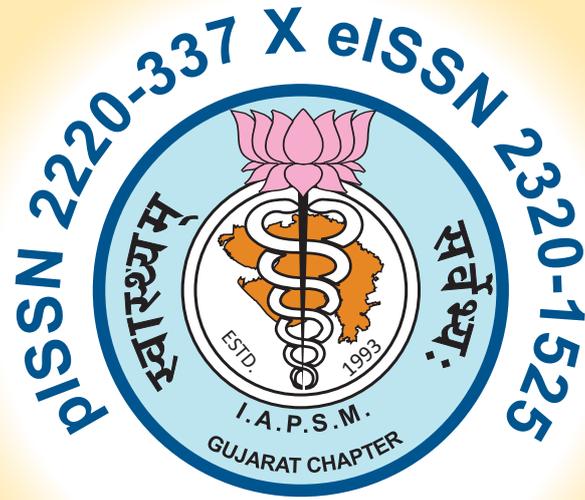


# HEALTHLINE

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JOURNAL OF INDIAN ASSOCIATION OF  
PREVENTIVE & SOCIAL MEDICINE-GUJARAT CHAPTER

## HEALTHLINE JOURNAL

The Official Journal of

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Volume 7 Issue 2 (July - December 2016)

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## The Heroes of the Health

**Vasudev S. Rawal**

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A teacher is like a mother in certain aspects. Both love their children / students. They are more sympathetic to the weaker ones. This soft corner is only to bring equality amongst them. They wish that the good quality of these apparently weaker children is better understood and they are motivated for the best results in their life.

A situation is often seen that a highly educated son moves abroad to earn name and fame leaving parents in India. The parents may receive financial help from this brilliant son but the other son who is not so progressive, may actually take them to the doctor and do all that is required to be done to these old parents. Both children are very good but the villagers may well receive the NRI one with a lot of enthusiasm in his occasional winter visit.

Medical education is a replica of this story. As a medical teacher, I am proud of all whom I taught but I extend my sincere appreciation for the less recognized ones through this article.

Many medicos have good social insights. They talk and debate on underdevelopment, malnutrition and poverty also with significant emotional involvement and a touch of nationalism. They actually wanted to contribute for their motherland. They are now best doctors. They have different careers and these reflect their scope of working for that cause.

The first group has doctor parents and is graced by the Almighty for a strong family support in academic career. Such parents are established clinicians and that was a factor for motivation and establishment in the ever increasing competition. A similar but another group of medicos have parents with lucrative business or holding high rank offices. The better educated parents, high social profile and ease of facilities make future more secure than many others. Yet another group that can form subgroup within these groups is made up of medicos having their near

relatives or family friends in the medical fraternity. These include uncles, aunts and in some smart cases, in-laws also. This always facilitated support for better outcome. Conventionally, these medicos are “blessed” ones. They mostly settle in the business already established by their guardians, move to USA and other countries or have their own relatively sophisticated establishments. Most do super specialization, some do specialization and few settle as good family physicians. It seems that their “Yoga – Kshema” is destined. With changing times during last two decades, these groups have proportionally increased as many medical colleges are coming up as “Self-Financed Institutes” (SFI). It is to be prayed that these “blessed” ones prosper further and share their capacity and happiness to the larger community, specifically those who have limited means to get treated, to the extent possible.

A different section of medicos (that may have members in the earlier described groups) is made up of highly meritorious, hardworking medicos who changed their lives with their results, skill and knowledge. Some have prestigious entry in the best branches or super specialization. Some have entry to foreign country by passing entrance examinations and others manage to start their wonderful clinics in cities and towns. The hard work brings extra ordinary benefits to their lives. These excellent doctors need to be congratulated with a wish that their expertise will help the poorest of the poor and remotest of the remote by some design, if not by default. This will open an avenue to save hundreds of lives in addition to the lives they could save so far. Those who settle outside India nurture their families with EUROS and Dollars while serving the foreign lands with due hard work. Some of these doctors make distinguished careers in medical care and research and earn good name to India also. It is true that the services of these best doctors are mainly restricted for the affording

patients here or abroad. Very few opt to dedicate to the poor larger community. This is usually due to lack of adequate number of such experts also. Their clinical expertise may reach to the needy and vulnerable populations but it sounds like a dream today. These doctors are “gifted” ones due to their ability to learn and make life brighter.

Other is the “learned” group of medicos as they decided to be the teachers of medicos of next generation. Though they did not have any conventional training to become a teacher, it was thought that they may be good teachers by default. This is not true anyway and several may have averted the students coming to the class or clinic but again, many decided to learn teaching and could succeed also. The teaching is a respected profession so far and allows one to live a scholarly, sophisticated life with comfortable economy. In medical college, a doctor with good clinical skill can automatically become a good teacher for teaching of skills. In other areas of conceptual teaching, communication and knowledge also play an important role. It is seen that if there is a desire, these shortcomings are often overcome. Modern technology (Power point Presentations and use of IT) helps them by facilitating the process but the boon may become a barrier if the teacher is totally dependent upon the device. In worst cases, students may find “googling” more comfortable and productive. It is true that in this competitive age, the students need the teachers who are good at leadership, mentoring and compassionate. It is hoped that the teachers are prepared to play these roles.

Following the labels of “blessed”, “gifted” and “learned” doctors with a significant gap of comfort is the group of “OK”. This OK is for the doctors who are not so good in socio-economic heritage or academic excellence but have managed to be in the clinical set up of hospitals, health care centers as Medical Officer or First level physician. Some may be lucky to be in charge of small hospital in Government or a trust. The positive factor is the use of their clinical skills and sharpening the same with more experience and newer devices. This is true for a small entrepreneurship of a family Physician also.

Abovementioned groups have various levels of life satisfaction, a very sophisticated metro-based lifestyle to a relatively peaceful professorial life. Some common findings are:

1. Almost all have a company of at least one more doctor nearby with whom they can exchange their ideas and discuss problems.
2. Most work in adequate clinical infrastructure to provide Primary and Secondary level patient care, e.g. minor surgical work, conducting normal deliveries, etc.
3. The academic, social and financial gains motivate them further to lead a better, satisfied family life.

It is a fact that services rendered by these doctors are respected in the community. The doctors are also in mood of serving the community through taking care of each individual patient in best possible way. Though this mood has many limitations in context of time, energy and motivation, the efforts have to be appreciated. The patients, therefore, respect these Gods in human shape. Their services to the sick persons will always lead to this respect. The million dollar question still remains about the community benefitted in numbers, proportions and community yet waiting to have some help. Let us have a look at.

