

Elders as Consumers and Producers of Unpaid Care Work in the Asia-Pacific Region –

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1. Introduction

The Asia-Pacific region is aging rapidly. Old age often comes with declining health, with varying degrees for each individual, but the end result is that as we age we often require the care and help of others, much more than when we were in peak working ages. This care can be healthcare provided by professionals such as doctors and nurses, but often the care is less intensive and is provided by unpaid family caregivers. Elders may need help with activities of daily living such as feeding and grooming themselves, or managing their households, or it may be more intermittent activities such as monitoring if elders are able to take care of their finances or manage medical conditions. Good care of this type enables elders to maintain their health and independence and have a good quality of life. In the face of population aging, many policymakers, advocates for elderly persons, and other stakeholders are trying to understand how care needs will change in the future, and specifically whether a “care crisis,” where there are many elders whose care needs might not be met adequately, is on the horizon.

To begin to answer this question, we can look to data on current patterns of the consumption and production of care. Current patterns can then be projected into the future to see how we expect care demand and supply to change. This paper will do that for one type of care – unpaid care work performed by unpaid family and community caregivers. Certainly market-based suppliers of care play an important role in the overall care economy, and an understanding of the overall care economy is the long-term research goal, but the building blocks of that project involve documenting current patterns of care in all spheres. This effort contributes to that documentation for the unpaid care work economy and can be combined with future work on the paid care economy and how they interact.

The focus of this work is further specified by confining its geographic scope to the Asia-Pacific region. The unpaid care work economy is going to have specific features in this region because it is home to many countries that are “getting old before they get rich.” While overall Europe is the oldest region of the world, it is also among the wealthiest and thus European governments have more resources and potentially more flexibility to meet care needs through a combination of paid and unpaid providers. The Asia-Pacific region, on the other hand, is aging rapidly but with likely fewer resources relative to its population size compared to Europe and thus may than be less able to meet care demand through paid care.

Given the importance of focusing on unpaid care work in Asia-Pacific countries, the first objective of this project is to document patterns in the region of unpaid care for older persons. Time use surveys (TUS) provide the data necessary to establish how much unpaid care older persons consume in terms of units of time. To estimate the market value of unpaid care consumed, that time can be weighted by imputed replacement wages that would be earned if the person providing the care was an “average” market provider, although this paper will focus only on the time-valued estimates.

The National Transfer Accounts (NTA, www.ntaccounts.org) project is an international research network focused on understanding the age dimension of our economies and it is making a contribution to the understanding of unpaid care work through the development of National Time Transfer Accounts (NTTA). NTA are empirical estimates of how countries produce, consume, save, and share market-based resources by age and NTTA create the same empirical estimates for non-market unpaid care work. Furthermore, as unpaid care work has been traditionally thought of as “women’s work,” NTTA estimates are disaggregated by sex so that we can understand the gender dimension of the production and consumption of unpaid care work. The countries that have these estimates available in the Asia-Pacific region are India, Mongolia, Thailand, Bangladesh, Turkey, and Vietnam.

The second objective of this project is to go into greater detail on unpaid care for older persons than just the consumption and production by age and sex. Specifically, we aim to examine the complete matrix of unpaid care work transfers between groups by age and sex, to understand who is providing care for whom by gender and generation. That is possible for a sub-set of the countries for which we can look at the marginal consumption and production of care by age and sex.

In a context of global population aging, estimates of eldercare are relevant to nations seeking to understand what eldercare is likely to be needed in the future. Thus the third objective of this project is to use our estimates to project the demand and supply of care for older persons in the face of changing population age structures. These projections indicate whether, if age patterns of care production and consumption stay the same but the population age structure changes, there will be a mismatch between the supply of and demand for unpaid care work in the future.

The paper ends with a review of the results and a discussion of policy insights.

2. Data and Methods

2.1. NTTA Overview

National Time Transfer Accounts follow in a longstanding tradition of social scientists who have critiqued standard measures of economic activity for various reasons, one of which has been that they leave out unpaid care work (Economist, 2016; Waring 1999). National accounts (United Nations, 2009), the system of cross-country comparative estimates of economic flows that is the basis for such well known economic aggregates as Gross Domestic Product, include some flows but exclude others. Specifically, national accounts cover flows that arise from the production and consumption of goods and services that are traded in a market for money, usually referred to as “market goods and services.” They do not consist exclusively of market-traded goods and services, however, as they do include some flows that are not traded in markets for money. The value produced by owner-occupied housing consumed by those living in that housing is included, as are some types of financial transactions and services that are not bought and sold in markets. Because these flows are not traded, economists and accountants have developed methods to measure indicators of these flows and thus impute their value in national accounts (U.S. Bureau of Economic Analysis, 2008). The production and consumption of goods produced by households for their own use, mostly the value of food grown by a household for its own consumption, is another kind of flow that is not traded in a market but whose value is imputed into national accounting measures of total production and consumption. What is not included in the national accounts production boundary? The value of home-produced services.

This aspect of economic life has been referred to by many names: unpaid care work, household production, unpaid household services, and others. I will use the term “unpaid care work” here. Unpaid care work (UCW) time inputs include productive activity by persons that is not already accounted for in national accounts.¹ UCW includes time spent in both direct care activities such as taking care of children, elders, sick or disabled persons, and of the community through volunteer activities, but also the indirect care activities of managing and maintaining a household. Cooking, cleaning, household management and maintenance are some of the activities included as indirect care activities.

While many researchers and advocates have noted for years that UCW is a valuable economic activity, we have finally reached the point where statistical agencies and international measurement and monitoring bodies such as the ILO and the UN explicitly include it in their work plans, goals, and reporting. The United Nations includes the recognition, reduction, and more equal sharing of unpaid care work as items in its set of sustainable development goals related to gender equality (<https://sustainabledevelopment.un.org/sdg5>). See also International Labour Organization (2018). While this is certainly progress, we are still decades away from having the kind of consistent, comparable data across countries on UCW that we have for measures like GDP and market labor force participation. In the meantime, we can create these measures for ourselves following the long-standing methodology that researchers have developed to estimate the production of UCW, by using time use surveys to gauge how much time people spend in this type of production (Landefeld et al., 2009; Abraham and Mackie, 2005).

What the NTTA approach brings to this methodology is a framework that explicitly acknowledges the role of age in determining much of the variation in UCW production. As UCW is largely driven by the lifecycle processes of birth, marriage, household formation, aging, and death, a focus on the age dimension is necessary to understand UCW and make intelligent policies that address it. Much work on UCW has focused on just one particular age group with a very wide age band, often those in their peak working or childbearing ages, rather than focusing on how UCW patterns change by age. Indeed, in some countries where age-dependent phenomena like marriage happen at very specific ages, any banded age group averages may obscure much of the UCW patterns we seek to understand.

In addition to an improved focus on age, the NTTA approach allows us to see the whole system of exchange of UCW between persons, however, not just production. To get the other side of the exchange, we can apply the National Transfer Accounts framework (Lee and Mason, 2011; United Nations, 2013), which has an existing methodology for imputing the consumption of market goods and services to individuals. Applying this methodology to unpaid care work services reveals the same system of transfers between persons in the UCW economy that NTA has revealed in the market economy – young and old in different countries and regions have different levels of “dependency” relative to the productive capacities of peak age workers, and those workers provide for the needs of young and old dependents in different ways and with different generational arrangements. What we use here is a hybrid methodology – combining traditional methodology to estimate household production satellite accounts with the NTA framework to impute consumption and transfers. This hybrid methodology is

¹ The aspect of UCW as produced “by persons” is important as it separates this work from other critiques of what has been left out of national accounting. One of the most significant of these is that national accounting does not include the value of the earth’s natural resources or the flow of services it provides, such as producing clean air and water.

called National Time Transfer Accounts (NTTA) and has been developed by the Counting Women’s Work project (www.countingwomenswork.org; National Transfer Accounts, 2017). Its strengths are that it brings a greater focus on the age dimension of UCW than previous research, making it amenable to the study of UCW in aging societies, and that it includes methodology to impute UCW consumption which would be much harder to observe directly.

2.2. NTTA Production Estimates

To produce NTTA estimates, we follow in the long-standing research tradition behind household production satellite accounting (Pan American Health Organization, 2010). The methodology requires time use survey data, such as a time diary survey where respondents tell survey takers what activities they engaged in over a certain time period and these activities are coded using a comprehensive coding scheme. Another type of time use survey data that is available is a comprehensive set of questions about how much time respondents spent on each of a set of specific activities. If the set of activities asked about are sufficiently detailed, then a full set of UCW activities and a comprehensive picture of UCW can be obtained.

We want NTTA to include activities that would be included in national income if they were performed for wages instead of by non-market labor. One way to determine if an activity meets this standard is the “third party criterion”: you can pay someone else to do it and still receive the benefit from it (Reid, 1934). Activities like sleeping, eating, sports and leisure activities would not be included, as paying someone to do these things would actually not give you the benefit of them. Any home management or care activities, on the other hand, would qualify by the criterion as you could pay someone to do them and benefit from the service. Another way to think about which activities to include is that they must not be recorded as part of national income as currently constituted but could be if they were contracted for instead of unpaid.

Separating and defining different activities is an important part of the methodology, and there are many different ways to classify activities. The countries in this study use different classifications, adapted to their own context and needs. The coding schemes and which activities qualify as UCW for each of the included countries are available in an appendix. There is variation across the countries included in how detailed they can be when accounting for care. Commonly, surveys distinguish between childcare and all other types of care. This reduces analytical power for studying eldercare, but fortunately we still have the age of the producer of the care, and the household structure, to give us clues on whether care is being produced or consumed by an elder.

Once all UCW activities have been identified, we can estimate the average time spent by each respondent in each type of UCW. Keeping these estimates separate by age and sex means we can focus our attention on elders and also acknowledge the historical division of labor between men and women – there is no country in the Counting Women’s Work project where women are not the main suppliers of UCW. As such, an “average” that is not gender disaggregated is bound to be misleading. We do smooth the sex-specific age schedules of care production with a cross-validation smoother called Friedman’s Supersmoother (Friedman, 1984), to reduce sampling noise and make figures easier to view.

A final note on estimating UCW production involves “multitasking.” Some surveys try to evaluate the extent to which people are doing more than one activity at a time. They may query respondents to see if any activities were being done simultaneously, or if there was a secondary activity the respondent was

also doing at the time they reported the first activity they indicate, or focus on a particular type of multitasking, such having supervisory responsibility for young children while also engaged in another task. Unfortunately, the variation in accounting for multitasking in the surveys means that they are not very comparable from country to country, so they will be left out of this analysis and only the primary activity indicated will be examined here. However, research that does include multitasking suggests that it is of large magnitude (Folbre, 2018). Most of this research focuses on the multitasking with care of young children, but it could also be significant with eldercare. Hopefully time use surveys in the future will come to an accepted instrument to measure multiple activities and future research will be able to include it in cross-country comparative work.

2.3. NTTA Consumption Estimates

We do not directly observe people consuming the value of the time that is documented in the NTTA production account. Instead, we use assumptions to allocate the value of that time to consumers in the household.

For general housework activities within the household (cooking, cleaning, household management and maintenance, etc.), also called “indirect care,” the time produced is divided equally among all household members. For example, a household with four members has a time use survey respondent who reports producing one hour of cooking on the survey day. The consumption of cooking time for the four people in this household on this day, including the survey respondent, is assumed to be fifteen minutes each. This makes the most sense theoretically because the consumption of these activities is mostly uniform across the household, or at least the data to make finer consumption distinctions such as which family member consumed how much at each meal, or how many hours each household member spent at home, is not available.

For direct care activities within the household, (childcare, adult care, or eldercare), we know this equal allocation would not be reasonable. The very young and very old consume much more in direct care than those in mid-life. For this reason, we use a regression approach, that exploits household structure to create weights to apportion the amount of direct care produced in a household.

Specifically, if households are observed to each produce some amount of childcare, we can estimate a household-level regression model on the survey data for each producer of direct care where we regress that producer’s amount of childcare produced on the number of household members in each child age/sex group. The regression coefficients on each age and sex group then become weights that can be used to apportion the household amount of childcare that is produced in each household by each time use respondent to each child in that household. Similarly for adult care, we can regress the household production of adult care by each time use respondent and the number of adults in each age/sex group. Note that for either type of care, the producer of the care is not included in the regression estimation even if he or she is in the target age group because he or she is not a potential target of the care. (The coding of self-care is different in all activity schemes from care for other persons.) This regression approach is somewhat limited in that it works by detecting the variability between households of different age and sex composition and cannot detect differences within households where individuals of similar age and sex may actually receive different levels of care. This is most relevant as regards to the sex differences in care consumption estimates. Our ability to detect different amounts of care given to

close-age males and females sharing the same household is minimal. Overall, then, our estimates here of sex differences in care consumption must be considered a lower bound.

To be more specific about the regression method for imputing consumption, a regression equation is estimated for each potential care producer (that is, for each household member who was asked to fill out the time use survey questionnaire) and for each type of direct care as follows:

$$X_j = \sum_a \sum_s \alpha(a, s) E_j(a, s) + \varepsilon_j$$

where X_j is the amount of a particular type of direct care time produced by survey respondent j , $E_j(a, s)$ is the number of members age a and sex s in the household of the survey respondent where those household members are “enrolled” in the care target age group, i.e. they are in that age group. Age a is grouped in 2-year groups to reduce noise. The regression coefficients pick up the extent to which more care of a particular type is produced in households that have more members in a particular age/sex group. The positive $\alpha(a, s)$ coefficients that come out of the regression are then assigned to the relevant age groups and used as weights to distribute the producer’s time produced to household members as consumption.

