The Gender Inequality Index (GII)

First Draft ~ 4 March 2011

Comments, suggestions, and other inputs are warmly welcome at:

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Purpose: To measure inequality in achievements between women and men.

Components: Labour market participation, empowerment, and reproductive health.

Required Data:

For international comparisons:

- Adolescent fertility rate (AFR): United Nations Department of Economic and Social Affairs
- Share of parliamentary seats held by each sex (PR): Interparliamentary Union’s Parline database
- Attainment at secondary and higher education (SE) levels: Barro and Lee (2010)

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1 This draft was prepared by OPHI for UNDP, and use with the joint 2011 Oxford Human Development Training Course Participants. It will be revised considerably drawing on their responses, insights and suggestions. This document was compiled with information from different Human Development Reports and other publications by UNDP. Diego Zavaleta and Melissa Friedman collated source materials for this draft, with support from Sebastian Silva Leander, Sabina Alkire, Maria Emma Santos, and others at HDRO including Amie Gaye and Tim Scott. Graphics are in progress for the next draft, and comments are warmly welcomed!
GII: Outline

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i. What is the Gender Inequality Index (GII)?

Gender equality is a recognized international policy goal for both its intrinsic and instrumental values. The disadvantages facing women and girls are a major source of inequality. All too often, women and girls are discriminated against in health, education and the labour market — with negative repercussions for their freedoms. The Gender Inequality Index (GII) is a new measure of these inequalities built on the same framework as the HDI and the IHDI — to better expose differences in the distribution of achievements between women and men in these three dimensions: reproductive health, empowerment and the labour market. It varies between zero (when women and men fare equally) and one (when men or women fare poorly compared to the other in all dimensions). The GII is designed to reveal the extent to which national human development achievements are eroded by gender inequality, and to provide empirical foundations for policy analysis and advocacy efforts.

The figure below shows the components of the GII and how they are measured.

Box 1: How can the GII be interpreted?

The Gender Inequality Index is similar in method to the Inequality-adjusted Human Development Index (IHDI). The IHDI can be interpreted as a percentage loss to potential human development due to shortfalls in the dimensions included. Since the Gender Inequality Index includes different dimensions to the HDI, unlike the IHDI, it cannot be interpreted as the loss in HDI due to gender inequality. Unlike the HDI, higher values of the GII indicate worse achievements.
**BOX 2: Relation between Inequality-adjusted HDI and the Gender Inequality Index (GII).**

The Inequality-adjusted HDI defines the loss in human development, as measured by the HDI, due to inequality in distribution of health, education and standard of living across a population. The Gender Inequality Index measures the loss in human development due to inequality in reproductive health, empowerment and labour market between women and men. Losses in HDI and the Gender Inequality Index are highly correlated (0.87), indicating that unequal distribution of human development is strongly associated with gender inequality.

The GII builds on previous gender indexes used in the HDRs. In previous reports, the HDR has used two other human development gender indices: the gender-related development index (GDI) and the gender empowerment measure (GEM). The GEM focused on political participation (measured by women’s shares of parliamentary seats), economic participation (shares of high level and professional positions) and power over economic resources (income gaps). However, these gender measures had some important limitations. Informed by some of the limitations of these indexes, the 2010 HDR introduced a new measure of gender inequality (the GII), which combines some aspects of the two previous measures but also has an innovative approach to assessing gender inequality.

**BOX 3: Limitations of previous gender indexes and innovations to address them**

Critics have noted three key drawbacks of the GDI and GEM:

- The measures combine absolute and relative achievements. Thus, a country with low absolute income scores poorly, even with perfect gender equity. The GDI adjusts the HDI for gender inequalities, thereby measuring both total achievements and disparities—though it was often misinterpreted as reflecting only the latter.
- Extensive imputations were needed to fill in missing data. For gender-disaggregated incomes in both indices, more than three-quarters of country estimates were partly imputed. With income the most important driver of the wedge between the HDI and the GDI, this imputation was particularly problematic.
- Nearly all indicators in the GEM arguably reflect a strong urban elite bias and use some indicators more relevant to developed countries.
Innovations

The Gender Inequality Index introduces methodological improvements and alternative indicators:

