

Major Activities of the Centre during July– December, 2016

1. Dr. Jyoti S. Hallad, Director, Dr. Shriprasad H., Joint Director. Mr. R. V. Deshpande, Asst. Director and Dr.Rajarama K.E.T., Assistant Director attended the National level Dissemination workshop of studies conducted by PRCs during 2015-16, organized by the Ministry of Health and Family Welfare, New Delhi, GoI, during 6-7 October, 2016 at Trivandrum and presented the papers.
2. Dr.Jyoti S. Hallad, Director, attended the State Coordinators' meeting of Longitudinal Ageing Study in India (LASI) project at Lonavala on 14th October, 2016 organized by IIPS, Mumbai.
3. Dr.Shriprasad H., Dr.Rajarama K.E.T., Mr. C. N. Noolvi and Mr. K. G. Kallihal attended the main survey ToT of (LASI) project from 3 -27 October, 2016 held at Lonavala.
4. Dr. Jyoti S. Hallad and Mr. Javeed A. Golandaj published an article on "Household Expenditure on Maternal Health Care in Rural Karnataka, India" in the Journal of Family Welfare Vol. 61 No. 2, December, 2015 pp 64-73.
5. Dr. Rajarama K.E.T., Asst. Director attended and presented a paper in IASSH conference held in Pune on 24-09-2016.
6. The staff of the Centre monitored NHM Programm Implementation Plan (PIP) at selected districts of Karnataka, Goa, Maharashtra and Telangana.

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ANC Registration and Pregnancy Outcome in NE States of India (Evidence from HMIS data 2013-14 and 2014-15)

Dilip Kr. Kalita¹ and Arpita Basak²

Abstract: Each pregnancy puts a woman and baby at risk of maternal and infant death. World Health Organization defines a maternal death as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes”. According to the data released by Registrar General of India, the MMR of India was 167 per 1,00,000 live births for the period 2011-13. Among the North Eastern States of India, Assam recorded MMR as 300 per 1,00,000 live births for the same period which is much higher than the national level. Antenatal care is one of the pillars of safe motherhood with the aim of improving pregnancy outcome for both the mother and the baby. The objective of this paper is to analyze the trends in antenatal care and pregnancy outcome in North Eastern States of India during 2013-14 and 2014-15. The study reveals that all the States of NE region except Manipur exhibit a significant development in respect of first trimester registration. Though many efforts are given to institutional deliveries, in Meghalaya about 50 percent of the total deliveries have taken place at home. Despite improvement in antenatal care, still birth remains an important unstudied and unexplained problem. Still birth ratio in Arunachal Pradesh, Nagaland and Sikkim indicate an increasing trend during 2013-14 and 2014-15.

1.1 Introduction

Antenatal Care is an important determinant of high maternal mortality rate and one of the basic components of maternal care on which life of mothers and babies depends (Nisar and White, 2003). The World Health Organization (WHO, 1991) defines antenatal care as a dichotomous variable, having had one or more visits to a trained person during pregnancy. It includes routine follow up provided to all pregnant women at primary care level from screening to intensive life support during pregnancy and up to delivery (Nisar and White, 2003). In India the Maternal Mortality Ratio is very high. According to the data released by Registrar General of India, the MMR of India was 167 per 1,00,000 live births for the period 2011-13. Among the North Eastern States, Assam recorded the MMR as 300 per 1,00,000 live births for the same period which is much higher than the national average. The major direct obstetric causes of maternal mortality in India are haemorrhage, puerperal sepsis, hypertensive disorders of pregnancy, obstructed labour and unsafe abortions. Maternal anaemia is a major contributor to the 'indirect' obstetric causes. While most of these causes cannot be reliably predicted, early detection and timely management can save most of these lives. According to SRS Bulletin 2014(September), the infant mortality rate of Assam and Meghalaya recorded as 54 and 47 per 1000 live births respectively which are higher than that of the national average (40 per 1000 live births).

Antenatal care is the systemic supervision of women during pregnancy to monitor the progress of foetal growth and to ascertain the well-being of the mother and the foetus. It is a pivotal factor for child survival and safe motherhood. The health of mother and her newborn child depends on ANC services. All pregnant women should have at least four antenatal care (ANC) services under the

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supervision of skilled attendants. A proper antenatal check-up provides necessary care to the mother and helps to identify any complications of pregnancy such as anaemia, pre-eclampsia and hypertension etc. The Government of India launched National Rural Health Mission (NRHM) currently known as NHM in April, 2005 to ensure coverage of all births with skilled attendance and to provide access to emergency obstetric and neonatal care services for women and newborns and thereby restrict the number of maternal and newborn deaths in the country. NRHM aims at providing at least three antenatal check-ups which should include a weight and blood pressure check, anaemia and eclampsia management, immunization against tetanus and iron and folic acid prophylaxis.

This study is an attempt to examine the extent of ANC utilization and outcome of pregnancies in the North-Eastern States of India.

1.2 Objectives:

The objective of the study is to examine the trends in antenatal care and pregnancy outcome in eight states of North East. We have studied the trend and patterns of ANC registration, first trimester registration, administer of TT vaccine, IFA distribution, haemoglobin and anaemic cases, home and institutional delivery, child sex ratio and still birth ratio.

1.3 Data and Methodology:

The database for the study was taken from the HMIS web portal of the Ministry of Health and Family Welfare, Govt. of India. HMIS data for the years 2013-14 and 2014-15 have been used for this study. In this paper we have analysed some indicators of ANC services and pregnancy outcome viz. ANC registration within 1st trimester, JSY registration, IFA tablets and TT1 distribution, Hypertensive and Anaemic cases, Home delivery, Institutional deliveries (public and private), Sex ratio at birth and Still birth ratio. Data from NFHS-3 (2005-06) and DLHS -4 (2012-13) are also taken into consideration to compare the findings of these studies in relevant aspects.

The study aims to examine the trend of these indicators among the North Eastern states viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim of India during the reference periods. Findings from earlier studies conducted by the PRC, Guwahati are also discussed to see the improvement of RCH services in the NE States.

2. Findings

2.1 ANC and First Trimester Registration

Antenatal care refers to pregnancy related health care, which is usually provided by health professionals. Antenatal care should monitor a pregnancy for signs of complications, detect and treat pre-existing and concurrent problems of pregnancy and provide advice and counselling on preventive care. ANC registration is an important component of NHM through which every pregnant woman gets pregnancy related services. ANC services help to reduce child and maternal mortality. First trimester registration is a vital component of ANC registration because most of the vulnerable pregnancy related diseases may occur during the first three months of the pregnancy.

Table 2.1: Status of ANC Registration by North Eastern States

NE States	2013-14		2014-15	
	Total Registration	PC of 1 st trimester registration	Total Registration	PC of 1 st trimester registration
Arunachal Pradesh	34633	42.0	32008	36.6
Assam	789120	71.8	685345	76.8
Manipur	87594	52.4	72783	58.9
Meghalaya	132397	33.3	120113	32
Mizoram	24464	68.8	22021	72.1
Nagaland	47196	37.5	40446	47.6
Tripura	77985	56.9	71708	62.8
Sikkim	9443	72	8571	77.9

In every North Eastern state, the number of ANC registration is found to be decreased from 2013-14 to 2014-15 (table 2.1). It also shows wide variation in proportion of first trimester registration among the NE States. Out of total ANC registration the proportion of first trimester registration recorded the highest in Sikkim in both the years (for 2013-14 it was 72% and for 2014-15 it was 78%) and lowest was recorded in Meghalaya (33% in 2013-14 and 32% in 2014-15). In all the NE states except Arunachal Pradesh, the percentage of first trimester registration has increased between the reference periods. However, Arunachal Pradesh has recorded 5 percent decrease of 1st trimester registration in 2014-15 than that of 2013-14.

2.2 JSY Scheme

Janani Suraksha Yojana (JSY) is one of the most important interventions of NHM being implemented with the objective of reducing maternal and child mortality by promoting institutional delivery. This is an innovative conditional cash transfer programme to provide monetary incentives to women to deliver in medical facilities. To implement the scheme, JSY also introduced the ASHA, a trained female community health activist, who is supposed to work as an interface between the community and the public health system.

Table 2.2 reveals that Assam recorded the highest number of women registered under JSY scheme with 94 percent in both the years 2013-14 and 2014-15. On the other hand, Manipur shows the lowest performance in this regard with 35 and 45 percent in 2013-14 and 2014-15 respectively. It is also to be mentioned that percentages of JSY registration has sharply decreased between the reference years in Arunachal Pradesh and Nagaland.

Table 2.2 Percentage of women registered under JSY Scheme

NE States	2013-14	2014-15
Arunachal Pradesh	69.8	58.7
Assam	93.7	94.1
Manipur	34.8	45.1
Meghalaya	40.6	50.5
Mizoram	71.6	82.0
Nagaland	54.4	43.1
Tripura	56.2	57.6
Sikkim	49.1	53.2

2.3 Tetanus Toxoid

Maternal and neonatal tetanus are important preventable causes of maternal and neonatal mortality. Two doses of tetanus toxoid are given to women during pregnancy to prevent these mortalities. If a woman has been vaccinated during previous pregnancy, however, she may require only one dose for the current pregnancy if the previous pregnancy occurred within 3 years of the last live birth. Table 2.3 reveals percentage of pregnant women who have received TT1 to total ANC registration.

Table 2.3: Proportion of antenatal registered women who have received Tt1

NE States	2013-14	2014-15
Arunachal Pradesh	62.2	56.9
Assam	80.8	83.6
Manipur	43.5	50.1
Meghalaya	40.7	40.1
Mizoram	57.5	59.8
Nagaland	43.6	47.2
Tripura	71.5	72.7
Sikkim	81.1	78.7

In Assam and Sikkim highest percentage of pregnant women received TT1 during 2013-14 to 2014-15 among the NE States. On the other hand, Manipur, Meghalaya and Nagaland recorded lowest percentage during the same period. However, Arunachal Pradesh, Meghalaya and Sikkim show decrease percentage in respect of TT1 administered from 2013-14 to 2014-15.

2.4 IFA supplementation

Proper maternal nutrition is important for the healthy intrauterine growth of the baby and may affect the baby's weight. It is a major threat to safe motherhood and to the health and survival of infants because it contributes to low birth weight, lower resistance to infection, impaired cognitive development, and decreased work capacity.

Table 2.4: Percentage of ANC registered women who have given 100 IFA tablets

NE States	2013-14	2014-15
Arunachal Pradesh	41.3	57.4
Assam	73.9	90.9
Manipur	23.6	27.1
Meghalaya	33.2	41.9
Mizoram	70.8	67.2
Nagaland	31.7	34.6
Tripura	38.3	60.9
Sikkim	80.8	82.5

It is observed in table 2.4 that in 2014-15, 91 percent of the ANC registered women had been given 100 IFA tablets in Assam followed by Sikkim (83 %), Mizoram (67 %) and Tripura (61%). However, IFA coverage in the state Mizoram has declined by 4 percent during 2013-14 and 2014-15.

Table 2.5: Percentage of ANC registered women having Hb level<11

NE States	2013-14	2014-15
Arunachal Pradesh	14.1	22.2
Assam	61.3	60.3
Manipur	8.6	13.0
Meghalaya	40.3	44.5
Mizoram	26.6	35.8
Nagaland	15.7	17.2
Tripura	19.0	25.5
Sikkim	39.5	35.6

It is observed from table 2.5 that the percentage of moderately anaemic (Hb level <11) women is the highest in Assam for both the year 2013-14 and 2014-15 which are recorded as 61 and 60 percent respectively. However, Manipur recorded the lowest percentage of such women found as 9 and 13 percent in 2013-14 and 2014-15 respectively. Of course Arunachal Pradesh and Nagaland also exhibit somewhat low percentage of moderately anaemic women during the reference period.

Table 2.6: Percentage of ANC registered women having Hb level<7

NE States	2013-14	2014-15
Arunachal Pradesh	0.7	2.3
Assam	0.6	0.6
Manipur	0.1	0.1
Meghalaya	2.2	2.4
Mizoram	1.3	0.9
Nagaland	0.6	0.8
Tripura	0.6	0.2
Sikkim	0.5	0.7

Table 2.6 represents the percentage of ANC registered women having Hb level<7 of NE States. It is observed that among the NE States Meghalaya recorded the highest percentage of pregnant women having Hb level <7 i.e. severe anaemia with 2 percent in 2013-14 and 2014-15. However, Manipur recorded the lowest percentage of such women found as 0.1 percent in both the reference periods.

2.5 Place of delivery

From the standpoint of child survival and health of the mother, it is advantageous for babies to be born under hygienic conditions with the assistance of a trained medical practitioner. One of the important objectives of NHM is to reduce child and maternal mortality through institutional delivery and 100 percent deliveries should be attended by the Skilled Birth Attendant (SBA).

Table 2.7: Percentage of Home delivery and institutional delivery

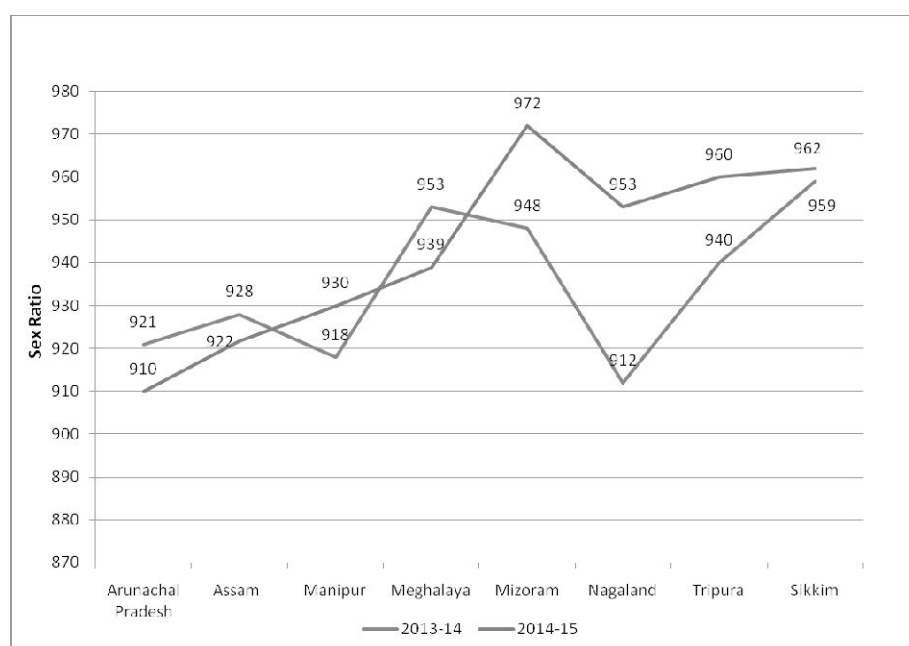
NE States	2013-14		2014-15	
	Home delivery	Institutional delivery (public and private)	Home delivery	Institutional delivery (public and private)
Arunachal Pradesh	4.6	95.4	5.5	94.5
Assam	16.1	83.9	15.4	84.6
Manipur	22.6	77.4	20.1	79.9
Meghalaya	48.2	51.8	49.0	51
Mizoram	10.6	89.4	9.8	90.2
Nagaland	26.6	73.4	23.1	76.9
Tripura	14.9	85.1	13.3	86.7
Sikkim	6.9	93.1	2.1	97.9

The proportion of institutional deliveries is more than that of home delivery in NE States of India. The percentage of institutional deliveries has increased sharply during 2013-14 to 2014-15. One factor contributing this pattern might be due to awareness of benefits of institutional medical care during pregnancy. In 2014-15, the highest percentage of institutional deliveries has recorded in Sikkim (97.9%) followed by Arunachal Pradesh (94.5%), Mizoram (90.2%), Assam (84.6%), Tripura (86.7%), Manipur (79.9%), Nagaland (76.9%), and Meghalaya (51%). However, it is also observed from the table 2.7 that in Meghalaya nearly 4% deliveries conducted at home in both the years 2013-14 and 2014-

2.6 Sex Ratio at Birth

As per SRS Statistical report 2013, the sex ratio at birth for the country has recorded 909 (female per 1000 male) in 2011-2013. However, the sex ratio at birth of Assam has declined to 920 during the same period against 931 in 2007-2009.

Figure 1: Sex Ratio at Birth for NE States



The figure 1 represents sex ratio at birth of NE States during 2013-14 to 2014-15 as per HMIS Web Portal data. In Arunachal Pradesh, Assam and Meghalaya the ratio decreased steadily from 2013-14 to 2014-15. The sex ratio at birth is recorded the highest in Mizoram (972) followed by Sikkim (962), Tripura (960) and Nagaland (953) in 2014-15. On the other hand, in the same period states which recorded low sex ratio are Arunachal Pradesh (910), Assam (922), Manipur (930) and Meghalaya (939).

2.7 Still birth rate

World Health Organization defines still birth as “the death of a baby before or during birth after 28 weeks of gestation”.

Table 2.8: Still Birth Rate

NE States	2013-14	2014-15
Arunachal Pradesh	12.0	22.5
Assam	23.4	22.5
Manipur	5.9	5.2
Meghalaya	22.4	22.0
Mizoram	10.6	11.0
Nagaland	12.6	17.3
Tripura	18.0	18.4
Sikkim	14.0	16.1

The table 2.8 shows the still birth rate of NE States during 2013-14 to 2014-15. Still birth rate in Arunachal Pradesh, Nagaland and Sikkim indicate an increasing trend during the reference periods. Among the NE states the highest still birth rate is recorded by Assam (23.4) in 2013-14 and Arunachal Pradesh (22) and Assam (22) in 2014-15. On the contrary, states which have recorded low still birth rate are Manipur (5.2) followed by Mizoram (11), Sikkim (16.1) and Nagaland (17.3) in 2014-15.

2.8 Newborns having weight less than 2.5 kg

The weight of the infant at birth is a powerful predictor of infant growth and survival, and is dependent on maternal health and nutrition during pregnancy. Low birth weight has been defined by the World Health Organization (WHO) as weight at birth of less than 2,500 grams (2.5 kg).

Table 2.9 represents the percentage of underweight newborns (i.e. less than 2.5 kg in weight at the time of birth) of NE States. In Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura the percentages of underweight babies remain almost same during the reference periods. However, Assam recorded the highest percentage of underweight newborns with 20 percent and 19 percent in 2013-14 and 2014-15 respectively.

Table 2.9: Percentage of newborns having weight less than 2.5 kg

NE States	2013-14	2014-15
Arunachal Pradesh	5.7	6.1
Assam	20.0	18.5
Manipur	3.6	3.9
Meghalaya	8.5	8.2
Mizoram	4.9	4.8
Nagaland	3.6	4.2
Tripura	10.4	10.5
Sikkim	5.5	6.7

3. Discussions:

ANC registration within first trimester means registration within 12 weeks of gestation. This early ANC registration leads to early ANC check up which is very important to avoid maternal and infant death. Except Arunachal Pradesh and Meghalaya all the NE states have the significant development in respect of first trimester registration in 2014-15 than that of 2013-14. When compared NFHS-3 (2005-06), DLSH-4 (2012-13) and the previous study (evidence from HMIS 2009-10 and 2010-11) done by PRC, Guwahati findings with that of the present study, it is observed that the percentages of first trimester registration have gradually increased in Assam and Sikkim. However, in other NE States there is no uniformity of increasing or decreasing trend regarding first trimester

registration. In Manipur according to NFHS-3, 65 percent women had registered for ANC within first trimester. On the other hand, the percentage has declined to 60 percent only in 2014-15 according to the HMIS data.