For time caring for persons outside of the household, we impute the production as consumed by all persons in the target population, using the age profile of consumption of care provided to household members as weights. In effect, we assume that care provided by non-household members is consumed in the same relative amounts as when care is provided by co-resident household members.

Once all of the production is imputed to consumers, producing the age- and sex- profiles is a matter of taking the age- and sex-specific average amounts of the persons in the time use survey. We smooth the sex-specific consumption schedules by age just as for the production schedules.

2.4. The necessity of household structure data

In the previous section, the imputation of consumption of UCW was shown to lean heavily on household structure. For some time use survey data, that is not a problem because, while you may only have data on the time use production of some members of a household, the survey takers also collected the complete roster of household members by age and sex.

For other time use survey data, the full household roster may not be available. This is the case for Bangladesh and Thailand in the set of countries included in this study. For those cases, an alternate source of household structure data was used: census samples available from the IPUMS International Database (Minnesota Population Center, 2018)². These samples provide complete listings of household members by age and sex which can be combined with the time use data on production of UCW activities. The combining is done by identifying as many matching variables in the time use survey and census sample as possible – age, sex, household size, relationship to household head, marital status, education and any other variable which is asked in a similar enough way between the two data sources to be a match. The average amount of production of UCW activities is calculated from the time use

² The author wishes to acknowledge the statistical offices that provided the underlying data included in IPUMS International making this research possible: Bangladesh Bureau of Statistics, Bangladesh; and National Statistical Office, Thailand.

survey in cells defined by all categories of the matching variables and then imputed onto individuals in the census sample with the same categories of the matching variables. This puts the time use production estimates for Bangladesh and Thailand into a context where the full household roster is available and makes it possible to estimate consumption of UCW time. An alternative method would be to “hot deck” the imputation, but that is less necessary in this case because we are focused on average production and consumption and do not need to preserve data on the degree of variability of unpaid care work around the average production estimates.

2.5. NTTA Transfers

We make the simplifying assumption that UCW time is consumed at the same time it is produced, therefore total production of UCW time must equal its total consumption and no net transfers are possible. This is true for the population as a whole but not for any individual or group with the population. To estimate transfers, we distinguish between indirect and direct care.

For direct care, all production is consumed by others, so the transfer outflow of direct UCW equals the production and the transfer inflow of direct UCW.

For indirect care activities like general housework, because we make the assumption that all indirect UCW benefits all individuals in the household equally, a producer does transfer all of his own production of indirect UCW but rather consumes some of it himself. The transfer outflow is therefore the portion of the production the producer does not consume herself, and the transfer inflow is the portion consumed that the producer did not produce herself.

2.6. Further Analyses Possible with Microdata

Thus far, we have discussed producing sex-specific age schedules of the production and consumption of UCW. These will be compared with similar schedules of time spent in paid work, to demonstrate the scale of the “invisible economy” of care relative to that of the more commonly measured market economy. While there is much to discuss in the age- and sex-specific production and consumption averages, at the same time these marginal views obscure much rich data. With estimates of production, consumption, and transfers as part of a complete household roster, we can see not just the average of who worked and who consumed, but also the complete matrix of who, by age and sex, provided care for whom.

These matrices can be estimated and graphed with 3D or “temperature” plots to show the care system in a given country. They reveal how much intergenerational care transfers there are between grandparents and grandchildren, or adult children and frail elderly parents. They also show the extent to which elders are providing care for other elders, and whether that pattern has specific gender dimensions.

2.7. Projection Techniques

2.7.1. Basic Scenario, “Only Population Age Structure Changes”

Once we are grounded in the empirical facts of the current UCW economy, we wish to then imagine how that economy might shift in the future. One way to do that is with the thought experiment “what if the

care economy stayed as it is currently in terms of the average production and consumption by age and sex, but the numbers of people in those categories changed?” This is a straightforward calculation holding the NTTA production and consumption estimates constant while using a population projection into the future to change the population age and sex structure.

The population projections come from the United Nations World Population Prospects database (United Nations DESA, 2017a) and the “medium variant” projection is used. The estimated population at 2015 is the starting point and the population by age and sex is projected to 2100. These projections continue the trajectory of population aging for most countries, with continuing gradual mortality decline and longer lives, and continuing gradual fertility decline for countries with above replacement fertility levels, and gradual fertility increases to replacement level for countries with below-replacement fertility. In our sample of six countries, all of them start the projection period in 2015 with at or above replacement fertility except Thailand, which starts below replacement. Thus, all countries but Thailand are projected to have gradual fertility declines over the period, and Thailand has a slight increase.

The calculation described above, weighting per capita UCW demand and supply curves by changing populations, creates an unpaid care work support ratio. These types of support ratios are a more empirically informed version of dependency ratios which are just ratios of population age groups. Support ratios have been used extensively to understand population aging’s impact on the market economy by the National Transfer Accounts project (United Nations DESA, 2017b), and suggested for the care economy as well, in other versions (Robine et al., 2007).

Specifically, the calculation for the unpaid care work support ratio in year y ($UCWSR_y$) is as follows:

$$UCWSR_y = \frac{\sum_a \sum_s UCWP(a, s) N(a, s, y)}{\sum_a \sum_s UCWC(a, s) N(a, s, y)}$$

where $N(a,s,y)$ is the projected population count of persons age a , sex s , in year y from the UN WPP database, $UCWP(a,s)$ is the average amount of time produced by persons age a , sex s as estimated using the NTTA methodology for the most recent year available for a particular country and $UCWC(a,s)$ is the average amount of time consumed by persons age a , sex s also estimated as in the NTTA methods, for the most recent year available

The UCWSR is basically a ratio of projected aggregates of production and consumption of unpaid care work, used to represent a future look at supply relative to demand. If the age groups that supply and demand care shift in the future, the market may be out of balance. If there is more projected demand than supply, there may not be enough care available for those in need. If the opposite arises, then time in the future may be freed up for other uses than providing care.

These basic projections are done at different levels, including only care for older persons, or only direct care, or all types of care combined. Each analysis reveals a different aspect of the care economy which may face demographic pressure in the future.

2.7.2. Care Scenarios in which Children Consume More Care

The “only population changes” projection scenario keeps the per-child consumption of care fixed. In many population projections where the base of the population age structure continues to shrink relative

to the older ages, this means that childcare demands will grow more slowly than childcare production, potentially freeing time from childcare that could be used to provide care to a growing share of elders.

This scenario may be overly optimistic, however, because of the evidence of the quantity-quality tradeoff in situations of lower fertility. We observe that lower fertility populations, both across countries and when one country's fertility falls over time, tend to invest more in each child so that the total investment in all children is fairly constant but that each child gets more. To evaluate this potential effect on the future, we will project a scenario based on constant per-child consumption of care and see to what extent it exacerbates any imbalance in the demand and supply in the UCW economy.

Other scenarios are certainly possible to imagine, given the tools created in this work. Future research may be able to consider scenarios of changing disability for older persons, changing participation in paid work, or changing policy around pensions, retirement, and support for market or family caregiving.

3. Results

3.1. Measuring the UCW Economy

3.1.1. Work time by type

To begin the discussion, we refer to Figure 1.1. This figure shows, for each of our six countries in Asia, smoothed lines for the average amount of time spent on unpaid care work or market work, in hours per week. Market work, shown as a dashed line, includes time spent earning wages, but also time spent working for a household-owned enterprise or farm, even if the person did not receive a wage for this work. Such unpaid family workers in market-based enterprises are already considered in many statistical systems as market workers and their production is imputed into existing national accounting frameworks. The estimates also include time related to market work, such as commuting time or time spent looking for work. The unpaid care work estimates, shown as solid lines, include time spent providing indirect care, that is doing general housework such as cooking, cleaning, laundry, household maintenance and management, and errands such as shopping and purchasing services for household use. They also include time spent providing direct care, whether that is care for children or adults, or care for the community through volunteering or taking care of non-household members. As mentioned in the methodology discussion, only primary activities are included. Each country's time use survey has some age cut off for children, below which children's data is not collected either from them or through reporting of older household members. It is assumed for the purposes of this analysis that children in these unobserved age groups produce no work at all.

For Bangladesh, Mongolia, Turkey, and Vietnam, we see that for many or most age groups, people are spending as much time producing UCW as producing market work. For India and Thailand, however, market work is much greater at most ages but there is still a large amount of UCW being produced. This finding is significant because it confirms the idea that leaving out UCW from our understanding of "work" renders a large part of the work people do invisible.

For the oldest people, UCW is generally greater than market work, and even in India where market work is greater at all ages, the gap is lowest for the oldest persons, not counting children. This makes the "invisibility" of UCW an even greater blind spot in our view of the working lives of older persons than of

people in the peak market work stage of life. There is broad consistency across countries in the “hump shape” of time spent in both types of work, with more work time in middle ages than for the very young or very old, but there is more variation in the shape of UCW across age groups.

Mongolia, Thailand, Turkey, and Vietnam all have some indication of an “M” shape, where UCW will be less in the ages after the greatest time demands for childcare are past, and before the ages where demands of caring for elderly relatives or young grandchildren begin to increase. This “M” shape contrasts with the idea that there is a “sandwich” generation in the middle that is tasked with the responsibility of simultaneous care of children and aging parents. In these countries, there does not seem to be an indication of a swell in care demand on middle-aged persons.

One note of caution in interpreting these figures and comparing the difference from country to country is warranted, before we move on. There is an obvious issue in interpretation that the time use survey data available for each country comes from different years. Most are recent and from a fairly concentrated number of years, but India is an important exception. The 1999 survey for India is currently the only comprehensive, nationally representative time use survey in India. It has most certainly changed by now, although we can at least note that India’s female labor force participation has not gone up but has in fact fallen since 1999. A new survey has been planned and is being conducted now. The data are tentatively scheduled to be released to researchers in 2020³ so the estimates from the 1999 survey will serve as a baseline to understand how the unpaid care work economy in India has changed over two decades.

Beyond the samples coming from different years, some of the variation from figure to figure for the different countries could be artifacts of different types of surveys done in each country or of different understanding of the survey instrument in different cultural settings. Therefore, it is a more reliable approach to evaluate whether internal patterns of difference within each country – by age, by gender, by type of work – vary across the sample of six than it is to make much of the absolute differences in the point estimates of a particular age/sex group between two countries.

3.1.2. Gender differences in work time by type

As mentioned earlier, part of what we want to understand about unpaid care work is how it fits in with the gendered economy – the system of norms, laws, preferences, and any other social or political institution which influences how men and women and girls and boys participate in economic life. This means setting aside ideas of an “average” person to observe patterns by males and females separately.

Figure 1.2 shows the same information as in Figure 1.1, but with each black line for average work broken out into a line for men in blue and a line for women in red. Market work is still a dashed line, unpaid care work still a solid line. Figure 1.3 highlights the gender differences by plotting the difference between the male and female line for each type of work. Differences are expressed as female minus male estimates, so lines above zero indicate that women are doing more of this work than men, while lines below indicate men are doing more than women.

The lines in Figure 1.3 for UCW (solid green) are generally all above zero at every age (there is a tiny exception for the oldest Vietnamese persons) showing the broad pattern of female specialization in

³ See <https://www.data2x.org/wp-content/uploads/2018/03/Data2x-TUS-Case-Studies-India.pdf> for details.

UCW. The lines for market work (dashed green) are generally all below zero at every age indicating male specialization in market work. The solid black line is the gender difference in total work, and it is the sum of the UCW and market work lines.

Gender differentiation is highest at ages 20 to 40 and lowest at youngest and oldest ages, consistent with the lifecycle process of bearing and raising children which drives the largest level of demand for UCW. This is a significant finding to keep in mind when seeking to understand older persons and work: while the magnitude of gender differences in work is less for the oldest age groups compared to peak working ages, those older persons likely spent their adult lives in a much more gender segregated world and thus will still feel the effects of the gendered economy even if actual work differences are less.

The gendered economy of female specialization in UCW and male in market work is incredibly consistent across countries, but the level of gender differentiation varies. Bangladesh, India, and Turkey showing the largest magnitude of differences between male and female, and thus the greatest degree of gender specialization by sector, and Mongolia, Thailand, and Vietnam have much less. If we consider the widest gap in the UCW versus market work gender differences as an indicator of gender segregation in economic life, then the six countries in order of greatest to least segregated are India, Bangladesh, Turkey, Mongolia, Thailand, and Vietnam. Some of the largest gender gaps in total work in Figure 1.3 (the solid black lines) are in Mongolia and Vietnam, however, indicating that lack of gender segregation is not associated with the “advantage” of less total work.

Indeed, what Figure 1.3 seems to show is three different gender systems for work. In Bangladesh and Turkey, we might say that the picture is symmetric but segregated: women are producing UCW hours in almost the same amounts by age as men are producing market work and similarly with men producing UCW hours in the same amounts as women produce market hours. The gender difference in total work is small in Bangladesh, with women having slightly more total work than men on average when young but it reverses with oldest ages. In Turkey, females’ greater total work is more consistent across age groups. It may be notable that these two countries share the characteristic of being predominantly Muslim with a historical legacy of cultural practices that favored separation of genders for persons not in the same family.

