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Global Demographic Change and the Case of Low Fertility

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1. Introduction

In this issue of *Population Horizons*, we have two interesting papers. The first considers the potential for demographic dividend and economic growth in Mail, and the second presents evidence from survey data on the changes in demand for children between 2003 and 2013 in Nigeria. Each of these papers is interesting in its own right, but it has to be remembered that national demograhpies are developing in a global context of declining mortality, declining fertility and population ageing (Leeson 2018, 2018a), and this paper attempts to contextualise briefly this global demographic development.

The demography of the 20th and 21st centuries was and is one of ageing, both at an individual and at population level (Lee 2003; Leeson 2009, 2014) – and population ageing, which was once regarded as an issue for the developed economies of Europe and North America is truly a global phenomenon now reaching Latin America (Leeson 2011, 2016), the only notable region of exception being sub-Saharan Africa, which remains relatively young in demographic terms (United Nations 2017).

As individuals, we are living longer and longer. Life expectancies at birth have increased at the global level from 47 years in the mid-20th century to around 71 years today, and are expected to rise to 78 years by the mid-21st century and to 83 years by the end of the century. As populations, we are also ageing, so that larger proportions of our populations are *old*. The proportion of the world's population aged 65 years and over has increased from 5 per cent in the mid-20th century to just over 8 per cent in 2015, and by 2050, it is expected to reach almost 16 per cent, equating to more than 1.5 billion people. The end of the century will see 23 per cent and 2.5 billion of the world's population aged 65 years and over (United Nations 2017).

As families, we are having fewer and fewer children. Fertility across all regions of the world declined from 1950 levels ranging from 6.6 in Africa to 2.7 in Europe to 2015 levels ranging from 4.7 in Africa to 1.6 in Europe. This downward trend is expected to continue to 2050 everywhere except Europe and Northern America, which are expected to experience relatively modest increases in fertility. By 2050, only Africa is expected to have fertility levels still above replacement level (at 2.9 for the continent as a whole). Such dramatic declines in fertility present huge challenges to individuals, to families, and to society as a whole, not least because many of these societies are largely family-based in respect of support.

2. Global demographic change, 1950-2050

The world is ageing – both at an individual and at population level – and this demographic development produces at the same time both challenges and opportunities for governments, communities, families and individuals across the globe (Harper 2006; Leeson & Harper 2006, 2007, 2007a, 2007b, 2008). While increases in longevity and life expectancy relate to our individual ageing, the declines in mortality and fertility relate to age structural change (population ageing), a situation in which the number of older people and their share of the population increases (Harper 2016).

For the first half of the 20th century, the populations of the different regions of the world were not that old, with the proportion of population aged 65 years and

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over ranging from 3.2 per cent in Africa to 8.2 per cent in North America. Not until 1970 did we see any region attain more than 10 per cent of its population aged 65 years and over (Europe at 10.5 per cent). In fact, North America (12.3 per cent) and Europe (14.7 per cent) were the only regions at the end of the 20th century to have more than 10 per cent of their populations aged 65 years and over. By 2015, Oceania (11.9per cent) has joined the aged regions of the world, but elsewhere proportions aged 65 years and over remain below 10 per cent, with Africa having increased only modestly from 1950 to 2015 to 3.5 per cent of its population aged 65 years and over. The next 35 years or so are predicted to witness dramatic increases in the number and proportion of older people in all regions of the world outside Africa. By 2050, almost 28 per cent of Europe's population is expected to be aged 65 years and over, followed by North America (almost 23 per cent), Latin America and the Caribbean (almost 20 per cent) and Asia (18 per cent). Africa will still have only 6 per cent of its population aged over 65 years.

This development reflects the development in levels of fertility and mortality, discussed in the following sections.

