State of the Urban Youth, India 2012

Employment, Livelihoods, Skills

IRIS Knowledge Foundation

UN HABITAT
Global Urban Youth Research Network

First published in India in 2013 for IRIS Knowledge Foundation, Mumbai, India.

Cover design: Parag Pilankar

Printed by Dhote Offset Technokrafts Pvt Ltd., 29, Satyam Ind. Estate, Jogeshwari (E), Mumbai, India

State of the Urban Youth, India 2012

Employment, Livelihoods, Skills

CHAPTER 3

Urban Youth in Health and Illness
A Rights Perspective

Siddarth David

In Brief

- The health and well being of youth is important for itself and not only because the country needs to realise benefits from the youth dividend. This section of the population is diverse with health needs that have not even been recognised adequately.
- Young people have a right to health and access to adequate, appropriate and sympathetic health care.
- The social determinants of health of the young include a wide range of factors including their childhood situations and environments, availability of food and nutrition, shelter, quality of work, availability of educational and financial resources.
- The median age of childbearing is around 20. Maternal mortality is the top cause of death among young women. More than half of young urban women are anaemic pointing to inadequate food.
- Health policies and health programmes that are ostensibly directed at youth are focused on their sexual and reproductive health. Despite this focus, they are not youth-oriented so that young people seeking sexual and reproductive health care rarely seek public health services. Not surprisingly, however reproductive and sexual health needs of sexual minorities remain unrecognised.
- Most health policies and programmes lack a comprehensive perception of the health of young people.
- Young people by their life circumstances are particularly vulnerable to certain diseases such as tuberculosis. This is especially evident in urban poor locations. Care and preventive services for these diseases must be particularly tailored to the young.

- The so-called older age group diseases are today appearing among younger age groups. For example cardiovascular diseases and diabetes. These and cancers are lifestyle diseases whose progressions are affected by early habits and environments of childhood.
- More than half the disabled in India are under 30 years. There are more young disabled in urban than rural areas.
- Focused research on the health concerns of youth in both urban and rural areas needs to be conducted in order to evolve appropriate well-targeted programmes.

The UN defines 'youth' as people who fall in the age group of 15-24 years that, comprising more than a quarter of the world's population, is the largest demographic group in history [WHO 2011]. Therefore, the health of this cohort is an important area for research, policy and action. One in every fifth person in the country is a youth. This statistic is expected to grow to one quarter of the population in the current decade. Of this, more than a third lives in urban areas and among them, more than half are men, an indication of the dynamics of migration in the country [NFHS-III]. The median age in India is around 25 years, which means that a large chunk of the population is young. This is less than the world average of 29.9 [UN 2010]. Thus they constitute a huge demographic whose needs have to be kept in mind while determining policy or planning action.

Youth is the phase in life, which plays a crucial role in future patterns of adult health. However, the dominant discourse on the health of youth, which is also the basis for most policies related to health, is a utilitarian view. Since youth constitutes a major portion of the country's working group population, its good health is seen to enhance the human resources and social capital to improve the political, economic and social well-being of a country as a "demographic dividend" [Morell et al 1998, World Bank 2007, IMF 2012]. This perspective restricts the concept of health of youth only to achieving targets such as in the Millennium Development Goals (MDGs) without looking at young people as a group with special needs.

Good Health as a Right

A more holistic perspective would be to look at the health for the youth as a universal human right to good health and well-being as enshrined in Article 25 of the Universal Declaration of Human Rights. Such an approach focuses on addressing the special needs and unique health risks faced by young people as a basic entitlement. However, the health needs of the youth have only recently been recognized by policy-makers [WHO 2011]. Health does not occur in isolation and is dependent on a number of underlying factors required for good health such as adequate food, essential education, clean water, good sanitation, safe environment and full social and political participation. Good health and well-being can only come in conjunction with achieving basic human rights. Health as a right lays emphasis on equal access to health services that address the distinct needs of the youth so that they are empowered to enjoy good health. It is by gaining access to relevant information, skills and opportunities that they would be able to adopt measures and remove barriers to realising their health rights. Adequate laws and policies to achieve social, economic and political rights will facilitate the youth to enjoy the highest attainable standards of physical and mental health. In consequence, health as right can only be achieved in conjunction with other social, economic and political rights.

Reflecting the global trends the picture of Indian youth with respect to health is rapidly changing especially in the last few years. Along with infectious diseases, maternal mortality and HIV/AIDS, suicides and motor accidents are slowly becoming serious concerns among the youth [Blum 2009]. Specifically in the context of urban India, the rise in the age of marriage, rising education levels, exposure to media, increased migration, rapid urbanisation and globalisation together with changing life-styles have affected mortality and morbidity trends [IIPS

2010]. Compared to previous generations, youth are no doubt healthier and more educated; nonetheless, there are many obstacles that inhibit young people from making an informed choice on their health and well being.

The public health agenda especially the goals aimed at reducing child and maternal mortality, HIV/AIDS and more recently on mental health, injuries, and non-communicable diseases need to focus on adolescents. Greater attention to youth as a group is needed within each of these public health domains for the success of those programmes. Strategies that place the youth as centre stage, rather than focusing only on specific health agendas provide an important opportunity to improve health, both in youth and later in life [Sawyer et al 2012].

Determinants of Health

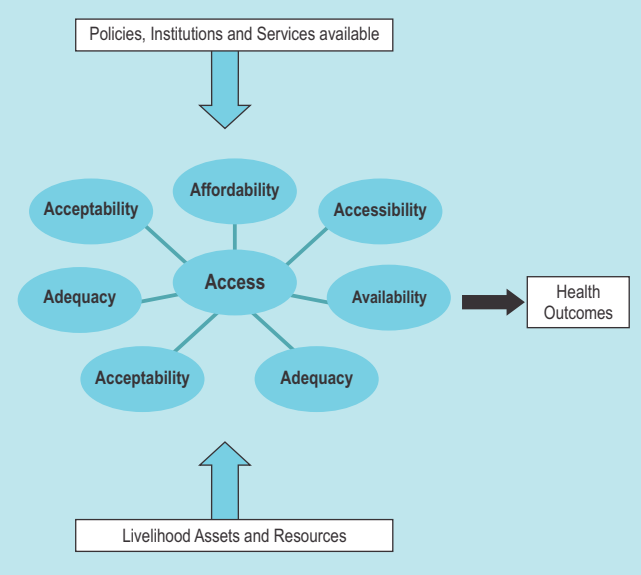
Health is influenced by many socio-economic factors that affect young people's autonomy in decision-making and access to health services [Viner et al 2012]. For example greater education levels have a positive impact on reducing morbidity and mortality due to acute and chronic diseases, reducing incidence of substance abuse, improving health outcomes and increasing life-expectancy [NPC 2007]. Nearly 86 percent urban women and 91 percent men are literate but only around half the youth have completed more than 10 years of education with social factors such as marriage continuing to impact educational attainment [NFHS-III].

