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Teenage Childbearing and Child Health in Eritrea

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Context: Eritrea experienced a decline in fertility between the mid-1990s and the first years of the new century. Much of the decline was observed among older women of reproductive age (20-49). Teenage childbearing is still high, although a decline is evident at these ages as well. The high rate of teenage childbearing is related to adverse health risks for the mother and child.

Methods: Data from the 2002 Eritrea Demographic and Health Survey (EDHS) are used to examine teenage childbearing and its health consequences. Bivariate analysis is used to calculate trends and differentials in teenage childbearing. Logistic and Cox hazard models are employed to examine the health impact of teenage childbearing on mothers and their children.

Results: Teenage childbearing is high in Eritrea, where around half of all women aged 19 have already been pregnant with their first child. Marriage is the most important factor causing women to initiate early childbearing and nearly all first births (97%) among teenagers occur within marriage. Social inequalities in early childbearing are evident: in both the 1995 and 2002 surveys, a lower probability of childbearing can be seen for teenagers with some education and living in urban areas compared to those who are uneducated or in rural areas. A decline in teenage childbearing is evident in all social groups over the period 1995-2002, except for urban residents. If the mother is a teenager when she gives birth, particularly if she is under 18, she can expect worse prenatal medical care, an increased risk of low birth weight and higher child mortality compared to an older mother. The effect of age of mother is significant even when controlling for other socio-demographic factors.

Conclusion: The significant effect of age of mother demonstrates that the health impact of teenage childbearing is not only due to socio-demographic factors that affect the teenager at different levels – at the community, household and individual levels – but also due to biological factors. Thus, strategies designed to reduce the health effects of teenage childbearing should address both maternal age and behavioral factors.

Introduction

Eritrea experienced considerable fertility decline between the mid-1990s and the first years of the new century, with total fertility declining from 6.1 to 4.8 children per woman. In addition to this overall fertility trend, teenage fertility also declined between 1995 and 2002. However, rural-urban differentials show that the decline in teenage childbearing is confined to rural areas. In 1995, one in three rural teenagers (15-19 years) had started childbearing, compared with one in five in 2002: a decline of about 40%. Over the same period in urban areas, the rate of teenage childbearing remained unchanged at the lower level of about 8% (ENSEO and ORC Macro International, 2003). Although teenage childbearing at the national level has started to decline, it is still high; the issue of early motherhood may have implications for both health and social outcomes.

Although teenage childbearing and its consequences on the health and social development of young mothers and their children have been well documented in many other sub-Saharan African countries (LeGrand and Mbacke, 1993; Gorgen et al., 1993; Adetoro and Agah, 1988; Nichols et al., 1986), no information on this subject exists in Eritrea today, with the exception of the Eritrea Demographic and Health Survey (EDHS) reports. This is due to the previous unavailability of data and to the impact of the recurrent wars and prolonged military tensions with Ethiopia – the thirty years war for independence (1961-1991) and the border conflict of 1998-2000. Wars disrupt not only socio-economic development, but also data collection systems and research. The main objective of this study is to examine the extent of teenage childbearing in Eritrea and to further check whether the trends given by the EDHS reports are genuine or artifacts. Some explanations are also given for differentials in trends between urban and rural areas. The second objective is to identify the women who are at highest risk of becoming pregnant while still in their teens (15-19 years); in other words, to examine the factors that might account for high incidence of early pregnancy. Finally, but most importantly, attention is paid to the impact of early childbearing on the health risks of the mothers and their children. Such analysis can improve our understanding of early childbearing in Eritrea and the health and social problems associated with it. It can also help policy-makers to design programs that may equip adolescents with the kind of education and skills they need.

Data and Method

In this study, data from the 2002 EDHS survey are used to examine teenage childbearing and its effects on child health and mortality. In some cases, data from the 1995 EDHS survey are used for comparative purposes. Cross-tabulations and multivariate statistical regressions are used to examine the level and trend in teenage childbearing and its effect on the child's low birth weight and mortality as well as on the mother's health. Cross-tabulations are mainly used to provide information on the levels, trends and socio-demographic differentials of teenage motherhood, which also lay the foundation for the multivariate analysis of the effects of teenage childbearing on the health of the mother and child. In the later analysis, logistic and Cox regression models are employed. The logistic model is appropriate when the dependent variable is dichotomous and there is no time involved, such as for mortality during the neonatal age, while the Cox regression is necessary when there is time dependency (for example, for mortality during the post-neonatal period) and time varying covariates. Teenage is defined as the age from 15 to 19 inclusive, which is the criterion most often used by researchers and health planners working on teenage sexuality and reproductive health.