2.1 Fertility

Understanding the dynamics of fertility has generated a large amount of research. Preston (1986) argued that the patterns of economic development across the 20th century led to a century of more or less uninterrupted fertility decline, the argument being that this economic development had increased both the socially constructed costs of children and the opportunity costs of responsible parenthood. These very low fertility levels (Caldwell and Schindlmayr 2003) came with advanced societies experiencing a *postponement* transition (Kohler et al. 2002, 2002a). Levels of educational attainment of females appear to influence fertility behaviour even in situations where there is no increasing labour force participation (Jain 1981). Of course, the cost of having and rearing children also comes into play in the decision-making processes associated with reproductive behaviour (Grant et al 2004). Easterlin (1968, 1976) proposed that economic uncertainty and rising unemployment reduces the tendency to marry and have children, and this theorisation was supported by Oppenheimer (1988, 2003) and Oppenheimer et al. (1997) in respect of the timing of family transitions. This relatively early work of Easterlin outlined the classic economic theories of fertility, which acknowledge the role of the costs of children and even further distinguish between direct costs such as food, clothing and education and indirect (opportunity) costs such as loss of income (Easterlin 1968, 1976). Later, emotional and psychological costs were added to the list of direct costs (Nauck 2006). As the cost per child increases then the number of children decreases (for example, Becker 1960) so that as disposable income increases with economic growth this increases the opportunity costs of having children, and there does seem to have been a significant body of evidence underpinning this negative correlation between economic growth and fertility (Grant et al 2004), but this is being challenged by more recent findings from Myrskyla et al (2009), Orsal & Goldstein (2010) and Luci & Thevenon (2010) which suggest a convex impact of economic growth on levels of fertility. The work of Becker also suggests a negative relationship between levels of fertility and the labour force participation rates of women (Becker 1960; Becker & Lewis 1973) and the experience of the last 50-60 years would seem to lend strong support to this theory. Higher levels of education for women tend to be associated with lower levels of fertility to a greater extent than educational attainment for men (Skirbekk 2008), but recent work from Kravdal & Rindfuss (2008) indicates that the association may be weakening in the Norwegian context at least, and is certainly more complex than otherwise assumed (Hoem et al 2006). Other factors could also impact on the development of fertility, for example, housing although the available evidence is suggestive but not conclusive, highlighting rather the complex of associated factors which may also impact on fertility (Mulder & Billari 2010; Kulu & Vikat 2008). Social and cultural factors may also play a role, but evidencing this may prove to be more problematic. The relationships between public policy and fertility are similarly complex and difficult to determine (Gauthier 2007).

In the 1970s to 1990s, the baby-bust levels of fertility (1.3 to 1.8) across Northern and Western Europe and North America were unprecedented (and not expected to remain at these levels) but elsewhere in the world, levels of fertility remained high and the world's population was expected therefore to reach 12 billion by the middle of the 21st century (Davis, Bernstam & Ricardo-Campbell 1986). In fact, what happened in the following decades was that fertility levels did remain low (or increased only moderately) in Northern and Western Europe and North America; even declined to much lower levels in Southern

Europe; and declined dramatically in Asia, coming down by the end of the 20th century to just above replacement level in the region as a whole and to extremely low levels in some countries such as the Republic of Korea (around 1.2), Hong Kong (around 1.0) and Singapore (around 1.3) (United Nations 2017). In the mid-20th century, fertility levels varied from 6.6 in Africa to 2.7 in Europe, and by 2015 this variance was from 4.7 in Africa to 1.6 in Europe. One hundred years later, the highest level of fertility is expected in Africa (2.9) and the lowest in Latin America and the Caribbean (1.76) (United Nations 2017). This is quite a reversal fertility fortune in as much as while Europe had the lowest level of regional fertility in 1950 and in 2015, by 2050 it is expected that Latin America and the Caribbean will have the lowest regional fertility, having declined from 5.9 in 1950 to just 1.76 in 2050.

It should be pointed out of course that within regions there can be quite significant variation across countries. In Latin America and the Caribbean, for example, fertility in 2015 ranged from 3.45 in French Guiana to 1.51 in Santa Lucia. By 2050, these two countries still represent the extremes, but while fertility in French Guiana has declined to 2.5 it has increased to 1.6 in Santa Lucia. By the mid-21st century, fertility levels are expected to converge towards replacement level across the regions outside Africa. Fertility in Africa, while expected to decline, it will be to around 3. There is, however, recent evidence of fertility stalling in some parts of sub-Saharan Africa (Howse 2015) and this would question the likelihood of levels attaining a low of 3 by 2050.

While these regional predictions for the development of fertility to the middle of the 21st century provide a global picture of fertility development, the intra-regional (and below this the intra-country) differences are more important in respect of understanding the complexity of the drivers of this fertility decline. Education, socioeconomic status and urban contra rural residence are all important determinants of fertility so that fertility tends to decline with increasing levels of urbanisation; to decline with increasing educational attainment of both males and females; and to decline with increasing socioeconomic status (Leeson & Harper 2012).

2.2 Mortality

As discussed by way of the introduction, life expectancies have been increasing steadily since the turn of the 20th century (Fries 1980; Leeson 1982), but what has been particularly striking is the improvement in survival at older ages (Leeson 1981; Vaupel 1998) and there is an increasing body of evidence that lives will continue to be extended for some time to come (for example, Bongaarts 2006; Thatcher 1999, 2001; Olshanky et al 2001; Robine, Saito & Jagger 2003; Wilmoth & Robine 2003; Christensen et al 2009; Vaupel 2010; Leeson 2011).

