

Accumulative reproductive life histories and grip strength in Indonesia: 1993-2014

Tiziana Leone, LSE

Heini Vaisanen, University of Southampton

Firman Witoelar, Australian National University

Reproductive histories put a burden on women's health. Pregnancies regardless of the outcome, as well as pregnancy and post-partum complications are known to create stress on bodies at least in the short term. So far the evidence on the impact of fertility on general health later on in life is mixed with low parity having a positive protective effect and no real significant effect on higher parities. There is a lack of studies taking into account pregnancies not ending in live births. Furthermore, this evidence is usually related to countries with low fertility and high standards of maternal health. We need to understand how decades of high fertility and high maternal morbidity and mortality in a low-income setting might have affected women's health. Using latent class models to analyse the first five waves of the Indonesian Family life Survey (IFLS) the aim of this study is to study the impact of cumulative reproductive histories on ageing, as indicated by grip strength later on in life. Preliminary results show a negative impact of the reproductive burden with terminations (spontaneous or induced) being the most significant factor. This study is set within the greater need to understand how high fertility might affect the ageing process of women in a low-income setting.

Extended abstract

Women's health research and policy efforts in low and middle-income countries over the last three decades have concentrated on women of reproductive age (15-49 years). The focus has been on antenatal care, prevention of pregnancy at younger ages, spacing and limiting of births. Population ageing has shifted attention to the health of older people (60 years and above). These two trends have led to a neglect of women's health in the mid-life in Low and Middle-Income Countries (LMICs). We know little about whether and how health policies and services meet the needs of this age group, one that is projected to grow rapidly in LMICs (United Nations 2013).

The relationship between fertility histories and later life health has been studied in depth and usually nulliparous, high parity or women who started childbearing early have a higher risk of mortality (Grundy and Read 2015, Read and Grundy 2016). However, this research is mainly limited to high income settings and it is rather limited in terms of understanding of the mechanisms that drive this relationship (Gustafsson, Janlert et al. 2011, Premji 2014). Evidence in Brazil shows that early childbearing can accelerate the process of ageing (Câmara, Pirkle et al. 2015).

Using the five waves of the Indonesian Family Life Longitudinal Survey (IFLS) this study's aim is to understand the impact of grip strength on

Grip strength is the mean of the best result obtained in each hand squeezing a Smedley's hand dynamometer where the dominant hand is reported by the interviewer. It is widely regarded as an excellent predictor of disability and worse health at older ages (Sayer, Syddall et al. 2006). When standardised it produces a reliable objective measure of health status (Rantanen, Guralnik et al. 1999, Sayer, Syddall et al. 2006, Taekema, Gussekloo et al. 2009).

A failure to acknowledge and address the health needs of women in mid-life is potentially detrimental to health - not only in the short-term, but also in the long-term particularly given the global context of emerging non-communicable diseases and increasing burden of elderly on weak or non-existent long-term care systems. To date no study has considered the progressive deterioration of health and the influence of cumulative effects of high fertility in a LIMC setting.

Indonesia has a population of 255 million (World Bank, 2017) and has been experiencing a steady economic growth in the last decade. The majority of the population are Muslim with a life expectancy that has risen from 48 years in 1960 to 69 years in 2014. Fertility has dropped from 5.7 in 1960 to 2.4 in 2014 with wide regional differences. Births attended by skilled staff were $\approx 40\%$ in early 1990s, 87% in 2013 and contraceptive prevalence has gone from $<30\%$ in the mid-1970s to 63% in 2013. Overall a picture of progress but that characterises also how past cohorts of women have endured higher levels of fertility with higher risks of birth injuries (Frankenberg, Buttenheim et al. 2009).

Methods and data

This study uses the first five waves (1996-2014) of the Indonesian Family Longitudinal Survey (IFLS). A total sample of 4237 women was selected. The sample includes those for whom grip strength and full reproductive histories (miscarriages, pregnancies, pregnancy complications) were available. We use Latent Class Analysis to measure the accumulated adversities (childhood conditions, pregnancy and childbearing distress) during the lifecourse. The models were run in MPlus.

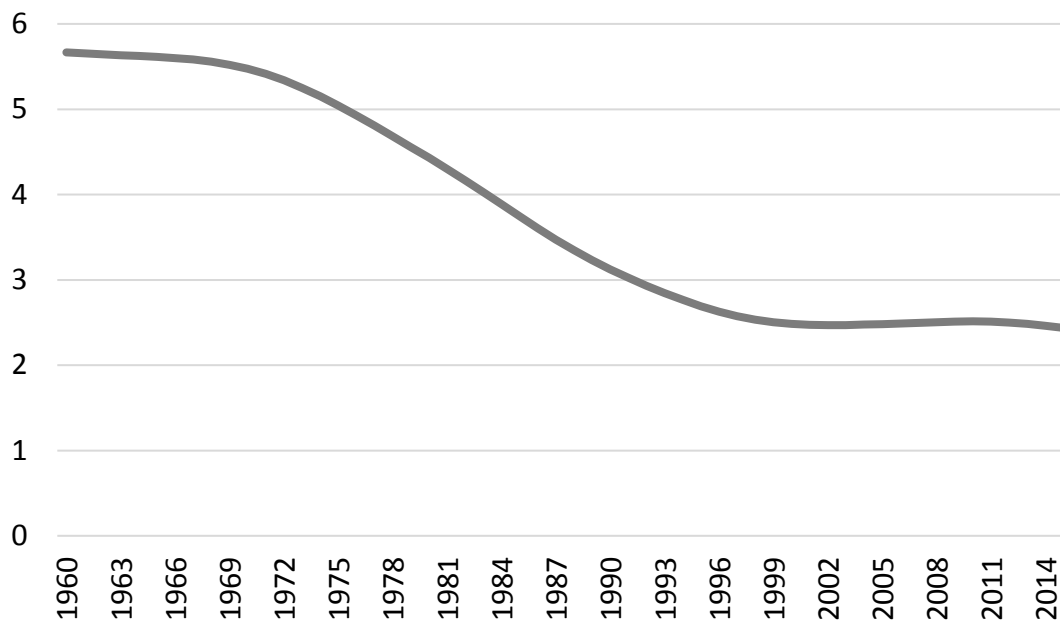
Grip strength is the mean of the best result obtained in each hand squeezing a Smedley's hand dynamometer where the dominant hand is reported by the interviewer. It is widely regarded as an excellent predictor of disability and worse health at older ages (Sayer, Syddall et al. 2006). When standardised it produces a reliable objective measure of health status (Rantanen, Guralnik et al. 1999, Sayer, Syddall et al. 2006, Taekema, Gussekloo et al. 2009).

