Unpaid care work production, consumption, and transfers in an aging world

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Abstract

Unpaid care work (UCW) is a major component of parental investment, of services provided to elders, and of the way we sustain society. Cultural, political, and economic institutions have developed over generations to supply this UCW, but as populations age and the demand for UCW shifts, those institutions will face challenges to balance demand and supply. This paper will document the consumption, production, and transfers of UCW by age and sex across a diverse set of countries, revealing distinct patterns of care. Empirical patterns are then combined with population projections to gauge potential excesses or shortfalls of care in a future population likely to be substantially older than it is today. Whether a nation is projected to have a surplus or shortage of UCW depends both on the nation's demographic trajectory and its particular system of UCW.

1. Overview

Unpaid care work creates the future. As infants, the most valuable investment our parents make in us is their time to care for us (National Transfer Accounts, 2017). Unpaid care work also undergirds the market economy, for who among us could hold a job without the mundane tasks of cooking, cleaning, laundering, or caring for us when we are sick? Certainly many people could outsource these tasks to a paid provider, but studies of this type of work show that, compared to the time spent on market work, unpaid care work takes up close to the same amount of time as paid work. It is notable then, that we know much more about market labor force participation than we know about participation in UCW. International databases are available to look up comparative data on market labor, by age, sex, and other characteristics for most every nation on the planet. Government statistical agencies and researchers in the public and private sectors make it their business to understand current patterns of market labor and project worker demand and supply to ensure economies can grow. Far less attention is paid to understanding the labor force involved in UCW.

The first objective of this paper will be to document current patterns of unpaid care in a diverse array of countries. Patterns of UCW production and consumption, in units of time, will be shown by age and sex, as well as the complete matrix of who transfers to whom. UCW will be divided into three types: direct care for children, direct care for adults and elders, and indirect care provided through unpaid housework and household management and maintenance. Showing the marginal production and consumption patterns by age and sex will address such questions as which age and sex groups are consuming the most or least UCW, which are producing it, and what are the major transfer channels, such as adult parent to young child, spouse to spouse, or adult child to elderly parent. And do these patterns vary

substantially across countries with different cultures, regions, and economic organization? Or do they vary depending on the three types of care discussed above?

The second objective of this paper will be to combine those estimates of current patterns by age and sex with population projections over the next fifty years to see the projected balance of care supply and demand in the future, for the UCW economy as a whole, and then for the three different types of care. A basic scenario in which we hold the age- and sex- dimensions of the care economy constant but follow projected changes in national populations by age and sex gives a first pass at understanding the future of the UCW economy. More speculative scenarios are also possible, such as the following:

- The health status of elders changes, affecting the demand for eldercare in the future.
- The labor force participation of women increases, decreasing the time they have to produce UCW.
- Men's participation in UCW increases as norms of gendered household labor change.

These projections will indicate whether there will be a mismatch between the supply of and demand for unpaid care work in the future in each country included.

One final analysis to be conducted is to evaluate how much each country's particular system of UCW determines the degree of mismatch. We can make this evaluation by swapping different country's current levels of demand and supply with a particular country's population projections. For example, if Thailand is projected to have a shortfall in UCW, would it still have that same shortfall if it had the average production and consumption of UCW of the United States? Of Bangladesh? Of Ghana? Certainly the UCW economy evolves with the demography so such a swap is very unrealistic, but it allows us to evaluate whether some UCW systems are more vulnerable to aging-induced supply and demand mismatch than others.

2. Data and methods

2.1. Time use survey (TUS) data and methods to estimate UCW production

TUS data, either in the form of a complete time diary survey, or a survey module with sufficient questions about UCW activities, provide the data to estimate the production of UCW. Currently, I am working on such data from the following countries: Ghana, Senegal, Thailand, Mongolia, Bangladesh, the United Kingdom, and the United States. More countries involved in the Multinational Time Use Survey (MTUS) may be available by the time of the PAA.

