Population and Millennium Development: Integrating Teen Fertility and Gender-Equity Programs*

* Revised title

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Background paper to the report *Public Choices, Private Decisions: Sexual and Reproductive Health and the Millennium Development Goals*

MillenniumProject

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This background paper was prepared at the request of the UN Millennium Project to contribute to the report *Public Choices, Private Decisions: Sexual and Reproductive Health and the Millennium Development Goals*. The analyses, conclusions and recommendations contained herein are the responsibility of the author alone.

* The title of this background paper has been revised. In the report *Public Choices, Private Decisions: Sexual and Reproductive Health and the Millennium Development Goals* the following title has been cited: *Integrating Teen Fertility and Gender Equity Programs.*

Front cover photo: TK

SUMMARY

This background document discusses the potential integration of population and development goals within the framework of the UN Millennium Development Goals. The discussion examines the specific connection between one population factor (unintended pregnancies among teens) and one Millennium Development Goal (the gender gap in educational attainment). Because pregnancy-related dropouts disproportionately (if not exclusively) affect girls, a logical argument can be made that by reducing pregnancy-related dropouts, countries can bring the educational attainment of girls closer to those of boys. Yet the policy question is whether reductions in pregnancy-related dropouts would make a difference that is large enough to warrant policy attention.

After reviewing the theoretical arguments for integration, the report presents some estimates of how much a variety of countries would narrow their gender gaps in schooling if they reduced the incidence of pregnancy-related dropouts. By comparing impacts across countries, the report draws tentative lessons about the circumstances under which policy integration of teenage fertility would have the greatest payoffs in terms of the UN goal of closing gender gaps in schooling. Overall, findings suggest that payoffs are likely to be greatest when countries have begun to address gender discrimination and in countries that are within intermediate levels of socioeconomic development. Reductions in teenage pregnancies are not a panacea but they can complement the efforts to address other barriers to gender equity in schooling.

Although this report focuses on teenage fertility as a factor, the general approach used here can be applied more widely to assess policies that address other causes of dropout. This approach can usefully complement the insights from statistical and evaluation studies. A triangulation of analytical approaches and policy experiences is warranted. Likewise, the search for appropriate gender-equity policies for each country requires a policy dialogue between different disciplines, between researchers and policy-makers, and between planners from different sectors. The present document hopes to contribute to this dialogue.

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I. Introduction

Can the UN meet its Millennium Development Goal of achieving gender parity in education by 2015? Moving close to this goal requires sound policy, specifically an increased ability to identify effective and integrated programs that make the best use of resources while benefiting multiple sectors. It also requires a willingness to recognize the diversity of situations across and within nations.[1] Even as the UN pursues a global agenda, planners must act locally, mindful of the unique constraints and opportunities of each nation or socioeconomic group.

Against this background, this report discusses the potential integration of population and development within the framework of the UN Millennium agenda. The reports examines the connection of teen fertility to gender equity concerns, i.e., would programs to reduce the incidence of teen pregnancies help narrow the global educational gaps between boys and girls? Specifically, how much would any policy effort to reduce pregnancy-related dropouts (PRDs hereafter) among teens pay off in terms of narrowing the educational gap between boys and girls?

Section 1 outlines a few theoretical arguments for integration, including the intuitive -but potentially faulty- notion that reductions in teenage fertility would help narrow the gender gap in schooling. Section 2 reviews several indicators of the relevance of teenage fertility to gender equity concerns. After noting the limitations of these indicators, Section 3 introduces a more direct method of impact assessment. The application of this method requires extensive data that can be met in part by using data

[1] Wodon, Q. and R. Jayasuriya. (eds.) 2003. *Efficiency in Reaching the Millennium Development Goals.* Washington DC: World Bank.

from Demographic and Health Surveys (DHS) to collect schooling information. We use these data to estimate the possible impact of reducing PRDs across several countries (section 4) but also within urban and rural areas in four of these countries (section 5). By analyzing how results vary across countries, we draw tentative policy lessons about the contexts where reductions in PRDs can foster gender equity in education. Section 6 is a general conclusion.

II. Why Consider Teenage Fertility?

Why should one consider teenage fertility among the possible initiatives to narrow the education gap between boys and girls? Why would the UN, in particular, consider an intervention that falls outside its eight Millennium priorities? Why not leave girls' schooling to education planners, and let the population and reproductive health community focus on teenage fertility? The reasons for integrating these two concerns can be summarized as follows.

II.1. Sex-specificity

In general, the gender gaps in education will be narrowed by programs that specifically target girls or by programs that address issues that disproportionately affect girls. If one considers the many reasons why pupils drop out of school (lack of money, distance to school, poor grades, poor health, lack of interest, the decision to seize a job opportunity), few are inherently sex-specific. One clear exception is pregnancy-related dropouts. Girls' schooling (more than boys') inordinately suffers from teen pregnancies, either because of legal restrictions to the continued enrollment of teen mothers, because of lack of

economic and social support to these teen mothers, or because teen fathers in developing nations generally do not withdraw from school as a result of impending fatherhood. Such sex-specificity implies that girls could benefit most from a reduction in pregnancy-related dropouts and therefore, countries would come closer to gender parity in education.

II.2. Synergy

Education and fertility may fall administratively into two different program domains, but they are often correlated in the lives of teens. Studies often find a negative correlation between fertility and education, whether at the national level, within families, or at the level of individuals.[2] While researchers disagree on the statistical interpretation of these correlations,[3] these correlations suggest that policies that affect one factor or the causes of one factor could also affect the other. Potential synergies therefore exist that can justify

[2] See e.g., Castro M.T. 1995. "Women's Education and Fertility: Results from 26 Demographic and Health Surveys. Studies in Family Planning. 1995, 26(4):187–202.

Jejeebhoy, Shireen J. 1995. *Women's Education, Autonomy, and Reproductive Behaviour: Experience from Developing Countries*. Oxford: Oxford University Press.

Kravdal, Ø. 2002. Education and Fertility in Sub-Saharan Africa: Individual and Community Effects. *Demography* 39(2):233-250.

Omariba, D. and W. Rasugu. 2005. "Women's Educational Attainment and Intergenerational Patterns of Fertility Behaviour in Kenya." *Journal of Biosocial Science*. 00, 1–31, Cambridge University Press.

UNFPA. 2002. *State of World Population 2002*. *People, Poverty, and Possibilities*. New York: United Nations. Available on-line at http://www.unfpa.org/swp/2002/pdf/english/swp2002eng.pdf

[3] They can reflect either the deleterious influence of fertility on schooling outcomes, the transformative effects of education on fertility behavior, or the fact that both fertility and schooling outcomes result from the same socioeconomic conditions (see e.g. Hoffman, S. 1998. "Teenage Pregnancy Is Not So Bad After All … Or Is It? A Review of The Literature." *Family Planning Perspectives* 30(5):236-239; see also Ribar, DC 1999. "The Socioeconomic Consequences of Young Women's Childbearing: Reconciling Disparate Evidence." *Journal of Population Economics* 12:547-565.)

policy integration. The UN, in particular, can benefit from finding win-win solutions that serve both its Cairo and its Millennium agendas.

II.3. Agency and immediacy

Granted that fertility affects education, why focus on the fertility of teens rather than the fertility of their parents or on national fertility? The idea here is that the former involves a greater role for the teens themselves, even if the behavioral choices of teens are often restricted severely by their socioeconomic circumstances[4]. While national or parental fertility also affect the schooling of children, their impact is less direct. Here, teens themselves –rather than their parents or society—contribute to shape their own educational outcomes hence a greater sense of agency. While families and society constrain teens' decision-making options, the line is more direct between the individuals who make the fertility decisions and those who bear the consequences of these decisions. Additionally, the effects of teenage fertility can occur immediately and this is relevant to the time-bound Millennium agenda and its 2015 benchmark.

II.4. Historical opportunity

In countries where fertility has recently begun to decline, the number of females within the early reproductive years is at a historical high and future cohorts will be smaller. There is thus a historical opportunity to affect a generation whose reproductive behavior will have a lasting impact on future trends in schooling. Many of these countries are also

[4] Friedman, D., M. Hechter and S. Kazanawa. 1994. "A Theory of the Value of Children." *Demography* 31(3):375-401.

experiencing high levels of urban unemployment that intensify competition for job opportunities. Furthermore, the age at marriage and premarital fertility are rising[5] and there is evidence that premarital fertility affects the subsequent chances of marriage.[6] In that context, teenage fertility and its schooling consequences become determining for the life chances and socioeconomic mobility of young women. A historical opportunity therefore exists to support the educational mobility of women and their families through prevention of unintended and early pregnancies.

II. 5. Caveats

While the integration of teenage fertility to gender-equity goals is intuitively appealing, some of its assumptions require careful consideration. To begin, not all teens are enrolled in school at the time of their pregnancy, and therefore, their pregnancy is irrelevant to their schooling outcomes. Even when a teen becomes pregnant while in school and she drops out afterwards, it is unclear whether the pregnancy was the trigger event or simply an aggravating factor. Some students may come to assess their life chances and conclude that they are best served by pursuing a romantic relationship and motherhood, rather than schooling as a preferred option.[7] Under those circumstances, teen fertility and poor schooling outcomes are not causally related. Rather, they both are mere symptoms of

[5] Gage, A.J. and C. Bledsoe. 1994." The Effects of Social Stratification on Marriage and the Transition to Parenthood in Freetown, Sierra Leone." In *Nuptiality in Sub-Saharan Africa Contemporary Anthropological and Demographic Perspectives*. Caroline Bledsoe and Gilles Pilon (eds). Oxford: Clarendon Press. Pp. 148-164.

[6] Meekers, D. and A.E. Calves. 1997. "Main' Girlfriends, Girlfriends, Marriage, and Money: The Social Context of HIV Risk Behavior in Sub-Saharan Africa." *Health Transition Review* 7(Suppl.):S361–S375.

[7] Friedmann et al. op. cit.

socioeconomic disadvantage. Addressing the "teenage fertility symptom," rather than the fundamental socioeconomic cure, will in this case do little to narrow the gender equity gap. On a different angle, one can argue that some teens have used their romantic relationships strategically as a means to further their education and this sometimes places low-income teens before a quandary. They rely on support from male partners to fund their schooling yet this partnership is risky from a schooling standpoint when a pregnancy occurs. In other words, these partnerships are both a facilitator and a hindrance to girls' education.

The analyses in this report are based on the direct accounts of women themselves about the reasons why they dropped out of school, rather than a statistical study of the correlations of fertility and schooling events in their lives. As such, it is more defensible to expect a causal connection even it is possible that pregnancies may not have been the only factor behind their dropout. In our analyses, we assume that when women report a pregnancy as the cause of their dropout, it is indeed the true and main reason why they dropped out. We do acknowledge that at least for some of these women, pregnancies may have only been a aggravating factor. In that sense, the estimates presented in this report are an upper bound estimate. Below, we examine several common indicators for the relevance of teenage fertility to girls' schooling.