1. Despite of substantial industrialization, the rural India has more than 60% population in most states and about 25% happen to be in hilly, difficult-to-reach, tribal areas.
2. The migrants in urban areas mainly find shelter in slums devoid of basic amenities.
3. This 70 -80% people in rural, tribal and urban slum areas and many of middle class families in all areas are affected with the escalating costs of the treatment.
4. The large component of promotion of health (Safe water, better nutrition, good housing, etc.) has hardly been an agenda of medical profession but most of the preventive measures of the diseases (mosquito bed nets, iodized salt, routine vaccination, etc.) also remain outside the domain excepting paid vaccination to approaching

beneficiaries. It is well known that these preventive and primitive activities are identified activities of Government services, specifically health services.

5. The fact remains that wherever they are, the worst sufferers are children and mothers, marginalized and poor, ignorant and old.

It simply means that those who prefer to work as Medical Officers and paramedical persons in these under-served populations are doing divine work. They make possible to reach the unreached. They know that –

1. Almost all of them are alone in work place as far as professional guidance is required. This may be extended to the craving for a professional group with which they can even chitchat about their day-to-day problems in person.
2. Most of these centres are relatively inadequate in supplies and infrastructure.
3. The professional progress in terms of updating the knowledge, skill and experience is very limited leading to marginal status in medical and larger community alike.
4. Preventive services save many lives and limit many complications but the credit is unlikely to be bestowed on the doctor as these are hidden processes. For example, Small pox eradication saved the nation millions of lives and billions of currency but recognition of the field health staff remained on paper.
5. The family and personal life (education of children, cultural gatherings, etc.) become restricted and lead to social isolation.
6. The administrative accountability and legal responsibility compel these doctors to play at the tunes of administrators. The paradox is that even a best administrator takes time to grasp health and medical issues and the best doctor takes time to understand the administration.
7. Awareness and strengthening of services have many hurdles in villages having politicized environment.

Whatever their merits and motivations are, the doctors in Primary Health Centres have accepted the task of Public Health. They serve millions of unreached. Poor and marginalized, vulnerable for diseases and socioeconomically deprived have a ray of hope in these doctors. Most have served these communities since years and are loved by them. However, the newly appointed and yet-to-be-appointed doctors need to be supported and saluted by our own medical fraternity as they are our fellow brothers and sisters who struggle for the cause that we could not focus upon – service to the children of Mother India in real need of our services.

Shall we, wholeheartedly, salute, appreciate and acknowledge them? We must.

## Assessment of Knowledge and Utilization of Untied Funds by Stake Holders at Village Health, Sanitation and Nutrition Committees in Udaipur District, Rajasthan

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### Abstract:

**Introduction:** Under National Rural Health Mission, Village Health, Sanitation and Nutrition Committees (VHSNCs) are formed at village level. An “untied” fund of Rs.10, 000/- per annum is given to VHSNC to empower them to address immediate health sanitation and nutrition needs of the community. **Objectives:** 1.To understand the current pattern of allocation and utilization of untied fund at VHSNCs and problems there in. 2. To assess knowledge of stakeholders regarding utilization of untied fund and their role. **Method:** A cross sectional descriptive study was done on thirty VHSNCs selected from three blocks, two tribal and one non tribal using multistage random Sampling Method.120 consenting stake holders were interviewed on a pretested semi structured questionnaire and records were reviewed. **Results:**73.33% non designated community members, and 46.67% Panchayati Raj Institute (PRI) members had no knowledge about Untied Fund flow to the VHSNCs. ASHAs and ANMs had significantly better knowledge. VHSNCs had received only 74.66% of the untied fund amount compared to norms. 81.54% received amount was actually utilized. 31% of the untied fund was used for administrative expenses and mandatory items. There was no significant difference between Tribal and Non Tribal blocks. **Conclusion:** The awareness and involvement of the non-designated community members and PRI in the utilization of Untied Fund at VHSNCs was less than adequate. Though Fund was released regularly to the VHSNCs but it was rather tied by being utilized for administrative and target centered activities.

**Key Words :** Non designated Community Members, Village Health, Sanitation and Nutrition Committee, Untied Fund

### Introduction:

The Government of India (GOI) launched the National Rural Health Mission (NRHM) in April 2005. Under the NRHM, each village or habitation with an Accredited Social Health Activist (ASHA) is expected to have a Village Health, Sanitation and Nutrition Committee (VHSNC).<sup>[1]</sup> VHSNCs are the first step towards communitisation of health care services and for making health a people's movement. Within a community empowerment approach, the NRHM envisages the VHSNC in charge of decentralized planning and monitoring at the village level.<sup>[2]</sup>

The members of the VHSNC include the Auxiliary Nurse Midwife (ANM), Panchayati Raj Institution (PRI) members, ASHA, Anganwadi Worker (AWW),

community members, school teachers and members of Non-Governmental Organizations (NGOs), Community-Based Organizations (CBOs) and Self Help Groups (SHGs).<sup>[2]</sup>

The roles of VHSNCs include development of the Village Health Plan (VHP), monitoring of health activities in the village (e.g. actively participating in Mother Child Health and Nutrition (MCHN) Day and Kishori Balika meeting).

To empower the VHSNC and to address immediate health needs of the community, the committee has been given the authority to utilize “untied” fund of Rs.10,000/- per annum. The purpose of this fund is to stimulate local action towards raising health awareness and organizing

village level meetings, sanitation drives and other identified health needs.<sup>[2]</sup>

The members are given training for roles and responsibilities and utilization of untied fund.

Though, the guidelines have been laid by the GOI for functions of the VHSNCs and utilization of the untied funds, but many studies<sup>[3-5]</sup> carried in different parts of the country show that utilization of untied funds deviates from the guidelines, this raises question on the purpose of this novel decentralized approach and the effective utilization of monitory resources.

Udaipur district is a tribal district, seven out of thirteen blocks are tribal with 5.09% of the population being Scheduled Cast (SC) and 57.47% population being Scheduled Tribe (ST)<sup>[6]</sup>, the outreach population has many unmet needs and depends mostly on local health care facilities and local community bodies like VHSNC. Till date no studies have been carried out in the district to assess the utilization of untied funds by the VHSNCs, this study is a step in this direction.

### Objectives:

To understand the current pattern of allocation to and utilization of untied fund by the VHSNCs and related issues.

- To assess knowledge and awareness of different stakeholders of VHSNCs regarding its various aspects viz formation, functioning and utilization of untied funds and their role and responsibilities thereof.
- To assess the involvement of PRI members and non-designated members from the community in its utilization.

### Method:

**Study area-** Udaipur district is situated in south of Rajasthan. It is third most tribal population district. The population is 30, 67,549 according to census 2011. Schedule Tribe population is 57.47%.<sup>[6]</sup>

A cross-sectional descriptive study was done using semi structured pre tested schedule and check list that were designed to capture the study objectives, after consulting guidelines for VHSNCs<sup>[7]</sup>

and reviewing field studies done on VHSNCs by UNFPA<sup>[8]</sup> and Public Health Resource Network.<sup>[1]</sup>

Total duration of study was six months, from 1<sup>st</sup> April 2013 to 31<sup>st</sup> September 2013.

