Modelling Variation in Reproduction:
Some Results from a Longitudinal Anthropological Demography of Three Indonesian Communities

Philip Kreager, Elisabeth Schröder-Butterfill,
Tengku Syawila Fithry, Vita Priantina Dewi,
and Dyah Rahayuningtyas

Abstract

The enduring heterogeneity of modern fertility poses a challenge to demographic modelling, as it requires study of variation within and between the many sub-populations that make up society. It also requires constituent groups being conceptualised as existing at different levels of social organisation (e.g. socio-economic strata, ethnicities, labour force sectors, kin and family networks), and specification of relationships and overlaps between these sub-populations. The network processes that build population and social structures compound the difficulty because, in their normal functioning, they are not closed population units of the kind that formal quantitative analysis normally employs. A different compositional demography is required. Data arising from a longitudinal, multi-site study of Indonesian communities provides an opportunity to explore how models of fertility variation over time may be constructed. The open and shifting character of local networks is described in terms of three overlapping types of kindred. Ethnography and randomised sample surveys together enable a model of socio-economic levels to be constructed and interpreted that takes account of network flexibility. Uses of the model include identification of conceptual and substantive deficiencies in a number of conventional demographic measures and models. Evidence of differences between networks and between levels show the continuing diversity of Indonesia's fertility transition, and the need to question the anticipated continuation of declines.

Modelling Variation in Reproduction:
Some Results from a Longitudinal Anthropological Demography of Three Indonesian Communities

Philip Kreager, Elisabeth Schröder-Butterfill,
Tengku Syawila Fithry, Vita Priantina Dewi,
and Dyah Rahayuningtyas

Arguably the most fundamental achievement of historical and contemporary demographic research in the later 20th and early 21st century has been to document the enduring heterogeneity of modern population trends, particularly the diversity of secular declines known as 'demographic transitions'. Contra the assumptions of the immediate post-war era, not only have the timing, tempo, and quantum of declines been shown to vary radically, but the range of historical variation in levels of fertility and mortality before transition, and the continuing diversity of fertility post-transition, have all been admirably demonstrated. This variation is visible in the most widely discussed macro-units of analysis, usually whole countries. National pictures, moreover, have been shown to be composed of heterogeneous declines amongst provinces, socio-economic strata, and local groups of different kinds.[1] Variations are not confined to trends in 'dependent' variables of fertility and mortality. Reductive models of economic development and modernisation were expected by early post-war demographers to provide the basis for a general theory of contemporary demographic change applicable in all places. Regular statistical correlations 'explaining' fertility and mortality declines in terms of a limited set of standardised 'independent' socio-economic variables were supposed to be readily forthcoming from analysis of national statistical sources and survey samples. The diversity of declines at so many levels, however, has inevitably undermined such confidence. There is no longer a single pattern to be explained. Not surprisingly, grand syntheses in which consistent correlations between demographic, economic, and social trends establish demographic transition theory as a universal at national and provincial levels have given way to thoughtful summaries of heterogeneity and the several approaches to it (e.g. Lee and Reher, 2011). That 'development' might bring an increase in inequalities, with consequently differing reproductive adjustments amongst sub-populations, has yet to become a principal object of theory.[2] Experience has nonetheless shown that macro-level trends are

composites made up of many local and regional patterns. Observation and analysis will need to be directed to the sub-populations from which these patterns have emerged if this complex compositional demography is to be explained.

Demography's remarkable achievement in demonstrating heterogeneity, however, has led to a seeming theoretical impasse. One horn of the dilemma is empirical: there appear to be a great many sub-populations that may be important, and they are likely to be related to each other in different ways. How best to identify and characterise them? The other horn of the dilemma, in consequence, is methodological. The sub-populations in which changes are occurring often do not coincide with the standardised units of population (households, cohorts, provinces, nations, etc.) that administrative data, censuses, and surveys employ, and on which most measurement and modelling rely. Standard data units, after all, reflect the purposes of prior eras of national administrative development more than those of scientific inquiry. The sub-populations in which people participate include, for example: family, kin and community networks, generations, language groups, class structures, migration networks, religious affiliations, social hierarchies, labour sectors, ethnic minorities, regional cultures, and local and national government patronage networks. The issue is not only that reliance on household units compiled according to administrative boundaries does not capture many groups. Memberships interact, people belong simultaneously to several sub-populations, and their participation in them changes over time. This dynamism needs attention, as influences on fertility are well known to reflect the way that class, religious and other memberships, together influence family life. As historians and anthropologists have long argued, the influence of these many groups cannot be treated as if all of them are on par: they exist at differing levels of social organisation and have different power relations. The usual methodological convention that reduces all populations to two levels, 'macro' and 'micro' is too crude. Nor is imagining a single, intermediate 'meso-level' adequate, as different societies and economies give rise to varying configurations of the several meso-level sub-populations, just listed. Specifying *which* sub-populations and *which* relationships underpin population changes is thus essential if the differential influence of social structures and inequalities on fertility is to be documented and compared.

The nub of the methodological dilemma is that constituent groups in society, *as populations*, differ in critical respects from the units that conventional quantitative data sources on their own provide. The latter are formally bounded because this is essential to precise quantitative

description and comparative analysis. But human populations, as social aggregates in their normal functioning, are not formally *closed* or discrete. This was recognised, at least implicitly, in some early revisions of the transition: amongst the processes that shape fertility are those involving flows of information and practices, sometimes called 'diffusion', within and between groups (e.g. Watkins, 1987). As social demographers gradually developed this perspective, they have focussed increasingly on documenting the nature of such flows as network phenomena (e.g. Kohler et al. 2015). However, networks, in marked contrast to the closed aggregates employed in census and survey classifications, are *open* population memberships. An individual commonly belongs to, and is able to draw on, different networks over time as they open up differing opportunities, including possible engagement in yet further networks. Such memberships overlap to a greater or lesser degree, and the ability to participate in multiple networks, and to vary participation, is often crucial to how individuals and groups adapt to changing circumstances, giving them a flexibility that can be essential to wider social change. [3] The compositions, relations between memberships, and the size and structure of such groups, are all demographic phenomena likely to change repeatedly across the life course as members adapt their needs and opportunities. Surveys, even in panel format, do not track multiple network memberships and the changing relationships between them, for the simple reason that surveys rely on random samples, but memberships are not random.

Thus, while the information flows that diffusion theorists have emphasised are obviously important to people's adaptations, communications are only part of relations between such members and between groups because networks reflect relations of power and influence in society. Networks, in other words, while integral to understanding how and why structural changes occur in society, take place in the context of extant structural differences. We may view changing networks and relations between them as building blocks of a social structure, as they have real and potential capacities to alter such structures. Arguably the central issue in understanding how societies continually generate demographic heterogeneity is to find a way to model the fluidity of network relations and relate these models to the closed units and models that demography customarily produces at provincial and national levels. At present, however, there is no consensus in demography comparable to other fields of population research as to how these building blocks, and the way they combine at different levels to make up social structures, should be defined in regular ways for comparative and modelling purposes.[4]

The subject of this special issue – understanding and modelling the social space of fertility differentials – entails several tasks, well described by the editors. One, as just remarked, is the

critical exercise of deconstructing the standardised units employed in conventional data sources. To gain traction any such critique must give rise to more realistic population units and compositions, thus making new interpretations possible. The view taken here is that this rethinking involves three methodological steps. The first is combined qualitative and quantitative ethnography of the building blocks, i.e. of local network sub-populations. An advantage of in-depth local research is that a complete mapping of a community's households becomes possible, providing the basis for rigorous, stratified sampling. This is carried out in a number of communities, chosen to reflect variation in ongoing social and economic changes in wider society. The second step is to develop sampling and survey design informed by the more detailed knowledge of local languages and mores gained ethnographically to devise local surveys which provide data on a community as a whole. This provides a systematic test of ethnographic hypotheses and their revision as necessary. The third step, then, is triangulation. As will be noted in later sections of this paper, ethnography produces several datasets, both qualitative and quantitative. Just as a local survey tests the ethnography, the much greater variation evident in the ethnography – notably life course data -- provides insight that informs interpretation of survey findings. Repeated ethnography and survey at later points in time then make this whole structure longitudinal.[5]

The outcome of this methodology is not only to show how socio-economic levels can be differentiated empirically and modelled from the bottom-up.[6] A second outcome is, at least in outline, a potentially different theory of what shapes reproduction. In contrast to the rational choice approaches which the editors have critically remarked -- in which reproductive choice is viewed as 'decision-making' addressed to whether or when to procreate -- the nature of actors' agency is geared to the composition and structure of sub-populations in which they participate. Take, for example, a person who participates in a number networks, variously of kin, affines, labour sectors, or religious affiliations. That person's ability to draw on the resources of one or several of these memberships depends on his or her positions in them, which define the wherewithal available to the person for a purpose like childbearing (in addition, of course, to the person's own abilities). Decisions regarding childbearing and rearing entail a number of alternative courses of action or support that are opened or closed by resources made (or not made) available by the several local and meso-level sub-populations that compose social structures. Familiar examples include whether kin or labour networks secure a partner's job; whether migration limits possible network sources of childcare assistance; or whether membership in religious or other organisations provides educational and other services.

Such decisions are not isolable as 'decisions' pro or contra bearing a child, as they are often the *fait accompli* of other courses of action (preserving social status, career choices, marriage, housing, etc.). There are many feedbacks between having or not having children and the wherewithal, opportunities and constraints of these memberships. Alternative courses of action, in other words, are adaptive properties of networks and the social structures they build -- rather than merely idealised individual rationalities or market choices. Their variation can be explored as part of the processes that continue to make groups differ, or may create new sub-populations.