It is observed that in all the NE states the number of ANC registration has found to be decreased in 2014-15 than that of the year 2013-14.

In Assam, Manipur, Meghalaya, Mizoram, Tripura and Sikkim the percentages of JSY registered have gradually increased. The highest registration under JSY is observed in Assam. Mizoram shows rapid increase in JSY registration from 33 percent in 2009-10 (PRC, Guwahati study, 2009-10) to 82 percent in 2014-15. It is observed that in 2014-15, Manipur and Nagaland could not cover 50 percent ANC registered beneficiaries under JSY registration though the Ministry of Health & Family Welfare, Govt. Of India instructs to register all the beneficiaries under JSY registration.

The effectiveness of antenatal care in ensuring safe motherhood depends on the services given during pregnancy like TT vaccine. TT vaccine is very important to prevent maternal and neonatal tetanus (MNT). In Arunachal Pradesh the proportion of TT vaccine has gradually decreased from 62 percent in 2009-10 to 37 percent in 2014-15. On the other hand, in Manipur the percentage has increased from 34 percent in 2009-10 to 60 percent in 2014-15. But in DLHS 4 (2012-13) in Manipur the proportion was recorded 74 percent which is much higher than the HMIS data.

Sikkim recorded the highest percentage of pregnant women provided 100 numbers of IFA tablets during 2013-14 (81 percent) and Assam during 2014-15 (91 percent) among the NE States. In Mizoram, number of women getting 100 IFA tablets is almost uniform (ranging 67 % to 69%) during 2009-10 to 2014-15 except the year 2012-13 when the number of women was notably low (47%). Manipur ranks lowest in the percentage of women given 100 IFA tablets. The possible reason is that most of the pregnant women have been taking IFA tablets from private institutions.

Maternal and child health is one of the integral parts of the Family Welfare Programme of India. The goals of the National Population Policy, 2000 adopted by Government of India are that 80 percent of all deliveries should take place in institutions, trained personnel should attend 100 percent of deliveries and MMR should be reduced to a level below 100 per 100,000 live births. In Meghalaya nearly 50% delivery conducted at home in both the years 2013-14 and 2014-15. In Arunachal Pradesh according to DLHS-4 (2012-13) 49 percent delivery conducted at home whereas in HMIS data only 5 percent and 6 percent home deliveries were recorded in 2013-14 and 2014-15 respectively. This difference might be arisen due to the fact that in Arunachal Pradesh home deliveries are not recorded at sub centres level in HMIS data. In Arunachal Pradesh and Sikkim the percentages of public delivery have decreased during 2013-14 and 2014-15. On the other hand in those states the percentages of private delivery have gradually increased.

Sex ratio at birth means number of female newborns per 1000 male newborns. It is an

important social indicator to measure the prevailing equality between males and females. In Arunachal Pradesh, Assam and Meghalaya the ratio decreased steadily during the 2013-14 to 2014-15. In Assam the sex ratio at birth decreased from 928 in 2013-14 to 922 in 2014-15 according to HMIS data.

Despite improvement in antenatal care, still birth remains an important unstudied and unexplained problem. Still birth ratio in Arunachal Pradesh, Nagaland and Sikkim indicate an increasing trend during 2013-14 and 2014-15. In Manipur the still birth ratio is gradually decreased from 8 per 1000 births in 2009-10 to 5 per 1000 births in 2014-15. In Sikkim the ratio was rapidly decreased from 39 in 2009-10, 20 in 2010-11 and 14 in 2013-14 but it is again increased to 16 per 1000 births in 2014-15. Even though Assam recorded as second highest percentage of first trimester registration (72 % in 2013-14 and 77% in 2014-15), still birth ratio is recorded highest among the NE states in Assam (23 per 1000 birth in both the years 2013-14 and 2014-15). This finding however, demands for quality ANC services in the state.

The proportion of newborns with a birth weight less than 2.5 kg varies considerably among the NE States from a low of 4 percent in Manipur and Nagaland, 5-11 percent in Mizoram, Arunachal Pradesh, Sikkim, Meghalaya and Tripura, to a high of 19 percent in Assam in 2014-15. However, in spite of improvement of ANC registration in Assam (second highest with 72 % in 2013-14 and 77% in 2014-15), the state shows the highest percentage of underweight newborns among the NE States (20 % in 2013-14 and 19 % in 2014-15). The NFHS-3 (2005-06) shows the similar findings of underweight babies in Assam. The percentage of underweight babies is supposed to be reduced after launching of NRHM, 2005. In NFHS-3, 2005-06 the percentage of underweight babies in Assam was 19 percent. After ten years of implementation of NRHM-2005, the percentage of under weight babies is still remaining same in Assam. Of course, the percentage of first trimester registration has improved from 40 percent in NFHS-3 (2005-06) to 77 percent in HMIS, 2014-15. It is found from HMIS data (2014-15) that districts like Barpeta, Cachar and Jorhat etc. show comparatively higher percentage of low birth weight babies. These districts are having more labour class population particularly wage and tea garden labourer. They have nutritional issues.

4 Summary:

The present study has discussed on the development of RCH services in North East regions. It is found that all the States of NE region except Manipur exhibit a significant development in respect of first trimester registration after launching of NRHM. The prevailing insurgency problem somehow interrupts the health care services in Manipur. However, Manipur shows 59 percent of first trimester registration according to HMIS 2014-15 which is somewhat lower than that of the NFHS-3 (2005-06) data where it was recorded as 65 percent. From the study it is observed that in Assam 74 percent and 91 percent women are recorded to receive 100 IFA tablets in 2013-14 and 2014-15 respectively whereas in

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the same periods 61 percent and 60 percent women are recorded moderately anaemic. In Meghalaya nearly 50% delivery conducted at home in both the years 2013-14 and 2014-15. In Arunachal Pradesh according to DLHS-4 (2012-13) 49 percent delivery conducted at home whereas in HMIS data only 5 percent and 6 percent home deliveries were recorded in 2013-14 and 2014-15 respectively. Even though Assam recorded as second highest percentage of first trimester registration (72 % in 2013-14 and 77% in 2014-15), still birth ratio is recorded highest among the NE states in Assam (23 per 1000 birth in both the years 2013-14 and 2014-15). The proportion of newborns with a birth weight less than 2.5 kg varies considerably among the NE States from a low of 4 percent in Manipur and Nagaland, 5-11 percent in Mizoram, Arunachal Pradesh, Sikkim, Meghalaya and Tripura, to a high of 19 percent in Assam in 2014-15.

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Does Women's Empowerment Influence their Reproductive in Health Behaviour?

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Introduction:

Women's health and self-esteem are affected by the value placed on them by the community. Their sexual subordination to men makes them vulnerable to adverse health consequences like unwanted pregnancy, venereal infection, etc. (Cook, 1995). Despite considerable development in healthcare, women do face more health risks than men. Though women are affected by the same health issues as men, their experiences are different due to limited control over their sexual and reproductive lives, lack of decision-making power and poor access to nutrition and healthcare services. This has an unfavourable impact on their health (World Conference on Women, 1995). The health risks also originate from genetic vulnerability and are compounded by the policy of neglect. The Beijing Conference in 1995, and more recently in 2010, discussed these issues. The vulnerability is acute in rural areas due to knowledge gaps and policy failures. The backward regions and social groups that face this hazard have higher morbidity and mortality rates. The Cairo International Conference on Population and Development in 1994 identified that the reproductive health of women is associated with their empowerment. Since then studies have been conducted to understand the influence of empowerment and fertility. However, this article deviates from the existing literature and attempts to identify the level of women's empowerment and its influence on their awareness of reproductive health in Karnataka.

Literature is available on this subject and has examined the empowerment, autonomy and status of women based on similar grounds. Das et al. (2002) in their study conducted in Pune and Baroda showed that certain aspects like ideal age at marriage, age for first child, family size, spacing between births, approval/disapproval of sex selective abortion, knowledge of contraceptives and fertility decisions were affected significantly by the status of women. However, socio-economic factors like education and employment have a strong influence on women's decision-making autonomy and on maternal and child health-care utilisation (Woldemicael 2007, Kishore and Gupta 2009, Mutharayappa 2011). Low levels of female education and lack of autonomy hinders child survival and fertility reduction (Gupta, 1996). The health status of women and children, particularly female children suffers when women's autonomy is curbed by patriarchal kinship. In fact, women with greater freedom of movement received higher level of antenatal care and are more likely to use safe delivery options (Bloom et al 2001). Importantly, women's empowerment is closely linked to positive outcomes for families and societies. Studies have focussed on maternal and child health-seeking behaviour. Researchers also have assessed women's status, socio economic indicators based on education, income, work and reproductive behaviour (Woldemicael 2007). However, very few studies have focussed on the relation between women's empowerment and their awareness of

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reproductive health behaviour. This study is an attempt to understand the role of empowerment in the reproductive awareness of women in Karnataka. To highlight these dimensions, the study relies on primary data. The present study uses empowerment and autonomy interchangeably because both are multi-dimensional, culturally grounded and relational.

Objective of the study:

The focus of the study is to highlight women's empowerment and reproductive health but the specific objectives are:

- I) to study the level of women's empowerment at their household.
- ii) to examine the influence of women's empowerment on reproductive health.

Data and methodology:

For the present study, data have been collected from married women aged 15-49 years. Two sets of questionnaires were prepared and canvassed – one at the household level and the other at the individual woman level. The household's questionnaire elicited background information of the household as well as the individuals in brief, which included name, relationship to the head of the household, age, marital status, schooling and occupation. This information was necessary to identify women eligible for individual interview in the household. After identifying the number of women in the household, the woman's questionnaire was canvassed separately. In the woman's questionnaire information relating to her age at marriage, age at which she started living with her husband, number of children born, problems during pregnancy and delivery and place of delivery was recorded. Women also were asked who took most of the decisions in her household and, more importantly, information was collected on her financial and sexual autonomy, awareness of domestic violence and freedom of movement.

The areas selected for the study was Chikkaballapura and Ramanagara districts of Karnataka. These two districts were selected mainly because they are located in the southern maidan region of Karnataka and are different in terms of population growth, density of population and sex ratio. The birth and death rates in Chikkaballapura and Ramanagara are lower than the state averages. Indicators like infant mortality and maternal mortality rate are also lower than the state average.

Primary data samples were selected in three stages. In the first stage, the districts were selected (one district in the high vulnerability region and another from low vulnerability region) based on performance of health indicators. Secondly, villages or Primary Sampling Units (PSUs) were selected using the Probability Proportional Size (PPS) method. In each district 40 PSUs were selected. After selecting the PSUs, listing of houses was conducted in all these PSUs for selection of households. Thirdly, households were selected based on house listing and the Circular Systematic Random Sampling method. In each PSU, 30 households were selected for in-depth interviews. We chose 1,200 households in each district mainly because a demographic estimation needs a larger sample and to

compile complete data a minimum of 1,000 households per district with a margin of 10-15 per cent non-responses and non-availability of respondents is required. The interview schedule was canvassed for all married women aged 15-49 years in the selected households. In all, we collected data from 1,216 households in Ramanagara district and 1,275 households in Chikkaballapura district.

Findings of the study:

An attempt was made to gather demographic information like age at marriage and marital status of women. In fact, the age at marriage and the age at which they start living with the husband were influenced by many factors such as the average marriageable age in their respective villages, the economic status of their parents, order of birth in the family and the attitude of the husband's family. During the fieldwork one respondent reported that she was married at the age of 16 years, i.e., soon after she completed her secondary schooling. Her sisters were married off immediately after attaining puberty. This is mainly because of the tradition in that village to get daughters married off before the age of 15 years. She was an exception in her family. Another respondent who had lost her parents and was brought up by her aunt reported that she was married off early because they got a good proposal. In another case, as the parents were poor, they married off their daughter to a man without getting to know about him. It was later discovered by the respondent that he was not mentally sound. In some instances, the in-laws in joint families were particular that the daughter-in-law should come to their home with the husband immediately after the marriage irrespective of their age. As narrated by those respondents the in-laws were concerned about the additional family member taking on household responsibilities than the age of the daughter-in-laws.

Data provided in Table-1 gives the details of the demographic profile of the women under study. It has highlighted the household size and type of families in the study area. Majority of the households are nuclear families, i.e., husband, wife and their children. Joint families are less but extended families still exist. About 18 per cent of the households have extended families. There are no differences between Ramanagara and Chikkaballapura districts in terms of type of families and household size. Secondly, majority of the eligible women between 15 to 49 years were Hindus. A small number of women were Christians. Among the Hindus, majority of them were from Other Backward Castes (OBC). Those belonging to ST and SCs comprised less than one-fifth of the sample. More than 90 per cent of them are currently married. Nearly half of them were married between the age of 18 to 20 years and close to one-fifth of them were married between 21 to 41 years of age.

Over three-fourths of women were married before they completed 20 years. This reveals that majority of parents married off their daughters well before the legal minimum age of marriage. Secondly, parents married off their daughters within six months or one year after attaining maturity. Less than one-tenth of the respondents were married when they were below the legal minimum age and almost all of them started living with the husband before their 18th birthday. During fieldwork when we asked the women at what age they started living with their husbands, majority of the women were unable to recall their age. However, some of the respondents were able to recall and reported that they started

living with their husbands soon after marriage. Very few joined their husbands after one or two years of marriage. Having married at a very young age most of the respondents were not aware of reproductive health and its responsibilities and many said that they mechanically gave birth to children without thinking about their health, spacing between children, their wishes etc. Another interesting pattern revealed in Table-1 is the current marital status. Though the percentage of currently married women was higher in both the districts, about 6 per cent of the women were widows and 3 per cent were divorced or separated.

Table-1: Characteristics of respondents (Percentage)

Characteristics	Total (N=2491)
Caste	
SC	18.5
ST	11.2
OBC	41.2
Others	29.1
Religion	
Hindu	93.6
Muslim	5.9
Christian	0.5
Demographic profile	Total (N=2491)
Marital status	
Currently married	91.4
Divorced/Separated	3.1
Widow	5.5
Age at marriage	
10-14	8.9
15-17	29.1
18-20	44.7
21-41	17.3
Age at which started to living with husband	
<15	8.8
15-17	28.6
18-20	43.7
21+	17.1
Do not know	1.8
Household size	
1-5	79.32
6-8	17.9
9+	0.3

Data shown in Table-2 depicts the reproductive health behaviour and awareness of the women. Over half of the women have living children and two-thirds of them have had safe deliveries in hospitals. About 70 per cent of them have knowledge of timing to get pregnant and around 90 per cent of them are aware of ideal spacing between the children. It is to be noticed that many women who did not have this awareness earlier acquired it and many older women are ensuring that their daughters and daughters-in-law follow it. Majority of them are following the family planning methods, which is mainly tubectomy or laparoscopy. Similarly, majority of them know where to obtain the family planning assistance and decide jointly along with their husband on the method to be followed. However, less than half of the women under study discussed family planning methods and its consequences with their spouses.

Table 2: Reproductive behaviour of women (percentage)

Reproductive health behaviour	Total (N=2491)
Number of children	
None	2.9
1 child	19.9
2 children	53.5
3 and above	23.8
Institutional delivery	68.3
Right knowledge of timing to get pregnant	71.7
Right knowledge of spacing between children	89.3
Current user of Family Planning method	93.7
Method of Family Planning used	
Permanent	96.6
Temporary	3.4
Awareness of place to get Family Planning method	
Government Health facilities	94.5
Private Health Facilities	5.5
Discussion between couple on Family Planning method	48.9
Decision to use Family Planning method	
Self	3.5
Husband	2.2
Both	94.3

To understand women's empowerment, variables like decision-making in the household, freedom of mobility, sexual autonomy, financial freedom and awareness of domestic violence were considered and ranked based on their responses. Regarding sexual autonomy, women in the study area were asked if they would justify refusing sex with husband when she knows that her husband has

sexually transmitted disease, when her husband is having sex with other women and when she is tired and not in the mood. Those who justified not having sex in all three instances had high autonomy, those with two had medium autonomy and those who had just one or none were categorised had low autonomy.

Regarding freedom of movement, three instances with three options were asked to assess if the women were free to go outside the house, be alone with somebody else or allowed to step out of the house at all. The three instances are – to go alone to the market, to the health facility and to go out of the village to visit family or friends. Those with more number of individual and joint movements out of the house had high autonomy, those with just two-three instances had medium autonomy and the rest had low autonomy.

To ascertain their decision-making power, they were questioned on who made decisions regarding four instances² about her healthcare, major household purchases, daily household needs and visiting family and relatives. Women who took decisions on their own and joint decisions with the husband or other family members were considered as having decision-making powers. Those who decided individually or jointly for all the options were considered as high, those with two-three as medium and those with less than two options were ranked low in decision-making.

To understand their awareness of domestic violence, respondents were asked whether they justified their husbands beating them under seven circumstances. The answer had binary options. They were asked if they justify their husbands hitting them if they go out without telling him, they neglect the house or the children, they argue with him, they refuse to have sex with him, they do not cook food properly, he suspects her of being unfaithful and they disrespect the in-laws. Those who did not justify husband's beating for six-seven instances were ranked as having high awareness, those with three-five as having medium awareness and those with less than two as having low awareness.

To assess the respondents' financial freedom, they were asked whether they ever have money of their own and they alone can decide how to use it. As the question had a binary option, those who answered positively ranked higher than those with negative answer.

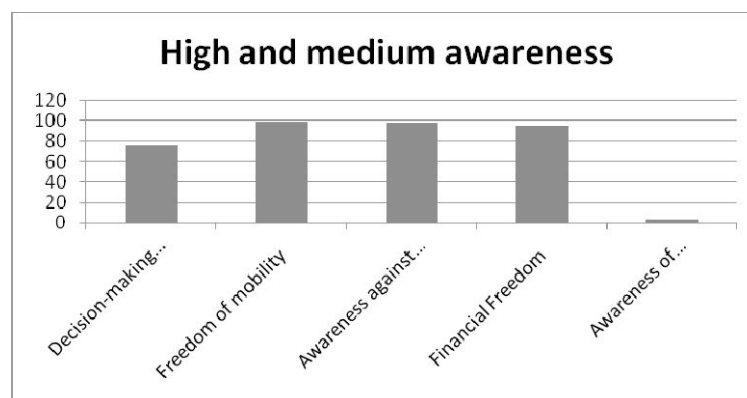
The present study found that awareness of sexual autonomy was very low, whereas the awareness of domestic violence from husband was high. More than half of the respondents had the decision-making power and more than three-fourths had freedom to move around within or out of the village alone or with a company. Over 90 per cent of the respondents had freedom to use money at will.

Table 3: Percentage of women who reported their level of empowerment in the household

Empowerment	High	Medium	Low	Total
Awareness of sexual autonomy	1.0	1.7	97.3	100
Decision-making power	54.4	22.1	23.5	100
Freedom of mobility	76.8	22.5	0.7	100
Awareness of domestic violence	81.3	16.6	2.2	100
Financial freedom	94.9	-	5.1	100

Data in Table 3 shows that women enjoy more financial freedom than sexual autonomy. More than 80 per cent are aware of domestic violence and about three-fourths enjoy high freedom of mobility. More than one-fifth of the women have medium awareness. However, more than 97 per cent have very low awareness of their sexual rights within the household. More than one-fifth of them have less decision-making power in the household.