III. The Salience of Teenage Fertility: A Few Indicators

Analysts can assess the relevance of teenage fertility to girls schooling by using one of several indicators, including the percentage of PRDs, the rates of teen pregnancy,

statistical correlations between teenage fertility and schooling, and program evaluations of the impact of reducing teenage fertility.

III.1. Percentage of pregnancy-related dropouts

A few surveys have asked questions about reasons for school dropout and answers to such questions provide a simple means to gauge the salience of fertility to schooling outcomes.[8] Figure 1 presents the DHS results regarding the incidence of pregnancy-related dropout in several African countries.

As the data show, the incidence of pregnancy-related dropout varies greatly across countries and across levels of schooling. These dropouts are more prevalent within junior secondary than in junior secondary or, understandably, in primary school. Across countries, the data in figure 1 show that few PRDs occur in countries such as Niger, Benin, the Comoros or Mauritania, but the numbers are much larger among the top tier of countries displayed in this figure. In terms of ranking (data not shown), pregnancies are the leading cause in the secondary school dropout of female among three of the 23 African countries in Figure 1.

However, PRDs are limited as a policy indicator. First, their policy importance depends heavily on the denominator. Given the same number of PRDs, higher percentages will be obtained where female dropout rates are low. Less obviously, the importance of PRDs also depends on their timing. When they occur early in the school cycle, the potential number of schooling years lost is larger than if they had occurred

[8] Demographic and Health Surveys (DHS). 2003. Statcompiler, ORC Macro. Measure DHS+project, http://www.measuredhs.com, accessed July 1, 2003.

later. Thus, the same percentage of PRDs can have vastly different consequences depending on their distribution over the school cycle. Third, the importance of PRDs as a policy priority must be judged against the magnitude of other sources of gender inequality in schooling. Finally, and more practically, the data on dropout reasons are often not available on the scale or detail needed. In such cases, rates of teenage fertility can be considered as a substitute.

III.2. Incidence of teenage fertility

Where PRD data do not exist, data on the incidence of teenage fertility can be used as a substitute. Figure 2 shows data on the incidence of teenage fertility in a number of countries, specifically, the percentage of women who reach age 20 without becoming mothers or pregnant. The country situations, again, vary. Teenage fertility is common in Niger or Mali for instance, where as many as 2 in every five girls become pregnant during their teen years. While this indicator is convenient because data are available, it is less satisfactory than the incidence of pregnancy-related dropouts. Among others, it presumes that a teen fertility necessarily compromises schooling and this is questionable in situations where girls (1) can continue their education after a pregnancy, (2) deliberately choose motherhood and early marriage over schooling[9] or (3) were not enrolled in school to begin with.

[9] Friedman et al. op.cit; Calves and Meekers, op. cit.

III.3. Statistical correlations

Analysts can also evaluate the relevance of fertility to gender equity based on statistical studies of the correlation between teen motherhood and the schooling of girls. The meaning of these correlations is ambiguous, however. A correlation may exist because girls who experience little success in their educational pursuits may choose the alternative path of early motherhood and marriage. It may also exist because girls who come from disadvantaged socioeconomic backgrounds are at greater risk of both dropping out of school and having an unintended pregnancy. In those situations, a mere correlation between teen fertility and schooling cannot be taken to imply that policy makers could narrow the gender gaps in schooling by reducing unintended pregnancies among teens.

III.4. Evaluation studies

Evaluation studies are another source of evidence. They are especially useful insofar as they assess actual programs and they consider the practical difficulties of implementation. When based on appropriate designs, evaluations can generate credible conclusions about policy impact, even though results are difficult to generalize to other settings.

In sum, several measures can serve to indicate the impact that teenage fertility could have on gender inequality in educational attainment. The common limitation of these measures from a policy stand point is that they do not fully address the quantification needs implied in the UN Millennium agenda. Under the quantitative and benchmarked Millennium agenda, it is important to assess *how much* any given program would affect the achievement of the Millennium Development Goals. Below, we describe a framework that permits such quantification.

IV. A Framework for Policy Assessment

a. The Framework

Schooling life tables provide a useful framework for education policy analysis. They can serve to estimate how much the gap in education between boys and girls would narrow if they managed to reduce one specific cause of dropout, in this case, pregnancy-related dropouts. In that sense, they are well suited to the UN quantitative agenda, where the interest is on meeting quantitative goals by 2015.

b. Strengths and weaknesses

The application of schooling life tables to the analysis of education policy is severely limited by their extensive data requirements. Yet this shortcoming must be weighed against its enormous possibilities in informing policy evaluation. The use of schooling life tables can support before-hand quantification of likely impacts, before resources are committed. Importantly from a UN perspective, this framework can express outcomes in the specific terms and units of the Millennium Development Goal in educational equity by gender. The section below briefly explains the main idea behind the proposed framework.

c. The main idea

The main idea here is that one can classify dropout reasons across two dimensions: type and timing. Based on type, the main distinction is between sex-specific (e.g. pregnancies) from non-specific reasons for dropping out of school. This distinction between intrinsically sex-specific and less sex-specific influences matters, because it

makes it possible to contrast the relative contributions of societal discrimination versus teen pregnancy. The second classification criterion is timing, where one can distinguish primary from post-primary dropouts. Crossing these two classifications generates four sources of gender inequality in educational attainment, as shown in Figure 3.

Schooling life tables expand the taxonomy outlined in Figure 3 into a more detailed and quantitative treatment. Rather than distinguishing two periods and two main reasons, a schooling life table examines dropout rates at every single grade and perhaps through a larger set of dropout reasons. A table will then use information on these grade-specific and reason-specific rates of dropout to estimate the levels of educational attainment. More importantly, it can be used to estimate how the levels of educational attainment would change if one modified one/several of the dropout rates. For instance, what would happen to educational attainment if one reduced the number of students who drop out of secondary school because of lack of money? In the case at hand, the exercise consists in examining how educational attainment for girls and the gap between boys and girls would change if one reduced the incidence of pregnancy-related dropouts (see Figure 4).

The calculations involved are tedious but can be expedited by creating a computing interface that planners can use to investigate the schooling implications of various policies, without being involved in the details of the calculations. As shown in the leftmost box of Figure 5, users would simply input choices about the nature (cause of dropout addressed) and intensity (percent by which this cause of dropout is reduced) of interventions, as well as about target populations and grade levels. Based on these input data, the output values (simulated magnitude of the gender gap) would be re-calculated

automatically. The system can therefore show how policy choices affect education outcomes, e.g. how a 25 percent reduction in PRDs among female 10th graders would reduce sex inequalities in secondary school attainment. More generally, planners can compare multiple policy alternatives and select the one with the most desirable effects. While the computations themselves are straightforward, the real limitations comes from data, as one needs detailed information about the reasons why pupils drop out of school at different grades. This lack of data has probably one key factor in limiting the application of schooling life tables to education policy. In recent years, however, the data collection efforts of DHS have generated information that partially overcomes these limitations. By combining these data with other available secondary information on the structure of the school systems of these countries as well as the rates of grade repetition, one is able to estimate the potential gender equity impact of reductions in the incidence of pregnancy-related dropouts.

V. National-level Assessments

The data used in these assessments come from DHS surveys but also with additional information from UN and World Bank sources. The calculations are described in detail elsewhere[10] and the results can be used to achieve three policy goals: (1) simulate the impact of reducing PRDs on the gender gap of a specific country, (2) decompose the gender gap of a country into its pregnancy and discrimination components, (3) compare

[10] Eloundou-Enyegue and Stokes (2004). Teen Pregnancy and Gender Inequality in Education: A Contextual Hypothesis: *Demographic Research* 11(11). December 2004

country responses with an eye toward understanding the contextual conditions under which reductions in PRDs are most likely to have a substantial impact.

Simulation

Figure 7 illustrates the detailed results of a simulation. It specifically shows, for one country, how the female to male ratio in school participation would change if countries began to reduce their incidence of pregnancy-related dropouts.

The bottom curve in this figure shows how the ratio in female to male enrollment changes as pupils progress through school, from the first to the 14^{th} grade. As these data show, this ratio gradually declines from parity at school entry until about 0.75 by the end of secondary school. The other curves show how the female-to-male ratios in school participation would change if one were to reduce the incidence of PRDs by 10%, 20%, … up to 100%. In this illustrative case, the elimination of PRDs would likely bring the country to parity in secondary school completion, if indeed pregnancies were the true and only reason why girls who report such dropouts terminated their education.

A simpler chart can be drawn if one focused on educational attainment, rather than a full description of what happens at all the levels of schooling. In that case, one could focus on a meaningful education milestone. By doing so, one no longer needs a full set of curves to illustrate program impact and instead, one can use a small bar, as shown in Figure 8. The bottom tip, the middle, and the top of this bar represents the value of the FMR in secondary school completion if pregnancy-related dropouts were reduced by 0%, 50%, and 100%, respectively. The total length of the bar therefore indicates the

magnitude of the potential impact of programs to reduce PRDs. This simpler presentation is practical in making cross-national comparisons, as shown in Figure 8.

As Figure 8 indicates, the size of the bars varies considerably across the 23 sub-Saharan nations in this analysis, from very low values in Niger and Benin to much higher values in countries such as Kenya, Uganda, the Central African Republic, or Cameroon, for instance. Ultimately, researchers can compare the results across countries as a way to understand the socioeconomic factors associated with greater program impact. Because the input data needed to simulate program impacts exist for few countries only, the lessons from these analyses are tentative. Nonetheless they suggest general guidelines about the contexts in which programs to reduce teenage fertility could have a sizeable impact on narrowing the educational gap between boys and girls.

Decomposition

Figure 6 below breaks down the total gender gap of several sub-Saharan countries into four sources, including “pregnancy within primary,” “discrimination within primary,” “pregnancy after primary school,” and “discrimination after primary school.” Results show three clusters of countries.

The first cluster (Chad to Comoros) comprises countries where gender discrimination with primary school is the main source of the gender gap in educational attainment. In Chad for instance, passage through primary school is associated with over a 50% decline in the female to male enrollment ratio in school participation as a results of gender discrimination alone.

In the second cluster (Eritrea, Madagascar, and Mozambique), the limiting factor here is discrimination within secondary school. In Eritrea, for instance, passage through secondary is associated with a 50 percent decline in the female-to-male enrollment ratio in school participation, because of gender discrimination alone. Compared to the first cluster, there is less gender discrimination within primary school, but some discrimination remains within secondary level. Based on these results, this middle cluster of countries should focus on addressing discrimination within secondary school. The specific areas of discrimination to address can be identified by examining the dropout causes that disproportionately affect girls.

A third cluster (Kenya through Zambia) is one in which PRDs within secondary school are the limiting factor. These countries are ones in which one is most justified in considering teenage fertility as a potential factor in narrowing the educational gap between boys and girls. The simulation below serve to indicate exactly how much individual countries would narrow their gender gaps, if they reduced their pregnancy-related dropouts.