The context

Indonesia is a lower middle-income country which has experienced a considerable economic growth as well as a considerable fertility decline over the last three decades (Fig 1.) Life expectancy was 48 years in 1960 while it has risen to 69 years in 2014. Births attended by skilled staff ≈40% in early 1990s with an increase to 87% in 2013. Finally, contraceptive prevalence was <30% in the mid-1970s, 63% in 2013 (UNPD 2017).

We are therefore looking at a country which only recently had a very high level of fertility and more in general a need of safe maternal health care which often would go unmet.

Figure 1. Indonesia fertility 1960-2017.



Source: World Bank, 2017

Preliminary results and discussion

The relation between fertility and grip strength emerges as complex and multifaceted. Nulliparous women and women with higher parity (3 or more children) show an decreasing grip strength load with rising age. The relatively negative impact of 1 to 2 children could simply be due to overall support from children and a low physical and mental burden due to fewer children. This result could potentially signify that in particular for younger women a small number of children could have a support effect.

Miscarriages have a negative effect on health deterioration, if there are more than two. This could be due to a selection effect but also to a toll such an experience brings from both the mental

and physical side. On one hand, women prone to miscarriage could have more health problems in general. On the other hand, the burden of an abortion and/or miscarriage can have its toll on the physical as well as mental health. Ideally, we would have liked to see a split between abortions and miscarriages as for the latter there could be a selection effect.

As for the socio-economic determinants, while it is quite clear why the relationship is inverse for education, it is not clear why it is positive for wealth and a more in depth analysis is needed. We tried splitting the sample into rural and urban in order to try to capture whether wealth was showing key differences by area. However, there were no significant differences.

This paper stresses on the need to consider pathways to ageing in order to design appropriate social care policies which will aim at preventing an overload of the health and social care systems in years to come.

References

- Câmara, S. M. A., C. Pirkle, M. A. Moreira, M. C. A. Vieira, A. Vafaei and Á. C. C. Maciel (2015). "Early maternal age and multiparity are associated to poor physical performance in middle-aged women from Northeast Brazil: a cross-sectional community based study." BMC Women's Health **15**(1): 1-10.
- Frankenberg, E., A. Buttenheim, B. Sikoki and W. Suriastini (2009). "Do Women Increase Their Use of Reproductive Health Care When It Becomes More Available? Evidence from Indonesia." Studies in Family Planning **40**(1): 27-38.
- Grundy, E. and S. Read (2015). "Pathways from fertility history to later life health: Results from analyses of the English Longitudinal Study of Ageing." Demographic Research **32**(4): 107-146.
- Gustafsson, P. E., U. Janlert, T. Theorell, H. Westerlund and A. Hammarstrom (2011). "Socioeconomic status over the life course and allostatic load in adulthood: results from the Northern Swedish Cohort." J Epidemiol Community Health **65**.
- Premji, S. (2014). "Perinatal Distress in Women in Low- and Middle-Income Countries: Allostatic Load as a Framework to Examine the Effect of Perinatal Distress on Preterm Birth and Infant Health." Maternal and Child Health Journal **18**(10): 2393-2407.
- Rantanen, T., J. M. Guralnik, D. Foley and et al. (1999). "Midlife hand grip strength as a predictor of old age disability." JAMA **281**(6): 558-560.
- Read, S. L. and E. M. D. Grundy (2016). "Fertility History and Cognition in Later Life." The Journals of Gerontology Series B: Psychological Sciences and Social Sciences.
- Sayer, A. A., H. E. Syddall, H. J. Martin, E. M. Dennison, H. C. Roberts and C. Cooper (2006). "Is grip strength associated with health-related quality of life? Findings from the Hertfordshire Cohort Study." Age and Ageing **35**(4): 409-415.
- Taekema, D. G., J. Gussekloo, A. B. Maier, G. J. Westendorp and A. J. M. de Craen (2009). "Handgrip strength as a predictor of functional, psychological and social health. A prospective population-based study among the oldest old." Age and Ageing **39**(3): 331-337.
- United Nations (2013). World Population Ageing 2013. UN. New York, NY.