In Mongolia and Vietnam we see a “second shift” pattern where market work looks more gender equal but UCW is quite unequal. These two countries share the characteristic of communist regimes, currently or historically, which emphasized gender equality in market labor force participation, but apparently did not stress the role of worker equality within the household with the same vigor. Similar patterns have been documented in former communist countries in Europe, such as Slovenia and Hungary (Sambt, et al., 2016).

Finally, in Thailand and India, we see what may be a pattern consistent with growing economies that are more amenable to letting women work in the market but still hold very traditional ideas about what work is appropriate for men. Thus, in these two countries women’s work lives look more evenly divided between UCW and market work while men’s work lives are almost completely segregated to market work alone.

It is interesting to note that the fertility levels of each country in the year of the time use survey are not related to the degree of economic gender segregation. Certainly India’s 1999 TFR of 3.38 children per women tracks with its high gender segregation, but Mongolia at 2.64 children per woman is the next

highest in fertility but has far less economic gender segregation than Bangladesh with a TFR of 2.24. Turkey's TFR of 2.07 is close to Vietnam's of 1.96, but their gender segregation is quite different. Thailand at 1.51 TFR is the lowest fertility country in this group of six but not the lowest gender segregation. (Fertility rates are from the World Bank's World Development Indicators database, World Bank, 2017.) This suggests that there is nothing biologically determinative about gender gaps in work, as our role in fertility is the most biologically-determined aspect of our lives. In other words, the gendered economy is not necessitated by biological aspects of childbearing and childrearing, or it would look the same in every country. That may be true for the direction of the difference, with women specializing in UCW and men specializing in market work, but there is great dispersion around that central tendency which comes from different histories and cultures, as well as different policy choices each country has made that affect firms, households, and individuals.

Bringing the focus back to the lives of older persons, we see that in all countries, older persons spend less time working than those in the peak working ages, but they still put in substantial amounts of work. In most of the countries in this sample, the biggest work allocation for persons age 85+ is women doing UCW. India is an exception where we see men doing substantial market work at those ages, and in Vietnam men's and women's UCW is about the same for the age 85+ group. It is also may be important that the "portfolio" of work by sector shifts away from market work and toward UCW. Again a reminder that the invisibility of unpaid care work means invisibility of the economic reality of older persons. Considering the gender differences in work at older ages, we can note that the shift in working life toward more UCW is a larger change for most aging men than for most aging women. Men in many contexts may experience this change as very negative if their culture has strict expectations on what is acceptable work for men.

3.1.3. Including consumption and transfers

We now include the consumption side of the care economy in Figure 1.4, which shows for the first time the age patterns of consumption and transfers of UCW. The production lines in blue of Figure 1.4 are the same as the lines for unpaid care work in Figure 1.1, but now we include estimates of who consumes those UCW services by age. (The scales are different for the two figures as well, so the UCW production lines will not look exactly the same.) The consumption line is shown in green. Because we make the simplifying assumption that UCW is consumed at the same moment it is produced, the difference between the production and consumption lines equal the net transfers of UCW. This is one distinguishing facet of the UCW economy compared to the market economy: in the market economy, instruments exist to so that the time of production does not have to be the same as the time of consumption. We can take out loans to consume today but pay back with earnings from a later time. We can produce today and save our resources through physical or financial resources and use those resources to consume at a later time. UCW services, however, are generally consumed at the moment they are produced – we eat the meal right after it is cooked. Certainly there are small time differences, such as consuming a clean house after it is cleaned, but generally the service is consumed at the moment of production and there is no way to save or borrow UCW other than through informal obligations to transfer with other individuals.

Looking at the green consumption lines, we see that the greatest consumers of UCW are children, but the level of that consumption varies across countries. (Note that the green consumption line merges with the purple transfer line at youngest ages because children are not producing any care themselves.

All of their consumption is a net transfer from older ages.) Vietnamese infants are estimated to consume over 60 hours per week of UCW while Bangladeshi infants consume just over 20 hours per week. Part of this is the mathematics of the consumption imputation – care work produced in a household is divided among the persons in that household, or the children in the household for childcare specifically. Thus, more potential consumers per household, smaller shares for each person. Household structure overall will thus have a significant impact on the consumption estimates, but that is not just artifactual. Households are the major structure through which private transfers flow from net producers to net consumers. Larger household sizes, more household complexity, is partly a strategy to share resources, not just a mathematical fact.

After about age 15, the consumption curves flatten out in most countries. UCW consumption is somewhat higher for older age groups compared to working ages in Turkey, Mongolia, and Vietnam, but there is not much difference in the other countries.

It is important to distinguish consumption from transfers. Age groups that consume care but produce about the same amount will be making no net transfers to other age groups. Individuals in those age groups may be transferring a great deal of UCW services to others, but if net transfers are zero then they are able to produce about the same amount of UCW as others provide to them for their consumption. Children are the only significant receivers of net transfers in any of the figures. Net transfers are slightly positive at the oldest ages (the dashed purple lines cross over from positive to negative at the oldest age groups). So the oldest persons in each country are receiving net transfers but the magnitude is much less than transfers to young children. A final observation on transfers is that adults age 20 to 40 are the largest net producers of UCW time.

What this picture tells us, then is that children are much more costly than elders in terms of UCW time. This is not because elders consume so little care, but rather because elders produce about as much as they consume in UCW time, requiring on average only small net transfers at the oldest ages. This finding would indicate no support for the idea that an aging society is heading for an imminent “care crisis.” It also does not support the idea that the oldest persons in these countries consume massive amounts of care.

I offer these conclusions with great caution, however. Such a result should be examined carefully and will require much replication before it is taken as fact. Other explanations will need to be ruled out. For example, it may be that care for elders is much harder to measure than care for children. Another important qualifier on these results is that they are averages for age groups, which can mask a great deal of difference for groups within the average. This was discussed before in the case of sex: the “average” person does not really exist in a context where so much population-level variability is determined by the sex of the person. There are certainly other characteristics, such as region or urban/rural status of the household, or socioeconomic status, that may also mark sharp dividing lines in the shape of the care consumption age profiles.

3.1.4. Gender differences in transfers of unpaid care work

In the previous section, it seemed as though elders were largely providing for their own care needs, at least on average. We now want to understand how that “average” is influenced by the gendered economy. Figure 1.5 shows the same net transfers line as in Figure 1.4, but disaggregated by sex.

Before we discuss the results, the interpretation of the sex-specific time transfers in Figure 1.5 must be qualified based on the limitations of the methodology. Recall that net transfers are the difference between production and consumption. Sex differences in UCW production come directly from the time use survey where we can observe how people spend their time and also know their sex from the survey data. The consumption estimates come from dividing all housework produced in the household equally among household residents with known age and sex and from numeric methods that devise age- and sex-specific weights to divide direct care produced in the household among those in the household. Thus, these estimates will be limited in detecting UCW if there is within-household sex differences in care consumption among persons of the same age. They will also be limited if there are types of care that might not be recognized as “care” by survey respondents.

Given these limitations, we must interpret the sex differences in net transfers as a “lower bound” on the true difference in transfer for males and females. Even with that limitation, however, we see in all countries women are making net transfers of UCW and men are receiving them. Only in Vietnam is there any age group of men making net transfers of UCW to other age/sex groups. Older women make net transfers of UCW even to the very oldest age group (85+) in most of the countries shown, although the magnitudes are small. Only in India and Vietnam do the oldest women receive small net transfers and no countries show older men making net transfers of UCW.

So, the previous suggestion that there may not be a care crisis in an aging society because older persons largely provide for their own care needs changes based on these results: there may not be a care crisis because older women provide much of older persons’ care. This is a very important finding for aging societies to understand. Population aging is certainly an indicator of many positive trends in reducing mortality and enabling persons to have the number of children they choose when they choose to have them, but it requires adaptation to a new reality. Given older women’s role as an important source of UCW our ability to adapt older population age structures will succeed or fail to the extent that older women keep providing care and experience that care provision as meaningful rewarding work instead of an unending and depleting burden.

Figure 1.6 shows the detail behind Figure 1.5, breaking each line into transfers of direct versus indirect UCW. Direct care work is shown in the solid lines, labeled as “care.” This consists of time spent on direct care for children, adults, or the general community. Indirect care work is shown in dashed lines, labeled as “housework” and consists of cooking, cleaning, household maintenance and management, and other general activities. As in Figure 1.5, work time for men is shown in blue, for women in red. All of the lines shown are net transfers, the difference between production and consumption of UCW. Lines above zero indicate age- and sex-groups who are net receivers of UCW time. Lines below zero are net producers. We see in this figure that males at all age groups including the oldest old are net receivers of housework services, except for a small age range in Vietnam. Women provide these net transfers at almost every age, except the oldest women in India and Thailand. Children receive the most net care, provided mostly by women aged 20 to 40. The largest transfers of UCW at older ages are of housework, going to older men.

Vietnam is the sole exception to the gender segregation pattern, in which men provide significant net care around age 20-30. While intriguing, this result comes from a small scale survey and requires replication in a larger sample in order to be considered a solid finding. (Vietnam is currently planning to add a time use module in one of its large, nationally-representative household surveys.) Early work on

UCW in the Philippines (personal communication with the author) shows some similarities to the patterns in Vietnam, however, with men providing significant amounts of UCW and both men and women in peak working ages focused on market work while younger and older family members take up more of the responsibilities of providing UCW. If this pattern is reproduced in Vietnam and other countries, it is an exciting finding that household systems of care provision across generations and genders can be so very different.

Focusing exclusively on the solid lines for direct care, it is an intriguing result that the lines for men are so close to zero in all of the countries except Vietnam. Not even at age 85+ do we see men and women on average requiring substantial net transfers of care at the population average level. As mentioned previously, this result raises the issue of care measurement: is our thinking about what constituted “care” so different for children versus elders that we are not able to measure them accurately with our current tools? Or are elders generally much healthier and more self-sufficient than we tend to think? If indeed elders’ needs for assistance are more concentrated in housework than in direct care, then that may mean an easier path for policymakers to help fill any “care gaps” with market-based suppliers. It is less expensive to subsidize the provision of housework than of help with more intimate activities such as bathing and dressing, among others (Osterman, 2017).

We are all familiar with stories in the media or from our own lives or communities of older persons requiring constant care from family members, managing their day to day lives, getting them professional care in a health crisis, assisting in activities of daily living on a constant basis. These stories are compelling, but at the population average level, we do not see evidence that this is a pervasive situation. What could explain this? One set of issues to test is methodological: are persons providing elders this type of care simply not coding these activities as “care?” This hypothesis could be examined by comparing results from general time use surveys to those from specialized surveys of older persons such as the Health and Retirement Survey (HRS) from the United States, the China Health and Retirement Survey (CHARLS), or the Japanese Study of Aging and Retirement (JSTAR).

The problem with this method is that those specialized surveys are generally only available in high income countries. For lower- and middle-income countries one possibility is to use the same time use surveys analyzed here, but look carefully at the time use of household members sharing a household with an elderly person. Do we see patterns of time use that could possibly also be care, such as social time spent with the elder, or time spent accessing services which might be for the elder, but the time use instrument is insufficiently detailed for us to isolate those codes? This is an important avenue for future research.

3.1.5. Patterns of direct care by type of care recipient

For this next set of results, only four countries will be shown, as the microdata is available to allow for finer-grained analyses. Figure 1.7 is a two-part figure that shows average production of UCW by type in the top panel, consumption of UCW by type in the bottom panel. Results combine both sexes into one average line by age, with general housework shown in black, and three types of direct care in the other lines: childcare shown in blue, adult care shown in red, and community care shown in orange. “Community” care includes volunteering activities which benefit community members generally as well as direct care activities benefiting persons but those persons are not co-resident household members but also were not coded as being specifically care for children or care for adults.

We see here that indirect care/housework is the major UCW production activity, with childcare less but still visible. Care for adults and community members, however, are barely visible on average. As discussed above, this may be a real finding, but it also is likely affected by measurement differences. People may have a much clearer idea of childcare as a type of work, while care for adults could also be combined with leisure activities. For example, when an adult child visits an elderly father, that time probably combines care for the elderly father with socializing. Depending on how the person considers this time in a survey and how a coder of the survey data considers this time, it might be classified as only a leisure activity. Eldercare is also likely less frequent than the daily duties of childcare, so eldercare measured in a survey will have higher variance than childcare. Older persons consume and produce mainly housework, with only tiny amounts of direct care shown consumed at oldest ages in India and Mongolia.

Figure 1.8 shows net transfers of direct care by type of care, which is the difference between the consumption and production lines in Figure 1.7, but also adds the dimension of sex. We see in all four countries that the magnitude of net transfers of community care and adult care are tiny compared transfers of childcare. We also see that women make net transfers of childcare up to very old ages, although certainly the volume of time transfer is less at older ages than at peak childbearing ages for these countries. Still, it appears that grandmothers are likely an important part of the supply of childcare needed.

3.2. UCW transfer matrices

The previous section ended with an observation about the potential importance of grandmothers as care providers. This implies something about the linkage between care provider and recipient that we can guess at looking at marginal age profiles, but which we can examine explicitly by plotting the complete matrix of care. By matrix I mean a square array where rows and columns represent the age/sex groups in our population and each cell in the array represents a care from persons defined by age and sex group to persons defined by age and sex group.