• It measures inequality between genders in three dimensions, with carefully chosen indicators to reflect women’s reproductive health status, their empowerment and labour market participation relative to men’s.
• It captures these dimensions in one synthetic index, since joint consideration of empowerment and development reflects important complementarities. And none of the underlying measures pertains to a country’s general level of development, so developing countries can perform relatively well if gender disadvantages are limited.
• The Gender Inequality Index combines elements of the GDI and the GEM. Income, the most controversial component of the GDI and GEM due to imputed, is not a component of the Gender Inequality Index.
• It does not rely on imputations at all but only on measured variables.
• The GII does not allow high achievement in one dimension to compensate for low achievement in another dimension. However, like the GDI, one cannot determine which of the sexes is better off by looking at the value.
• The approach is consistent with that for inequality—comparing two groups, women and men, and considering only inequalities between them, at the country level. Like the IHDI, the GII captures the loss of achievement in key dimensions due to gender inequality. It ranges from 0 (no inequality in the included dimensions) to 1 (complete inequality).
• The GII increases when disadvantages across dimensions are associated—that is, the more correlated the disparities between genders across dimensions, the higher the index. This recognizes that the dimensions are complementary and that inequality in schooling tends to be correlated with, say, access to work opportunities and maternal mortality. Overlapping disadvantages are an important aspect of gender inequality, and capturing them is a major advantage of the GII. This contrasts with the IHDI, for which data limitations impede capturing associations across dimensions. The method also ensures that low achievement in one dimension cannot be totally compensated for by high achievement in another.

The GII is not perfect. Among its shortcomings is the bias towards elites that remains in some indicators (such as parliamentary representation). Even so, the inequality adjustments cast important new light on the position of women in almost 140 countries. Yielding insights on gender gaps in well-being and empowerment, it also underlines the importance of proactive public policy to overcome systemic disadvantages.

BOX 4: Limitations on the new index, GII

The Gender Inequality Index faces very major data limitations, which constrained the choice of indicators, for example:
• The use of national parliamentary representation excludes participation at the local government level and elsewhere in community and public life.
• The labour market dimension lacks information on incomes, employment and on unpaid work by women.
• The Index misses other important dimensions, such as time use – the fact that many women have the additional burdens of care giving and housekeeping, which cut into leisure time and increase stress and exhaustion.
• Asset ownership, gender-based violence and participation in community-level decision making are also not captured.

**BOX 5: Other gender indexes**

There are several other gender indexes used by different institutions in the world, such as The World Economic Forum’s Global Gender Gap Index (GGI), the Economist Intelligence Unit’s Women’s Economic Opportunity Index (WEOI), and the OECD’s Social Institutions and Gender Index (SIGI). They differ from the GII in many ways yet can be useful complements as they help us to understand the underlying causes of gender inequalities in economic participation.

The World Economic Forum’s Global Gender Gap Index (GGI), for example, uses different dimensions and indicators to the GII. It also measures gender gaps without taking into consideration a country’s level of development. In contrast, the GII shows the loss to potential achievement in a country due to gender inequality across reproductive health, empowerment and labour market participation.

The Economist Intelligence Unit’s Women’s Economic Opportunity Index (WEOI), focuses on laws and regulations about women’s participation in the labour market and social institutions that affect women’s economic participation. It has five dimensions—labour policy and practice, women’s economic opportunity, access to finance, education and training, women’s legal and social status, and general business environment. Each category or sub-category has four to five indicators.

The OECD’s Social Institutions and Gender Index (SIGI), focuses on the causes behind inequalities rather than inequality outcomes. It has 12 indicators on social institutions, which are grouped into 5 categories: Family Code, Physical Integrity, Son Preference, Civil Liberties and Ownership Rights.

Future drafts will include other measures presented by Seth on 4 March 2011.


ii. Indicators – Dimensions

The GII is a composite measure reflecting inequality in achievements between women and men in three dimensions: reproductive health, empowerment and the labour market. The health dimension is measured by two indicators: maternal mortality ratio and the adolescent fertility rate. The empowerment dimension is also measured by two indicators: the share of parliamentary seats held by each sex and by secondary and higher education attainment levels. The labour dimension is measured by women’s participation in the work force.

Reproductive health of women and girls is measured by maternal mortality ratio (MMR) and adolescent fertility rate (AFR). This is premised on the understanding that the degree to which a society prioritizes the well-being of women during childbirth is intrinsically important, and a clear signal of women’s status in society. In many countries around the world, the risk of death in childbirth could be significantly reduced through the provision of basic education, access to contraceptives, the provision of antenatal health services, and skilled attendance of births. Early childbearing tends to prevent young women from achieving higher levels of education which is necessary for success in the labour market and accessing other life opportunities. Early childbirth also poses a significant health risks for the mother and her baby.¹

For the dimension of empowerment, the female and male shares in parliamentary seats and percentages of adult females and males aged 25 years and older with secondary and higher levels of educational attainment are used. Women have traditionally been disadvantaged in the political arena, at all levels of government. Estimates for parliamentary representation at the national level reflects women’s visibility in political leadership and society more generally, and the extent to which women can hold high offices.

