

DIFFERENTIAL AGE-STRUCTURAL TRANSITIONS IN DEVELOPING COUNTRIES

Proposal for *Aide au Sejour de Chercheur Senior*

Ian Pool*

Overview

The world, particularly its developing country regions, has recently witnessed an unprecedented shift in the drivers of demographic change, and the flow-on effects of these for policy and development. Population transformation will now increasingly rely on changes in structural factors, especially, age-structural transitions (ASTs), geographic redistribution including ‘megalopolisation’, labour force sectoral transformation and shifts in family structures – size, generational patterns, localisationⁱ. By contrast, until recently, dynamics (natural increase and, less importantly, migration) have been the dominant drivers of demographic change: first, after World War II came the rapid decreases in mortality, which accelerated global increases, and then, across much of the world, the unprecedented reproductive revolution, which has radically slowed world growth.

Labour force and family changes are intimately interrelated with ASTs – sometimes as determinants and sometimes as consequences. Geographic redistribution is also interrelated, but, as ASTs are the outcome not only of differential patterns of natural increase but also of mobility transitions, especially at a sub-national level, this issue is raised below among the research questions proposed here

In a seminal paper, Jean-Claude Chesnais demonstrated how dynamics, above all fertility transitions, translated into age-structural changes, and identified the generational (defined here as a ‘set of adjacent cohorts’) effects that these would have. Chesnais noted, in particular, that ‘the increase in population is not evenly distributed by age’. He constructed ‘age-specific transitional multipliers’ for broad age-groups. The importance of this finding can not be overstated: it has very significant policy implications, particularly as the multipliers vary hugely from one population to another, as is illustrated in the table below comparing France and Kenya. Essentially, Jean-Claude Chesnais’ work sets the research questions for my project to be outlined belowⁱⁱ.

<u>Transitional Multipliers for:</u>	<u>France</u>	<u>Kenya</u>
Total population	2	20
Ages 0-14 years	1.5	10
<u>Ages 65+ years</u>	<u>10</u>	<u>200</u>

*Emeritus Professor of Demography, National Institute for Demographic and Economic Research, University of Waikato, New Zealand

The shifts from growth-driven population changes to structurally-driven changes have confronted the demographic community with major challenges. But, a co-terminous concern over population ageing has confounded the issue – in fact, most of the world is battling with ASTs, not ageing, yet ageing has attained a much higher profile in western policy and even research communities, and also in international agencies advising developing countries about development and funding programmes.

The challenges posed to research on ASTs also, however, bring advantages: the population-policy/development links are far more evident than past studies had shown, as ‘Dividends’ research (reviewed below) has so powerfully demonstrated. The reason is simple: almost all market activities and policy, and not just social policy, are directed towards, or are dependent on specific age-groups ((eg fiscal policy – who pays the taxes? who universally is dependent on public support? what are the ages of military conscripts?)ⁱⁱⁱ).

This proposal has as its objective to synthesise existing and emerging streams of work on ASTs.

Background to this Proposal

In the 1945-80 period, the focus of demography had been very much on high population growth and its components, particularly fertility, and on the methodologies associated with this. Age structural analysis was a minority concern, ageing even more so, and thus there was little investment in methodologies for analysing changing age-pyramids. Ironically, while leading mathematical demographers (eg Bourgeois-Pichat, Coale and Keyfitz) had greatly enhanced theories about age-structures, this work was, most appropriately, turned towards natural increase -- to the very practical issue of indirect estimation -- and not ASTs. While some progress has been made recently, even descriptive analyses remain far from sophisticated^{iv}. But in the 1970s Europe began to become aware of ageing, while world-wide the slowing of growth took much of the demographic community almost by surprise. But, Chesnais’ contribution in the 1980s was to make us rethink ASTs. Subsequently, work on age-structures taken three major directions:

1. Mapping and analysing different patterns not just for age-groups but also for cohort flows, in which I have played an instrumental role^v, sometimes in high level policy contexts as well as academic^{vi}.
2. The formulation and elaboration of the Demographic Dividends (bonuses) paradigm, which in turn has spawned the National Transfer Accounts (NTA) analyses. The ‘Dividends’ and NTA research are extremely important and have greatly enriched demography’s understanding of population-development interrelations, as I have documented elsewhere. They show, *inter-alia*, that age-structural changes are a major factor in economic development. A step forward realised by NTAs is that they pay particular attention to social-economic transfers, particularly those called ‘intra-family’, which have been shown to be very significant. Beyond this, if the first

demographic dividend is well managed, this can generate a ‘second demographic dividend’, even in developing countries, that will coincide with the onset of real ageing (see below)^{vii}. Nevertheless, NTAs and Dividends are outside the scope of this project, which focuses much more on identifying the wider ‘societal’ implications of ASTs: social, political, familial, cultural, health, as well as economic. Education will be among the factors identified, although not focused on here. This is an issue to which the Vienna group of demographers has given detailed attention, seeing the educational transition as the key driver of development^{viii}. Curiously, it is earlier work by the CIA that provides a sort of an inspiration for this proposal, but the most apposite model comes from research I myself carried out on Arab demography^{ix}.