The following pages illustrate this bottom-up approach and its implications, drawing on a multi-site, longitudinal study of three Indonesian communities, which is now in process of restudy at the twenty year interval.[7] We begin with a brief resumé of the communities and how this methodology has been employed. Principal constituent sub-populations emerge gradually from observation and documentation of network dynamics. The methodology and its findings readily assist identifying limitations of some common demographic models, and in the fourth section of this paper, three are briefly noted: childlessness and low fertility; inter-generational support relationships; and age-structural transitions. The reproductive spaces of the three communities are then illustrated in a quantitative summary of fertility patterns and differences between age groups and socio-economic levels, focusing on two of the Indonesian communities. Four case studies illustrate the longitudinal ethnographic picture of the levels, age groups, and networks. Reproductive variations across the life course of groups are related to resource options that sub-population memberships in different levels and networks make available. The case studies are supplemented by data recently collected as part of the ongoing research. A more complete quantitative analysis of the communities for the whole twenty year period is, however, not possible at this stage, as the current restudy is in its early phase.

1. Research Setting

Beginning in April 1999, a joint Indonesian and British research team has studied the populations of three communities: Kidul in East Java, Koto Kayo in West Sumatra., and Witan in West Java.[8] The family systems in the two communities on Java are characterised by normative nuclear/bilateral patterns, whilst the Minangkabau population of Koto Kayo is traditionally extended/matrilineal. Each community is characterized by a mixed economy,

drawing on income from migrants, from employment in local government, and from services and small-scale manufacturing, while also retaining the traditional economic base in agriculture and local markets. The communities are thus all, but in different ways, participating actively in Indonesia's rapidly expanding economy.[9] Of the three, Witan has remained closest to the much older historical pattern in which wealth, status and inter-generational relations are grounded in rich agricultural resources, notably premium rice land *(sawah)*. Koto Kayo likewise draws on historical precedent, in its case *sawah* plus a migrant diaspora established by the early 20th century which brings considerable status and a continuous stream of wealth into the community. Family networks in Kidul have neither copious *sawah* nor long established diaspora links, relying instead on varying combinations of a mixed economy. Proportions of older respondents' adult children reported in 2000 as no longer resident in the community (46, 75 and 45 per cent, respectively) give some idea of the active engagement of family networks in regional, national and international economies. All communities are predominantly Muslim. Languages spoken in the home are respectively Javanese, Sundanese, and Minangkabau, although the national language, Bahasa Indonesia, has become increasingly prevalent. Interviews were conducted in more than one language in each site.

A combined methodology, beginning with a year's ethnographic fieldwork, and continued site visits, enabled compilation and analysis of people's life histories and mapping of kin networks and exchanges over time. Semi-structured interviewing achieved substantial coverage of the population aged 60 or over (the principal focus of the early phase of research), between 80 and 97 percent in the respective communities. Repeated in-depth interviews were conducted with between 20 and 60 older people, complemented by in-depth interviews with one or more other adult network members in most cases. Focussing on older cohorts has proven particularly helpful as their life courses entail the history of family vital events and their community networks. Fieldwork makes possible observation of local events and processes, facilitating familiarity with the problems and adjustments normal to changing circumstances that make up much of people's daily lives. During fieldwork a comprehensive mapping of households in the communities was completed and updated, enabling two rounds of randomised surveys of health, household economy, and inter-household exchanges in each of the three communities. Stratified sub-samples of households with and without elderly were included. Many important sets of relationships are opened up by this combined qualitative and quantitative database, revealing differences in social and economic status within and between networks and generations, which shape economic support, reproduction, and elderly

care. Surveys, in-depth case study, and observational data have additionally allowed support from absent network members to be included in analysis.

2. Methodology *in situ*

A number of observations can be made about this research strategy as a basis for understanding the social space of reproduction, and in contrast to conventional demographic approaches. First, the constituent groups making up communities, and the units of comparison for analysing them, are not decided in advance. Which sub-populations are fundamental to a given person's resources and behaviour is an open question. We began, following demographic custom, by focussing on households and talking to their members. The Javanese social norm is for households to be based on nuclear families; the Minangkabau prefer extended families with three generations. However, there is much variation, and household compositions are in constant flux. This reflects the passage of property and support between generations, both upwards and downwards across the life course, and in response to changing needs: education, setting up small businesses, division of labour, marriage, divorce, and migration (Kreager and Schröder-Butterfill, 2008). For practical reasons, it is simply not possible for most families to observe preferred arrangements all, or even some, of the time (Schröder-Butterfill, 2005; Schröder-Butterfill and Syawila Fithry, 2012). Rather than devising a classification of the resulting arrangements as a static set of household types, it became clear that a more realistic picture would take kin networks as basic units, viewing households as nested within them and tracking changing events and compositions over time.

We found that important networks were usually kindreds, as both kin and affines, and sometimes neighbours, were involved (Kreager, 2006). Three kindred types were readily distinguishable: a total range of recognised kin (the 'abstract kindred', from a family elder's perspective); a more limited range of kin ('proximate kindred') defined by material support exchanged across the elder's life course; and, finally, the small group of kin and neighbours providing significant support or care at the time ('immediate kindred'). Proximate networks evolved as generations aged, since different sets of members of the abstract kindred become relevant as time goes on. The open character of network sub-populations is ever apparent. For instance, support needed in early adulthood (e.g. older kin providing childcare, or helping finance or build a house), did not have to be sustained as young people grew into maturity. In mid-life proximate kin might involve labour and other exchanges between siblings or affines.

Of course, adult needs and responsibilities often changed late in life, as needs for care or hospitalisation meant that the membership of proximate and immediate kindreds was revised repeatedly. These changes, for example as made to secure property or care for an older person, commonly had consequences for the social space of reproduction. Network resources available at a given point in time for childcare, educational support, and other concerns are often consequences of past compositional changes in networks that responded to needs other than reproduction *per se*. They nonetheless remain crucial to available childcare resources – e.g. merely who is on hand to help, or cover costs – and other needs.

Proximate networks have consistent properties, even as memberships change. Usually they involve a division of labour that combines some adult children, nieces or nephews resident in the community together with significant participation of some of those living elsewhere. Although not an explicit strategy that people claimed to follow, this pattern had the obvious advantage that members of different generations were able to call on support from multiple sources. They changed supporting, caring and other roles in the network as the varying needs of different members arose. The high percentages of younger generation migrants, noted above, indicates the common character of the family as a network not simply resident in one household and location. Migration, in addition, was often not a one-off move away from the community; members might come and go, over different durations. (It is perhaps worth keeping in mind that Indonesia, as an archipelago, has a very long history of movement over widely varying distances (see Hugo, 2015; Schröder-Butterfill, et al. 2018)).

The ethnography of multiple, shifting networks reveals the fluidity of alternatives and constraints that can impact on childbearing, rearing, and social status. Members of a network often give different accounts of 'the same' events and human relationships. After all, not everyone's perspective on children and the family is the same, and (*pace* demographic convention) the household head's perspective is not necessarily privileged. It is thus often necessary to make some assessment of the relative accuracy of different accounts, and of motivations behind them. Differences are often telling. People, after all, may be more candid on one occasion than another, and this affects many issues, notably: whether they report a child as own or adopted; whether some children have died; whether there have been family disagreements over children, property or residence; whether there was a previous marriage; or whether behaviour considered immoral is mentioned at all. The same member may give a different account on different occasions. More important, comparing different network

members' accounts often provides missing information. Such issues are fundamental to accurate collection of even basic demographic data. Observations that members of one network may make on the behaviour of other families and their networks sometimes provide additional clues. In short, triangulation of findings from different datasets is crucial to data quality.

Because our evidence was collected in several ways (observation, everyday conversations, life course interviews, surveys), the results formed different datasets that could be compared. In this way the possible influence of research methods on findings could be monitored.[10] For instance, many apparently simple topics in demographic surveys assume that respondents can make accurate estimates. Examples include: Does the household head know the income of a co-resident adult son? Do people know the cash value of their agricultural holdings, or of the labour contributions which different members make in tilling them? Triangulation here arises from the fact that quantitative information does not just arise from surveys: many of the issues discussed in semi-structured interviews turn on incomes, durations, remittances, and so forth. Data files were compiled on quantitative reportage that took place during such qualitative interviews, and this helped to ensure that potentially important aggregate differentials could be compared and assessed between what people reported in surveys and in-depth interviews. The comparison of these data to survey reportage then provided further grounds for assessing accuracy. The ability to make comparative checks such as these obviously is not available to survey analysis and interpretation on its own. Checks are only possible where a multi-method approach is employed in which sustained ethnography *precedes* surveys. Of course, in-depth data are not authoritative on their own either: where previously unrecognised ambiguities, relationships, and events are discovered in comparing surveys with other datasets, then further interviews and related ethnography become necessary.

Put another way, research activities take place in the social space of families, their reproduction, and other concerns. Data collected are never completely separable from local realities as understood at the point of their collection. This needs to be kept uppermost in mind when researchers decide how best to specify units and relationships for comparative and modelling purposes. How to answer the question raised earlier -- *which* sub-populations are realistic units of analysis, and what levels of aggregation need to be distinguished -- obviously has a profound effect on what research is or is not able to show. Sometimes

demographic units may be aligned almost exactly with local social categories. *Anak angkat*, or informally 'adopted children', identifies a small but significant group of this kind (Schröder-Butterfill and Kreager, 2005). In most cases, however, sub-populations employed for comparison and analysis, like the three kindreds just outlined, are identified through extended observation and in-depth interview backed up by quantitative evidence compared between in-depth and local survey data.