Comparative analyses

Figure 9 shows the relationship between a country's levels of teenage fertility and the potential impact of programs to reduce pregnancy-related dropouts. On the X axis of this figure, countries are ranked by increasing order of the percentage of women who reach age 20 without becoming mothers or pregnant. This ordering is expected to represent the countries' advance in the transition in teenage fertility, with countries to the right being more advanced in the process. For each country, the estimated impacts of PRD program

are plotted by thin bars. Using this figure, one can examine the correlation between the initial size of the gender gap (the bottom tip of the thin bars) and the country's advance in teen fertility. Most importantly, one can also examine the correlation between the potential impact of PRD programs (length of the thin bars) and the countries' advance in the transition in teenage fertility. Statistical analyses indicate that the size of these bars on average is greatest for the middle-range countries, even as the chart clearly shows important exceptions such as the Central African Republic or Madagascar.

VI. Differences within Case Countries

Previous analyses have focused at the national level. Yet because countries are heterogeneous, it makes sense to examine differences within countries, especially between rural and urban areas. Not only do rural areas differ in terms of their levels of fertility and age at marriage, but they also differ in terms of access to schooling opportunities. For this reason, programs to address teenage fertility may be relevant in one sector but not the other. Figure 10, shows the results of these more detailed analyses for selected case countries, including Kenya, Madagascar, the Dominican Republic, and Nepal.

These four countries present contrasted scenarios with respect to the size of existing gender gaps in schooling and their sensitivity to reductions in pregnancy-related dropout, but also with regard to their rural-urban differences. Kenya presents a fairly unusual situation where rural enrollments exceed urban enrollments (data not shown). In this country, both rural and urban gender gaps in secondary school completion would be narrowed by reductions in pregnancy-related dropouts, with a stronger response from the

rural populations. In the rural sector of this country, it would take about a 65% reduction in pregnancy-related dropouts in order to close the gender gap, whereas about an 80% reduction would be needed in the urban sector.

Madagascar presents a more classic case where urban enrollments are considerably higher than rural enrollments (data not shown). The gender gap in secondary completion in this country is also high for both rural and urban population. These gaps would respond moderately to reductions in pregnancy-related dropouts, but in neither area would the gender gap in schooling close because of programs to reduce PRDs. Other factors, including attention to discriminatory practices at the primary level of schooling, are needed. In other words, Madagascar is a setting where PRDs would not be sufficient.

The situation is quite opposite in the Dominican Republic where the response to reductions in PRDs would be modest but it is not even needed. The country was already close to parity and attention to teenage fertility is not warranted on gender-equity grounds. Finally, Nepal offers a scenario of high contrast between urban and rural situations. Gender parity has been achieved among the small urban population of this country, but the gaps are quite large within rural communities. Nepal's situation illustrates quite clearly how analyses must go beyond a study of national aggregate and examine possible differences within countries. Even if a reduction of PRDs would do little to advance educational equity between rural boys and girls, the gap in the rural sector deserves attention.

VII. Tentative Policy Lessons

The various case countries reviewed above suggest tentative policy lessons. Overall, the gender-equity payoff of reducing PRDs varies substantially across countries. While not always necessary or sufficient, it has some effect, especially in countries that also address discriminatory barriers to gender equity and in countries that are at intermediate stages of socioeconomic development. These various lessons are discussed in turn.

1. The gender-equity payoffs from reducing PRDS vary across countries

As shown in Figure 9, program impacts vary substantially and such variation cautions against blanket statements about the potential gender-equity payoffs of reducing PRDs in developing countries.

2. Reducing PRDs is neither always necessary nor sufficient

A few countries, South Africa for instance, have now closed their gender gaps in secondary school completion in spite of some incidence of pregnancy related dropouts. Conversely, other countries such as Nepal, Tanzania, and Burkina Faso would not close their gaps, even if they managed to eliminate all pregnancy-related dropouts. Still other countries show little incidence of pregnancy related dropouts but have large gaps in secondary completion. These findings indicate that PRD programs are neither necessary nor sufficient components of efforts to close the gender gaps. Nonetheless, they would make a substantial difference in many countries, particularly within the sub-Saharan

region. Among the 23 sub-Saharan countries where data were available, the simulations showed that current gender gaps would be reduced on average by one third.

3. Payoffs depend on efforts to limit gender discrimination

PRD program impacts will be greater where countries have begun to address discrimination-related factors. Some interaction exists between PRD programs and efforts to address other sources of the gender gaps namely discrimination at the primary and the secondary level. Overall, simulations show that the impact of PRD programs will be substantially greater when countries address the problems that occur before puberty or outside the realm of pregnancy. Again, policy integration on a case-to-case basis is warranted.

4. Countries fall under four different gender equity-regimes

One important contribution of this framework is to draw attention to qualitative differences in the makeup of gender inequality. Two countries can have a gender gap of the same magnitude but the source of this gap can differ dramatically. In terms of the sources of inequality, countries can be classified under four regimes, as shown in Table 1.

Under a cultural regime, gender discrimination within primary school remains substantial. Other factors may be important, but the fundamental factor that needs to be addressed is cultural acceptance of gender equity in education. Only when this first factor is addressed would programs to address other factors be likely to payoff. The next regime is labeled economic. In this situation, discrimination has subsided within primary school but it remains substantial at the secondary level. This regime is labeled economic

because families begin to value their daughters' schooling, but they will still divest disproportionately from girls when the costs of schooling are high or when the economic conditions are difficult. Under the third, demographic regime, discrimination is moderate but there is a substantial incidence of pregnancy-related dropouts, especially at the secondary level. This is the stage during which PRD programs are likely to have the most substantial impact. In the final stage, all four sources of gender inequality have been addressed and the country has closed its gender gap in schooling.

5. The impact of reducing PRDs depends on socioeconomic context

Preliminary analyses show PRD program impacts to be associated with several aspects of socioeconomic development. Two important aspects of development include the extent of progress in teen fertility transition (i.e. the percentage of teens who reach the age of 20 without becoming pregnant) and the cultural advances in gender equity as indicated by the female to male ratio of literacy within the adult population. In designing gender equity programs, planners could consider investing in reducing PRDs in countries that have already made some advance in promoting cultural acceptance of girls' schooling and where early fertility and marriage are becoming less normative. Where these other barriers are being removed, unintended pregnancies become a more critical factor to the UN goal of closing the global gender gap in education.

VIII. Conclusion

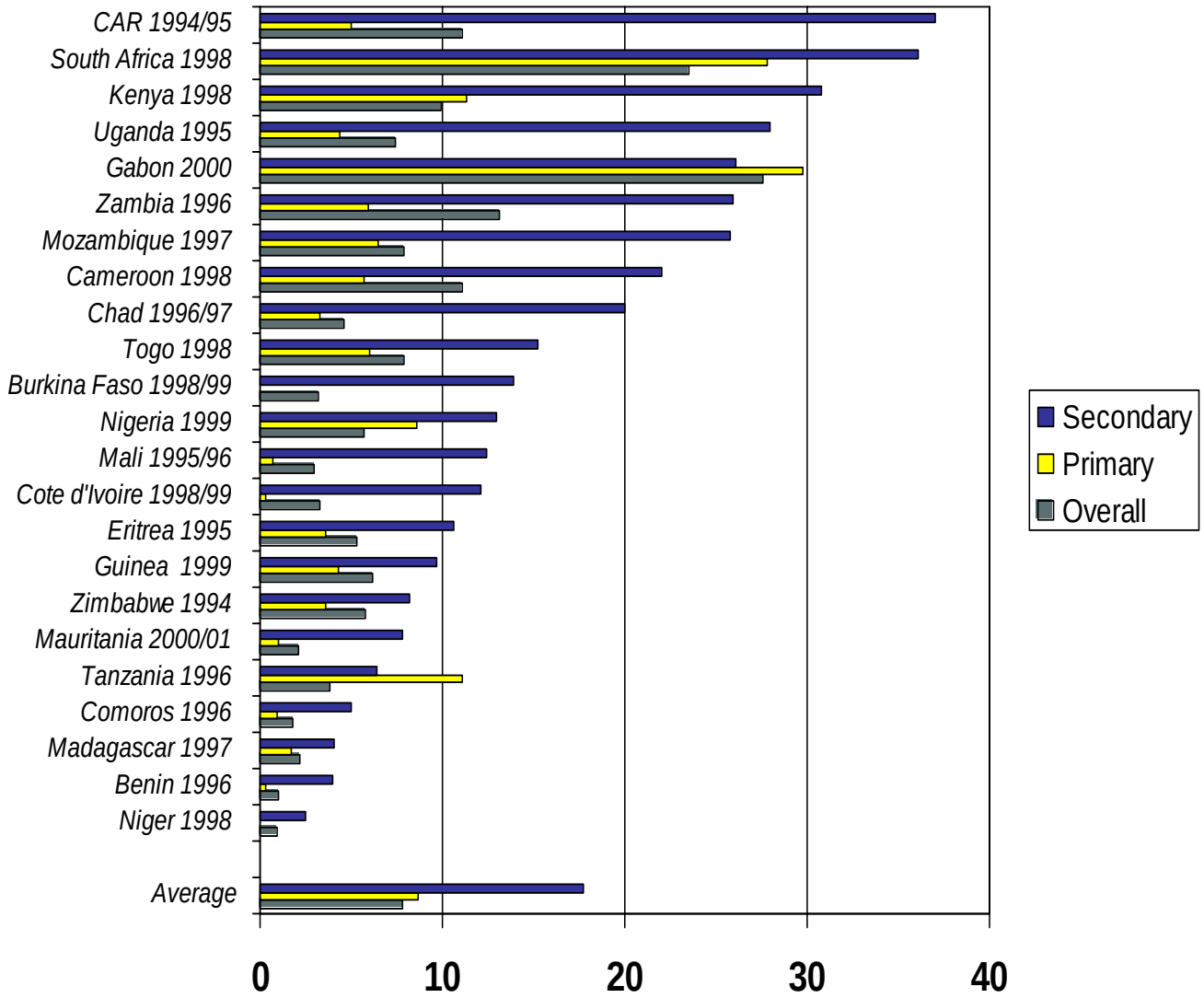
The UN progress in closing the global gender gap in education depends on the extent to which individual countries can identify programs that are most effective within their

socioeconomic environment. In identifying these programs, policy analysts can rely on decades of policy experience and on previous research in this area. In addition, however, policy analysts can use schooling life tables and the increasingly available education data on developing countries to simulate, *before hand*, the potential impact of different education policies. This report attempted such an analysis, focusing on the potential impact of pregnancy-related dropouts on gender parity in educational attainment. In countries where the required input data is available, planners can use schooling life tables to generate quantitative upper-bound estimates of the gender-equity impact of investments in programs to reduce teenage fertility.

