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AGE-STRUCTURAL TRANSITION IN INDONESIA:

A comparison of macro- and micro-level evidence

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Abstract

This paper responds to recent calls for empirical study of the impact of age-structural transition. It begins by reviewing evidence of cohort oscillations in twentieth-century Indonesia, which indicates that current older generations are likely to have smaller numbers of children on whom they may rely than generations before and after them. However, to assess whether the imbalances implied by this situation are actually influencing people's lives, attention to further factors shaping the availability and reliability of younger generations, notably differences in socio-economic status and in patterns of inter-generational support flows, is required. Community-level Indonesian data confirm that elders in the lower social strata are child-poor. Social structural and family network patterns, however, have a greater influence on the availability of inter-generational support than cohort differentials.

Keywords

age-structural transition; ageing; Indonesia; socio-economic stratification; wealth flows; anthropological demography

Nothing has caused more time-consuming and adrenalin-producing controversies than the myth that macrocosm and microcosm obey exactly the same laws. (Ernst Mayr 1982)

Population ageing is a later phase in the wider and more complex process of age-structural transition. Although ageing is a product of demographic transition, its consequences belong to an era that is only beginning, in which demographic changes are likely to be effected increasingly via compositional adjustments, of which natural increase effects are only one aspect (Pool 2005, p. 22). Changes that flow from compositional impacts of age-structural

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transition have recently been outlined (Pool & Wong 2006; Tuljapurkar *et al.* 2005). The quantum of fertility, for instance, is likely to be influenced by the changing size of cohorts of women available to bear children. A sequence of smaller and larger birth cohorts then creates cohort oscillations—‘wave’ or ‘echo effects’—as the size of each cohort comes to be reflected in subsequent fertility. Age-structural transitions may also have differing degrees of impact on specific cohorts. Where there is greater density of life-course transitions, say, where young people experience several events—marriage, procreation and the uptake of new jobs—all in a brief period, then support available to older age groups may be seriously ‘squeezed’. Alternatively, younger cohorts that sustain high levels of elderly support may find it necessary to reduce their fertility. Where crises in older cohorts fall in the same ‘dense’ interval as children’s life-course events, impacts on elders’ health and mortality may ensue. Migration, as well as fertility and health, may be shaped by generational imbalances. For example, the needs of elderly cohorts with fewer children may limit those children’s choices regarding more distant movement, or stimulate their return migration.

Cohort effects, however, do not work in isolation, so there is a second set of compositional adjustments that needs to be considered in assessing cohort wave and flow effects. Cohort imbalances may, for example, have varying implications for different socio-economic strata, for rural or urban areas, or for ethnic groups, especially where these differences also entail contrasting traditions of family support and access to governmental agencies. Age-structural changes interact with the institutions, communities, and networks that coordinate human and social agency. As Chan (2005, p. 240) noted, a more detailed set of sub-populations is likely to be needed than can be provided by cohort data.

Ageing and cohort ‘squeezes’ pose practical and empirical questions about different groups in a nation’s population: *Which* older people do not have access to reliable support? *Who* do the squeezes hurt? *Which* groups, or members of them, are able to escape problems raised by cohort imbalances? The uncertainty experienced by older people with few or no available children is not only a matter of past net reproduction. Other aspects of people’s life-courses and institutional options, e.g. occupational, kin, religious or other community networks, are likely to give some elders more extensive human resources on which to rely. Institutions and networks may be sorely tried by age-structural imbalances. However, it is also possible that they can function to alleviate imbalances without popular awareness of a ‘squeeze’ ever arising. Evidently, a demography which is able to differentiate between sub-populations of elders experiencing different levels of risk would carry advantages from a policy viewpoint.

This paper begins by outlining briefly the history of age-structural transition in Indonesia at the national and provincial levels. The focus then shifts to compositional differences between sub-populations at the local levels, i.e. ethnic communities, socio-economic strata and networks, drawing on a combination of survey and ethnographic data for villages in East and West Java, and West Sumatra.¹ Cohort imbalances began in the middle decades of the twentieth century as family and community networks faced political, economic and military

NOTES

1. Indonesian village data presented in this paper were collected in the first two phases of ‘Ageing in Indonesia, 1999–2007’, a comparative anthropological and demographic study supported by the Wellcome Trust and

upheavals. Differing patterns of marriage, reproduction and child survival arising from that era indicate that families in different strata were not equally successful in coping with these problems. Consequently, some are now relatively child-poor. Translating cohort imbalances into the experience of different sub-populations at the community level enables macro-level

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2. For example, one approach is to divide the population into broad groups, above and below a stipulated poverty level. Thus, Ananta and Bakhtiar (2005) noted that aggregate levels of poverty in Indonesia have declined in recent years, and used provincial census data to identify members of the lowest economic stratum and factors that would account for their situation. A province characterized by substantial in-migration of several ethnic groups, Riau Archipelago, was chosen for analysis. Variables normally associated with poverty improvements, i.e. advantages of education, work status and employment sector, did not yield a consistent explanation of changing poverty. When ethnicity and religion were included, the several sub-populations, e.g. Malay, Chinese, Muslim and Hindu, turned out to include a mixture of economic levels, and poor people who had high as well as low educational and employment characteristics. The authors concluded that no general correlates of low economic levels emerged.
3. Why elders under 70 should, in general, have more available children than those over 70 is a question requiring detailed consideration of the life-courses and networks of the elders in the two cohorts. There is not space to include these data here.
4. A further important issue, not addressed here, is the availability of surviving children by gender. In all three communities, frail elders may have no daughters or have all their daughters living at a distance, which becomes a significant issue for care and support. Differences in gender roles and preferences between the three communities, however, make this a complex issue in its own right. As noted elsewhere, networks commonly provide alternative sources of support that compensate for this problem (Kreager & Schröder-Butterfill in press). As in the data shown here, however, access to children, whether sons or daughters, is generally greater in the upper strata.
5. Raw data for Figures 4–6 are given below; childless elders not included.

