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Adolescent Health Determinants for Pregnancy and Child Health Outcomes among the Urban Poor

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Adolescents among the urban and rural poor have a high incidence of chronic energy deficiency (CED) and anemia, more so in girls than in boys. Adolescent pregnancies (15-19 years) contribute to 19% of total fertility in India and record the highest maternal mortality rates. Besides maternal age, lack of education, low socio-economic status, maternal undernutrition and limited access to maternal health services are important determinants of poor pregnancy outcomes. Low birth weight is the major adverse outcome for the infant and an important determinant of increased child mortality. There is a lack of data for long term follow up of infants of adolescent mothers versus mothers 20 years and above, and more specifically, in the urban poor setting, an emerging concern.

Key words: Adolescent, Low birth weight, Pregnancy, Urban.

In India, the adolescent population constitutes more than one fifth (23%) of the

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total population(1). Among the SAARC countries also, adolescents comprise a sizeable proportion (one-fifth) of the total population and the total population in the region, as a whole will increase by 18% by 2020(2). The growth in numbers is likely to affect poor urban communities, since young people are the sector most likely to migrate to urban areas(3).

India has the fastest growing segment of urban poor in the world. India's urban population increased by 31.2% between 1991 and 2001-nearly double the increase of 17.9% in rural population over the same period(4). Young adults are the most fertile section of the population so that urban growth has now become self-perpetuating. In future the growth of the population of young people in the developing countries will primarily be in urban areas(5).

Urban services and infrastructure have not kept pace with rapid urbanization. Insecurity relating to regular income, food, shelter, access to health care services, along with poverty and difficult physical and social environment has adverse impact on the health of the urban poor. The adolescent boys and girls in the urban slum areas face the problem of malnutrition, early marriage, unwanted pregnancy, illegal and unsafe abortion, sexually transmitted diseases, sexual exploitation and violence that compound the difficulties of adolescent physical and psychosocial development(6). Early marriage has been and continues to be the norm, particularly

for girls. The risks of early pregnancy are exacerbated by poverty and inadequate access to maternal and child health services.

Research on urban slums encounters a critical problem. Existing data are rarely disaggregated in intraurban location or socio-economic criteria. Data sets as NFHS disaggregate by "urban" and "rural", but go no further. Thus the slum population and the poorest squatters are statistically identical to middle class and wealthy urban dwellers. Worst yet, the poorest urban populations are often not included at all in data gathering. Without exception, disaggregated data will show dramatic differences in health indicators between slum and non-slum populations or between lower and upper economic quintiles. There is a great need to promote disaggregated urban data collection(4).

In this review, we look at adolescent health and its determinants, and its impact on pregnancy and its outcomes. The paper is divided into sections on the nutritional, biological and social determinants of adolescent health, which contribute to poor pregnancy outcomes both for the young mother, a child herself, and her infant. An effort has been made to present data specific to urban slums, from varied sources, wherever available.

Determinants of Adolescent Health

(a) Nutritional determinants

An adolescent girl is a child herself with significant nutritional requirements during the adolescent growth spurt. In an adolescent mother who is likely to be already malnourished if she is an urban slum dweller, the competing nutritional needs of pregnancy and growth, will affect the growth of the fetus and hence the birth weight of the child(7).

Anemia: Anemia is one of the primary

contributors to maternal mortality (20-25%) and is significantly associated with a compromised pubertal growth spurt and cognitive development among girls aged 10-19 years(8). The NFHS-2 found that 56% of adolescent girls in the age group 15-19 are anemic in India(1). Results from various studies conducted particularly in the urban slums, on the prevalence of anemia in underprivileged adolescent girls 10-15 years of age and summarized in a review by Kanani(9) has shown the prevalence of anemia ranging from 65-75% with age specific variations.

Chronic Energy Deficiency (CED): Young adolescent mothers have a lower body mass index (BMI) since the BMI increases markedly during adolescence as pubertal changes occur(10). A low BMI status, indicative of chronic energy deficiency, is a particularly important aspect of the nutritional risks of women, during reproductive years. In a study conducted in an urban slum of Varanasi, 70% of girls aged 13-18 years had BMI <20, 51.4% were suffering from CED, and 10% were stunted(11).

The birth weights of newborns appear to be linearly correlated with both maternal body weight and height. Naidu *et al*(12) demonstrated that mean birth weights of infants improved as the BMI value moved from grade 3 CED (BMI <16.0) to normal BMI value (between 18.5-25). The proportion of low birth weight infants increased among mothers with low BMI. There is also some evidence to indicate that poor maternal nutritional status, as exemplified by a low BMI, is associated with poor lactational performance and poorer growth in infants(13).