Using multistage random sampling method, three out of thirteen blocks (23%), two blocks each with tribal population (Kherwara and Sarada) and one block with non-tribal concentration of population (Badgaon) were selected. From each block three Primary Health Centre (PHC) areas (30%) were selected randomly and from all three selected PHC areas in each block ten VHSNCs per block were selected randomly (total 30) out of the VHSNCs, that were formed and functioning as per records (total 149). Random selection at all stages was done by lottery method. . Four members were selected from each of the VHSNC as respondents subjected to their availability. One PRI member (Sarpanch or ward panch), one ANM, one ASHA and one member representative from either the local community or CBOs or teacher (an effort was made to interview at least 50% of such representatives). 120 (62%) out of 193 members in the selected VHSNCs were interviewed. The VHSNCs were visited for data collection on their monthly meeting days. Program Schedule of meetings was taken from the records. The members were identified after procuring their names from the records.

### Data collection:

Primary data was collected through an interview of consenting respondents (four per VHSNC). 120 respondents were interviewed using pretested semi structured questionnaire.

Secondary data was collected through review of records at VHSNCs and Blocks, all documentary evidence of fund flow and utilization were checked. Prior permission from Chief Medical and Health Officer (CMHO) was taken for it.

### Study limitation:-

Block Chief Medical Officers (BCMO), Block Panchayati Raj Officers, CMHOs, District Nodal Officer, MO I/C PHC and service utilizers other than the members of the committee were not included as respondents in the study. The sample size is not big hence the results of this study cannot be generalized.

**Data Analysis**

Collected data were entered electronically and analyzed with MS-EXCEL, SPSS, and EP-16. Chi-square test was applied as test of significance, depending on the sample size, a p value <0.05 was considered statistically significant.

The study structure was examined and cleared by ethical committee of the institution.

**Results:**

Majority of the members in study VHSNCs, 140 (72.54%) and 90 (75%) respondents had not received any formal training. (Table 1)

**Table 1: Training status of members in the study VHSNCs (Record review)**

Members	Formally Trained	Untrained	Total
Total members n=193	53** (27.46)	140 (72.54)	193 (100)
Total Respondents n=120	30 (25)	90 (75)	120 (100)

\*Figures in the parenthesis indicate percentage,

\*\*Distributed only among eight out of thirty study VHSNCs

Only 37.5% respondents were affirmative on fund flow to the VHSNCs. More than one third (35.83%) of respondents did not know about the fund flow. Majority of other community members, 22 (73.33%) and 14 (46.67%) PRI members did not know about fund flow and more members from these

two groups denied receipt of untied fund at their VHSNC (33.33% and 26.67% respectively), whereas 23 (76.67%) ANMs and 16 (53.33%) ASHAs were affirmative on fund flow to VHSNCs. The difference in awareness among members was statistically highly significant (p<0.001). (Table 2)

None of the respondents bore very good knowledge of utilization of Untied Fund, around half of respondents had no knowledge. Knowledge level of health workers was significantly better as compared to the remaining two groups of respondents. Significantly more PRI members and other members had poor knowledge score as compare to health workers. (p<0.05) (Figure 1)

As per one year records (April 2012 to March 2013) majority 22 (73.33%) of study VHSNCs in all three blocks had received regular fund flow. Fund flow was irregular to 8 (26.67%) VHSNCs under study. The records showed that there was no significant difference in regularity of fund flow to non-tribal and tribal blocks. (Table 3)

The study VHSNCs had received only about three fourth (74.66 %) of the untied fund amount that should have been received as per norms, most of the received untied fund (81.54%) was actually utilized by all the VHSNCs under study. More untied fund was utilized in Kherwara block (85.22%) than Badgaon (80.54%) and Sarada (78.73%) blocks. the Utilization certificate for around 12 % of actual received untied fund of VHSNCs under study were pending at the time of present study. There was no statistically significant

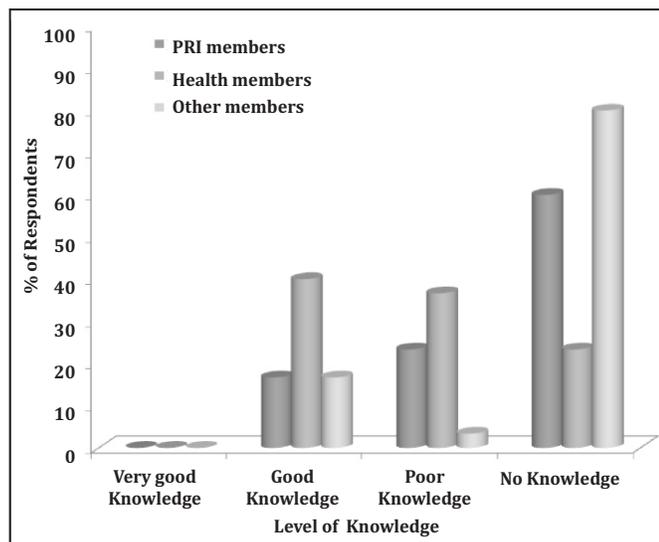
**Table2: Awareness of the respondents about fund flow to VHSNCs**

VHSNC receives fund	PRIs member n=30	Health Workers		**Other members n=30	Total n=120	p value
		ANMs n=30	ASHAs n=30			
YES	6 (20.00)	23 (76.67)	16 (53.33)	0 (0)	45 (37.50)	<0.0001
NO	10 (33.33)	7 (23.33)	7 (23.33)	8 (26.67)	32 (26.67)	0.7957
Do not know	14 (46.67)	0 (0)	7 (23.33)	22 (73.33)	43 (35.83)	<0.0001
Total	30 (100)	30 (100)	30 (100)	30 (100)	120 (100)	

\*Figures in the parenthesis indicate percentage

\*\*Other members= members from CBOs, Teachers and non-designated members from community

**Figure 1: Level of knowledge of respondents regarding area of untied fund utilization by their VHSNC**



\* Figures in the parenthesis indicate percentage  
 \*\* Health Workers= ANMs and ASHAs  
 \*\*\* Other members= members from CBOs, Teachers and non designated members from community

Score decided on areas of untied fund utilization as per guidelines provided by District Health Society (DHS).<sup>[9]</sup> One mark for each area (maximum marks= 12) Level of knowledge classified according to marks obtained:- (Very good Knowledge =10-12, Good Knowledge=7-9, Poor Knowledge=4-6 and No Knowledge =<4.)