Higher levels of educational attainment expand women’s freedoms by strengthening their capacity to question, reflect and act on their condition and also to access information. Educated women are more likely to enjoy satisfying work, to use their voices in public debate, to be able to care for their own health and that of their family, and to take other initiatives. We use secondary and higher educational attainment because disparities are much greater at these levels.²

In the labour market dimension, female to male labour force participation rates are used. While at some point in their life cycle, women especially may opt to not participate in the labour market, the level of participation reflects both a person’s willingness to work and perceptions about work opportunities available and ability to combine productive work with reproductive responsibilities. However, labour force participation, includes both the employed and

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¹ The risk of maternal death is five times higher in teen births, in part because their bodies are not yet fully developed: Rowbottom (2007)

² We do not include differences in primary attainment as these are relatively minor in contrast to higher levels. In contrast, only 30 percent of countries have achieved gender parity in secondary school, and only 6 percent in tertiary education.
unemployed (actively looking for work, as well as those wanting to work part-time and gives no indication of working conditions such as access to maternity leave and child care benefits, which are important for women to combine their reproduction and productive activities.

**Important dimensions have not been included.** There are other important issues that are relevant to women’s well-being, but for which valid, reliable, and timely data are lacking. Indicators of *time use, asset ownership and control over productive resources; gender based violence and other aspects of empowerment* are all important but are not included due to data paucity.

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**BOX 6: International comparability versus context specific discrimination**

The GII has been designed for international comparability and thus its dimensions and indicators are fixed across countries. This is useful because it enables comparison between women’s status in a country vis-à-vis the rest of the world. This provides policy relevant information for both national governments and the international community. Yet gender discrimination is context specific. Thus, while national teams are encouraged to adopt this methodology, they are also urged to use other indicators relevant to their countries’ specific context. It is easy to adjust the GII (if data are available) as the functional form of the GII can easily incorporate more indicators and dimensions. Thus, a national team can produce the GII for international comparison and a national GII that is more relevant to the specific context.

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**Sources of data used for calculating the Gender Inequality Index**

The Gender Inequality Index relies on data from major publicly available databases, including:

- The maternal mortality ratio from UNICEF’s *The State of the World’s Children*,
- The adolescent fertility rates from the UN Department of Economic and Social Affair’s *World Population Prospects*
- The educational attainment statistics from Barro-Lee data sets
- The parliamentary representation from the International Parliamentary Union
- Labour market participation from the International Labour Organization’s LABORSTA database.

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**BOX 7: Policy relevance**

The Gender Inequality Index provides insights into gender disparities in health, empowerment and labour market in almost 140 countries. It can be
useful to help governments and others better understand the gaps between women and men. Measures of the disadvantages for women raise awareness of problems, permit monitoring of progress towards gender equity objectives and keep governments accountable.

### iii. Measurement

#### Technical Note: Calculating the Gender Inequality Index

The GII is computed using the association-sensitive inequality measure suggested by Seth (2009). The index is based on the general mean of general means of different orders—the first aggregation is by the geometric mean across dimensions; these means, calculated separately for women and men, are then aggregated using a harmonic mean across genders.

#### Computing the Gender Inequality Index

There are five steps to computing the GII.

**Step 1.** Treating zeros and extreme values

The maternal mortality ratio is truncated symmetrically at 10 (minimum) and at 1,000 (maximum). The maximum of 1,000 is based on the normative assumption that countries where the maternal mortality ratio exceeds 1,000 are not different in their ability to create conditions and support for maternal health. Similarly, it is assumed that countries with 1–10 deaths per 100,000 births are essentially performing at the same level.

The female parliamentary representation of countries reporting 0 per cent is coded as 0.1 per cent because the geometric mean cannot have zero values and because these countries do have some kind of political influence by women.
Step 2. Aggregating across dimensions within each gender group, using geometric means

Aggregating across dimensions for each gender group by the geometric mean makes the GII association sensitive (see Seth 2009).

\[ G_F = \sqrt[3]{1 \cdot (MMR \cdot AFR)^{1/2} \cdot (PR_F \cdot SE_F)^{1/2} \cdot LFPR_F}, \]

For women and girls, the aggregation formula is

\[ G_M = \sqrt[3]{1 \cdot (PR_M \cdot SE_M)^{1/2} \cdot LFPR_M}. \]

Step 3. Aggregating across gender groups, using a harmonic mean

The female and male indices are aggregated by the harmonic mean to create the equally distributed gender index.

\[ HARM (G_F, G_M) = \left[ \frac{(G_F)^{-1} + (G_M)^{-1}}{2} \right]^{-1}. \]

Using the harmonic mean of geometric means within groups captures the inequality between women and men and adjusts for association between dimensions.