3. Deciding Sub-Population Units and Levels

Three principal sub-populations emerged from the research: networks (inclusive of households), generations, and socio-economic levels. It is easiest to see the three as referring to different tiers of social organisation. Socio-economic levels are the largest sub-populations and reflect key economic differences. Network and generational relations, while building the differences between socio-economic levels over time, also cut across them. The focus here will be on the influence of socio-economic levels in shaping reproductive spaces. As we shall see, such differences arise from the influence of network and generational interactions. However, as these variations are by nature multifarious, they are described more briefly by providing specific examples. Illustrations from case study material nonetheless indicates the basic roles of the three types of kindred networks in shaping the social space of reproduction.[11] A more detailed account of network dynamics and a typology of outcomes is given in Schröder-Butterfill (2015).

In formulating the model of socio-economic levels, two respects in which it is an analytical construct deserve emphasis. First, although all three communities are profoundly status conscious, there exists no explicit, commonly shared vocabulary of social castes or classes. People nonetheless remark differences of reputation, property and so forth in many ways. As they consider such differences telling in their lives, devising a coherent empirical framework for describing these differences is critical for understanding and comparing inequalities in social experience. Second, the model of four levels, described below, is basically a *closed* model, i.e. a summary device bringing together evidence from datasets on networks, households, and surveys so that the four levels can be treated analytically as discrete units. It was developed on the basis of the three-step methodology described above, that is, *after* the sustained ethnographic and first round survey programme in late 2000. [12] The key analytical point here is that the model does not stand alone. That is, both building

and subsequently interpreting it requires us to consider the *open* network processes of the three kindred networks, described above, as these are the active processes that define individual and family position in the four levels, and which continue to sustain (or perhaps fail to sustain) such positions.[13] While the model stood up well following a second round of fieldwork and survey, in 2005, one purpose of the current research is to test how well it is holding up after a longer duration, and to revise it as necessary.

Comparison of the datasets leading to the four-part scheme drew additionally on linguistic data: the recurring but informal descriptive phrases that people use in ordinary language (Schröder-Butterfill, 2015). In the course of fieldwork, some distinctions emerged more clearly than others. All villagers could say which were the richest families, describing them in the two communities on Java variously as *orang kaya* (rich person), *wong sugih* (rich person) or *benghar pisan* (very wealthy), and in Sumatra as *urang baharto* (person with wealth). In common parlance these terms are synonymous. Patterns of education and religious observance (notably, pilgrimage), together with local survey data on assets, income and expenditure for this group, were consistent with local opinion. Often people of the highest status were descendants of long established local families. Social intercourse in all three communities emphasized deference in everyday social life: poorer villagers commonly avoid visiting their rich kin, as gossip is likely to portray them as looking for handouts.

Villagers could also readily identify which were the poorest families, using phrases like *kurang mampu* ('less able')*, wong susah* (person who experiences hardship), or *urang bangsek* (poor person) to describe them. At this level, family income depended wholly or partly on charity, and neither modern productive assets nor consumer goods were common. In the Sumatran site, they were further distinguished by being almost entirely newcomers to the village (*pendatang*).

How and whether to make distinctions within the large group who are neither rich nor poor -- and which together make up well over half of the community population -- was much less straightforward. Differences between them were not immediately recognisable in everyday discourse, as no single phrase recurred consistently to describe this broad group. Contrasting levels of wealth and material assets were, however, indicated in the local surveys, in which some households in the broad band between rich and poor were found to possess twice the average income of the others. Typically, households belonging to the

former grouping are nested in networks with reasonably secure and often multiple modest incomes; several household members are likely to work, and incomes may be supplemented by support from elderly parents' pensions and/or profits from the land. We therefore decided to identify this group as being the 'comfortable' stratum, reflecting a number of adjectives like *lumayan* (fair), *manangah* (middling) or *sadang* (moderate) that recurred in people's observations on them.

The situation of those households between the 'comfortable' and the poor is captured aptly by a phrase common to all three communities, *cukup-cukupan*, translatable as 'getting by'. These families lack the diversified resources and networks of the 'comfortable'. Although their labour enables them to be self-sufficient and to participate respectably as full members of the community in most social exchanges, they have no material safety net should a health or other crisis occur. Not surprisingly, as the threat of descent into outright poverty is ever present, quite a number of *cukup-cukupan* households were the objects of occasional charitable support. The distribution of households amongst the four levels are given in Table 1.

Table 1: Distribution of Households by Socio-economic Levels in the Three Communities (percentages)

	Rich I	Moderate II	Getting-by III	Poor IV	Total (N)
Kidul (East Java)	16.0	29.2	43.4	11.3	106
Witan (West Java)	10.9	30.7	49.5	8.9	101
Koto Kayo (West Sumatra)	8.2	36.7	30.6	24.5	98

Source: Household survey and fieldwork data 2000.

4. Exploring the Model: Some Examples

The value of a model, of course, lies partly in the extent to which its applications successfully clarify empirical relationships and give rise to further unrecognised, or insufficiently appreciated, ones. In so doing it should enable us to specify limitations in extant models, and provide ways of correcting them. The four tier model outlined above, although arising via a field methodology atypical to demography, nonetheless is a closed model of a conventional descriptive demographic kind. Exploration and application of the model is

straightforward, and to date has provided useful critical leverage over a number of standard demographic approaches. These are: tracking patterns of low fertility and childlessness; understanding and mapping variations in inter-generational transfers; and identifying limitations of dependency ratios for capturing the impacts of age-structural transition. All three are directly relevant to conceptualising and comparing social spaces of reproduction, as they lead on to describing current variations in that space in the three communities.[14]

4.1 The Child Poor

Perhaps the first thing to note about Table 1 is that it is not a classification based solely on incomes, assets or occupations. There are other issues critical to status that have to be included. Property inheritance, for example, commonly occurs over the course of person's later adult life, and in consequence older men and women of recognised wealth and higher status may come to live in a household which, in its material appurtenances and current income, are modest. Their investment, obviously, is in their family network, i.e. much family property is now the possession of other, younger members. Often an individual's characteristics entail other status resources – e.g. healing expertise, religious and political office – and added resources sometimes flow from these network connections to other family and kin. The table therefore reflects adjustments made in triangulating life course histories and observation with survey data to give an adequate account of social as well as economic status criteria. Even when these adjustments are made, the table reveals an uneven distribution, with over half of households in all three communities falling into the two lower levels. Additionally, there are evident differences between the communities in the number of households in Level 1, and also at the bottom of the scale. Households in Levels 3 and 4 are more evenly distributed in Koto Kayo, for reasons noted below.

One of the most fundamental demographic questions for the social space of reproduction is the distribution of children across socio-economic levels. Relative supplies of children have an evident bearing on the size of family networks and their capacities, and hence on the conditions in which childbearing and rearing occur. What is at issue is not just having children and ensuring they are sufficient to rely on, but the greater involvement in the daily life of the community that comes at each life stage as one's children are growing up (e.g. arranging ritual celebrations to accompany birth, circumcision, and marriage; assisting in costs and celebrating the fruits of education; entry into the job market; election to office; etc.). Involvement at each stage opens up social and economic opportunities for

exchanges and forging links to kin and in the community. For this reason it is crucial to look beyond households to the network that family members build across their life courses. Table 2 therefore turns from the survey data to the quantitative picture of family networks resulting from life course interviews. The four levels are here simplified to two, as the evidence shows clearly that marked inequalities affect both the *cukup-cukupan* and *kurang mampu,* as opposed to the *orang kaya* and *lumayan. A* striking association between socio-economic status and the availability of children in this way becomes apparent: in all three communities the better-off are much less likely to be childless or have small family sizes. Indeed, they are much more likely to have many children. Between one quarter and two-thirds of elderly people who are economically disadvantaged have either no children at all, or only have one or two surviving children. The latter points to much smaller kin networks, and many fewer opportunities to expand links. Having fewer younger generation members not only increases the need to rely on kin other than children, but doing so with less network resources to offer in exchange. This characterises poorer groups in all three communities.

From a conventional demographic point of view, the non-Malthusian character of this is striking.[15] More than this, the unequal economic and social opportunities that can confront the child poor raise the issue of their vulnerability. Confining analysis, as is usual in survey research, to households limits what we can know about their access to network alternatives. But how well are networks able to cope? The differentials in Table 2 are the product of a number of factors -- levels of childbearing, survival, and migration – across the life course of generations and their networks. One implication is that, for lower strata, the picture is one of the inter-generational transmission of poverty: the economic situations of poorer people are bound up with worse health conditions, diets, and means to assist the children they do manage to have; the children, starting and usually continuing in life at a disadvantage, are in turn likely to have much less in the way of support they can offer the older generation.[16]

Table 2: Availability of Children to Elderly People by Membership to
Upper or Lower Two Socio-economic Levels (percentages)

	Kidul		Witan		Koto Kayo	
	Upper	Lower	Upper	Lower	Upper	Lower
No children	18.8	32.1	5.0	8.5	5.7	10.7

One or two children	18.8	32.1	0	19.2	15.1	21.4
Three or four children	20.9	19.8	17.5	34.0	24.5	25.0
Five or more children	41.7	16.0	77.5	38.3	54.9	42.8
N=	96	106	40	47	53	28

Source: Fieldwork data 1999-2000. For Kidul and Witan the differences are significant (χ^2=22.2, p=0.008 and χ^2=18.9, p=0.026); for Koto Kayo the difference is not significant.

