one of those things people don't seem to talk about..." women's experiences of social support following miscarriage: a qualitative study", *BMC Women's Health* **18**(1), 176.

Bruckner, T. A. & Catalano, R. (2018), 'Selection in utero and population health: Theory and typology of research', *SSM - Population Health* **5**, 103–113.

Bruckner, T. A., Mortensen, L. H. & Catalano, R. A. (2016), 'Spontaneous pregnancy loss in denmark following economic downturns', *American journal of epidemiology* **183**(8), 701–708.

Budig, M. J. & England, P. (2001), 'The wage penalty for motherhood', *American Sociological Review* **66**(2), 204–225.
URL: *http://www.jstor.org/stable/2657415*

Flenady, V., Wojcieszek, A. M., Middleton, P., Ellwood, D., Erwich, J. J., Coory, M., Khong, T. Y., Silver, R. M., Smith, G. C., Boyle, F. M. et al. (2016), 'Stillbirths: recall to action in high-income countries', *The Lancet* **387**(10019), 691–702.

Gangl, M. & Ziefle, A. (2009), 'Motherhood, labor force behavior, and women's careers: An empirical assessment of the wage penalty for motherhood in britain, germany, and the united states', *Demography* **46**(2), 341–369.
URL: *https://doi.org/10.1353/dem.0.0056*

Gash, V. (2009), 'Sacrificing their careers for their families? an analysis of the penalty to motherhood in europe', *Social Indicators Research* **93**(3), 569–586.
URL: *https://doi.org/10.1007/s11205-008-9429-y*

Oesch, D. & von Ow, A. (2017), 'Social networks and job access for the unemployed: Work ties for the upper-middle class, communal ties for the working class', *European Sociological Review* **33**(2), 275–291.

ONS (2020), 'Child and infant mortality in england and wales: 2020'.

Quenby, S., Gallos, I. D., Dhillon-Smith, R. K., Podesek, M., Stephenson, M. D., Fisher, J., Brosens, J. J., Brewin, J., Ramhorst, R., Lucas, E. S. et al. (2021), 'Miscarriage matters: the epidemiological, physical, psychological, and economic costs of early pregnancy loss', *The Lancet* **397**(10285), 1658–1667.