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GENDER IN LOW- AND MIDDLE-INCOME COUNTRIES: GENERAL METHODS

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> …we will strengthen our national statistical capacity to collect, analyse and disaggregate data, including by sex, age and other relevant factors that may lead to disparities, and support a wide range of child-focused research. -- Follow-up actions and assessment, A World Fit for Children
>
> General Assembly resolution S-27/2, 10 May 2002.

THE MICS3

The 1990 World Summit for Children adopted the World Declaration on the Survival, Protection, and Development of Children and its Plan of Action, and there governments pledged to monitor progress towards achieving those goals. To aid in this effort, UNICEF developed the Multiple Indicator Cluster Survey (MICS), a nationally representative and internationally comparable household survey. With the MICS, low- and middle-income countries (LMIC) in different regions of the world were equipped to monitor and evaluate progress of children and women (UNICEF, 2006). The MICS supports evidence-based policy formulation, assesses trends, and measures disparities, and it has become a principal tool to assess achievement of the Millennium Declaration and the Millennium Development Goals (MDGs) and the World Fit for Children (WFFC) Declaration and Plan of Action (UNICEF, 2006).

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The MICS3 was carried out in 50 countries between 2005 and 2010. All chapters in this Monograph use data from the MICS3. Table 2.1 shows the countries that participated in the MICS3 and the number of households sampled in each country.

Content

The MICS3 has three questionnaires: a Household Questionnaire, a Questionnaire for Individual Women (15 to 49 years old), and a Questionnaire for Children Under Five (available at http://www.childinfo.org/mics3_questionnaire.html). Each questionnaire is composed of core, additional, and optional modules, which are sets of standardized questions grouped by topics (see Bornstein et al., 2012). The basic criteria for inclusion of MICS3 indicators were their relevance to MDG, WFFC, and UNICEF goals, international agreement on indicators, previous testing, feasibility of collecting data, and proven quality.

In total, the three MICS3 questionnaires contain 42 modules, 21 of which are core, 8 are additional, and 13 are optional. Countries were recommended to use all (relevant) core modules, whereas additional modules focus on issues that may be applicable only to certain countries, and optional modules were included if a country expressed particular interest in a topic. The MICS covers a large array of issues, and its flexibility allows countries to adapt the survey to their particular situations and needs, but the MICS keeps comparability across countries through standardized questions and administration. Strict criteria for any customization of questionnaires at the country level were established; the general rule was not to change comparability of international indicators.

In this Monograph, we use the MICS3 modules related to anthropometry (child growth), child mortality, child development (caregiving), discipline, and child labor to shed light on central issues related to child gender across the developing world. Although 50 LMIC conducted the MICS3, for analyses in this Monograph we used 41 countries (some countries had not released their data to the public at the time of our analysis, and some countries did not include modules that contain data pertinent to our main interests). The 41 LMIC we include represent 12 countries in central and eastern Europe, 6 countries in eastern Asia and the Pacific, 14 countries in sub-Saharan Africa, 4 countries in the Middle East and northern Africa, and 5 countries in Latin America and the Caribbean. The total number of families approximated 2,000,000 people in over 400,000 households, but each chapter uses a subsample based on inclusion criteria for the topic of interest (e.g., families with children under 5 who completed a particular subset of questions). Data on child gender were collected in the Household Questionnaire and were coded 0 for boy, 1 for girl.

Because fewer than 1% of questionnaires were answered by a male respondent, we included only those households where the child's principal female caregiver responded to the MICS3 questionnaire. Respondents identified the people who serve in the role of the child's mother and father. In a great majority of cases, the mother and father are the child's biological parents. However, female caregivers who were not the child's biological mother chose whether to answer the "mother" questions about themselves or about another mother figure. Presumably, mothers might include some adoptive mothers, stepmothers, aunts, grandmothers, and foster mothers, just as fathers could include some adoptive fathers, stepfathers, uncles, grandfathers, and foster fathers. Hence, when we refer to "mothers" and

"fathers," we mean the people who serve in the social role of parent, regardless of their biological ties to the child (Leon, 2007).