**Table 3: Fund flow to VHSNCs in last one year (April 2012 to March 2013) (Record Review)**

Fund flow	Badgaon n=10	Kherwada n=10	Sarada n=10	Total n=30	p value
Regular **	7 (70)	8 (80)	7 (70)	22 (73.33)	0.8432
Irregular ***	3 (30)	2 (20)	3 (30)	8 (26.67)	
Total	10 (100)	10 (100)	10 (100)	30 (100)	

\* figures in the parenthesis indicate percentage  
 \*\* Regular- fund was received in first quarter of year  
 \*\*\* Irregular- fund was received after first quarter of year

difference in fund received and utilized in nontribal and tribal blocks. (Table 4)

More than one third share (31%) of the untied fund was used for administrative expenses and mandatory

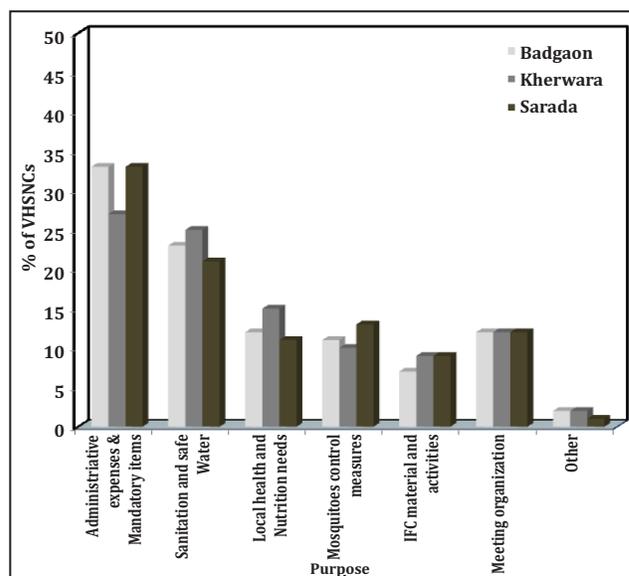
items followed by 23% utilization for sanitation and provision of safe water. Only 12.67 % of untied fund was utilized to meet health care and nutrition needs of the community and a meager i.e. 8.33% of the untied fund amount was used for imparting information and creation of awareness in the community. Same order was followed in the study VHSNCs of all the three blocks. (Figure 2)

Majority of respondents in the study 73 (60.83) said that the decision regarding utilization of received untied fund was taken solely by ANMs, 19 (15.83%) respondents opined that MO at PHC decided this matter. Joint decision making by the ANM and PRI member was opined by 17 (14.17%) respondents. Only 11 (9.17%) respondents said that such decisions were taken by common consensus through a meeting. This difference in opinion of respondents was statistically significant (p<0.0001) and the nontribal and tribal blocks did not differ significantly in the trend (p value >0.05). (Table 5)

**Discussion :**

Majority of VHSNCs were formed three to five years back and most of the current members were in committees since then. Mean age of members was 38.17 years. More than 50% of CBOs and non-designated community members and 37% PRI members were women. 25% PRI members and 30%

**Figure 2: Purpose of Utilization of untied fund (in percentage) at the VHSNCs up to March, 2013**



**Table 4: Total Untied Fund (UF) received (in percentage) and utilized by VHSNCs in blocks under study in Udaipur district (Record Review)**

Untied Fund	Badgaon	Kherwada	Sarada	Total	p value
As per guidelines, total UF(%) that should have been received	100	100	100	100	
Actual UF (%) Received	76.5	76.09	71.39	74.66	0.7147
Utilization (%) of actual UF Received	80.54	85.22	78.73	81.54	0.5361
Balance (%)	8.85	4.78	6.79	6.71	0.5409
UF(%) for which Utilization Certificate pending	10.88	10	14.48	11.75	0.6567

**Table 5: Respondents opinion on decision makers for utilization of untied fund received by the VHSNCs**

Decision maker	Badgaon n=40	Blocks		Total n=120	p value
		Kherwada n=40	Sarada n=40		
ANM alone	26 (65)	25 (62.5)	22 (55)	73 (60.83)	0.6346
MO at PHC	6 (5)	5 (4.16)	8 (6.66)	19 (15.83)	0.8592
ANM and PRI member	4 (10)	6 (15)	7 (17.5)	17 (14.17)	0.6189
By common consensus in the meetings	4 (10)	4 (10)	3 (7.5)	11 (9.17)	0.9047

\*Figures in the parenthesis indicate percentage  
 $\chi^2 = 111.11$ ,  $df = 3$ ,  $p < 0.0001$

of the other members (CBOs and non-designated) from the community were illiterate. This made it difficult for them to understand guidelines on fund utilization.

Majority of members (54%) were from General and OBC category, 40 % of PRI members belonged to ST category. Udaipur is third most tribal population concentration district in Rajasthan. As per 2011 census more than half (57.47%) population here belongs to ST category<sup>[6]</sup>, two out of three blocks covered in the present study were tribal, still, ST and SC representation in VHSNCs was not proportional to their population. It was observed that non designated community

shared only 16% of overall membership and of these only 19% were ST and 16% were SC. The concept of VHSNC is based on community participation and the allotment of untied funds reflects community ownership, poor participation from the marginalized community in a district where majority of the population is tribal does not fulfill the purpose of VHSNC.

Most of the respondents (75%) had received no formal training before joining the VHSNCs and out of the 30 VHSNCs under study, 22 had no formally trained member. Lack of training reflected in lack of awareness regarding functions of VHSNC and utilization of the Untied Funds. Keeping this in view

along with the poor literacy status of the VHSNC members, there is a strong need for regular refresher

reporting to higher authorities and for administrative purpose such as for purchasing of stationary, registers, furniture, mandatory items instructed by higher authority, etc. Other important activities like village survey and formulation of VHP were neglected. ( $p < 0.001$ ) Availability of insufficient funds for the designated functions of VHSNCs is a matter of concern as it makes the untied fund rather tied up, there should be provision of a separate budget for administrative purposes.

There was no transparency in untied fund utilization. ANM was highlighted as sole decision maker for utilization of fund by more than 60% respondents. Only 11% respondents said that decision was made by common consensus through VHSNC meeting. ( $p < 0.001$ ) The new guidelines (2012)<sup>[7]</sup> recommend that PRI member and ASHA should operate a joint account in bank for the handling of untied fund, but all study VHSNCs were still following old guidelines and the account was in name of PRI member and ANM. This shows that there is a gap in coordination between health workers and the local community members about fund flow and its utilization. This trend compromises the autonomy and jeopardizes the objectives like community ownership and community monitoring. Same phenomenon was observed by Pramod Kumar Sah et al<sup>[3]</sup>, they found that majority of members were unaware of areas where fund was utilized and it was opined that president or secretary decided about the use of funds, without consulting other members.