Accepted criteria for identifying UCW activities have been developed in the process of creating household production satellite accounts (Abraham & Mackie, 2005), and this work follows those criteria. I calculate average time spent in UCW activities by age and sex and smooth those schedules over age to produce age profiles of the production of the three main types of care (direct childcare, direct care for adults and elders, and indirect care), separated by sex, for each country.

2.2. Household roster data and methods to impute UCW consumption

Some time use survey instruments indicate the exact member of the household who is the target of a direct care activity, making it possible to assign the UCW produced as the consumption of a particular

individual. However, many TUS do not have this feature. In order to estimate care consumption in a consistent way across different surveys, we will instead apply one consistent set of methods for imputing care in all countries. In this way, we do not observe the consumption of UCW directly. Instead, consumption is imputed to persons in households based on the amount of UCW we observe as being produced in the TUS and a set of assumptions or models about how the consumption of UCW is distributed.

For indirect care within a household, i.e. the general activities within the household (cleaning, maintenance, etc.), the time produced is divided equally among all household members, making the assumption that all household members benefit equally from this work. For direct care within a household, i.e. the age-targeted care activities within the household, this model is not appropriate, and numerical methods are used. For childcare, a household-level regression model is estimated on the survey data where we regress the household 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 consumption weights that can be used to apportion the household amount of childcare observed in a household to each child in that household. Similarly for adult care, we can regress the household production of adult care and the number of adults in each 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. For UCW that benefits non-household members, the production is distributed as consumption to all persons in the target population, proportional to the type of care provided within the household members as weights.

Once all of the production is allocated as consumption, then producing the age- and sex- profiles is a matter of taking the age- and sex-specific average amounts and smoothing over age to create sex-specific consumption schedules by age just as for the production schedules.

Note that a full household roster, giving the age and sex of each member of the household of any time use respondent, is necessary for these methods just described. Some time use surveys collect this data, but for those that do not (Bangladesh and Thailand in the current set of countries), an alternate source of household structure data was used. Specifically, census samples available from the IPUMS International Database. 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 imputation 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, and education. The average amount of production of UCW activities is calculated from the time use 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 estimates 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 not inference or variability.

2.3. Estimating UCW transfers and the complete transfer matrix

Making the simplifying assumption that UCW time is consumed at the same time it is produced, 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 is shared equally across all individuals in the household, a producer does consume a portion of his own production of indirect UCW. 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.

In the process of imputing consumption, then, we go through calculations that apportion each UCW activity produced by a person in a household with known age and sex, as the consumption of another individual in a household of known age and sex. Thus, at least for care produced for the benefit of own-household members, a full matrix of transfers from persons of a particular age and sex to person of a particular age and sex are known. We can include care for persons outside of the household in this transfer matrix by assuming the transfers are distributed proportionally to the marginal production and consumption shares.

These matrices can be estimated and graphed with 3D or "temperature" plots to show the care system in a given country. They reveal the scale of intergenerational care transfers between grandparents and grandchildren, adult children and frail elderly parents, or between spouses. They can show whether these patterns have specific gender dimensions as well.

2.4. Population projection data and projecting UCW demand and supply

Once we are grounded in the empirical facts of the current UCW economy, we can 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 UCW production and consumption estimates constant while using a population projection into the future to change the population age and sex structure. This calculation will be done using the United Nations World Population Projections out to 2100.

This is basically a projection of the aggregate production and consumption of unpaid care work used to represent a future look at supply and 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.

Scenarios other than "constant care economy" will also be estimated. Using projections of the prevalence of disability produced by the Global Burden of Disease project (http://www.healthdata.org/gbd) and reasonable assumptions of the level of care required by a disabled versus non-disabled person, we can evaluate how much the care projections would change as disability changes. Similarly, evaluations of changing gender norms around the production of UCW could be evaluated – how much does UCW supply shift if women close the gender gap in UCW with men by 25%? By 50%? This would involve a reduction of women's UCW, but what if the gap closed instead by men increasing their UCW to close the gap? That is a different scenario, but also one that is straightforward to calculate, and instructive in thinking about policy levers available to address any UCW demand and supply mismatch in the future.

