Literacy and gender in Bangladesh
A human development success story—with a *caveat*

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Literacy data from the 2011 census of Bangladesh show that

- Literacy of young persons nearly tripled between 1964 and 2004

- The formerly substantial gender gap disappeared

- Near universal literacy among persons 15-19 years of age may be reached within the next few years

Surprising, perhaps, if you are used to looking only at adult literacy rates, but this summary statistic obscures as much as it reveals. To learn what census and survey data on literacy can teach us we need to disaggregate them by age. Adult literacy rates, like crude birth rates, are "crude". They disregard population age distribution and the age profile of literacy.

1. Age-specific proportions literate

Figure 1 shows age-specific proportions literate from the Bangladesh 2011 census *Socio-economic and Demographic Report: National Series Volume 4*, available online here as of 17 July 2014.

The rapid overall fall from around 80 percent literate at young ages to around 30 percent literate at older ages stands out. Secondary features are the slightly lower percentage for 15-19 year old persons and the irregularity of the points for the oldest ages.

2. Literacy over time

Older persons are not less literate because they are *older*. They are less literate because they were educated longer ago, when fewer people went to school. The nominal variable is age. The real variable is calendar time.

But how to draw out the implications of age-specific proportions literate for change over time? If persons who become literate do so at age 10 years, a literate person enumerated in the census at age x became literate $x - 10$ years before the census reference time.

The census reference time is 15 March 2011 or, in decimal terms, time 2011.203. The proportion literate for persons age x is therefore an indicator of the proportion of 10 year old children who became literate at this point in time.

For data given by five year age groups, the average age of persons in any group may be approximated by the midpoint of the group. Persons age 60-64 years at the census, for example were age 62.5 years on the average. If the average age at which literacy is attained is 10 years, the average time at which persons in this age group became literate is $2011.203 - 62.5 + 10$, or 1958.7.
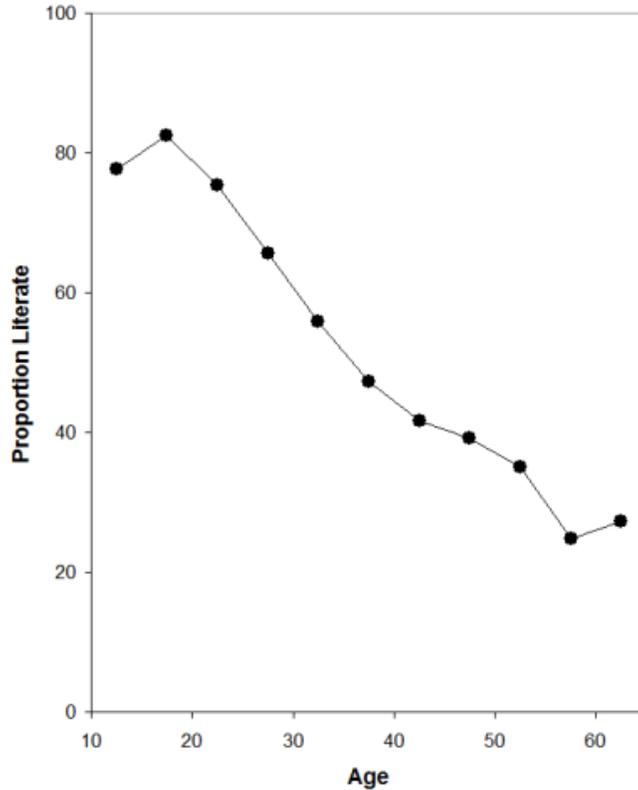
Figure 1 Age-specific proportions literate: Bangladesh census of 15 March 2011

Figure 2 show the same proportions literate as Figure 1, but plotted against time rather than age. The time plot is simply the age plot drawn backwards (which is to say forward in time) and located in calendar time.

Figure 2 shows that the proportion of children becoming literate more than doubled between the early 1950s and the early 2000s.

The last point (10-14 age group) in Figure 2 is lower than the next-to-last point (15-19 age group), but this should ¡em¿not¡/em¿ be interpreted as a decline. The last point is included in Figure 2 to emphasize the relation between Figures 1 and 2. When our purpose is to show the historical trend, it should be excluded.

The reason is that some of the 10-14 year olds represented by the last point are still in the process of becoming literate. Within any birth cohort there is a distribution of ages at which literacy is attained. When plotting age-specific proportions literate over time we want to begin at an age by which all or nearly all of the persons who ever become literate have attained literacy.

3. Disappearance of the gender gap

Figure 3 shows time plots of age-specific proportions literate for males and females, excluding the point for the 10-14 age group.