3. Research on ‘ageing’, which focuses only on the end product of ASTs that they are passing through as a result of the radical changes in dynamics described by Chesnais. In most developing countries, ageing is a more distant problem than the ASTs that currently have an impact on the economically critical working ages, and which affect shifts in distributions at young and working ages – older ages remain proportionately small, and will be for a long to come.

It must be stressed, however, that this proposal does not relate to ‘ageing’ *per se*, although, where appropriate, passing reference will be made to this last phase of an AST. Ageing, as used here, relates to population increases (absolute and proportional) at older ages (an arbitrary age of 65+ years is taken); ASTs relate to the phases that population passes through as it ages, and within old age itself. The important questions posed about ageing in this paper are three in number:

- (a) That, while a focus is put on the growing burdens of ageing, using dependency ratios, much less attention is paid to the dynamics and structures of younger support populations; this was particularly evident at the Cairo ICPD, which then guided population assistance over the next decade or so^x. The numbers and structures at working ages were in the 1990s, and often will be into the future, affected by ASTs that, in many countries, produce turbulent waves, termed ‘disordered cohort flows’.
- (b) That the survivorship changes that are driving changes in the rates of ‘numerical ageing’ (correctly speaking, the ‘growth in numbers at older ages’) are far more important at pre-retirement ages than at older ages. In populations with lower levels of mortality, cohort differences in numerical ageing are determined primarily by the sizes of the birth cohorts that generated the cohort flows.
- (c) That, trends in the rates of ‘structural ageing’ (the proportion of the population at older ages) is mainly a function not of improving survivorship, but of decreasing sizes of birth cohorts and/or fertility rates^{xi}.

Research Question # 1: Numerical vs Structural Ageing

Detailed work I have carried out comparing East Asian countries with western developed countries (WDCs: I include Japan in both groupings) shows that trends in ‘numerical’ and

‘structural’ ageing vary widely, as is clearly evident in Chesnais’ transitional multipliers. The mixes of these have very significant policy implications that ironically, among the WDCs, actually favour the already slow growth of western European countries that already have ‘old’ age structures -- they will have low rates of both numerical and structural ageing; the neo-Europes will be faster. In contrast, the trends for both forms of ageing are most severe for some developing countries undergoing rapid, recent declines in fertility, but also suffering from the momentum effects of large cohorts born in the past before their recent fertility declines.

The intersections of these mixes also change over time. As these trends have severe distorting effects across the age-pyramid, the mixes, as well as the independent patterns, have major policy implications. Thus, as a preliminary step, this issue will have to be looked at.

Research Question # 2: Variations in Timing and Trends for ASTs

There are major differences in timing and trends in the Third World between, say, Brazil, India and South Africa, with more gradual ASTs, and, by contrast for example, Kenya, Mexico and Thailand with more rapid ones. This is because recent declines in fertility in many (but not all) developing country regions have been at varying times and have followed different trajectories^{xii}. This is not just a Third World issue. Elsewhere, I have compared France and Italy, two of the low fertility, slow growth, western European WDCs. Their ageing trends will have very different population and policy impacts: they had very similar broad age-distributions in 1960, by 2040 their distributions will be very different^{xiii}. Analogous but more marked differentials are opening up in the developing countries. The resultant age structures will also place varying pressures on demands for services and markets.

Research Question # 3: Disordered Cohort Flows

Much of the recent research on ASTs has dealt with ‘phasic’ changes – shifts from high proportions at young ages (say more than 30% aged 0-14 years), to disproportionate concentrations at middle ages (when a ‘window of opportunity’ for Dividends’ occurs) to disproportionately old-aged distributions (say 10% aged 65+ years). This is the triptych that the literature on ‘Dividends’ paints. But detailed cohort analyses show that this obscures a great deal of turbulence within each of these groupings, particularly at the working ages. This has policy implications because there is marked variability in the needs and capacities of cohorts at different life cycle stages – say youth, 15-24 years; early working and family building ages, 25-34; mid-adult working, childbearing and child-rearing ages, 35-44; later working and child-rearing ages, 45-54; and pre-retirement ages, 55-64 years. A focus on phasic analyses dampens down the turbulence of cohort flows, particularly if the oscillations are highly irregular, as in the case of China or the Russian Federation^{xiv}.

Research Question # 4: Frameworks

The operational phases of this project will attempt to synthesise the existing knowledge so as to develop a multi-dimensional (variability in timing, in velocity, and in turbulence)

framework that classifies developing countries' ASTs. Building on this, the differential policy effects will be identified across the social and political sectors.

Research Question # 5: Sub-National Trends

The intersection of the demographic and age-structural transitions with the mobility transition has produced marked sub-national differences in many countries. While this will be a by-product of the research, where readily evident this will be identified and listed.