Sampling

Each country designed and selected a probability sample, national in coverage, and field implemented the MICS with minimum deviation from an overall standard design. A three-stage sample frame was used: In the first-stage, primary sampling units (PSUs) were defined, if possible, as census enumeration areas, and they were selected with systematic probability proportionate to size (pps); the second stage was the selection of segments (clusters); and the third stage was the selection of the particular households within each segment that were to be interviewed in the survey. To foster sample implementation, implicit stratification was followed. When this form of geographic stratification is used together with pps sampling, the sample proportionately distributes into each of a nation's administrative subdivisions as well as its urban and rural sectors. Depending on the country, the design was likely to vary with respect to the number of PSUs, the number of segments or clusters per PSU, and the number of households per segment, and, hence, the overall sample size. The MICS Manual (UNICEF, 2006) tables calculated sample sizes to be used by the country if the table values fit the country situation. The number of PSUs tended to range from 250 to 350, the cluster sizes (the number of households to be interviewed in each segment) ranged from 10 to 30, and the overall sample sizes ranged from 2,500 to 14,000 households. Existing samples could be used only if they were valid probability samples (e.g., a Demographic and Health Survey or a labor force survey). Because there were many families with more than one child in the target age range (e.g., under 5, 5–14), and we did not want to add within-family variance to already complex designs, we randomly selected a child from each family with more than one child in the specified age range.

Implementation

Each country followed the same stages of implementing the MICS3: making logistical arrangements, preparing the questionnaire and training materials, training fieldworkers, collecting and preparing the equipment, carrying out pilot studies, setting up data processing (computers, staff), and considering and solving ethical issues. Field teams (interviewers and supervisors) were recruited and trained in interview techniques, contents of the questionnaires, field procedures, and use of equipment. All data were entered twice into standard databases with internal consistency checks. After cleaning data files and checking data quality, countries prepared technical reports and data were centrally archived.

A MICS global team oversaw preparation of the survey tools and instruments, training of country teams, follow-up of country performance, quality of data, and approved final reports. To minimize survey biases and ensure data reliability, the same team standardized implementation procedures and prepared technical documents and programs to be used across participating MICS3 countries. Prior to implementation, UNICEF organized workshops in each region to review critical steps, such as survey design and preparation, data processing, data analysis and report writing, and data archiving and dissemination. At any time, governments could seek consultation from UNICEF. Global MICS3 evaluations

confirmed that the tools, technical assistance, and data were of high quality (UNICEF, 2006).

GENDER EQUALITY INDICES

Because national gender equality can be measured in various ways, in the substantive chapters that follow MICS3 data are related to two national indicators of gender equality, each composed of different indicators. The Gender Relative Status Index (GRS; Beneria & Permanyer, 2010; Permanyer, 2010) is a measure of the extent to which one gender is favored over the other in a country in life expectancy, adult literacy rate, gross enrollment in school, and estimated earned income. Because MICS3 data were collected between 2005 and 2010, we used data from the 2008 Gender-Related Development Index (GDI; UNDP, 2008) to compute the GRS. GRS values < 1 indicate that women are disadvantaged compared to men, and GRS values > 1 indicate that men are disadvantaged compared to women. In the 35 countries for which data were available, all countries scored below 1 indicating that women were disadvantaged compared to men; hence, a higher score indicated greater gender equality. GRS scores were available for 36 of the 41 countries in our database (Table 2.2) and had adequate variance (range = .540 – .929).

The Gender Inequality Index (GII; Gaye, Klugman, Kovacevic, Twigg, & Zambrano, 2010; UNDP, 2011) was developed by the United Nations in 2010 and revised in 2011 to measure women's disadvantages in areas of reproductive health (maternal mortality, adolescent fertility), empowerment (female seats in parliament, difference in male and female school enrollment), and the labor market (difference in male and female labor participation). The GII ranges from 0, which indicates that women and men fare equally, to 1, which indicates that women fare as poorly as possible in all measured dimensions. The GII can be interpreted as the percentage loss to potential human development due to gender inequality in the three dimensions. The 2011 values for the GII ranged from .049 for Sweden to .769 for Yemen. GII scores were available for 30 of the 41 countries in our database (Table 2.2) and had adequate variance (range = .151 – .769).

THE HUMAN DEVELOPMENT INDEX

In the substantive chapters that follow, MICS3 data are organized by and also related to the Human Development Index (HDI; UNDP, 2008). The HDI was developed by the United Nations to measure the social and economic status of a country. The HDI has three major components: life expectancy (in years), education (composed of the adult literacy rate and the percentage of school-aged children enrolled in primary, secondary, and tertiary school), and gross domestic product (GDP; in purchasing power parity [PPP] in U.S. dollars). The HDI offers a proxy for the level of support that is generally available to promote human development in poor nations. As such, it connects to many physical and social aspects of the family and home environment with known relations to child well-being. Moreover, the HDI is rooted in a development paradigm that focuses on human growth and the role of contexts and environments to support the development of human potential. The focus of our analyses is on building capabilities and potential in young girls and boys. Given its underlying ethos and aims, we selected the HDI as a macrolevel indicator that mirrors a focus on economic

and social development of a nation (Azariadis & Drazen, 1990; Lucas, 1988; Mankiw, Romer, & Weil, 1992; Nelson & Phelps, 1966).