Step 4. Calculating the geometric mean of the arithmetic means for each indicator

The reference standard for computing inequality is obtained by aggregating female and male indices using equal weights (thus treating the genders equally) and then aggregating the indices across dimensions:

\[ G_{GII} = \sqrt[3]{Health \cdot Empowerment \cdot LFPR} \]

where \( Health = \left( \sqrt[3]{\frac{1}{MMR} \cdot \frac{1}{AFR}} + 1 \right) / 2, \)

\( Empowerment = \left( \sqrt{PR_F \cdot SE_F + PR_M \cdot SE_M} \right) / 2 \) and

\[ LFPR = \frac{LFPR_F + LFPR_M}{2}. \]
Health should not be interpreted as an average of corresponding female and male indices but as half the distance from the norms established for the reproductive health indicators—fewer maternal deaths and fewer adolescent pregnancies.

**Step 5. Calculating the Gender Inequality Index**

Comparing the equally distributed gender index to the reference standard yields the GII,

\[
I - \frac{\text{Harm}(G_F, G_M)}{G_{\text{REF}}}
\]

**Example: Brazil**

<table>
<thead>
<tr>
<th>Reproductive Health</th>
<th>Empowerment</th>
<th>Labour market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal mortality rate</td>
<td>Adolescent fertility rate</td>
<td>Parliamentary representation</td>
</tr>
<tr>
<td>Female</td>
<td>110</td>
<td>75.6</td>
</tr>
<tr>
<td>Male</td>
<td>55</td>
<td>75</td>
</tr>
<tr>
<td>(\text{GII} = (1 / 110 - 1 / 75.6) \times 0.094 - 0.488 - 0.640)</td>
<td>((1 / 0.906 - 1 / 0.463) \times 0.488)</td>
<td>((0.488 \times 0.488 + (0.640 - 0.640)) / 2 = 0.431)</td>
</tr>
</tbody>
</table>

Using the above formulas, it is straightforward to obtain:

\[
G_F = 0.115 = \sqrt{\frac{1 - \frac{1}{110}}{75.6}} \times 0.094 - 0.488 - 0.640
\]

\[
G_M = 0.820 = \sqrt{1 - \frac{1}{0.906} - 0.463 - 0.852}
\]

\[
\text{Harm}(G_F, G_M) = 0.201 = \left(\frac{1}{2} \left( \frac{1}{0.115} + \frac{1}{0.820} \right) \right)^{-1}
\]

\[
G_{\text{REF}} = 0.546 = \sqrt{0.305 \times 0.431 \times 0.746}
\]

\[
\text{GII} = 1 - \frac{0.201}{0.546} = 0.632
\]

**iv. Statistical Analysis**

The GII, estimated for 138 countries, reveals that gender inequality varies tremendously across countries, from 17 percent to 85 percent. These losses in achievement due to gender inequality are not directly comparable to total inequality losses (measured by the IHDI) because different variables are used. The GII shows that countries with unequal distribution of human development also experience high inequality between women and men, and countries with high gender inequality also experience unequal distribution of human development.
BOX 8: Main findings in terms of national and regional patterns of inequality

The world average score on the GII is 0.56, reflecting a percentage loss in achievement across the three dimensions due to gender inequality of 56 percent.

Regional averages range from 32 percent in developed OECD countries, to 74 percent in South Asia.

At the country level losses due to gender inequality range from 17 percent in the Netherlands, to 85 percent in Yemen. Sub-Saharan Africa, South Asia and the Arab States suffer the largest losses due to gender inequality.

Regional patterns reveal that reproductive health is the largest contributor to gender inequality around the world – women in sub-Saharan Africa, with a massive 99 percent loss, suffer the most in this dimension, followed by South Asia (98 percent) and the Arab States and Latin America and the Caribbean (each with 96 percent loss). The Arab States and South Asia are both also characterized by relatively weak female empowerment.

v. Data presentation
Reproductive health is the largest contributor to gender inequality

Source: HDRD calculations using data from the HDRD database.