Adolescent and Young Adult Health Inequalities by Urbanicity and Wealth[1]

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[1] We are grateful to Astra Zeneca for financial support for this project. We had able computational assistance from Huan He, Hannah L. Lantos, Bolanle Ajao, Maria Luisa Navarro Sanchez and Yvesyvette Young.

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ABSTRACT

We examine the relative well-being of three groups of female adolescents and young adults in low and middle income countries: 1) the urban poor; 2) the urban non-poor; and 3) those in rural areas. Our data are from 51 recent Demographic and Health Surveys. We compared six key outcomes (early marriage, contraceptive use, early sexual debut, no schooling and underweight and overweight) through logistic regression within countries and summarized the results via meta-analysis.

Our findings suggest that female adolescents and young adults in rural areas remain disadvantaged relative to non-poor urban dwellers on all outcomes. Poor urban adolescents are also disadvantaged relative to the urban non-poor on all outcomes. With respect to underweight, we find that poor female adolescents and young adults from urban areas are disadvantaged relative to both their rural and their non-poor urban counterparts.

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INTRODUCTION

In this paper we investigate how poor urban adolescents and young adults in low and middle income countries (LMIC) are faring compared to two groups: 1) more affluent urban adolescents and young adults; and 2) rural adolescents and young adults. We focus on key determinants of health—early sexual debut, early marriage, contraceptive use, and schooling; as well as one indicator of health itself—BMI.

Although, there is regional variation in levels of urbanization---the Americas and Europe exceed 70% urban while Africa and Asia are around 40%---people who live in urban areas are now a majority of the world's population and virtually all population growth for the foreseeable future will be in urban areas (UN 2012). In light of this dramatic population change, there is beginning to be a great deal of interest in urbanicity and health in developing countries (Sverdlik 2011).

The focus of health scholarship and policy in contemporary LMICs has been on rural people, most particularly rural children. It remains the case that the majority of infants and children at high risk of poor outcomes reside in rural areas (Van de Poel, O' Donnell and Van Doorslaer 2007). Since World War II urban people in LMIC have had better health than rural people. This is a contrast with Europe and the U.S. a century earlier when those regions were developing. In the historical context, there was an "urban penalty" or a substantial health and mortality disadvantage that attended urban dwellers. Evidence suggests that this derived from disease producing conditions in cities that were so pernicious as to overcome the positive selection of rural migrants to the city (Kesztenbaum and Rosenthal 2011).

Some speculate that the dramatic increase in urbanization, which has been accompanied by both the emergence of megacities (i.e. cities with populations of more than 10 million) and the development of urban slum areas, may lead to a re-emergence of an urban penalty in developing countries (Jorgenson, Rice and Clark 2012). More specifically, the unprecedented size of modern cities and the consequently large slum areas have given rise to the hypothesis that the urban penalty in modern cities accrues to the urban poor only. The wealthy urban dwellers of Europe and America's cities in the 19th century suffered as much as the poor from the nascent state of preventive and curative care at the time they lived. For the affluent of the LMICs today modern medical advances---most particularly immunization from communicable diseases, aseptic treatment of injuries and modern methods of addressing obstetric complications---together with the benefits of adequate food and sufficient shelter render their health risks low. Garenne (Garenne 2010) contrasts historical Sweden and modern LMICs. He finds that under-5 mortality in Sweden was originally higher in urban areas and declined for both urban and rural children with development and eventually converged. His calculations for LMICs now indicate that rural under-5 mortality was originally higher than its urban counterpart, declined at the same rate as urban under-5 mortality, but the urban decline has stagnated, while the rural decline continues.

Montgomery and his colleagues (2003) led the way in finding out whether or not there was an urban penalty emerging for the poor in developing countries in their sentinel book *Cities Transformed.* Focusing on infant and child health they found that, while in a few countries it appeared that the urban poor were at a disadvantage relative to rural dwellers, in general there was no evidence of a widespread urban penalty. Since the

publication of this important book there have been many updated analyses and the complexities of the issue are evident.

The correlation between urban residence and good health may be spurious and confounded by both poverty and migration status. Many urban residents now are migrants from rural areas and migrants are known to be healthier than non-migrants. The urban advantage in infant and child health outcomes often reduces or disappears after positive migrant selection, the higher average socioeconomic status of urban dwellers or both are controlled (Bocquier et al. 2011; Van de Poel, O' Donnell and Van Doorslaer 2007). Moreover, there may be an interaction between urbanicity and poverty. Matthews and her colleagues (Matthews et al. 2010) find that socioeconomic inequalities in maternal and child health outcomes vary by urbanicity. They propose a typology of five different patterns. These range from very poor rural health with no inequality by SES and substantial inequality by SES in urban health (e.g. Chad) to very good urban health with no inequality by SES and substantial inequality by SES in rural health (e.g. Dominican Republic).

Despite the documented existence of confounding, there is evidence that city life for the poor in today's developing countries, may, like city life historically, actually have a corrosive effect that operates on recent migrants from the rural areas over time. There is both positive migrant selection on health as well as deterioration in the health of rural migrants with time in the city (Bocquier et al. 2011; Omariba and Boyle 2010).