The HDI ranges from .00 to 1.00, and countries with an HDI of .80–1.00 are considered high, .50 to .79 medium, and .00 to .49 low. This tripartite division is used to organize LMIC in the following substantive chapters (Table 2.2). (The HDI was not available for Iraq and Somalia because of missing GDP data.) Because the MICS3 data were collected between 2005 and 2010, we used the 2008 HDI (UNDP, 2008) which is based on 2006 data. This version of the HDI was calculated for 179 countries and territories. Our sample does not represent the 56 highest ranking countries on the HDI because this Monograph addresses gender in LMIC. The sample of countries in this Monograph adequately represents the rest of the range on the HDI. The 41 countries represent 11% (8 of the 75) high-HDI countries, 27% (21 of the 78) medium-HDI countries, 38% (10 of the 26) low-HDI countries, and 13% (2 of the 15) of countries for which the HDI could not be calculated.

As might be expected, the three national measures of gender equality and human development are related. The correlation between the GII and GRS was $r(25) = -.75$, $p < .001$, in our sample of countries, indicating overlap, but still nearly 44% of their variance was unshared. Also, countries with lower gender equality tended to have lower overall human development, $r(34) = .65$, $p < .001$, for GRS-HDI, and $r(27) = -.79$, $p < .001$, for GII-HDI.

MAIN AIMS, ANALYTIC PLANS, AND HYPOTHESES

The main aims of substantive chapters in this Monograph are to describe the situations of multiple domains of early development in young girls and boys across the developing world and to relate them to national measures of gender equity and sociodemographic well-being. To do so, we address two common questions analyzing how developing (and previously underresearched) countries vary with respect to indicators of child growth and mortality in Chapter III (Bradley & Putnick, 2016), caregiving in Chapter IV (Bornstein & Putnick, 2016), discipline and violence in Chapter V (Deater-Deckard & Lansford, 2016), and child labor in Chapter VI (Putnick & Bornstein, 2016), and how key indicators of national gender equity (GRS and GII) and sociodemographic development (HDI) relate to each of these substantive areas of human development. Our underlying assumption is that multiple domains of development may differ by child gender, as emphasized in the Convention on the Rights of the Child, and we hypothesize that countries also vary in the situations of each domain.

To investigate the first question, we employed an analysis of mean differences between girls and boys (and mothers and fathers, if available). The statistical procedure used varies by chapter due to variations in the design and dependent variables, but in all analyses we include country and child gender as factors and model the interaction between them. In general, we were not interested in main effects of country because these studies were designed to investigate gender differences. However, it was ideal to include country in the models to account for the sometimes vast differences in dependent variables across countries and to investigate interactions between Child gender and Country. In all models we also include covariates that are appropriate to the particular dependent variables.

To investigate the second question, we collected the gender effect sizes from models for each country and correlated them with country-level indicators of the nations' gender equity and economy (GRS, GII, and HDI). Correlating the country-level indicators with effect sizes tells us, for example, if girls are at a greater disadvantage compared to boys in lower-HDI countries or countries with greater gender inequality. We did not employ covariates for these country-level correlations because the model effect sizes were already adjusted for family-level covariates.

We used the HDI to organize the 41 LMIC because we hypothesized that the extent of social and economic development of a country helps to explain some differences among countries in the situations of girls and boys. The gender-related effect sizes for each dependent variable were aggregated at the country level and correlated with the country GRS, GII, and HDI. We believe that macrolevel variables like the GRS, GII, and HDI likely antecede microlevel variables such as are tallied by the MICS3. However, in these chapters we calculate correlations, and so we eschew language that indicates causation and restrict ourselves to the language of associations.

For all tests we report the significance level and a measure of effect size (when available). Sample sizes are so large that many small effects are statistically significant. In this light, focus on the effect sizes is more meaningful than focus on significances. For continuous dependent variables we report partial eta squared (η_p^2) from models and Cohen's (1988) *d*, and for dichotomous dependent variables we report odds ratios (OR). We include Cohen's *d* because (unlike partial eta squared) it is a directional measure of effect size that reflects gender differences. We use Cohen's (1988) benchmarks for small (.01), medium (.06), and large (.14) eta-squareds and small (.20), medium (.50), and large (.80) ds, which can be interpreted in terms of standard deviations from the mean (e.g., a *d* of 1.5 indicates that the mean for girls was 1.5 standard deviations above the mean for boys). For dichotomous dependent variables, we report ORs, which can be interpreted in terms of their odds of occurrence (e.g., an OR of 3.5 means that the odds of girls engaging in the target behavior is 3.5 times the odds of boys engaging in the target behavior, and an OR of .50 means that the odds of girls engaging in the target behavior is half the odds of boys engaging in the target behavior). ORs are only available for main effects of gender and individual country contrasts (i.e., an individual country's deviation from the overall effect, which is not the focus of this Monograph). Because there are 41 countries, ORs are not computed for overall effects of country or Country by Gender interactions.