3. Expected findings

To give some flavor of the expected findings, we can show the example of Ghana. Figure 1 shows production and consumption age profiles by age and sex based on Ghana's time use survey of 2009. Two broad types of UCW are shown: direct care (which is childcare and adult/eldercare combined) and indirect care (indicated as housework). Direct care is grouped in this way to avoid overcrowding the chart, but the final paper will show estimates separately. Also, consumption is shown as single sex for a similar reason, as male and female consumption estimates are very similar. What we observe from this chart is that, as is the case for most every country with the data to estimate it, women are doing substantially more UCW compared to men, however older men look to be doing substantial direct care work in their 70s and 80s. Could this be a measurement issue? Or is the role of grandfather or elderly husband of particular importance in Ghana's care economy? It bears further exploration and in the final paper the full to/from matrix of care transfers will be visible to answer some of these questions.

Women's production of direct care peaks in the childbearing ages between 20 and 40, but indirect care is high for many age groups starting as soon as the time use survey data begins to measure it at age 10. For consumption, we see that direct care is very high for infants and young children, very low for adults, and rises again at the oldest ages. Indirect care consumption is more constant across the age groups.

Given Figure 1's picture of Ghana's care economy, how will demand and supply of UCW change with projected future population change? Figure 2 shows the age schedules of Figure 1, multiplied by the UN World Population Prospect's population projection for Ghana by age and sex, from 2010 to 2100, and expressed as a ratio of consumption to production. Those familiar with analyses of the economic effect of population aging will recognize this calculation as a support ratio. We are used to seeing that calculation for comparing market consumption and production. Figure 2 does the same analysis for UCW. Of course, UCW is different from market flows because UCW has to balance at any point in time. The care economy is in balance in 2009 when the time use survey was taken and we know that it must remain so over time, but that will mean that the picture in Figure 1 will have to change. Figure 2 simply shows us where the changes are likely to be the largest.

Three ratios are shown: the support ratio for direct care, for indirect care, and for the two combined into the total. We see that all of the support ratios increase over time – there is more potential production of UCW per unit of projected demand, more care supplied than is necessary to meet the demand. The increase is highest for direct care, and stems from the population projection's scenario of lower fertility. Declining numbers of children mean far less demand by the biggest consumers of direct care. The indirect care support ratio rises slightly, so that the total care support ratio rises, indicating that there is about 20% more care produced than needed to meet the demand.

How could Ghana's care economy change, then, if this 20% productive capacity were to be turned to other uses? Could Ghana's women reduce their UCW production to close the gender gap with men? Could it be used for market work to boost the economy? Could it be allocated to the smaller number of children in future cohorts, thus increasing the human capital investment in Ghana's future? All of these changes are potentially quite beneficial. That this change comes through population aging is significant because it highlights potential positive impacts of lower fertility and an older population. It can also enhance the discussion of demographic dividends by focusing attention on the time that is "freed up" through demographic transition, and the policy implications for making the most of that time.

Figure 1. Smoothed age schedules of production and consumption of UCW, Ghana, 2009, in hours per week