Most of the scholarly work on the nexus between health, poverty and urbanicity has had young children as the focus. An exception is the work of Dodoo and his colleagues. They find that the urban poor are particularly likely to engage in risky sexual behavior than either the rural poor (Dodoo, Zulu and Ezeh 2007) or non-poor urbanites (Greif, Dodoo and Jayaraman 2011). It is critical that consideration of how adolescents and young adults living in urban poverty fare be part of the scholarly and policy discourse. The process of adolescent development as well as the progression of social roles leads adolescents and young adults to interact directly with their environment far more than younger children. Thus, there is reason to believe that to the extent that an urban penalty derives from exposure to negative environmental impacts among the poor, adolescents and young adults may be more vulnerable than younger children.

The current paper tests the hypothesis that there is an urban penalty in less developed countries but, that in contrast to historical Europe it has only emerged among the urban poor.

METHODS

Data

The Demographic and Health Surveys (DHS) are a set of "nationally-representative household surveys that provide data for a wide range of indicators in the areas of population, health, and nutrition" usually conducted every five years (DHS Overview). We included 51 DHS surveys that were done since 2000 in our analysis.

Study Samples

To create our study samples we first selected female respondents from each of the countries who were from 15 to 24 years of age. One of our outcomes is early marriage see below) defined as marriage before age 18 and that study sample consists of female respondents 18 to 24. Another outcome is contraceptive us and that study sample consists of female respondents who are sexually experienced.

Outcomes

There are six outcomes in the analysis. The first four are important determinants of health. These are: 1) early *sexual debut* or sex before age 15; 2) *early marriage* or marriage before age 18 among those 18 and older; 3) *contraceptive use* among the sexually active*;* and 4) *no schooling*. We have two health outcomes, both based on BMI: *underweight* and *overweight*.

Predictors

We have two predictor variables. The first is *urbanicity* (rural and urban). The second is *poverty*, which is based on the wealth index variable. DHS provides a wealth score for each household, which is estimated from the first factor of the principal component analysis of the family's durable assets. We defined poor households as those in the lower three quintiles of the distribution of wealth in each country. We combine these two variables (urbanicity and poverty) into one that distinguishes among three categories of adolescent and young adult: 1) young rural women (both poor and non-poor combined); 2) poor young urban women; and 3) non-poor young urban women. We use the urban poor as the reference category and therefore estimate the odds of young rural women experiencing one of the main outcomes of our interest, compared to the urban poor as well as the odds of the urban non-poor experiencing one of the outcomes, compared to the urban poor.

Methods

Our analytic strategy is to compare our six outcomes for the three groups of women (rural women, poor urban women, non-poor urban women) using logistic regression within countries. All results are weighted for the complex survey design and non-response rates. Our standard-error estimates for 95% confidence level estimation are adjusted for design-effect due to cluster level sampling and higher intraclass correlation >0. In countries where only married women were sampled, we used the "all women factor" provided by DHS to make our results generalizable to the whole population. We then conducted a meta-analysis as a technique to summarize the results in an efficient way.

RESULTS

Table 1 contains the distributions of the 15 to 24 year old female respondents by our three category urbanicity and wealth variable. There is only one case (Moldives) where there were insufficient numbers (n < 25) in each category. In Table 2 we summarize the results of the meta-analysis. The table gives the estimate of the effect size from the meta analysis as well as its confidence interval. This constitutes an estimate of the association across the 51 countries.

Table 2 shows that across the 51 countries the odds of an early sexual debut are not different for rural people than the urban poor. This is clear from the fact that the estimate of the overall effects size is 1.00 and that the 95% confidence interval of the estimate is 0.83 to 1.17. This finding is similar for early marriage (among young women 18 and older). These results suggest that overall; the urban poor have the same risk of early sexual debut and early marriage—with their attendant risks—as those in rural areas. The table also shows that there is an urban advantage in these important determinants of health for urban adolescents and young adults who are not poor. Overall, non-poor urban women are only half as likely as their urban poor or rural counterparts to initiate sex or marry early.

The third outcome is contraceptive use (among the sexually active). Here the results suggest that there is a consistent urban advantage. Sexually active young women in rural areas are less likely than the urban poor or the urban non-poor to have ever used contraception. The urban poor, however, are disadvantaged compared to their non-poor urban neighbors with respect to contraception. A similar pattern holds for the probability of having no schooling—that is, a wealth inequality within cities, but a rural disadvantage compared to the urban poor.

Our final outcome is BMI. We examine levels of underweight and overweight separately. Table 2 shows that poor urban women are more likely to be underweight than *either* young women in rural areas or their more affluent counterparts in cities. With respect to overweight, the group at most risk is the affluent urbanites—although poor urban women are more likely to be overweight than rural young women.

DISCUSSION

In sum, we found that among adolescent and young adult women in 51 LMICs surveyed in the first decade of the 21st century the evidence on the emergence of an urban penalty is mixed. A clear urban penalty is emerging with respect to overweight, which underscores the importance of adolescence and young adulthood as key stages of life for combating NCDs. Both poor and more affluent urban young women are more likely to be overweight than young women from rural areas. Among urban young people, the odds of overweight are higher among the non-poor than the poor.