The four contour plots in Figure 2.1 each represent the complete UCW transfer matrix for each of the four countries for which full survey data was available. For Mongolia and India, a sample of that country's household structure was made a part of the time use survey – for those countries the full household roster by age and sex was available for each household that had a time use respondent. For Thailand and Bangladesh, only the age and sex of the time use respondents was recorded, but there was a great deal of additional data on the household. Using this additional data, time production for each respondent was imputed onto individuals from census samples so that their full household structure was known.

Each country figure is a matrix where each cell represents the average amount of time produced by someone of a particular age and sex that was consumed by someone of a particular age and sex. Note that the average is per UCW producer. Cells shown in red represent an average transfer of more than 4 hours per week. Yellow is for 3-4 hours, green is for 2-3 hours, light blue is for 1-2 hours, and dark blue is for less than one hour.

Along the horizontal axis are the age and sex of the producers, 5-year grouped age bins with males listed first followed by females. Along the vertical axis are the same age/sex bins. Thus, each country figure has four quadrants. The bottom left represents male to male transfers, top right is for female to female

transfers, bottom right is female to male transfers, and top left is for male to female transfers. Along the diagonal are UCW transfers from an age/sex group to the same age/sex group.

Looking across the figures for these four countries, we see Thailand has the lowest volume of transfers of any of the countries. While certainly some of these differences are due to differing time use survey instruments, it is suggestive at least that the UCW economy in Thailand is different from the other countries. One hypothesis to test in seeking to explain this difference is that more of the care economy in Thailand may be involved in market care provision, as opposed to unpaid care work, than in the other countries. We also see in Thailand that the entire left half of the chart is dark blue, the lowest level of transfer, indicating that men are making barely any UCW transfers compared to women.

Bangladesh and India's plots look very similar and, in contrast to Thailand's, show some regions of large transfer volume. As in Thailand, though, these significant transfer volume areas for these two countries are on the right-hand side of the country contour plot, indicating women making the transfers. Some men in Bangladesh are making transfers, but they are small. Transfers along the diagonal of the bottom right quadrant of a plot indicate UCW transfers from wives to similarly aged or slightly older husbands. These reduce at oldest ages but are still large enough to be seen into age groups in their 60s. Mothers make the largest transfers to sons (bottom right quadrant) and daughters (upper right quadrant), as shown by the red areas for transfers to the youngest ages. We also see grandmothers making transfers to grandchildren in the green areas that extend along the youngest age recipient rows out to older age groups for women care providers.

There is some indication that mothers and grandmothers transfer slightly more time to sons and grandsons compared to daughters and granddaughters because the regions of transfers to young boys are slightly larger than for young girls. This could be preferential treatment, or it could stem from boys requiring more care for their more frequent illnesses and accidents. A different explanation could be that this is a distribution effect from techniques of sex-selection causing sex ratios for young children tilted toward boys. If there are simply more boys than girls among babies and young children, then mothers and grandmothers will make greater transfers on average to boys than girls even if the average boy and average girl receive the same average care.

Mongolia seems to have the most diversified UCW system with men making more transfers of care to children and wives and more transfers coming from oldest age groups, indicating that elderly Mongolian men may take a greater role in caring for their elderly wives than men in many other countries. It is a further research question to find out how this might work in practice. Does a couple age together and allocate the caregiving of elderly spouses based on which spouse is physically able to give care and which requires it, rather than strict ideas of the gender-dependent nature of the caregiving role? Is this different than in other countries because of differing patterns of health and disability by sex in Mongolia? Or different marriage patterns, where the wives might not be as uniformly younger than husbands compared to other countries?

The nature of a country's transfer system may have implications for how well the system can respond to changes in the age, sex, and household composition of a society. It may be that a more diversified transfer system like Mongolia's may be more adaptable than what looks like the more restricted system in India. One way to begin to understand how the UCW transfer system may adapt to the future is to project it forward into time. We turn to that type of analysis in the next section.

3.3. Projections of the UCW Economy

3.3.1. Changing populations with fixed UCW system

We have seen in the previous set of analyses how much time societies spend on unpaid care work, as much if not more than they spend on market work. The provision of UCW sustains societies, maintains wellbeing, enables market work, and secures the future of the population through reproduction and the raising of children. Given UCW's vital role, one of the main reasons to study it is to gauge whether or not the supply of UCW will be sufficient in the future. A way to begin is to project the supply and demand for UCW into the future and take their ratio to see if there is any mismatch. We know from the exploration in the previous section that the demand and supply patterns are heavily influenced by age and sex, so a starting point to projecting UCW into the future is to project how our future populations will change by age and sex, combine that projection with our current UCW system, and see how projected demand and supply compare in this imagined future.

Figure 3.1 shows UCW support ratios, that is the various age- and sex-specific schedules of different types of UCW production and consumption (as shown in Figure 1.7, but for a single sex combined), weighted by population projections by age and sex, and compared to one another. This calculation is performed for the production/consumption ratio for six different groupings of types of UCW: all UCW combined, general housework only, direct care only, direct care for children only, direct care for adults only, and finally community care activities. Note that the detailed care sub-type data necessary to include Vietnam and Turkey in the bottom row of graphs in Figure 3.1 for different types of direct care is not currently available.

Each of the six panels shows a different type of UCW support ratio and we see that different types of care production or consumption favor particular age groups and those groups grow at different rates in the projected population. Recall that the per capita age/sex care schedules stay fixed in these calculations to what was estimated for each country in the most recent year in which data were available to compute the NTTA estimates. Thus, Figure 3.1 constitutes a thought experiment: what if the care economy stayed as it is currently in terms of the average production and consumption by age and sex, but the numbers of people in those categories changed? Taking the ratio of production/consumption is a support ratio. Increases in the ratio indicate that a given level of consumption becomes easier to support because there are more units of available supply relative to demand. Decreases mean that the current per capita consumption patterns are not sustainable.

While the overall UCW support ratio is relatively stable over time in all countries, with just a slight increase, this overall UCW stability is achieved because of slight decreases in the housework support ratio but increases in the direct care support ratio. It becomes easier to supply the necessary care over time because children are very expensive in terms of UCW and aging populations have fewer of them. It becomes more difficult over time to provide the necessary care to adults because the average age of the adult care consumer is significantly older than of the adult care producer. Because the net transfers of UCW to adults are so much smaller than to children, however, the overall UCW support ratio is largely unaffected.

What to make of this result? Overall it does not appear that changing population age structures will strain the care provision system, but this may only be the case if childcare and care for elders and adults

can be substituted for one another. The reason the direct UCWSR (panel 3 in Figure 3.1) is only because the time “freed up” through increases in the childcare UCWSR (panel 4 in Figure 3.1) is greater than the decreases in the adults and community UCWSR (panels 5 and 6 in Figure 3.1).

This type of calculation – combining childcare with other types of care – makes the implicit assumption that all direct care is fungible across care recipients. This is a strong assumption. Women in their peak childrearing ages are the main suppliers of care to young children. Will the young women of future generations be willing to switch their care supply from the young children they “didn’t have” to the elderly parents they do have? Those young women will certainly have more education than previous generations of women, with smaller gaps relative to their male peers. They will likely have career aspirations more similar to their male peers as well, which could mean higher female market labor force participation and less time for caregiving.

Thus, even though there does not seem to be an overall demand/supply mismatch, policymakers and those concerned with elders’ wellbeing would do well to keep their eye on data on caregiving for elders specifically.

3.3.2. The UCW system of the future under “quantity-quality tradeoff”

In the previous section, the thought experiment was that the UCW economy is fixed as it is today and only population changes. We now turn to one scenario in which the UCW economy might change along with population change. What if fertility falls and parents, instead of switching their care of children to other types of care, kept the amount of care they produce at the same level but spent more time with each child? We have empirical evidence that this dynamic occurs in terms of both market goods and services and in terms of time when comparing countries in a cross-section (Vargha and Donehower, forthcoming). Countries seem to spend a similar amount on market goods and services and UCW time for all of their children combined, relative to each country’s level of income, which means that parents in countries with fewer children spend more on each child.

How can we model this type of dynamic in the form of UCWSRs? We keep the projected production of direct childcare per caregiver constant, but allow the projected consumption of direct childcare to change so that aggregate childcare produced is equal to aggregate childcare consumed. In this scenario, then, aggregate consumption and production of childcare is always the same, as at the beginning of the projection period, but the per child endowment changes.

Figure 3.2 shows the results of this scenario, a thought experiment of population aging allowing greater per capita investments in children while not increasing overall unpaid childcare demand. So, the fourth panel is a horizontal line at 1.0 throughout the projection period. Now population aging does nothing to decrease the pressure on the care economy by freeing up time in less childcare, so the greater mismatch in eldercare demand and supply over time (panel 5 of Figure 3.2) is seen in the overall direct care support ratio (panel 3 in Figure 3.2). However, direct care as seen in previous charts is a much smaller part of the overall UCW economy than general housework activities. Thus we still have the overall effect on the projected UCW economy in panel 1 of Figure 3.2 that there does not seem to be a looming crisis or coming time crunch in the overall UCW economy even without the substantial time saving that might be realized through population aging reducing relative demand for childcare.

What level of care time increase might children see under a quantity-quality tradeoff scenario? Figure 3.3 shows how much the age profile of childcare consumption would change, for ages 0-18, over time, if the dynamics of the quantity-quality tradeoff were followed. The blue line shows the unpaid childcare consumption age profile at the beginning of the period, the red line shows how that schedule would look in 2050 if it was equal in aggregate to the projected production of childcare, and the green line follows the concept forward to 2075. The magnitude of the care increases under this scenario varies from country to country. Mongolia would see significant gains, more than an hour a day on average, by 2075. Thailand and India much less, and Bangladesh barely any increase in up to 2075.

This scenario, in which caregivers maintain fixed per capita care production schedules but children get more time per child would be one way to achieve a different type of demographic dividend than is usually discussed. The more common notion of demographic dividends is that during the demographic transition from high to low mortality and fertility age structures shift temporarily to favor age groups with greater market productivity, thus raising overall productivity rates and economic growth without needing changes in the underlying technology or market (see UN DESA, 2017a for a discussion). This is often referred to as the first demographic dividend, but there is also the idea of a second demographic dividend where population aging shifts toward age structures with greater savings and wealth, enhancing capital supply and promoting productivity-enhancing investment that make future workers more productive. A quantity-quality tradeoff in investments of UCW may function in a similar way, if the greater per capita UCW time children receive makes them more productive when they eventually enter the market labor force.

This type of demographic dividend, enhanced non-market investment in children's human capital, is generally ignored in the literature. It is paid in time rather than money and it should be investigated further for its potential to ameliorate some of the growth-depressing dynamics of population aging on the market economy. This discussion of UCW support ratios offers a way to explore one type of demographic dividend in unpaid care work, but there are more scenarios that could be investigated. The "freed up time" from relatively fewer time-expensive children can only be spent in three ways: more time for market work, more time for non-work, or increase the per child time investment (as in the quantity-quality tradeoff). All would be welfare improving, but specific tools are needed to judge what the optimal outcome might be and what policy levers could be developed to achieve a particular outcome.

4. Conclusions and next steps

4.1. What have we learned?

This work has been largely descriptive, with the aim of understanding unpaid care work as produced and consumed by older persons in a group of Asia-Pacific countries. The exercise has yielded many insights, summarized as follows:

- Unpaid care work is a large part of the economy and a substantial part of the work performed by older persons. Leaving this type of work out of economic observation and analysis obscures much of how older persons spend their productive time.

- Although both men and women perform UCW and market work, women do the majority of UCW and men of market work in all countries observed. This is true for most age groups in most countries. There is, however, a great deal of variation across countries in the degree to which men's and women's economic lives are segregated by market versus household sector.
- Children are by far the largest consumers of UCW time. With the tools and data used here, we see no evidence that the average older person consumes anywhere near the amount of UCW time that average child does. In most countries the oldest ages consume about the same amount of UCW time on average compared to working ages. However, this finding is qualified by significant concerns about existing time use survey's ability to measure UCW consumed by elders in a comparable way to UCW time consumed by children.
- Each country has a distinctive system of UCW with different age and gender dynamics. For older persons, however, older women provide much of the care consumed by older persons as well as making substantial UCW time transfers to younger family and community members.

In addition to documenting current patterns, a further analysis speculated on whether these current patterns of care demand and supply would be sustainable in a future likely to have population age structures which are much older than they are today. The conclusions from that exercise include the following:

- Current per capita levels of care demand are sustainable with projected population aging under two conditions:
 - The methods used here are able to measure care consumption of older persons accurately.
 - UCW produced for children that is not needed in the aging future can be used to care for the oldest age groups which will have increased needs.
- Even if the production of UCW for children does not go down, there may only be a small shortage of UCW for older persons. This conclusion is also contingent upon their not being a great deal of UCW consumption by elders that is not measured in time use survey data. It is also contingent upon older women continuing to make UCW transfers to their older husbands.