Our results suggest that these impacts vary greatly across countries. They tend to be greatest within countries that are socio-economically intermediate and have begun to address gender discrimination, whether such discrimination is culturally or economically-based; Countries fall under four gender equity regimes, including a cultural regime, an economic regime, a demographic regime, and an egalitarian regime, depending on the main source of discrimination against girls; By identifying these regimes and simulating, before implementation, the possible impact of policy, planners would be in a better position to achieve the effectiveness that is essential to meeting the UN in gender parity in education. As with any simulation, the accuracy of results depends on the quality of the input data on the dropout reasons and dropout rates. The DHS data collection efforts have opened an opportunity but these data are incomplete and additional data collection efforts on schooling must be pursued by national administrations or research institutions. Further, the simulations proposed here must be accompanied by additional assessments of the practical and economic feasibility of the policy options that appear most promising.

This implies a broad policy dialogue not only between 1) different academic disciplines, but also 2) between researchers and policy-makers, and 3) between planners from different sectors. The present document hopefully contributes to this broad dialogue.

Figure 1. Percentage of all female dropouts caused by pregnancy, by level of education



Source: DHS (2003). Average computed by author, using countries' population size in year 2000 used as weights

Figure 2. Percent of teens reaching age 20 without becoming mothers or pregnant

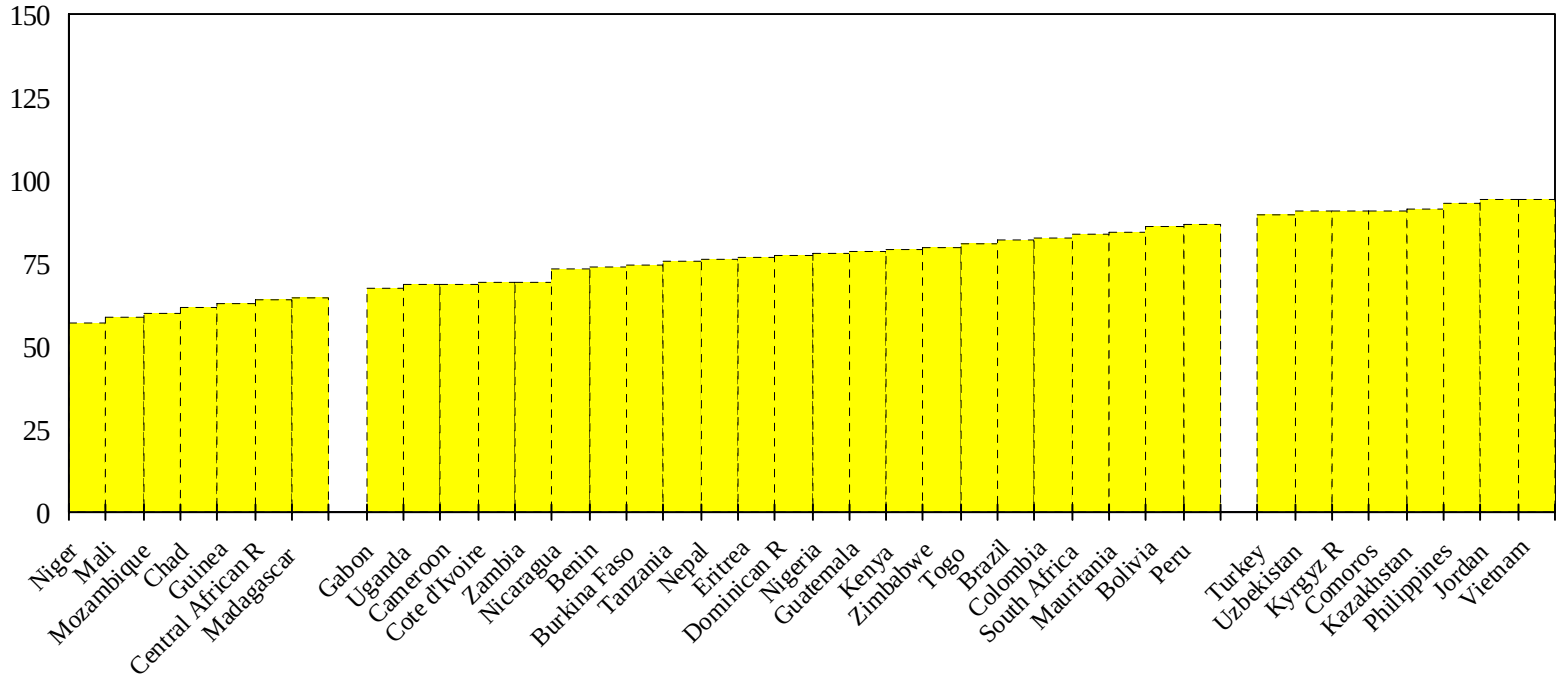


Figure 3. A Classification of Sources of Gender Inequality, by timing and reasons for dropout

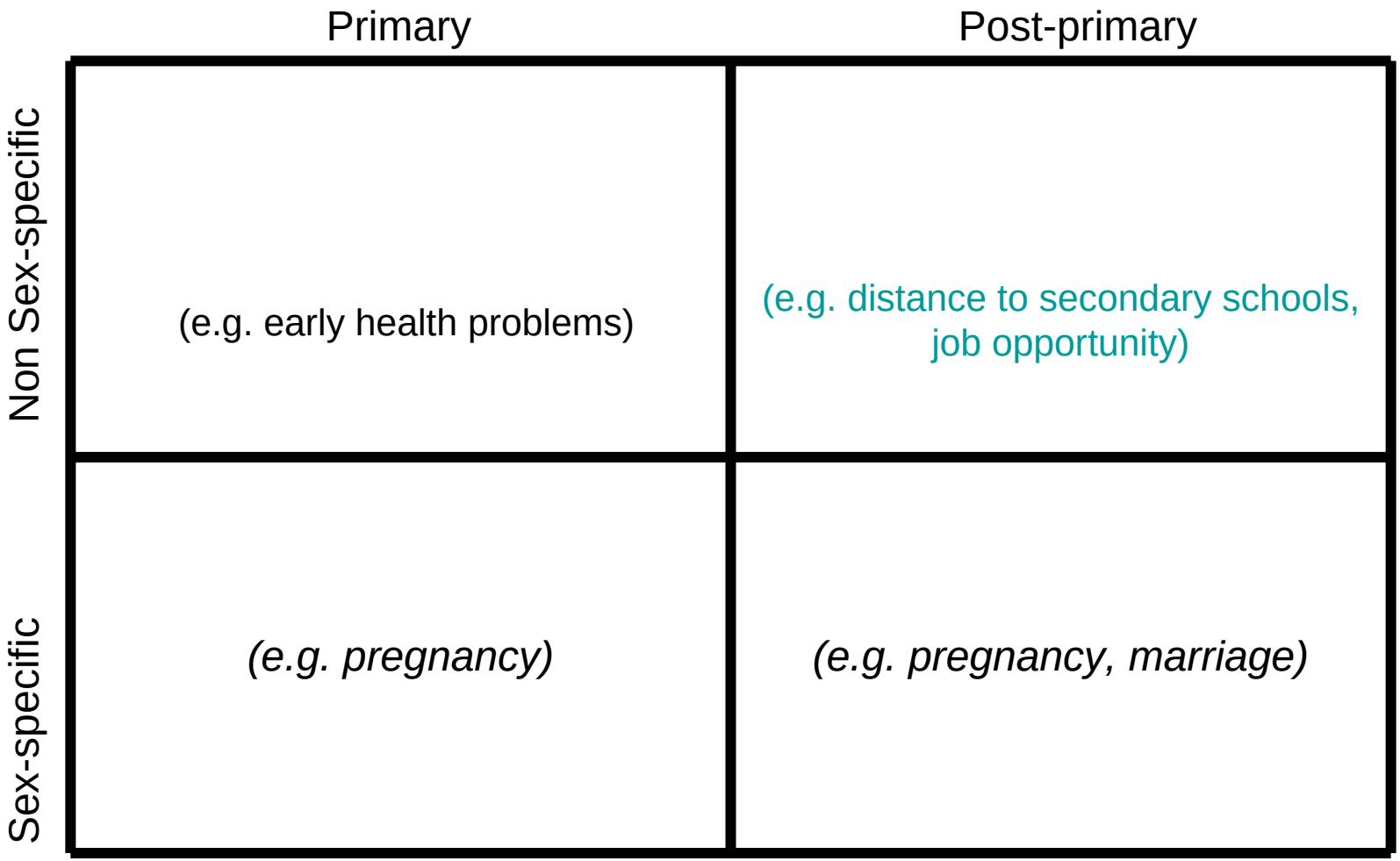


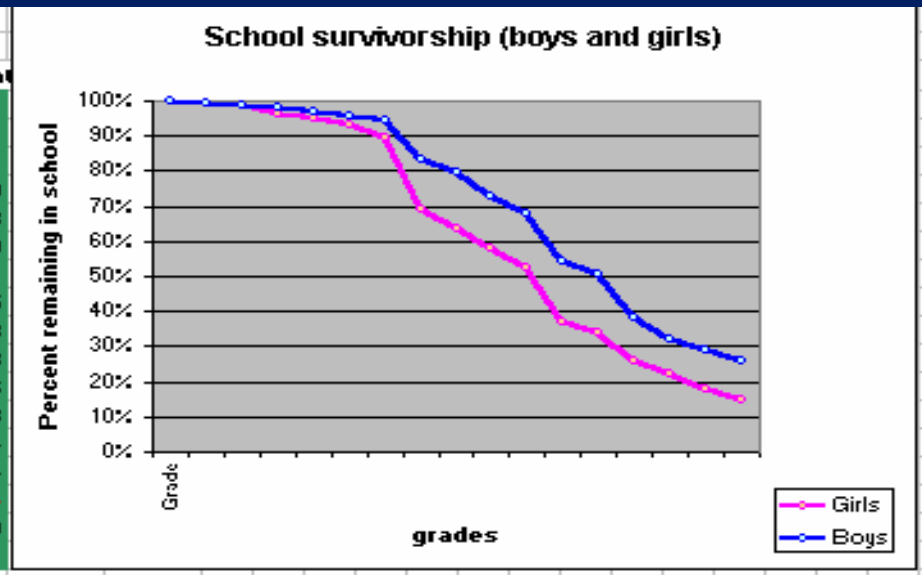
Figure 4. Example of a Complete Schooling Life-table and its Related Simulation