The factual situation of the meetings also revealed that only five VHSNCs actually held a meeting on the scheduled day, member attendance was poor, with no participation from the PRI members and non-designated Members from local village. Average member attendance was 3.6, which is not in accordance with the guidelines that suggest a minimum quorum of seven members. In another study Singh et al<sup>[12]</sup> also observed that PRI members and members from other sectors did not attend the meetings and in majority of the cases the decision regarding the utilization of untied fund was taken by ANM herself instead of VHSC meeting.

Based on these findings, there is an evident lack of transparency in utilization of funds which are more tied than untied.

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**Conclusion:**

The concept of VHSNCs is based on local governance. Decentralization of health and sanitation services was planned to make them need based in local context. The findings of this study show that the participation of local marginalized community in the VHSNCs was less than adequate, though Untied Fund is released regularly to the VHSNCs but the awareness and involvement of the non-designated community members and PRI members regarding fund flow and decision making on its utilization was significantly low. Handling of Untied Fund is not in the hands of the local community rather, ANM emerged as the key person for the withdrawal of money and its utilization. The nature of fund was more tied as it was utilized mostly on buying stationary, furniture and on matters related to administration and target centered activities. The study reflects a need for sensitization and capacity building of the members for effective functioning and utilization of Untied Fund.

**Recommendations:**

Based on above findings, following recommendations are made for judicious and priority based utilization of the Untied funds by the VHSNCs:

- The participation of local marginalized community in VHSNCs should be increased and should be in proportion to their local population.
- Formal training and regular re orientation should be planned for the members to sensitize them about the objectives and priorities for untied fund utilization and their responsibility as a member of the committee.
- Meetings should be held regularly with adequate quorum and participation from local community should be ensured.

**Declaration:**

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## A Record Based Study on Clinico-Epidemiological Characteristics of Influenza A (H1N1) Confirmed Cases Admitted in Various Hospitals of Rajkot City, Gujarat, 2015

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### Abstract:

**Intoduction :** The Influenza A (H1N1) disease started in India in May 2009 and the first laboratory-confirmed case was reported from Hyderabad on 16<sup>th</sup> May 2009. After that, every year large numbers of positive cases were reported throughout India and Gujarat. **Objective:** To study clinico-epidemiological characteristics of confirmed cases of influenza A (H1N1) virus infection, hospitalized in various hospitals of Rajkot city (January 2015 to May 2015) **Method:** In the year 2015 from 1<sup>st</sup> January to 31<sup>st</sup> May, total 420 cases of Influenza A (H1N1) were admitted in identified hospitals of Rajkot city. Community Medicine department, P.D.U. Govt. Medical College, Rajkot has collected case record forms of all patients which include information like demographic profiles, high risk factors, clinical profile etc. Data entry and analysis was done by using MS Excel 2007. **Results:** Maximum cases (50.7%) were from the age group of 30-49 years, 57.4% cases were females. Overall case fatality rate was 19.8%. Top five presenting symptoms among cases (n=361) at the time of admission were cough (96.7%), fever (92.5%), shortness of breath (81.2%), sore throat (27.9%) and body ache (14.6%). Out of 372 patients, 44.1% patients had one or more co-morbid disease. Only 19.1% patients had received antiviral within 2 days of onset of symptoms. **Conclusion:** Survival rate was 80.2% among admitted patients of Influenza A (H1N1). Early diagnosis and treatment may reduce the severity of the disease.

**Key words :** Clinico-Epidemiological Characteristics, Influenza A (H1N1),

### Introduction :

2009 H1N1 (sometimes called “swine flu”) is a new influenza virus causing illness in people. In April 2009, the novel influenza A (H1N1) virus was first detected in Mexico<sup>[1]</sup> and then in the United States (US).<sup>[2,3]</sup> This was originally referred to as “swine flu” because many of the genes in this new virus were found in pigs in North America.<sup>[4]</sup> After wards disease transmitted to many other parts of the world and WHO had declared the pandemic on 11<sup>th</sup> June 2009.<sup>[1]</sup> The WHO declared H1N1 post-pandemic on 10<sup>th</sup> August 2010. The pandemic influenza A (H1N1) virus is now circulating as seasonal influenza A (H1N1) virus.<sup>[5]</sup>

The disease started in India in May 2009 and the first laboratory-confirmed case was reported from Hyderabad on 16<sup>th</sup> May 2009 but only few cases were reported till August 2009.<sup>[6]</sup> From Gujarat state, the

first H1N1 positive confirmed case was reported in June 2009.<sup>[7]</sup> Saurashtra region, in the western part of Gujarat state, reported its first case in August 2009.<sup>[8]</sup> After that, a large numbers of positive cases were reported throughout India and Gujarat till now.<sup>[9]</sup>

The symptoms of Influenza A (H1N1) flu virus in people include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills and fatigue; sometimes vomiting and diarrhea also seen. Severe illnesses and deaths have occurred as a result of illness associated with this virus.

The present study summarizes the clinico-epidemiological characteristics of confirmed cases of influenza A (H1N1) virus infection, hospitalized in various hospitals of Rajkot city of Saurashtra region from January 2015 to May 2015.

**Method:**

Rajkot district has witnessed three waves of Influenza A(H1N1) from the year 2009 to 2015. Also Rajkot city being the economical capital of the Saurashtra region is most developed city with good connectivity with nearby and all important places and having quite a good number of tertiary care medical facilities. It has one Government Medical College affiliated hospital and 10 private multi-specialty hospitals which are providing admission to serious case of Influenza A (H1N1).

As a part of prevention and control of any outbreak of Influenza A(H1N1) as well as reducing the mortality due to it, state health department has created mechanism to monitor and keep the track of all cases admitted in all the hospitals where ever cases of Influenza A (H1N1) are admitted. Health department under the leadership of Chief District Health Officer is locally coordinating with the related hospitals in this regards. Also local health team is collecting case record forms from the treating hospital as a part of this.

In the year 2015 from 1<sup>st</sup> January to 31<sup>st</sup> May total 420 cases of Influenza A(H1N1) were admitted in identified hospitals of Rajkot city and 83 deaths were reported amongst them. Community Medicine department has collected case record forms and analyzed them.

In case record form several types of information were collected. e.g. age, sex, religion, residential area, presenting symptoms and signs at the time of admission, pregnancy, co-existing conditions and outcome status. Other variables were also included like duration of hospital stay, duration between onset of illness and hospital admission/diagnosis etc.

This data was entered and analyzed in MS Excel 2007. Analysis was done using the available information for the particular variable.