Citengah: number of elders 85

Downward flows (to young descendants)	17.6
Downward flows (to adult descendants)	9.4
Balanced flows or independence	58.8
Upward flows	7.1
No flows	7.1

Kidul: number of elders 153

Downward flows (to young descendants)	19.0
Downward flows (to adult descendants)	14.4
Balanced flows or independence	34.0
Upward flows	26.8
No flows	5.9

Koto Kayo: number of elders 47

Downward flows	14.9
Balanced flows or independence	19.1
Upward flows	63.8
No flows	2.1

imbalances to be examined in light of the heterogeneity of past and ongoing adaptations. The potential implications of this approach for models of changing dependency, often described as ‘demographic dividends’ (Adioetomo 2006; Ananta *et al.* 2005; Mason & Lee 2004), are then considered by way of conclusion.

Sketching the Macro-picture

The existence of relatively low reproductive levels, particularly in Java and Bali over the course of the twentieth century, has been known for some time. Hirschman and Guest (1990, pp. 142–143) rightly characterized total fertility, just before fertility transition in Java and Bali (4.27), and in Indonesia as a whole (4.59), as ‘moderate’. Such levels are comparable to those countries with low levels in mid-eighteenth-century Europe, for example, Sweden (4.21). Indonesian regions with higher pre-transitional fertility levels such as Sumatra (5.43) are in the range of pre-transitional England and Wales (5.28) (Livi-Bacci 1992, p. 122). The oscillations underlying these relatively moderate levels are visible in Figure 1, in which the pattern of the Indonesian age structure may be characterized as ‘temple-shaped’ rather than pyramidal.

The temple shape may be accounted for as follows. The striking indentation at (a) indicates missing births of the late 1930s and 1940s. A sustained downturn of the economy and society was perpetuated by a sequence of major events: the impact of worldwide recession on the colonial economy followed by the Japanese occupation of 1942–1945, and then the war of independence. Deteriorating health and dietary conditions of the 1930s were compounded by the effects of war: forced labour, steep declines in agricultural yield and population displacements. The indentation at (a) refers to people aged 40 to 54 in 1990 or in other words, those people born between 1936 and 1950. Assuming that the majority of these people were born during their mothers’ principal reproductive years, broadly, ages 18 to 35, then the mothers of these children could themselves have belonged to a wide distribution of five-year birth cohorts between 1900 and 1940.

Although age-specific mortality data do not exist for this period, data from a number of sources can be assembled to give a plausible account of demographic conditions. Retrospective estimates based on the 1973 Fertility-Mortality Survey indicate that levels of child mortality for the 1945–1949 birth cohort were twice as high as for the 1965–1967 birth cohort; village level data in Yogyakarta (Central Java) for the late 1940s are consistent with these figures, giving an infant mortality rate of 271 per 1000 (Hugo *et al.* 1987, p. 118). Levels of divorce, which in the 1940–1949 marriage cohorts reached 20 per cent (Jones 1992; Panel on Indonesia *et al.* 1987), may be seen as a kind of index of social instability, reflecting not only conflicts between spouses, but their separation and disappearance during war-time. Moreover, such disruptions are likely to have stimulated the spread of pathological sterility, since high levels of sexually transmitted diseases were already established amongst Dutch and Indonesian troops, along with the movement of poor rural women to urban areas for prostitution (Van der Sterren *et al.* 1997). Infertility levels in Indonesia were the fifth highest of the countries participating in the World Fertility Survey, with women of cohorts born in the 1920s and 1930s reporting levels of childlessness between 6.8 and 12.6 per cent (Vaessen 1984). It may be noted that total fertility of just over four births per woman, cited

earlier, is comparable to rates in post-war tropical African countries in which pathological sterility and disrupted marriage patterns were also prevalent (Bongaarts *et al.* 1984). There is some likelihood that contraceptive practices, breastfeeding and abortion will also have affected reproductive levels (Boomgaard 2003). Data incompleteness, of course, enjoins caution; the fertility of cohorts born in this era may indeed be over-estimated rather than under-estimated. Adioetomo (2006) provided independent confirmation of the impact of wartime mortality and health conditions as evident in the 1961 Census.