GIRLS

Simulation coefficient

% girls remaining

t	Lx	q1	qo	1	d	T	e	S		F/M rat
k	100000	0	0.01	0	500	1068408	10.684	100.0%	k	1
1	99500	0	0.01	0	497.5	968408	9.7327	99.5%	1	1
2	99003	0	0.03	0	2970.1	868908	8.7766	99.0%	2	1
3	96032	0	0.01	0	960.32	769906	8.0171	96.0%	3	0.9759
4	95072	0	0.02	0	1901.4	673873	7.088	95.1%	4	0.9788
5	93171	0.01	0.03	0.01	3540.5	578801	6.2123	93.2%	5	0.9729
6	89630	0.06	0.17	0.06	20615	485630	5.4182	89.6%	6	0.9511
7	69015	0.03	0.05	0.03	5245.2	396000	5.7379	69.0%	7	0.8275
8	63770	0.04	0.05	0.04	5548	326985	5.1276	63.8%	8	0.8023
9	58222	0.04	0.05	0.04	5531.1	263215	4.5209	58.2%	9	0.8023
10	52691	0.09	0.2	0.09	15438	204993	3.8905	52.7%	10	0.7766
11	37253	0	0.08	0	3092	152302	4.0884	37.3%	11	0.688
12	34161	0.07	0.16	0.07	7993.6	115049	3.3679	34.2%	12	0.6784
13	26167	0	0.15	0	3977.4	80888.8	3.0913	26.2%	13	0.6874
14	22190	0	0.19	0	4216	54721.8	2.4661	22.2%	14	0.6874
15	17974	0	0.19	0	3415	32532.2	1.81	18.0%	15	0.6249
16	14559	0	0.2	0	2911.7	14558.6	1	14.6%	16	0.5681



BOYS

Dropouts associated with other factors

% boys remaining

t	Lx	q1	qo	d	T	e	S
k	100000	0	0.01	500	1216573	12.166	100.0%
1	99500	0	0.01	497.5	1116573	11.222	99.5%
2	99003	0	0.01	594.02	1017073	10.273	99.0%
3	98408	0	0.01	1279.3	918071	9.3292	98.4%
4	97129	0	0.01	1359.8	819662	8.4389	97.1%
5	95769	0	0.02	1532.3	722533	7.5445	95.8%
6	94237	0	0.12	10837	626764	6.6509	94.2%
7	83400	0	0.05	3919.8	532527	6.3852	83.4%
8	79480	0	0.09	6914.8	449127	5.6508	79.5%
9	72565	0	0.07	4716.7	369647	5.094	72.6%
10	67849	0	0.2	13705	297082	4.3786	67.8%
11	54143	0	0.07	3790	229233	4.2338	54.1%
12	50353	0	0.24	12286	175090	3.4772	50.4%
13	38067	0	0.15	5786.2	124737	3.2768	38.1%
14	32281	0	0.11	3518.6	86670	2.6849	32.3%
15	28762	0	0.11	3135.1	54389.2	1.891	28.8%
16	25627	0	0.34	8815.7	25627.1	1	25.6%

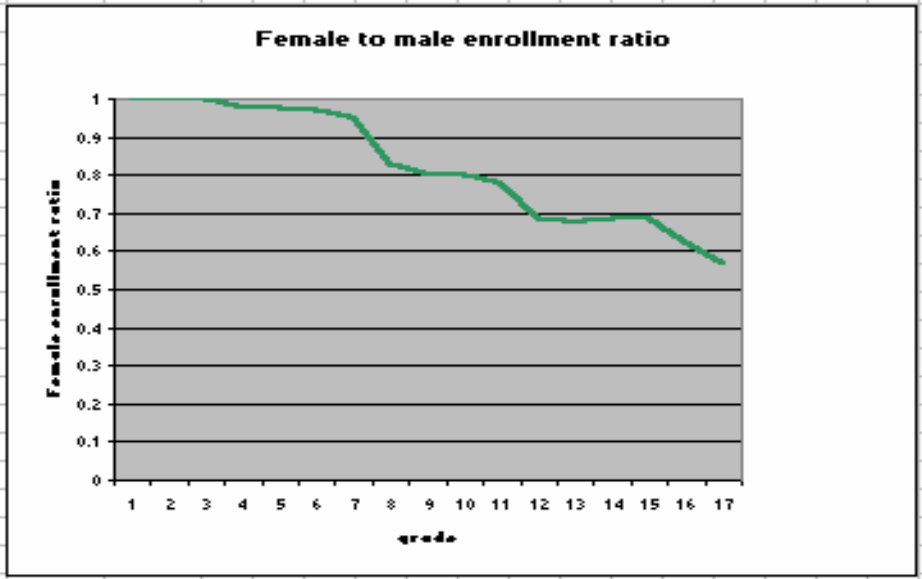


Figure 5. Schematic representation of a computing interface for using schooling life table simulation in appraising education policies

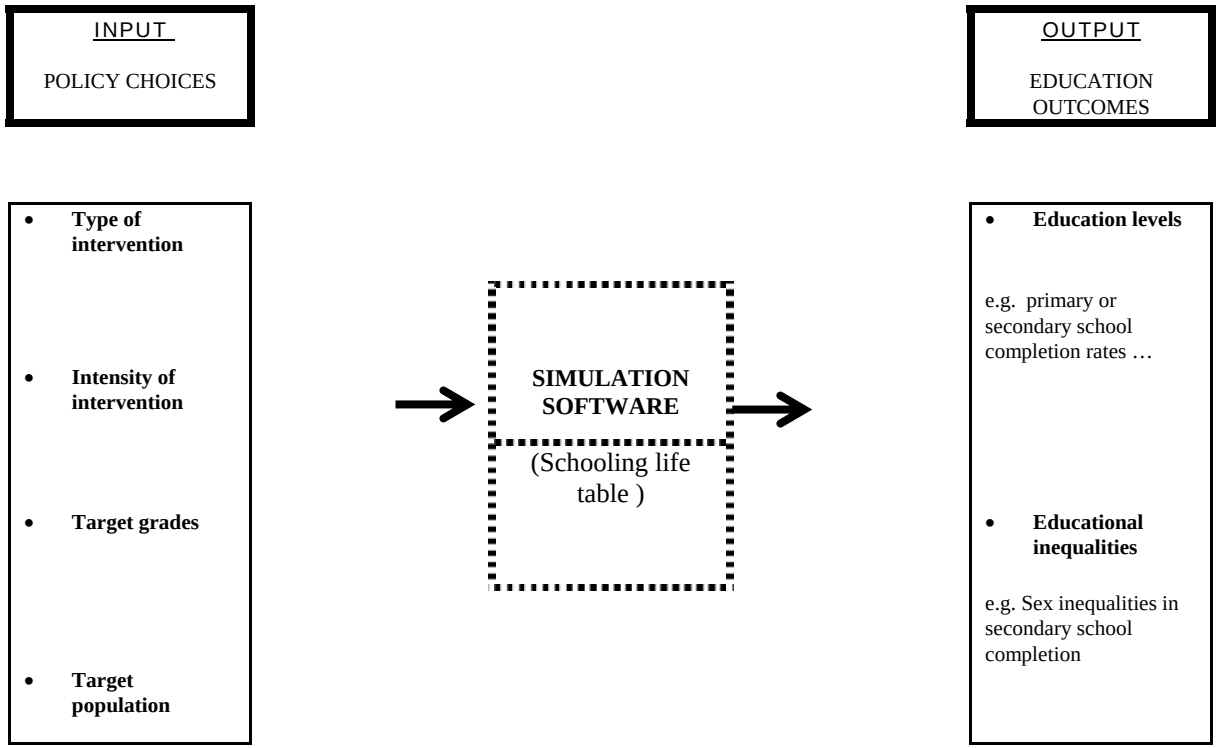


Figure 6. Percent reduction in the female-to-male survivorship associated "pregnancy" and "non pregnancy" factors at the primary and secondary levels, respectively (23 sub-Saharan countries)

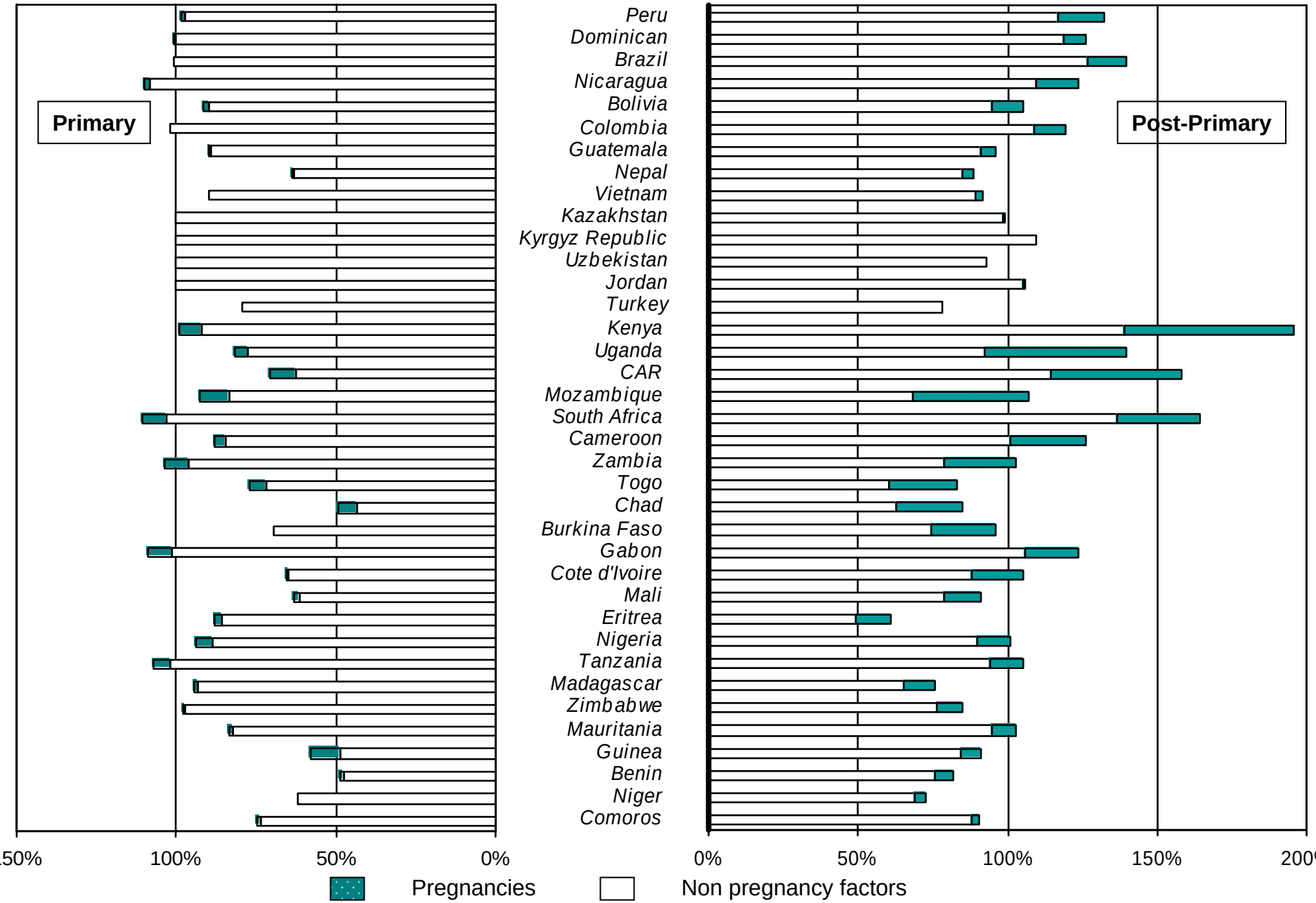


Figure 7. Detailed simulation results for the effects of reducing pregnancy-related dropouts on the female-to-male enrollment ratio in school survivorship