Background Characteristics of Female Teenagers in Eritrea

Overall, women in the youngest age group (15-19 years) constitute one-fifth of all women of reproductive age (15-49 years) in Eritrea in 2002. The percentage distribution of women under 20 by selected background characteristics is presented in Table 1. Four out of nine female teenagers live in urban areas. One out of every two teenagers has primary education and another 29% has secondary education or higher; compared to older women, teenagers have higher educational attainment. In Eritrea, teenage women are expected to give birth only when they are married. 31% of all teenage women were married at the time of the survey. The proportion of married teenage women increases from 12% among women aged 15 to as high as 53% among those aged 19 (see Table 1).

The bottom panel of Table 1 provides a broad picture of the knowledge and practice of any contraceptive method among teenage women in Eritrea (modern or traditional

methods of family planning). Knowledge of any contraceptive method is generally high (about 90%). However, although a substantial proportion of teenagers know at least one way to avoid pregnancy, only 3.5% of all and 8.2% of ever married teenagers had ever experienced or practiced contraception. A preliminary analysis showed that contraceptive use is higher among educated and ever married women, compared with uneducated and never married ones, but does not vary significantly by rural-urban residence (not presented here). We also looked at the reasons women offer for not using any method of contraception in order to see whether there are social or cultural factors that inhibit the use of contraception. The main reasons reported by teenagers relate to the desire for more children, opposition to use, ignorance, health concerns, and side effects.

Table 1 about here

Fertility Preferences

Since specific information on the attitude of women towards fertility preferences was collected in the 2002 EDHS, it is useful to begin by examining the stated fertility desires of teenagers. From each currently married non-pregnant woman, information was sought on whether the woman would like to have (another) child or not. For pregnant women, the question was: "After the child you are expecting, would you like to have another child or not?" Table 2 shows the teenagers' fertility preferences by some socio-demographic factors. Overall, the proportion of currently married teenagers who expressed unequivocal preference for more children in the future is 97% (i.e., 42% expressed a desire to have a child soon and another 55% reported a desire to have a child later); only 3% reported that they do not want any more children. The desire for a child appears to be associated with the socio-demographic factors included in the analysis: education, contraceptive use, and number of living children in particular. Teenagers with some education are more likely to prefer to have a child later than those with no education. The data indicate that contraception among teenagers is practiced primarily for spacing or postponement purposes. In fact, contraception is practiced not to stop childbearing – the desire to cease childbearing is not reported at all, whereas the desires to bear and to space children are both widely expressed. The desire for a child is strongly related to the number of living children a

4

teenager has. The desire to delay childbearing among married teenagers with no children is 46%; this increases to 76% and 79% among teenagers with 1 and 2 children, respectively. In sub-Saharan Africa, delaying or limiting childbearing is practiced almost exclusively in relation to an earlier live birth (Frank, 1987) and this practice appears to be reflected here in the Eritrean case. Overall, the observations above indicate that Eritrean teenagers have a desire to space or delay childbearing that is apparently associated with education, the number of living children a woman has, and contraceptive use.

Table 2 about here

Levels and Trends of Teenage Childbearing

The fact that teenagers are not practicing contraception means that they are highly likely to be exposed to the risk of pregnancy (Garenne et al., 2000), which in turn explains their high childbearing. The high level of early childbearing is demonstrated by the proportion of teenage women who were mothers or pregnant with their first child during the surveys (Figure 1). About 51% and 36% of teenagers at age 19 were either mothers or pregnant with their first child in 1995 and 2002, respectively. Consistent with expectations, in both surveys teenage childbearing is higher in rural than in urban areas and among uneducated than educated women. Marriage is the most important factor causing women to initiate early childbearing in Eritrea, where almost all teenage first births (97%) occur within marriage. A decline in teenage childbearing is evident among all social groups, except among women residing in urban areas and those with secondary education. While the absence of a decline in childbearing among young women with secondary education could be an artifact of misreporting or of small sample size in that group, the constant level of childbearing among urban women needs further investigation. Although the overall level of early childbearing has started to decline in Eritrea, it is still high, and this high rate of teenage childbearing seems to be due to the low contraceptive prevalence and, perhaps more fundamentally, the high demand for children.