4.2. [How is this relevant to policy?](#)

One of the most important messages from this work is simply that policymakers must become aware of the role of UCW in economy and society and provide resources to measure and understand UCW. For too long, UCW has been invisible in policy spheres, taken for granted as something that would always just get done somehow, by families and mainly by women, at no cost to the state and needing no support from the state. Populating aging is doing much to change that picture as policymakers in low-fertility countries worry about the role of UCW demands in possibly keeping people from having the number of children they want. The potential care needs of aging societies all over the globe are also focusing policy attention on UCW. The work discussed in this paper was able to shed light on many of those issues, but only for those countries with a high-quality time use survey. The more surveys done in more countries, especially low income countries where this data is rare, the more we can shape a discussion based on fact rather than speculation. Policymakers also need to support data gathering and

research focused specifically on the care needs of older persons so we can be sure we are not underestimating the scale of potential needs.

Policy concerns around UCW also often focus on gender equality issues and child welfare. Certainly the analysis here has relevance in those areas and suggests that the main question for policymakers who work on issues around older persons in the Asia-Pacific region is the role of older women in providing UCW. That older women are at the heart of UCW provision for older persons is both an equity issue – is it fair that older women are doing so much more of this type of work than older men – and a welfare issue – is this type of work compatible with a good quality of life? In many countries older men are doing as much market work as older women are doing UCW, so the system may be “fair” on the basis of total hours worked by men and women, but this ignores potential asymmetries between the two types of work. There may be compensating asymmetries with market work having some advantages and some disadvantages relative to UCW. For example, the greater hazards of market work compared to UCW may be compensated for by access to money, and UCW may generate social standing and satisfaction in equal measure to that available through market work in certain cultural contexts.

One of the main potential problems is if older women’s UCW production leaves them vulnerable to lack of resources for themselves once an older husband passes away. If women specialized in UCW all their working lives, they would not have access to pension income. Policymakers would then need to know if survivor benefits adequately protected widows after a husband’s death. Also, changing family systems which may have more divorce now than when policies on survivor’s benefits and inheritance were formulated may leave older women unprotected. Setting aside issues of access to income, who provides care to the older women when they enter the oldest age groups and need care themselves? At the least, policymakers should discuss how to monitor the welfare of this vulnerable population and make sure they have ways to reach out for support when it is needed.

Finally, this work has also explored ways in which UCW is very relevant to economic policymakers. If we treat UCW as truly productive work, then older men and women who produce UCW are vital parts of the labor force. This role should be recognized and supported, and programs the support older persons can be understood to be productivity enhancing, not just welfare enhancing. While the empirical estimates discussed here did not find huge demand for eldercare which has the potential to swamp the supply in the future, health policies that bring down elders’ rates of disability will enable them to contribute more to social functioning, productivity, and wellbeing into the future.

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Data Appendix

Bangladesh

Time use survey data from Bangladesh are from the Bangladesh Pilot Time Use Survey of 2012, conducted by the Bangladesh Bureau of Statistics. The author wishes to thank colleagues from the National Transfer Accounts/Counting Women's Work research team at the University of Dhaka for sharing their estimates.

Details on the survey are available here:

http://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/96220c5a_5763_4628_9494_950862accd8c/TUSReport2012.pdf

This survey is a 24-hour time diary survey, coded using the 2003 version of the International Classification of Activities for Time Use Statistics. The full coding scheme is available in Annex 21 of the Guide to Producing Statistics on Time Use: Measuring Paid and Unpaid Work (United Nations Department of Social and Economic Affairs, 2005), which can be accessed here:

<https://www.un.org/development/desa/capacity-development/tools/tool/guide-to-producing-statistics-on-time-use-measuring-paid-and-unpaid-work/>

Codes (from survey dataset variable "act5") included in activity groups:

- Market work: 1111-5900
- Indirect care (general housework): 6111-6900
- Direct care for household children: 7111,7112,7113,7114
- Direct Care for household adults: 7121,7122,7123
- Direct care for household others (includes age not specified): 7200,7900
- Direct care, volunteering: 8000-8999, except 8116 and 8117
- Direct care for non-household children: 8116
- Direct care for non-household adults: 8117

India

Time use survey data are from India's Pilot Time Use Survey, conducted in 1998-1999 by the Ministry of Statistics and Programme Implementation (MOSPI). They include data from six states (Haryana, Madhya Pradesh, Gujarat, Orissa, Tamil Nadu and Meghalaya). The author wishes to thank colleagues from the National Transfer Accounts/Counting Women's Work research team at the International Institute for Population Sciences for sharing their estimates.

Details on the survey are available here:

<http://mail.mospi.gov.in/index.php/catalog/130>

This survey is a 24-hour time diary survey, coded using a scheme developed for the survey.

Codes (from survey documentation) included in activity groups:

- Market work: 111-329, 892
- Indirect care (general housework): 411,421,431,441,461,471,481,491
- Direct care for household children: 511,521,531,561,571
- Direct care for household adults: 541,551,562,572
- Direct care for household others (includes age not specified): 591
- Direct care, volunteering: 611-691
- Direct care for non-household children: not available
- Direct care for non-household adults: not available
- Direct care for non-household members: 581

Because codes for non-household children and adults were not available separately, they were grouped into a single set of activities and their consumption was distributed proportionally to the household adults and household children age profiles.

Mongolia

Time use survey data from Mongolia are from the Mongolian Time Use Survey of 2015, conducted by the National Statistical Office (NSO) of Mongolia.

Data are freely available online and data and details on the survey are available here:

<http://web.nso.mn/nada/index.php/catalog/108>

This survey is a 24-hour time diary survey, coded using an early version of the International Classification of Activities for Time Use Statistics (ICATUS). While the ICATUS has been updated since Mongolia began conducting time use surveys, they have continued to use this version. A report on a previous survey, with the coding used in that survey and the 2015 version can be accessed here:

<https://unstats.un.org/unsd/demographic/sconcerns/tuse/Country/Mongolia/sourcemng2000.pdf>

Codes included (from variable “activity_code”) in activity groups:

- Market work: 0-199
- Indirect care (general housework): 211-299
- Direct care for household children: 311-319
- Direct Care for household adults: 321-339
- Direct care for household others (mainly travel related to care): 380, 390
- Direct care, volunteering: 411-499, except 416 and 417
- Direct care for non-household children: 416
- Direct care for non-household adults: 417

Thailand

Time use survey data from Thailand are from the Thailand Time Use Survey of 2014, conducted by the National Statistical Office of Thailand.

Details on the survey are available here:

http://web.nso.go.th/eng/stat/timeuse/time_use.htm

This survey is a 24-hour time diary survey, coded using an adapted version of the 1997 International Classification of Activities for Time Use Statistics, which is very similar to the version used in Bangladesh. The full coding scheme is available in Annex 21 of the Guide to Producing Statistics on Time Use: Measuring Paid and Unpaid Work (United Nations Department of Social and Economic Affairs, 2005), which can be accessed here:

<https://www.un.org/development/desa/capacity-development/tools/tool/guide-to-producing-statistics-on-time-use-measuring-paid-and-unpaid-work/>

Codes (from survey dataset variable “ICATUS_A”) included in activity groups:

- Market work: gen paidwk= 1111-5999
- Indirect care (general housework): hwk= 6000-6999
- Direct care for household children: 7111,7112,7113,7114
- Direct Care for household adults: 7121,7122,7123
- Direct care for household others (includes age not specified): 7200,7900
- Direct care, volunteering: 8000-8999, except 8116 and 8117
- Direct care for non-household children: 8116
- Direct care for non-household adults: 8117

Turkey

Completed estimates for Turkey are included courtesy of the National Transfer Accounts/Counting Women’s Work research team and were calculated using the same methodology. For details see the Counting Women’s Work project website at www.countingwomenswork.org.

Vietnam

Completed estimates for Vietnam are included courtesy of the National Transfer Accounts/Counting Women’s Work research team and were calculated using the same methodology. For details see the Counting Women’s Work project website at www.countingwomenswork.org.

Figure 1.1. Average time spent working at each age by type of work, hours per week. See Data Appendix for time use survey source details.

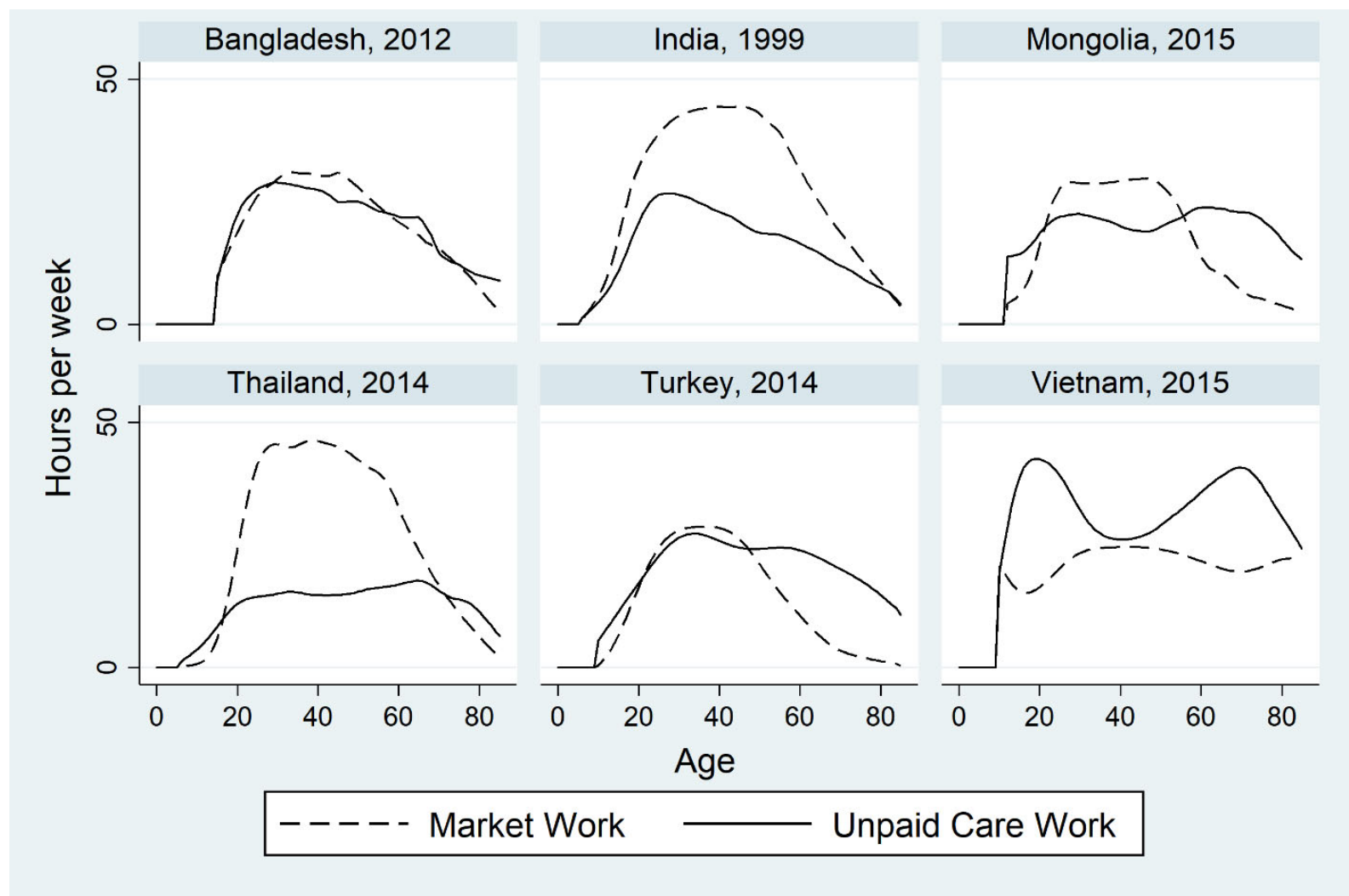


Figure 1.2. Average time spent working at each age by type of work and sex, hours per week. See Data Appendix for time use survey source details.