Evidence of the first echo of these factors is visible at (b) (Figure 1), as the reduced birth cohorts of the late 1930s and 1940s reached childbearing age. Historical factors of divorce, mortality and infertility had not disappeared by the 1960s. Hull and Tukiran's (1976) pioneering study, based on the 1971 Census, revealed that between 14 and 23 per cent of Javanese and Balinese women born before 1941 were childless, owing chiefly to sterility and to a lesser extent, the death of all children. Their data are substantially confirmed by later compilations of these generations contained in the 1985 Indonesian Intercensal Survey, the Indonesian Family Life Surveys of 1993 and 1997, and village-level data (see Schröder-Butterfill & Kreager 2005, for a review). The most recent echo of the small birth cohorts of the late 1930s and 1940s is visible in their children, born during the 1970s and 1980s, at (c) (Figure 1). The confounding influence of Western contraceptive methods is also apparent by that time. Levels of total fertility for Java and Bali reached 2.7 in 1991 whilst for Indonesia as a whole, the level reached 3.0. Some provinces like East Java reported levels as low as 2.1 (Kasmiyati & Kantner 1998, p. 1b).

An approximate idea of the potential impact of these oscillations may be gained by mapping changing relative cohort sizes over time. Figure 2 plots the ratio of Indonesian women born 20 years apart, adapting a simple measure of changing generation size proposed by Lutz and Sanderson (2005). For purposes of discussion here, we assume that women have all their daughters at the same time, although Lutz and Sanderson's (2005) 'cohort succession ratios' are for both sexes. The ratios may be taken as approximating the numbers of mothers relative to daughters, analogous to a gross fertility rate. The lack of detailed cohort data over the period in question, however, needs to be kept in mind. In the absence of records on the ages of 'mothers' at birth, it is inevitable that many 'daughters', say, of the 1935–1939 birth cohort, born 20 years after 'mothers', were in fact daughters of other women, i.e. they were born earlier or later than 1915–1919. The exercise is also carried out for East Java—an area long remarked for its lower fertility.

While highly simplified, Figure 2 confirms changes in the relative numbers of young women who could be available to care for older women. We see a steady fall in the number of 'daughters' relative to 'mothers' who were born in the early decades of the twentieth century. Thus, East Javanese women born in about 1917 had slightly fewer than three 'daughters' whereas the number for women born in the 1920s fell to only 1.5. The latter cohorts were having their children in the wartime conditions of the 1940s. The situation then improves slightly, so that the fertility of these 'daughters' moves back towards two, i.e. the birth cohorts born in the late 1950s and 1960s. The patterns illustrated in Figure 2 conform to the experiences of women born in generations subject to problems of infertility and marriage instability outlined earlier. The indented cohorts at (a) in Figure 1 are visible in

Figure 2, in the low fertility of 'mothers' born in the 1920s; despite improving health conditions by the 1960s, the smaller indentation at (b) in Figure 1 is evident in the fertility of close to two 'daughters' per woman for cohorts born in the 1940s. Assuming a normal sex ratio, these data are compatible with the total fertility calculated by Hirschman and Guest (1990), mentioned earlier.

These waves and troughs were not, however, uniform across Indonesia. This can be seen in Figure 3, where changing generational ratios for East Java are now accompanied by those of West Java and West Sumatra.

The trends in the three provinces are broadly similar, although the greater success of West Javanese and West Sumatran women in having two to three daughters on average is clear. The precipitous drop in fertility of women born in the 1920s is a telling index of the impact of war. As we shall see, life-course data from village studies in these provinces confirm the difficulties faced by many women. Cohorts of older people born before 1940, for example, show significant levels of childlessness and as Figure 2 suggests, these levels are the highest in East Java.

Three observations on the preceding sketch of Indonesian age-structural transition can bring this part of the paper to a close. First, the diversity of cohort shifts at provincial levels suggests that mapping wave and trough effects for a country as a whole is likely to disguise important variations. At a national level, we do not get clear answers to the question of *which* population groups are more affected by waves and troughs. Second, the important differences in proximate determinants underlying the troughs at points (a) and (c) in Figure 1 raise some further questions that lie outside the immediate focus of this paper. Broadly, there was a shift from factors that were previously difficult to control in the absence of medical improvements, notably infant mortality and infertility, to the influence of improved maternal and child health, and modern contraception. High levels of spousal separation and divorce, which reflected the conditions of war and economic hardship, also retreated. As pathological sterility, divorce and infant mortality lessened, and means of reproductive control improved, undesired childlessness is likely to have decreased and children may be distributed more equitably amongst couples. Whether there could be better access to children cannot be answered at the level of the cohort without further data on parity and child survival.

However, parity and survival are not the only issues in distribution. The third observation is that the history of child distribution must also be brought into the calculation. Childlessness and low fertility consequent on disruptions of the 1930s and 1940s led to a number of alternative welfare arrangements for childless elders, e.g. adoption, as well as for older people whose children were not available or not helpful. These factors could alleviate a shortage of children in the higher socio-economic strata, but much less so in the lower socio-economic strata (Schröder-Butterfill & Kreager 2005). In the East Javanese community discussed in the later sections of this paper, a lack of children due to demographic factors like infertility and infant mortality affected between 27 and 38 per cent of elders in the lower two strata. When this percentage is adjusted for alternative sources of children, e.g. adoption and remarriage to spouses with children, childlessness lessens somewhat for poor elders at the margins of subsistence from 27 to 22 per cent, while it worsens from 38 to 61 per cent

for the poorest poor on account of non-support by children lost to migration and inter-generational transmission of poverty. In sum, societies with a history of relatively low fertility, absent children and childlessness may develop alternatives to child-support for older people. These alternatives, however, carry adaptive advantages only for some cohort members.