**Results:**

Out of 420 cases, 207 (50.9%) cases were admitted throughout in Government hospital while 178 (43.7%) cases were admitted in Private hospitals throughout. Age group  $\leq 5$  years and  $\geq 65$  are years considered at greater risk of mortality. Maximum

cases belonged to the age group of 30-49 years. Total 11.9% cases were from this high risks group i.e. 2.6% in the age group of 0-5 years and 9.3% were reported in the age group of  $\geq 65$  years and 88.1% were reported in the age group 5- 65 years. (Table 1)

More cases were reported among females (57.4%) as compared to males (42.6%). More cases

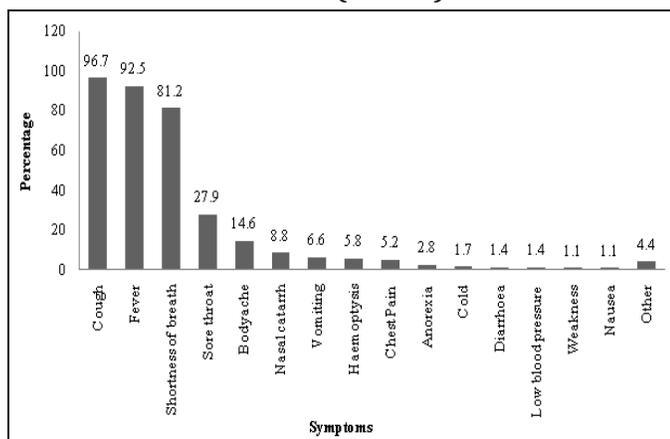
**Table 1: Demographic characteristics of confirmed cases of Influenza A(H1N1) admitted in various hospitals of Rajkot city (n = 420)**

Pattern of Hospitalization	Frequency	Percentage
Government throughout	207	50.9
Private throughout	178	43.7
Government then transferred to Private	5	1.2
Private then transferred to Government	7	1.7
Private then transferred to another Private	10	2.5
<b>Age</b>		
0-4 Years	11	2.6
5-14 Years	8	1.9
15-29 Years	57	13.6
30-49 Years	213	50.7
50-64 Years	92	21.9
$\geq 65$ Years	39	9.3
<b>Sex</b>		
Male	179	42.6
Female	241	57.4
<b>Area type</b>		
Urban	172	41.0
Rural	248	59.0
<b>Area of residency</b>		
Rajkot Corporation	132	31.4
Rajkot District excluding corporation	120	28.6
Other District	168	40.0

(59.0%) were reported from rural area as compared to urban area (41.0%). 60% of cases admitted were from Rajkot district including Rajkot city also. 40.0% of cases were from nearby districts. (Table 1)

Top five presenting symptoms among cases (n=361) at the time of admission were cough (96.7%), fever (92.5%), shortness of breath (81.2%), sore throat (27.9%) and bodyache (14.6%). (Figure 1)

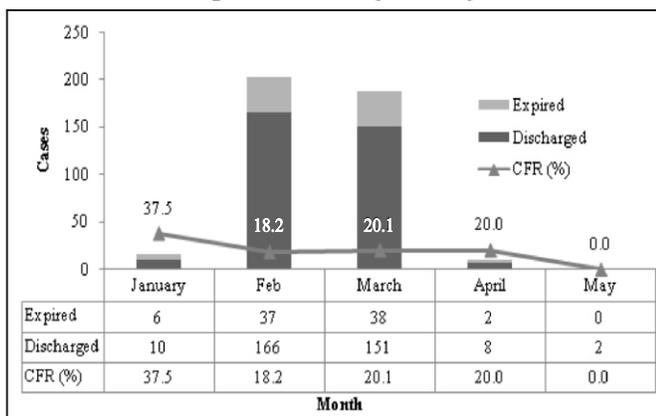
**Figure 1: Common presenting symptoms among cases of Influenza A (H1N1) at the time of admission (n=361) \***



\* Multiple responses considered

Highest number of cases and deaths were reported during February and March month. The first confirmed case was reported in first week of January although total 16 cases were reported during January. Peak started in February and large number of cases were reported during February and March. Then gradually number of cases declined in April and May 2015. (Figure 2)

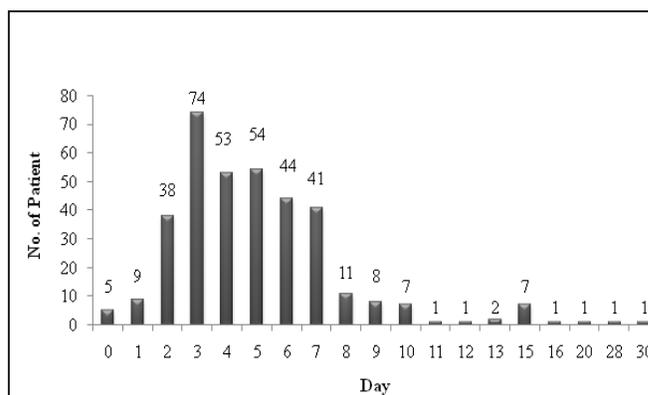
**Figure 2 : Month wise distribution discharged and expired cases (n=420)**



Out of 420 cases, 337 (80.2%) were discharged, 83 (19.8%) were expired. One fifth of the admitted patients died. Overall Case fatality rate was 19.8%. Case fatality rate was highest in January and March month i.e. 37.5% and 20.1% respectively. (Figure 2)

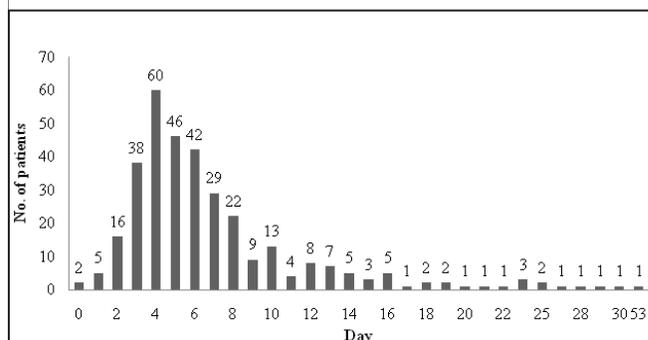
Majority of patients (181) admitted between 3 – 5 days of onset of symptoms. Only 52 patients admitted within 2 days of initiation of symptoms. (Figure 3)

**Figure 3: Time interval between onset of symptoms to admission (n=359)**



From the available data, it was found that among various comorbid conditions, 18.1% patients had Diabetes Mellitus followed by Hypertension in 11.2% patients. Other comorbid conditions were Coronary Heart Diseases (2.5%), Other heart diseases (2.5%), Chronic Respiratory Diseases (2.5%) and Renal Diseases (2.2%). Out of 184 women, 10 (5.4%) were pregnant. From the available data, it was observed that 87.5% patients had pneumonia and almost two third patients had anaemia, 23.8% patients had thrombocytopenia and 16.9% patients had elevated S. Creatinine level. (Table 2)