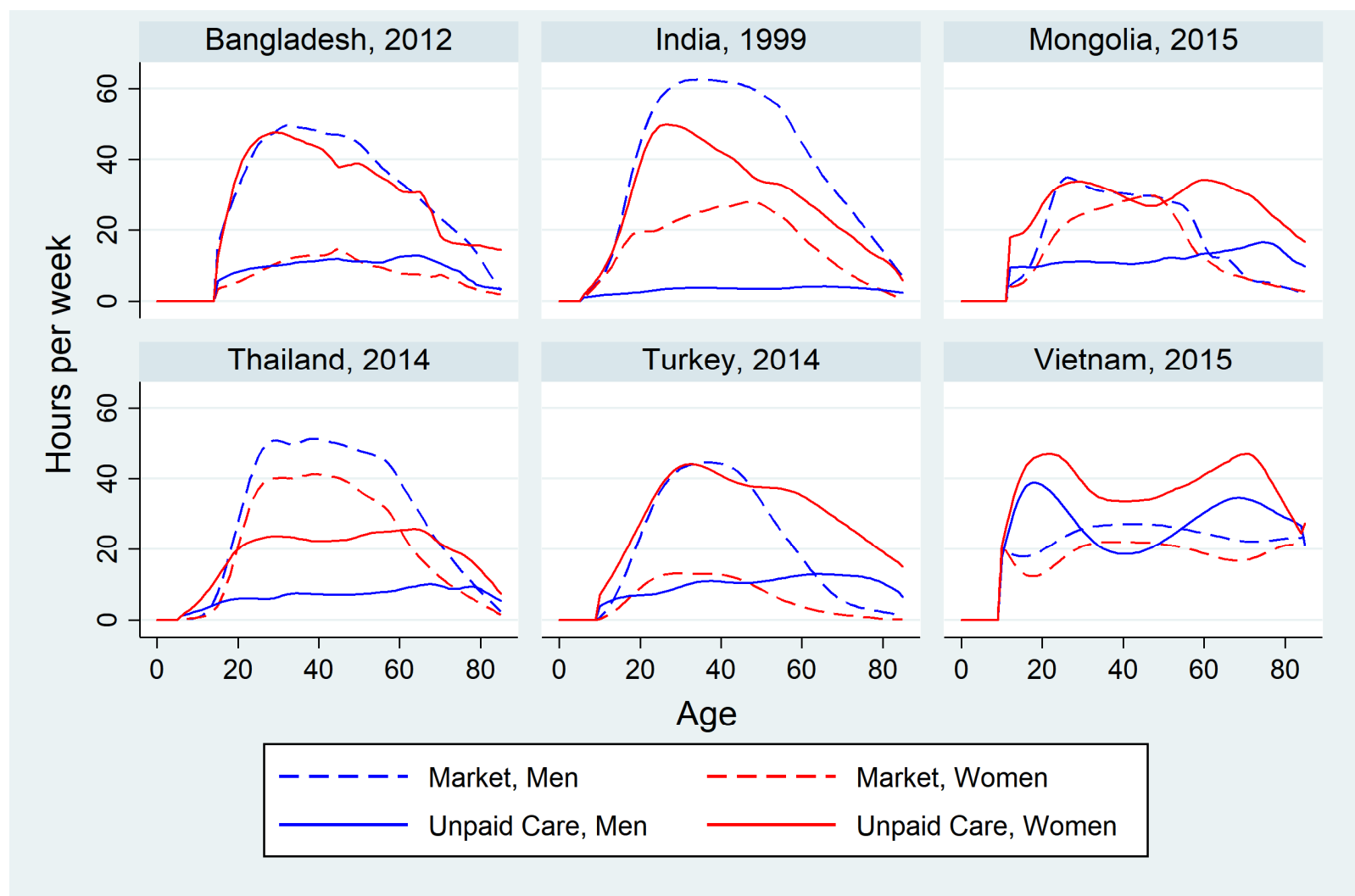


Figure 1.3. Gender differences in average time spent working at each age by type of work, hours per week for females minus males. Values above zero indicate greater female time spent, below zero greater male time spent. See Data Appendix for time use survey source details.

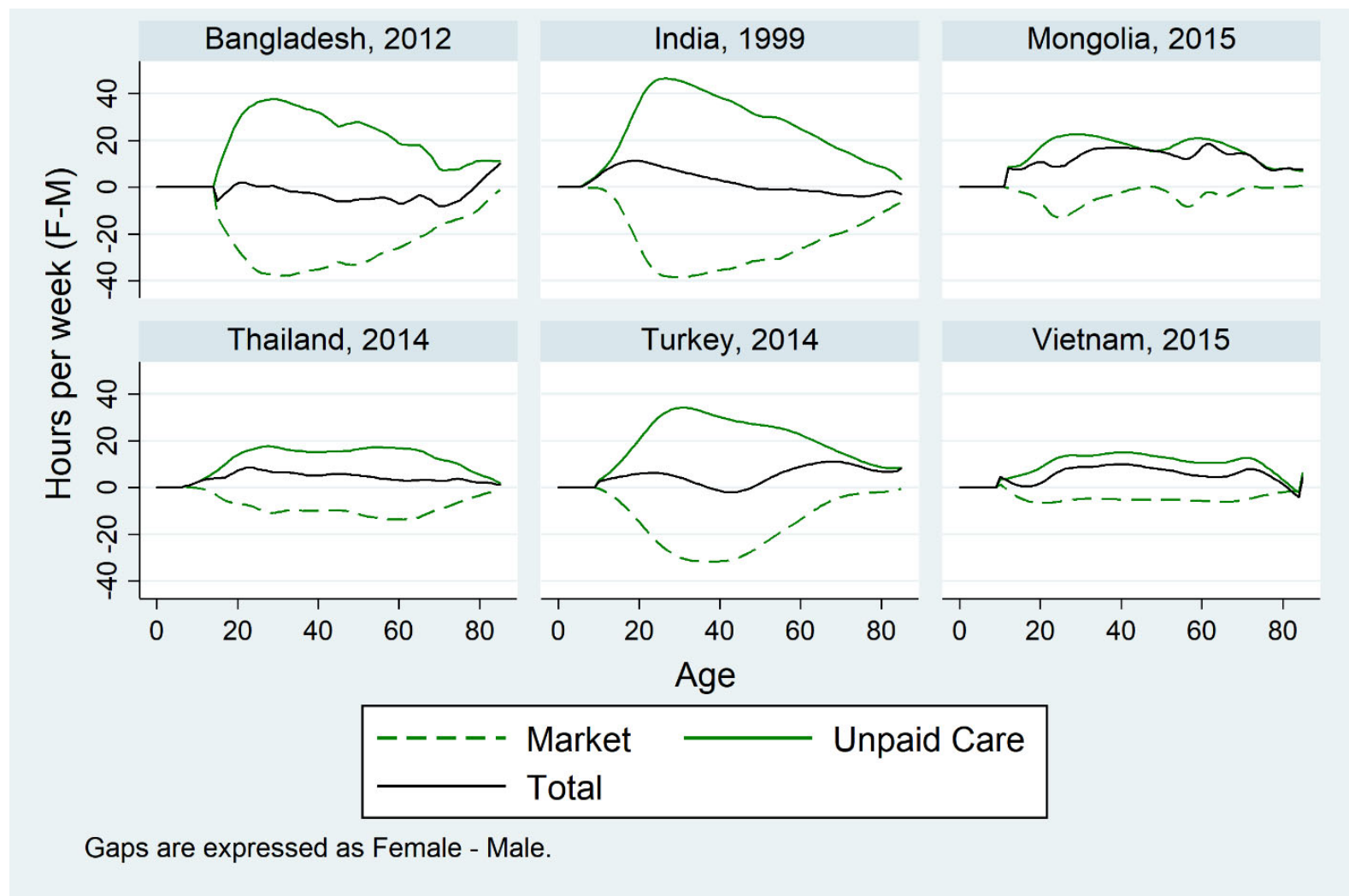


Figure 1.4. Age profiles of production, consumption, and transfers of unpaid care work, average hours per week. For time transfers, values above zero indicate that the age group receives net transfers, below zero that they make net transfers to other age groups. See Data Appendix for time use survey source details.

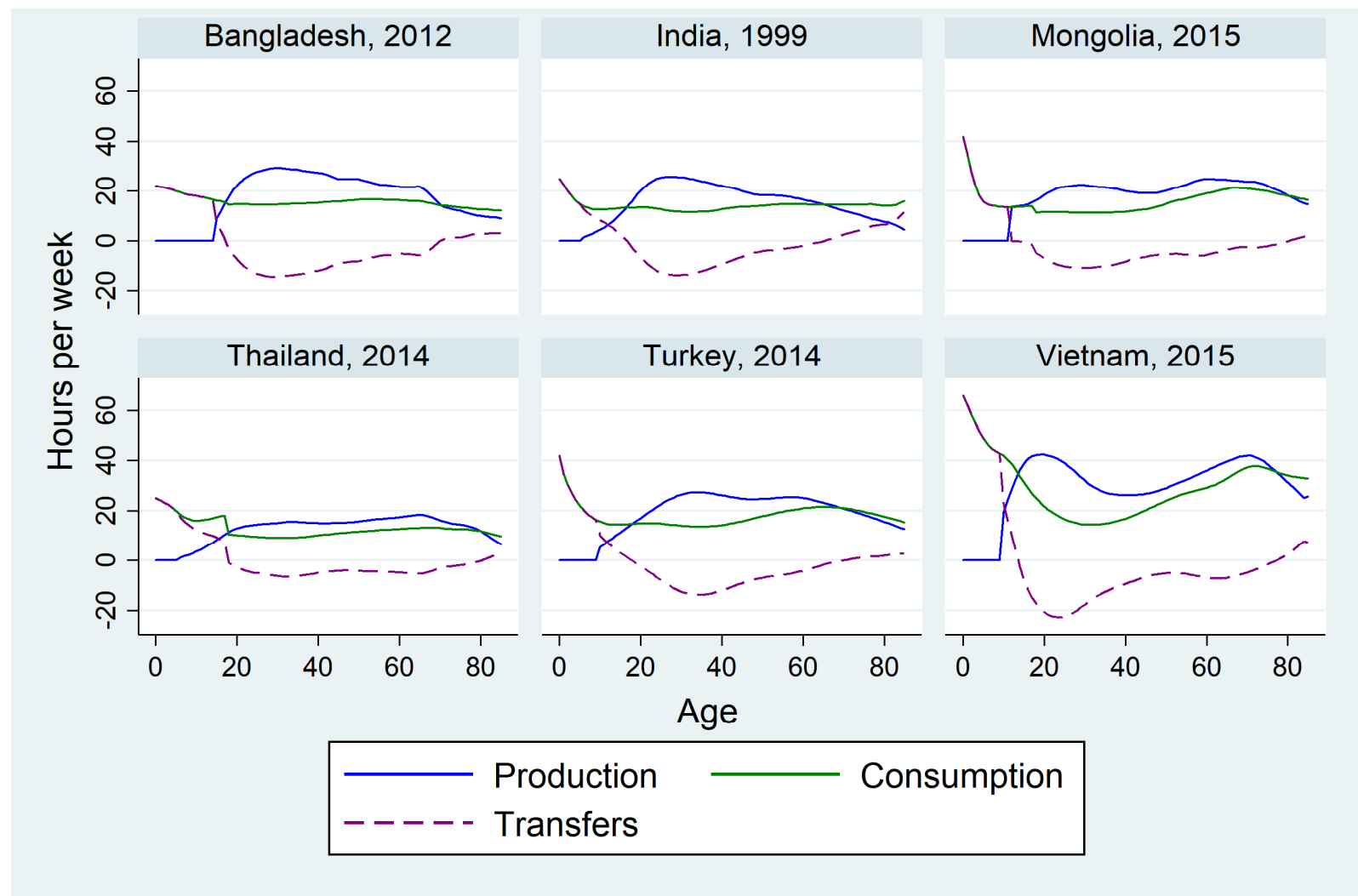


Figure 1.5. Age profiles of net transfers of unpaid care work, average hours per week, by sex. Values above zero indicate that the age/sex group receives net transfers, below zero that they make net transfers to other age groups. See Data Appendix for time use survey source details.

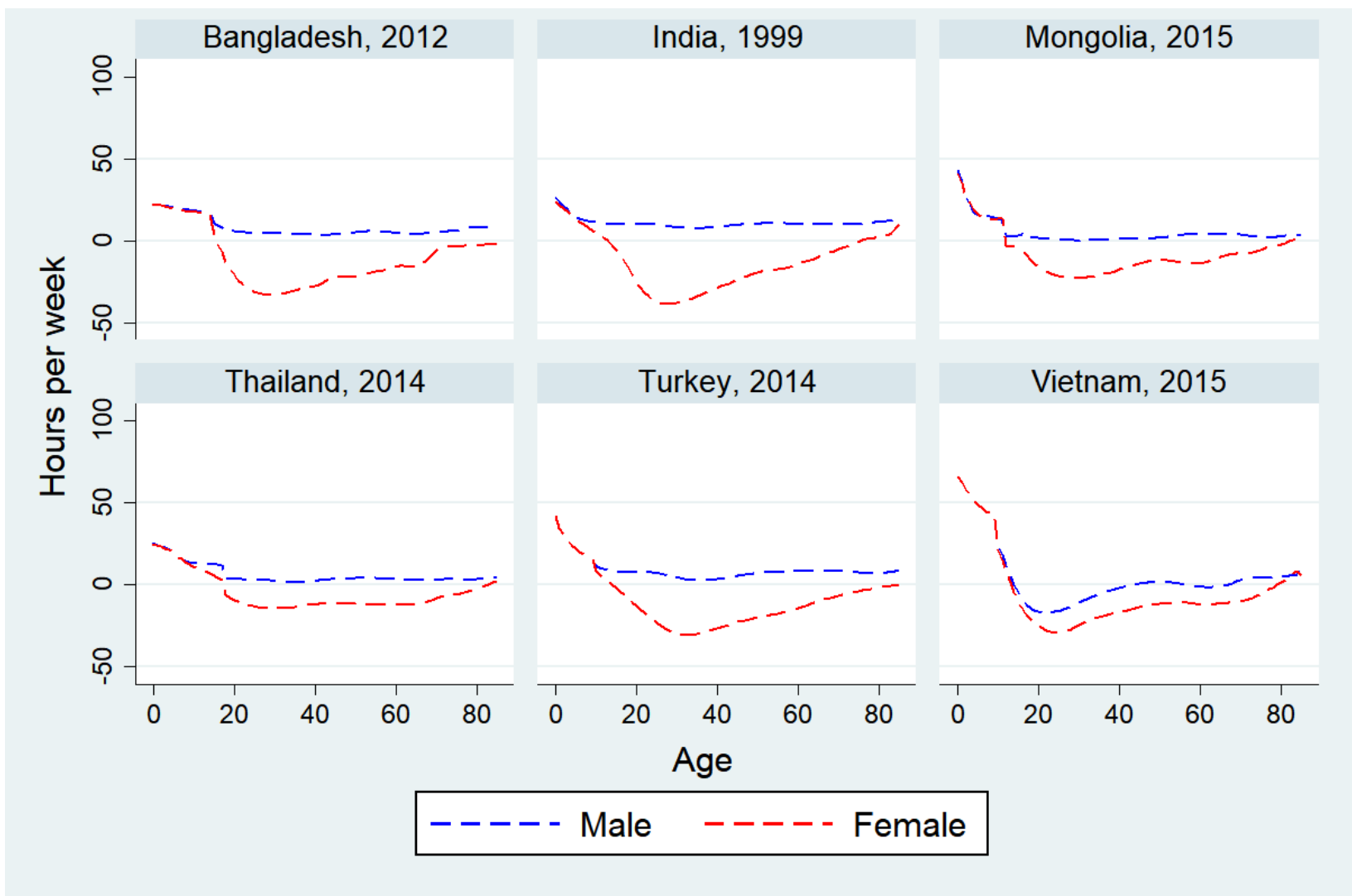


Figure 1.6. Age profiles of net transfers of unpaid care work, average hours per week, by sex and type. Values above zero indicate that the age/sex group receives net transfers, below zero that they make net transfers to other age groups. Dashed lines are for general housework activities, solid lines for direct care of persons. See Data Appendix for time use survey source details.