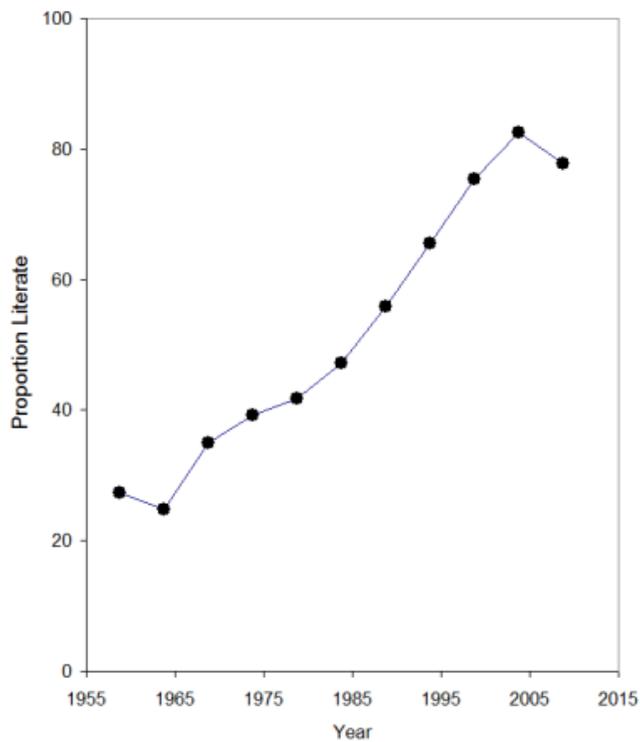During the late 1950s and early 1960s, the proportion of male children becoming literate

Figure 2 Proportions of young persons becoming literate: Bangladesh, 1955-2005
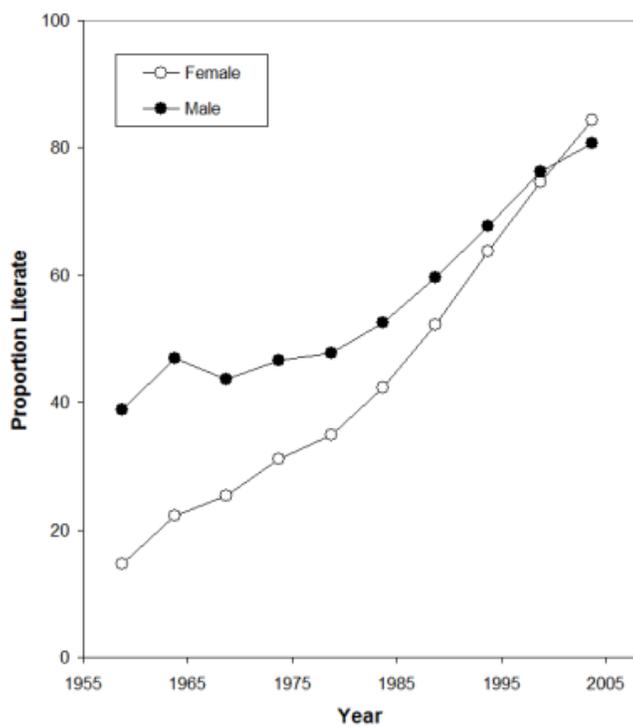

Figure 3 Elimination of the literacy gender gap: Bangladesh, 1955-2005

was over twice the level of female children becoming literate. From 1970, the gap steadily narrows and then disappears. The last points in the series show females having slightly higher literacy than males. But for the discontinuity in the rate of increase for males, the levels would be identical.

The discontinuous slowing of the increase for males indicated by the last point in the series is anomalous. Should it be taken at face value as an indication of a slowdown in the improvement of male literacy? Is it a data problem? Is there another explanation?

4. Toward universal literacy

Figure 4 extrapolates the trend in Figures 2 and 3. The extrapolation suggests that 100 percent of children might become literate by about 2015.
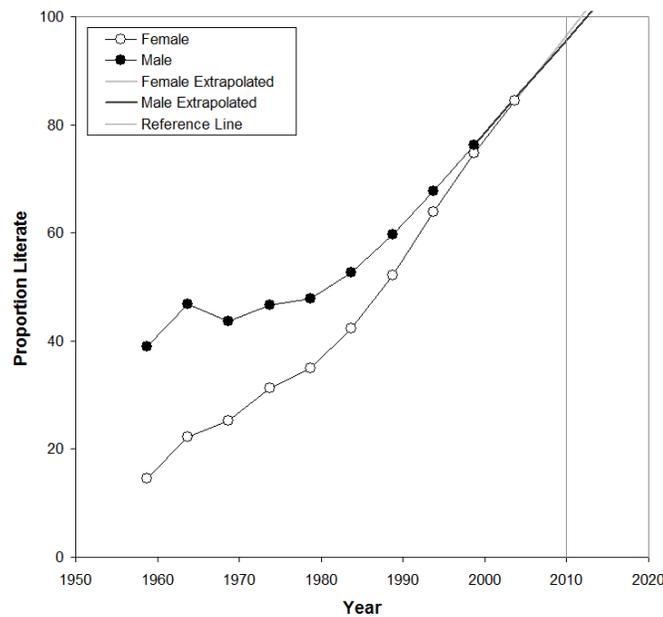