Poverty is another factor that determines access to health-care, informed choices, adequate nourishment, safe water and sanitation all of which influence health outcomes. With one-fifth of Indian urban population living under a dollar a day [World Bank 2010] the access and choices to achieving good health and well being is limited for a large section of the youth. Apart from education and literacy, income, gender, availability of health-care services, risk-perception, social networks, cultural practices and physical environments all affect the overall health status.

Livelihood plays a key role in determining the health outcomes as it directly connected with many of the socio-economic determinants of health like education and poverty. It provides the resources necessary for getting timely and good quality health-care services. Delay in appropriate care and hospitalization is the cause of preventable deaths that account for more than two-thirds of the mortality in low-income groups [WHO 2002]. Livelihoods also affect factors such as education (leading to knowledge of healthy practices and recognition of risks), nutritious food, safe sanitation, immunization and a good living-environment all of which contribute to good health outcomes [Gruskin and Braveman 2008]. The nature of employment can also directly affect health as many low-income jobs involve exposure to toxic substances and unsafe-working conditions [cf…JAGDISH]. Conversely, livelihoods are also dependent on the health of an individual acting as an economic asset that would provide for conditions to maintain good-health and well being [OECD 2003].

A useful framework to begin looking at health in the context of the livelihoods is the Health Access Livelihood Framework **(Figure 1).** Started as a strategy to effectively combat malaria in Tanzania, the framework places health outcomes at the interface between health-services and the health-seeking ability of the person [Obrist et al 2007]. Health-services reflect government policies and actions

Figure 1: Health access Model



Source: Adapted version form Obrist et al 2007

while the health-seeking ability of a person depends on his or her social capital, physical capacities and economic resources. Accessing health-care is the consequence of the interaction between these two factors and reflects the health outcome. Five factors determine access to health care:

- → **Availability** the type and nature of services available, the skill of the health-care provider, resources available to meet health needs.
- → **Accessibility** the distance to the hospital/clinic, mode of transport, time taken to reach it.
- → **Affordability** the costs of taking treatment, price of other commodities like medications, cost of travel.
- → **Adequacy** the ability of the health-care service to give quality care, suit the requirements of the patient (budget, time, etc.).
- → **Acceptability** the patient feeling non-discriminated, welcome and trusts the health-care provider.

Positive health outcomes depend on how well the health system fares with respect to these five aspects. Sustainability of such positive outcomes are dependent on policies and laws that create services which can be accessed by people and at the same time build an environment where people can satisfy their socio-economic needs without social biases and discrimination.

Youth Health in Policies and Laws

Policies and laws have a critical role in realizing the health rights of the nation as it responds to the health needs, determines the focus areas, enables provision of good-quality services and facilitates equitable access to services. In India, the National Population Policy 2000 for the first time recognised that youth constitute an under-served group with special sexual and reproductive health needs and further advocated special attention to them [MoHFW 2000]. Subsequently various other policies began increasingly recognising and identifying the youth as a group with special and distinct needs that have to be addressed [MoWCD 2001; NACO 2002]. For instance, the National Policy for the Empowerment of Women identified adolescents and young women as a vulnerable group; the National AIDS Prevention and Control Policy noted the need to promote a better understanding among the highly vulnerable population of the youth and the 11th Five-Year Plan (2007–12) underscored the importance of investing in the youth. Recently the government has drafted a 2010 National Youth Policy drawing attention to the multiple needs of the young and the need for holistic and multi-pronged action set-up a special body the "Rajiv Gandhi National Institute for Youth Development" for this purpose [MoYAS 2010] [Cf YOUTH POLICY CH..].

Meanwhile laws related to health and well being mainly address young people's sexual and reproductive health. For example, the Prohibition of Child Marriage Act 2006 puts severe strictures on underage marriage; the Protection of Women from Domestic Violence Act 2005 includes physical, sexual and economic violence under its purview; and the Medical Termination of Pregnancy Act (MTP) 1971 with its 2002 amendment. The Right of Children to Free and Compulsory Education Act 2009 and the upcoming the Protection of Children from Sexual Offences Bill 2011 mainly looks at the health and health-related issues concerning youth. This shows that the key focus on youth appears to be their sexual and reproductive health. Apart from the obvious challenges of enforcement, the laws mainly serve as a punitive measure not fully able to bring about societal change among young people and the wider community on these issues and the choices they have as individuals [IIPS 2010, Jejeebhoy and Santhya 2011].

A glance at the schemes and programmes for the youth also reveal the underlying emphasis on reproductive and sexual health. Be it the Adolescence Education Programme (AEP), the Janani Shishub Suraksha Karyakram (JSSK), the School Health programme [NACO 2005, MoHFW 2006; 2008, MoSPI 2012]. There has also been focus on nutrition of youth with schemes like the Kishori Shakti Yojana and the recent 'SABLA'

programme. (MoWCD 2010; Patnaik 2011). Apart from these national level programmes some states have different programmes for youth mainly on reproductive health. Again as with the laws the implementation of these programmes remains uneven and far from satisfactory coupled with inadequate human power and resources. Consequently many young people lack access, in practice, to such services [Santhya et al 2011]. Most of the schemes primarily look at sexual and more specifically reproductive health needs with an overwhelmingly utilitarian lens and do not see overall health as a right. In the changing profile of the country's urban youth mental health and substance abuse among other issues are key causes of morbidity and mortality.

Another concern in policy is the lack of comprehensive data on the health status of the youth as studies are mostly based on small-scale, issue-based and often unrepresentative samples [IIPS 2010; Jejeebhoy et al 2011; Santhya et al 2011]. Moreover most of the schemes are appropriate for rural areas leaving out the urban youth affecting the large numbers of urban poor. Measures are required to ensure that programmes are accessible to young people in urban areas by expanding and modifying the scope and content of programmes to suit the context.

Food and Nutrition

Under nourishment in India is highest among the youth with urban areas having nearly half of young men and women who are abnormally thin [NFHS-III]. Poor nutrition is related to income; one-fifth of urban India lives in poverty (World Bank 2010). Within cities, slum populations have slightly higher incidence of abnormally thin youth in comparison with non-slum population especially in bigger cities like Mumbai and Delhi [NFHS-III] underlining the extremes of wealth and disparity in larger cities as compared to smaller ones.