**Figure 4 : Duration of hospital stay among survived patients (n=332)**



**Table 2: Presence of Co-morbid condition among confirmed cases of Influenza A (H1N1)\***

	Frequency	Percentage
<b>Presence of Co-morbid disease (n=365)</b>		
Diabetes Mellitus	66	18.1
Hypertension	41	11.2
Coronary Heart Diseases	9	2.5
Other Heart diseases	9	2.5
Chronic Respiratory Diseases	9	2.5
Renal Diseases	8	2.2
Other	37	10.1
Pregnant women (n=184)	10	5.4
Pneumonia (n =352)	308	87.5
Aneamia (n=136)	91	66.9
Thrombocytopenia (n =168)	40	23.8
Elevated Serum Creatinine (n=160)	27	16.9

(\* n differs for each variable based on availability of Hospital records)

Majority of survived patients (186) had 3 – 6 days of hospital stay before final outcome. (Figure 4)

Based on available data it was observed that out of 325 cases, 110 (33.9%) patients were first treated by General Practitioner. Majority of patients (87.1%) were given antibiotic. Only 19.1% patients had received antiviral within 2 days of onset of symptoms and 36.0% patients were kept on ventilator. (Table 3)

Around two third patients directly went to recognized Influenza A (H1N1) treating hospital. Influenza A (H1N1) is a viral disease although 87.1% patients were given antibiotic for secondary bacterial infection management. Early initiation of antiviral is necessary to reduce severity of disease, but only one

fifth patients could receive antiviral within 2 days of initiation of symptom. One third patients needed to be kept on ventilator. Steroid is mainly given to critical patients and 18.9% patients were given steroid. (Table 3)

**Table 3: Treatment profile of confirmed cases of Influenza A (H1N1)\***

	Frequency	Percentage
First treated by General Practitioner (n=325)	110	33.9
Patients given antibiotic (n=294)	256	87.1
Received antiviral within 2 days (n=357)	68	19.1
Kept on ventilator (n=328)	118	36.0
Patients given steroid (n=296)	56	18.9

(\* n differs for each variable based on availability of Hospital records)

**Discussion:**

The present analysis was carried out in confirmed cases of Influenza A(H1N1) admitted in various hospitals of Rajkot city during January to May, 2015. In the year 2015 from January to May total 420 confirmed cases of Influenza A (H1N1) were admitted in various recognized treating hospitals of Rajkot city.

In our study, most common affecting age group was 30-49 years and females (57.4%) were affected more as compared to males while equal proportion of males and female were found in the study by Domadia et.al.<sup>[11]</sup> and Patel PB et al.<sup>[12]</sup> In contrary to our findings, males were affected more in various studies done by Rana et al.<sup>[10]</sup> (55.6%), Samara et al.<sup>[13]</sup> (61.5%), Puvanalingam et. al.<sup>[14]</sup> (55.6%) and Bhatt et.al.<sup>[15]</sup> (55.8%). Most common affected age group varies in other studies i.e. Rana et. al.<sup>[10]</sup> (13-45 years), Domadia et.al.<sup>[11]</sup> (12-40 years), Patel PB et.al.<sup>[12]</sup> (20-50 years). This difference may be attributed to difference in socio-demographic characteristics in the community surveyed.

Common presenting symptoms among cases at the time of admission in our study were cough (96.7%), fever (92.5%), shortness of breath (81.2%), sore throat (27.9%) and bodyache (14.6%) while similar common presenting symptoms were observed in the study done by Domadia K et al.<sup>[11]</sup> i.e. fever (80%) followed by sore throat. Similar symptoms observed in the studies done by Li YQ et al.<sup>[16]</sup> and Torres J P et al.<sup>[17]</sup>

In our study overall Case Fatality Rate (CFR) was 19.8% while 22.4% CFR reported by Domadia K et al.<sup>[11]</sup> in Jamnagar and less CFR i.e. 5.9 % was observed in 2015 by Patel PB et al.<sup>[12]</sup> in Surat city. In another study done during the epidemic of 2009 in Gujarat by Rana et al.<sup>[10]</sup>, it was 19.9%. High case fatality rate in January month can be explained due to few cases reported in month of January. In present study maximum cases were seen in February month. Similar finding was observed by Patel PB et al.<sup>[12]</sup> in February month 76.3% were reported.

The results of the current study show a median of 3-5 days between onset of illness and hospital admission, compared to 3.8 days in the study done in Surat by Patel PB et al.<sup>[12]</sup> 3 days in US by Jain S et al.,<sup>[18]</sup> 4 days in Australia and New Zealand by Webb SA et al.<sup>[19]</sup> The time duration between onset of illness and hospital admission and diagnosis is more than other studies.<sup>[18,19]</sup> Possible explanation could be that patients from rural areas and small town areas were initially treated at local level by general practitioners and then if not improvement were seen they were refer to the higher centre.

In present study 66.9% patient had anemia, 23.8% had thrombocytopenia and 5.4% patients were pregnant. In study done by Chudasama et al.,<sup>[20]</sup> 34.6% patients had anemia, 22.9% patients had reported thrombocytopenia and 5.5% were pregnant women. In study done by Jain S et al.<sup>[18]</sup> had reported 7% pregnant women in US and Chang et al.<sup>[21]</sup> reported 16.7% pregnant women in Australia.

Hospital stay in present study was 3-6 days while it was between 5.7 - 6.8 days in Domadia et al.<sup>[11]</sup> and 6 days in Chudasama et al.<sup>[20]</sup>

In present study, only 19.1% had received Oseltamivir within two days after the onset of illness, in contrast to 45% in the US by Jain S et al.<sup>[19]</sup> In study done by Rana et al.,<sup>[10]</sup> it was observed that oseltamivir was started after 5 days in 52% of cases. Initial primary treatment by general practitioners or local physicians and delayed referral to a higher center may be the possible explanation for the delayed start of Oseltamivir in suspected or confirmed influenza A (H1N1) patients.

Incidence rate of H1N1 cases of whole Rajkot district population (excluding the cases of other district) for the period of January-May 2015 was 7.8 per 1 lakh population as compared to 16.4 per 1 lakh population in Jan-March 2015 in Surat.<sup>[13]</sup> It was 10.7 and 24.7 per 10 lakh population in Gujarat and Delhi respectively in 2015.<sup>[22,23]</sup>

#### **Limitations:**

The data was taken from hospitalized patients, so patients who became infected in the community and did not go to the hospital were not included. Also, patients who were treated on an outpatient basis and who were not tested were not included in the present study. The analysis was done among 420 cases only admitted between January to May 2015. The analysis was done among cases admitted in Rajkot city hospitals only. The analysis was based on secondary data; hence the missing and incomplete data in either survived or deceased may have contributed to the biased findings. The analysis was done using case summary forms and death summary forms, filling of the same by untrained persons may have contributed to the biased findings.