Figure 1 about here

5

Although most adolescents who have begun childbearing have given birth only once, a small proportion has given birth twice (see Table 3). The mean number of children ever born to teenage women is lower in 2002 than in 1995, confirming our earlier observation of a decline in teenage fertility between the two survey years. A comparison of the mean number of children ever born by rural and urban residence and calendar year (not presented here) reveals that the decline only occurred in rural areas, again confirming the above findings. The results derived from the 2002 EDHS data indicate that 2% of women aged 18 and 10% of women aged 19 have given birth to at least two children. By giving birth early and, presumably, at short intervals, these teenagers and their children may be subject to higher health and mortality risks. The evidence for teenage childbearing's high health risks for the mother and child is discussed in the next section.

Table 3 about here

In an attempt to find some explanations for the observed rural-urban differences in teenage childbearing trends, further analysis was made on spousal separation and marriage of young women (Table 4). A comparison of the proportions of married teenage women residing with their husbands at the time of the 1995 and 2002 EDHS surveys shows that a significant decline occurred in Eritrea, particularly in rural areas between 1995 and 2002. While 39% of married teenage women in the rural areas were living away from their husbands in 1995, this figure had almost doubled (72%) in 2002. Among urban teenagers, the change is much smaller (from 41% to 56%). Thus, the rural-urban differences in teenage fertility trends observed above may reflect, in part, the differences in the increased proportion of separation of married couples as the result of the recent border conflict. The border conflict with Ethiopia, which is still unresolved, has resulted in military mobilization of all Eritreans, but mostly males aged 18-40 years. One would expect that spousal separation of couples would reduce women's exposure to the risk of pregnancy. In Ethiopia it has been found that spousal separation was the main mechanism by which civil war affected fertility (Lindstrom and Berhanu, 1999). A comparison of the marital status between the two surveys indicates that there has not been any change in the proportion of ever married teenage women in urban areas, while it has slightly decreased in rural areas.

Table 4 about here

Health Consequences of Teenage Childbearing

Health Care

The aim of this section is to examine the impact of early childbearing on the probability of receiving any prenatal care during pregnancy and of supervision of delivery by health professionals, after controlling for birth order, education of mother, household socio-economic status, and mother's childhood residence. Table 5 presents the logistic regression estimates of the two health measures. The data show that teenagers are less likely to seek prenatal medical care during pregnancy compared with mothers aged 20 years or above, but the difference is not statistically significant. Younger women are also less likely to be supervised by a health professional during delivery than older women. All the control variables have significant effects on prenatal care and attended delivery. For example, birth order has a negative and highly significant effect on the likelihood of receiving prenatal care and presence of a health attendant at delivery. The effects of mother's education, household economic status, and childhood residence are strongly and significantly associated with prenatal care and attended delivery, where the adjusted odds of receiving prenatal care before birth of the child and attended delivery are much higher among mothers with some education, better household economic status, and urban residence.

Table 5 about here

Birth Weight and Prolonged Labor

Table 6 presents the results of a logistic regression for the probability of a child weighing less than 2,500 grams at birth (a standard measure of low birth weight). Children born to mothers under 20 are more likely to weigh less than 2,500 grams at birth compared to children of older women. Although the effect of mother's age is significantly reduced after adjusting for birth order, the effect of mothers being younger than 18 remains significant (Model 1). The increased risk of low birth weight among children born to mothers under 18 is consistent with the findings of a study conducted in Mali and Burkina Faso (LeGrand and Mbacke, 1993). The same study

indicated that the impact of teenage childbearing on birth weight did not change with the addition of other demographic and socio-economic factors. Further, we found that first and twin births are significantly at a higher risk of having low birth weight compared with higher order and singleton births. Children born to women with secondary or higher education, with high household economic status, and to rural residents are at significantly lower risk of having low birth weight than children born to women with no education, low household economic status, and residing in urban areas.