Another indicator of nutrition is anaemia, which is a marker for inadequate diet. Nearly half the urban female youth suffer from some form of anaemia while only a fifth of male youth suffer from anaemia. These are shockingly some of the highest rates in the world and the highest in South Asia [Ramachandran 2008]. While urban populations have lower rates of anaemia than rural populations there is no stark difference between slum and non-slum populations [NFHS-III]. The stark gender difference, with women having considerably higher levels of anaemia, is symptomatic of the bias against women in society. Another trend is that married women have higher levels of anaemia than unmarried women while the reverse is true for men, pointing to how women within marriage may have the least claim and access to nutritious food. High levels of anaemia combined with poor nutrition among women can be crucial factors in maternal mortality and poor health of children with studies pointing to at least two-fifths of deaths directly or indirectly associated with anaemia [Dutta 2004]. The prevalence of anaemia is associated with lower age of childbirth, inadequate spacing and lower education [Gautam et al 2010]. Thus underscoring the importance of and the social acceptance of equal status to women, which can alone address these issues concurrently the existing programmes like the KSY and SABLA need to be more streamlined to target adolescent girls and young mothers in cities keeping in mind the different marginalized groups and social biases to reduce the high prevalence of anaemia in the country.

Sexual and Reproductive Health

Nearly one-tenth of young men and 0.4 percent of young women in urban India have engaged in sex before the age

of 15. Among youth, a quarter of men and 0.4 percent women have had multiple partners while only one-third of such women and around half of such men reported using any protection [NFHS-III]. This highlights the need to have sex education and awareness building among the youth at an early age. With the stigma and culture of silence associated with discussion of sex it would be difficult for the youth to make safe-sex choices and become vulnerable to unwanted pregnancies, sexual violence and STIs.

Though 90 percent of urban youth have heard about HIV/AIDS, less than half of them have comprehensive knowledge of the conditions, routes of transmission and prevention of the infection [NFHS-III]. On the other hand, nearly two-fifths of new infections are reported

among people below 25 years of age and one in every 1000 HIV positive person is a youth [NACO 2011]. Prevalence of HIV/AIDS among youth in urban India is almost twice as high as youth in rural areas; the prevalence rates are higher among young urban men than they are among women. Within cities, that slum populations have only slightly more prevalence and slightly less awareness of HIV/AIDS compared to non-slum populations [NFHS-III]. The gender gap is underscored by the fact that married women are eight times more susceptible than unmarried women indicating that most women contract HIV/AIDS from their spouses. The vulnerability of women is further highlighted by the fact that the prevalence rate across demographics is highest (1.9 percent) among young women who are divorced, separated, or widowed. This underscores how the burden of discrimination, blame and care of HIV/AIDS falls heavily on women who are often refused shelter, access to treatment and care denied a share of household property, or blamed for a husband's HIV diagnosis [Bharat 2001]. Also around one-tenth of urban youth have reported STIs other than HIV/AIDS that is higher than among rural youth. Access to safe sex choices is dependent on a number of social factors, which given that the veil of secrecy that exists around the topic is never really addressed except at health centres.

Around one in every 25 urban youth reported sexual assault. This is nearly twice higher than among rural youth. Around 8 percent reported sexual violence by spouses, higher than in other age groups [NFHS-III]. This draws attention to an urgent need to address the sexual issues and concerns of youth, especially through reducing young women's vulnerabilities. As comprehensive knowledge of safe sex is strongly associated with education and exposure to media, raising awareness and minimising social stigma on the issue is necessary for containing the sexually transmitted diseases. Moreover these efforts should be combined with advocating consensual sex and breaking the culture of silence associated with sexual violence through more sensitive medical and criminal-justice systems in order to address the serious problem of sexual violence in the country.

Victims of aversion, discrimination and abuse by society and criminalization and violence by law are sexual minorities including transgender and homosexuals who have only recently been reluctantly recognized and counted as 'normal citizens' both by law and in the census [PUCL 2001; CREA 2011]. There are no clear numbers available of sexual minorities among the youth let alone in urban areas (some figures estimate transgenders to constitute 500,000 and homosexuals to be around 5 million) but it is fair to assume that they may constitute a significant proportion of them come under the those categories [Agoramurthy and Hsu 2007]. Ostracisation over the decades has led to the neglect of the health and sexual needs among this section, which requires special attention. Social biases prevent them from accessing even basic health care. Criminalisation and stigma attached to different sexual minorities obstructs their access to healthcare services and negotiating safe sex practices making them more vulnerable to HIV/AIDS and other STIs. The continuing violence and stigma besides physical injuries has also led to range of mental health problems like depression, suicidal tendencies and substance abuse [Nirantar 2005; CREA 2008]. There is a need to recognize and address the needs sexual minorities whose access to health care is curtailed by law and society.

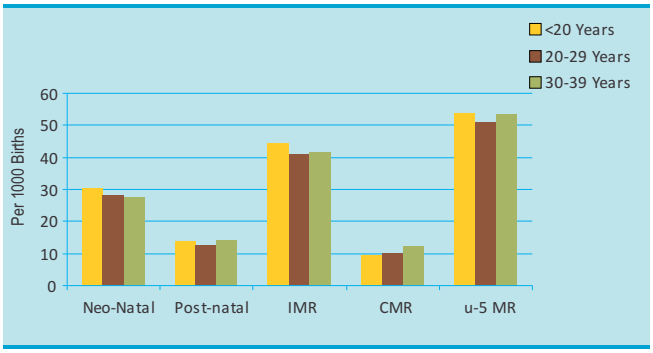
The youth years are also the peak of childbearing years accounting for nearly half of the country's fertility. Attitudes and practices related to reproductive health and other health outcomes, as well as the ability to make or influence decisions that will affect health, depends greatly on the age at which people marry. Half of the young women and 1/5 of the young men are married by 25; moreover, 14 percent urban women in the 15-17 year bracket are married. A considerable proportion of urban women still marry below the legal minimum age at marriage. Age of marriage is strongly linked with the level of education as there is a seven-year difference in the age at marriage between women with no education and women with at least 12 years of education. On average urban women marry more than two years later than do rural

Table 1: Age wise percentage of women aged 15-24 who have begun childbearing by residence and city

	15-19			20-24		
City	Slum	Non-Slum	Total	Slum	Non-slum	Total
Delhi	11.8	3.1	4.9	52.2	39.8	42.3
Meerut	9.2	2.0	5.6	53.3	44.6	48.5
Kolkata	8.7	6.9	7.7	39.4	35.0	36.4
Indore	6.2	7.7	7.3	55.1	51.4	52.2
Mumbai	9.8	2.9	6.7	49.5	34.6	41.8
Nagpur	7.0	3.6	5.0	45.5	38.6	41.5
Hyderabad	7.4	5.6	5.9	50.4	41.9	43.3
Chennai	12.6	4.3	5.9	52.0	38.5	41.3

Source: NFHS III

Figure 2: Age of mother at child mortality among urban women



Source: NFHS 3

women. Significantly, educational attainment among married persons is much lower than that among never married persons showing how early marriage impacts education. Girls who enter early marriage and become mothers have inadequate information about reproductive and sexual heath issues, which severely impact their access, decision-making in reproductive and sexual health services critically affecting maternal and child health [ICRW 2007]. Considering the role, that men also play in

the reproductive and sexual health choices it is essential that they are also educated and aware of such issues, which suggest that an older age for marriage is key to improve health outcomes [Mathur et al 2003].

