

Limits to Fertility Postponement in the Context of Reproductive Ageing. Results from Polish GGS Survey.

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Extended abstract

The main aim of the analysis is answering at the question concerning biological limits to fertility postponement related to decrease in female fecundity (reproductive ageing) during life cycle. This research question seems to be important in the context of observed age at birth of the first child, which is driven by postponement of decision concerning onset of deliberate attempts to conceive.

Taking into account these opposing trends of decrease in fecundity and simultaneous increase in age at first attempt to conceive we expect to observe difficulties in realization of fertility intentions resulting in lower than planned number of offspring, more difficult progression to parity two and higher and finally increase in the share of childless. For the purpose of analysis it is essential to find out whether females in contemporary developed societies have reached age at first attempt to conceive where decrease in fecundity might seriously endanger aforementioned factors that is waiting time to first pregnancy, progression to higher order births and risk of childlessness.

Main motivation for this paper arises from observation that most of demographic analyses focuses on socio-economic factors affecting fertility decision such as situation on labor market, education or institutional context. These analyses seems to ignore increasing divergence between lifecycle of modern females and changes of fecundity over the life course and makes no assumptions concerning fecundity or implicitly assume no changes in fecundity. For instance, most of demographers assume that births lost due to postponement are possible to regain as a result of recuperation effect. This implicitly assumes constant pattern of female fecundity over age or at least that decision concerning pregnancy is not delayed beyond the point of significant loss of reproductive potential. From the perspective of studies on age patterns of female fecundity contemporary developed societies have reached age at first attempt to conceive (in some countries around age of 30) where apparent fecundability stands for approximately 70% of maximum value (Woods 1989, 1994). It seems that further increase at age of first attempt to conceive might result in aforementioned

negative consequences. An analysis of interrelation between reproductive senescence and conception might, furthermore, contribute to the analysis of realization of fertility intentions.

In most of the survey studies, childless respondents reveal that they would like to have two children which seems to be a quite standard finding (Toulemon and Testa, 2005, Testa 2012, Régnier-Loilier and Vignoli 2011). Moreover, most of the author focus on socio-economic factors influencing gap between planned and actual number of children ignoring at this same time possible biological factors.

Reproductive ageing has been under study for a long time but apparently has not been incorporated extensively into demographic studies. First approaches to study variability of human reproductive potential over age also called reproductive ageing come from the field of evolutionary ecology of human reproduction (Kaplan, Hill et al. 2000, Hill and Hurtado 1991, Shanley and Kirkwood 2001, Hawkes 2003). A significant increase in life expectancy, which resulted from social and economic development along with diffusion of contraception, changed relation between evolutionary shaped fecundity and individual decisions concerning procreation. It seems that humans have not been evolutionary designed for late procreation as it is observed in contemporary developed societies. Average age at first procreation in historical European societies almost overlap with age of maximum fecundity which allowed females to achieve much higher completed fertility even in highly unfavorable mortality conditions and no contraception. Taking into account increase in life expectancy, decrease in infant mortality rate and overall drop in quantum of reproduction decreasing fecundity might have no effect on realization of fertility intentions. However influence of reproductive ageing with respect to realization of reproductive intentions might again gain its significance as average age at procreation reached age 30 and beyond. Thus, late age at onset of procreation might result not only in increase of sub-fecundity or infertility but also in less time for medical intervention or application of assisted reproductive technologies.

Taking into account these considerations we have to stress that increasing divergence between natural patterns of fecundity over age and individual reproductive patterns shaped by social and economic circumstances might result in lowered probability of conception, less chances for transition to higher parities an increased risk of involuntary childlessness (Bianchi and Campana 1994, te Velde and Pearson 2002, te Velde et al. 2012).

Present analysis accounts for impact of reproductive ageing on chances of successful procreation by measuring waiting time to pregnancy (WtP). This simple retrospective methodology reflects generally approved definitions of sub-fertility and infecundity as number of months with regular unprotected intercourse ending (or not) in pregnancy.

According to definitions approved by WHO after 6 unsuccessful cycles around 20% of couples exhibit slight decrease in fecundity (sub-fecundity), after 12 unsuccessful cycles we observe around 10% of sub-fertile couples and after 48% unsuccessful cycles around 5% of couples is assumed to be sterile (Zegers-Hochschild et al., 2009, Gnoth et al. 2005). Thus, measures of WtP might be used to infer indirectly, about process of reproductive ageing which manifests itself via length of interval necessary for conception.

Measurement of WtP allows estimate proportion of sub-fertile and sterile couples as well as account for changes in conception probability with age. Therefore, postponement of reproduction and simultaneous decrease of fecundity might be responsible not only for increase in waiting time to first pregnancy but also in increase in proportion of sub-fertile and childless couples. What follows, we may also observe increase in length of interval between first and second pregnancy or event inability to conceive second child. In the literature we may find excellent methodology for measuring WtP with use of short retrospective questionnaire (Olsen, Juul, Basso 1998, Joffe et al. 2005). For the purpose of measuring WtP in Polish GGS survey we have used slightly modified version of questionnaire proposed by Joffe and colleagues (2005).

Questionnaire aimed at measurement of WtP has been used in first wave of Polish Generation and Gender Survey conducted in 2011. In the section of questionnaire devoted to fertility we have placed questions concerning infertility (as declared by respondents) and questions concerning number of menstrual cycles needed for conception. This retrospective method allowed us measurement of waiting time to pregnancy with respect to age of respondents. Analyses reveal that there is a significant increase in WtP among women aged 35+ and slight increase in WtP among females aged 30-35. At this same time we observe no differences in WtP among younger females. Estimates of infertility yields around 7% for females (as declared by all female respondents in the sample) and only around 3% for males (as declared by all males respondents in the sample). Observed difference is most likely due to aversion among males for admitting their infertility or lack of proper diagnosis among them. Although we observe, as predicted, the effects of reproductive ageing for females 35+ taking into account age at first birth in Poland (around 29 years in 2012) the effect might not influence completed fertility rates on the level of population in a significant way. Although we may think that within some social groups characterized by more substantial postponement of fertility this effect could be more pronounced.

Taking into account theoretical considerations as well as empirical results, we may conclude that decrease in fecundity might have a particularly strong effect for women who

have reached age of 35. Beyond that age fecundity drops to about 60% of maximum value for women aged 20-22. In such case the interval between onset of deliberate attempt to conceive and actual pregnancy might get wider presumably increasing chance for being childless or in case of successful first pregnancy it might reduce chances for second pregnancy.

From this perspective, Poland is not a country where reproductive senescence might have a great impact on realization of fertility intentions and therefore fertility rates on the population level. However, due to continuous increase in age at first attempt to conceive at least in some social groups we expect that share of couples having problems with conception or at least with prolonged WtP might increase in the future. Thus, in countries with relatively late age at first reproduction we expect to find higher rates of infertility or sub-fertility followed by higher frequency of childless couples.

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