To examine whether teenagers suffer from complications associated with delivery, models on prolonged labor were estimated (Table 6). Teen mothers under 18 are more likely to suffer from prolonged labor than older mothers. But, after adjusting for birth order, they are no longer at a higher risk of prolonged labor, suggesting that the increased risk mainly comes from first birth. In addition, women are at higher risk of prolonged labor during twin births than during single births. Mothers with no education and low household economic status are at significantly higher risk of prolonged labor than mothers with some education and middle or high economic status. Use of prenatal care is generally known to improve low birth weight and reduce complications during delivery. The results of this study, however, show that babies born to women who received prenatal care are not better in terms of birth weight compared with babies born to women who did not receive any care. This is also true with regard to prolonged labor.

Table 6 about here

Child Mortality

The main focus of this section is to examine the impact of teenage childbearing on child mortality. The study of mortality by age of child is limited to under two years and is subdivided into three segments: neonatal (0 month), post-neonatal (1-11 months), and toddler (12-23 months) mortality. The subdivision is due to the fact that the underlying determinants of child mortality and, consequently, the importance and choice of preventive and curative measures, vary with age. For instance, neonatal mortality is influenced mainly by biological factors including reproductive immaturity

among teen mothers, maternal malnutrition during pregnancy, and other problems associated with pregnancy and delivery (Bhatia 1989; Obungu et al., 1994). Infectious diseases and other exogenous factors are infrequent during this age because of low exposure to contaminated agents and the protective effect of mother's milk (Teran, 1991). On the other hand, during the post-neonatal period, exogenous (environmental and socio-economic) factors are more important.

Control variables included in the regression models are birth order, multiplicity, mother's level of education, household socio-economic status, and mother's childhood residence. Preliminary analysis showed that prenatal health care is not an important predictor of child mortality and hence it is excluded from the mortality analysis. The results from the multivariate analysis of child mortality are presented in Table 7. This table suggests that children born to teenage mothers experienced significantly higher mortality risks than those born to older mothers. The increased risk of mortality remains unchanged even when we control for other socio-demographic factors. In the case of neonatal and post-neonatal ages, children born to 20-24-year-old mothers are also at higher risk of death than are the children of mothers who are 25 or older, suggesting that the effect of early motherhood continues beyond the teenage years. These results confirm the findings of other previous studies in different developing countries (Trussell and Hammerslough, 1983; Pebley and Stupp, 1987; Hobcraft et al., 1985; Woldemicael, 1999). In Kenya, it was found that mortality among neonates and post-neonates born to teenage mothers was higher than that of children born to older mothers (Obungu et al., 1994). It is suggested that the higher risk of death among children of teenage mothers is, in part, due to the fact that the women have not yet reached full reproductive maturity and are ill prepared to handle the newborn child (Trussell and Hammerslough, 1983). On the other hand, other studies argue that the higher mortality risk among children of teenage mothers does not necessarily mean that the mother being a teenager has an independent impact on the child's health (Sullivan et al., 1994). Most of the increased risk may come from other factors associated with teenage pregnancy, such as late or no receipt of prenatal care (Brown, 1985; Makinson, 1985) because young and first-time mothers are too shy to visit maternal clinics (LeGrand and Mbake, 1993), or it may be associated with maternal and fetal infection or poor nutrition (Geronimus, 1987). In this study, we

find that much of the effect of early motherhood on child mortality is independent of the explanatory factors that we have at hand.

The effects of other variables are, for the most part, in the expected directions. During the neonatal period, first born children experience significantly higher mortality than older children. In contrast, for post-neonatal age, mortality appears to be higher for high birth orders. The higher risk of death among first born children during the neonatal period is likely to be attributable to the biological influence of primiparity, namely that many first births occur before the woman has reached full physical and reproductive maturity (Pebley and Stupp, 1987). Twin births experience much higher risks during infancy, but after the post-neonatal period there is no significant excess mortality risk among twins. Mother's education is strongly and negatively related to child mortality, while the effect of household economic status on mortality is most often not statistically significant. There is no significant difference between rural and urban mortality during the neonatal age, but mortality is higher in urban than in rural areas for the post-neonatal and toddler periods.

Table 7 about here

Discussion and Conclusion

In this study, evidence is presented on several reproductive issues of early childbearing among Eritrean female teenagers. The findings highlight important aspects of the health consequences of teenage childbearing on the mother and her child.