In India maternal mortality is the leading cause of death among young women [Patel et al 2012] making it a critical health-issue among the youth. Maternal mortality is linked very closely with low age of childbirth, low fertility levels and large birth intervals and enabling such conditions are necessary to lower the mortality levels. The maternal mortality rate is 77/1000 for teenage pregnancies compared to 55/1000 furthermore it is also connected to child and infant mortality and post partum complications [NHFS-III]. The median age for childbearing is around 20 but 1/6th of teenagers are pregnant with 12 percent already having had a child. Though also teenage child-bearing is twice as high among rural than urban women it is nine times as high with no education in general [NFHS-III]. The number of teenage pregnancies is three times higher in slum populations than in non-slum areas. Teenage pregnancies are less likely to be institutional deliveries and nor are they likely to have accessed pre-natal and ante-natal care [NFHS-III]. Thus in urban India around one-third of youth use some form of contraception including sterilization, pills, condoms and natural methods like withdrawal but at the same time the need for contraception of nearly half the youth is unmet [NFHS-III]. Nearly two-thirds of mothers with only sons opted for contraception as against less than one-third of mothers with only daughters [NFHS-III].

The most prevalent method and the one with widespread knowledge among the youth is female sterilization with 1 in 10 women having undergone the process. More seriously around 1 percent of adolescent girls have reported having undergone sterilisation procedures [NFHS-III] - an indicator, some scholars see as evidence of how the "culture of sterilization" the corner-stone of family-planning has been promoted fanatically by the government [Saavla 1999]. But the quality of these services is abysmally poor [Malvankar and Sharma 2000] and is often driven by lack of other forms of

contraception, providing incentives, coercion of poor couples and the provider's need to achieve targets [Srinivasan 1998] rather than a pragmatic approach to reproductive health [Basu 2005]. Around a fifth of young women and a tenth of young men had not had any exposure to contraception messages [NFHS-III]. Use of contraception is lowest among young men as opposed to older men [NFSH-III]. Consequently the burden of contraception falls on women to whom the only accessible method available is sterilization.

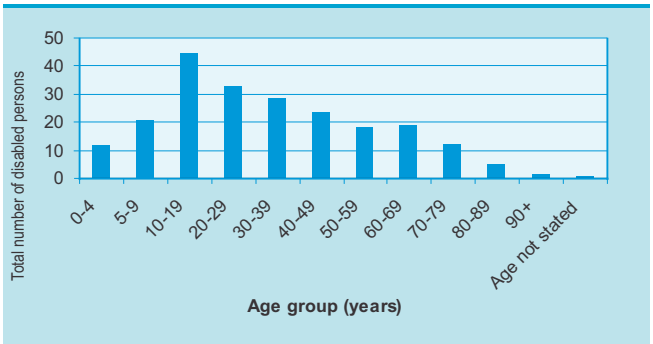
Abortion has become an extension of contraception, as non-use of other forms of contraception as opposed to failure of contraception is the chief reason for medical

termination of pregnancies [Ramanthan and Sharma 2004]. Since population control is the underlying focus of contraception services, they are not offered to unmarried youth. This leads to unwanted pregnancies and illegal unsafe abortions [Ramani 2003]. The nation was collectively shocked last year when a young Indian woman in Ireland who was refused abortion because of Irish religious principles died but there is not enough outcry about the thousands of women in India who die for want of access to abortion services [AAPI 2004, NDTV 2012, Times of India 2012]. While putting in place checks and balances to prevent sex-selective abortions the public health system also needs to provide safe services to those who require termination of pregnancies without discrimination.

Disability

Both the 2011 Census and the 2002 NSSO report around 2 percent of the population as disabled. This appears to be an under-estimation attributable perhaps to reporting of mainly physical than cognitive disabilities and stigma attached to India [Singal 2008]. More than half of the disabled persons in India are under the age of 30. While rural India has more cases of disability than urban, among youth it is the reverse [MoSPI 2011]. The enrolment of the disabled sections in education is abysmal with just 2 percent of the disabled persons having attended schools and 1.2 percent of disabled youth in tertiary education. Work participation rates are also grim with around 3.6 percent disabled in employment in urban areas [NCPEDP 2004; Singal 2008]. Societal discrimination, neglect and abuse among disabled populations are compounded for women by their social and family situations [CREA 2011]. The linkages between poor nutrition and preventable infections with disability on one side and the lack of opportunities due to inability to access formal education and social limitations severely inhibit their access to healthcare.

Figure 3: Estimated total number of disabled persons in each age group



Source: NFHS 3

Mental Health

There has been a slow acceptance of psychological problems because of the stigma attached to it as a public health concern. In India mental health needs are largely unmet [Murthy 2011]. This has resulted in poorer clinical outcome and longer duration of illness where the burden falls squarely on the family leading to fewer help-seeking instances [Farooq et al 2009]. The Ministry of Family and Health Services (MoFHS) in a study in six states points out that nearly 10 percent of the urban youth displayed symptoms such as severe stress, depression and anxiety which are indicative of mental disorder [IIPS 2010].

A key indicator of the mental health status is the number of suicides in the country among the youth. About 40 percent suicide deaths in men and about 56 per cent of suicide deaths in women occurred in individuals aged 15–29 years [Patel et al 2012]. Lower educational achievements, substance abuse, violence, and poor reproductive and sexual health were some of the reasons pushing youth into depression and suicide [Pillai et al 2009]. Suicide was the second leading cause of death in both sexes. This may be an underestimation as suicide is often underreported in India. But even with the current circumstances of reporting, suicide is the cause of about twice as many deaths as is HIV/AIDS and about the same number as maternal causes of death in young women which is the leading causing of death among young women. Among men, it is as high as mortality in motor accidents, which is the leading cause of death among young men [Patel et al 2012]. However, it attracts little attention in policy and action posing a huge health challenge.

A study of 53 cities in India has showed a rising trend of suicides with domestic problems, illness and unrequited love being the main reasons for attempting suicides [NCRB 2011]. The study shows that smaller cities such as Kollam, Rajkot and Durg have the highest rates of suicides in the country as opposed to metros like Mumbai and Delhi. With the steady decrease in maternal mortality, suicide will probably become the leading cause of death in young women in urban India in the next few years. Therefore providing counselling and adequate mental health services that focus on the youth that address structural determinants of poor mental health such as gender disadvantage, the individual experiences of depression, etc. should be part of the health policy.

Linked to mental health is dependence on substances like tobacco products and alcohol. In 2011, substance-abuse control was identified as the "most urgent and immediate priority" intervention to reduce non-communicable diseases responsible for nearly five million deaths in the world annually [Beaglehole, Bonitaand Horton 2011]. NFHS-III reports that 35 percent men and 3 percent women among the urban youth consume tobacco with chewing tobacco and oral consumption the dominant methods which slightly better than rural consumption. Among urban youth smokers in India, nearly three-fourths of both the sexes smoke regularly.