Moreover, food security among women in adolescence and young adulthood appears to be particularly concentrated among the urban poor who are more likely to be underweight than either their more affluent urban neighbors *or* their age mates in rural areas.

The urban advantage with respect to early sex and early marriage in these countries appears to hold only among those from more affluent households. There is no difference, with respect to early sexual debut or early marriage, between the urban poor and rural adolescents and young adults.

In contrast, we also found that the accessibility of services that typically characterizes cities appears to persist. Young poor urban women are more likely to have attended school and to have used contraception (if they are sexually active) than young women in rural areas although they are disadvantaged by their poverty.

If this paper is accepted for the 2013 Population Association of America meetings, we will include a set of graphs that contrast the overall estimate from the meta analysis with the estimate from each country. On the basis of these graphs, we will be able to discuss regional and other types of variation.

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Table 1. Number of Women 15 to 24 and the percent who are rural, urban poor and urban non-poor by country.

Country	Number of 15 to 24 year old women	Rural	Urban	
			Non Poor	Poor
		Percent		
Albania	2454	59.0	33.0	8.0
Armenia	1893	42.0	42.0	21.1
Azerbaijian	2875	44.7	39.0	16.3
Bangladesh	3599	79.2	15.7	5.1
Benin	6248	54.8	35.9	9.3
Bolivia	6256	31.9	46.4	21.7
Burkina Faso	5050	73.3	26.2	0.5
Cambodia	6889	76.9	21.3	1.8
Cameroon	4936	41.5	44.9	13.5
Chad	2432	76.3	21.8	1.9
Columbia	20563	22.2	39.2	38.6
Congo (Brazzaville)	3060	42.2	41.4	16.4
Congo Democratic Republic	4304	52.1	38.5	9.4
Dominican Republic	10089	28.4	39.1	32.5
Egypt	3203	70.9	19.5	9.6
Ethiopia	6940	73.0	26.3	0.8
Ghana	1902	49.9	38.0	12.1
Guinea	2800	60.9	36.6	2.5
Guyana	1783	71.2	19.7	9.1
Haiti	4704	50.2	43.0	6.8
Honduras	8239	46.1	39.9	14.0
India	47590	68.6	24.4	7.0
Indonesia	4939	65.4	20.5	14.0
Jordan	1512	15.1	21.6	63.4
Kenya	3475	75.0	24.2	0.7
Lesotho	3337	69.9	28.0	2.1
Liberia	2675	51.1	40.5	8.4
Madagascar	6776	81.8	17.2	1.0
Malawi	9559	80.4	17.3	2.3
Moldives[1]	1387	72.3	26.8	0.9
Mali	5781	61.4	35.7	2.9
Moldova	2541	56.8	37.1	6.2
Morocco	6306	42.0	40.2	17.8
Mozambique	4910	57.3	37.0	5.7
Namibia	4101	55.1	37.0	7.9
Nepal	5050	86.3	11.9	1.8
Niger	3369	77.0	22.5	0.6
Nigeria	12626	64.1	28.8	7.1
Pakistan	2068	72.1	19.9	8.0
Philippines	4896	43.1	37.8	19.0
Rwanda	5628	83.9	13.5	2.6
Sao Tome and Principe	1014	45.9	32.2	22.0
Senegal	6648	50.2	36.7	13.2
Sierra Leone	2384	55.5	39.7	4.8
Swaziland	2320	76.6	19.8	3.6
Tanzania	4081	68.8	28.7	2.5
Timor-Leste	5487	73.5	22.2	4.3
Turkey	1283	32.6	28.8	38.6
Uganda	3646	80.3	18.5	1.2
Ukraine	1788	28.7	45.9	25.3
Zambia	2944	54.1	43.7	2.2
Zimbabwe	3786	60.1	36.2	3.7

[1] Urban Poor Group has fewer than 25 cases.

Table 2. Effect Sizes of Odds Ratios for the Rural and the Urban Non-Poor compared to the Urban Poor, Women 15-24 Years Old, 47 DHS Countries Meta-Analysis.

	Early Sexual Debut			Early Marriage[1]			Contraceptive Use[2]			No Schooling			Underweight			Overweight		
Urbanicity and Wealth Interaction	Est	LCI	UCI	Est	LCI	UCI	Est	LCI	UCI	Est	LCI	UCI	Est	LCI	UCI	Est	LCI	UCI
Rural	1.00	0.83	1.17	0.99	0.89	1.09	0.68	0.60	0.76	1.20	1.00	1.39	0.84	0.76	0.92	0.78	0.67	0.89
Urban Poor		1			1			1			1			1			1	
Urban Non-Poor	0.45	0.39	0.52	0.34	0.31	0.38	1.50	1.31	1.70	0.19	0.16	0.23	0.72	0.64	0.81	1.26	1.10	1.42

[1]Among Women 18 to 24 Only

[2]Among Sexually Active Women