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## RESEARCH BRIEF: ONLINE APPENDIX

# DELAYING MARRIAGE AND CHILDBEARING CAN IMPROVE EDUCATIONAL OUTCOMES IN BURKINA FASO'S SAHEL REGION

## ANALYTICAL APPROACH

Using a multiple decrement life table, this analysis estimates the amount of time that girls in Burkina Faso spend in school from the first grade of primary through the last grade of upper secondary and then uses cause elimination to assess effects of competing reasons for dropping out of school. The estimates were made for three geographic levels: national, administrative Sahel region in Burkina Faso, and the rest of Burkina Faso excluding the Sahel. The analysis uses the most recent annual statistics reported by the government of Burkina Faso: 2015-2016 and 2016-2017 for primary school data and 2012-2013 and 2013-2014 for secondary school data.<sup>1</sup> To calculate the specific probability that girls drop out of school for a set of independent reasons during primary or secondary schooling, the analysis uses data from the Demographic and Health Surveys (DHS) Comparative Studies Report on Education published in 1998, which to our knowledge is the most recent data source available for reasons for school dropout by level of schooling.<sup>2</sup>

To estimate the expected years of schooling of girls in school, the analysis uses region-, grade-, and sex-specific promotion, repetition, and dropout rates.<sup>3</sup> Because promotion and dropout rates were not reported for *Troisième*, the last year of lower secondary school, we estimated the promotion and dropout rates for *Troisième*, validating them against administrative data on cohort sizes from two consecutive annual reports. Promotion rate from one grade level to the next is calculated as the *number of new entrants to the higher grade level of education for the following year t+1* divided by the *number of students enrolled in the prior lower grade of education in the given year t* and multiplied by 100. *Number of new entrants to a grade in year t+1* is estimated by the *number of students in year t+1* minus the *number of repeaters in year t+1*. We then performed a multiple decrement life table analysis to estimate the expected years of schooling by school level (primary, lower secondary, upper secondary). The total number of expected years of schooling is estimated as the sum of expected years at each level.

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The analysis uses the probability of dropping out and the distribution of reasons for dropping out to model the cause-specific risks of exiting the school system at each grade level and estimates expected years of schooling after elimination of causes related to marriage, pregnancy, and associated care work and economic stress. Given cultural, geographic, and other similarities between Burkina Faso's Sahel Region and neighboring Mali, data from Mali may better capture reasons for girls' dropout in this region than national data for Burkina Faso. Therefore, this analysis estimates cause-specific dropout rates based on the Burkina Faso probability of dropping out and data from Mali as a proxy for the distribution of causes in Burkina Faso's Sahel Region.

## **ASSUMPTIONS AND LIMITATIONS**

The analysis makes several general assumptions:

1. The groupings used as reasons for dropout are independent of each other.<sup>4</sup>
2. Students do not re-enter school after exiting.
3. Students start school in the first grade of primary school and follow the progression at each level (primary and secondary) until they dropout or graduate.
4. All girls live through age 19, the age at which school would be completed if a student progresses through the grades as planned. Mortality rates were not incorporated into the analysis.
5. The proportion of dropouts due to each reason measured remains constant within schooling level but may vary between levels.<sup>5</sup>

The analysis uses grade as an indication of age, assuming individuals follow the age progression around which the school system was designed and not accounting for factors that affect actual age and average age within grades (for example, advanced-placement students, students who were held back, students re-entering school at a later age).

The lack of consistent and recent data also causes limitations in the analysis. Because no recent data existed by grade on reasons for school dropout out in Burkina Faso's Sahel Region at the time of the analysis, we used 1998 data from Mali, assuming that the Sahel Region's recent cause-specific distribution for reasons for dropping out follows the same distribution as Mali in 1998. Grade-specific dropout rates were not available from the same years across all grade levels, so we used 2012-2013 and 2013-2014 annual statistics for secondary school data and 2015-2016 and 2016-2017 for primary school data.



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Finally, we assume that dropping out due to pregnancy, marriage, unpaid care work, or economic need are independent of any other reason for dropping out of school and that there cannot be multiple reasons for dropping out outside of the grouping.

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## References

<sup>1</sup> Government of Burkina Faso, Direction des Etudes et de la Planification, and Ministère des Enseignements Secondaire et Supérieure (MESS), « Annuaire Statistique des Enseignements Post-Primaire et Secondaire 2012-2013 » (Ouagadougou: Government of Burkina Faso, Direction des Etudes et de la Planification, and MESS, 2013); Government of Burkina Faso, Direction General des Etudes et des Statistiques Sectorielles (DGESS), and MESS, « Annuaire Statistique des Enseignements Post-Primaire et Secondaire 2013-2014 » (Ouagadougou: Government of Burkina Faso, DGESS, and MESS, 2013); and Government of Burkina Faso, DGESS, and Ministère de l'Education Nationale et de l'Alphabétisation (MENA), « Annuaire Statistique de L'Enseignement Primaire 2015/2016 » and « Annuaire Statistique de L'Enseignement Primaire 2016/2017 » (Ouagadougou: Government of Burkina Faso, DGESS, and MENA, 2016 and 2017).

<sup>2</sup> After the analysis was completed, Burkina Faso's Ministry of the Economy, Finance, and Development along with the National Institute of Statistics and Demography published a report on employment and the informal sector that includes data on reasons for dropout by administrative region and by sex but not by grade; INSD and AFRISTAT, *Enquête Régionale Intégrée sur l'Emploi et le Secteur Informel (ERI-ESI), 2018: Rapport Final* (Ouagadougou, Burkina Faso et Bamako, Mali: INSD et AFRISTAT, 2019).

<sup>3</sup> Region-, grade-, and sex-specific proportions of the grade in year  $t$  that were promoted to the next grade-level, repeated the same grade-level, or dropped out before year  $t+1$ .

<sup>4</sup> The groupings used as reasons for exit are the following: (1) reasons related to marriage, pregnancy, unpaid care work, and economic need, and (2) other reasons (a residual category).

<sup>5</sup> The analysis uses the cause-specific distributions for reasons women ages 15-24 leave both primary and secondary school as reported in the DHS Comparative Studies Report on Education published in 1998.