Also NHFS-III shows that nearly one-fifth of men and around half a percent of women consume alcohol with more than a quarter of the men and half of women who drink regularly (at least once a week) which has been an increasing trend along the years. The consumption of alcohol and tobacco increases with age and reduces with greater wealth, better exposure to media and higher education in the youth. What is striking is that among urban young men consumption is particularly high even at age 15 with 16 percent using tobacco and 6 percent drinking alcohol. The linkages between drinking and accidents and accidental injuries, violence, safe sex, as well as along with long-term implications on the liver, brain and mental health have been clearly documented in India [Chandra et al 2003; Gururaj 2004].

Table 2: Suicide mortality in India

Age	Estimated death per 100,000	
	Male	Female
15-19	1.19	1.68
20-24	25.5	24.9
25-29	27.4	15.9

Source: Patel et.al. 2012

Disease Profile

With the highest burden tuberculosis in the world, containing and preventing the disease which claims more than 3 lakh lives every year in India is a major health challenge [Behera 2012]. However, the country's health system is yet to effectively control this epidemic, which is further exacerbated by co-infection with HIV and drug-resistant forms of TB. TB affects 3 in 1000 youth, which is only slightly less than the prevalence among adults in India (5/1000) [NFHS-III]. However, the comprehensive knowledge of TB is lowest among youth [NFHS-III]. This is a matter of concern considering that these rates are almost comparable with those in sub-Saharan Africa.

This accounts for more than a quarter of the world's burden of disease [Dye 2006; The Hindu 2012] making it a critical area for public health-intervention. More than half the deaths in India are due to causes such as cardiovascular diseases, cancer, diabetes and asthma [Reddy et al 2005]. Although these are cast as problems afflicting an 'older' age group most of the causal factors lie in life-style and health and hygiene practices shaped in youth [Murthy and Matthew 2004]. Moreover, these diseases seem to be affecting increasingly young adults in cities.

Cardio-vascular diseases affect nearly one-tenth of urban India which has increased six-times in the last 40 years. Diabetes levels have quadrupled in urban India with young adults becoming more susceptible [Reddy et al 2005; Ramachandran 2005]. NFHS-III states that 14/1000 adults have diabetic conditions while 2/1000 youth have the same condition, which is significant; developed countries like the US have rates 1.8/1000 cases among the youth [Liese et al 2006]. As youth grow older, the risk of heart disease and complications from diabetes would be a

significant health burden. Public health campaigns, combined with targeted interventions are desperately needed for diabetes prevention and treatment of such diseases in which substance abuse; lifestyle changes and socio-economic conditions have a role to play.

Tobacco-related cancers account for two-fifths of liver and stomach cancers comprising one-fifth of all the cases [Dixit et al 2012] Tobacco and alcohol usage are interestingly around two-fifths and one-fifth, respectively, among the male youth. Similarly, the risk of cervical cancer the most common among Indian women [Dixit et al 2012] is related to hygiene and early-child birth [Satija 2009]. Early-detection and treatment is crucial for preventing mortalities due to cancer but nearly 75 percent of cancers are recognised only in advanced stages in India [Varghese 2003]. Making the role of public health systems in raising awareness, screening and treating is critical in addressing the issue which has significant socio-economic consequences. The National Cancer Control Programme (NCCP) which has contributed substantially to bringing the issue into the

forefront needs to link up with other health programmes and expand on its programmes and coverage to involve youth to deal with this critical health concern.

Violence and Health

Violence has detrimental impact on the health of individuals with not only physical and psychological impacts but also wide-range of reproductive and demographic health outcomes and is directly related to unnatural deaths like burns and injury by weapons [WHO 2002]. Consequently addressing violence has become an important aspect in studying health.

More than one-fifth of urban women reported violence and more than a one-fourth reported domestic violence is the most pervasive form of gender violence including emotion and physical which is lower than rural areas [NFHS-III]. But it is still a significant proportion considering that many such instances remain unreported in a pervasive culture of silence. Apart from physical and emotional injuries, studies have shown a linkage between domestic violence and maternal and infant mortality, HIV/AIDS prevalence and severe mental trauma like depression and suicidal tendency [DILASA 2008].

A key indicator of domestic violence is burns and fire-related deaths where the all-India figures show that 65 percent are women of which 57 percent are of women in the age group 15-34 [Saghavi et al 2009]. With such high rates among women, it is imperative to deal with domestic violence as a critical health issue among young women. Increasing the sensitivity and approachability of health services as well as law enforcement bodies to deal with this social malaise is essential.

Conflict related violence whether it is due to insurgency and separatist movements in areas like Jammu and Kashmir, the North-Eastern States and Central India or communal and ethnic violence or state-led violence leads to high mortality and morbidity especially among youth , the main demographic affected by this violence [PUCL 2008; IDSA 2010]. For example in Manipur more than half the injuries and mortalities of the injuries due to

violence was among men below the age of 30 especially in urban areas [SATP, Sinha and Roy 2010]. Similarly, the severe psychological impact of conflict has been well documented among young adults in Kashmir [Jong et al 2008]. Extensive research is needed to help unravel the true extent of the burden of conflict-violence and its socio-economic outcomes on public health.

Another category that is seldom discussed in India is mortality due to transport accidents, building collapses, fires, industrial mishaps and occupational hazards but contributes to significant (one-fifth according to National Crimes Records Bureau in 2011) mortality and morbidity in urban India. There are few studies on demographic and regional variations.. According to the National Crimes Records Bureau (NCRB) the highest mortality is among youth accounting for one-third of the fatalities especially in urban areas [NCRB 2011]. The NCRB records show that smaller cities record drastically higher levels of fatalities due to such causes than do larger cities

[NCRB 2011].

Health-Seeking Behaviour

Seeking health-care services and information on health among adolescents as in other groups are dependent on their definition of needs, perception and biases along with external factors like social contexts like gender, marital status, class and availability of services [WHO 2007]. The IIPS Report (2010) states that while most youth who experienced poor-health symptoms such as high fever sought help, more men (95 percent) than women (90 percent) seek health-services. In the case of physical injuries, only half the young women sought health-care as opposed to more than three-quarters of young men, which could be due to social acceptance of violence against women and stigma attached to it and risk-perception of injuries in women. Further, more unmarried young women (62 percent) than married (51 percent) sought medical health-care showing how marriage can affect health-seeking behaviour. Nearly two-thirds of youth go to a private clinic, which is the general trend in India where nearly 80 percent of the medical expenses are

in the private sector [Gangolli et al 2005] With most of the expenses being out-of-pocket fewer economically backward people can access healthcare.

Another factor in seeking health services is also trust rather than need among youth in case of health concerns are related to sexual and psychological issues [WHO 2007]. These factors are an important determinant in accessing health services especially with regard to reproductive and mental health with particular stigma attached to them. According to the IIPS Report (2010) only half of the youth who had symptoms of sexual or reproductive health problems sought health-care and more married than unmarried youth accessed health services which results in many such ailments going untreated.