Exploring variation in childbearing has helped to reveal the nature of network coping strategies and their limitations, as well as the extent to which standard demographic and economic measurement obscures fertility-related causes of vulnerability (Schröder-Butterfill and Kreager, 2005). One thing which is clear from in-depth interviewing is that the poor did not wish to have fewer children, nor try to (Indrizal, 2004; Schröder-Butterfill, 2004). For the oldest generation, the childbearing pattern in Table 2 reflects the much less favourable situation of the proximate determinants of fertility and mortality in their prime childbearing years, particularly in the 1940s and 1950s. This was true not only in the communities we studied. The era of Japanese wartime occupation and subsequent war of independence saw major disruption of local agricultural production, spousal separations and deaths, and increased levels of STDs owing to enforced wartime prostitution (van der Sterren et al. 1997)). As late as 1971 infant mortality rates remained over 100, by which time total fertility had returned from wartime lows around 4 to an estimated 4.7 (DHS, 2002-3); infant and child mortality were doubtless much higher in the wartime and the early independence era, for which data remain incomplete. As Table 2 shows, the considerable impacts of disruption on vital rates are visible not only amongst the poor. But that is not the end of the matter, as it is here that networking options become significant.

Greater status and wealth provide alternative avenues to gaining children, which is not apparent in standard demographic measures, such as Children Ever Born (CEB). If we take the East Javanese community, Kidul, as our case in point, CEB calculated from fieldwork data on the four levels show that the mean number of children born to villagers aged over 60 in 2000 was 4 in the two higher strata, and 3.25 in the two lower (Schröder-Butterfill and Kreager, 2005); the former figure is comparable to CEB for that cohort in East Java as a whole (DHS 1991). Overall CEB, however, occludes the marked reproductive

shortfall shown in Table 2, namely childlessness reaching nearly one in five in upper, and one in three in lower strata. Without attention to key sub-population differentials, CEB is likely to be misleading. There are, however, alternative routes to having children, which include remarriage to someone with children and the longstanding custom of informal adoption which is common throughout Southeast Asia (Koentjaraningrat ,1957; Carsten, 1991; Sriono, 1992). Indeed, even people who have children often adopt further children. Additional issues that affect the availability of younger generations arise from migration, particularly as it reduces network size in the lower two socio-economic groups (Kreager, 2006). Put very simply, where poor people have fewer resources and can contribute very little to their children's life prospects, those children may be more likely to leave the community and cease all contact with their elders. This has affected older generations, for example, subsequent to the Indonesian government transmigration schemes in which children moved to distant islands. When these several factors are taken into account, it becomes clear that the social space of reproduction – i.e. of having and retaining younger generation members – depends not only on having babies, but on their subsequent distributions.

Put another way, conventional demographic childlessness (i.e. nil fertility) needs to be compared to actual childlessness. The latter is composed of only some of those who did not succeed in bearing children of their own. To that group must be added those who have ceased to have any contact with children who have left the community, or owing to divorce and family conflict. But to identify those who actually lack access to children and their support, we also have to subtract from those with nil childbearing those who have subsequently acquired children through adoption or remarriage. The outcomes are illustrated in Table 3 for the East Java community. Differences of socio-economic level are again critical: alternative routes to acquiring children improve the availability of children for those at higher levels, and to a lesser extent for those 'getting by', but the situation of the very poorest level is considerably disadvantaged. The limited resources and reputations of the poor leave them with much less chance to adopt or make strategic marriages.

Table 3: Demographic and Actual Childlessness by Socio-economic Level, Kidul, East Java (percentages)

Socio-economic Level	Demographic childless	Actual childless
I Rich	17.3	11.1
II Comfortable	17.3	5.6

III Getting by	26.9	22.2
IV Poor	38.5	61.1
N=	52	36

Looking at childlessness and low fertility thus raises important questions for the ability of standard fertility measures to reflect central concerns in the social space of reproduction, notably the threat of remaining childless. As a historical and contemporary problem, childlessness and the stigma that attaches to it has been remarkably widespread, over long periods.[17] Reliance exclusively on household figures which do not take account of network adjustments may hide the actual extent of vulnerability, and the coping mechanisms used to deal with it.

4.2 Wealth Transfers between Generations

Conceptualising the social space of fertility by consideration of the distribution of younger generations amongst sub-populations like socio-economic levels, networks, and generations, opens up further issues beyond coping with low or nil fertility. An obvious case in point is the structure of inter-generational support. Demographers' interest in this topic was greatly stimulated by Caldwell's important work on intergenerational wealth flows (1976). Put forward initially to provide a micro-level mechanism to explain fertility transition, his research raised attention to changes in the 'rationality' of having children. His idea was that intergenerational transfers could be modelled as net wealth flows: through most of history, he argued, labour and other contributions of younger generations radically outweighed the cost of children, so that the net flow of wealth was always 'upward' (i.e. from younger to older generations). With modernization and the increasing impacts of Western culture, however, greater expenditures on education and other supports for children made them radically more expensive, so that net flows 'reversed' (i.e. to 'downward' from parents to children). In consequence, Caldwell reasoned that people would take steps to have fewer children. The approach led to much constructive research into intergenerational support, but the findings have shown that the generality of Caldwell's hypothesis is not supported (Lee, 2003). The theory, moreover, in its attempt to provide a one-size-fits-all mechanism and to reduce the diversity of flows to 'net' relationships in households, neglected variations in the social space governing reproduction.

Caldwell's African research remains important, on three counts. He remarks the West African institution of fostering, and the circulation of children across kin networks. The implications of his work thus extend beyond the household. And in defining 'wealth', he included social and moral criteria as well as economic. His idea of net wealth flows, however, was not anchored in life course research. The difficulty of tracking exchanges quantitatively over long periods resulted in his making no sustained attempt to model and measure flows. Bound up with this is the absence of attention to how flows vary between groups of differing wealth and status.

Analysis of flows in the two communities of Kidul and Koto Kayo confirms the critical importance of these limitations, revealing three major variations that are absent from the account Caldwell proposed (Kreager and Schröder-Butterfill 2008). First, combined ethnographic and survey data reveal different flow patterns amongst the four levels, and that the patterns are not the same in the two communities. In Kidul, downward intergenerational support flows from elderly parents to adult children predominate in the two higher levels with upward flows being greater in the lower, particularly in Level 3. The picture was the reverse in Koto Kayo: upward flows were four times greater to the highest level than all other flows between generations. The second major variation was that there are not just two sorts of flow. Reciprocal or balanced flows make up from a third to nearly half of flows, and can be found in all levels, particularly in the middle two (in Kidul) and the lower two (in Koto Kayo). These variations are partly explained by the different economic adaptations of the two communities: because of the established role of migration in Koto Kayo, remittances play a very large role in transfers, and take the form of flows from younger generation members who are away from the community to the predominantly older cohorts remaining at home. The situation in Kidul is much more mixed: in general, downward flows reflect costs of helping younger adult members to support themselves in new businesses or during crises; upward flows reflect needs for support by frail elders; balanced flows, which predominate, reflect normal relations in the absence of crises and marked short-term needs. Taking the three types of flow together, changes in flow patterns over time reflect the needs and adaptations that accompany the succession of life cycle stages of individuals and families.

For example, balanced flows, i.e. where there is mutual support between generations, reflect the fact that members of a 'proximate' kin network make different contributions (labour, paying for schooling, meeting healthcare costs, etc.) according their current

economic situation, abilities, and skills. Both older and younger generations share the load. This normative balance, however, tends to shift as adults move into late life and their material contributions decline (or property has already been passed on), and then a smaller network of 'immediate' kin are able to meet their daily needs. Flows of support thus shift upward. Issues fundamental to the social space of differential fertility, like financial support for children's education, availability of grandparental support for children, and support for children coping with broken marriages, are all bound up with such changing flows. The timing and incidence of reproduction, in other words, are subject to many short-term, and often longer term, changes in the direction of support. The capacity of networks to provide support for parents and children varies with socio-economic status, not merely because of greater wealth or status, but because of the greater human capital in network size and relationships that accrue over time to upper strata.

In sum, reducing the diversity of network relationships to 'net' flows in households leaves us with a very impoverished picture of the social space in which reproduction takes place. The idea that generational relations can be reduced simply to 'up' versus 'down' leaves out the differential impacts of life course processes and the relative accumulation (or lack) of human, social and material capital that characterizes different socio-economic levels. As the discussion in section 4.1 shows, members of younger generations and their contributions are redistributed in order to assist different members of a network. Children are not relevant merely to the couple who bear them, and the opportunity to bear and rear them successfully is subject to the structure and capacity of the networks in which parents or potential parents participate. Networks, in other words, create opportunities and constraints. Given that this diversity and variation in members' roles and contributions is natural to networks, there can be little surprise that a continuing heterogeneity is characteristic of fertility. Compositional demography, by breaking down populations into levels, generations, and networks, and examining the processes that relate them over time, provides an essential empirical base for unpacking this diversity.[18]

5. Reproductive Spaces in Younger Generations

Discussion to this point has focussed on socio-economic differences and networks built up over individual and family life courses, relying on older persons' networks, which provide the most comprehensive picture across generations. While striking reproductive

differences are evident between levels, it is no less evident that their explanation requires understanding the networks that are the building blocks by which social and economic statuses are formed, sustained, or decline. In other words, a socio-economic stratification model – whether constructed 'top-down' (cf. note 6), or 'bottom-up' (as in the methodology developed here) -- is not necessarily an adequate guide to fertility differentials on its own. As a model, it has the familiar 'snapshot' properties of closed models in demography more generally: it reports outcomes, not processes. To interpret it, and to ensure that the basic demographic data on which it is based are accurate, the processes that give rise to differences of status and wealth need to be tracked over time and understood. Their observation requires multiple methods that enable data quality checks. The model then becomes useful for critical analysis as well as substantive description, as noted in the preceding section.