The first half of the 20th century saw life expectancies at birth for both males and females in the more developed world increase by around 20 years. In absolute terms, it will take 100 years from 1950 to 2050 to increase these life expectancies at birth by another 20 years. This is driven by a shift in mortality declines from the young to older age groups, reflecting the demographic reversal of the earlier conviction that mortality at older ages is intractable (Wilmoth 1997; Vaupel 1998). Indeed, declines in mortality among the extreme aged have been noteworthy (Vaupel 1998) and improvements albeit more modest have also occurred in the second half of the 20th century (Kannisto 1996; Kannisto et al 1994). It is interesting to note that while life expectancy at birth has increased steadily, life expectancy at age 65 was slow in beginning to increase. Indeed from the mid-19th century to the early 20th century, it remained more or less the same, and the difference between male and female life expectancy at age 65 was small. The turn of the 20th century saw life expectancy at age 65 begin to increase steadily – particularly for females, and with this came a divergence of male and female life expectancies, mirroring the development to some extent for life expectancies at birth. Around the world, new generations can expect to live longer than previous generations, and the rate of increase is surprisingly strong and constant (Leeson 2014, 2014a, 2016a). Life expectancies at birth for both sexes combined have increased at the global level from around 47 years in the mid-20th century to around 70 years today, and are expected to rise to around 77 years by the mid-21st century. In Europe, for example, these life expectancies have increased from 64 years in 1950 to around 76 years today, and are expected to reach around 82 years by the middle of the 21st century. Most countries of the world experienced significant mortality declines after 1950, which led to marked increases in life expectancies at birth for both males and females, with life expectancies for males rising from between 36 years (Africa) and 66 years (Northern America) in 1950 to between 60 years (Africa) and 78 years (Northern America) in 2015. For females,

increases for females have been from between 38 years (Africa) and 72 years (Northern America) in 1950 to between 62 years (Africa) and 82 years (northern America) in 2015.

Female life expectancy continues to exceed male life expectancy in all regions at all points in time 1950-2015. In 1950, the gender gap was about twice as high (6 years) in the more developed regions of the world (Europe, Northern America and Oceania) than in the developing regions (Africa, Latin America and Asia), a reflection of high levels of mortality across the life course for both males and females in the developing regions. By 2015, the gender gap has widened in absolute terms by 1-3 years in Europe and the developing regions, while it has fallen by 3 years to just 3 years in Northern America.

Much of these improvements are related to a shift from mortality from infectious diseases to mortality from non-communicable diseases. The population forecasts assume continuing declines in mortality in all regions of the world and in addition, the developed – developing country differences are expected to decrease so that by 2050, life expectancies at birth for males range from 69 years in Africa to 84 years in Northern America, and from 73 years in Africa to 86 years in Northern America for females. In the course of 100 years (1950 – 2050), male life expectancy at birth will have increased by 33 years in Africa and 18 years in Northern America. The corresponding increases for females are 35 years and 14 years.

3. Discussion

This paper has presented data for global population change and the drivers of this change for the period 1950 to 2050. The regions are characterised by declines in both fertility and mortality. The result is an ageing of the populations across the world. However, the data reveals that the regions have achieved this from different 1950-starting points and at different speeds.

Does it matter that fertility seems to be on the way down globally? Ten years ago, it was suggested

> "Slowing the rise in human numbers is essential for the planet..." Engelman, Scientific American, June 2009

So surely, low fertility is good for the planet? But is it good for us as individuals? Is it good for our families? Is it good for our communities?

Since the early-mid 1980s, when countries in the more developed regions were experiencing a baby-bust, demographers have researched the causes and consequences of what is called below-replacement fertility (that is levels of fertility that mean a population is unable to replace itself, but this does unfortunately not take migration into account). But long before this era of baby-bust, demographers had researched the causes and consequences of the so-called demographic transition when societies transitioned from high levels of mortality and fertility to low levels of fertility and mortality, experiencing in between time dramatic population growth. The historic low levels of fertility in the 1980s declined even further, and although levels have *recovered* in some countries but remain below replacement level, today, fertility almost everywhere is either relatively stable or still declining and population forecasts from the United Nations suggest population stabilization by the middle of the 21st century at around 10 billion people – still too many, some will say.

But of course, in a demographic climate of low fertility, we also have increasing life expectancies and ageing of our populations. So, perhaps we have successfully addressed one issue (population growth) but raised a second (population ageing), akin to a demographic hydra. In this respect, we must ask if low fertility is actually the kind of social problem we would like to have in as much as it has solved the potentially more threatening social problem of continued population growth.

So low fertility leads to ageing populations and could even lead to population decline for some countries where migration is unable to compensate. Forecasts also suggest that the Old World's share of global population will decline. Low fertility also means fewer workers entering future labour markets and perhaps threatens competitiveness in our globalised world. But did I hear someone say; what about technology and the movement of labour around the globe? I am sure I did.

If we regard low fertility as a problem, we should be asking ourselves why our young generations have given up on having children and we may well discover that there are fundamentally much more serious problems at the heart of the matter as was suggested nearly 20 years ago

> "Families do not find the environment in which they live conducive to child-bearing" Green Paper: Confronting demographic change, March 2005

The question quite simply is: how does a society allow and enable women to have the children they desire and at the same time ensure the children that society needs?

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