Diagram 1



Data highlighted in Table 3 and Diagram 1 reflects the respondents who rank high in decision-making, awareness of sexual autonomy, freedom of mobility, awareness of domestic violence and financial freedom against their demographic characteristics. The diagram shows clearly that women in these districts lack sexual autonomy. The other empowerment variables like freedom of mobility, awareness of domestic violence, financial freedom and decision-making have not translated into sexual autonomy, showing that the women are holding on to a traditional belief to save a marriage and the traditional ideal of submissiveness in women.

Table 4: Percentage of women who reported having high empowerment with background characteristics

Background characteristics	Awareness of sexual autonomy	Decision-making power	Freedom of mobility	Awareness of domestic violence	Financial Freedom
Age of the eligible women					
18-25	0	41.6	70.3	0	96
26-39	1.4	51.8	84.2	1.4	97.8
40-49	1.6	51.6	79.8	1.6	97.6
Marital Status					
Currently married	0.9	48.1	77.8	79.1	96.9
Widow	2.9	61.8	88.2	76.5	100
Separated/Deserted	0	33.3	77.8	88.9	100
Religion					
Hindu	1.1	54.7	77.5	81.3	94.9
Muslim	0.7	56.3	68.8	79.9	93.8
Christian	0	58.3	58.3	83.3	100
Caste					
SC	0.4	53.8	73.3	77	93.9
ST	0.4	59.3	75	87.1	93.2
OBC	1.6	53.8	79.1	80.8	95.1
Others	1.6	53.8	76.4	82.3	95.9
Work Status					
At home	0.9	43.4	78.5	78.5	2.7
Working outside	1.4	57.2	79.3	80	2.8
Age at marriage					
Below 18 years	48	39.4	38.3	46.8	35.9
18 and above years	52	60.6	61.7	53.2	64.1
Age of cohabitation					
Less than 15 years of age	11.5	9.9	8.8	11	8
15-17 years	34.6	28.6	28.9	34.6	27.5
18 and above years of age	50	59.2	60.5	52	63.1
Do not know	3.8	2.3	1.8	2.4	1.4

Data in Table 4 shows high level of empowerment of women and their corresponding awareness of reproductive health. The overall sexual autonomy of the women in the study is very low. However, Hindu and Scheduled Caste women and widows enjoy marginal advantage. The age at marriage and cohabitation, have some influence on the sexual autonomy of the women. The age of the women also influences their freedom of mobility, with some exceptions. Women in the age group of 26-39 years are more free to move around than those aged 40 to 49 years. Generally, as the women grow older, household responsibilities reduce and they could go out of the house freely but this is contested in the

study. However, majority of the women in all the age groups enjoy more financial freedom.

When marital status is considered, widows have considerably good level of awareness of sexual autonomy, decision-making power, freedom of mobility and financial freedom. Those separated have more awareness of domestic violence. However, most of them live with relatives and only one-third have decision-making power. Nonetheless, they have complete freedom in deciding on how to spend the money they have either earned or have been given. It could be inferred that this awareness might be due to their bitter experiences. Domestic violence might be one of the reasons for the separation. The reasons for separation or desertion are beyond the scope of this study. However, none of the widowed women is aware of sexual autonomy, though they enjoy financial autonomy. However, the married women are marginally better than the widows regarding sexual autonomy and decision-making are. In other categories, awareness level was more among widows and separated/deserted women. Widows and those separated/deserted lead life independently and this might give them more awareness of their freedom. Currently married women are constantly under the protection of the husband and family. The power relations within the family prevent women getting awareness and making use of it. During the field visit, some married women were questioned about their freedom to go to market, relatives place, and out of village and they responded that though they have the freedom to go alone, the husband, son or a family member always accompanied them. In fact, some women took pride to reveal this. It shows that they still embrace the old belief that a woman has to be under the protection of husband and son after marriage. Further, less than half of the married women have been vested with the decision-making power in the house. In the families of most of the currently married women, joint decisions play an important role and restrict the sole decision making power of a woman. This also explains why not all married women enjoy financial freedom.

Religion does not seem to influence the awareness of women. Hindus are leading in sexual autonomy, though marginally, and in freedom of mobility. Christian women are more among those who have awareness of domestic violence, have decision-making power and financial freedom. Muslim women who take decisions in the household are marginally more compared to Hindus. However, they have less financial freedom compared to Hindus and Christians. It is to be noted that the Muslim women have more freedom to move and very few of them have awareness of sexual autonomy.

Among the Castes, the Scheduled Caste women have less awareness compared to STs and OBCs. The OBC women are more aware of their right to refuse sexual demands from the husband under certain circumstances. They have more freedom of mobility and financial freedom. The ST women have more decision-making power and awareness of domestic violence and are better informed than their SC counterparts.

The work status of women plays a role in shaping their personality. The exposure to the outside

world, information and awareness will be more for those who go out of the house to work. In the study, though seen in all the categories of autonomy, the influence is very marginal in case of mobility, domestic violence and financial freedom. However, it has boosted their decision-making powers and awareness of sexual autonomy.

Age at marriage and duration since marriage are two important variables to understand the differentials in fertility (Karkal and Rajan 1989). As there was ambiguity among most of the women in reporting the date of marriage, the study considered the age at cohabitation to understand the age at which the women moved in to their husband's house. This also indicates the age from which they are prone to fertility/reproductive health issues. The age at marriage and the age at cohabitation determine the level of the women's awareness of all aspects of autonomy considered in the study. More than half of those who reported having sexual autonomy were married when they were 18 years and above and started to live with their husbands thereafter. Similarly, they have more decision-making power, awareness of domestic violence, freedom to move and to use money at will. The difference in awareness in reproductive health according to the age at marriage and at cohabitation is obvious, explaining the correlation between awareness levels and autonomy of women. This might be because the women who are married at early age are moulded by the family customs and traditions more easily and at a tender age they tend to internalise whatever is taught.

Reproductive health behaviour:

The International Conference on Population and Development (ICPD) at Cairo defines reproductive health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity in all matters relating to the reproductive system and to its functions and processes (United Nations, 1994) '. The origins of reproductive health problems often lie in human behaviour that reflects socially and culturally constructed patterns of gender relations (Ramasubban and Jejeebhoy 2000). Hence, women's bodies and social realities are different. Similarly, women's health risks and their health-seeking behaviour are also different. This has additional impact on their reproductive health (Ramasubban and Jejeebhoy 2000).

Table 3 delineates the reproductive health behaviour of the women in the study. The awareness of sexual autonomy is minimal among married women. Women with less awareness of sexual autonomy have three or more children. Women planning family and yet to have children were marginally more in number and have knowledge of sexual autonomy. More than half of the women irrespective of the number of children have decision-making power in the households. Women having three or more children have marginally more decision-making power in their households. More the awareness of freedom of mobility more the number of children such women have. However, more the awareness of domestic violence lesser the number of children and vice-versa. Nonetheless, financial freedom does not seem to influence the number of children.

High Empowerment and Reproductive Health Behaviour:

Having high awareness of sexual autonomy has a very small role to play deciding the number of children, institutional delivery, knowledge of the timing to get pregnant, use of family planning methods, the place to get help with family planning and couple's discussion on family planning methods. However, more than three-fourths of the women with awareness of sexual autonomy had knowledge of spacing between children. Similarly, 3 per cent of the women with awareness of sexual autonomy took independent decision on the method of family planning. However, around 7 per cent of the women who had this awareness, allowed their husbands to decide the family planning method they would use.

Women seem to enjoy considerable decision-making power within their household. About 90 per cent of women who have decision-making power have knowledge of spacing between children and more than 60 per cent of the women enjoying decision-making power decided the method of family planning they would use. In addition, more than half of such women have taken joint decision on use of family planning method. Women who have less than 50 per cent decision making power have knowledge of timing pregnancy and for 45 per cent having awareness of decision-making, the husbands decide family planning method to be used and only around 42 per cent of them are using temporary methods. In all the other parameters, the influence of high awareness of decision-making is above 50 per cent.

Those who are free to move about without permission from husband or the household members have high freedom of mobility. In the study, more than two-thirds of the women enjoy freedom of mobility. Nearly 90 per cent of women who enjoy high freedom of mobility have the knowledge of spacing between the children. Similarly, around 80 per cent of the women with high freedom of mobility have taken the decision on the family planning method. The overall influence of freedom of mobility seems to be positive on the reproductive health behaviour of women.

Majority of the women have the awareness of domestic violence. Many of the respondents unanimously opined that a husband should not abuse a woman physically, mentally or emotionally. Very few of them were also of the opinion that it was not wrong for a husband to beat his wife when she annoyed him and that beating the wife is his right. According to them, a wife will mend her ways only if a husband punishes her. In our study, it is seen that more than three-fourths of the women are against husband beating his wife. The influence of awareness against domestic violence on all the variables of reproductive health behaviour is more positive than that of freedom of mobility. However, the last column of Table 1, which depicts the financial freedom of the women, reveals that this has been the leading variable in deciding the reproductive health behaviour of women. Financial freedom has not restricted the number of children because 95 per cent of those who have high financial freedom have three or more children.

Table 5: Percentage of women who reported high awareness on empowerment variables according to their reproductive health behaviour

	Reproductive health behaviour	Awareness of sexual autonomy	Decision-making power	Freedom of mobility	Awareness of domestic violence	Financial Freedom
1	Number of children					
	None	1.4	55.1	71.0	88.4	94.2
	1 child	1.1	51.3	75.2	85.6	95.8
	2 children	1.3	55.3	78.3	80.8	95.0
	3 and above	0.5	59.5	78.4	76.3	94.9
2	Institutional delivery	0.6	50.3	71.1	85.4	95.2
3	Knowledge of timing to get pregnant	1.3	47.4	73.7	88.2	93.4
4	Knowledge of spacing between children	76.0	89.8	90.3	89.6	90.0
5	Current user of FP method	1.2	56.7	78.4	80.3	95.1
6	Method of FP					
	Permanent	1.2	57.2	78.7	80.1	95.1
	Temporary	0.0	41.5	69.2	83.1	92.3
7	Awareness of place to get FP method					
	Government Health facilities	1.2	56.8	78.6	80.2	95.0
	Private Health Facilities	0.0	55.8	75.0	79.8	95.2
8	Discussion between couple on FP method	0.7	52.3	75.3	83.8	95.8
9	Decision to use FP					
	Self	3.0	63.6	80.3	78.8	80.3
	Husband	7.1	45.2	69.0	73.8	83.3
	Both	0.9	56.7	78.8	80.6	96.0

Medium Empowerment and Reproductive health behaviour:

Low awareness of sexual autonomy among women (Table 6) continues. However, 86 per cent of those who have awareness of sexual autonomy have the correct knowledge of spacing between the children. About 1.3 per cent among them had high awareness. However, around 14 per cent with medium awareness of sexual autonomy had no right in deciding their family planning method.

More than one-fifth of the women have medium level of decision-making power. More than 88 per cent of women with this awareness have the correct knowledge of spacing between the children and one-third of them do not have the power to decide about the family planning method because their husbands play a more decisive role.

Nearly one-fifth of the women do have medium level freedom of mobility and awareness of domestic violence. However, there is an exception with regard to knowledge of spacing between the children. More than 85 per cent of the women having medium awareness of the factors given have the correct knowledge of the spacing between the children. However, 31 per cent of women having medium freedom of mobility are unable to decide on the method of family planning. The percentage of women taking independent decision on family planning method is less among those with medium level of awareness. As the financial freedom consisted of only two options, it could not be included in Table 4 measuring the medium awareness of women.

Table 6: Percentage of women who reported medium awareness on empowerment variables according to their reproductive health behaviour

	Reproductive health behaviour	Awareness of sexual autonomy	Decision-making power	Freedom of mobility	Awareness of domestic violence
1	Number of children				
	None	0.0	23.2	29.0	10.1
	1 child	2.1	19.9	23.3	13.6
	2 children	1.5	23.8	21.3	17.5
	3 and above	0.0	20.4	20.9	18.9
2	Institutional delivery	1.5	25.3	28.3	13.6
3	Knowledge of timing to get pregnant	2.6	30.3	26.3	10.5
4	Knowledge of spacing between children	84.6	88.8	85.9	89.4
5	Current user of FP method	1.8	22.5	21.1	17.1
6	Method of FP				
	Permanent	1.8	22.6	20.8	17.3
	Temporary	1.5	20.0	30.8	16.9
7	Awareness of place to get FP method				
	Government Health facilities	1.7	22.2	20.9	17.2
	Private Health Facilities	2.9	26.0	24.0	18.3
8	Discussion between couple on FP method	2.0	23.7	24.2	15.0
9	Decision to use FP				
	Self	3.0	19.7	18.2	18.2
	Husband	14.3	33.3	31.0	26.2
	Both	1.5	22.3	20.8	16.8

Low Empowerment and Reproductive Health Behaviour:

Data provided in Table 7 gives the details of the women having low awareness of various factors and its influence on their reproductive health behaviour. More than 90 per cent of the women have very low awareness of their right to refuse sex with husband under certain circumstances. However, there is

exception where around 79 per cent of women having low awareness of sexual autonomy allowed their husband to take a decision on using family planning methods. Hence we can infer that majority of women who have low awareness on sexual autonomy are more aware of the healthy reproductive matters when compared to those with low awareness of other factors like decision-making, freedom of mobility, financial freedom and awareness of domestic violence. In fact, women with less freedom of mobility and financial freedom have less knowledge of healthy reproductive behaviour according to data in Table 5. It is to be noted that majority of women with low awareness and freedoms have more knowledge of spacing between children.

Table-7: Percentage of women who reported low awareness on empowerment variables according to their reproductive health behaviour

	Reproductive health behaviour	Awareness of sexual autonomy	Decision-making power	Freedom of mobility	Awareness of domestic violence
1	Number of children				
	None	98.6	21.7	0.0	1.4
	1 child	96.8	28.8	1.5	0.8
	2 children	97.2	20.9	0.3	1.7
	3 and above	98.6	20.2	0.7	4.8
2	Institutional delivery	97.9	24.4	0.6	1.0
3	Knowledge of timing to get pregnant	96.1	22.4	0	1.3
4	Knowledge of spacing between children	89.5	88.3	82.4	75.9
5	Current user of FP method	97.0	20.9	0.5	2.6
6	Method of FP				
	Permanent	97.0	20.2	0.5	2.7
	Temporary	98.5	38.5	0.0	0.0
7	Awareness of place to get FP method				
	Government Health facilities	97.0	20.9	0.4	2.6
	Private Health Facilities	97.1	18.3	1.0	1.9
8	Discussion between couple on FP method	97.4	24.0	0.5	1.2
9	Decision to use FP				
	Self	93.9	16.7	1.5	3.0
	Husband	78.6	21.4	0.0	0.0
	Both	97.6	21.0	0.4	2.5

There is an important point to note in the table - irrespective of whether the women enjoy high, medium or low autonomy - majority of them have the correct knowledge of spacing between children. It is also evident that the proper spacing is not followed in many instances. In many cases, before the child turned one year old, some women had again become pregnant. They could not maintain the space due to family compulsions, lack of knowledge during the time of conceiving, late realisation or late information of spacing time. During the fieldwork, we observed that many respondents were married when they were young and did not know about marital life and reproductive health. When they were pregnant, initially and in the subsequent years, they had to listen to their in-laws or their parents. In some cases, the mothers of the respondents urged them to have the second child soon because they were getting too old to look after their daughter and grandchildren. There is also an instance where a respondent gave birth to three children as per her mother's wish because her mother had only one daughter. In another instance a woman, working as helper in an Anganavadi, had two daughters but had not adopted family planning because her mother-in-law wanted a grandson for the continuity of the family. The eldest daughter is nearly two years old and the second one is barely a year old and the respondent is pregnant again, much against the doctor's advice because she is severely anaemic. Hence, in many cases respondents were not in a position to think either of their pregnancy or about the spacing. This shows that family tradition and culture determine status of reproductive health. As shared by the respondents, they have been educated on the spacing between children late in life through programmes and anganavadi as well as Aasha workers.

The study shows that high freedom of mobility, freedom of utilisation of finances, awareness of domestic violence and decision-making power have positively influenced the reproductive health behaviour of women. Women seem to have less knowledge of their sexual autonomy. The influence of high awareness of sexual autonomy can be seen only in case of knowledge of spacing between children. The influence of financial freedom is more on the reproductive health behaviour followed by awareness of domestic violence and freedom of mobility.

Discussion and Conclusion:

Studies conducted on women's health have documented gender-based inequalities and vulnerabilities in women's health (Nathanson, 1977; Arber, 1993). They have mentioned that gender is a measure of both biological and social differences and, therefore, it is likely that health inequalities between men and women reflect both gender related biological and social factors. Crompton and Kemeny (1999) and Borg and Kristensen (2000) highlighted that gender disparities in health status are directly affected by the socio-economic status. According to Denton and Walters, (1999), women report higher levels of health problems because of reduced access to the material and social factors that foster good health. Women report higher levels of health problems because they are exposed to higher levels of demands and obligations and experience more stressful life events.

However, studies have shown that empowerment of women has a strong impact on maternal and child health care (Woldemicael, 2007; Kishore and Gupta, 2009; Mutharayappa, 2011). Decision-making has a strong influence on women's reproductive behaviour (Jeejebhoy 1998). Foetal loss is associated with domestic violence while lack of decision-making, mobility and control over resources will compromise the health and nutrition of women (Jeejebhoy, 1998). Women with greater freedom are more likely to receive antenatal care and use better delivery care (Woldemicael, 2007). Hence, women's autonomy has become a major determinant of maternal health care utilisation (Bloom et al., 2001).

In this context, the present study is an attempt to understand the level of empowerment among women in Karnataka. It shows that women in Karnataka are better empowered in terms of decision-making, freedom of mobility, financial autonomy and awareness of domestic violence. Women with more empowerment are better informed on reproductive health behaviour compared to those with less empowerment. The awareness of sexual autonomy is alarmingly very low indicating at the submissiveness of women and their increased vulnerability to sexually transmitted diseases. When other four aspects of empowerment used in the study is taken into consideration, it is seen that financial freedom has more influence on awareness of reproductive health followed by freedom of mobility, awareness against domestic violence, freedom of mobility and lastly by decision-making.

The study, which includes five empowerment variables, shows that women with more empowerment tend to have awareness on reproductive health. Majority of the women irrespective of their empowerment levels are aware of the ideal spacing between children through effective family planning programmes. The study also hints at the existence of gender-based power relations in awareness of sexual autonomy.

To improve the awareness of reproductive health among women in Karnataka, awareness through family planning programmes should intensify and make women aware of their sexual autonomy in order to avoid their vulnerabilities to sexually transmitted diseases. Women should also be educated in order to ensure greater participation in the household's decision-making process. Marriage before attaining the legal age should be discouraged because the study shows that most of the women who married at a young age and started cohabiting with their husbands have less decision-making powers.

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Epidemiological Transition in view of Changes in the Pattern of Causes of Death and Age Structure of Mortality in Urban Population of Bihar

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Abstract : Analysis of changes in the pattern of causes of death shed light on epidemiological transition in which cause of death shift from infectious and parasitic diseases to chronic and degenerative diseases in adulthood. This is important to implement target oriented public health interventions to further reduce avoidable mortality and disease burden. This study attempts to measure mortality trends by calculating percentage of major causes of death to total deaths by age and sex for urban population of Bihar by using medical certification of cause of death (MCCD) data for 2002-2014. Results show that though non-communicable diseases are getting increasingly prominent communicable diseases in the form of infectious and parasitic diseases and the respiratory diseases have still retained a significant position in the mortality pattern. Thus, urban Bihar is in early stage of epidemiological transition facing dual burden of mortality where along with increasing prominence of non-communicable diseases there is considerable presence of communicable diseases. These results also align with the findings of other studies in developing countries. This calls for investigating the health and mortality conditions of state's population in detail and necessitates a comprehensive policy and action plan to prevent and control disease burden and promote healthy ageing.