We turn therefore to evidence of differential fertility across younger generations, giving some indicative examples from interviews of how the network inequalities noted in the preceding pages are currently evolving. To begin with, an overview is given in Table 4, which presents the situation at the time of the 2000 round of the survey in the East Javanese community. Of course, much of the fertility of interest today was incomplete at that time, as some women had not completed their childbearing years, and others had not begun. The data simply provide a representative baseline for discussion of the community as a whole.

Table 4: Fertility of Married Women by Age Group,
Kidul, East Java

Birth cohort	1971-80	1961-70	1951-60	1941-50
Age group	20-29	30-39	40-49	50-59
Levels I&II	1.29	1.88	3.0	4.71
Levels III&IV	0.9	2.21	2.91	3.7
Levels I-IV	1.06	2.04	2.94	4.12
Number	17	49	18	17

Source: 2000 Household Survey

The right-hand column gives the completed fertility, by level, of women born in the 1941-1950 cohort, and the 40-49 column indicates the substantially completed fertility of women born 1951 to 1960. The figures for the oldest cohort are broadly comparable to the mean number of children ever born to women in these cohorts (4.24) as reported for the

whole province of East Java (DHS 1991), but one child less for the 1951-1960 birth cohort (4.0) (DHS, national data, 1991). Local data, as with provincial and national data, are likely to reflect the wider impact of war-time on childbearing, noted earlier. Sample sizes are smaller in the older two cohorts, partly reflecting the cumulative mortality experience of those ages. The economy and health conditions improved only gradually as the new national government established itself during the 1950s. By the early 1960s it was still the case that more than one in ten babies died (Hugo et al., 1987). The cohort in the left hand column, women born 1971-1980, is smaller for different reasons, i.e. not all had entered marriage and thus childbearing. Their fertility levels, and those for the 1961-1970 birth cohort, were moreover subject to some very different influences than their elders, notably the promotion of family planning under the 'two child only' policy of the Soeharto regime which is credited with facilitating a decline in fertility at the national level from around 5.5 to 2.6 over a 25-year period (Niehof and Lubis, 2003). The data have been compared to kin network records from fieldwork, with which they are consistent.

The figures in Table 4 take no account of variations in the distribution of children across families and networks, as presented in Tables 2 and 3. In effect, Table 4 averages out those variations: the situation of people with nil or low childbearing is effectively swamped by the larger numbers of those having 5 or more children. In short, data on levels taken on their own give only a very partial account of inequality of access to the younger generation. While data for younger age groups are incomplete, an overall trend of fertility over time across the four age groups seems clear. On one hand, groups following those aged 50-59 appear to be on their way to lower reproductive levels. It is very unlikely that the over 40s would all on average have at least one more child, so that their completed fertility is likely to be closer to 3.0. Whether those under 39 will reach the level of 3 children is an open question, to which we return, below. Differences between levels, however, appear lessened over time, possibly reflecting the impact of the national family planning programme (which was very active by the 1970s). The steeper fall in fertility in the upper two strata of these cohorts could plausibly reflect this, given their greater participation in wider economy and society.

Table 5: Fertility of Married Women by Age Group, Koto
Kayo, West Sumatra

	20-29	30-39	40-49	50-59
Level I&II	2.5	2.79	3.25	5.13

Level III&IV	2.63	2.79	3.31	4.5
Level I-IV	2.58	2.79	3.29	4.81
Number	12	28	24	16

Source: 2000 Household Survey

Table 5 gives parallel data from the 2000 survey for women in Koto Kayo, the Minangkabau community on Sumatra. Once again, a clear gradient by age is visible, although level differences are much less, and fertility is higher at all levels and age groups than in Kidul. The variation in child availability presented in Table 2 is again not visible in these averages. Such variation is important as Table 2 shows that lower strata in Koto Kayo have access to significantly more children than their peers in Kidul. Whether this makes their situation significantly different is, as we shall see, an interesting question. To assess these continuing, if gradually smaller, variations in the fertility of successive age groups in the two communities, we return to the action of local networks, i.e. the dynamics of the open sub-populations that constitute socio-economic levels. Case study data also enable us to consider whether the incipient fertility decline implied by the data from 2000 in Tables 4 and 5 has indeed proceeded as transition theory would lead us to expect.

Ethnography of these groups is ongoing and interviewing is not yet complete, especially as the randomized survey of the communities in the current research round will not take place until late 2019. Current findings can therefore only be suggestive. Four case studies, comparing members of upper and lower socio-economic levels and their networks in two of the communities will at least help to indicate how variation is evolving. The case studies are particularly helpful in describing how some networks come to be composed of families belonging to different strata and lead to differing childbearing patterns. In Kidul, the cases contrast generational changes in networks that are typical of local family economies, relying in particular on shop keeping. In Koto Kayo, the cases contrast higher status networks able to draw on incomes from premium agricultural land together with the migration economy, with lower status networks having neither resources.

5.1 Kidul, East Java

i. Suci and her descendants

Of a distinguished local family, Suci nonetheless inherited very little in material terms. But by her industry as a shopkeeper she was able to generate capital enabling her husband to farm rented *sawah*. Together they gradually built their reputation as *orang kaya*, i.e. respectable members of the highest status level. She confirmed this by undertaking prestigious religious education, and making a major donation to help found a local religious school. Suci had a single son, Suroso, born 1939. Reflecting the riskiness of so little potential support in the younger generation, she adopted Rudi, a boy from her wider kin network whose parents' marriage had broken down. Subsequently she also adopted one of his children, Samsul, and raised a girl, Fitri, from a poor distantly related family. Fitri eventually married Suroso.

In the 1960s Suroso and Fitri had four children (born in the 1960s), of which two died, while Rudi and his wife have had three children; the fertility of both couples is thus significantly higher than reported in the second column of Table 4. Suroso and Fitri's two children have had four and three children. Suci has steadily assisted her three son's schooling, also providing Suroso with a house and some land, and assisting Rudi and Samsul with a house. Rudi and Samsul both proved to be good students, and Suci was willing to invest in their education beyond secondary school, which has helped both of them to get good jobs on other islands in the archipelago. Rudi's family lives in a nearby village, and there are steady exchanges back and forth between his household and Suci's. His children have also succeeded in school and gained good jobs, while they have yet to marry. All are in Level 2.

The situation of Suroso, however, has been disappointing to Suci. Economically unsuccessful, and losing reputation through a sequence of misdemeanors, Suroso made a modest living as a craftsman until his death in 2015. His family belongs to the 'getting-by' (i.e. Level 3). Just as Suroso was not a good student, and stopped his schooling early, so his four children have not continued in education and have married early, producing between them seven children – much higher than would be indicated in the first column of Table 4. Suroso's widow, Fitri, and her children remain in Strata 3, and while they provide company and some assistance to Suci, the flow of support will remain downwards.

ii. Aisha

Aisha's second marriage was into a distinguished, first level family, and she is active in the local mosque belonging to the purist, conservative stream of Islam in the village. From that marriage there is *sawah* and severance pay from her late husband's position in a local sugar factory. With her daughters, Aisha for many years additionally made a good income as a maker and seller of cakes in the local market. Her eight surviving children (five girls, three boys born between the late 1950s and mid-1970s) have followed differing reproductive paths. The first three had three or four surviving children each, born in the period of the intense family planning campaign, which was relaxed after the fall of President Soeharto in 1998. Of the subsequent five children, three have had five or more surviving children, born mostly in the period after decentralization (2000 onwards) which was characterized by disinvestment family planning services and greater civic and religious freedoms. They openly eschew modern methods of birth control, citing religious prohibitions of family planning. One child, married and now in her 40s, remains childless, while the last child has yet to marry. Three of Aisha's six offspring with children have experienced the death of a child. In addition to Aisha's support of her children over the years, there is strong mutual exchange between the children, who have all remained local and go in and out of each other's houses with ease. Most of these families belong to Level 2, although one is poorer, and one (benefitting from the husband's international migration income) may in due course rise to be Level 1.

5.2 Koto Kayo, West Sumatra

iii. Karima

Karima, who died aged 87 in 2016, was a descendant of one of the community's founding families and inherited extensive *sawah* and other agricultural land. She lived her life, as is appropriate to the matriarch of a matrilineal Minangkabau family, in its magnificent ceremonial family house, or *rumah gadang*. Of her seven children, one daughter has remained in the community and house with Karima, and shares responsibility for managing the family lands. She is a senior teacher in a nearby school. The other six children have all had successful migration careers (*rantau*), sending regular remittances to the home and wider community, which secure the family network's reputation, wealth, and status. One of these more distant parts of the network is involved in education, as is one of her sons' wife; the remaining children are successful merchants. Karima's second child, now in his 60s, who has remained childless, has for many years returned to Koto Kayo weekly, and has become a senior official in community administration. The family is in a real sense the model of what a traditional Minangkabau family of high status is supposed to be. Because, as is now normal to Koto Kayo, the great majority of sons and daughters have left, the family network is under the threat that none of the daughters in the younger generation will return to live in the *rumah gadang* and continue to supervise its property or take a major role in the community as is expected of a prestigious family. It is hopeful, at least, that one of the three daughters of Karima's sixth daughter, may do so. The other five children living away have had respectively 4, 2, 1, 2, and 3 children. As they live in urban settings (Pekanbaru, Jakarta) without plans to live in Koto Kayo, their fertility at this stage appears to reflect the wider decline of reproduction near to replacement level in urban areas of the country.

iv. Amin

As the great majority of the children of landed families in Koto Kayo leave on *rantau*, it is not surprising that poorer people in the community, who have less wherewithal and fewer connections, tend to remain in the community, or in villages nearby, working the land of richer people. Amin is one of them. His two children have, between them, eleven offspring, who have had very limited opportunities of education, and face economically limited futures similar to Amin's. His daughter and son, and eight of his grandchildren, are in this situation. Amin is unusual in Level 3, as he possesses a small amount of his own rice land, which has enabled him to assist building a house for a daughter and to pass on the land to her. She now cares for him. His poverty, however, has meant that his children's education was minimal, and so the network as a whole remains 'getting-by' in Level 3. His son, and one grandson, have at least advanced to be small shopkeepers in towns not far away in Sumatra. The son was able to send small sums of money regularly until he unfortunately pre-deceased his father.