Figure 4 Extrapolating the trend of proportions of children becoming literate: Bangladesh, 2000-2015

"Universal" does not in practice mean 100 percent. The historical experience of developed countries suggests that literacy may rise to around 99 percent or higher, but not to 100 percent.

The extrapolation for males excludes the last point in the series shown in Figure 3, the point for the 20-24 age group. The rationale is that extrapolation of the last two points for males shown in Figure 3 brings an implausibly sharp divergence between future trends for males and females.

Implausible does not equal impossible, however, and the trend discontinuity for males noted in the preceding section merits closer scrutiny.

5. Population dynamics of rising literacy

Imagine a society that has just achieved the goal of making all children literate—one of the aims of the Millenium Development Goal 2, *Achieve universal primary school education.* In the long run, the adult literacy rate in this society will be 100 percent. In the present, however, lower literacy among older persons keeps the adult literacy rate below 100 percent.

Figure 5 shows how long it could take for the adult literacy rate in Bangladesh to rise to 100 percent. It is based on the most recent UN Population Division "medium variant" population projection for Bangladesh, the 2011 census proportions literate shown in Figure 1, and the extrapolation shown in Figure 4.
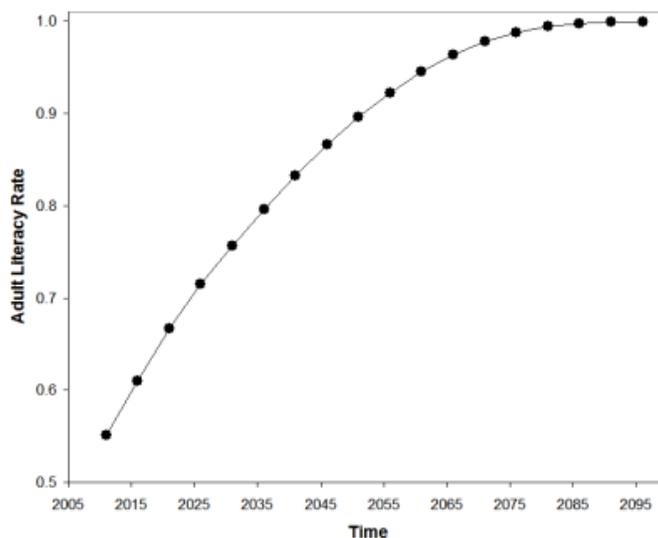

Figure 5 Time required for adult literacy rate to reach 100 percent: Bangladesh

Adult literacy rises by 7 percentage points between 2011 and 2016, but the rate of increase slows in each subsequent quinquennium. It takes over 30 years to reach 90 percent and another 20 years to reach 99 percent.

The long lag between achieving universal literacy for children and universal literacy for adults is a consequence of literacy being acquired in childhood. Short of educating masses of adults in adult education programs, it is unavoidable. This is the caveat referred to in the title.

6. Statistics for policy and program use

A statistical indicator for policy and program purposes should relate in a simple and direct way to the policy or program objectives. The proportion of primary school age children enrolled in school and the proportion of children who become literate are good indicators. If levels are judged too low, the actions that may be taken to raise them are clear: build more schools, train more teachers, encourage school attendance, and so on.

The adult literacy rate is a poor indicator because it depends heavily on factors not or minimally subject to policy and program initiatives, including current age-specific proportions

literate and an educational system in which literacy is expected to be attained in childhood.

As a practical example, consider the *Education for All Initiative* Goal 4, "Achieving a 50 per cent improvement in levels of adult literacy by 2015, ...". Given the 54 percent adult literacy rate for Bangladesh in 2011, a 50 percent increase implies a target level of $54 + 27 = 81$ percent.

Figure 5 shows that even with proportions of children becoming literate rising to 100%, an adult literacy rate of 81 percent will take 25-30 years, based on the UN population projections. Achieving this rate more quickly would require a massive adult literacy program. Was this understood when EPA Goal 4 was set?