Key words: Causes of death, epidemiological transition, mortality pattern, MCCD, non-communicable diseases, communicable diseases

Introduction :

Analysis of changes in the pattern of causes of death shed light on the epidemiological transition in which causes of death shift from infectious and parasitic diseases to chronic and degenerative diseases in adulthood (UN, 1998). To identify and monitor the rapidly changing disease and mortality patterns and accomplish the health system needs, studying and reporting updated information on causes of death is essential. It becomes especially important in view of the epidemiological transition that developing countries are witnessing. The pattern of causes of death has been well documented in developed countries. Among them, Abdel Omran's (1971) theory of epidemiological transition is an attempt to account for the extraordinary advances made in health care in industrialized countries since the 18th century (Caselli et al., 2002).

In the present scenario of epidemiological transition, increasing mortality and morbidity are attributable to double burden of communicable and non-communicable diseases in India (Reddy et al., 2005; John et al., 2011). During 2012, approximately 60% deaths were due to non-communicable diseases viz., cardiovascular diseases (26%), chronic respiratory diseases (13%), cancers (7%), diabetes (2%) and injuries (12%); and 28% to communicable, maternal, perinatal and nutritional conditions (Sharma, 2013; WHO, 2014).

Bihar is the focus of this study to trace epidemiological transition in its urban population for several reasons. It is the third most populated state of India with approximately 9% (about 10 billion as

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of 2011 census) of the total population. It is the poorest state, with the exception of Orissa, and ranked among the slowest growing regions of the country until recently. The Crude Birth Rate, Crude Death Rate, Natural Growth Rate, Infant Mortality Rate, Maternal Mortality Rate, Total Fertility Rate, Sex Ratio, and Child Sex Ratio were recorded respectively as 27.7, 6.7, 21, 44, 261, 3.6, 916 and 933 respectively against the national averages of 21.8, 7.1, 14.7, 44, 212, 2.4, 940, and 914 (RGI, 2011).

In Bihar, CDR declined from 13.9 in 1981 to 6.2 in 2014 and CBR from 39.1 to 25.9 (RGI, 2009, 2014). Life expectancies have risen from a low of 52.9 years in 1981-85 to a high of 68.1 years in 2010-14. The increase in the average life of a male (13.6 years) was, however, slower than that of a female (16.9 years) (RGI, 2016a).

In this study, an attempt has been made to explore the changes in the pattern of causes of death and age structure of mortality by sex in urban population of Bihar for the period from 2002 to 2014 by using Medical Certification of Cause of Death (MCCD) data.

Data and Methods

Medical Certification of Cause of Death reports for the years 2002 to 2014 is the main data source used in the study (RGI, 2002-2014a). The MCCD data is collected according to ICD-10 classification. Data derived from MCCD is tabulated in conformity with the International Classification of Diseases (ICD) – Tenth Revision (1993) (WHO, 1993). It has been adopted in the Office of the Registrar General, India (ORGI) for classification of causes of death since MCCD 1999 report. The statistics on medically certified causes of deaths is being tabulated as per the National List (ICD –10, modified according to Indian conditions). The underlying cause of death is taken into account while tabulating the cause-specific mortality (RGI, 1995). More details can be found at other places (Gulati, 2015a).

While compiling MCCD data, a large number of deaths under the head 'NS' (Age Not Stated) in each cause of death was found. These deaths were distributed in all stated age groups in proportion to total deaths in those age groups. It was done for all the years for all causes of death by age and sex. In order to make data comparable, all causes of death have been combined into nine major causes of death groups in the following age groups – Below 1 year, 1-4 years, 5-14 years, 15-24 years, 25-64 years, 65 years and above. Percentage of causes of death to total deaths by age and sex for 2002-2014 has been calculated.

Results

Percentage contribution of the major causes of death in different age groups in urban population of Bihar have been calculated and presented in tables 1 to 6. Tables 1 and 2 present the main causes of infant and child deaths during 2002-2014.

Table 1: Percentage contribution of major causes of death in infants below 1-year age in urban population of Bihar (2002-2014)

Major Causes of Death	Male				Female			
	2002	2006	2010	2014	2002	2006	2010	2014
Certain conditions originating in the perinatal period	66.6	55.2	59.4	37.6	61.1	55.9	57.0	38.2
Diseases of the circulatory system	12.2	7.4	0.4	27.7	20.7	6.3	1.5	27.7
Certain infectious and parasitic diseases	7.0	5.2	4.6	31.8	8.9	2.8	4.0	23.1
Diseases of the respiratory system	3.1	16.6	30.5	2.9	3.6	24.4	34.7	4.1
Diseases of the digestive system	2.5	0.2	1.3	0.0	1.2	0.4	0.4	0.0
Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	2.3	10.4	0.0	0.0	1.9	6.3	0.0	0.0
Injury, poisoning and certain other consequences of external causes	0.4	0.2	0.0	0.0	0.6	0.8	0.0	0.0
Neoplasms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	5.9	4.8	3.8	0.0	2.0	3.1	2.4	6.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source: RGI, 2002-2014a)

The results reveal that “certain conditions originating in the perinatal period” contributed to 66.6% share of male infant deaths in 2002, declined to 55.2% in 2006, rose to 59.4% in 2010 and declined to 37.6% in 2014. The second leading cause of infant deaths was “diseases of the circulatory system” which contributed to 12.2% share in 2002, declined to 7.4% in 2006, 0.4% in 2010 and rose to 27.7% in 2014. The third leading cause of death was “certain infectious and parasitic diseases” with a contribution of 7% in 2002, declined to 5.2% in 2006 and rose to 4.6% in 2010 and 31.8% in 2014.

“Certain conditions originating in the perinatal period” contributed to 61.1% share of female infant deaths in 2002, declined to 55.9% in 2006, rose to 57% in 2010 and declined to 38.2% in 2014. The second leading cause of death was “diseases of the circulatory system” which contributed to 20.7% share in 2002, declined to 6.3% in 2006, 1.5% in 2010 and rose to 27.7% in 2014. The third leading cause of death was “certain infectious and parasitic diseases” with a contribution of 8.9% in 2002, declined to 2.8% in 2006 and rose to 4% in 2010 and 23.1% in 2014 (Table 1).

Table 2: Percentage contribution of major causes of death in children in 1-4 years age group in urban population of Bihar (2002-2014)

Major Causes of Death	Male				Female			
	2002	2006	2010	2014	2002	2006	2010	2014
Certain infectious and parasitic diseases	41.2	9.5	30.8	76.5	18.9	12.6	29.2	60.1
Diseases of the circulatory system	30.5	21.0	13.9	14.7	42.6	17.6	16.4	17.5
Diseases of the respiratory system	9.1	17.7	31.8	2.8	5.1	22.5	28.3	3.1
Diseases of the digestive system	6.2	0.4	7.5	1.5	3.8	2.7	13.7	1.3
Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	3.3	26.6	3.7	0.6	4.1	26.8	3.2	0.7
Injury, poisoning and certain other consequences of external causes	1.1	1.3	1.1	1.2	12.0	0.8	0.0	0.6
Neoplasms	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Certain conditions originating in the perinatal period	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	8.6	23.5	11.2	2.7	13.5	16.2	9.2	16.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source: RGI, 2002-2014a)

In case of male children in 1-4 years age group, “certain infectious and parasitic diseases” contributed to 41.2% share in 2002, declined to 9.5% in 2006 and rose to 30.8% in 2010 and 76.5% in 2014. “Diseases of the circulatory system” contributed to 30.5% share in 2002, declined to 21% in 2006 and 13.9% in 2010, rose to 14.7% in 2014. The third leading cause of death was “diseases of the respiratory system” which contributed to 9.1% share in 2002, rose to 17.7% in 2006 and 31.8% in 2010 and declined to 2.8% in 2014.

In case of female children, “diseases of the circulatory system” was the leading cause of death which contributed to 42.6% share in 2002, declined to 17.6% in 2006 and 16.4% in 2010, rose to 17.5% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” which contributed to 18.9% share in 2002, declined to 12.6% in 2006 and rose to 29.2% in 2010 and 60.1% in 2014. The third leading cause of death was “diseases of the respiratory system” which contributed to 5.1% share in 2002, rose to 22.5% in 2006 and 28.3% in 2010 and declined to 3.1% in 2014.

In the year 2014, “certain infectious and parasitic diseases” was the leading cause of death of both male and female children (Table 2).

Table 3: Percentage contribution of major causes of death in children in 5-14 years age group in urban population of Bihar (2002-2014)

Major Causes of Death	Male				Female			
	2002	2006	2010	2014	2002	2006	2010	2014
Certain infectious and parasitic diseases	33.1	13.7	27.6	50.4	22.2	14.0	24.9	49.1
Diseases of the circulatory system	25.0	23.5	6.2	14.5	34.8	16.7	9.7	25.8
Diseases of the respiratory system	10.0	6.8	6.5	1.5	7.2	8.2	8.7	3.0
Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	5.5	33.4	5.3	1.6	3.1	35.8	6.4	4.4
Diseases of the digestive system	5.1	1.9	15.8	7.7	8.0	1.8	18.0	4.0
Injury, poisoning and certain other consequences of external causes	1.9	3.2	12.2	15.4	11.4	1.8	15.9	3.1
Neoplasms	0.0	0.8	0.0	0.0	0.0	0.9	0.0	0.0
Certain conditions originating in the perinatal period	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4
Others	19.4	16.7	26.4	8.5	13.3	20.8	16.4	10.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source: RGI, 2002-2014a)

Table 3 shows the percentage contribution of the leading causes of death in children in 5-14 years age group. In male children, the leading cause of death was “certain infectious and parasitic diseases” which contributed to 33.1% share in 2002, declined to 13.7% in 2006 and rose to 27.6% in 2010 and 50.4% in 2014. “Diseases of the circulatory system” contributed to 25% share in 2002, declined to 23.5% in 2006 and 6.2% in 2010 and rose to 14.5% in 2014. The third leading cause of death was “diseases of the respiratory system” which contributed 10% share in 2002 and declined in subsequent years.

In case of female children, “diseases of the circulatory system” was the leading cause of death with a contribution of 34.8% share in 2002, declined to 16.7% in 2006 and 9.7% in 2010 and rose to 25.8% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” which contributed to 22.2% share in 2002, declined to 14% in 2006 and rose to 24.9% in 2010 and 49.1% in 2014. The third leading cause of death was “injury, poisoning and certain other consequences of external causes” which contributed to 11.4% share in 2002, declined to 1.8% in 2006, rose to 15.9% in 2010 and declined to 3.1% in 2014.

In the year 2014, “certain infectious and parasitic diseases” was the leading cause of death of both male and female children (Table 3).

Table 4: Percentage contribution of major causes of death in youth in 15-24 years age group in urban population of Bihar (2002-2014)

Major Causes of Death	Male				Female			
	2002	2006	2010	2014	2002	2006	2010	2014
Diseases of the circulatory system	35.0	25.8	29.3	17.0	25.4	15.1	18.7	23.7
Certain infectious and parasitic diseases	25.0	14.5	22.0	36.8	13.8	9.3	19.6	24.5
Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	6.4	30.8	7.6	3.5	3.7	27.1	4.1	4.3
Diseases of the digestive system	6.3	5.8	5.4	8.7	6.6	3.4	3.7	3.1
Diseases of the respiratory system	4.5	1.2	5.0	0.4	3.1	1.8	3.7	0.5
Injury, poisoning and certain other consequences of external causes	4.3	11.0	15.0	20.1	10.9	14.6	19.0	11.5
Neoplasms	0.0	0.4	0.7	0.7	0.0	0.9	0.0	1.9
Certain conditions originating in the perinatal period	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.9
Others	18.5	10.5	15.0	12.6	36.5	27.8	31.2	29.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: RGI, 2002-2014a)

Table 4 shows the percentage contribution of main causes of death in youth population in 15-24 years age group. In male youth, the leading cause of death was “diseases of the circulatory system” which contributed to 35% share in 2002, declined to 25.8% in 2006, rose to 29.3% in 2010 and declined to 17% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” which contributed to 25% deaths in 2002, declined to 14.5% in 2006 and rose to 22% in 2010 and 36.8% in 2014.

In female youth, “diseases of the circulatory system” contributed to 25.4% share in 2002, declined to 15.1% in 2006 and rose to 18.7% in 2010 and 23.7% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” which contributed to 13.8% share in 2002, declined to 9.3% in 2006 and rose to 19.6% in 2010 and 24.5% in 2014.

In the year 2006, “diseases of the circulatory system” was the leading cause of death of both male and female youth with shares of 25.8% and 15.1% respectively. “Diseases of the circulatory system” was the leading cause of death of male youths, whereas in case of female youths it was “certain infectious and parasitic diseases” in 2010. “Certain infectious and parasitic diseases” was the leading cause of death of both male and female youth in 2014 (Table 4).

Table 5: Percentage contribution of major causes of death in adults in 25-64 years age group in urban population of Bihar (2002-2014)

Major Causes of Death	Male				Female			
	2002	2006	2010	2014	2002	2006	2010	2014
Diseases of the circulatory system	36.2	27.0	30.5	19.8	30.9	17.4	26.8	19.4
Certain infectious and parasitic diseases	20.5	13.8	17.3	41.1	14.3	9.3	15.7	21.3
Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	7.2	31.5	5.7	4.7	4.4	27.1	5.0	1.5
Diseases of the digestive system	5.0	4.5	8.8	5.4	4.5	3.9	8.7	4.4
Diseases of the respiratory system	2.9	1.7	2.7	0.6	2.6	1.9	2.6	0.4
Injury, poisoning and certain other consequences of external causes	2.9	5.0	11.0	6.3	3.7	6.9	6.1	7.5
Neoplasms	0.3	1.3	1.4	9.3	0.8	5.0	1.3	12.4
Certain conditions originating in the perinatal period	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	25.0	15.2	22.6	12.8	38.8	28.6	33.8	33.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source: RGI, 2002-2014a)

Table 5 illustrates the main cause of death in adults in 25-64 years age group. “Diseases of the circulatory system” contributed to 36.2% share of male adult deaths in 2002, declined to 27% in 2006, rose to 30.5% in 2010 and declined to 19.8% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” with a share of 20.5% in 2002, declined to 13.8% in 2006 and rose to 17.3% in 2010 and 41.1% in 2014.

“Diseases of the circulatory system” contributed to 30.9% share of female adult deaths in 2002, declined to 17.4% in 2006, rose to 26.8% in 2010 and declined to 19.4% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” with a share of 14.3% in 2002, declined to 9.3% in 2006 and rose to 15.7% in 2010 and 21.3% in 2014. “Certain infectious and parasitic diseases” was the leading cause of death of both male and female adults in 2014 (Table 5).

Table 6: Percentage contribution of major causes of death in elderly in 65 years and above age group in urban population of Bihar (2002-2014)

Major Causes of Death	Male				Female			
	2002	2006	2010	2014	2002	2006	2010	2014
Diseases of the circulatory system	45.0	33.6	57.3	38.0	46.4	30.4	53.1	33.3
Certain infectious and parasitic diseases	11.1	5.6	7.3	19.5	12.4	4.8	8.0	9.0
Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	3.8	41.5	5.6	7.5	2.3	35.5	8.2	4.9
Diseases of the digestive system	3.3	2.2	9.0	5.8	3.5	1.5	8.8	7.2
Diseases of the respiratory system	2.0	2.5	0.4	0.1	2.6	3.6	0.2	0.1
Injury, poisoning and certain other consequences of external causes	1.9	0.5	2.4	5.6	3.2	0.6	2.7	12.1
Neoplasms	0.5	0.0	0.0	4.6	0.0	1.3	0.0	6.0
Certain conditions originating in the perinatal period	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	32.4	14.1	18.0	18.9	29.6	22.3	19.0	27.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source: RGI, 2002-2014a)

Table 6 provides data on leading causes of death in elderly population in 65 years and above age group. “Diseases of the circulatory system” contributed to 45% share of male elderly deaths in 2002, declined to 33.6% in 2006, rose to 57.3% in 2010 and declined to 38% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” with a share of 11.1% in 2002, declined to 5.6% in 2006 and rose to 7.3% in 2010 and 19.5% in 2014.

“Diseases of the circulatory system” contributed to 46.4% share of female elderly deaths in 2002, declined to 30.4% in 2006, rose to 53.1% in 2010 and declined to 33.3% in 2014. The second leading cause of death was “certain infectious and parasitic diseases” with a share of 12.4% in 2002, declined to 4.8% in 2006 and rose to 8% in 2010 and 9% in 2014 (Table 6).

Age Pattern of Mortality (2002–2014)

The change in the age pattern of mortality over time is crucial in understanding the feature of mortality transition. Table 7 shows the share of deaths as per broad age groups in total population of Bihar. The percentage share of death in the below 14 years age group was 35.6% in 2002, stood at 26.2% in the year 2014. The death share of middle-age category (15–59 years) decreased marginally from 25.5% in 2002 to 19.6% in 2014. The percentage share of death for the age group 60 years and above was 38.8% in 2002, increased substantially to 54.2 in the year 2014 (RGI, 2002-2014b).

Table 7: Percentage Share of Deaths to Total Deaths by Age in Bihar (2002-2014)

Age (in years)	Year			
	2002	2006	2010	2014
Below 1	23.6	23.5	19.6	19.6
1-4	7.5	8.6	7.0	4.2
5-14	4.5	6.4	3.1	2.4
15-59	25.5	25.7	25.6	19.6
60+	38.8	35.8	44.7	54.2
Total	99.9	100.0	100.0	100.0

(Source: RGI, 2002-2014b)

A further break-up of the below 14 years age group shows that infant deaths share reduced from 23.6% in 2002 to 19.6% in the year 2014. The child death share fell from 7.5% to 4.2%; and share in the 5–14 years category fell from 4.5% to 2.4% in that period. The overall reduction in below 14 years mortality during the period was 26.4%, with the fall being 44% in the age group 1–4 years, 17% in those below 1 year and 47% in children between 5-14 years. For the same period, there was a 23% decrease in mortality in the group 15–59 year adult population. Mortality in the oldest age group of 60 years and above increased by 14%.

There had been greater contribution of infant and child deaths in the total number of deaths in total population of Bihar. In 2002, about one fourth of all deaths were due to infant deaths (23.6%). This share declined in 2010 and 2014. In 2014, about 19.6% of all deaths were infant deaths showing a satisfactory improvement in the expectation of life as it greatly affected by the deaths under age one. The contribution of child mortality in 1-4 years age group was 7.5% in 2002. In 2014, this share came down to 4.2%. The share of death in 5-14 years age group was 4.5% during 2002 and declined to 2.4% in 2014. The contribution of the deaths of 15-59 years age group was 25.5% in 2002, declined to 19.6% in 2014. About two-fifths (38.8%) of all deaths belonged to the aged population in 2002 and this share had sharply increased to the level that now every second death is an aged person in Bihar (RGI, 2002-2014b).