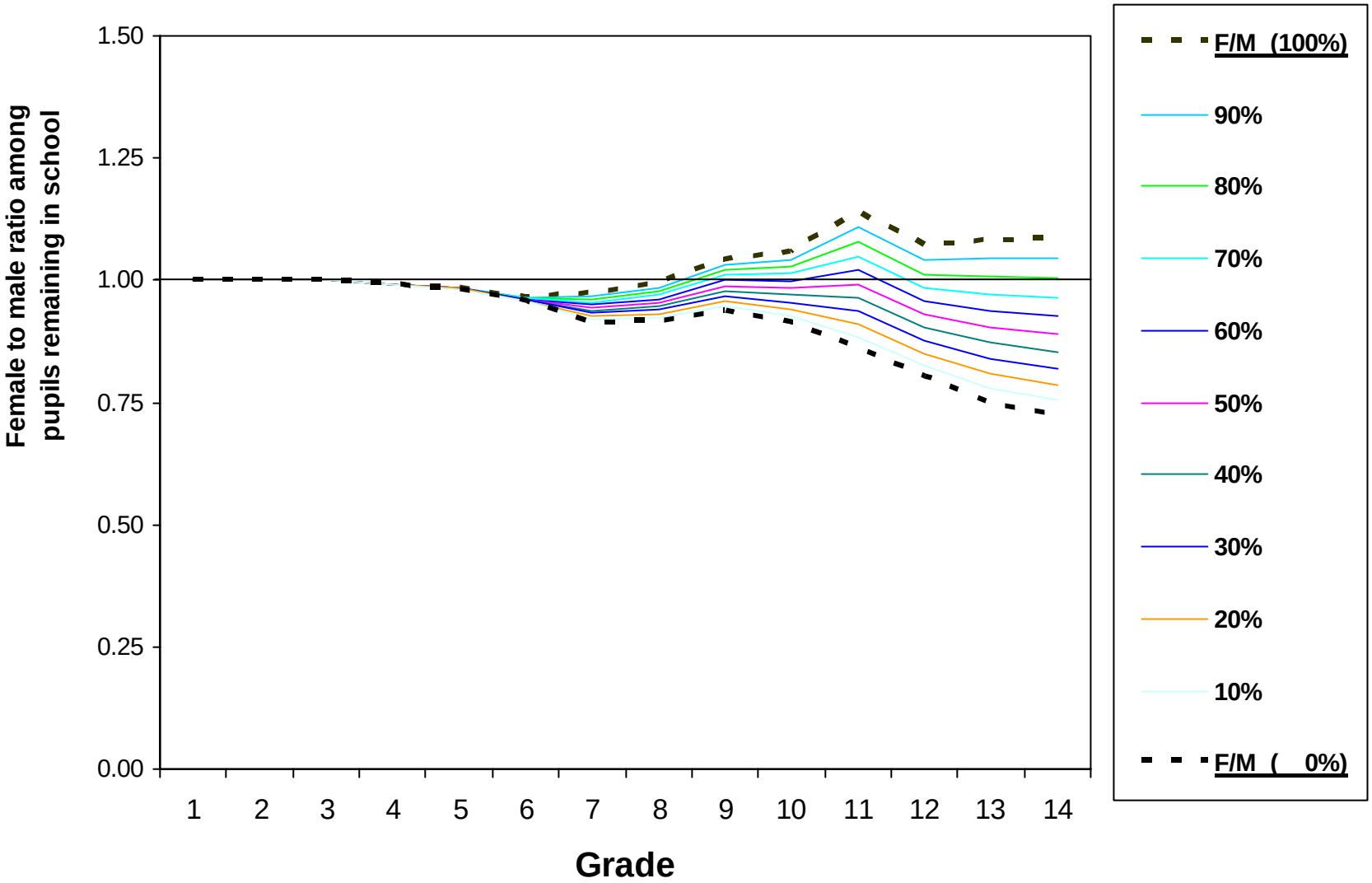


Figure 8: Simulation results for the impact of reducing pregnancy-related dropouts on the female-to-male ratio in secondary school completion (23 sub-Saharan countries)

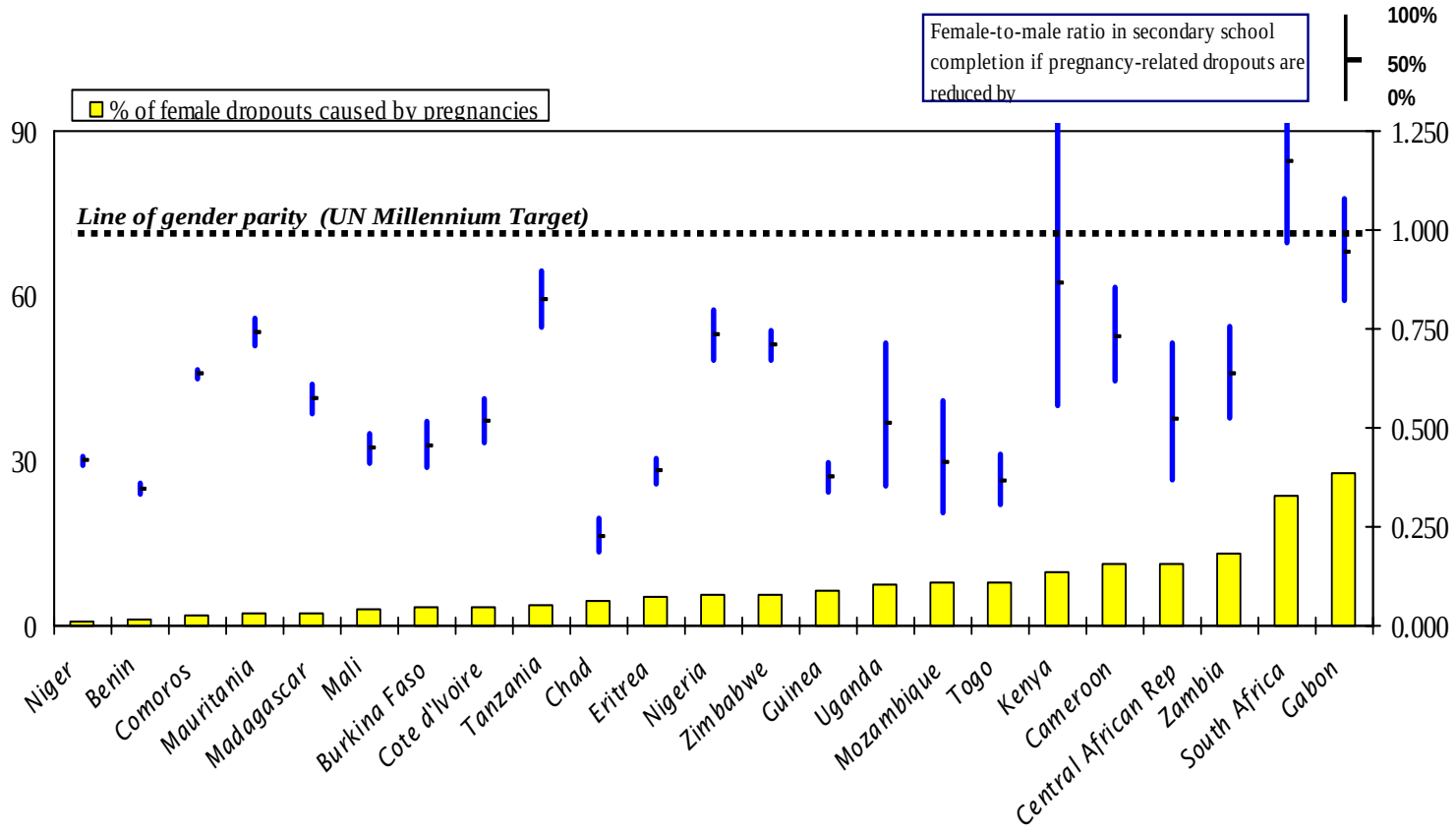
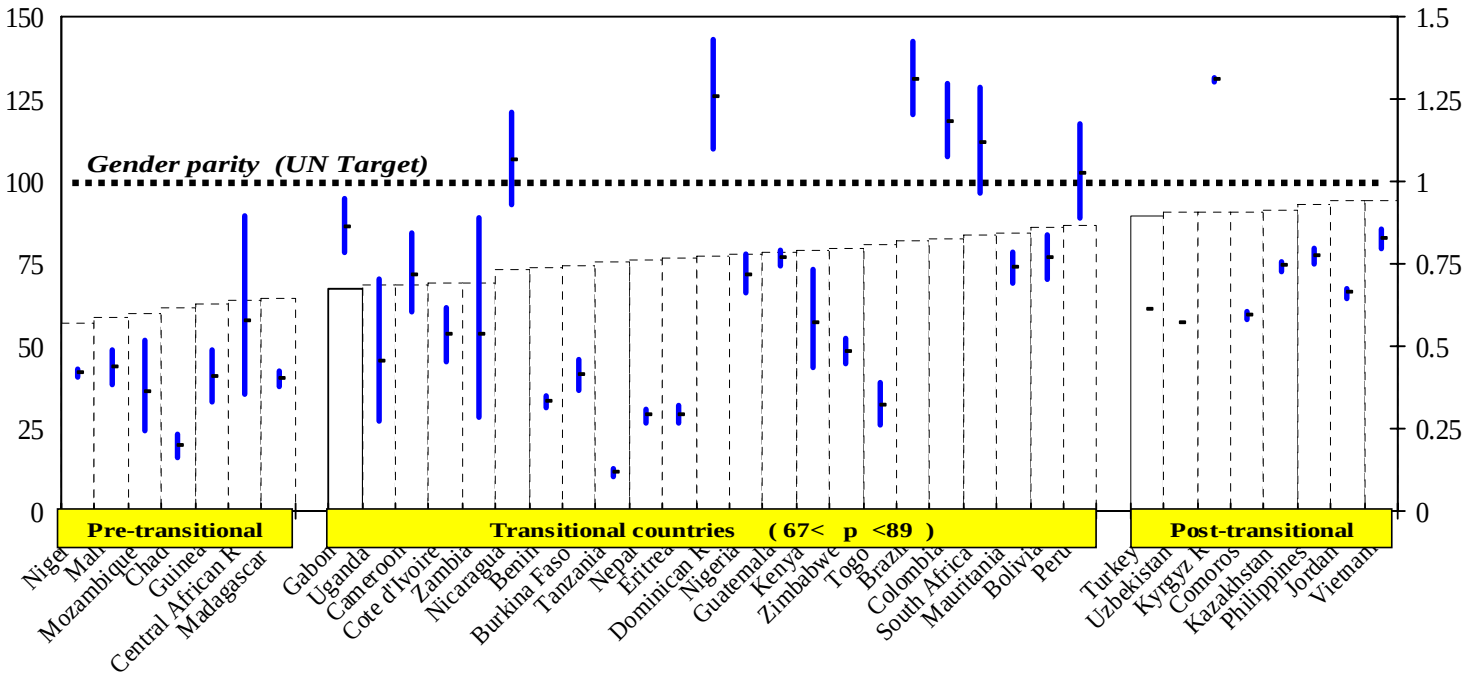