(b) Biological determinants

Maternal mortality has been reported to be higher in adolescent pregnancies with 380 to

645 / 100,000 live births for girls between 15-19 years while it is 250-342 / 100,000 live births for women aged 20-34 years(14). The question is whether teenagers are inherently a high-risk group due to biological factors or whether social factors including prenatal care or both are important determinants of poor pregnancy outcome in this group(15).

Physical maturity: The development of the pelvic birth canal is slower than that of the early teenage spurt of long bones. The birth canal does not reach its mature size until several years after growth in height has ceased by the age of 18 years(10). As a result cephalopelvic disproportion (CPD) is the commonest problem encountered during labor in teenage pregnancies, as the pelvic architecture is not yet completely formed and mature enough for delivery(16). Significant incidence of prolonged / obstructed labor and hypotonic uterine contractions in adolescent pregnancies have been reported by Pachauri and Jamshedji(15).

Age: The mother's age seems to confound the risk of infant death as the Infant Mortality Rate (IMR) for adolescent mothers is 40% higher than for older mothers (107.3 and 75.8 per 1000 live births respectively)(17). Joshi and Pai(18) in their study of organized slums of Mumbai have demonstrated a direct association between maternal age and low birth weight (LBW), the incidence being 47% in the adolescent age group as compared to 34% in the 20-24 years age group and 29% in the 25-29 years. In a study of a semi urban population by Kushwaha *et al.*(19), the incidence of LBW in age groups 15-17 years and 17-19 years were 81% and 56% respectively. It is well documented that primigravidas pose a high obstetric risk. The vast majority of teenagers are primigravidas. NFHS-1 survey (1992-93) shows infant mortality rates to be higher for the first birth

order (93/1000 live births) as compared to second and third birth order (77 & 72 respectively)(20).

(c) *Social determinants*

Early marriage: In most countries of the SAARC region, nearly 60% of all girls are married by the age of 18 years with one fourth marrying by the age of 15 years. In India, every third adolescent girl in the age group of 15-19 years is married. Mean age at marriage among female adolescents is 14.7 years and mean age at cohabitation slightly higher (15.5 years)(17). This has been shown to increase with the educational status and the standard of living, both of which are more likely to be compromised in the slum setting. Moreover, women who marry at a young age are likely to find motherhood to be the sole focus of their lives, at the expense of development in other areas such as formal education, training for employment, work experience and personal growth.

Early childbearing: According to NFHS-1 nearly 58% of adolescents have commenced childbearing. Only 7% adolescent females use contraception(17). Given the poor educational and socio-economic status and limited access to family planning services the situation would be even worse in the slum settings. Fertility in the age group of 15-19 years accounts for 19% of total fertility in India. About 23% of married adolescent girls age 15-19 years have second order of birth(1).

The age specific fertility rate (15-19 years) in India has been shown to be the highest at 145 (births/1000 woman age 15-19 years) in the poorest urban quintiles (most likely to be residing in the slums) as against 41 in the richest urban quintile, 135 in poorest rural quintile and a population average of 116(21).

The data may not reflect the actual situation as a substantial numbers of

pregnancies in married and particularly unmarried girls go unreported because of the high rate of deliveries at home or in places other than institutional settings.

Literacy: NFHS-2 data clearly indicates that only 7% of married women in the age group of 15-19 years have attained a higher secondary level of education. As many as 55% are illiterate in this age group and only 17% have completed primary schooling(1). Low levels of literacy adversely affect reproductive and sexual health awareness and thus quality of life. In a study undertaken in the urban slums of Greater Mumbai, to study the impact of maternal biosocial determinants on birth weight, it was observed that 52% of illiterate mothers gave birth to low birth weight babies suggesting that education plays a considerable role in preventing LBW(18).

Socio-economic status: The lower socio-economic status of the mother is also associated with low birth weight babies(16). Domestic responsibilities, working for livelihood, inadequate rest along with malnutrition especially when the energy demands are increased, contribute to a large number of women delivering low birth weight infants(12,18). The consequences are reinforced by the fact that children of young and illiterate mothers tend to face the same cycle of economic deprivation and under nutrition as experienced by their mothers.

Gender inequity: Gender disparities in feeding patterns are widespread in India and take their toll on the growth of adolescent girls(12). There is a gender gap in education reflected by the 20% gap in literacy between boys and girls overall. School dropout rates are also significantly higher for girls and since disaggregated data is not available for literacy rates in urban slum settings, it can only be assumed that the situation would be far worse

given the fact that there is lack of awareness among parents, frequent migration, lack of resources and the compulsion to earn livelihood and assume household responsibilities in childhood.