Discussion

The analysis of MCCD data provided key insights in terms of epidemiological transition in urban population of Bihar. “Certain conditions originating in the perinatal period” were the leading cause of death of both male and female infants during 2002-2014. “Certain infectious and parasitic diseases” were the leading cause of death of male children of 1-4 years age group in 2002, 2010 and 2014. “Diseases of the circulatory system” were the leading cause of death of female children of 1-4 years age group in 2002. “Certain infectious and parasitic diseases” was the leading cause of death of female children in 2010 and 2014. “Certain infectious and parasitic diseases” were the leading cause of death of both male and female children of 5-14 years age group in 2010 and 2014. In male youth in 15-24 years age group, the leading cause of death was “diseases of the circulatory system” in 2002, 2006 and 2010. In female youth, the leading cause of death was “diseases of the circulatory system” in 2002. “Certain infectious and parasitic diseases” was the leading cause of death in 2010 and 2014. In adult population in 25-64 years age group, “diseases of the circulatory system” was the leading cause of death of both male and female in 2002, 2006 and 2010. “Certain infectious and parasitic diseases” was the leading cause of death of both male and female adults in 2014. In the elderly population in 65 years and

above age group, “diseases of the circulatory system” was the leading cause of death of both male and female during 2002-2014.

There has been reduction in child mortality share and increase in the share of elderly mortality indicating that Bihar's epidemiological transition has been marked by major changes in the age structure of mortality. Such mortality transition shows further reflection in disease pattern of deaths. As mortality tilts towards higher age groups, diseases of adults and elderly population emerge as the largest contributors of overall mortality and diseases of younger population take lower position.

Besides, the change in age structure of mortality, epidemiological transition feature major changes in cause-specific mortality and disease-specific changes in mortality pattern which in turn influence the health profile of any region. From the data it appears that “certain infectious and parasitic disease”, “diseases of the circulatory system”, “diseases of the respiratory system”, “diseases of the digestive system”, and “injury, poisoning and certain other consequences of external causes” were the most contributory causes of death groups in urban Bihar's mortality. Except for respiratory diseases and certain infectious diseases, these groups belong to non-communicable diseases. “Diseases of the respiratory system” includes both communicable and non-communicable diseases. “Certain infectious and parasitic diseases” mostly includes communicable diseases. “Injury, poisoning and certain other consequences of external causes” is often called an external cause of mortality.

“Diseases of the circulatory system”, which contributed to 33.8% of overall mortality in 2002, contributed 22.7% in 2014 and become the second most important cause of mortality. “Certain infectious and parasitic diseases” which was the next important in 2002 and contributed 17.9% mortality now become the leading cause of mortality with contribution of 29.8% in 2014. The share of digestive deaths to overall mortality increased from 4.7% in 2002 to 4.9% in 2014; share of neoplasms increased from 0.3% to 7.5%; endocrine, nutritional and metabolic diseases from 0.8% to 5.5%; diseases of the genitourinary system from 1.8% to 4.7%; injury, poisoning and certain other consequences of external causes from 3.5% to 7.3%.

In epidemiological transition of urban population of Bihar, though non-communicable diseases are getting increasingly prominent communicable diseases in the form of infectious and parasitic diseases and respiratory diseases have still retained a significant position in the mortality pattern. Thus, urban Bihar faces dual burden of mortality where along with the increasing prominence of non-communicable disease there is considerable presence of communicable diseases. A person more than 60 years of age in Bihar is 168 times more likely to report a chronic illness as compared to a person age 0-14 years. This also strengthens our observation that the epidemiological transition is in its early stages in Bihar facing double burden of infectious and chronic diseases. Rich-poor gap in the burden of disease is more pronounced (Prinja et al., 2015). The results also align with the findings of other studies in developing countries (Gulliford, 2003; Huynen et al., 2005; Karar et al., 2009; Lozano et al., 2012). In a study in urban Maharashtra, it was discovered that communicable diseases are decreasing over time but they are still predominant in infants, children, youth and adult population (Gulati 2015b). In a study, it was found that Goa has witnessed a phase of gradual decline of infectious and communicable deaths and has increasingly been facing non-communicable type of mortality (Borkar, 2015). These findings also align with the findings of this study.

Though the results of the study may not be generalized to whole of Bihar because close to 85% of the population lives in villages but in the absence of quality cause of death data these results can become inputs for predicting current and future health care needs and possible changes in national health policy agenda and strengthening existing health system.

Limitations of the Study

The scheme of MCCD has been functioning at different levels of efficiency in various States/UTs. During 2014, 33 States/UTs reported the data on MCCD in the prescribed format. The percentage of medically certified deaths to total registered deaths during 2014 was 20.5%. Bihar reported MCCD data for the first time in 2002 and percentage of medically certified deaths to total registered deaths was 7.6%. It had gone up to 10.6% in 2014 (RGI, 2016b).

The missing deaths or deaths that physicians were unable to code cannot be ignored but given their low proportion it is safe to assume that they did not affect the general pattern of cause of death trend. These deaths are classified under the cause of death group “symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified” in MCCD reports. In 2006, Bihar reported a good percentage of deaths in this group in both male and female in all age groups. Thus, individual errors in medical certification cannot be ignored completely.

The cause of death profile of a population is dependent on changes in the health system, socio-economic and cultural factors and political commitments which are not addressed in this study. Keeping in view the limitations of this study and other relevant studies in this field (Huynen et al., 2005; Bassani et al., 2010; Jagnoor et al., 2011) there is a need of reliable and timely information on leading causes of death and changes in their trends. The assessment of these trends indicates whether society is making progress in reducing the burden of premature mortality and shows the gaps where greater efforts are needed.

Conclusion

The findings of the study calls for investigating the health and mortality conditions of the state's population in detail and thereafter revisiting the existing population and health policy to bring improvement in morbidity condition of the population. The state has to fight back with preventable infectious diseases on the one hand and a growing prevalence of non-communicable diseases on the other. The double burden of disease pose challenges in improving the overall health status of the population and necessitates a comprehensive policy and action plan to prevent and control this burden and promote healthy ageing.

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Payment for Treatment of Gynaecological and Reproductive Morbidities (GARMs): Role of Residual Saved Money: Evidences from Rural Nalanda District, Bihar

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Abstract : The paper examines the healthcare utilization for gynecological and reproductive morbidities (GARMs) during pregnancy with availability of meager money-saved by women (unknown to husbands) as motivational factor. Analysis based on primary data collected rural Nalanda, Bihar in 2015 using pre-structured and pre-tested schedules. A total of 660 married pregnant women (15-49 years) having at least one child in last five years were selected using random sampling from 12 villages. Estimates of residual saved-money, odds ratios and predicted probability derived from logistic regression. Study shows that pain associated with female genital organs and menstrual cycle (55%) and menstrual disorder (53%) are common. The residual saved-money and gynecological healthcare services are significantly and positively associated among rural women. The study confirms that the GARMs are significant public health concern in rural Nalanda, and special emphasis be given to pregnant women to make them more conscious about importance of such savings to take timely decision to seek treatment and pay for gynecological and reproductive problems.

Keywords: Residual saved-money, gynecological and reproductive morbidities (GARMs), rural women, Nalanda district, Bihar.

Background

Recent maternal mortality (MMR) estimates show that India has improved considerably with 174 deaths (per 100,000 live births) in 2015, from 374 in 2000 - a decline of about 54 percent. However, about 45,000 mothers in India still died annually due to pregnancy and child birth complications, contributing to 15 percent of the global share (WHO, 2015). Among the Indian states, maternal mortality is still very high especially in eight states, collectively named as the 'empowered action groups' (EAG*), and Assam, with MMR averaging 246 per 100,000 live births (ORGI, 2013), more so in the rural areas.

The gynecological and reproductive morbidities (GARMs) such as pain and other conditions associated with female genital organs and menstrual cycle, menstruation disorder, female genital prolapsed, pregnancy and childbirth the puerperium, etc., have been found responsible for most of maternal deaths and childbirth complications (ranging from 14-56 percent as found in rural Nalanda, Bihar). In other countries, eclampsia has been found in 2-3 cases per 10,000 births in Europe, but 10-30 times more common in developing countries than in high-income countries (Duley, 2009). However, studies have also found that the nutrition and body mass index (Fujiwara and Nakata, 2010; Vyver et.al., 2008), complications such as polycystic ovary syndrome and infertility (Lambert-Messerlian et.al., 2011), strenuous workout and exercise (Chang et.al., 2009; Earth and Sthapit, 2002; Tegerstedt et.al., 2006) and presence of chronic morbidities (Adachi, 2008) are positively associated with the GARMs among women. But, despite the fact that GARMs contribute vastly in overall maternal mortality and childbirth complications, very few work on GARMs caught the attention of researchers. Complicating 2-8 percent of all pregnancies, pre-eclampsia is the major contributor to maternal mortality worldwide (Khan et.al.,

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2006; Steegers et.al., 2010).

The GARMs have array of negative consequences such as healthcare cost for expensive hormonal drugs and other laboratory tests (Houston et al., 2006), poor health (Adachi, 2008; Mathias et al., 1996), limitations on attendance from regular day to day life, and missed activities (Houston et.al., 2006; Kadir et.al., 2010). The existing studies on healthcare for GARMs include the medication of such disorders (Ganzevoort et.al., 2005; Visser and Wallenburg, 1995; Walker et.al., 1983; Walraven et.al., 2002) mostly in developed countries. But, the situation in rural setting in India is slightly complicated with a patriarchal society where despite the efforts of healthcare providers, women still do not take decision to seek advice/treatment even for her own health (Dyson and Moore, 1983). Therefore, understanding what brings women to healthcare providers for treatment of sensitive personal illnesses become important, as observed particularly in rural Bihar.

As not many studies exist on GARMs in India, this paper examines the determinants and risk factors as well as the factors that motivated women for advice or treatment of GARMs, including the role of residual saved-money.

Data and Methods

The data used in this study come from primary field survey conducted in 12 villages during February to May 2015 using structured and pretested schedule. A total of 660 married women aged 15-49 years with pregnant for 3 to 4 months or having at least one child in last five years were selected using random sampling. The information on GARMs, women's socio-economic and demographic characteristics, birth history, and treatment seeking behaviours, etc., collected through face-to-face interviews using a bilingual schedule after obtaining their informed consent. The data collected using CSPro 6.1 software and analyzed using STATA 13.

Bivariate and multivariate binary logistic regression technique was used to predict the healthcare utilization among women experiencing the GARMs. The Tukey post-hoc test was employed to examine significance of availability of residual saved-money across women sharing common characteristics.

Dependent variable: The dependent variable is healthcare utilization for GARMs, measured by category (1= yes; otherwise= 0), for treatment or advice sought from any health personnel at any health facility.

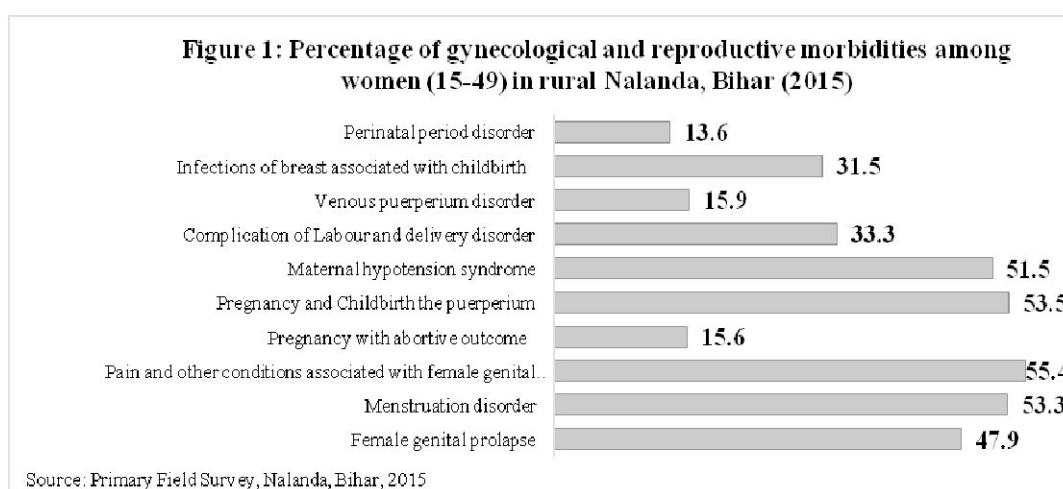
Independent variables: The information on GARMs was primarily provided by the women through symptoms experienced in last five years prior to survey. The concept of residual saved-money is being introduced, which is the meager amount of money saved by women from weekly or monthly household budget. In general, the head of the household gives some money to housewife to buy household daily needs. But the entire amount may not be spent and some amount saved and kept undisclosed. Based on the mean amount derived (e.g. Rs. 552; SD: 59.61), women were categorized into two - (a) **below mean:** if they possess amount below the mean, and (b) **above mean:** if the residual saved-money is more than the mean amount. The women were also categorized by education level (0= illiterate, 1= primary, and 2= secondary); work status (0= no paid work/housewife, 1= engaged in agricultural related activity, 2= contribute in husband's business along with her own role); parity

(0=1/2, 1=3, and 2=3+); sanitation facility (0= non improved toilet, 1= improved toilet), religion (0= Hindu, 1= Muslim) and caste (0= scheduled caste/tribe, 1= Other backward classes, 2= others).

Results and Findings

Gynaecological/Sexual and Reproductive morbidities among women in rural Nalanda

The study found that about 62 percent of respondents reported experiencing any one of the many GARMs in the study area (Table 1). Women reported experiencing various GARMs, ranging from lowest of perinatal period disorder (14%) to pain and other conditions associated with female genital organs and menstrual cycle (55%), followed by menstruation disorder (53%) and pregnancy and childbirth puerperium (54%).



Similarly, postcoital bleeding (spotting or bleeding) unrelated to menstruation during or after sexual intercourse (28%) was also common among women experiencing menstrual related problem (Fig.1). About 52 percent of women found to experience maternal hypotension syndrome, and 8 percent women found to experience signs of *fetal hypoxia* in study population of Nalanda. The other GARMs such as *venous puerperium disorder* (16%), *inflammation of vein* (12%) and *severe inflammation of vein* (10%) during pregnancy were also reported.

As shown in Table 1, 68 percent of women aged 35-49 years were found to experience *prolapse* compared to 42 per cent among 15-25 years ($p < 0.001$). The women with lower parity and parity higher than 3+ were found be at higher risk of *female-genital-prolapse* ($p < 0.001$). By work status of women, those participating in husband's occupation along with her role of housewife were lesser at risk of prolapse (51%). However, the GARMs such as *menstruation disorder*, *pain and other conditions associated with female genital organs and menstrual cycle*, *pregnancy and childbirth puerperium*, *maternal hypotension syndrome* were also common, and about two-fifths of women were found to experience such problems ($p < 0.05$). Education found negatively

associated with GARMs ($p < 0.001$). The *genital prolapse* (76%), *menstruation disorder* (85%), *pain and other conditions associated with female genital organs, and menstrual cycle* (85%), *pregnancy and childbirth puerperium* (77%), *maternal hypotension syndrome* (76%), *complication of labour and delivery disorder* (45%), *infections of breast associated with childbirth* (54%) were more common among illiterate women ($p < 0.001$). The socio-economic factors such as wealth status, and type of houses were also found significantly associated with the GARMs. As socio-economic status of the women improves the chance of being affected by such morbid conditions tend to decreases.

The study also found that couples were engaged in agricultural activity have higher risk for pregnancy with abortive outcomes ($p < 0.01$). Age of women, parity, husband's work, women's work status, and education were found to be significantly associated with maternal disorder predominantly related to pregnancy, childbirth and puerperium ($p < 0.001$). About 92 percent of women with higher parity (3+) experience more of pregnancy and childbirth puerperium. As shown in Table 2, women in lower economic status (94%), dominant Hindu women (66%), and OBC (all) experience any one of the GARMs in last one year prior to survey ($p < 0.001$).

Residual saved-money (RSM) and risk of GARMs

In every household, the women were usually given some amount of money to maintain household's daily needs. The unspent money remains with women and saved secretly or unknown to other family members. Such unspent money is termed as 'residual saved-money', and the mean amount is Rs.552 (SD = 59.61). Table 3 presents the results of analysis of variance (ANOVA) and Tukey post-hoc test with respect to individual and household level factors. The result shows statistically significant difference between groups on the basis of work status ($F(2, 663) = 3.67, p = 0.01$). A Tukey post-hoc test reveals that the residual saved-money was significantly higher among women engaged in some activity compared to housewives ($3.70, \pm 0.54, p = 0.02$). Similarly, significant difference in mean of residual saved-money was also noted by women's educational status and, therefore, residual saved-money found significantly higher among secondary and higher education compared to the primary educated women ($9.56, \pm 0.87, p = 0.001$). Similarly, a significant difference found by wealth status of women ($F(2, 663) = 39.55, p = 0.0001$).

Are women with higher residual saved-money really safe for GARMs?

The study found that women with some money in hand are not totally safe from such morbidities, but have comparatively lower risks of GARMs. The predicted probability for healthcare utilization for such morbid conditions has been estimated among the women based on the amount of residual money - lower than mean (LRM) and higher than mean (HRM). The results of predicted probability derived from binary logistic regression were presented in Tables 3 (for individual level factors) and household level factors (Table 4).

Women's characteristics such work status, wealth status, and education were found to be significant. In case of educational attainment among women, on an average, women with secondary and higher education show higher probability to seek advice/treatment for such gynecological and reproductive morbidities (21% point

compared to 18% point) than among women with LRM ($p<0.001$). This probability again increases, among primary educated women (to 24% point) if possessing HRM. Similarly, women with higher socio-economic status were found to be at higher chance of healthcare utilization. For instance, higher probability of advice or treatment seeking (about 0.54) indicated among woman of high socio-economic status with high residual saved-money, as compared with woman of middle status with lower residual saved-money (0.43).

Residual Saved-Money: Can it be a boon in gynecological and reproductive healthcare?

Better economic status and income generating opportunities among women enhance women's health (Bloom et al., 2001; Roy and Chaudhuri, 2008). An attempt was made to boost the maternal healthcare by financial empowerment through JSY in India (Paul, 2010), but, implementation of the JSY is questionable (Gupta et.al., 2012). The reason may be, in case of JSY, women have to depend upon their husband or family member to get the JSY money. Therefore, women may not have the unreported and hidden money (saved-money) available to use for healthcare utilization for GARMs. The residual saved money was found to be statistically significantly associated with advice or treatment seeking behavior ($p<0.001$), although the mean residual saved money is a meager Rs. 552. The women with higher residual saved-money were less likely to report such morbidities. Additionally, likelihood of healthcare utilization found to be higher among women with higher residual saved-money. The one-way *anova* clearly shows that the residual saved-money statistically significantly higher among women engaged in some activity compared to housewives ($3.70, \pm 0.54, p=0.02$).

Among women age 25-35, 0.81 is the average probability of the healthcare utilization if every woman in the study population were treated as if they possess HRM, whereas, 0.77 would be the average probability as if they possess LRM. Among women with primary education, it is 0.18 whereas it is 0.24 for women with LRM ($p<0.001$). Similarly, the women with better economic status were more likely to seek advice/treatment for their GARMs in rural Nalanda, Bihar.