In Eritrea, teenage women (15-19 years) constitute 21% of all women at reproductive ages (15-49 years). The level of education among teenagers is higher compared with older women in the reproductive age span. More than half of teenage women live in rural areas. Marriage is the most important factor causing women to initiate early childbearing and about 97% of teenage first births occur within marriage. More than 90% of teenagers reported that they know at least one way to avert pregnancy. Nevertheless, only 3.5% of all married teenagers stated that they have ever practiced any method of contraception and the evidence also reveals that the prevalence of

contraceptive use has not changed over time. While abortion is illegal except in cases when the pregnancy endangers the life of the pregnant woman, its practice is believed to be substantial, especially in urban areas. Data on abortion are scarce and unreliable, however.

Limited access to family planning services in conjunction with the high demand for children may be one of the potential reasons for the low prevalence of contraceptive use. Family planning programs are virtually non-existent in Eritrea and the coverage is low. There is a Family Planning Parenthood Association under the Primary Health Care Program of the Ministry of Health, but it only renders some counseling services to married couples who voluntarily visit that association.

Attitudes, beliefs, and social norms appear to be more important barriers to improved reproductive health than lack of access to or use of contraceptive methods. Existing norms and values seem to inhibit conversations about reproductive health issues within relationships and with friends. For example, open discussions with partners, parents, or friends about the subject of teenage pregnancy and how to protect or avoid problems such as unwanted or unplanned pregnancy are not common. This is particularly true for rural societies where the subject is not socially or culturally accepted and where pregnant schoolgirls and unmarried mothers are considered outcasts. Old customs that encourage forced marriage and early childbearing still exist, although they have been weakened in recent years. Parents still require their daughters to marry and have children very early. Traditions, such as the desire to perpetuate the man's lineage, prestige, and the need for economic support in old age also prevail. These factors are likely to be the main contributors to the high rate of teenage childbearing, particularly in rural Eritrea.

Desire for more children appears to be influenced by education, number of living children, and contraceptive use; teenagers with some education, one or more living children, and who ever used contraception are more likely to want to delay their next birth.

The evidence from the trend analysis demonstrates that while early childbearing substantially declined in rural areas between 1995 and 2002, it remained unchanged at

a lower level in the urban areas. Given the low level of contraceptive use on one hand, and the high demand for more children on the other, the obvious question to pose is what mechanism accounts for the fertility decline in the rural areas? Apparently, the reduction in teenage childbearing is likely to be accounted for either by reduced exposure to sexual relations (perhaps due to the increased proportion of spousal separation caused by the border conflict) or by delayed marriage, or both. In addition, war and economic crises can lead to low reproductive aspirations (Hobcraft, 1996). The recent border conflict with Ethiopia could have resulted in an unintentional limiting of births due to social and economic disruptions or due to reduced frequency of intercourse because of spousal separation. Military tensions could also have resulted in conscious adjustments in fertility behavior since married couples are more likely to opt to avoid births and unmarried teenagers are likely to delay marriage during the time of trouble.

The effects of early childbearing on the mother and child are examined by controlling for other variables including birth order, multiplicity, mother's education, household economic status, and mother's childhood residence. The evidence shows that teenagers, especially those under 18, are less likely to seek prenatal medical care during pregnancy and to be attended to by health professionals during delivery, compared to older mothers.

Concerning the impact of teenage childbearing on the child's health, children of mothers under 18 are observed to be at significantly greater risk of having low birth weight (less than 2,500 grams), compared with children of older mothers. Children of mothers under 20 face significantly higher risk of mortality during their first two years of life than children of older mothers. This holds true even when other important socio-economic variables are held constant.

The observed health problems and increased mortality hazards of children born to teen mothers seem to be the consequences of a combination of physiological and behavioral circumstances of mothers. Physiological immaturity at childbirth in combination with poor nutritional status and poor health care facilities in a country such as Eritrea are indeed likely to have adverse effects on child's health. Usually, neonatal mortality is considered to be a consequence of endogenous biological risk

factors during pregnancy and delivery, while deaths beyond the first month of life of the infant are mainly attributed to exogenous factors such as socio-economic and environmental factors (Poston et al., 1985; Bhatia, 1989). In this study, the effect of early motherhood is extended to the second year of the child's life. It has been suggested that in situations of economic hardship and social disruption, teenage girls are less likely to mature physiologically and more likely to remain unaware or ambivalent with respect to reproductive behaviors (Singh, 1986; Wulf, 1986; Garenne et al., 2000). It is likely that female Eritrean teenagers already disadvantaged by reproductive immaturity are more vulnerable to the unfavorable socio-economic conditions caused by the war and drought crises than older women.