Constructing the Micro-picture

The redistribution of young people as an ordinary part of inter-generational support is an example of the adaptive capacities of family and community networks, which make them a potentially crucial consideration in evaluating the impact of cohort imbalances. Whether institutions like adoption arose in the past because of age-structural change is, of course, a moot point. What is clear is that alternative arrangements bound up in family and community networks may provide people with options when new uncertainties arise. We can, in consequence, restate the issue of age ‘waves’ and ‘squeezes’ as follows. The hypothesis is that the relative impact of cohort imbalances on the current situation of older people is not direct. Rather, it is a function of the capacities of social structures and family systems to adapt and accommodate changing cohort sizes. We need, therefore, to identify what regulates the supply and distribution of younger people on whom older persons can rely, and to whom, in many cases, they continue to make important contributions. Are cohort troughs a primary factor behind the increased risk of a shortage of children, or are they mitigated by other factors?

The data sets arising from ‘Ageing in Indonesia’ enable us to locate members of specific cohorts in the socio-economic strata and network populations making up the communities in which they live. We can then examine: (1) strata by strata the supply of adult children and of other younger cohort members available to elders of different cohort waves, and (2) the patterns of supportive and non-supportive relationships in which elders are bound up. In this way, both the availability of younger people and their reliability, as indicated by current patterns of inter-generational support, can be assessed.

Two possible lines of interpretation then arise. First, if trough effects act directly and independently on the situations of older people, we may expect that differences in socio-economic status will have little or no effect on the supply of children available to them; all socio-economic strata will show more or less the same levels. Given the differences in the scale of trough effects over time, as we have seen in Figures 1–3, these too should be reflected in the availability of local cohort members, regardless of membership in different socio-economic strata. Alternatively, if differentials in the availability of children are the result of circumstances that condition childbearing and survival, such as socio-economic position and network support, then we would expect these circumstances to shape the supply and availability of children. Indeed, these factors could introduce larger or smaller differentials in child availability for particular groups in the population than what is implied by cohort imbalances. Cohort waves and troughs, after all, reflect only some aspects—chiefly age and fertility—of the complex social processes that determine how many and which children are involved in generational exchanges.

Socio-economic Strata

The development of a reliable social and economic stratification framework for Indonesia is an outstanding problem of considerable importance. The diversity of Indonesian society, coupled with its uneven economic development, make units of comparison difficult to establish.² Anthropological and historical evidence has, for some time, revealed wide and widening economic cleavages. Scholars agree that while local social relations have a strongly hierarchical character, an explicit class structure or class-consciousness is lacking. Differences in wealth and status are widely recognized at the local level whilst at the same time, strenuously played down. Anthropologists, for a time, were able to deal with more strictly economic differences, at least in rural areas, by grouping villagers into asset classes based chiefly on holdings of quality rice land (Hart 1986; Hüsken 1989; Penny & Singarimbun 1973; Wolf 1992). As the rural population and economy have become increasingly bound up in economic development, however, this approach is now insufficient.

'Ageing in Indonesia' approached this problem by undertaking a longitudinal analysis of three rural communities, employing a methodology that combines ethnography, panel surveys, life-course and network analysis. The communities—Kidul in East Java, Citengah in West Java and Koto Kayo in West Sumatra—were selected for characteristics that make them reasonably typical of the major Javanese, Sundanese and Minangkabau ethnic groups to which they belong. Each retains a traditional agricultural base that has gradually been subsumed into a mixed economy now mostly reliant on employment opportunities and commercial markets of regional urban centres. The communities are actively engaged in the migration patterns and market penetration of rural areas that are basic to Indonesian economic development. They are located in provinces in which proportions over the age of 60 are projected to be between 10 and 16 per cent by 2020 (Ananta *et al.* 1997); in 2000, proportions over the age of 60 in the respective communities were 10.6, 7.3 and 18 per cent, reflecting the impact of migration of younger cohorts on local age structures. These provinces are, of course, the ones used to illustrate changing generational ratios in Figures 2 and 3.

Ethnography and life history analysis enabled the mapping of kin networks and exchanges within them over time. Semi-structured interviews were carried out with between 80 and 97 per cent of older people in each village. Repeat in-depth interviews were conducted with between 20 and 60 informants per village, complemented in almost all cases by in-depth interviews with one or more other adult family members. Two surveys—one addressed to household economy and the other to health—were carried out in 2000 and 2005 on a random sample of 50 households with elderly members and 50 households without elderly members. Comparison of data arising from surveys, in-depth interviewing and observation of village life enables detailed cross-checking of data accuracy.

An important consideration in Indonesian society is that social and economic differences are not characterized by an agreed vocabulary of class distinctions. Strata may be identified, however, by aligning economic differences revealed in the surveys with local terms of reference that people use in conversations and in-depth interviews to describe their own and others' relative social positions. Four distinctions recur in everyday speech: wealthy (*orang kaya*), comfortable (*lumayan*), getting by (*cukup-cukupan*) and dependent on charity

(*kurang mampu*). A more detailed account of how strata were constructed is given in Kreager (2006, pp. 8–9.) Implications for older cohorts of socio-economic stratification in the three communities may be seen in Table 1.