(d) Access to Health services

According to NFHS-(1) data, among mothers less than 20 years, only 7% receive antenatal care from a health worker or professional and 41.6% are assisted at delivery by a skilled birth attendant(6). Over two-thirds of deliveries occur outside the health care institutions. One in six births to adolescents is mistimed or unwanted(17). A large proportion of these births can be avoided if adequate information on contraception and access to health services are available to adolescents.

The reproductive and child health services in our country are often barred to adolescents or require them to reach a certain age before they can utilize them.

Outcomes of Adolescent Pregnancy

Pregnancy-related deaths are the leading cause of mortality for 15-19 years old girls (married and unmarried) worldwide. The risk of maternal death is about three times higher in late adolescent (15-19) girls; and those less than 15 years old are 5 times as likely to die as women in their twenties. They also have a higher propensity to experience adverse outcomes such as higher fetal wastage (miscarriage and / or still births)(2). Prior spontaneous abortions and higher stillbirth rates have been reported in different studies(15,16).

The most frequently encountered complications during pregnancy and labor are toxemia of pregnancy, eclampsia, preterm labor and cephalopelvic disproportion. The risk of toxemia of pregnancy has been shown to be three times higher. Fetal distress during

labor, respiratory distress syndrome (RDS), icterus and trauma (birth injuries) have been reported more frequently for offspring of teenagers(13).

Comparison of NFHS-1 and 2 data reflects a decline in neonatal, infant and under five mortality cases from the year 1991 to 1998. However these rates continue to be higher in mothers less than 20 years compared to 20-29 years age group (*Table I*).

Adolescent Health and its Impact on Child Health

The association of adolescent pregnancy with higher incidence of low birth weight and infant mortality rate is well established. Low birth weight is a key predictor of malnutrition and an important determinant of child mortality(19). One of the most detrimental outcomes of low birth weight is growth retardation in the young girl which perpetuates a vicious cycle of female malnutrition throughout adulthood and is now seen as intergenerational transmission of physical (small mothers have small babies), social and economic disadvantages into the next generation.

Urban child mortality statistics are not a true reflection of health of children in an urban area because of large slum and migratory populations. The urban "average" masks differences within urban areas. A study by the World Bank (Poverty Thematic Group) which analyzed the NFHS 2 data on basis of economic quintiles to unmask differences in the urban population estimated that the infant mortality rate was 121 in the poorest urban quintile as compared to 43 in richest urban quintile, 109 in poorest rural quintile and 86.3 as population average(21). USAID under the Environmental Health Project published similar findings in its report, the IMR for the slums in Ahmedabad being 123 whereas that

TABLE I—Infant and Child Mortality by Mother's Age at Childbirth

Infant and child mortality	Maternal age at child birth			
	<20 years		20-29 years	
	NFHS-I	NFHS-II	NFHS-I	NFHS-II
<i>Neonatal mortality</i>				
Rural	76	66.1	49.3	44.7
Urban	48.1	48.4	31.4	28.1
Total	70.8	63.1	44.8	40.7
<i>Infant mortality (0-1)</i>				
Rural	113.8	97.9	83.8	70
Urban	79.1	67.6	52.1	42.4
Total	107.3	92.7	75.8	63.3
<i>Under five mortality (0-5)</i>				
Rural	150.3	127.7	120.4	101.2
Urban	100.5	87.5	70.7	56
Total	140.9	120.8	107.8	90.2

Source: National Family Health Survey-1 (1992-93) and -2 (1998-1999) (22,1)

of the whole city was 76(4). The percentage of children stunted and children underweight ($-2SD$, weight for age, <4years of age) also showed similar trends, with 69.3% being stunted and 74.3% being underweight in poorest urban quintile in comparison to 55.2% and 59.5% in poorest rural quintile. Since the offspring of adolescents start their lives with the added disadvantage of often being low birth weight, they are more likely to fall within these categories because of poor nutritional status and the malnutrition resulting from burden of childhood illnesses due to poor environmental condition(21).