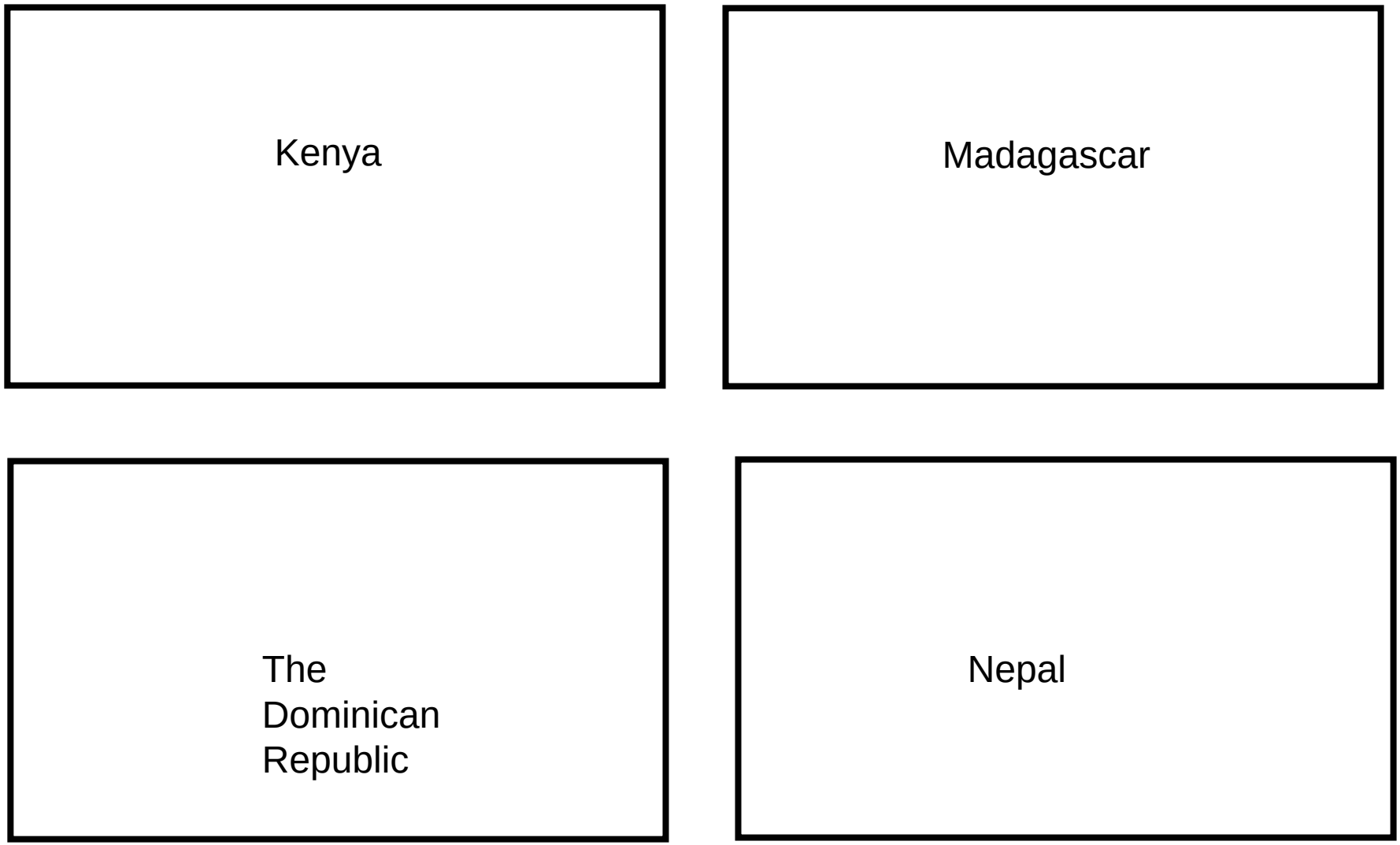
Figure 9. Gender-equity impact of reducing pregnancy-related dropout, by national levels of teenage fertility



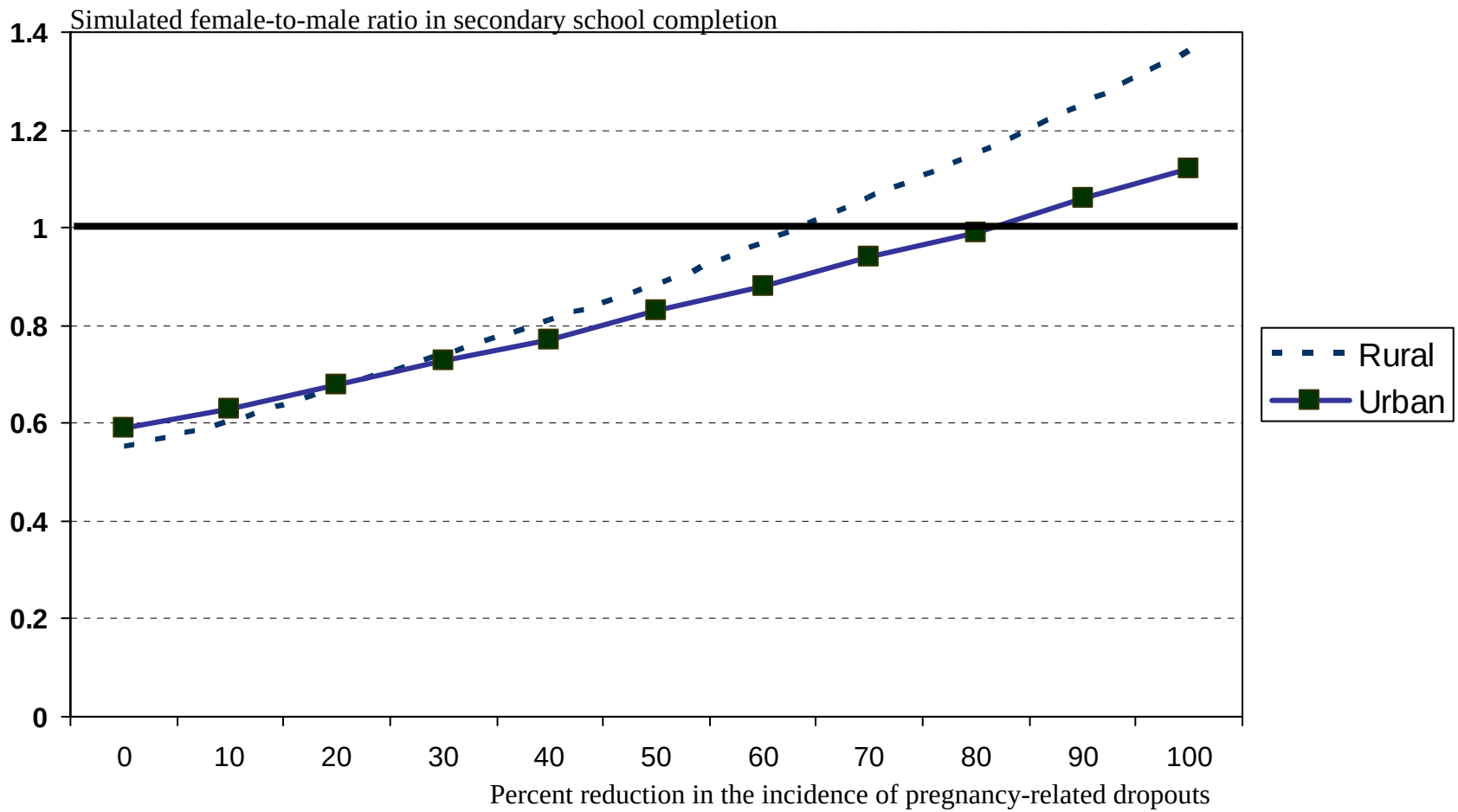
A. BY TRANSITION STAGE IN TEEN FERTILITY

(*percentage (p) of teens turning 20 without becoming mothers of pregnant (right Y axis***))**

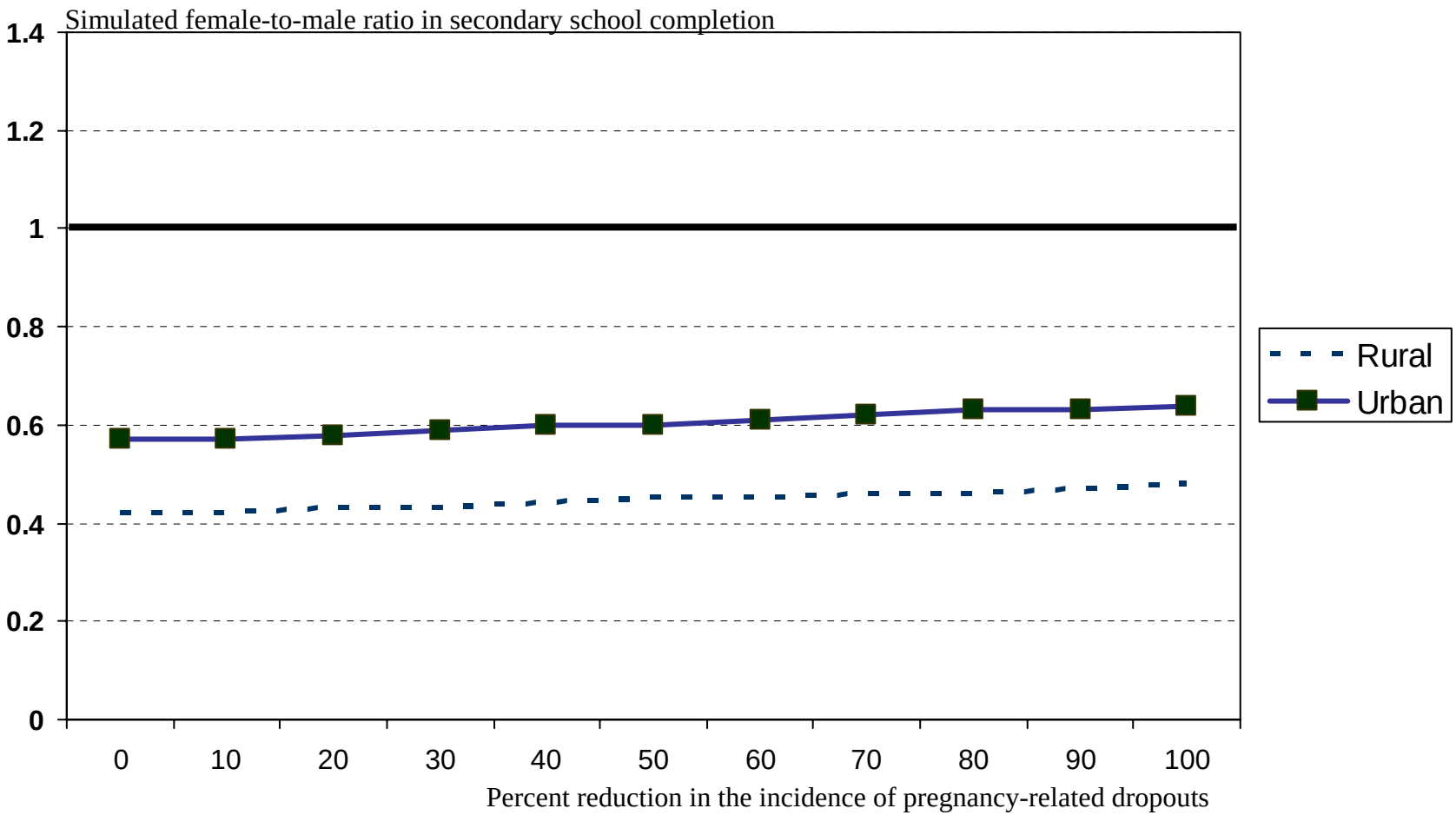
Figure 10. Estimated impacts of reductions in pregnancy-related dropouts on the female-to-male ratio in secondary school completion