5.3 Discussion and Conclusion

The four case studies, while a small sub-set of those currently being collected, provide a good indication of the variability of reproduction in these communities and the

social spaces of which it is part. The striking difference between reproductive patterns in these case studies and the fertility trends implied in Table 4 raises several potentially interesting questions about the current course of Indonesia's fertility transition. While there can be no suggestion that the four are representative in any formal sense, they reflect the heterogeneity of network arrangements which is normal to reproductive spaces in these Indonesian communities. Networks continually redistribute members of younger generations. At present, demography lacks formal models for tracking such adjustments over time and evaluating their consequences. Here we have considered networks chiefly in their implications for socio-economic status, including how the neglect of local status differences and of network alternatives can make conventional demographic approaches to the 'determinants' of fertility and inter-generational exchanges inaccurate. Two of the above case studies may serve to illustrate why and how widely accepted demographic assumptions can go wrong.

Amin and his family provide a clear case of the intergenerational transmission of poverty. Merely referring to 'wealth flows' in such cases is misleading – the local phrase *cukup-cukupan*, or 'getting by', is more apt, since what exchanges do occur are very small. Nor can there be a 'window of opportunity', as there is little realistic possibility of saving or investing in education. A minority of Amin's children and grandchildren may perhaps over their lifetimes succeed gradually in raising their socio-economic status. For most of them, however, having fewer children would make little difference to their life chances, since their employment continues to be confined to local trading and agricultural labour. In short, there is little sense to imputing birth control as a realistic strategy of improvement for sub-populations that remain, and are strongly likely to remain, economically marginalized.

Aisha and her family, in contrast, have higher status, but their reproductive space nonetheless shows no sign of fertility transition. To the contrary, strong solidarity with flows of support balanced within the network continue to provide insurance against a significant fall in socioeconomic status. A corporate strategy based on multiple ties, pooled economic and social capital, and shared moral values, may facilitate either higher or lower fertility levels in the group, and current fieldwork is looking at this dynamic, for example, as it may permit more education of brighter children (as with Suci's adopted son and grandson), or alternatively, participation in local religious networks which provide important avenues to influence. Strong network ties are likely to mean that advantages gained by some members

can help all or, at least, some others. In short, a good empirical knowledge of how networks facilitate alternatives for some, while imposing limitations for others, is arguably the only firm basis on which formal models of reproductive heterogeneity may be developed. Models that differentiate socio-economic statuses are useful for indicating how such differences tend to be reinforced over time, as long as we remember that networks still have the capacity to open multiple paths which may include change. Possible implications of the four case studies for current Indonesian fertility patterns, may be noted as follows.

The oldest generation in Kidul and Koto Kayo reflects the great fertility variation (from one to eight children) of the generations who entered childbearing in the difficult war years. In most cases, however, their children have followed differing reproductive paths from their parents. Aside from Karima's children (who have averaged 2 children each), and Suci's adopted son Rudi (whose children have thus far delayed childbearing), the fertility of other members of the next generation as given in the case studies averages between 3 and 5, and the even greater fertility of some of Aisha's younger children is striking. Overall, these levels are noticeably higher than Hull's recent estimates of total fertility for East Java (1.8), but the parallel figures in Table 5 for the younger age groups in Koto Kayo are very close to his estimate for West Sumatra (2.8) (Hull, 2016). Life histories currently being compiled in Koto Kayo, however, also show a pattern similar to Kidul: some younger women currently have between seven and nine children, i.e. even higher than shown in the East Javanese case studies. The seeming tendency toward fertility decline to replacement level, implied in Tables 4 and 5, disguises important variations. Central trends in TFRs, of course, inevitably displace the heterogeneity of sub-populations at meso-levels, and the case studies with very high fertility could in any case be atypical. Potentially significant levels of reproductive variation, however, should not simply be dismissed out of hand. The set of cases suggests that it is worth looking more closely at whether some reversal of the fertility declines that occurred in Java and Sumatra during the period 1970-2000 could now be under way. Such a change, while not consistent with the expectations of demographic transition theory, is unlikely to surprise Indonesian specialists. Two main approaches to trying to understand whether it is occurring will be evident from the preceding discussion.

First, the conventional route into the social space of reproduction, following modernization and demographic transition thinking, would suggest that the range of outcomes just described is entirely to be expected, and the groups with somewhat higher fertility will

prove to be small minorities. The conventional view portrays three stereotypical outcomes, to which the case studies might appear to conform. One is that the support provided over the early life course by Level 1 elders like Suci and Karima, having enhanced their children's educational and economic opportunities, has facilitated their move into more competitive commercial and urban environments. The completed fertility near replacement in this group is therefore to be expected. Second, the considerably higher fertility of Aisha's children may reflect, in part, the greater wealth in the family, which reduces possible economic constraints on childbearing. The strong religiosity of the family, however, might appear to stand out as a likely differentiating factor, following the pre-conceptions of modernization theory, which stereotype traditional religious views as 'obstacles' to family planning. Finally, families trapped by the inter-generational transmission of poverty (as Amin's), and downwardly mobile families that have not availed themselves of educational and commercial opportunities (like Suroso's), are, as modernization theories have long maintained, the least likely to show reproductive decline. They have, in fact, had similar or greater numbers of children to their parents. The conventional modernization view, in short, discourages us from considering variation as potentially important. The variants can be explained without our having to look further. As the focus is on trends of economic growth and fertility declines at the national level, variations appear simply as outliers that might be expected, sooner or later, to conform to modern norms. That, all the while, intergenerational transmission of poverty substantially continues, and that there are other discourses in society that question this logic of modernization, are matters that lie outside the purview of the conventional view.

In the bottom-up approach followed here, the significance of variants is not a function of model values decided in advance. Compositional demography aims, to begin with, to identify the differences that distinguish significant sub-populations and how their nature is, or is not, being sustained. The basic network structures and life course relationships that build sub-populations and link people in communities – kinship, marriage, property, and so forth – have evolved as market, contraceptive, and reforming religious ideals and practices have increasingly shaped members' lives and impacted on them. The former structures and relationships nonetheless remain fundamental. That so many of Karima's children have left for urban space, and Amin's have not, is an established Minangkabau pattern distinguishing rich and poor that has existed at least since the early 20th century. Their strong Muslim identity is also not new, and does not specify any numerical fertility norm. Indeed, although the 'two-children only' ideal is now widely known in Indonesia, the diversity of reproductive

outcomes and the way they vary within and between socio-economic levels, show that any stated agreement with the new numerical family size norm needs to be checked against network realities. The continuing predominance of collaborative network behaviour is an ubiquitous fact of life to which fertility levels have long adjusted, whether up or down. Simply having fewer children does not facilitate meeting obligations, nor being able to rely on others: most of the problems that networks enable people to cope with cannot have a single answer.

The higher fertility of Aisha's younger children, or the similar emerging case study material from Koto Kayo, are one expression of this, as are the variants of Amin's and Suroso's families. Whether additional children are likely to be a burden, and for whom, will depend on a person's place in networks, the utility of ties, and which members can be drawn upon for support. Thus, support needed for younger or older generations – whether for childcare, educational funding, assistance in daily tasks, migration remittances, or whatever – are part and parcel of the division of labour that characterizes network memberships. Agency and choice in procreation, from this point of view, are not 'determined' by 'independent' variables like levels of income, education, or urbanization in association with family planning. They are, rather, properties of sub-population composition and structure.

Bibliographical References

BASU, A., AABY, P. (1998), eds., *Methods and Uses of Anthropological Demography*, Oxford: Clarendon Press, pp. 298-322.

BLACKER, J. (1994), "Some thoughts on the evidence of fertility decline in Eastern and Southern Africa", *Population and Development Review* 20 (1), 200-5.
BLOOM. D., J. SEVILLA, and D. CANNING (2003). *The Demographic Dividend.* Santa Monica: Rand.
CALDWELL, J. (1978), "Toward a restatement of demographic transition theory', *Population and Development Review* 2 (3-4), 321- 366.
CALOT, T. AND T. FREJKA. (2003), "Cohort reproductive patterns in low-fertility countries", *Population and Development Review* 27 (1), 103-132.
CAMPBELL, K. L., and J. W. WOOD, (1988), "Fertility in traditional societies', in P. Diggory, (ed.) *Natural Human Fertility.* London: Palgrave MacMillan, pp. 39-69.
CARSTEN, J. (1991). "Children in between: Fostering and the Process of Kinship on Pulau Langkawi, Malaysia." *Man (NS)* 26(3): 425-443.

CHESNAIS, J-C. (1992), *The Demographic Transition,* Oxford: Clarendon Press.

COALE, A. J. (1969) " The decline of fertility in Europe from the French Revolution to World War II, in S.J. Behrmann, L.Corsa and R, Freedman, eds., *Fertility and Family Planning,* Ann Arbor: University of Michigan Press.
GREENHALGH, S. (1994), ed., *Situating Fertility,* Cambridge: Cambridge University Press.

HAJNAL, J. (1965), "European marriage patterns in perspective", in D. Glass and D. Eversley, eds. *Population in History,* London: Aldine, pp. 101-43.

HAJNAL, J. (1982), "Two kinds of preindustrial household formation system" *Population and Development Review* 8 (3), 449-94.