While today's urban youth are healthier and better educated than earlier generations, social and economic vulnerabilities that affect their health outcomes persist. Despite the increased access to health information and services, young people still face significant risks related to health and many lack the knowledge and power to make informed positive health choices. Policies and programmes for the youth generally fail to recognise the different social, economic and spatial variations that determine their access to health services, choices for good health and participation in the health system. Understanding the diversity within the group would necessitate more research of the youth population which would enable policy-makers to modify health programmes to meet the requirements of different groups according to their health needs.

The major thrust on sexual health with the prism of population control and prevention of infections has to change with a more pragmatic approach of promoting safe choices with informed decision-making and creating an environment for discussion. Information dissemination, service provision and health programmes should include unmarried youth and sexual minorities being both non-judgemental and unbiased. Similarly reproductive health should involve the entire process from conception to post-natal care keeping in mind social

contexts, gender-bias, power-imbalances, limited knowledge of risks, lack of access to health-care facilities, shortage of trained persons and poor nutrition intake to come up with context-specific programmes.

Mental health is still to receive adequate attention even with high numbers of youth reporting symptoms of mental health disorders. Policies and programmes need to be planned and implemented to detect and provide appropriate and accessible care to address this critical health-problem. Substance abuse is another area that is a concern that has to be addressed both at the level of prevention and care.

The biggest challenge in writing this chapter was the lack of data on the subject, making it difficult to bring out the complexities of the health characteristics of the urban youth. Available data categorises the youth as a monolith, leaving behind several vulnerable groups like low-income groups, the disabled, migrants and sexual minorities.

This in itself highlights the pressing need for more studies focusing on the health of the youth both spatially and temporally.

References:

Agoramoorthy, G and J H Minna, (2007). 'India's Homosexual Discrimination and Health Consequences. *Revista de saúde pública,* 41(4), 657-660.

Basu A.M (2005). 'Ultramodern Contraception: Social Class and Family Planning in India'. *Asian Population Studies;* 1(3):303-323

Beaglehole, R, R Bonita, et al. (2011). 'Priority Actions for the Non-communicable Disease Crisis'. *The Lancet,* 377(9775), 1438-1447.

Behera, D. (2012). 'New Strategies of TB Control in India: Are We on the Right Track?' *The Indian Journal of Tuberculosis,* 59(3), 130.

Bharat, S, P Aggleton, P, and P Tyrer (2001). 'India: HIV and AIDS-related discrimination, stigmatization and denial (Vol. 3). Geneva: UNAIDS' http://data.unaids.org/Publications/IRC-pub02/jc587-india_en.pdf (Accessed 12th December, 2012)

Braveman P and S Gruskin S (2003). 'Poverty, equity, human rights and health'. *Bulletin of the World Health Organization,* 81(7):539-545. (Accessed 12th December, 2012).

Chandra, P. S, V A Krishna, et al (2003). 'High-risk Sexual Behaviour and Sensation Seeking Among Heavy Alcohol Users'. *The Indian Journal of Medical Research,* 117, 88.

CREA (2006). 'Sexual Rights and Social Movements'. http://files.creaworld.org/files/wp.pdf (Accessed 20th January, 2013).

____(2011). "Count Me In!". http://web.creaworld.org/files/cmir.pdf (Accessed 20th January, 2013).

DILAS (2008). *Guidelines for Health Professionals in Responding to Domestic Violence,* http://www.cehat.org/go/uploads/Publications/Guideline-ENG.pdf (Accessed 10th December, 2012).

Dikshit R, Gupta PC, et al (2012). "Cancer Mortality in India: A Nationally Representative Survey". Lancet; 379:1807–1816.

Dutta, D C (2004). "Anaemia in pregnancy. Text book of Obstetrics including Perinatology & Contraception". New Central Book Agency Ltd, Kolkata, India

Dye C (2006). Global epidemiology of tuberculosis. *Lancet,* 367(9514), 938-40.

Farooq S, Large, et al (2009). "The relationship between the duration of untreated psychosis and outcome in low-and-middle income countries: a systematic review and meta analysis. Schizophrenia research", 109(1-3), 15-23.

Gangolli, L. V, Duggal R, et al (2005). "Review of healthcare in India". Mumbai: Centre for Enquiry into Health and Allied Themes. http://www.cehat.org/publications/PDf%20files/r51.pdf (Accessed 13th December, 2012).

Gautam V P, Bansal Y, et al (2002). "Prevelance of Amaemia Amongst Pregnant Women and its Socio-Demographic Associates in a Rural Area of Delhi". *Indian J Community Med,* 27(4), 10-2002.

Gururaj G (2004). "The Effect of Alcohol on Incidence, Pattern, Severity and Outcome from Traumatic Brain Injury". *Journal of Indian Medical Association;* 102(3),157–160.

IMF (2012). "Asia and Pacific: Managing Regional Spill-overs and Advancing Economic Rebalancing". http://www.imf.org/external/pubs/ft/reo/2012/APD/eng/areo0412.pdf (Accessed 5th December, 2012).

International Monetary Fund Staff (2012). "Regional Economic Outlook, April 2012: Asia and Pacific-Managing Spillovers and Advancing Economic Rebalancing ". INTERNATIONAL MONETARY FUND.

International Centre for Research on Women (ICRW), (2007). "New Insights on Preventing Child Marriage: A Global Analysis of Factors and Programs". http://www.icrw.org/files/publications/New-Insights-on-Preventing-Child-Marriage.pdf (Accessed 20th December, 2012).

International Institute for Population Sciences (IIPS) and Macro International, (2007). "National Family Health Survey (NFHS-3), 2005–06: India: Volume I & II". IIPS, Mumbai, India.

____(2010). "Youth in India: Situation and Needs 2006–2007". http://www.popcouncil.org/pdfs/2010PGY_YouthInIndiaReport.pdf (Accessed 30th November, 2012).

Institute for Defence Studies and Analyses (IDSA), (2010). "The Need for a Strategic Response to Insurgency and Terrorism". http://www.idsa.in/system/files/IB_Strategic%20ResponsetoInsurgencyandTerrorism.pdf (Accessed 1st January, 2013).

India Today, (2011). "Men at risk". October 17th. http://indiatoday.intoday.in/story/india-tops-the-world-in-heart-attacks-among-35-plus-men/1/154103.html (Accessed 23rd December, 2012).

Jejeebhoy SJ and Santhya KG (2011). "Sexual and Reproductive Health of Young People InIndia: A Review of Policies, Laws and Programmes". http://www.popcouncil.org/pdfs/2011RH_SexRHYoungPeopleIndia.pdf (Accessed 7th December, 2012).

de Jong Kaz, K. S., Nathan, F, et al. Conflict in the Indian Kashmir Valley II: psychosocial impact. Conflict and Health, 2. http://www.conflictandhealth.com/content/2/1/11 (Accessed 24th December, 2012).