Discussion and conclusion

The study presents the spectrum of gynecological and reproductive morbidities and radiates knowledge that existing socio-economic determinants are not enough to reduce the risk of GARMs in rural women as observed among women the study population of Nalanda, Bihar. There is a need for mechanism for women to identify risks of such morbid conditions related to pregnancy and childbirth and means to healthcare utilization, such as availability of residual saved-money. The study also found that rural women were at varying risk of different types of GARMs, ranging from 14-55 percent of perinatal-disorder, pain-related to genital organ and menstrual disorder. Despite presence of high level of GARMs, no study is available to understand its extent as well as interventions to prevent among rural women of Nalanda. A study reported that about 46 percent of women were suffering from uterine-prolapse in urban Delhi (Bhatnagar et.al., 2013), whereas, in Nalanda, it is 48 percent. Women experiencing prolapse tend to increase as the age increases ($p<0.001$). Other than age of women,

fertility preference level such as parity shows positive relationship with occurrence of prolapse, which is as high as 76 percent among illiterate women, compared to primary (36%), and secondary (20%) level educated women. Out of 54 percent of rural women experiencing *pregnancy and childbirth puerperium*, about 27 percent found to experience *excessive vomiting in pregnancy* along with *nausea, vomiting and headaches*. A study found that nausea and vomiting during pregnancy occurred in approximately 75-80 percent of pregnant women (Badell et.al., 2006). Some previous studies also suggest that frequent *nausea and vomiting during pregnancy* were positively associated with gallbladder disease, gastritis and allergy ($p < 0.05$) (Järnfelt-Samsioe et.al., 1983).

GARMs not only affect the health but affects women's quality of life (Grandi et.al., 2012; Iacovides et.al., 2014; Tavallae et.al., 2011). Although very little is known about the prevalence of dysmenorrhea among women particularly of rural settings, studies suggest that dysmenorrhea is significantly associated with late or early age at menarche, prolonged and heavier menstrual flow, lower socio-economic and nutritional status and inadequate physical work exercise (Abdul Razzak et.al., 2010; Balbi et.al., 2000; Blakey et.al., 2010; Fujiwara et.al., 2009; Latthe et.al., 2006; Ortiz et.al., 2009). In case of the study population, prevalence of dysmenorrhea ranges from 14-39 percent. The study also supports earlier findings that older age is protective factors for such pain (Tavallae et.al., 2011). The maternal disorder predominately related to pregnancy such as pre-eclampsia with headaches, visual disturbances, and epigastric pain affects 35 percent women in the study area. Unfortunately, despite the known fact that GARMs are major cause of maternal mortality and morbidities (Sibai et.al., 2005) neither the frequency has come down nor the prevention of the disorder implemented successfully (Dekker and Sibai, 2001; Sibai, 1998). Similar factors such as age, parity, educational attainment, work status, and wealth status (proxy of socio-economic status) are found to significantly influence GARMs among rural women of Bihar. The odds of any GARMs found to be higher among poor women (OR: 8.81, $p < 0.001$). Despite gynecological morbidities indicating considerable impact on the maternal health status and overall quality of life of women (Palep-Singh and Prentice, 2007), they lack the attention of public health community (Harlow and Campbell, 2000; Walraven et.al., 2002). About 32 percent of women in rural Nalanda found to experience breast disorder, which is slightly lower than among Lebanese women with a prevalence of 54 percent (Karout et.al., 2012) and among Indian female medical students with 67 percent (Anandha Lakshmi et.al., 2011). It may be mentioned that despite considerable research on economic empowerment and widespread prevalence of fewer maternal GARMs in rural settings, very few studies the impact on healthcare context (Barua et.al., 2003; Barua and Kurz, 2001; Mutatkar and Apte, 1999; Singh et.al., 1999).

This study also found that the availability of residual saved-money is significantly associated with healthcare utilization, as women possessing more residual saved-money are more likely to seek advice/treatment for GARMs. The generalization of the findings may need caution as women's characteristics and setting may vary hugely with the study population. Nevertheless, it emerges that in case of factors influencing healthcare utilization during motherhood, certain dimensions (such as availability/possession of residual saved money) may be more important than others such as education and partner's occupation (Glewwe, 1999), but further emphasis also needed to examine how such practice can be promoted in a large-scale.

Table 1: Prevalence of gynaecological and reproductive morbidities (GARMs) among women by selected background characteristics (Individual) in rural Nalanda, Bihar (2015)

Covariates	Prolapse	MenDis	MenGen	Abortion	Pregchild	MatHySynd	LabDis	Venous	BreastDis	PPD	Any One	N
Age group												
15-25	19.4***	43.95***	70.93***	81.21***	124.29***	90.05***	28.63***	47.67***	31.33***	24.77*	77.71***	
	42.18	45.02	45.02	11.13	39.61	39.61	28.05	11.56	25.27	11.13	50.87	461
25-35	58.49	74.68	82.91	16.35	82.39	82.39	41.51	32.7	49.06	24.53	82.91	159
35-49	67.5	65	67.5	65	100	65	65	-	35	-	65.4	40
Parity	14.16***	65.88***	110.33***	8.20*	178.22***	124.57***	86.08***	40.14***	38.53***	2.71	125.19***	
One/Two	49.38	49.58	55.01	16.05	49.17	43.62	43.62	16.87	37.45	16.05	60.42	243
Three	38.66	38.4	33.33	10.92	27.85	32.77	10.92	5.46	16.81	10.92	38.82	232
Three+	56.76	77.6	84.7	21.08	92.43	85.41	49.19	28.11	42.7	14.05	92.35	185
Husband occupation	208.68***	62.91***	119.59***	41.88***	308.74***	113.46***	153.41***	28.67***	68.47***	24.23***	121.14***	
Agricultural Labour	35.27	34.47	29.55	26.57	26.14	26.14	18.36	18.84	19.32	17.87	35.98	261
Others	72.62	65.91	72.73	14.58	71.72	68.43	55.06	19.94	50.6	16.07	78.54	399
Women's occupation	42.47***	26.84***	8.21*	32.23***	18.93***	5.46	4.84	130.04***	33.30***	54.82***	5.36	
Housewife	44.71	43.62	49.85	17.65	46.47	49.12	33.53	3.24	31.18	11.76	57.86	340
Agricultural Labour	50.26	65.45	61.26	22.8	60.62	49.22	29.53	21.76	19.69	36.42	68.06	187
HW plus work	51.13	60.61	61.36	-	61.36	60.15	39.1	39.85	49.62	-	61.36	133
Women's Education	221.63***	235.22***	274.19***	45.74***	241.30***	235.95***	116.67***	57.34***	156.99***	7.39*	330.63***	
Illiterate	76.27	84.75	85.08	8.81	76.61	76.27	48.81	27.12	53.56	17.63	94.52	295
Primary	36.45	48.6	60.75	36.45	73.33	73.33	48.6	12.15	36.45	12.15	73.33	232
Sec. & High	20.08	20.08	20.08	14.77	19.7	14.83	10.23	4.92	4.92	9.85	20.15	133
Death outcome	0.05	0.19	0.09	2.19	0.29	0.16	0.7	0.001	0.57	0.28	0.33	
Yes	46.38	55.07	55.07	21.74	57.35	54.41	28.99	15.94	27.54	11.59	64.71	69
No	47.74	53.04	57.35	14.91	53.04	51.18	34	15.91	31.99	13.9	61.15	591
Total	47.6	46.7	55.24	15.62	53.45	51.35	33.48	15.92	31.53	13.66	61.52	660

Note: Chi2 value *** (1 percent level of significance), ** (5 percent level of significance), * (10 percent level of significance), - indicates below 1 percent

Table 2: Prevalence of GARMs among women by selected background characteristics (Household level Factors), rural Nalanda, Bihar, 2015

Covariates	ProLapse	MenDis	MenGen	Abortion	Pregchld	MathySynd	LabDis	Venous	BreastDis	PPD	Any One	N
Wealth Status	133.06***	153.80***	238.62***	29.20***	97.88***	210.98***	77.47***	53.01***	67.31***	58.86***	183.89***	
Low	72.27	83.19	94.09	5.46	78.06	79.08	55.04	28.15	49.58	-	94.51	238
Middle	44.3	44.07	40	21.81	44.07	30.54	22.15	13.09	26.51	21.81	48.81	292
High	10	19.53	19.53	20	29.69	30	20	-	10	20	29.69	130
Source of water	170.99***	78.58***	148.54***	32.04***	70.34***	148.59***	52.01***	79.86***	99.76***	31.16***	145.72***	
Tube well/borehole	27.52	39.65	36.86	21.38	40.54	33.42	24.32	9.58	19.41	15.97	43.14	118
Standpipe/Public	74.04	79.81	90.38	-	74.04	78.42	60.58	45.19	66.35	-	90.38	135
Unprotected Well	82.58	70.97	80.65	10.97	73.55	72.9	39.35	12.9	40.01	16.77	89.68	407
Sanitation facility	0.2	32.01***	32.0***	79.27***	75.81***	83.70***	43.68***	20.03***	13.96***	28.98***	54.53***	
Improved	37	83.12	83.12	5.01	100	38.75	27.67	9.33	21.03	8.33	100	78
Open Space	47.28	49.32	51.8	11.05	47.34	44.9	29.08	13.61	29.08	11.05	56.43	582
Religion	27.20***	37.40***	40.65***	0.08	36.57***	47.83***	19.04***	3.52	16.84***	2.2	55.91***	
Hindu	50.66	56.89	59.17	15.74	57.02	55.41	35.9	16.72	33.77	14.26	65.79	604
Muslim	14.29	14.55	14.55	11.29	14.55	27.14	20.14	15.14	27.14	7.14	14.55	56
Caste	10.22**	50.98***	50.98***	171.85***	50.21***	103.82***	36.90***	2.77	43.18***	61.47***	68.07***	
SC	45.57	48.52	51.24	6.4	48.03	43.84	30.05	17.73	27.34	9.85	55.97	400
OBC	62.77	87.23	87.1	60.64	87.23	74	60.64	11.7	60.64	39.36	100.0	94
Other	43.98	46.06	47.88	12.65	47.59	42.17	26.51	13.86	25.3	8.43	53.33	166
Total	47.6	46.7	53.3	15.62	53.48	51.35	33.48	15.92	31.53	13.66	61.52	660

Note: Chi2 value *** (1 percent level of significance), ** (5 percent level of significance), * (10 percent level of significance), - indicates below 1 percent

Table 3: Result of One-way ANOVA determining the amount of unreported money was different for groups with different background characteristics among women in rural Nalanda, Bihar (2015)

Covariates	Mean saving	Residual saved money	ANOVA	Tukey post-hoc test
Age group				
15-25	554.469	25-35 Vs 15-25	(F (2, 663)=3.22, p = 0.041)	(-0.046, \pm 0.5, p =0.0001)
25-35	554.42273	35-49 Vs 15-25		(-24.796, \pm 0.87, p =0.033)
35-49	529.67262	35-49 Vs 25-35		(-24.75, \pm 0.61, p =0.052)
Husband Work				
No Work	550.52835	Others Vs Agricultural Labour	(F (1, 664)=7.66, p = 0.001)	(4.073, \pm 0.75, p =0.032)
Agricultural Labour	554.60168			
Women's Work				
No Work/HW	550.46393	Agricultural Lab. Vs No Work/HW	(F (2, 663)=3.67, p = 0.01)	(3.695, \pm 0.54, p =0.02)
Agricultural Lab.	554.15864	HW Plus Work Vs No Work/Housewife		(7.181, \pm 0.14, p =0.473)
HW Plus Work	557.645	HW Plus Work Vs Agricultural Labour		(3.486, \pm 0.78, p =0.051)
Women's Education				
Illiterate	556.50847	Primary Vs Illiterate	(F (3, 662)=13.67, p = 0.0001)	(-13.157, \pm 0.08, p =0.0001)
Primary	543.35113	Secondary & Higher Vs Illiterate		(-3.597, \pm 0.77, p =)
Secondary & Higher	552.91125	Secondary & Higher Vs Primary		(9.56, \pm 0.87, p =)
Wealth Status				
Low	445.86744	Middle Vs Low	(F (2, 663)=39.55, p = 0.0001)	(105.537, \pm 0.06, p =0.0001)
Middle	551.4046	High Vs Low		(107.210, \pm 0.08, p =0.0001)
High	553.07783	High Vs Middle		(1.673, \pm 0.32, p =0.031)
Sanitation facility				
Improved	549.31013	Open Space Vs Improved	(F (1, 664)=0.33, p = 0.036)	(4.144, \pm 0.246, p =0.075)
Open Space	553.454			

Note: F-ratio (df. of between groups and within), Tukey post-hoc test (contrast \pm Standard error), p: level of significance. Women's characteristics such as parity, caste, religion, source of water and death as pregnancy outcome were not found statistically significant.

Table 4: Predicted probability of healthcare utilization for gynecological and reproductive morbidity among mothers in rural Nalanda, Bihar, 2015

Individual Level Factors		LRM	HRM	Full Model	Household Level Factors		LRM	HRM	Full Model
Age group					Wealth Status				
15-25		0.339	0.385	0.357	Low		0.756	0.727	0.728
25-35		0.772***	0.81***	0.795***	Middle		0.428***	0.507*	0.455***
35-49		0.377***	0.439***	0.404***	High		0.47***	0.54***	0.263***
Parity					Source of water				
One/Two		0.615	0.629	0.627	Tube well		0.322	0.354	0.335
Three		0.501***	0.552***	0.526***	Standpipe		0.595**	0.566*	0.569***
Three+		0.35*	0.315***	0.335**	Unprotected		0.856***	0.835***	0.846***
Husband Work					Sanitation facility				
Agricultural Labour		0.356	0.362	0.359	Improved		0.299	0.544	0.359
Others		0.547***	0.582***	0.562***	Open Space		0.535***	0.51	0.525***
Women's Work					Religion				
No Work/HW		0.53	0.563	0.546	Hindu		0.485		0.504
Agricultural Lab.		0.482***	0.531***	0.502***	Muslim		0.425		0.38*
HW Plus Work		0.276	0.315***	0.29	Caste				
Women's Education					SC		0.414	0.435	0.419
Illiterate		0.836	0.849	0.844	OBC		0.95***	0.971***	0.959***
Primary		0.184***	0.241***	0.199***	Other		0.432	0.397	0.426
Secondary & Higher		0.207***	0.182***	0.194***					
Death outcome									
Yes		0.46	0.634	0.532					
No		0.48***	0.503***	0.49***					
level of significance		0.0001	0.0001	0.0001	level of significance		0.0001	0.0001	0.0001
II (Null)		-254.73	-202.289	-457.429	II (Null)		-254.73	-202.289	-457.429
II (Model)		-145.057	-89.34	-237.645	II (Model)		-106.617	-99.945	-212.179
AIC		312.113	200.685	497.29	AIC		235.235	219.891	446.358
BIC		355.102	241.129	546.705	BIC		278.223	256.658	495.772
N		368	292	660	N		368	292	660

Note: Residual: Residual saved money. ***: p<0.001, **: p<0.01, *: p<0.05, LRM: lower residual saved money than its mean (Rs<552); HRM: higher residual saved money than its mean (Rs>552).

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SEXUAL HEALTH PROBLEMS AND TREATMENT SEEKING BEHAVIOR AMONG MIGRANT BRICKKILN WORKERS IN VARANASI, INDIA

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The present study is exploratory in nature; sample of 400 male migrant brickkiln workers selected from different brickkilns through adopting stratified random sampling approach in Varanasi District. More than one third workers reported to suffer from any STI problem. However, less than half of the workers suffering with any STI did not avail any treatment. A significant proportion of workers were availing treatment of RTI/STIs from chemist shops and faith healers. Counseling at individual level through inter personal communication is required to sensitize the workers focusing on adverse effects of forced sex that leads to sexual diseases including RTI/STIs.

Introduction

Reproductive tract infections including sexually transmitted infections (RTIs/STIs) are recognized as a public health problem, particularly due to their relationship with HIV infection. The prevention, control and management of RTIs/STIs are a well-recognized strategy for controlling the spread of HIV/AIDS in the country as well as to reduce reproductive morbidity among sexually active population. The growing public and governmental awareness of the spread of the RTI/STI and AIDS epidemic has brought the importance of male sexual health problems in general and sexually transmitted infections (STIs) in particular into attention because of the role of STIs in increased risk of HIV infection. One of the important behavioral aspects of reproductive health issues concerning men is proper understanding of sexual health problems and ensuring their effective treatment. In the absence of curative and preventive therapy, even after more than two decades of the clinical detection of the RTI/STI & HIV/AIDS virus that causes AIDS, creating people awareness and knowledge regarding HIV/AIDS is the only cost effective strategy for primary prevention especially in the developing countries like India (World Bank, 1997). Despite efforts of NACO and other international and national agencies, studies have pointed out that knowledge among the people regarding STIs, HIV/AIDS and other male sexual health problems is inadequate.

The convergence framework of National Rural Health Mission (NRHM) provided the directions for synergizing the strategies for prevention, control and management for RTI/STI services under Phase 2 of Reproductive and Child Health Programme (RCH 2) and Phase 3 of National AIDS Control Programme (NACP 3). While the RCH draws its mandate from the National Population Policy (2000) which makes a strong reference “to include STI/RTI and HIV/AIDS prevention, screening and management in maternal and child health services”, the NACP includes services for management of STIs as a major programme strategy for prevention of HIV. The NACP Strategy and Implementation Plan (2006-2011) makes a strong reference to expanding access to package of STI management services both in general population groups and for high- risk behavior groups and also acknowledges that expanding access to services will entail engaging private sector in provision of services. There is a

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worldwide growing concern on male sexual health problems especially sexually transmitted infection (STIs) and HIV/AIDS. Very few community-based studies are available on the knowledge and prevalence of sexually transmitted infections among men and very little is known about their treatment-seeking behaviors.

A study by Narayana (1996) reported that among men interviewed in Uttar Pradesh, 13 percent had at least one perceived symptoms of genital infections. The study reported that the proportion of men who reported symptoms was close to the proportion of men who had premarital sexual contacts. It is likely that a large number of men who had experienced risky sexual contacts also reported symptoms of sexually transmitted infections. Difficulty while urinating, pain with urination, frequent urination, and swelling of testes or groin were major symptoms reported. On the other hand, there is increasing evidence that symptoms such as pain in urination and swelling of testes are often reported by men who had no sexually transmitted infection (Hawkes, 1998). The qualitative study by SARATHI in the rural areas of Gujarat revealed that the biomedical concept of STDs did not neatly match the community cultural concept of “illnesses of nether areas” (Gernon and Tezeem, 1996). Although men recognized that these diseases are sexually transmitted, the category of diseases is defined by a region of a body and these diseases were believed to be caused in addition to a sexual transmission. The structured qualitative data of Mumbai slum study (Verma et al, 1999) shows that there are four major domains of male sexual health problems. In addition to sexually transmitted infections, men are equally concerned about quality and quantity of semen and its importance, which includes erectile deficiencies and premature ejaculations. A number of problems that may be indicative of the presence of STIs are thought to be transmitted through both sexual and other means subsumed under the category “*Garmi*”.

Identification of sexually transmitted diseases (STDs) as risk factor for the spread of HIV infection has also contributed largely on increasing global awareness on STDs (Ramasubban, 1999). It is reported in various studies (Bang and Bang, 1989; Prasad et al, 1987; Joshi et al, 1991) that there is a high prevalence of STIs in general population and the fact that males remain asymptomatic for most parts makes its early detection difficult. As a result, they are neither reported nor treated.