However, the higher risk of death observed among children born to teen mothers cannot be explained by biological factors alone. Behavioral factors that affect the woman at the community, household, and individual levels seem to have contributed to the increased risk. Some studies in other developing countries found that teenage mothers, especially those under 18 and those in school at the time of pregnancy, are more likely to exhibit poorer prenatal behavior and hence poor health outcomes (Alam, 2000; LeGrand and Mbake, 1993). It has been emphasized that behavioral factors such as inadequate use of health facilities during pregnancy and postpartum periods can lead to increased complications among adolescents and their children (Makinson, 1985).

The persistently high teenage fertility with its health problems may have demographic and social implications and it impacts on the overall fertility and hence on population growth. It is argued that early pregnancy leads women to have a greater number of children with less spacing between them, contributing to the overall fertility and population growth rates (Stern, 1997). The high teenage childbearing may have further impacts, of which the most important is its adverse effects on the health of mother and child. The increased mortality of children born to teen mothers is a clear indication of a high risk associated with early motherhood. Such findings should have important policy implications in Eritrea. Our findings highlight that much of the effects of early motherhood are related to young age. Thus, policies designed to reduce the health effects of teenage childbearing should address both biological (maternal age) and behavioral factors.

Acknowledgements

References

Adetoro, O.O and Agah, A. 1988. The implications of childbearing in postpubertal girls in Sokoto, Nigeria, International Journal of Gynaecology and Obstetrics 27(1):73-77.

Alam, N. 2000. Teenage motherhood and infant mortality in Bangladesh: Maternal age effect of parity one, Journal of Biosocial Sciences 32( ):229-236.

Bhatia, S. 1989. Patterns and causes of neonatal and postneonatal mortality in rural Bangladesh, Studies in Family Planning 20(3): 136-146;

Brown, S. 1985. Can low birth weight be prevented? Family Planning Perspectives 17(3): 112-117.

Eloundou-Enyegue P.M., Stokes C.S., and Cornwell G.T. 2000. Are there crisis-led fertility declines? Evidence from Central Cameroon, Population Research and Policy Review 19(an): 47-72;

ENSEO (Eritrea National Statistics and Evaluation Office) and ORC Macro International. 2003. Eritrea Demographic and Health Survey 2002, Calverton, Maryland, USA; Macro International.

Frank O. 1987. The demand for fertility control in sub-Saharan Africa, Studies in Family Planning 18(4): 181-201.

Garenne M., Tollman S. and Hahn K. 2000. Premarital Fertility in rural South Africa: A challenge to existing population policy, Studies in Family Planning 31(1): 47-54.

Geronimus A.T. 1987. On teenage childbearing and neonatal mortality in the United States, Population and Development Review 13(2): 245-279.

Gorgen R. Maier B. and Diesfeld H.J. 1993. Problems Related to school girl pregnancies in Burkina Faso, Studies in Family Planning 24(5): 283-294.

Hobcraft J.N., McDonald J.W. and Rutsein S.O. 1985. Demographic determinants of infant and early child mortality: A comparative analysis, Population Studies 39(3): 363-385.

Hobcraft J.N. 1996. Fertility in England and Wales: A fifty-year perspective, Population Studies 50(3): 485-524.

LeGrand T.K. and Mbacke S.M. 1993.Teenage Pregnancy and child health in the Urban Sahel, Studies in Family Planning 24(3):137-149.

Lindstrom D.P. and Berhanu B. 1999. The impact of war, famine, and economic decline on marital fertility in Ethiopia, Demography 36(2): 247-261.

Makinson C. 1985. The health consequences of teenage fertility, Family Planning Perspectives 17(3):132-139.

Nichols D., Ladipo O.A., Paxman J.M. and Otolorin E.O. 1986. Sexual behaviour, contraceptive practice, and reproductive health among Nigerian adolescents, Studies in Family Planning 17(2):100-106.

Obungu W., Kizito P.M. and Bicego G. 1994. Early childhood mortality in Kenya, DHS Further Analysis Studies no. 12: 1-13, Calverton, Maryland, USA; Macro International.