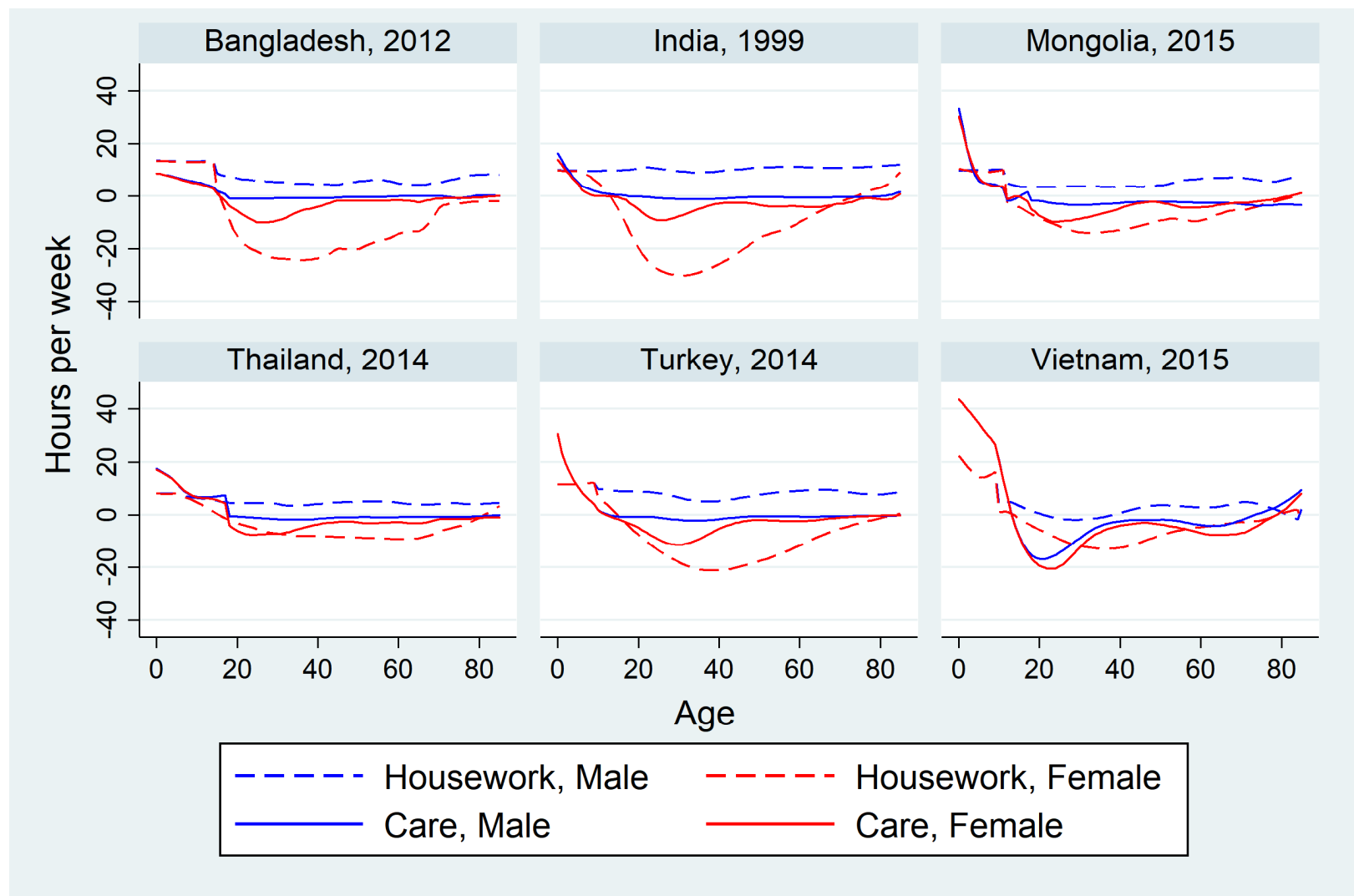
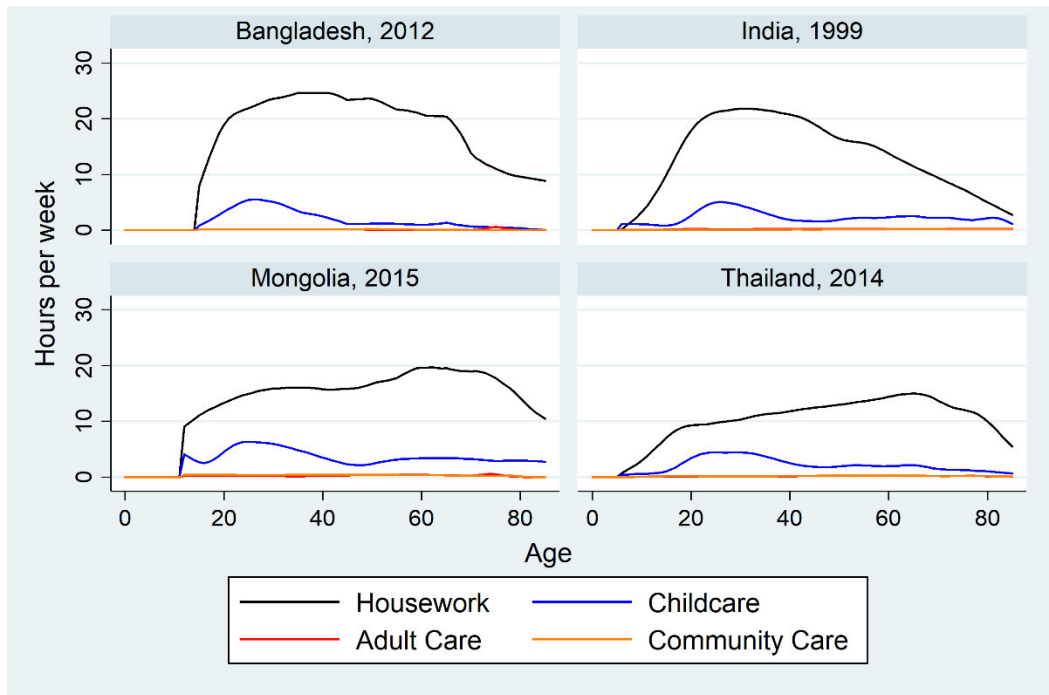


Figure 1.7. Age profiles of production and consumption of unpaid care work, average hours per week, by type. Indirect care (housework) is shown in black, while direct care is divided into three types by the type of care recipient (children in blue, adults in red, community in orange). See Data Appendix for time use survey source details.

a) Production



b) Consumption

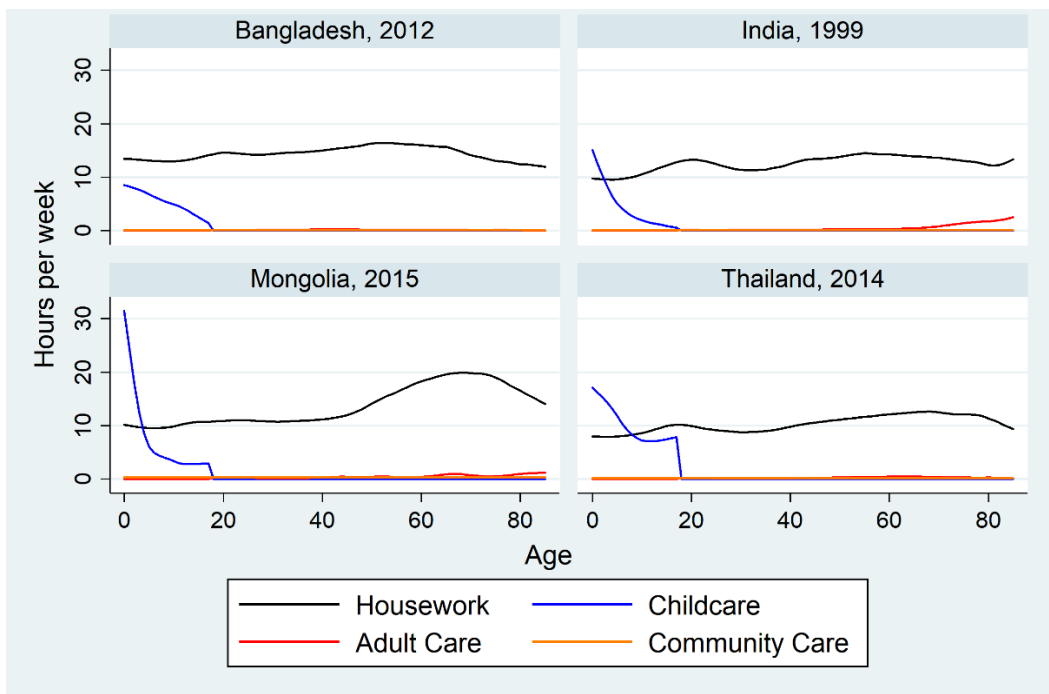


Figure 1.8. Age profiles of net direct care transfers by sex and type of care recipient. See Data Appendix for time use survey source details.

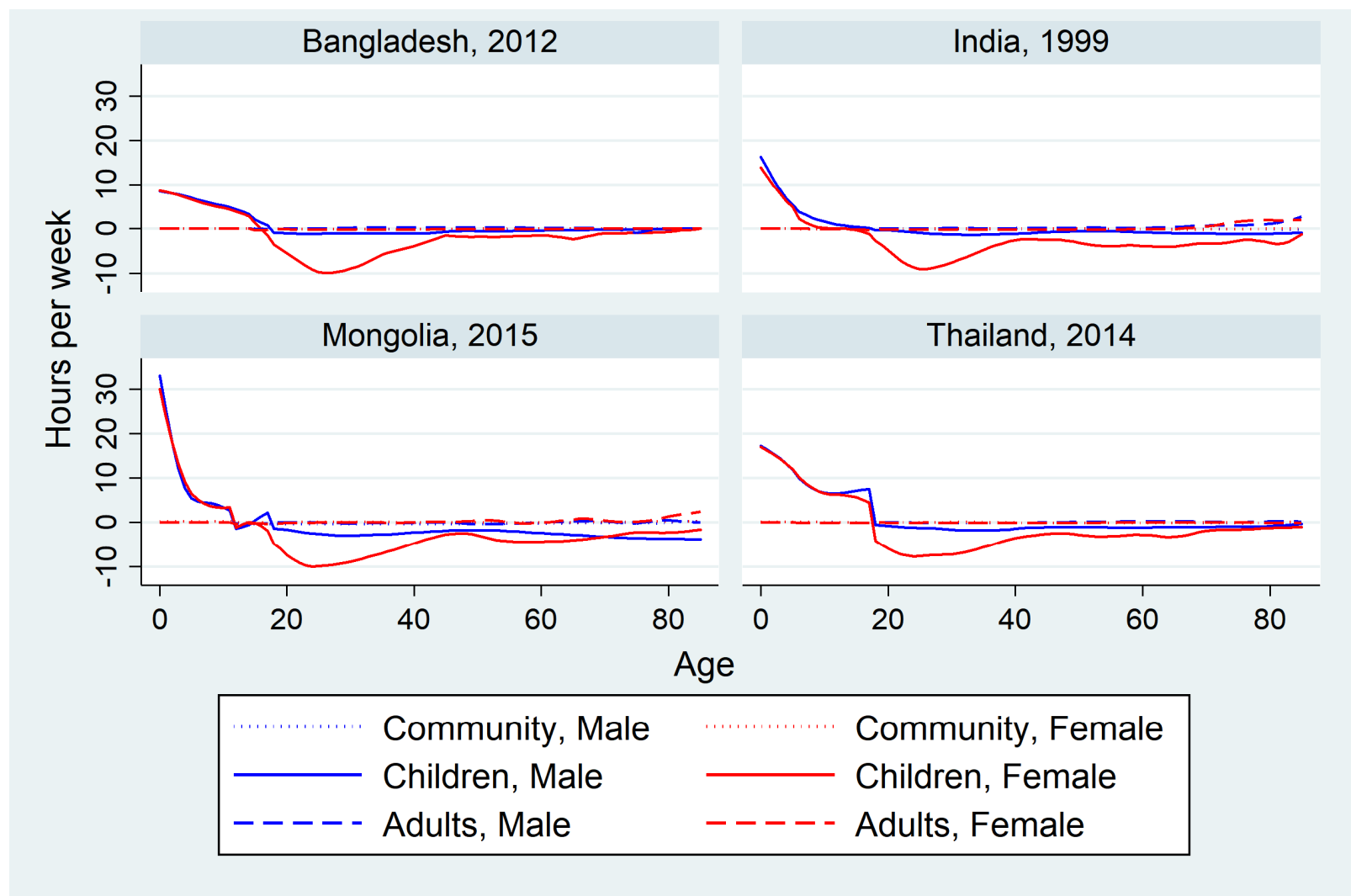


Figure 2.1. Average UCW time produced by an age/sex group that is consumed by a particular age/sex group, in hours per week. Averages are per time producer. Cells shown in red represent an average transfer of more than 4 hours per week. Yellow is for 3-4 hours, green is for 2-3 hours, light blue is for 1-2 hours, and dark blue is for less than one hour.