HUGO, G. (2015), "Constructing migration in South-East Asia: Conceptual, empirical and policy issues", in P. Kreager, B. Winney, S. Ulijaszek and C. Capelli, eds., *Population in the Human Sciences: Concepts, Models, Evidence.* Oxford: Oxford University Press pp. 292-330.

HUGO, G. T. H. HULL, V. J. HULL and G. W. JONES (1987). *The Demographic Dimension in Indonesian Development*. Singapore: Oxford University Press.

HULL, T. (2016), "Indonesia's fertility levels, trends and determinants: Dilemmas of analysis", in C. Z. Guilmoto and G. W. Jones (eds.), *Contemporary Demographic Transformations in China, India and Indonesia*, Springer, Cham, Switzerland, pp. 133-151.

INDONESIA, DEMOGRAPHIC AND HEALTH SURVEYS, 1991, 2002-3. Jakarta: Statistics Indonesia.

INDRIZAL, E. (2004), "Problems of elderly without children: A case-study of the matrilineal Minangkabau, West Sumatra" in P. Kreager, and E. Schröder-Butterfill, eds. *Ageing Without Children: European and Asian Perspectives*. Oxford, Berghahn, pp. 49-76.

JOHNSON-HANKS, J. (2015), "Populations are composed one event at a time", in P. Kreager, B. Winney, S. Ulijaszek and C. Capelli, eds., *Population in the Human Sciences: Concepts, Models, Evidence.* Oxford: Oxford University Press pp. 238-256.

JOHNSON-HANKS, J. (2017), "Vital Conjunctures Revisited", in. P. Kreager and A. Bochow, eds., *Fertility, Conjuncture, Difference: Anthropological Approaches to the Heterogeneity of Fertility Declines.* Oxford: Berghahn, pp. 326-340.

KERTZER, D. (1984), *Family Life in Central Italy, 1880-1910.* Brunswick NJ: Rutgers University Press.

KERTZER, D. and FRICKE, T. (1997) eds. *Anthropological Demography: Towards a New Synthesis*, Chicago: Univ. of Chicago Press.

KOENTJARANINGRAT (1957). *A Preliminary Description of the Javanese Kinship System.* New Haven: Yale University Southeast Asia Studies.

KOHLER, H-P., S. HELLERINGER, JE. R. BEHRMAN, and S.C. WATKINS (2015), "The social and the sexual: Networks in contemporary demographic research", in P. Kreager, B. Winney, S. Ulijaszek and C. Capelli, eds., *Population in the Human Sciences: Concepts, Models, Evidence.* Oxford: Oxford University Press pp. 196-237.

KREAGER, P. (2004), "Where are the children?" in P. Kreager, and E. Schröder-Butterfill, eds. 2004. *Ageing Without Children: European and Asian Perspectives*. Oxford, Berghahn, pp.1-48.

KREAGER, P. (2006), "Migration, Social Structure and Old-Age Support Networks: A Comparison of Three Indonesian Communities", *Ageing and Society* 26: 1, 37-60.

KREAGER, P. and E. SCHRÖDER-BUTTERFILL, (2008). "Indonesia Against the Trend? Ageing and Inter-Generational Wealth Flows in Two Indonesian Communities", *Demographic Research* (Special Issue on Strong Family Ties), 19:52, 1781-1810.

KREAGER, P. and E. SCHRÖDER-BUTTERFILL, (2010), "Age-Structural Transition in Indonesia: A Comparison of Macro- and Micro-Level Evidence", *Asian Population Studies* 6:1, 25-45.

KREAGER, P. and E. SCHRÖDER-BUTTERFILL (2015) "Differential Impacts of Migration on the Family Networks of Older People in Indonesia: A Comparative Analysis", In: L. A. Hoang and B. Yeoh, eds. *Transnational Labour Migration, Remittances and the Changing Family in Asia.* London: Palgrave MacMillan, pp. 165-193

KREAGER, P., B. WINNEY, S. ULIJASZEK, and C. CAPELLI, eds. (2015), *Population in the Human Sciences: Concepts, Models, Evidence.* Oxford: Oxford University Press.

KROEKER, L. (2017) "Low fertility and secret family planning in Lesotho", in P. Kreager and A. Bochow, eds., *Fertility, Conjuncture, Difference: Anthropological Approaches to the Heterogeneity of Fertility Declines.* Oxford: Berghahn, pp. 247-278.

LEE, R. (2003), "Rethinking the evolutionary theory of aging: transfers, not births, shape senescence in social species", *Proc. Natl Acad. Sci.* 100 (16), 9637-9642.

LEE, R. and D. REHER (2011), eds. *Demographic Transition and Its Consequences, Population and Development Review*, 37 (Supplement), 1-275.

LESTHAEGHE, R. and L. NEIDERT (2009), "US presidential elections and the spatial pattern of the American second demographic transition", *Population and Development Review* 35 (2), 391-400.

LIVI-BACCI. M. (1982). "Social group forerunners of fertility control in Europe", in A. Coale and S. C. Watkins (eds.) *The Decline of Fertility in Europe,* Princeton: Princeton University Press, pp. 182-200.

NIEHOF, A. and LUBIS, F. (2003). (eds). *Two is Enough: Family Planning in Indonesia under the New Order (1968-1998).* Leiden: KITLV Press.

NOBLE, D. (2006), *The Music of Life: Biology beyond Genes.* Oxford: Oxford University Press.

PAULI, J. (2017), "The key to fertility: generation, reproduction and class formation in a Namibian community", in. P. Kreager and A. Bochow, eds., *Fertility, Conjuncture, Difference: Anthropological Approaches to the Heterogeneity of Fertility Declines.* Oxford: Berghahn, pp. 43-71.

PETIT, V., K. QURESHI, Y. CHARBIT, and P. KREAGER (eds.). (in press) *The Anthropological Demography of Health.* Oxford: Oxford University Press.

PIKETTY, T. (2104). *Capital in the Twenty-First Century.* Cambridge, Mass: Belknap.

POOL, I., L. WONG, and E. VILQUIN, (2006), *Age-Structural Transitions: Challenges for Development.* Paris: CICRED.

RANDALL, S. (in press). "The tensions between comparability and locally meaningful data", in Petit, V., K. Qureshi, Y. Charbit, and P. Kreager (eds.) *The Anthropological Demography of Health.* Oxford: Oxford University Press.

RANDALL, S., E. COAST, and T. LEONE. (2011). "Cultural constructions of the concept of household in sample surveys", *Population Studies* 65 (2):217-229.

SCHNEIDER, J. and P. SCHNEIDER. (1996). *Festival of the Poor: Fertility Decline and the Ideology of Class in Sicily, 1860-1980.* Tucson: University of Arizona Press.

SCHRÖDER-BUTTERFILL, E. (2004). "Adoption, patronage and charity: Arrangements for the elderly without children in East Java, in P. Kreager and E. Schröder-Butterfill, eds. *Ageing without Children: European and Asian Perspectives*, Oxford: Berghahn, 2004, pp. 106-146.

SCHRÖDER-BUTTERFILL, E. (2005). "The impact of kinship networks on old-age vulnerability in Indonesia". *Annales de Démographie Historique,* pp. 139-163.

SCHRÖDER-BUTTERFILL, E. 2015. "Networks, Strata, and Ageing: Towards a Compositional Demography of Vulnerability". In Kreager, P., B. Winney, S. Ulijaszek and C. Capelli, eds. *Population in the Human Sciences: Concepts, Models, Evidence.* Oxford: Oxford University Press, pp. 257-291.

SCHRÖDER-BUTTERFILL, E. and P. KREAGER, (2005). "Actual and *de facto* childlessness in old-age: evidence and implications from East Java, Indonesia, *Population and Development Review* 31: 1, 19-56.

SCHRÖDER-BUTTERFILL, E. and P. KREAGER, (2018) Gendered support for older people in Indonesia: A comparative analysis. In *International Handbook of Gender and Demographic Processes*, N.E. Riley and J. Brunson, eds. Springer: New York, pp. 247-266.

SCHRÖDER-BUTTERFILL, E., P. KREAGER, T. SYAWILA FITRY, and V. PRIANTINA DEWI) (2018) *"Gendered Support for Older People in Indonesia: A comparative analysis"*, In N.E. Riley and J. Brunson, eds., *International Handbook of Gender and Demographic Processes*, New York: Springer, pp. 247-266.

SCHRÖDER-BUTTERFILL, E. and R. MARIANTI, (2006) eds. *Understanding Vulnerabilities in Old Age: Ageing and Society, Special Issue:* 26, 1: 9-35.

SCHRÖDER-BUTTERFILL and T. SYAWILA FITRY, (2012). "Care dependence in old age: preferences, practices and implications in two Indonesian communities", *Ageing and Society* 34, 3:361-387.

SRIONO, E. (1992). Pengangkatan Anak di Bangkalan, Madura. *Working Paper Series 'Bidang Kajian Madura'.* Universitas Jember: East Java.

SZRETER, S. (1984). "The genesis of the Registrar-General's social classification of occupations", *British Journal of Sociology* 34: 522-46.

SZRETER, S. (1996). *Fertility, Class and Gender in Britain, 1860-1940.* Cambridge: Cambridge University Press.

SZRETER, S. (2011). "Theories and heuristics: how best to approach the study of historic fertility declines?" *Historical Social research/Historische Sozialforschung,* 36 (2), 65-98.

SZRETER, S. (2015). 'Populations for studying the causes of Britain's fertility decline: communication communities', in P. Kreager, B. Winney, S. Ulijaszek and C. Capelli, eds., *Population in the Human Sciences: Concepts, Models, Evidence.* Oxford: Oxford University Press, pp. 172-195.