Palloni A. Hill K. and Aguirre G.P. 1996. Economic swings and demographic changes in the history of Latin America, Population Studies 50(1): 105-132.

Pebley A.R. and Stupp P.W. 1987. Reproductive patterns and child mortality in Guatemala, Demography 24(1): 43-60.

Poston, Dudley L. and Richard G. Rogers 1985. Toward a reformulation of the neonatal mortality rate, Social Biology 31(1-2): 1-12.

Singh S. 1986. Adolescent pregnancy in the United States: An interstate analysis, Family Planning Perspectives 18(5): 210-220.

Stern C, Teenage Pregnancy as a social problem: A critical perspective, Salud Publica de Mexico, 1997, 39(2): 137-143.

Sullivan J.M., Rutstein S.O. and Bicego G.T. 1994. Infant and child mortality, DHS Comparative Studies no.15, Calverton, Maryland, USA; Macro International.

Teran M.M. 1991. Early feeding patterns and children's health in Mexico, In Proceedings of the DHS World Conference, Washington DC, 5-7 August, vol. I: 451-474, Columbia MD; Macro International.

Trussell J. and Hammerslough C. 1983. A hazards-model analysis of the covariates of infant and child mortality in Sri Lanka, Demography 20(1): 1-26.

Woldemicael G. 1999. Infant and child mortality in Eritrea: Levels, trends and determinants, PhD Dissertation, Demography, Stockholm University, Sweden.

Wulf D. 1986. Teenage pregnancy and childbearing in Latin America and the Caribbean: A landmark Conference, International Family Planning Perspectives 12(1): 17-22.

Table 1: Percentage* distribution of teenage women by selected background characteristics, Eritrea, 2002

Background Variables		Current Age					
	15	16	17	18	19	15-19	15-49
Urban-rural residence							
Urban	43	51	50	40	49	46	43
Rural	57	49	50	60	51	54	57
Education							
No education	17	16	14	30	29	21	50
Primary	67	53	47	45	32	50	30
Secondary+	16	32	39	26	39	29	20
Household economic status							
Low	57	50	44	59	43	52	55
Middle	14	22	22	15	22	18	21
High	23	21	25	19	27	22	25
Marital status							
Never married	88	82	76	51	48	69	23
Married	12	18	25	49	53	31	77
Total (number)	426	424	326	545[a]	280	2001	8754

Contraceptive knowledge		Ever use (all 15-19):		Ever use (married):		Current use (married):	
No	yes	Never used	Used	Never used	Used	Not using	Using
9.8	90.2	96.5	3.5	91.8	8.2	97.7	2.3

* For the purpose of clarity, percentages in the top panel are rounded to the nearest whole number
[a] The high concentration of women at age 18 is likely to be due to shifting of ages from the adjacent two ages 17 and 19.

Table 2: Fertility preferences of currently married teenagers (%), Eritrea, 2002

Socio-demographic factors	Want soon	Want later	Want no more
Residence			
Rural	42.6	55.3	2.1
Urban	38.1	56.7	5.2
Education			
No education	53.8	42.9	3.3
Primary	33.2	64.7	2.1
Secondary+	28.9	69.2	1.9
Contraceptive use			
No	43.5	53.8	2.8
Yes	24.5	75.5	0.0
Number of living children			
0	52.0	45.9	2.1
1	21.4	75.6	3.0
2	14.3	78.6	7.1
Ever had terminated pregnancy			
No	41.9	55.4	2.6
Yes	45.5	54.5	0.0
Total	42.0	55.4	2.6

Table 3: Percentage distribution of adolescents by number of children ever born (CEB), Eritrea, 1995 and 2002

	1995				Mean number	Number of
	Number of CEB				of CEB	adolescents
Age	0	1	2+	Total		
15	98.3	1.7	0.0	100.0	0.02	303
16	89.4	9.2	1.4	100.0	0.12	217
17	87.4	12.6	0.0	100.0	0.13	190
18	65.5	29.8	4.7	100.0	0.39	275
19	54.2	34.7	11.1	100.0	0.59	144
Total	81.1	16.1	2.8	100.0	0.22	1129
	2002					
15	99.1	1.3	0.0	100.0	0.01	461
16	97.9	2.9	0.0	100.0	0.03	283
17	93.9	6.1	0.4	100.0	0.07	278
18	80.7	17.5	1.8	100.0	0.22	498
19	70.7	20.3	10.0	100.0	0.40	241
Total	89.0	9.1	1.9	100.0	0.13	2001