For the purposes of this analysis, the four strata are simplified into two groups, ‘upper’ and ‘lower’, although we shall note later some principal features of the most vulnerable stratum. Table 1 transmits the cohort patterns shown in Figures 1–3 to the village level. The lower half of the table describes child availability to elders born in 1930 or earlier, and corresponds broadly to the childbearing outcomes of parents who were experiencing their reproductive years during the wartime disruptions of the 1940s and early 1950s. The children born belong to the indented cohorts (a) in Figure 1. The upper half of Table 1 describes children available to elders aged 60–70, i.e. elders born in the years 1930 to 1940 and having their babies in the 1950s and later [cf. indentation (b) in Figure 1]. We will consider the averages given in Table 1 first, in relation to the more general situation of cohort imbalance described in Figures 1–3, before turning to the implications of socio-economic strata for elders in poorer parts of the communities.

Average numbers of surviving children show much variation. The lower strata in Kidul have surviving children at levels near or below replacement level. While the upper strata have succeeded in having three to four children, these figures are nonetheless below the estimated Java/Bali TFR of 4.27 cited earlier (Hirschman & Guest 1990). The overall average number of surviving children, taking the two cohorts in Table 1 together, is 2.73. This is, in effect, a full child and a half lower than the estimated fertility of the pre-war and wartime era. The lesser fertility of cohorts illustrated at the regional and national levels in Figures 1 and 2 is thus plainly visible, yet the full range of differentials in child availability within the community—between a high of 3.98 and a low of 1.98—is even greater. More is at issue here than pure cohort effects. The corresponding averages for the West Javanese (4.4) and West Sumatran (4.7) communities are closer to the pre-transitional total fertility rates (TFRs) cited earlier for these provinces (4.27 and 5.43, respectively), although Koto Kayo in West Sumatra is relatively lower and Citengah in West Java is slightly higher. Again, the average child availability in both cohorts is noticeably lesser for the lower strata in these communities, although the range of variation is not as great as in Kidul. The poorer strata over the whole period in these two communities had, on average, about one available child less than the better-off. Yet, the level they have achieved, i.e. three to four children, is as good as that of the better-off strata in Kidul. In short, the wider picture of cohorts with fewer children, whilst confirmed at the village level, disguises variation that is likely to carry major advantages and disadvantages for different groups of older people in these communities.

Without question, the percentage of older people with one or no surviving child in Table 1 reveals significant imbalances in the supply of children in the three communities. With the exception of the lower strata in Kidul (East Java), however, the majority of elders had three or more children in all cases. The imbalance is visible mostly in the lower strata. In the 60–70-year-old age group, levels of zero or one child in the lower strata characterize between 13 and 53 per cent of older people. If cohort effects were the only issue, we would expect Table 1 to show a greater depletion of children amongst the over-seventies, since they had their children in the 1930s and 1940s when, according to Figure 2, relatively less childbearing

occurred in East Java as a whole. However, contrary to Figure 2, and to the greater size of Indonesian cohort troughs as shown in Figure 1, the range is somewhat less (6.7 to 43.7 per cent). The imbalance of available children for the over-seventies is once again more pronounced in the lower strata, especially in East Java. The issue is thus not one of an absolute shortfall across all strata, as would be expected in a pure cohort trough effect, but rather an imbalance in how children are distributed by socio-economic strata.³

The several factors that account for this pronounced shortfall of children in the lower strata of both cohorts are discussed elsewhere (Indrizal 2004; Kreager 2004, 2006; Kreager & Schröder-Butterfill 2007; Schröder-Butterfill 2004, 2005; Schröder-Butterfill & Kreager 2005), and can be summarized briefly. In all three communities, the situation of poor people in later life is an accumulative outcome of events over their life-course. Some were poor to begin with whilst others experienced economic misfortunes. These liabilities increased their health risks over the long term via limited access to health care, intensive manual labour, and higher risks of deaths to infants, children and spouses. One consequence of these risks, which serves to compound them, is smaller family network size. Having fewer or no children reduces opportunities to build networks in the community via links to other people, usually established in the course of the marriage, employment and life-course rituals of one's children. Inter-generational transmission of poverty is one likely consequence. Parents who have relatively fewer resources to assist their children experience greater risk, both of having contact with their children cease when these children leave the community, and of having children who may remain in the community but who will have few resources to help them late in life. Small networks are also usually coupled with a narrower range of respect within the community. In contrast, those with greater material resources and more children are much better placed to cope with the likelihood that some children will turn out to be unreliable or cease contact. Even if childless, they can use their wealth to secure adopted children or marry spouses with children. From the children's point of view, modestly larger networks enable eventual demands of the older generation to be shared, with greater allowance for competing demands.

It is with respect to such alternative sources of access to the younger generation that the distinction between the lowest two socio-economic strata and those higher up on the socio-economic scale becomes particularly telling. In the East Javanese community, which experienced the highest overall levels of childlessness, the percentage of persons over age 60 without children falls to 16.7 per cent when successful adoption and other alternative routes to children are taken into account. The comparable figure for the third stratum (*cukup-cukupan*) is 22.2 per cent of elders—an improvement of some 10 per cent over the figures for either age group cited in Table 1. However, the figure for the poorest poor (*kurang mampu*) rises to 61.1 per cent, reflecting a considerable lack of access to possible child support in consequence of migration and other factors. For some parts of the community, therefore, limited access to children is much greater than the cohort troughs charted in Figures 2 and 3 would suggest.