SZRETER, S., ed., (2019), *The Hidden Affliction: Sex, Disease and Infertility in History.* Rochester: University of Rochester Press.

SZRETER, S., SCHOLKAMY, H. and A. DHARMALINGHAM eds. (2004). *Categories and Contexts: Anthropological and Historical Studies in Critical Demography.* Oxford: Oxford University Press.

VAN DER SIJPT, E. (2017). "Accounting for reproductive difference: sociality, temporality and individuality during pregnancy in Cameroon", in. P. Kreager and A. Bochow, eds., *Fertility, Conjuncture, Difference: Anthropological Approaches to the Heterogeneity of Fertility Declines.* Oxford: Berghahn, pp. 193-217.

VAN DER STERREN, A., A. MURRAY, and T. HULL (1997). "A history of sexually transmitted diseases in the Indonesian archipelago since 1811", in M. Lewis (ed.) *Sex, Disease and Society: A Comparative History of Sexually Transmitted Diseases and HIV/AIDS in Asia and the Pacific.* Westport, Conn.: Greenwood, pp. 203-30.

WATKINS, S. (1987). "The fertility transition: Europe and the Third World compared", *Sociological Forum* 2, 4: 645-673.

Notes

[1] Beginning, of course, with Coale (1969) and more recently Lesthaeghe and Neidert (2009). Chesnais (1992) provided the first framework showing how variant national types might be compared. On post-transitional diversity, since Calot and Frejka's influential synthesis of trends in low fertility countries (2003), a vast literature has developed, not only on variation but on serious limitations in the units and measures employed (e.g. Goldstein 2009). Evidence of variation in societies prior to transition is necessarily limited in Europe by reliance perforce on parish data before 1840, and in the developing world by a general lack of data in the colonial era. Even so, syntheses of local studies quickly established TFR levels varying between 3.5 to over 9 (e.g. (Campbell and Wood (1988) and Livi-Bacci1982) The combination of historical and anthropological demography has led to many fruitful local studies (e.g. Kertzer, 1984; Schneider and Schneider, 1996; Pauli, 2017), and likewise to the linkage of social history and historical demography (Szreter, 2011).

[2] Piketty (2014) recently has put great stress on demographic transition as a background factor making rentier elements more powerful as population growth slows and ageing proceeds, although the macro-level focus of his analysis precludes attention to variations.

[3] Thus, for the Indonesian communities from which case studies are drawn later in this article, we show how three overlapping types of kin networks provide a changing core of support which enable individuals and groups to adapt to needs across the life course. These networks are simultaneously engaged in a wider division of labour in which the networks of richer and poorer families are related. For example, the rich, in one of the communities, can draw on the poor to do most local agricultural labour. This, in turn, frees up time and capital for the rich to build and extend several further networks: migration streams that bring greater wealth to them in the community; greater access to community institutions (local government, education, religious institutions) and the power and influence that come with them; and generational ties grounded in property and social status. Poorer groups, in contrast, remain poor because access to such adaptive ties, and the capacity to use them to advantage, remain unavailable to them. Of course, not all better-off members of the community succeed equally, and there can also be downward social and economic mobility. In this way we can see how wider social structures are differentiated by the flow of network relationships.

[4] In contrast, the need to structure evolutionary theory by population levels, together with emphasis on relations between constituent sub-populations, has, from the later 19th century, been developed extensively, embracing genetics, ecology, physiology, and other fields of population biology (Noble, 2006; Kreager et al., 2015).

[5] This approach places random sampling and survey design in the context of prior and continuing ethnography (including in-depth interviewing, observation and compilation of networks, and so forth). The multi-site strategy allows comparison of different adaptations to an evolving national economy which, whilst not representative in a strict sense, provides sustained study of variation in population structures and their social and economic correlates. The approach might be called 'phase 2 anthropological demography'. Phase 1, so to speak, is excellently reviewed in several publications (Kertzer and Fricke, 1997; Basu and Aaby, 1998; Greenhalgh, 1994). It focussed on defining the elements of an anthropological critique of transition theory and of its methodology. It is hoped that the current work represents a unified (if preliminary) quantitative and qualitative methodology able to inform demographic practice more generally. The approach draws additionally upon current innovative research, notably by Johnson-Hanks (2015, 2017), Petit et al. (in press, and Szreter (1996: 2015).

[6] Contrast may be made here to stratification models developed in the context of 'top-down' European administrative systems, in which occupational or other typological criteria classified in advance are applied to previously established local administrative areas. Szreter (1984) provides a classic case study of the kinds of problems such models generate.

[7] Research commenced in 1999 with the Wellcome Trust's support *(Ageing in Indonesia 1999-2007)*, further assisted by the British Academy, and currently continued as part of a wider study under generous grants from the Australian Research Council (*Understanding Social, Economic and Health Vulnerabilities in Indonesia,* led by Lyn Parker), and the U.K Economic and Social Research Council. The authors are grateful to Edi Indrizal, at Andalas University, Padang, and Haryono, at the Center for Health Research, University of Indonesia, for their contributions to the first phase of field research in West Sumatra and West Java, respectively.

[8] All three village names, as also those of individuals in case studies later in this paper, are pseudonyms.

[9] Participation also includes the influence of the intensive national family planning programme of the Suharto government, particularly in the 1970s and 1980s. Niehof and Lubis, in their review of the programme, its effects, and contexts (2003), credit it with the decline of fertility from a national TFR of 5.5 to 2.6; with their fellow contributors, however, they also remark the continuing importance of infertility, local practices that already facilitated family limitation, and the tendency of declines to stall by the 1990s. As TFRs for East Java given later in this paper confirm, rates between 4 and 4.7 in the 1960s indicate that significant areas had relatively lower fertility before the programme.

[10] Demographers have remarked the tendency of survey units and questions, for example, to predispose people to certain answers and to preclude evidence of major local relationships and categories (e.g. Blacker, 1994; Randall in press; Randall, et al. 2011)

[11] A few further remarks may perhaps be added on the role networks in building and differentiating socio-economic status, since they also cut across levels. Network dynamics are the day-to-day relationships that build or vary property and reputations, thus demarcating people of different levels and relative status within them. Usually only some members of a kin network will be in the higher status groups. Although there are cases of social mobility in which particular members and households rise or fall – sometimes dramatically -- from one level to another, a major general finding of the research is that network dynamics tend to reinforce extant economic and social status differences. Abstract kindred networks often include both poor and rich households, i.e. networks do not rise or fall as a whole, and differences between socio-economic levels are reinforced by the fact that, out of a whole abstract kindred only some are involved in proximate, material support relationships. The abstract kindred may be broken down into a number of proximate and immediate kindred networks that serve the interests of different sets of kin at different levels in the status hierarchy. Kin at higher status levels are more likely to be involved in exchange relationships with other higher status members. This does not mean that support cannot flow to less well-off members, but such flows are the exception, not the rule. Members of poorer levels generally do not seek direct support from their better-off kin, as such solicitation is seen as shameful. Often the help which the better-off provide to poorer kin is disguised in various ways – for example, as payment for (possibly imaginary) services provided by poorer members (see Schröder-Butterfill, 2005).

[12] Anthropologists' and historians' previous attempts to devise socio-economic stratification schema for rural Indonesia were based chiefly on landholdings, which in the current economic setting is no longer adequate. That said, their work also arrived at a schema distinguishing four sub-population levels, and as landholding remains a significant part of local economies, our framework could be considered a further development of the earlier attempts (See Kreager, 2006).

[13] A general statement of how open and closed population models have both become necessary to explanation in demography and other population sciences is given in the introduction to *Population in the Human Sciences: Concepts, Models, Evidence* (Kreager, et al. 2015).

[14] As presenting case study and related material from all three field sites for all points of argument would greatly lengthen this paper, in the following pages evidence is drawn from one or another of the sites, as appropriate.

[15] Arguably there should be little cause for such surprise here. The pattern in which the better-off have significantly higher fertility, and it is the poorer strata who take up abortion and contraception in light of the uncertainty of their circumstances, is documented, for example, in Africa (e.g. Pauli, 2015; van der Sijpt, 2015; Kroeker, 2015). Over a longer period, the European marriage pattern from the 16th to the early 19th century reflected insufficient economic niches available to poorer strata, with strong impacts on reproduction: 12-20 per cent not marrying over long periods, and significant delays in marriage (Hajnal, 1982; Kreager, 2004). As Hajnal noted, this pattern returned as a major factor in late 19th-century fertility transitions across Europe (Hajnal, 1965).

[16] A model for the comparative study of vulnerability is presented in Schröder-Butterfill and Marianti (2006).

[17] Kreager (2004). The much less attention which demographic research has given to pathological sterility in the West appears to be one dimension of that stigma (Szreter, 2019).

[18] The elementary fact that children are not distributed uniformly across constituent groups in a population also carries major implications for a further prominent demographic approach, closely associated with the study of age-structural transitions. Population ageing is, of course, both a consequence of, and a potential influence on, fertility. Research and policy addressed to 'demographic dividends' or 'windows of opportunity' (Bloom et al., 2003; Pool et al., 2006) address the growing intergenerational imbalance between relatively large older generations and smaller younger ones in terms of cohort sizes and dependency ratios. However, macro-level analyses employing these population units and measures do not take into account variations in childbearing at the several meso sub-population levels. Nor do they include the processes that redistribute children that arise in the interaction of socio-economic levels and network dynamics that we have been considering. As Tables 1 and 2 demonstrate, dependency ratios on their own cannot account for the many other factors that shape child availability. At least in the Indonesian case, such variation has important implications for the adequacy of 'dividend' models as a guide to policy (Kreager and Schröder-Butterfill, 2010), and particularly as such models neglect gender differences (Schröder-Butterfill et al., 2018).