The maternal characteristics also affect the under-5 mortality rate, which is significantly higher for those children born to mothers under 20 years, as reflected in *Table II*. Urban slum infants experience higher rates of illnesses that require hospitalization and more injuries, such as poisoning, burn and

TABLE II—*Childhood Mortality Rates by Maternal Characteristics*

	IMR (per 1000)	CMR (per 1000)	U5M (per 1000)
<i>Mother's educational level</i>			
Illiterate	101	44	141
Literate, not completed middle school	63	23	84
Middle school completed	56	9	65
High School & above	37	6	43
<i>Mother's age at birth</i>			
<20 years	107	38	141
20-29 years	76	35	104
30-39 years	91	34	122
40-49 years	112	58	163
<i>Birth order</i>			
1	93	26	117
2	77	32	106
3	72	37	107
6	98	40	134
7	120	54	168

Source: NFHS-1, 1992-93(22).

IMR= Infant mortality rate; CMR = Child Mortality rate; U5M rate = Under Five Mortality rate.

superficial trauma that require medical care. Inadequate environments and the relative inexperience of young mothers appear to be the major causal factors(23).

Program Experiences

The issues related to female adolescent health need to be viewed not only from the point of view of the health of the adolescent herself, but also from the perspective of intergenerational health and development. However, there are very few examples of effective interventions for adolescent health and development in India.

As of now adolescent health issues are being addressed in government program at

national level mainly through the Reproductive and Child Health program (under the Ministry of Health and Family Welfare) and Integrated Child Development Scheme (under the Department of Woman and Child Development). Both seem to have a tunnel focus, viewing them as a future parent or preparing them for adulthood rather than addressing their immediate concerns as adolescents. Very little of its impact is seen in the urban poor context because of lack of infrastructure and urban health planning.

Two examples of small-scale efforts made by non government organizations are CEDPA's (Center for Development and Population activities) Better Life Options program (BLP) being implemented in the urban slums of Delhi, rural Madhya Pradesh and Gujarat(8) and the 'Integrated Adolescent Development Program for Women's Empowerment' in the urban slum of Tigri in New Delhi by MAMTA, an NGO that works with special focus on adolescents across the country. These programs take a holistic approach towards adolescent health and development of both sexes by integrating education, entrepreneurship development and sexual reproductive health, while involving the community and ensuring adolescent participation for the success of the program. The impact of these interventions can be seen in the higher number of adolescents completing education, later age at marriage, greater mobility for girls, engagement in livelihood activities, greater access to health services and increased self esteem and confidence.

The March Ahead

The issues related to adolescent health, and particularly to adolescent pregnancy and improved child health outcomes, are prevention of early marriages and management of adolescent pregnancies. Integrated

Key Messages

- An adolescent is a 'child'; any pregnancy in this age is a 'child pregnancy'.
- Adolescents with undernutrition and a high incidence of anemia are not prepared to undertake marriage and childbearing.
- Adolescent undernutrition leads to an intergenerational effect "Small mothers give birth to small babies who in turn grow into small mothers and so on".
- An increase in maternal mortality and low birth weight, are the major adverse outcomes of adolescent pregnancies.
- Urban poor adolescents are a marginalized group who lack education, information and access to services.

strategies, which are gender sensitive, are required to address this multifaceted problem both at the policy level and at the service delivery, as has been demonstrated by certain program experiences till now. International experiences show that an adolescent health and development approach, with reproductive and sexual health as the main strategy, influences maternal and infant health. It is time to act now – adolescents are our biggest investment for the future. This is also the surest way to achieve our demographic and population goals.

Some steps for immediate action are

- Strengthen national capacity in collection, compilation, updating and analysis of quantitative and qualitative data on adolescents. Create a national adolescent database on various health determinants with special focus on urban poor.
 - Formulate a comprehensive national strategy and program of action to address the multidimensional needs of adolescents in urban slums and involve adolescents in all stages of planning and implementation.
 - Establish adolescent counselling and guidance centers in urban slum areas in partnership with NGOs and Private / Public institutions. HIV /AIDS pre-
- vention, care and support should form an integral part of this.
- Integrate adolescent health issues especially pregnancy, childcare, contraception, nutrition and personality development in our existing health care system. Ensure access to quality health services that are gender sensitive and adolescent friendly. Reorient and enhance skills of health providers to address this important area.
 - Focus on young male involvement in sexual and reproductive health programs, enhance their knowledge on partner's needs, use of contraceptives and improve their access to comprehensive health care services.
 - Enforce and evaluate the 'Child Marriage Restraint Act' through community participation and adolescent involvement in both urban and rural areas.
 - Enforce girl child school retention preferably till 18 years and incorporate life skill education in all schools. Link education to livelihood opportunities.
 - Recognize and promote the rights of adolescents, including their rights to education, to enter into marriage with free and full consent, to have their views taken

into account in matters that concern them, and their right to decide when to have / not to have children, and the number and spacing of these children (Rights Bound Approach).

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SPECIAL ARTICLE

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