To summarize, the supply of children in the three communities is not effected primarily by raw cohort imbalances. Older people's access to young people hinges on their relative success in building a responsive network over the life-course, which contributes in turn to

whether they sustain, improve or lose their social status. The advantages provided by links between individuals, families and friends effectively intervene in raw cohort imbalances, so that the local supply and demand of young people is not proportionate to the shortfalls implied by the macro-picture. In other words, analysis confined to cohort relations may mix up sub-populations as defined by strata and network memberships; it treats all individuals as similar when their membership in different sub-populations gives them widely differing characteristics. Once we distinguish between the sub-populations to which they belong, however, we begin to get a clear idea of this intervention. Data on two elements are essential to assessing the extent to which social structural and network factors mitigate age-structural affects. They are: (1) parity, including alternative routes to acquiring children and allowance for several forms of child loss; and (2) network size and composition. The three Indonesian communities indicate that relative shortfalls of available young people are an aspect of relative social position and related network behaviour. Members of the poorer strata are more vulnerable to losing contact with children who migrate, and are less successful in building alternative networks, for example, via adoption.

Wealth Flows

Having demonstrated the impact of stratification and outlined the network factors that underpin older people's security, we turn now to the question on the reliability of children. Whatever fiscal and sectoral policies may best enable the economy to capitalize on demographic 'dividends' (Pool 2007), the values and practices that sustain or erode intergenerational exchanges mean that family and community networks will remain in the front line of support. Sizable cohorts of children may be of little importance even in the better-off strata if few of them are prepared to engage with their elders. Successive waves of relatively small cohorts may experience no disadvantage in consequence of having fewer children if these children, or adoptees, actively support older family members. From an elder's perspective, the 'dividends' that arise from inter-generational relationships depend not merely on the number of potential ties, but on the quality of at least some of them.

A striking feature of all three communities is that most adult children remain involved in their parents' support networks, despite the fact that a high proportion of these children, i.e. between 45 and 75 per cent (Kreager 2006, p. 46), live away from the communities. People commonly remark on the impact of migration on their lives, but there is no evidence that older people in these communities, or their children, see themselves as belonging to proportionately small generations. They are much more concerned with the practicalities of sustaining family ties. The roles and relationships of parents and adult children are subject, of course, to change, and at any given point, there will be some children in a given network who contribute very little. In the three Indonesian communities, continuing contact, if only an annual visit on a key date in the Muslim religious calendar, remains important, and not simply as a matter of solidarity. Life-course analysis of networks shows that when an elderly crisis emerges, or when there are pressing demands on some children's time or capacities, those who have not taken a major role hitherto then take on new and instrumental roles (Kreager & Schröder-Butterfill 2007; Schröder-Butterfill 2005). In other words, one of the prime characteristics of family networks in these communities is their changeability and hence, the diversity of potential support relationships they make possible.⁴

As discussed elsewhere (Kreager & Schröder-Butterfill 2008), the mutability of networks means that the conventional demographic approach to net wealth flows, in which they are contrasted for entire communities as either 'up' from children to parents or 'down' from parents to children, is insufficient. Survey data from both the 2000 and 2005 rounds in the three Indonesian communities show that both upward and downward flows characterize different sub-populations present in a given community at any point in time. There are, in addition, groups engaged in balanced flows (reciprocity), and a residual group not engaged in inter-generational exchanges. This diversity is very important to evaluating the potential importance of cohort imbalances. Family networks provide mechanisms which make it possible for members of younger and older generations to vary the directionality and level of flows in response to the changing composition and availability of members, and their evolving resources and abilities.

Figures 4–6 indicate prevailing differences in wealth flows between elderly parents and their children and grandchildren in the three communities, by showing the relative distribution of elderly respondents by support flow type. Only elders with children, including adoptees where appropriate, are included. Elderly people are classed as providing more inter-generational support than they receive, i.e. downward flows, receiving more inter-generational support than they provide, i.e. upward flows, or engaging in balanced or no exchanges. As Figures 4–6 show, striking differences are evident between the communities.⁵ We shall first outline briefly the several co-extant flows of support in the three communities, following which we will illustrate the importance of differentiating flows by strata with reference to the East Javanese site.

The matrilineal Minangkabau (Figure 4) come closest to the common stereotype of elderly people being dependent on support from the younger generation. Almost two-thirds of the older Minangkabau are net recipients of support from their children and grandchildren. This support, most commonly in the form of remittances from children, grandchildren, nephews and nieces who are on labour migration, is often additional to the income the older people derive from the rice lands they control. Only 15 per cent of elders are net providers of inter-generational support, commonly in the form of assistance to single adult children who are still residing at home or who are in the process of establishing themselves on labour migration.