What the people do when they have symptoms or suspicion of a sexuality transmitted disease (STD) has major implications for transmission and consequently for disease control. Delays in seeking and obtaining diagnosis and treatment can allow for continued transmission and the greater probability of an adverse sequel (Ward et al, 1997).

Data and Method

Primary data have been collected for this study from the Varanasi District using by mix method approach. A combination of quantitative and qualitative techniques has been used to fulfill the objectives of the study. The quantitative data was collected through structured questionnaire of male brickkiln workers in the age group of 18-40 years by developing a suitable research design, while the qualitative insights are based on key informant interviews as well as individual level in-depth interviews with appropriate check list. The present study is exploratory in nature; the sample of 400 male migrant

brick kiln workers in the age group 18-40 was selected from different brickkilns through adopting stratified random sampling approach. According to All India Bricks and Tiles Manufacturer Federation (AIBTMF, 20011-12), there are 226 brickkilns producing bricks and tiles in Varanasi district. Out of them, 55 brickkilns are located in Kashi Vidyapeeth & Araziline block but during the pre survey visits it was found that only 37 brickkilns were working in the study area. All the 37 brickkilns were divided into four strata based on their geographical proximity and four brickkilns were randomly selected from each of the four strata. Thus a total of 16 brickkilns were included in the study. From each of the 16 brickkilns, all the males who fulfilled the inclusion criteria of age *18-40 years*, *migrated at least for the last 6 months* and *consumed alcohol in the last 12 months* were included in the study. The study could successfully interview 363 migrant brickkiln workers who fulfilled the inclusion criteria. These brickkiln workers were asked certain set of questions in order to draw out information and the major issues covered in the structured questionnaire are based on their perception and practices in case of sexual health problems. The objective has been answered by asking questions to the worker were related to sexual health problems such as whether he had pain during sexual intercourse, pain during urination, early ejaculation, wet dream etc. in the last 6 months and their treatment seeking behavior. The qualitative data has been collected from the above selected brickkiln workers. The information was obtained by using two following tools of enquiry: Key informant questionnaire & In-depth interview guidelines. To get the brickkiln perspectives on the issues being studied under this research, key informant and In-depth interviews were conducted using a suitably developed check list focusing at key construct of the research issue. The workers selected for the qualitative interview were the brickkiln workers, brickkiln owner, brickkiln supervisors and local pharmacist or Health care providers.

To fulfill the objective of this study uni-variate, bi-variate and multivariate like binary logistic regression techniques have been used. Most of the attitude and perception related issues were explored using various statements having potential to constitute psychological scales.

Knowledge and awareness about sexual health problems and RTI/STIs

Almost two decades have elapsed since 1970s, still the knowledge about male sexual health problems & STI/HIV vary a great deal among different group of population especially workers in the unorganized sector. This is in spite of the fact that there is restless effort on the part of the media, government as well as non-government organizations to disseminate knowledge at various levels. A study of women migrant brickkiln workers in Haryana noted the difficulty in collecting information regarding the extent and nature of their sexual exploitations and their problems related to sexual health, as nearly 83 percent women did not respond and declined to discuss the issue (*Singh, D.P 2005*). The knowledge, attitude and perceptions on various sexual health problems play a key role in transmission of sexually transmitted infection. Since these perceived disorders carry a social stigma a higher proportion of them do not seek treatment and even if the treatment is sought it is not from the appropriate sources (ICMR 1999). However, social and behavioral factors may have influence on the treatment-

seeking behaviors for these sexual health problems.

The main objective of this section is to examine the knowledge about the male sexual health problems among the migrant brickkiln workers in Varanasi district. For the purpose, certain set of perception-based questions on male sexual health problems, had been asked to the migrant brickkiln workers such as “Only bad people got sexually transmitted disease; Condoms could not protect against a sexually transmitted disease; when a person had STD, he should've used condom while having sex” and others. From the results presented in Table 1, an important part of the study has been assessed, which is the knowledge of migrant brickkiln workers on male sexual health problems. It was also about the various notions and misconceptions which they had perceived on sexual health. Lack of knowledge about appropriate sexual behavior often leads to inappropriate sexual behaviors. This was evident from the fact that half of the migrant brickkiln workers (47%) felt that sexually transmitted diseases only affected the people who were bad or wicked and it did not affect good and god fearing people. More than half of the migrant brickkiln workers (69%) felt that if anybody had pus discharge he should be checked for sexually transmitted diseases which was a positive treatment-seeking behavior. Around 55 percent migrant brickkiln workers felt that sexually transmitted diseases could be cured just by getting antibiotics from a chemist. However, that was not true as just getting antibiotics from a chemist might not solve the problem. Further, it was heartening to see that around 64 percent migrant brickkiln workers knew that having sexually transmitted diseases increased the chances of getting AIDS. However, around 40 percent migrant brickkiln workers felt that condoms could not protect them from sexually transmitted diseases. Around 70 percent migrant brickkiln workers felt that if they had an ulcer on their genital they should get it checked for sexually transmitted diseases. Surprisingly, about 40 percent migrant brickkiln workers felt that if they had sexually transmitted disease their partner should not be checked or treated for the same. Interestingly, 45 percent migrant brickkiln workers did not feel that using condom while having sex was important when one had sexually transmitted disease. Around 41 percent migrant brickkiln workers felt that they could tell someone by appearance if he or she had sexually transmitted disease. Further, 39 percent migrant brickkiln workers felt that they could get sexually transmitted diseases by using unclean public toilets. Moreover, 41 percent migrant brickkiln workers felt that if they had an antibiotic before sex with a sex worker, it could prevent any sort of sexually transmitted disease from affecting them. These justifications vividly reflect in the qualitative quote given below that was collected during interaction with migrant brickkiln workers.

“..... kabhi-kabhi aadami ko dekhkar bata sakte hain ki esko garmi (gupt rog) ka bimari lag gaya hai kyonki jisko garmi lagta hai wah apne guptango ko kujalata rahata hai, kabhi kabhi uske sarir (body) par lal lal dane pad jate hain aur vah bar bar peshab karne jata hai esse pata lagta hai ki esko gupt rog ho gaya hai.....”(Age 32, Education – 5th Class, Brickkiln worker).

Above findings confirmed that migrant brickkiln workers were not well aware of the transmission dynamics of STI/STDs, and the reasons behind spread of sexually transmitted disease. They were following the existing dogma, stigma and misconceptions attached with sexually transmitted

disease.

Widespread prevalence of RTI, STI and HIV/AIDS in the world's lesser developed regions has thrown challenges towards making people aware about these life diminishing diseases. This section aims to study socio-economic differentials in the level of awareness about RTI, STI among the migrant brickkiln workers.

Table 2 revealed the level of knowledge about sexually transmitted diseases among the migrant brickkiln workers according to their socio-demographic characteristic. For this purpose, two point scales had been prepared based on the set of eleven questions which was related to awareness and perception about sexually transmitted disease, categorized into three levels (low, moderate and high). About 31 percent of migrant brickkiln workers had low-level knowledge of STDs and similarly 39 percent had moderate-level knowledge of STDs and only 30 percent had high-level knowledge of STDs. Though, the distribution of level of knowledge about STDs was not uniform across various background characteristics, instead of this, description has been given further. Nearly one quarter (24%) migrant brickkiln workers below the age of 21 years had low-knowledge about STDs. More than 30 percent migrant brickkiln workers in the age group of 21-30 years and 30 years and above had low-knowledge about STDs. Further, more than 30 percent married migrant brickkiln workers, irrespective of staying with the wife or not, had low-knowledge about STDs. Further, 26 percent unmarried migrant brickkiln workers had low-knowledge about STDs. If we look at caste-wise distribution, knowledge about STDs was low among migrant brickkiln workers belonging to SC and ST category of the society. Those with higher duration of stay in brickkiln had lower knowledge of STDs. Nearly 35 percent migrant workers staying in the brickkiln between 1 to 2 years had low-knowledge about STDs compared to 23 percent migrant workers staying in the brickkiln for 6-12 months. Around 36 percent migrant brickkiln workers who were educated up to upper primary or higher had low-knowledge about STDs compared to 26 percent migrant brickkiln workers who were illiterate with low-knowledge about STDs. The same issues were also reinforced during the qualitative interactions, which was evident from the following quote,

“.....I had heard about STD (Gupt Rog) from my friend but why and how it happens I don't know but it happens in the body (Age 35, Education-Illiterate, Brickkiln worker)”

It was evident from these findings that level of knowledge about sexually transmitted disease was not impressive at all, irrespective of all the background characteristics. It was like one-third of migrant brickkiln workers had low-level knowledge and one-third had moderate-level knowledge, similarly one-third of migrant brickkiln workers had high-level knowledge about STDs.

The above findings suggest adopting strategic approaches for programme aiming to raise RTI, STI and HIV/AIDS awareness and knowledge among migrant brickkiln workers. These included improving access to information, strengthening information, education and communication through IEC and BCC activities, organizing regular health check up camps and health counseling focused on prevention efforts and sensitization on the issues of RTI/STI and HIV/AIDS.

Symptomatic prevalence of RTI/STI

Sexually Transmitted Infections/Reproductive Tract Infections (STI/RTI) are common public health hazard in developing countries, contributing to a huge economic burden on individuals as well as health systems (Over 1993). According to the World Health Organization (WHO, 2013), each year around 499 million cases of curable STIs occur throughout the world in the age group of 15-49 years, of which 80 percent cases occur in developing countries and about 79 million cases occur in India annually. Another study suggests that about 40 million cases of RTIs occur in India each year (Aggrawal et al, 2006). National Family Health Survey (NFHS-3) reported that 11 percent women and 5 percent men in the 15-49 years' age group had STI/RTIs related symptoms in the past year? (NFHS-3, 2005-06). STIs lead to several complications in women such as tubal blockade, pelvic inflammatory diseases, chronic pain syndromes, sexual dysfunction and many others. They cause significant morbidity among males as well including strictures, sexual dysfunction, genital ulcers, and kidney and bladder problems. They also lead to complications in the neonate like Chlamydia conjunctivitis, sepsis and other morbidities. Most of these complications are preventable with early diagnosis, treatment and prevention of infection. This section is devoted to present the possible symptomatic prevalence of RTI/STI among male migrant brickkiln workers (aged 18-40 years) in Varanasi district. There are two methods adopted for diagnosis of any STI infection or disease. One is the pathological method with the facility of the laboratory testing having medically trained personals along with clinical examination and second is the traditional symptomatic approach under which the diagnosis of the disease is made through reporting of symptoms, therefore, for this survey method of symptomatic approach was adopted to assess the prevalence among male migrant brickkiln workers (aged 18-40 years) in Varanasi district. It is a matter of concern that till now, little is known about the prevalence of Sexually Transmitted infection or diseases (STI's) among men in developing countries such as India. Table 3 provides symptomatic prevalence of sexually transmitted infections among the migrant brickkiln workers in Varanasi District. Around 20 percent of migrant brickkiln workers reported pain during urination. Around 7 percent reported pain during sexual intercourse whereas 2 percent reported erectile dysfunction. Over one percent of the migrant brickkiln workers reported involuntary discharge of semen and around three percent reported premature ejaculation. Three percent migrant brickkiln workers reported an abscess in penis and around 2 percent reported foul smelling colored discharge from their penis. More than one third (38%) migrant brick kiln workers reported suffering from some STI in the survey area.

It was interestingly found from the results of symptomatic prevalence of STIs among migrant brickkiln workers that about forty percent were suffering from some kind of STIs but the prevalence of various symptoms related to STIs was found to be quite less. It might be because of not responding correctly to a particular symptom because these symptoms were linked to various types of stigmas, misconceptions, fear and even masculinity of the person. So awareness and proper knowledge of STDs

and its symptoms was extremely needed.

A pervasive theme in male sexual health concern in India and South Asia is centered around the carried symptoms and problems encompassed by the concept of *gupt-rog* (*secret illness in Hindi*) which refers to culturally defined illnesses that belongs to the secret parts of the body (Pelto et al, 2000). Looking towards symptomatic prevalence of STIs by their socio-economic dimensions among the migrant brickkiln workers, the findings presented in Table 4 show that, around thirty-eight percent of migrant brickkiln workers reported suffering some kind of STIs though it was not homogeneously distributed across the various background characteristics. According to age group, half of migrant brickkiln workers in age group of less than 21 years of age were suffering from some STI. Migrant brickkiln workers who were married and staying with their wives within them nearly 39 percent workers reported to suffered from any STI as against the migrant brickkiln workers who were unmarried, where around 42 percent were reported suffering from some STI problem. In addition, migrant brickkiln workers with low-exposure to mass media among them around 44 percent have had STIs problem. Surprisingly, migrant brickkiln workers who had low attitude towards condom use, within them nearly 41 percent reported suffering from some STI problem. The findings stated out that majority of the migrant brickkiln workers had suffered from at least some STI problems irrespective of socio-demographics variables like age, marital status, exposure to mass media and condom attitude. Various programs on early diagnosis and treatment of RTI/STI should be initiated within the context of their working environments. In addition, awareness and motivational programme at individual level like group meetings, counseling and home visits to sensitize the migrant brickkiln workers on the issue of RTI/STI and HIV/AIDS. Proper guidance and knowledge must be provided on common symptoms, common methods and modes of transmission, complications and preventive measures on RTI/STI and HIV/AIDS.

Treatment seeking behavior

Generally, in India, men and women with self-reported symptoms of reproductive morbidity do not seek treatment due to existing taboos and inhibitions regarding sexual and reproductive health. They hesitate to discuss the reproductive problem, especially, due to shame and embarrassment (Bang et al, 1989). Even if they seek treatment, a majority of men and women seek health care from quacks or unqualified. Untreated STIs could not only lead to PID, ectopic pregnancy, infertility and cervical cancer but also fetal loss, health problem of new born and increased the risk of HIV infection. In addition to health consequences, men and women experienced social consequences in terms of emotional distress related to sexually transmitted infection. As most of these illnesses progresses to a chronic state and remain with them for the rest of their lives, the importance of early detection and management becomes evident. Until now, it is a matter of concern that little is known about the prevalence of Sexually Transmitted Infection (STIs) or Sexually Transmitted Diseases (STD's) among men and

women in developing countries such as India. Clinical examination also confirmed STI/s among majority of them (Joseph et al, 2000). Kulkarni and Adhikari in a study of adolescent women in India and Nepal report relatively high rates of STIs problems especially in the settings where boys and girls have limited access to adequate health care (Jejeebhoy, 1995). From the above reviews the findings presented in Table 5, 38 percent migrant brickkiln worker suffered from at least one self-reported STI problem. Among them, more than half of the brickkiln workers ((54%) went for the treatment. Surprisingly 46 percent workers suffering from STI did not avail any treatment for their ailment. Around less than one fourth (15%) availed public health services and 19 percent availed private health services and more than half of the migrant brickkiln workers (66%) availed other health services which included chemist and faith-healers.

As per the findings of the study presented in Table 6, a significant proportion of migrant brickkiln workers (66%) were availing health services from chemist shops or faith healers. Less than one-fourth of the migrant brickkiln workers (19%) went to private hospitals and around 15 percent migrant brickkiln workers went to government hospitals to seek STI treatment. Half of the migrant brickkiln workers, who were unmarried, went to chemist shop and one-fourth of them went to faith healers to seek out their STI treatment. As far religion is concerned, migrant brickkiln workers who were from other religious majority of those consulted Chemist and faith healers as compared to Hindu workers for their STI treatment. Migrant brickkiln workers who had a low exposure to mass media within that majority of them were availing health services from chemist's shops and faith healers. Further, even literacy rates did not play significantly as those with higher levels of schooling were also availing health services from chemist's shops and faith healers. Further, the migrant brickkiln workers who had low attitude towards condom use among those a high proportion of migrant brickkiln workers were availing services from chemist shops and faith healers. However it is striking to note that among the migrant brickkiln workers who were less duration of stay in the brickkiln were more likely to avail STI services from Govt. Or Private health facilities as against those have larger duration of stay (More than 12 months).

The same issues are also justifying in the mentioned below qualitative quote during interaction with brick kiln worker.

“.....Many migrant brickkiln workers in the area suffer from sexually transmitted problem/Gupt Rog but they do not know about it. They came here and ask me about their problem such as I feel burning sensation while urination based on that I give medicine to them. They neglect their health problems because of ignorance, illiteracy and poverty..... (According to a local Chemist who has a shop in the nearby area)”

Table 7 depicts the profile of the migrant brickkiln workers reported suffering from a STI but did not go for a treatment in the last 12 months. It was found that less than half of the migrant brickkiln workers (46%) were not taking any treatment though this proportion was not uniform across all

background characteristics, the description has been given further. Migrant brickkiln workers who were below 21 years of age group, among them half of the brickkiln workers (68%) were reported not to go for the STI treatment. Surprisingly, migrant brickkiln workers who were unmarried, within them more than three fourth (78%) did not go for any STI treatment. Migrant brickkiln workers who were married and not staying with wife, within them 34 percent and migrant brickkiln workers who were married and staying with wives, within them 36 percent reported not to go for any STI treatment in any health facilities. This indicates that the treatment of any STI, however, still become the culture of silence and stigma among the unmarried workers than the married workers. Migrant brickkiln workers who were illiterate, nearly 65 percent of them did not avail any treatment as compared to migrant brickkiln workers (46%) completing primary level of education and migrant brickkiln workers (18%) completed upper primary/middle level of education and above. Out of the total Hindu migrant brickkiln workers nearly half (49%) did not avail any treatment as compared to migrant brickkiln workers (25%) from other religion. Migrant brickkiln workers who were ST within them, nearly half of the workers (48%) did not avail any treatment as compared to SC migrant brickkiln workers (42%). Surprisingly, migrant brickkiln workers who were high exposure to mass media among them more than half of the migrant brickkiln workers (57%) did not avail any treatment of STI whereas migrant brickkiln workers who had moderate exposure to mass media within them around 44 percent and migrant brickkiln workers who have low exposure to mass media within them 33 percent reported not to go for any STI treatment in any health facilities.

Table 8 represents the results in form of the logistic regression odds ratio which show that migrant brickkiln workers in the age group of 21-30 years were 1.8 times, and, more than 30 years of age were 1.3 times more likely to approach chemist and faith healers, than the public/private health services, with respect to migrant brickkiln workers of below 21 years of age for their STI treatment, however, this analysis is not statistically significant. Migrant brickkiln worker who had spent more than 12 months in the brickkilns were 1.02 times more likely to go to chemist and faith healers than the public/private health facilities for their STI treatment as compared to migrant brickkiln workers spending 6-12 month in the brickkiln but this is not significant. Migrant brickkiln workers who had completed education of upper primary or above/middle were 42 percent less likely to approach chemist and faith healers for their STI treatment than their illiterate counterparts, however, this result is not significant. Migrant brickkiln workers belongings to other religion were 66 percent less likely to go to chemist and faith healers compared to Hindu migrant brickkiln workers.