END NOTES

ⁱ Pool, I (2006a) 'The Way Forward: Changes in Population Structures', in Hobcraft, J (ed) *The ICPD Vision: How Far has the 11-year Journey taken Us?* Report from a UNFPA Panel Discussion, IUSSP, XXV International Population Conference, Tours, 19 July 2005, UNFPA, NY: 24-39

ⁱⁱ Chesnais, J-C (1990) 'Demographic Transition Patterns and their Impact on Age-Structure', *Population and Development Review*, 16, 2: 327-54; see also (1986) 'La transition démographique: Etapes, formes, implications économiques', *Population*, 41,6: 1059-70

ⁱⁱⁱ Bloom, D, Canning, D and Sevilla, J (2003) *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*, Rand, Santa Monica: xi; Pool I (2007a) 'Demographic Dividends: Determinants of Development or Merely Windows of Opportunity', *Ageing Horizons*, 7: 28-35 esp 30, www.ageing.ox.ac.uk/ageing_horizons/

^{iv} Pool, I, Prachuabmoh, V and Tuljapurkar, S (2005) 'Age-Structural Transitions, Population Waves and "Political Arithmetick"', in Tuljapurkar, Pool and Prachuabmoh (eds) *Population, Resources and development: Riding the Age-Waves*, Vol 1, Springer, Dordrecht: 3-10, esp 9-10

^v Pool *et al* (2005); Pool, I (2005) 'Age-Structural Transitions and Policy: Frameworks' in Tuljapurkar *et al* (eds): 13-39; Pool and Wong, L (2006) 'Age-structural Transitions and Policy: An Emerging Issue', in Pool, Wong and Vilquin, E (eds) *Age-Structural Transitions: Challenges for Development*, CICRED, Paris: 3-13; Pool (2006b) 'Mapping Age-structural Transitions: A Comparative Perspective', in Pool *et al* (eds): 21-57

^{vi} Pool, I (2007b) 'The Relevance of Changing Age-Structures for Social and Economic Development' Invited Presentation, Executive Director's Lecture Series, UNFPA, NY Mar 28th; Pool (2008) 'ASTs, Demographic Dividends: Different Dimensions and their Policy Implications', Keynote Presentation Expert Group Meeting, UNFPA and Futures Group, University of Stockholm, hosted by Austrian Academy of Sciences, Vienna Oct 7-9. Both of these papers are in the public domain but unpublished, so I have attached them to this application.

^{vii} Bloom *et al* (2003), Lindh, T (1999) 'Age structure and Economic Policy' *Population Research and Policy Review*, 18: 261-77; Pool (2007a); Malmberg, B and Lindh (2006) 'Forecasting Global Income Growth using Age-Structure projections' in Pool *et al* (eds): 59-82; Mason, A (2006) 'Population Ageing and Demographic Dividends: The Time to act is Now', *Asia-Pacific Population Journal*, 21,3: 7-16; Mason and Lee, R (2006) 'Reform and Support Systems for the Elderly in Developing Countries', *Genus*, LXII,2: 11-35; NTAs are the subject of a very large, seminal book Lee and Mason (Lead authors and eds) (2011) *Population Aging and the Generational Economy: A Global Perspective*, Edward Elgar, Cheltenham

^{viii} Lutz, W (2010) 'Education will be the Heart of 21st Century Demography', *Vienna Yearbook of Population Research*, 8: 9-16

^{ix} CIA (1990) 'Documents', reprinted *Population and Development Review*, 16,4: 801-07; Pool, I (2012) 'Demographic Turbulence in the Arab World: Implications for Development Policy', *Journal of Peacebuilding*

and Development, 7,1: 33-50, ([on-line and downloadable](#)). I am not a West Asian/Arab specialist, but, because of the work I have done on ASTs and their implications, I was invited by UN/ECWA to participate in a high level panel on Arab youth in Beirut. This sparked my interest and, when the Arab ‘spring’ occurred I wrote this more public access paper.

^x Pool (2006a): 33; (2007a): 31, both of which critique the undue emphasis on ageing at the ICPD, 1994, which had severe operational consequences – developing countries facing AST-waves and disordered cohort effects because of these were disconcertingly counselled instead by international agencies to deal with ageing, a distant project. In 2005, concerned about this pressure, the South African government asked me to give a seminar that put it into context: Pool, I (2005) ‘Population Waves: South Africa in a Comparative Context’, Presentation South African Statistical Services (Pretoria), 22 March .

^{xi} Pool (2007a) I am indebted to Rowland, D (2009) ‘Global Population Aging: History and Prospects’, in Uhlenberg, P (ed) *International Handbook on the Demography of Aging*, Springer-Verlag, NY: Chapt 3, with whom I had detailed discussion on this issue; see also (1996) ‘Population Momentum as a Measure of Ageing’, *European Journal of Population*, 12: 41-61; the original idea of disordered flows seems to be Waring, J (1975) ‘Social Replenishment and Social Change: The Problem of Disordered Cohort Flows’, *American Behavioural Scientist*, 14, 2: 37-56

^{xii} Pool (2006b), (2007b), (2008)

^{xiii} Pool, I (2010) ‘Age-Structural transitions in Industrialised Countries’, in Tuljapurkar, S, Ogawa, N and Gauthier, A (eds) *Ageing in Advanced Industrial States: Riding the Age Waves, vol 3*, Dordrecht, Springer: 3-21; for Developing countries see Pool (2007b), (2008).

^{xiv} Pool (2007b); for Russia and China see Pool (2005)