In West Java (Figure 5), balanced flows, or situations of inter-generational independence, predominate (58 per cent). This pattern fits the high degree of residential independence among older Sundanese people, and the fact that most elders who live with a child nonetheless have income from work, small pensions or agricultural land, permitting them economic independence. More than a quarter of the older people are net providers of support for their children or grandchildren. The community possesses the considerable advantage of large amounts of quality rice land, which remains in the hands of community members. This enables many more children to remain in gainful local employment, either via inheritance or, for the poorer strata, by steady work on the lands of others. Those who leave the community, chiefly to work in neighbouring urban centres, may be supported financially by their parents in making the move and hence, contribute to the balanced/independent flows indicated in Figure 5. Departing poorer members of the community, however, are more likely to engage

in transmigration schemes to distant locations; they are much more likely to be lost to elders' networks, in which case the evidence of 'no flows' becomes a marker of these elders' economic and social disadvantage.

The most heterogeneous picture emerges in the East Javanese community (Figure 6). As many as a third of the older parents are net providers of inter-generational support within their family networks. Almost half of these involve support flows to adult children or grandchildren, i.e. to individuals whom one would expect to be independent or even to be providing support to elderly parents or grandparents. A further one in three elders is in an arrangement in which the generations are mutually inter-dependent on or independent of each other. This includes cases where the generations engage merely in occasional exchanges of gifts or services, and cases of intense but roughly balanced flows. A quarter of the elders are net recipients of support from their children or grandchildren. This embraces older people who are physically dependent, as well as those who have no income and are unable to offset their material dependence by offering services in exchange. Finally, a small group of older parents, making up six per cent, are neither giving nor receiving any inter-generational support; they are arguably the most vulnerable older people in Kidul.

The East Javanese community illustrates how differing inter-generational flows map well onto the four socio-economic strata outlined earlier. Arrangements where net flows of support are downward are dominated by well-off older people; being rich (*kaya*) continues to entail responsibilities for children and grandchildren. That said, 10 per cent of the downward arrangements involved very poor (*kurang mampu*) households and 26 per cent involved households who were merely getting by (*cukup cukupan*); there are likely to be deleterious welfare consequences for the older people in these households (Schröder-Butterfill 2004). In addition, four per cent of the elderly households did not engage in any exchanges at all, marking them as a most vulnerable group without reliable kin to turn to. Older parents who depend on upward flows of inter-generational support tend to be in households that are just getting by. These parents' inability to make material contributions reinforces their families' relative poverty, so that flows in either direction are very modest. A third of the elders receiving upward flows were themselves rich or comfortably off. The predominance of comfortably off older people (*lumayan*) in arrangements where flows of support are balanced is not surprising; these parents are wealthy enough to be independent but not so rich as to attract many dependants. Where they reside with their children, their households tend to benefit from multiple incomes or cooperation between the generations.

Taken together, Figures 4–6 demonstrate a remarkable flexibility and potential for variation in inter-generational support. Family networks provide a mechanism in most socio-economic strata that enable younger and older generations to vary flows to cope with changing needs and availability of network members. Thus, the second round of the surveys, conducted in 2005, revealed shifts in all three communities toward upward flows to those oldest members whose labour and other contributions had diminished with their increasing frailty during the intervening five years (Kreager & Schröder-Butterfill 2008).

Conclusion

As Pool *et al.* (2005, p. 9) remarked, the analysis of age-structural transitions requires close study of 'the connection between age waves and social change in families, households, and at higher levels of aggregation'. To this end, this paper has examined both macro- and micro-evidence of the presence and impact of age-structural imbalances potentially affecting the lives of current Indonesian elderly. The main finding is that an analysis of age-structural transition confined to cohorts as principal units of description and analysis gives insufficient attention to other constituent units of the population critical to generational and wider social change. In the communities analysed, socio-economic strata and networks of inter-generational support define sub-populations that have capacities to over-ride cohort effects. Members of younger generations are not uniformly distributed across socio-economic strata, and members of the higher strata tend to have larger and more effective networks. The flexibility of networks enables children to share support roles over time, and in the higher strata, children are likely to have more siblings and access to more resources. Elders in the higher strata have more resources to contribute to networks, which in turn strengthens their position. In short, differences in cohort size in themselves cannot give an adequate account of potential inter-generational risks since they do not thoroughly account for the distribution of children, or for the complexity of factors that make children able and willing to provide support. Wave effects, though evident at the macro-level for Indonesia, are not mirrored at the local level once these compositional effects are taken into account. Macro- and micro-level phenomena are not homologous, and it is difficult to see how actual impacts of age-structural transition can be established if the assumption of homology remains untested.

A comparative study of three communities cannot, of course, provide a decisive test of the impact of age-structural imbalances in Indonesia as a whole. Differences in socioeconomic stratification and family networks of the kind found in these communities, however, are characteristic of Indonesia's major Javanese, Sundanese and Minangkabau ethnicities, and the need to track their impact on the process of age-structural transitions emerges as a potentially important variable in the coming years. As Ananta *et al.* (2005) and Adioetomo (2006) noted, Indonesia is entering its demographic 'window of opportunity', the approximately 30-year period in which a relative preponderance of younger cohorts provides a chance for investment in human and other capital infrastructure. What, then, are the likely implications of the current disjunction between the macro- and micro-pictures of Indonesian age-structural transition traced in this paper for this window?