Logistic regression of the Table 9 revealed that in Model 1, migrant brickkiln workers in the age group of 21-30 years were 70 percent less likely and workers of more than 30 years of age were 53 percent less likely to suffer from any STIs symptoms as compared to the migrant brickkiln workers of below 21 years of age, however, in Model 2 migrant brickkiln workers in the age group of 21-30 years are 88 percent less likely whereas in Model 3 migrant brickkiln workers are 93 percent less likely to

suffer from any STI as compared to the migrant brickkiln workers more than 30 years of age. As far education is concerned, in Model 3, migrant brickkiln workers who have completed schooling of more than upper primary level/middle are 94 percent less likely to suffer from any STI as compared to the illiterate migrant brickkiln workers. Looking for attitude towards condom use, it is found that migrant brickkiln workers who have high attitude towards condom use are 66 percent less likely to suffer from any STI problem than the migrant brickkiln workers who have low attitude towards condom use, whereas, in Model 3, migrant brickkiln workers who have medium or moderate attitude towards condom use are 95 percent less likely to have any STI problem than migrant brickkiln workers having low attitude towards condom use. It is found that exposure to mass media, duration of stay in a brickkiln, exposure to sexual stimuli or material do not show any significant result or statistically not significant. The above findings of this section revealed the most common treatment-seeking behavior among the migrant brickkiln workers was self-medication through private pharmacies following advice, mostly given by local chemist, drug selling shop and faith healers. The main reasons for not going to health facilities were fear of social discrimination or shyness of genital examination and the culture of silence, the stigma associated with the sexual health problems or “gupt rog” prevailing mostly among the migrant brickkiln workers irrespective of caste, education or religion. The findings indicate that strengthening health education and promotion through interventions at the individual level and community level among the migrant brickkiln workers is recommended to improve quality of RTI/STI management. Health education messages should be more accessible for the workers in a brickkiln in the unorganized sector. There is also a need to alleviate the stigma associated with RTIs and favorably modify the treatment-seeking behavior of the patients. Promoting condoms and their availability to the migrant brickkiln workers in the unorganized sectors are also important steps in prevention of the RTI/STI and HIV-AIDS.

Summary of findings

The important part of the study was to assess the knowledge of migrant brickkiln workers on male sexual health problems. It was also about the various notions and misconceptions which they had perceived on sexual health. Lack of knowledge about appropriate sexual behavior often leads to inappropriate sexual behavior. The finding revealed that most of the migrant brickkiln workers have no clear knowledge and idea about sexual health problems. Findings show that more than half of the migrant brickkiln workers think that if anybody has signs of STD's, he should get an antibiotic from the chemist. It simply means that people are not aware of the seriousness and severity of STD' because they are taking it quite casually and are not going to the doctor for a proper treatment. Migrant brickkiln workers are not aware of the transmission dynamics of STD's because a larger proportion of the migrant brickkiln workers think that if a person has STD's, his sexual partner should not be treated. Interestingly, there is an outcome which shows the unconsciousness and ineptness of the knowledge related to STD's

because about forty percent migrant brickkiln workers think that a person can get a sexually transmitted disease from an unclean public toilet.

From the above findings we can say that majority of migrant brickkiln workers do not have complete, correct and complete knowledge but have a lot of myths and misconception about STI. There is a need for the special attention to be given to migrant brickkiln workers through behavior change communication leading to improved knowledge on causation, transmission and prevention. It should include improving access to information, strengthening information, education and communication through IEC activities, organize regular health camps and health counseling focusing prevention efforts and sensitize on the issues of STI and HIV-AIDS by various civil organization, NGOs, Government bodies and different stake holders on monthly or yearly basis.

According to marital status, one third of migrant brickkiln workers who were unmarried had high level-knowledge of STD's. Surprisingly it was found that more than one third of migrant brickkiln workers, who have low exposure to mass media, have high- level knowledge of STD's. Almost 37 percent of migrant brickkiln workers who are literate (upper primary or above) have high-level knowledge of STDs; it means as the education level increases, knowledge about STDs also increases.

The symptomatic prevalence of sexually transmitted infections among the migrant brickkiln workers stated that more than one-third brickkiln workers reported suffering from some STI problem followed by pain during urination and pain during sexual intercourse. Interestingly, within unmarried migrant brickkiln workers, around forty-two percent have reported suffering from STI's of some kind; this may be because of multiple sex partners, unsafe sex and lack of knowledge. Migrant brickkiln workers who have low exposure to mass media, within them, half of the migrant brickkiln workers were reported suffering from some STI's. Also among workers who were illiterate and had primary- level education, about forty percent of them reported to have STI's as against only 30 percent among those educated middle schools or above. Thus there is an inverse relationship between education and any STIs. It is found that migrant brickkiln workers who have high attitudes towards condom use are less likely to suffer from any STI's and who have low positive attitude towards condom use are more likely to suffer from any STI's.

The findings stated out that majority of the migrant brickkiln workers have suffered from at least some STI problems irrespective of socio-demographics variables like age, marital status, exposure to mass media and condom attitude. Various programs on early diagnosis and treatment of RTI/STI should be started at individual level like group meetings, counseling and home visits to sensitize emigrant brickkiln workers on the issues of STI and HIV-AIDS. Proper guidance and knowledge must be given on common symptoms, common methods and modes of transmission, complications and preventive measures on STI and HIV-AIDS.

Looking towards the treatment-seeking behavior of brickkiln workers, more than half of them went for the treatment. Surprisingly, 46 percent workers suffering from STI did not avail any treatment

for their ailment. The findings revealed that among those brickkiln workers who sought any treatment for their ailment, a significant percentage of them were availing health services from chemist shops or faith healers. Nearly half of the unmarried workers went to chemist shop and one-fourth went to faith healers to seek out their STI treatment. Those who had a high exposure to mass media were also availing health services from chemist's shops and faith healers. Further, even literacy rates did not play a significant role as those with higher levels of schooling were also availing services from chemist's shops and faith healers. Further, a large proportion of those migrant brickkiln workers who had low attitude towards condom use were availing services from chemist shops and faith healers. The above findings of this section revealed that the most common treatment-seeking behavior among the migrant brickkiln workers is self-medication through private pharmacies, following advice mostly given by local chemist, drug sellers shop and faith healers.

The main reasons for not going to health facilities were fear of social discrimination or shyness of genital examination and the culture of silence, the stigma associated with the sexual health problems or “*gupt rog*” irrespective of the socio-demographic characteristic. The findings indicate that strengthening health education and promotion through interventions at the individual level and community level among the migrant brickkiln workers is recommended to improve quality of STI management. Health education messages should be more accessible for migrant workers in the brickkiln in the unorganized sectors. There is also a need to alleviate the stigma associated with STIs and favorably modify the treatment-seeking behavior of the patients. Promoting condoms and their availability to the workers in the unorganized sectors are also important steps in prevention of the STI and HIV-AIDS.

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Table 1: Percent distribution of migrant brickkiln workers on knowledge about male sexual health problems, Varanasi, 2012

Knowledge about Sexual health problem	Percentage
Only bad people get sexually transmitted disease	47.4
If anybody has pus discharge, he should be checked for a sexually transmitted disease.	68.6
If anybody has signs of sexually transmitted disease he should get an antibiotic from the chemist.	54.5
Having a sexually transmitted disease increases the chances of getting AIDS	63.6
Condoms cannot protect against a sexually transmitted disease	33.9
If anybody has an ulcer on his genital he should get checked for a sexually transmitted disease.	69.7
If a person has sexually transmitted disease, his sexual partners should also be treated.	40.2
When a person has STD, he should use condom while having sex	54.8
A person can tell by appearance if someone has sexually transmitted disease.	40.8
A person can get a sexually transmitted disease from an unclean public toilet	38.8
If a person takes an antibiotic before having sex with a sex worker, it prevents a sexually transmitted disease.	41.3
Total (N)	363

Table 2 Percent distribution of migrant brickkiln workers on knowledge about male sexual health problems by selected background characteristics, Varanasi, 2012

Background characteristics	Knowledge of STDs			N
	Low	Moderate	High	
Age (in years)				
Below 21	24.0	45.3	30.7	75
21-30	33.0	37.0	30.0	200
>30	31.8	37.5	30.7	88
Marital status and living arrangements				
Married Staying with wife	33.6	41.0	25.4	122
Married not staying with wife	31.6	34.9	33.6	152
Unmarried	25.8	42.7	31.5	89
Religion				
Hindu	31.5	38.6	30.0	337
Others	23.1	42.3	34.6	26
Caste				
SC	34.4	43.8	21.9	64
ST	30.1	37.8	32.1	299
Exposure to mass media				
Low	34.1	34.1	31.7	41
Moderate	25.7	40.5	33.8	210
High	39.3	37.5	23.2	112
Exposure to sexual stimuli				
Low	29.4	32.9	37.8	143
High	31.8	42.7	25.5	220
Duration of stay in brickkiln				
Between 6-12 months	23.0	42.1	34.9	126
More than 12 months	35.0	37.1	27.8	237
Education attainment				
Illiterate	25.8	42.3	32.0	97
Primary level (1-5)	31.6	41.5	26.9	193
Middle/Upper primary level (6-8) & above	35.6	27.4	37.0	73
Total	30.9	38.8	30.3	
N	104	146	113	363

Table 3 Symptomatic prevalence of STIs among migrant brickkiln workers in the last 12 months preceding the survey, Varanasi, 2012

Symptoms of STIs	Percentage	N
Pain during urination	19.6	71
Pain during sexual intercourse	6.6	24
Lack of erection	1.9	7
Involuntary Passing of semen	1.4	5
Premature ejaculation	3.3	12
Abscess in penis	3.3	12
Yellowish/greenish discharge with foul smell from penis	2.5	9
Any STI	38.0	138

Table 4: Proportion of migrant brickkiln workers reporting sexual health problems by socio-demographic and behavioral characteristics in the last 12 months preceding the survey, Varanasi, 2012

Background characteristics	Any STIs	
	Percentage	N
Age (in years)		
Below 21	53.3	40
21-30	29.5	59
>30	44.3	39
Marital status and living arrangement		
Married Staying with wife	39.3	48
Married not staying with wife	34.9	53
Unmarried	41.6	37
Religion		
Hindu	37.4	126
Others	46.2	12
Caste		
SC	37.4	126
ST	46.2	12
Exposure to mass media		
Low	43.9	18
Moderate	37.1	78
High	37.5	42
Exposure to sexual stimuli		
Low	29.4	42
High	43.6	96
Duration of stay in brickkiln		
Between 6-12 months	39.7	50
More than 12 months	37.1	88
Education attainment		
Illiterate	38.1	37
Primary level (1-5)	40.9	79
Middle/Upper primary level (6-8) & above	30.1	22
Attitudes towards Condom use		
Low	41.2	49
Moderate	38.2	79
High	27.0	10
Total (%)	38.0	138

Table 5: Symptomatic prevalence of any STIs symptom and sought out treatment among migrant brickkiln workers in the last 12 months preceding the survey, Varanasi, 2012

	Percentage	N
Suffered from at least one self reported STI problem	38.0	138
Not go for Treatment	46.4	64
Sought out treatment	53.6	74
Source of treatment		
Public	14.8	11
Private	19.0	14
Others	66.2	49

Table 6: Percentage distributions of migrant brickkiln workers availing treatment in different health facilities by socio-demographic characteristics in the last 12 months preceding the survey, Varanasi, 2012

Background characteristics	Govt. hospital	Private hospital/ Private clinic	Chemist shop	Faith Healers
Age (in years)				
Below 21	23.1	7.7	38.5	30.8
21-30	12.8	20.5	35.9	30.8
>30	13.6	22.7	18.2	45.2
Marital status and living arrangements				
Married Staying with wife	9.7	12.9	38.7	38.7
Married not staying with wife	20.0	25.7	20.0	34.3
Unmarried	12.5	12.5	50.0	25.0
Religion				
Hindu	15.4	18.5	29.2	36.9
Others	0.0	33.3	33.3	33.3
Caste				
SC	21.4	14.3	35.7	28.6
ST	13.3	20.0	30.0	36.7
Exposure to mass media				
Low	8.3	0.0	50.0	41.7
Moderate	18.2	20.5	27.3	34.1
High	11.1	27.8	27.8	33.3
Duration of stay in brickkiln				
Between 6-12 months	12.5	29.2	33.3	25.0
More than 12 months	16.0	14.0	30.0	40.0
Education attainment				
Illiterate	23.1	0.0	30.8	46.2
Primary level (1-5)	14.0	20.9	32.6	32.6
Middle/Upper primary level (6-8)& above	11.1	27.8	27.8	33.3
Attitudes towards Condom use				
Low	12.9	16.1	35.5	35.5
Moderate	18.4	18.4	28.9	34.2
High	0.0	40.0	20.0	40.0
Total	14.8	19.0	31.1	35.1
N	11	14	23	26

Table 7: Profile of migrant brickkiln workers reported to suffer from any STI in the last 12 months but did not go for treatment in any health facilities, Varanasi, 2012

Background characteristics	Not taking any treatment	N
Age (in years)		
Below 21	67.5	27
21-30	33.9	20
>30	43.6	17
Marital status & living arrangements		
Married staying with wife	35.4	17
Married not staying with wife	34.0	18
Unmarried	78.4	29
Duration of stay in brickkiln		
Between 6-12 months	52.0	26
More than 12 months	43.2	38
Education attainment		
Illiterate	64.9	24
Primary level (1-5)	45.6	36
Middle/Upper primary level (6-8) & above	18.2	4
Religion		
Hindu	48.4	61
Others	25.0	3
Caste		
SC	41.7	10
ST	47.4	54
Exposure to mass media		
Low	33.3	6
Moderate	43.6	34
High	57.1	24
Type of Alcohol		
Desi Daru	43.1	47
Tadi	57.7	15
Beer	66.7	2
Total	46.4	64

Table 8: Logistic regression odds ratio of migrant brickkiln workers according to source of STI treatment from Local chemist and faith healers other than public/private health facilities, Varanasi, 2012

Background characteristics	Exp(B)	95% C.I. for EXP(B)	
		Lower	Upper
Age(in years)			
Below 21 [®]			
21-30	1.80	0.74	4.37
>30	1.26	0.46	3.46
Marital status and living arrangements			
Married staying with wife [®]			
Married not staying with wife	1.20	0.58	2.45
Unmarried	3.79***	1.44	10.01
Duration of stay in Brickkiln			
Between 6-12 months [®]			
More than 12 months	1.02	0.53	1.96
Education attainment			
Illiterate [®]			
Primary Level (1-5)	0.72	0.31	1.66
Middle/Upper primary level (6-8) & above	0.58	0.20	1.68
Religion			
Hindu [®]			
Others	0.34**	0.12	0.95
Caste			
SC [®]			
ST	0.86	0.40	1.82
Exposure to mass media			
Low [®]			
Moderate	1.30	0.59	2.87
High	1.59	0.65	3.86
Type of alcohol use			
Daru [®]			
Tadi	1.36	0.62	2.99
Beer	1.79	0.21	15.64

Table 9: Logistic regression odds ratio of migrant brickkiln workers showing prevalence of any STI for selected background and behavioral characteristics, Varanasi, 2012

Background characteristics	Model 1			Model 2			Model 3		
	Exp(B)	95% C.I.		Exp(B)	95% C.I.		Exp(B)	95% C.I.	
		L	U		L	U		L	U
Age (in years)									
Below 21 [®]									
21-30	0.30***	0.16	0.55	0.12**	0.02	0.63	0.07***	0.01	0.48
>30	0.47**	0.23	0.96	0.19	0.02	1.85	0.14	0.01	1.87
Education attainment									
Illiterate [®]									
Primary level (1-5)	1.70*	0.94	3.08	0.74	0.17	3.21	0.64	0.12	3.37
Middle/Upper primary level (6-8) & above	1.00	0.48	2.07	0.14*	0.01	1.33	0.06**	0.00	0.85
Exposure to mass media									
Low [®]									
Moderate	0.54	0.25	1.14	0.47	0.08	2.92	0.60	0.08	4.48
High	0.57	0.26	1.26	0.83	0.12	5.87	0.55	0.07	4.39
Exposure to sexual stimuli materials									
Low [®]									
High	0.44	0.02	7.89	NA	NA	NA	NA	NA	NA
Duration of Stay in brickkiln									
Between 6-12 months [®]									
More than 12 months	0.74	0.45	1.23	0.38	0.08	1.77	0.48	0.10	2.45
Condom attitude									
Low [®]									
Medium	0.75	0.45	1.23	0.08***	0.01	0.45	0.05***	0.01	0.36
High	0.34**	0.14	0.83	1.21	0.05	27.49	0.43	0.01	13.55
Non-Spousal sexual partner									
FSW [®]									
Girl friend				4.37**	1.05	18.21	5.12*	0.98	26.90
Male sexual partner				42.02*	0.80	2198.50	181.58**	1.26	26186.54
Unprotected sex									
No [®]									
Yes				0.51	0.13	1.97	0.31	0.06	1.60
Coercive sex									
No [®]									
Yes				0.56	0.06	5.01	0.33	0.03	3.42
Frequency of alcohol use									
Everyday [®]									
2-3 in a week							0.11*	0.01	1.19
Once and less a week							0.09*	0.01	1.16
Risky drinking									
Low [®]									
Moderate							0.38	.09	1.61
High							0.03**	.00	0.65

[®] Reference category (** *p<0.01) (**p<0.05) & (*p<0.10). ^{NA} Due to small sample size in the different level

Meta Data on Household Amenities for Major States of India					
State	Percent households having toilet facility	Percent households having exclusive room for bathing	Percent households using safe fuel for cooking (LPG /electricity/biogas)	Percent households availing banking facility	Percent households having mobile phones
India	50.2	58.5	28.6	58.7	43.4
Andhra Pradesh	52.1	67.2	35.8	53.1	54.9
Karnataka	55.1	86.3	33.5	61.1	53.2
Kerala	96.3	46.4	36.5	74.2	46.8
Tamil Nadu	54.3	64.2	48.3	52.2	62.1
Bihar	24.2	37.5	8.2	44.4	54.9
Jharkhand	23.1	25.5	12.1	53.9	67.5
Gujarat	59.6	67.5	38.3	57.9	27.2
Harvana	70.2	82.5	44.0	68.1	58.6
Himachal Pradesh	70.4	74.9	38.7	89.1	66.9
Madhya Pradesh	30.1	47.2	18.5	46.6	44.1
Chhattisgarh	26.1	20.2	11.3	48.8	51.6
Maharashtra	66.1	85.4	44.1	68.9	40.6
Uttar Pradesh	37.0	55.2	19.1	72.0	53.7
Uttarakhand	67.0	69.4	44.7	80.7	61.2
West Bengal	61.4	35.9	18.3	48.8	64.8
Rajasthan	35.7	55.5	23.3	68.0	42.9
Odisha	23.2	19.7	10.4	45.0	62.5
Punjab	80.5	88.9	55.9	65.2	35.6
Assam	66.8	41.8	19.1	44.1	62.3

Source: Census of India, 2011

Demographic Indicators of South Indian States and India

State	Population (in 000's) 2011	Annual Exponential Growth rate (% 2001-2011)	Sex Ratio (Females per 1000 males) 2011	Crude Birth Rate 2010	Crude Death Rate 2010	Infant Mortality rate	Under 5 mortality Rate	Maternal Mortality Rate	Total Fertility rate, 2009
Andhra Pradesh	84,666	1.06	992	17.9	7.6	46	52	134	1.9
Karnataka	61,131	1.47	968	19.2	7.1	38	50	178	2.0
Kerala	33,388	0.48	1084	14.8	7.0	13	14	81	1.7
Tamil Nadu	72,139	1.46	995	15.9	7.6	24	33	97	1.7
India	1,210,193	1.64	940	22.1	7.2	47	64	212	2.6

Source: Family Welfare statistics in India, 2011, MoHFW, New Delhi

Compiled by: Rajarama K E T