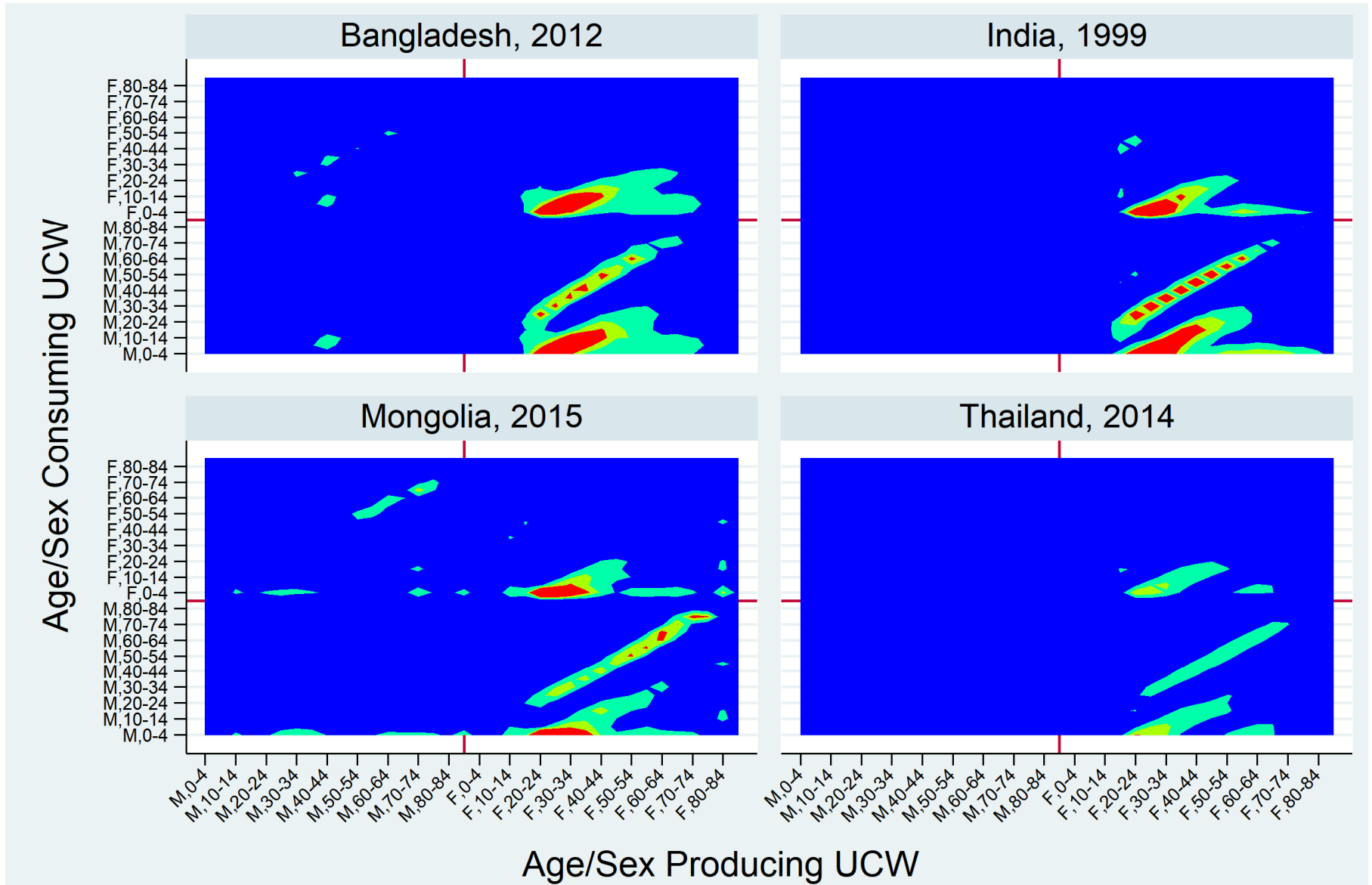


Figure 3.1. Unpaid Care Work Support Ratios, by country and type of unpaid care work. Ratios are projected units of UCW production per unit UCW consumption.

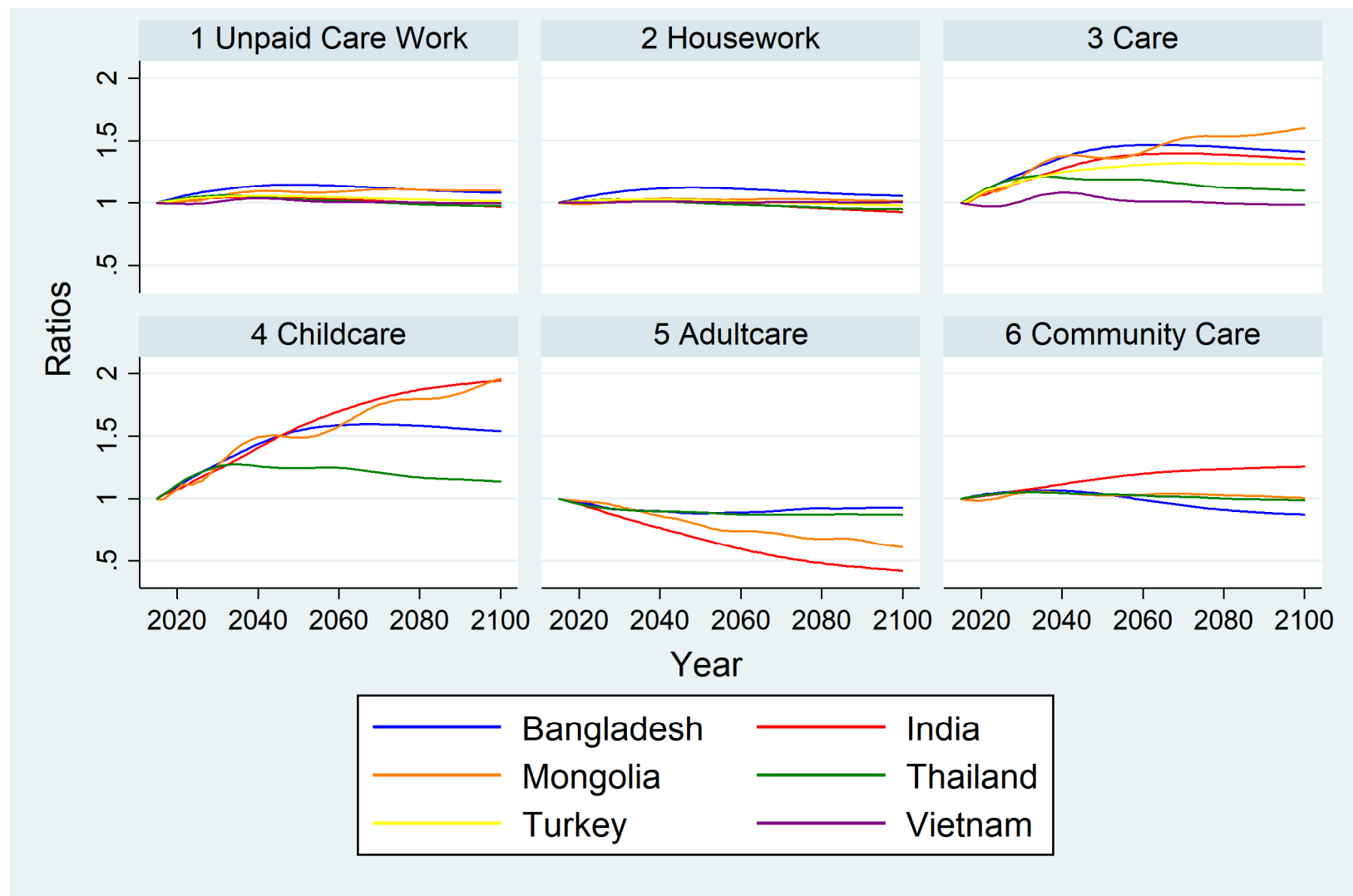


Figure 3.2. Unpaid Care Work Support Ratios, by country and type of unpaid care work, allowing per capita childcare consumption to shift so that it matches aggregate childcare production. Ratios are projected units of UCW production per unit UCW consumption.

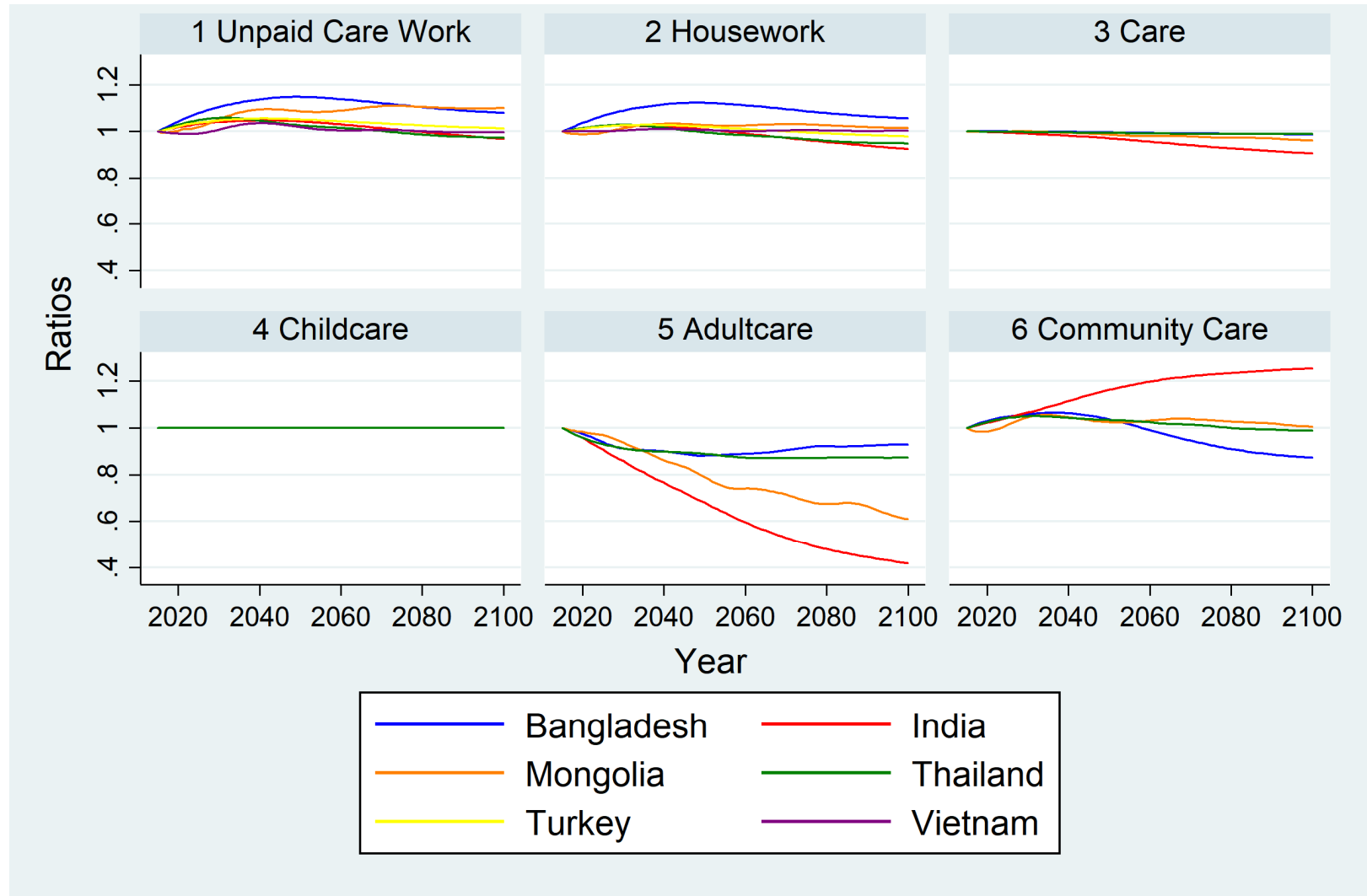


Figure 3.3. Average consumption of unpaid childcare, ages 0-18, for current year and then projected so that aggregate consumption of childcare matches aggregate projected production.