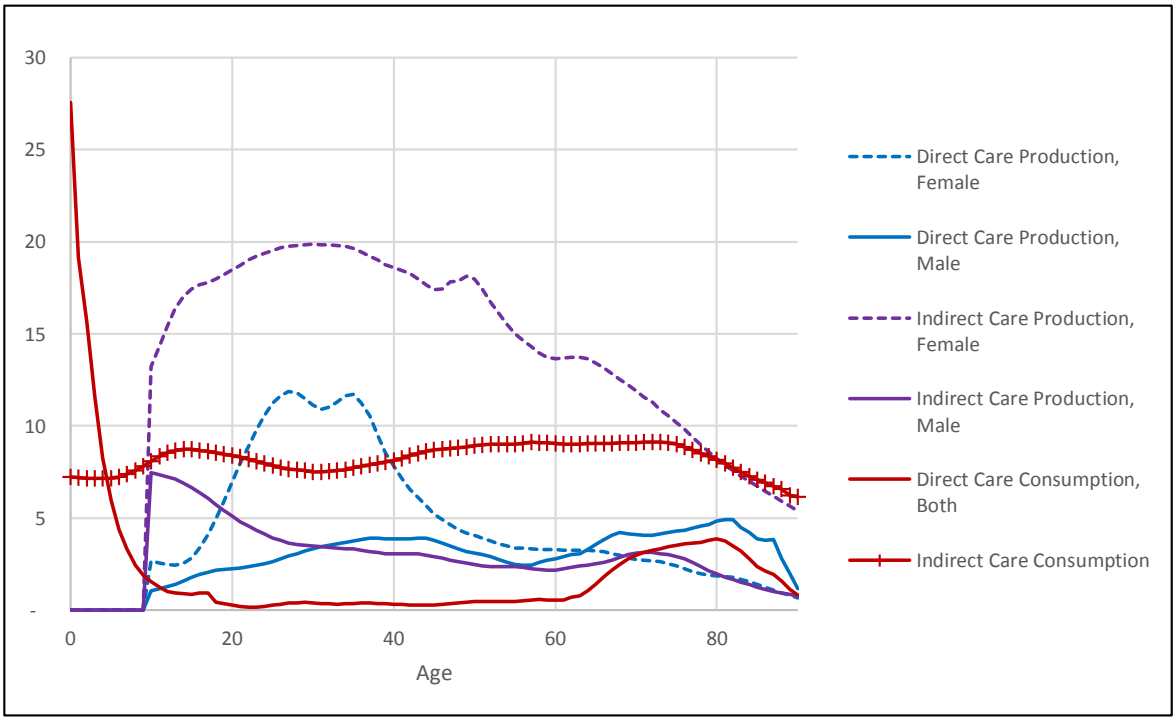
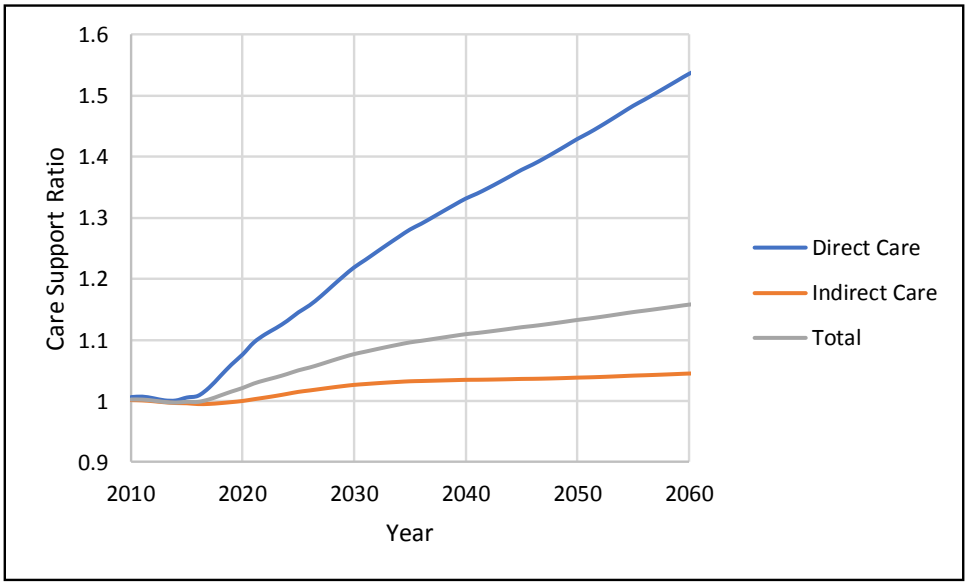


Figure 2. Projected care support ratios (projected production per unit of projected consumption) combining Ghana's 2009 care economy with UN WPP population projections



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