Liese AD, D'Agostino RB, et al. (2006). "The Burden of Diabetes Mellitus among US Youth: Prevalence Estimates from the SEARCH for Diabetes in Youth Study". *Paediatrics;* 118(4),1510-1518.

Mathur S, Greene M, et al. (2003). Too young to wed: the lives, rights and health of young married girls. International Center for Research on Women.

http://www.icrw.org/files/publications/Too-Young-to-Wed-the-Lives-Rights-and-Health-of-Young-Married-Girls.pdf (Accessed 20th December, 2012).

Mavalankar D and Bharti S, (1999). 'The Qualtiy of Care in Sterilization Camps: Evidence from Gujarat' In Improving Quality of Care in India's Family Welfare Programme edited by Koenig MA and Khan ME. Population Council-India, New Delhi: 293-313. http://www.womenstudies.in/elib/sys_and_serv/hc_the_quality_of_care.pdf (Accessed 20th December, 2012).

Ministry of Health and Family Welfare (MoHFW), (2000). "National Population Policy 2000". http://mohfw.nic.in/NRHM/Documents/national_Population_Policy_2000.pdf (Accessed 7th December, 2012).

____(2006). "Implementation Guide on RCH II: Adolescent Reproductive Sexual Health Strategy, for State and District Programme Managers". http://www.mohfw.nic.in/NRHM/Documents/ARSH/Implementation_guide_on_RCH%20II.pdf (Accessed 8th December, 2012).

____(2008). "School Health Programme". http://mohfw.nic.in/showfile.php?lid=660 (Accessed 8th December, 2012).

Ministry of Statistics and Programme Implementation (MoSPI), (2011). "Disability in India: A Statistical Profile". http://mospi.nic.in/Mospi_New/upload/disablity_india_statistical_profile_17mar11.htm (Accessed 23rd January 2013).

____(2012). "SAARC Social Charter India Country Report, 2012". http://mospi.nic.in/mospi_new/upload/SAARC_India_Country_Report-2012-31aug12.pdf (Accessed 8th December, 2012).

Ministry of Women and Child Development (MOWCD), (2001). " National Policy for the Empowerment of Women 2000". http://wcd.nic.in/empwomen.htm (Accessed 7th December, 2012).

____(2010). "Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) SABLA-The Scheme". http://wcd.nic.in/schemes/SABLAscheme.pdf (Accessed 20th December, 2012).

Ministry of Youth Affairs and Sports (MoYAS), (2003). "National Youth Policy 2010". http://yas.nic.in/writereaddata/mainlinkfile/File916.pdf (Accessed 7th December, 2012).

Morrell S. L, Taylor R. J, et al (1998). Unemployment and young people's health. Medical journal of Australia, 168(5), 236-240.

Murthy R.S (2011). "Mental Health Initiatives in India". *The National Medical Journal of India;* 24(2): 98-107.

Murthy N.S and Matthew A (2004). "Cancer Epidemiology, Prevention and Control". *Current Science;* 86(4),518-527.

National AIDS Control Organisation (NACO), (2002). "National AIDS Prevention and Control Policy".http://www.nihfw.org/NDC/DocumentationServices/NationalHealthProgramme/NATIONALAIDSCONTROLPROGRAMME.html (Accessed 7th December).

____(2005)."Adolescence Education Programme-Life Skills Development". https://www.nacoonline.org/upload/NACOinActiion/Facilitators%20Guide.pdf (Accessed 8th December, 2012).

____(2011). "Annual Report 2008-09". http://www.nacoonline.org/upload/REPORTS/Annual_Report_NACO_2008-09.pdf (Accessed 12th December, 2012).

National Centre for Promotion of Employment for Persons with Disability (NCPEDP), (2004). "Status of Mainstream Education of Disabled Students in India-A Research Study". http://www.aifo.it/english/resources/online/books/cbr/incedu-india%20NCPEDP%20audit.pdf (Accessed 23rd January 2013).

National Crimes Records Bureau (NCRB), (2011). "Accidental Deaths and Suicides in India-2011". http://ncrb.nic.in/CD-ADSI2011/ADSI-2011%20REPORT.pdf (Accessed 7th December, 2012).

National Poverty Centre (NPC), (2007). "Policy Brief No. 9-Education and Health". http://www.npc.umich.edu/publications/policy_briefs/brief9/policy_brief9.pdf (Accessed 3rd December, 2012).

Nirantar (2005). "Voices Against 377". http://files.creaworld.org/files/Voices_Report_English.pdf (Accessed 20th January, 2013).

____(2012). "Thane Hospital Horror: Pregnant woman dies after doctors allegedly pull out her uterus". July 4th. http://www.ndtv.com/article/cities/thane-hospital-horror-pregnant-woman-dies-after-doctors-allegedly-pull-out-her-uterus-239324 (Accessed 3rd December, 2012).

Obrist B, Iteba N, et al. (2007). "Access to Health Care in Contexts of Livelihood Insecurity: A Framework for Analysis and Action". PLoS Med;4(10): http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0040308 (Accessed 20th December, 2012).

Organisation for Economic Co-operation and Development (OECD), (2003). "Poverty and health in developing countries and action". http://www.oecd.org/health/18514159.pdf (Accessed 20th December, 2012).

Parasuraman S, Kishor S, et al. (2009). "National Family Health Survey (NFHS-3). A Profile of Youth in India" http://www.measuredhs.com/pubs/pdf/OD59/OD59.pdf (Accessed 30th November, 2012).

Patel V, Ramasundarahettige C, et al. (2012). "Suicide Mortality in India: A Nationally Representative Survey". Lancet; 379:2343–2351.

Patnaik A (2011). "Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (SABLA)". http://indiacurrentaffairs.org/rajiv-gandhi-scheme-for-empowerment-of-adolescent-girls-sabla-smt-anita-patnaik/ (Accessed 20th December, 2012).

Pillai A, Andrews T, (2009). Violence, psychological distress and the risk of suicidal behaviour in young people in India. International Journal of Epidemiology, 38(2), 459-469.

People's Union for Civil Liberties-K, (2001). Human Rights Violations Against Sexuality Minorities in India: A PUCL-K Fact-finding Report about Bangalore. http://sangama.org/files/sexual-minorities.pdf (Accessed 20th January, 2013).

PUCL, (2008). "Rebuilding Lives". http://www.pucl.org/Topics/Religion-communalism/2008/jaipur-rebuilding-lives.html (Accessed 31st December, 2012).

Ramachandran A, (2005). Epidemiology of diabetes in India—three decades of research. Journal of Assoc Physicians of India, 53(34), 8.http://www.japi.org/january2005/NO-34.pdf (Accessed 21st December, 2012).

Ramachandran P, (2008). "Nutrition Transition of India: 1947-2007". http://wcd.nic.in/research/nti1947/NTI1947CONTENT.htm (Accessed 7th December, 2012).