Kenya


Simulated female-to-male ratio in secondary school completion
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
10
20
30
40
50
60
70
80
90
100
Percent reduction in the incidence of pregnancy-related dropouts
Rural
Urban

Madagascar


Simulated female-to-male ratio in secondary school completion
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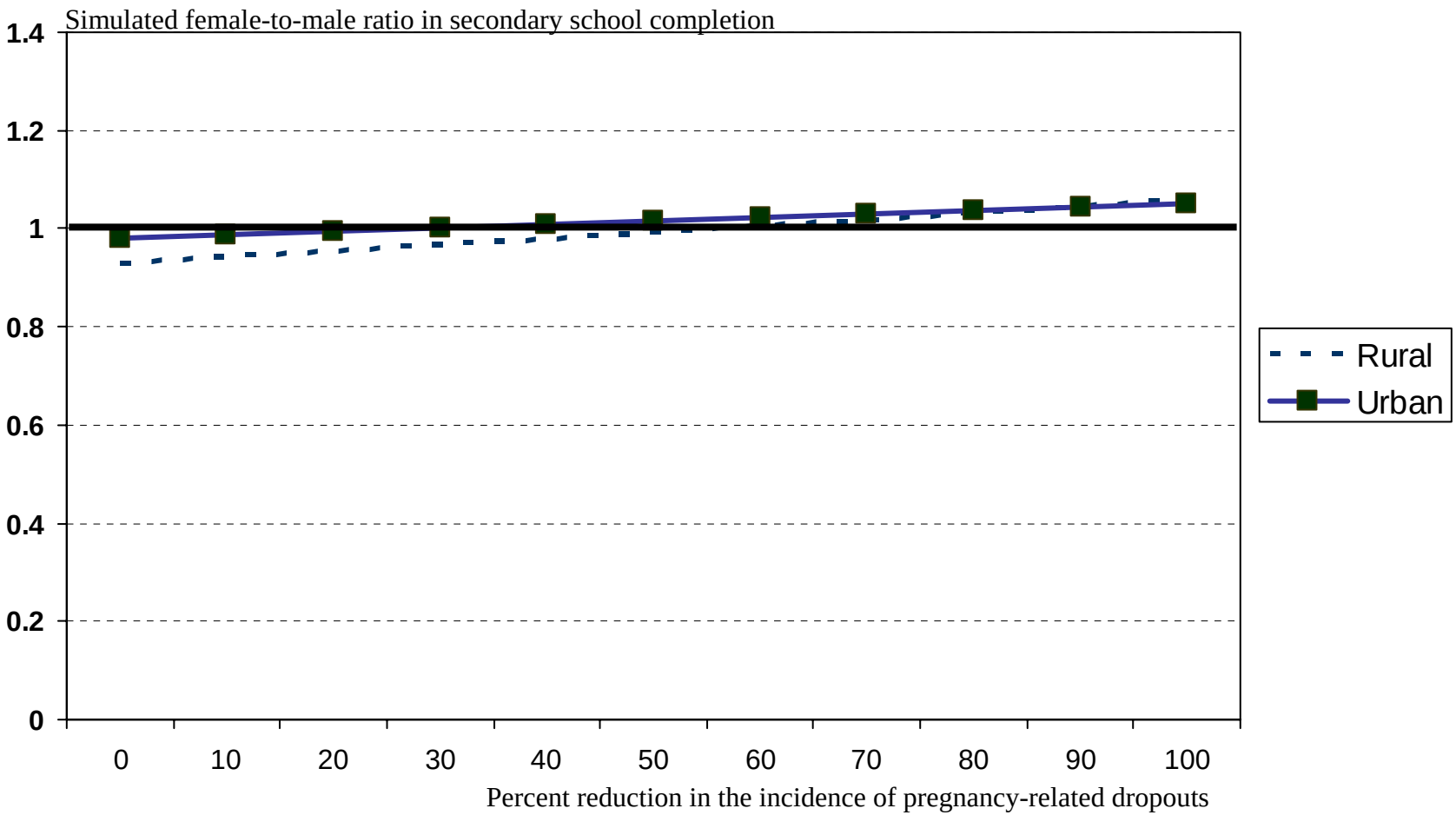
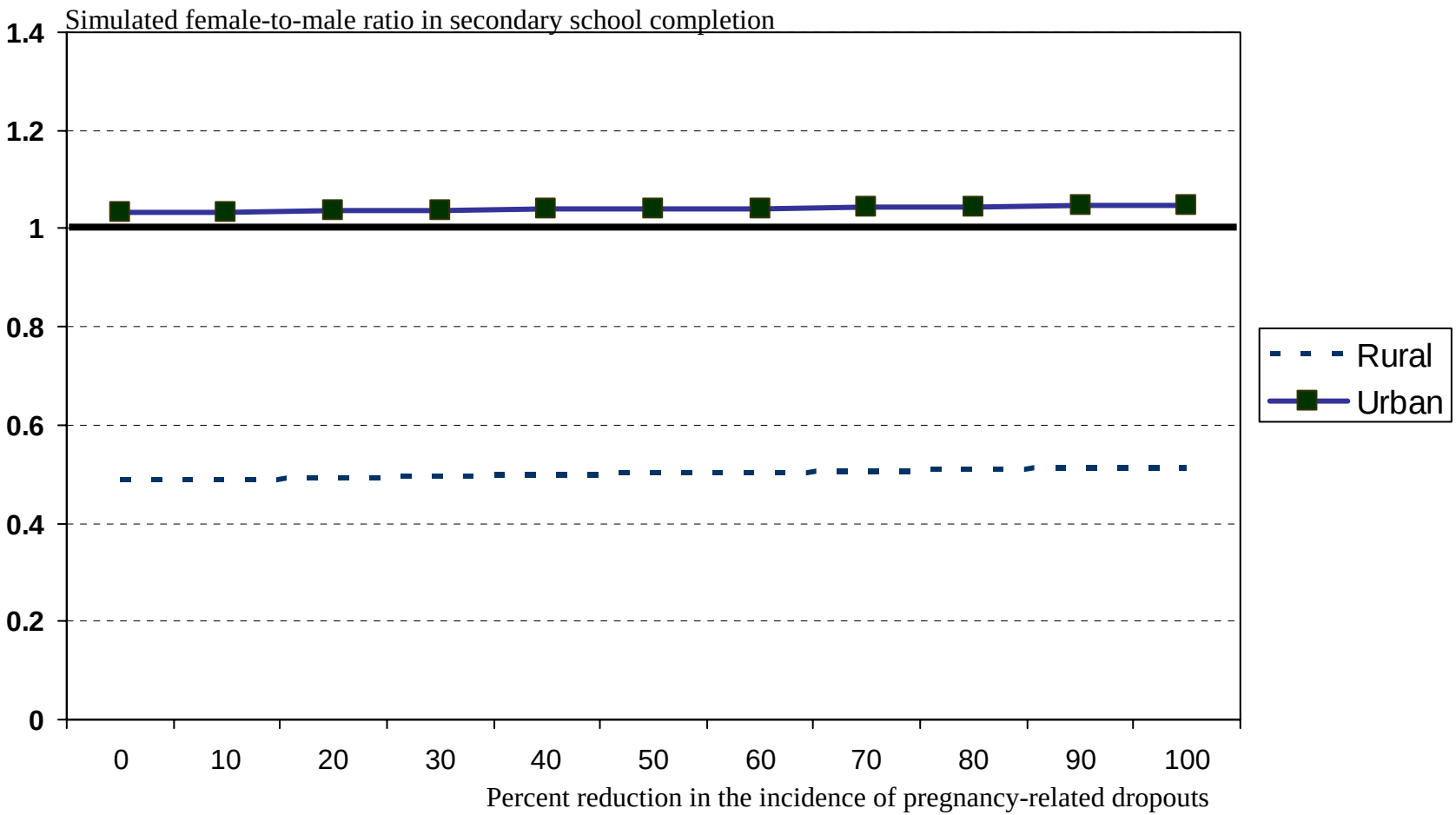
1.2
1
0.8
0.6
0.4
0.2
0
0
10
20
30
40
50
60
70
80
90
100
Percent reduction in the incidence of pregnancy-related dropouts
Rural
Urban

Dominican Republic



Nepal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0.8
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0
0
10
20
30
40
50
60
70
80
90
100
Percent reduction in the incidence of pregnancy-related dropouts
Rural
Urban

Table 1. Proposed typology and characterization of gender equity regimes*.

	SOURCES OF GENDER INEQUALITY IN EDUCATIONAL ATTAINMENT			
	Discrimination		*Pregnancies*	
	Primary school	Secondary school	Primary school	Secondary school
REGIME				
Cultural	SUBSTANTIAL	----(variable)---	-----(variable)----	-----(variable)---
Economic	Low	SUBSTANTIAL	-----(variable)----	-----(variable)---
Demographic	Low	Low	VARIABLE	SUBSTANTIAL
Egalitarian	Low	Low	Low	Low

Notes: *The shaded cells represent the leading sources that should focus attention. Cells to the left of shaded cells indicate factors that have already been overcome. Cells to the right represent factors that may or may not be important but that should focus attention until the limiting factor is addressed.