Table 4: Percent ever married and percent of married teenage women residing with husbands by residence and calendar year

Residence	Ever married		Residing with husband	
	1995	2002	1995	2002
Urban	11.2	10.6	59.0	44.0
Rural	55.0	48.2	60.6	28.0
Total	37.6	32.0	60.4	30.5

Table 5: Logistic regression results (odds ratios) of determinants of prenatal medical care and delivery at health centers

Variable	Prenatal care	Attended delivery
Mother's age		
<18	0.75	0.60**
18-19	0.80	0.88
20-24	1.09	0.66**
≥25	1	1
Birth order		
1	1	1
2-3	0.90	0.52***
4+	0.80*	0.38***
Education		
No education	1	1
Primary	1.90***	1.81***
Secondary	3.80***	4.18***
Household economic status		
Low	1	1
Middle	2.81***	4.72***
High	4.59***	20.86***
Childhood residence		
Rural	1	1
Urban	2.66***	1.93***

 Note: The data on prenatal care and attended delivery only refer to children born five years before the survey (2002)

Table 6: Logit regression results (odds ratios) of determinants of low birth weight and prolonged labor during delivery

Variable	Birth weight (<2,500gm)		Prolonged labor (during delivery)	
	Model 1	Model 2	Model 1	Model 2
Mother's age				
<18	1.67*	3.08**	1.12	1.64***
18-19	1.06	1.81*	0.81	1.16
20-24	0.82	1.16	0.95	1.12
≥25	1	1	1	1
Birth order				
1	1	-	1	-
2-3	0.61*	-	0.58***	-
4+	0.39**	-	0.55***	-
Multiplicity				
Single	1	1	1	1
Twin	1.98*	1.54	1.71**	1.58*
Education				
No education	1	1	1	1
Primary	0.79	0.85	0.60***	0.61***
Secondary	0.49**	0.60	0.54***	0.61***
Household economic status				
Low	1	1	1	1
Middle	0.85	0.83	0.50***	0.50***
High	0.51**	53**	0.38***	0.39***
Residence				
Rural	1	1	1	1
Urban	1.63*	1.63*	1.17	1.17
Prenatal care				
No	1	1	1	1
Yes	0.91	0.90	1.10	1.11

Note: The data on birth weight and prolonged labor only refer to only children born five years before the survey (2002)

Table 7: Logistic and Hazard Cox regression results on determinants of mortality for Neonatal, Post-neonatal, and Toddler periods, Eritrea

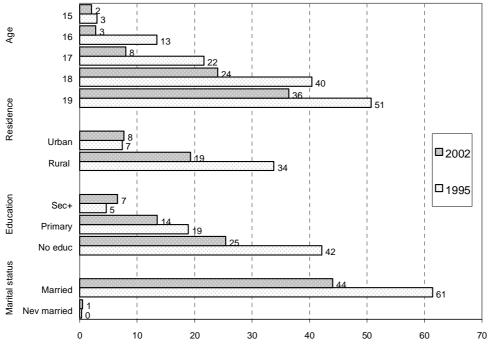| Variable	Neonatal (Odds ratios)	Post-neonatal (Relative risks)	Toddler (Relative risks)
Mother's age at child birth			
<18	1.74***	2.21***	1.59***
18-19	1.86***	1.67***	1.62***
20-24	1.29***	1.52***	1.02
≥25	1	1	1
Birth order			
1	1	1	1
2-3	0.71***	1.09	1.07
4+	0.72***	1.43***	1.17
Multiplicity			
Single	1	1	1
Twin	7.45***	2.09***	1.24
Education			
No education	1	1	1
Primary	0.74***	0.65***	0.54***
Secondary	0.60**	0.48***	0.37***
Wealth index			
Lowest	1	1	1
Middle	0.66***	0.86*	0.91
Highest	0.80*	1.00	0.90
Residence			
Rural	1	1	1
Urban	0.95	1.31**	1.30**

Figure 1: Levels and Trends in teenage childbearing by selected socio-

Percent of teenage women who started childbearing