Ramanathan M and Sharma P S, (2004). "Abortion Assessment Project – India (AAPI): Summary and Findings". http://www.cehat.org/aap1/keyfind.pdf (Accessed 13th December, 2012).

Ramani S, (2003). "Abortion Costs and Financing-A Review". http://www.cehat.org/aap1/work5.pdf (Accessed 13th December, 2012).

Reddy KS, Shah B, Varghese C and Ramadoss A. 2005. "Responding to the Threat of Chronic Diseases in India". Lancet; 366:1746–1751.

Srinath Reddy, K Shah, et al. (2005). Responding to the threat of chronic diseases in India. Lancet, 366(9498), 1744-1749.

Sanghavi P, Bhalla K et al. (2009). "Fire-Related Deaths in India in 2001: A Retrospective Analysis of Data". Lancet; 373:1282–1288.

Santhya, K G, Jejeebhoy S J, et al. (2011). "Effects of the Janani Suraksha Yojana on Maternal and Newborn Care Practices: Women's Experience in Rajasthan". http://www.popcouncil.org/pdfs/2011PGY_JSYRajasthan.pdf (Accessed 7th December, 2012).

Satija A, (2009). "Cervical Cancer in India". South Asia Centre for Chronic Disease (SANCD). http://sancd.org/uploads/pdf/cervical_cancer.pdf (Accessed 21st December, 2012).

http://www.satp.org/ (Accessed 23rd December, 2012).

Saavala M (1999). "Understanding the Prevalence of Female

Sterilization in Rural South India". *Studies in Family Planning;* 30(4),288-301.
Sawyer SM, Afifi RA, et al. (2012). "Adolescence: A Foundation for Future Health". *Lancet;* 379:1630-1640.
Sinha S and Roy N, (2010). "Deriving the Burden of Conflict in Northeastern India: Patterns of Victimization in the "Manipur Micro-level Insurgency Database of 2008-2009", TISS, Mumbai.
Singal N (2008). "Forgotten Youth: Disability and Development in India". Research Consortium on Educational Outcomes and Poverty, University of Cambridge. http://recoup.educ.cam.ac.uk/publications/WP14-NS.pdf (Accessed 23rd January 2013).
Singh S K, L hungdim H, (2004). "Women's vulnerability to STI/HIV in India: Findings of the CHARCA Baseline Survey" http://www.endvawnow.org/uploads/browser/files/charca_baseline.pdf (Accessed 12th December, 2012).
United Nations Department, (2011). "World Population Prospects: The 2010 Revision, Volume I". http://esa.un.org/unpd/wpp/Documentation/pdf/WPP2010_Volume-I_Comprehensive-Tables.pdf (Accessed on 12th December, 2012).
Varghese C, (2003). "Cancer Prevention and Control in India" in '50 Years of Cancer in India' by the Ministry of Health and Family Welfare (MoHFW). http://www.mohfw.nic.in/WriteReadData/l892s/pg56to67-29242281.pdf (Accessed 21st December, 2012).
Viner RM, Ozer EM, et al. (2012). "Adolescence and the social determinants of health". *Lancet;* 379:1641–1652.
WHO (2002). "Improving the health of the poor". http://whqlibdoc.who.int/publications/9241590130.pdf (Accessed 14th December, 2012).
____(2002). "World Report on Violence and Health". http://whqlibdoc.who.int/hq/2002/9241545615.pdf (Accessed 31st December, 2012).
____(2007). "Adolescents, Social Support and Help-Seeking Behaviour" (Accessed 13th December, 2012).
____(2012)."Youth and Health Risks" presented at the 64th World Health Assembly, 16th-21st May 2011, Geneva. http://apps.who.int/gb/ebwha/pdf_files/WHA64/A64_R28-en.pdf (Accessed on 3rd December, 2012).
World Bank (2006). "World Development Report 2007: Development and the Next Generation". http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2006/09/13/000112742_20060913111024/Rendered/PDF/359990WDR0complete.pdf (Accessed 4th December, 2012).
____(2010). http://data.worldbank.org/indicator/SI.POV.URHC/countries

The state of science : A personal view

Science education in India today is in a plateau of disillusionment. A couple of decades ago we were on the ascending slope of the Hype curve with the technology trigger. The trajectories of science careers did not fare well pitted against IT engineers, M.Ch-D.M doctors and Finance MBAs.

In the 1950s and 1960s science literacy campaigns and popularization endeavours across the country, albeit well intentioned, created a shallow view of sober science with science as fun paradigm. With the deeply ingrained myth that we are the inheritors of an ancient Eldorado of sciences and titillated by technology triumphs of peaceful nuclear devices and home assemblies of globally purchasable subsystems, we have come to believe that all is well with Indian science. The complaisance may not be entirely misplaced.

According to the India Science Report: Science Education, Human Resources and Public Attitude towards Science and Technology (National Council for Applied Economic Research 2005) India has a stock of 40.2 million graduates, post graduates and diploma holders in science and technology (human resources in science and technology-HRSTE) The number of HRSTE grew by 7.9 per cent annually between 1981and 1991 and by slightly less, 6.9 per cent between 1991 and 2000. Core HRST comprise 3.4 per cent of the working population in 2004. Maharashtra has the largest stockpile of all graduates plus of all states.

The tragedy of our triumphs was that India was forced into a technology control regime after 1975. Scientific goods and services freely available to the rest of the world were denied to us. Many a bright mind was engaged in industriously making second and third rate instruments to stay afloat in science. There was a colossal waste of talent. The fashion of publish or perish ran its relentless course and science became the graveyard of abandoned ambitions for our youth.

There is no denying the fact that the Departments of Atomic Energy and Space continued to solicit talented science graduates but most of them went in search of greener pastures leaving the field to the next best.

In striking contrast, Singapore a nano-nation state designed and deployed an energetic science education program and took science seriously to the class room. In the Program for International Student Assessment for science, Singapore consistently scored high along with China. We linger around as laggards somewhere at 73-74 ranks.

The inability to secure a Nobel Science prize to India after Sir C.V. Raman was lamented by none other than the President of India in the last science congress. The disenchantment was patently luminous. Why study science? Why not some other money spinning subject? That is a recurring refrain in the minds of parents and studens.

India had a Science policy resolution of 1958 and Science and Technology policy resolution in 2003. Sensing that something is rotten with science education in India, now we have an STI 2013. We want to position ourselves amongst top five global scientific powers by 2020.

It is nice to label us as an IT superpower but we have failed in mastering the wafer technology. One wonders if we can make ultrapure water for wafer technology without importing membranes for RO units. We are good only as a 'service sector' and lack miserably in hardware development. To put science on its derailed route and project it as the true beacon of hope for personal growth and national development, we must give flesh and blood to our newly conceived STI policy 2013. With a meager 155,000 scientist count, we are far behind 1.42 million of China and 222,000 of Korea and the formidable figures of the developed nations. Should we not study science with passion?