On the positive side, the active involvement of most children in family networks, and the customary institutions that enable access to adoptees and other younger kin, may help to overcome problems of support for those elders with few or no children. The fact that flows draw on reliable support, both from children living close by and away from the elder's community, shows that the involvement of young people in the wider economy can help to give elders and their communities access to development. As the child cohort sizes considered in this study are, for historical reasons, smaller than those that follow, there may also be grounds for optimism in the fact that those reaching later life in the coming three decades may have more network possibilities than those born between 1936 and 1950. Post-war health improvements mean that poor elders are much less likely to have lost children to

infant and child mortality. On the negative side, however, we have seen that some 10 to 26 per cent of elders' households in the two lower strata of the East Javanese community give net support to younger cohorts, and many more are engaged in balanced flows. The inter-generational transmission of poverty that characterizes the lower strata in the three communities, the continuing support that even poor elderly give to adult children, and the propensity of the poor to have smaller networks and fewer children on which to rely, all indicate the sub-population to which policy efforts need to be directed if demographic 'dividends' are to be accessible to all.

Further positive outcomes are methodological. First, our data provide strong support for an emphasis on compositional demography such as that put forward in recent writings on age-structural transition, but call for greater refinement of the population units to which it is applied. Second, they provide an encouraging counter-evidence to doubts over whether impacts of cohort shifts can really be assessed. The need to test models against evidence is basic science, but this is inevitably complicated where data are needed at several levels of analysis. Mason and Lee (2004), for example, in their account of Indonesia's 'dividend', remarked that 'a full accounting of the effects of fertility [transition] is a complex and elusive goal ... the empirical methodology for estimating the full effects is far from obvious. Feedbacks, long-term effects, and direction of causation all enter the picture, as do institutional practices' (p. 4). Obviously, our findings address only some of the causal factors and institutional feedbacks at issue, and only for a brief interval. Nonetheless, it is clear that empirical data on institutions, feedbacks and causation are realizable and of crucial importance. The issue of whether demographic 'dividends' can be realized depends at least in part on how and whether family networks and hierarchical relations in communities enable the relatively large cohorts of young adults available during the 'window of opportunity' to be utilized effectively (UNFPA 2008). The apparently 'elusive' nature of impacts to which Mason and Lee (2004) refer can be overcome by a methodology in which cohort shifts are integrated into other compositional adjustments.

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FIGURE 1.

Population of Indonesia in 1990, based on ex-post projection.

Source: Birg *et al.* (1998, p. 54).

Note: This figure is a historical projection based on simulations developed by the Bielefeld University Indonesian Population Research Project, 1995–1997. Published sources like the Indonesian Statistical Bureau (Biro Pusat Statistik 1992), United Nations (1994, p. 42) and World Bank (1994, p. 270) disagree on whether the population pyramid for Indonesia in 1990 was being undercut at the base. The problem is complicated by the fact that no Indonesian census was held between 1930 and 1961. Additionally, the census of 1930 did not collect age data, but merely grouped the population into three broad age groups. The starting point for the projection was a stable population age structure (cf. McNicoll & Singarimbun 1983, p. 21). Estimates of fertility and mortality over the period 1930 to 1990 (Hugo *et al.* 1987, p. 117; United Nations 1994, p. 676) were then applied to this structure. For details, see Brüß and Schröder (1997).

FIGURE 2.

Generational ratios: 'daughters' to 'mothers', 20-year generation spans.

Data: Ananta *et al.* (1995); United States Census Bureau (2000). We have found that United Nations (1994) estimates give similar results.

FIGURE 3.

Generational ratios: 'daughters' to 'mothers', 20-year generation spans.

Data: Ananta *et al.* (1995); Biro Pusat Statistik (1997).

FIGURE 4.
Distribution of net inter-generational support flow types among elderly people in Koto Kayo, West Sumatra.
Data: Survey and in-depth interviews, 1999–2000.

FIGURE 5.

Distribution of net inter-generational support flow types among elderly people in Citengah, West Java.

Data: Survey and in-depth interviews, 1999–2000.

FIGURE 6.

Distribution of net inter-generational support flow types among elderly people in Kidul, East Java.

Data: Survey and in-depth interviews, 1999–2000.

TABLE 1

Availability of surviving children by upper and lower socio-economic grouping of older persons in three communities of Indonesia (percentages).

Age	Kidul, East Java		Citengah, West Java		Koto Kayo, West Sumatra		
	Upper	Lower	Upper	Lower	Upper	Lower	
< 70	No children	14.6	31.0	0	6.5	7.4	15.4
	One child	12.5	22.4	0	6.5	3.7	23.1
	Two children	4.2	10.3	0	19.4	11.1	0
	Three or more	68.8	36.2	100	67.7	77.8	61.5
	Number of elders	48	58	19	31	27	13
	Average number of children per elder	3.98	2.29	5.53	3.68	4.37	3.69
70+	No children	22.4	33.3	9.5	12.5	3.9	6.7
	One child	16.3	10.4	0	6.3	0	0
	Two children	6.1	20.8	0	0	15.4	20.0
	Three or more	55.1	35.4	90.5	81.3	80.8	73.3
	Number of elders	49	48	21	16	26	15
	Average number of children per elder	2.96	1.98	4.81	3.94	5.46	4.20

Data: Semi-structured interviews, 1999–2000.