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TABLE 2.1

COUNTRIES PARTICIPATING IN MICS3 AND SAMPLE SIZE OF EACH COUNTRY

Country	Number of Households	Country	Number of Households
Albania *	5,150	Mauritania *	10,361
Algeria	29,476	Mongolia *	6,220
Bangladesh *	62,463	Montenegro *	2,258
Belarus *	6,707	Mozambique *	13,995
Belize *	1,832	Myanmar	29,238
Bosnia and Herzegovina *	5,549	Nigeria *	26,735
Burkina Faso *	5,523	Palestinians in Lebanon	6,200
Burundi *	8,200	Palestinians in Syria	8,000
Cameroon *	9,667	Sao Tome and Principe	5,646
Central African Republic *	11,723	Serbia *	8,730
Côte d'Ivoire *	7,600	Sierra Leone *	7,078
Cuba	8,466	Somalia *	5,969
Djibouti *	4,888	Suriname *	5,746
Gambia *	6,071	Syrian Arab Republic *	19,019
Georgia *	12,010	Tajikistan *	6,684
Ghana *	5,939	Thailand *	40,511
Guinea-Bissau *	5,305	Togo *	6,492
Guyana *	5,008	Trinidad and Tobago *	5,557
Iraq *	17,873	Tunisia	9,580
Jamaica *	4,767	Turkmenistan	NA
Kazakhstan *	14,564	Ukraine *	5,243
Kenya	NA	Uzbekistan *	10,198
Kyrgyzstan *	5,179	Vanuatu *	2,632
Laos *	5,894	Vietnam *	8,355
Macedonia *	4,701	Yemen *	3,586
Malawi	31,200	Zimbabwe	12,500

Note. NA = Neither data nor report are available for the country.

* Country is included in this *Monograph*.

TABLE 2.2

GENDER EQUALITY AND HUMAN DEVELOPMENT INDICES BY COUNTRY

HDI Rank	Country	GRS	GII	HDI
	High HDI			
57	Trinidad & Tobago	.771	.331	.833
64	Montenegro	.804	--	.822
65	Serbia	.814	--	.821
67	Belarus	.916	--	.817
68	Macedonia	.782	.151	.808
69	Albania	.825	.271	.807
71	Kazakhstan	.929	.334	.807
75	Bosnia and Herzegovina	--	--	.802
	Medium HDI			
81	Thailand	.876	.382	.786
82	Ukraine	.883	.335	.786
87	Jamaica	.863	.450	.771
88	Belize	--	.493	.771
89	Suriname	.752	--	.770
93	Georgia	--	.418	.763
105	Syrian Arab Republic	.665	.474	.736
110	Guyana	.781	.511	.725
112	Mongolia	.869	.410	.720
114	Viet Nam	.865	.305	.718
119	Uzbekistan	.846	--	.701
122	Kyrgyzstan	.857	.370	.694
123	Vanuatu	.859	--	.686
124	Tajikistan	.818	.347	.684
133	Laos	.737	.513	.608
138	Yemen	.540	.769	.567
140	Mauritania	.747	.605	.557
142	Ghana	.810	.598	.533
147	Bangladesh	.718	.550	.524
150	Cameroon	.693	.639	.514
151	Djibouti	.698	--	.513
	Low HDI			
154	Nigeria	.641	--	.499
159	Togo	.632	.602	.479
160	Gambia	.733	.610	.471
166	Côte d’Ivoire	.568	.655	.431
171	Guinea-Bissau	.684	--	.383
172	Burundi	.827	.478	.382
173	Burkina Faso	.716	.596	.372

HDI Rank	Country	GRS	GII	HDI
175	Mozambique	.749	.602	.366
178	Central African Republic	.672	.669	.352
179	Sierra Leone	.621	.662	.329
	HDI N/A			
N/A	Iraq	--	.579	--
N/A	Somalia	--	--	--

Note. GRS scores were computed based on data extracted from UNDP (2008) Table 4. GII scores are excerpted and reproduced from UNDP (2011) Table 4. HDI scores are excerpted and reproduced from UNDP (2008) Table 2.

N/A=Not available because of missing data. -- = Data were not available