#### **Conclusion:**

In our study, more cases were found in females and more cases were reported from rural area. Top five presenting symptoms among cases at the time of admission were cough, fever, shortness of breath, sore throat and bodyache. Survival rate was 80.2% among admitted patients of Influenza A (H1N1). Majority of patients admitted between 3 - 5 days of onset of symptoms. Only 19.1% patients had received antiviral within 2 days of onset of symptoms. 44.1% patients had one or more Co-morbid disease. Early diagnosis and treatment may reduce the severity of the disease.

**Recommendations:**

Community should be made aware about symptoms of Influenza A(H1N1). They should be educated to consult a qualified doctor as early as possible when symptoms of Influenza A (H1N1) develops. Laboratory parameters like S. Creatinine, total platelet count should be closely monitored on daily basis from the day of admission. Awareness among doctors including General Practitioner regarding identification of symptoms and signs of Influenza A(H1N1) and early initiation of Oseltamivir is must. Special focus should be given in the management of patients having one or more high risk factors(especially co morbid disease, pregnancy etc.).

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## Seasonal Variation in Level of Thyroid Hormones in Surat, Gujarat

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### Abstract :

**Introduction :** The principal hormones of thyroid gland are Triiodothyronine (T3) and Thyroxine (T4). Several changes in thyroid function and thyroid function tests occur with advancing age as well as during various seasons. **Objective:** To investigate the impact of age, gender and seasons on the level of Thyroxine (T4), Triiodothyronine (T3) and Thyroid Stimulating Hormone in individuals free of thyroid diseases. **Method:** Present record based cross sectional study was done in patients of a multispecialty Hospital of Surat, Gujarat. Records of patients attending the hospital during April 2012 to March 2013 were form the study population. Written consent of the patients was taken and ethical approval was obtained from IEC. The serum levels of T3, T4 and TSH in 112 individuals attending the Hospital in different seasons were examined. Hormonal assay was done by using AIA 360 immunoassay. Data were entered in Microsoft excel and were analysed using Epi info software. **Results:** The Mean  $\pm$  SD for T3, T4 & TSH was  $2.78 \pm 0.50$ ng/dl,  $1.54 \pm 0.78$ ng/dl &  $1.78 \pm 1.22$   $\mu$ IU/L. The mean value of TSH is elevated in females than males while T4 is slightly higher in males and T3 remained almost same in both genders. The mean T3 level was highest in age group of 30-40 years and minimum in patients of <20 years age. Mean T4 level was highest in age group of 41-50 years and minimum in patients of >50 years age. Mean TSH level was highest in age group of 20-30 years and minimum in patients of >50 years age. There is significant change in thyroid hormone levels in both genders of different age group in different seasons. **Conclusion:** It is concluded that the age and seasons have an appreciable effects on the levels T3, T4 and TSH.

**Keyword:** Thyroxine, Triiodothyronine, Thyroid Stimulating Hormones

### Introduction :

The principal hormones of thyroid gland are Triiodothyronine (T3) and Thyroxine (T4) and their concentrations are 93% and 7% respectively. The normal total plasma T4 level is approximately 8  $\mu$ g/dL (103 nmol/L), and the plasma T3 level is 0.15  $\mu$ g/dL (2.30 nmol/L). Several changes in thyroid function and thyroid function tests occur with advancing age, as reviewed by Mariotti et al<sup>[1]</sup> and Adler et al<sup>[2]</sup>.

Studies on the natural course of thyroid function tests in the elderly are often complicated by confounding factors such as the increased prevalence of autoimmune subclinical hypothyroidism, of chronic (non-thyroidal) illness and of medication induced changes in thyroid function tests.<sup>[1,3-5]</sup>

After exclusion of these confounders, most studies show similar results: A clear, age-dependent decline in serum Thyroid Stimulating Hormone (TSH) and (free) T3, whereas serum (free) T4 levels remain unchanged. The inactive metabolite T3 (Reverse T3) seems to increase with age.

In normal individuals the range of thyroid hormones and TSH in the blood is as follows<sup>[6]</sup>:

Free Thyroxine (T4) - 0.89-1.76ng/dl

Free Tri-iodothyronine (T3) - 2.3-4.2ng/dl

Thyroid Stimulating Hormone (TSH) - 0.5-5.0  $\mu$ IU/mL

Age has an effect on the concentration of T3, T4 and TSH. It is studied that gradual increase in autonomous tissue with age makes individual more

susceptible to thyroid problems. Higher frequencies of thyroid problems are noted in people above 40 yrs of age.<sup>[7]</sup>

Fasting state along with acute and chronic illness are associated with a decreased serum T3 and increased rT3, without any evidence of thyroid disease.<sup>[8-13]</sup> This is often referred to as non-thyroidal illness. The high prevalence of non-thyroidal illness, due to malnutrition and the presence of chronic illness, is an important confounder in the assessment of thyroid function in the elderly.<sup>[1,3]</sup>

This is illustrated by a recent study in 403 healthy ambulatory men (aged 73-94 years), in which subjects with systemic infectious, inflammatory, and malignant disorders were excluded. In this study, 63 men met the criteria for non-thyroidal illness, which was defined as a low serum T3 and a high serum rT3.

There is a paucity of literature on effect of age, sex and seasons on the levels of thyroid hormones had been scarcely researched in western part of India. So, this study was done to investigate the impact of age, gender and seasons on the level of Thyroxine (T4), Triiodothyronine (T3) and Thyroid Stimulating Hormone in individuals free of thyroid diseases.

#### Method:

Present study was a record based cross sectional study done in patients of a multispecialty hospital of Surat, Gujarat. Records of patients attending the hospital during April 2012 to March 2013 formed the study population. Total 112 patients had attended the hospital for thyroid hormone test were included in the study. Secondary data on age, gender, TSH, T3 and T4 level were analyzed. Permission from hospital authorities was taken to conduct the study. The confidentiality of individual patients was maintained throughout the study.

Collection of blood sample: Blood samples were obtained from anti-cubital vein of subjects who attended hospital for various problems other than the thyroid or related diseases. Serum was separated by centrifugation at 2000 rpm for 5 mins.

Determination of hormones: The samples were analysed for T3, T4 and TSH by AIA-360 FLOUREMETRIC ENZYMATIC IMMUNOASSAY by using ST AIA pack T3, ST AIA pack T4 and ST AIA pack TSH supplied by TOSOH manufactures in central laboratory of hospital itself. Data were entered in Microsoft excel and were analysed using Epi info software.

#### Results:

The present study was done among total 112 patients of a multispecialty Hospital of Surat. The Mean  $\pm$  SD for T3, T4 & TSH was 2.78 $\pm$ 0.50ng/dl, 1.54 $\pm$ 0.78ng/dl & 1.78 $\pm$ 1.22  $\mu$ IU/L. There were total 64 females and 48 males in study participants. In Males, Mean  $\pm$  SD for T3, T4 & TSH was 2.63  $\pm$  0.79 ng/dl, 1.54  $\pm$  0.68 ng/dl and 1.55  $\pm$  1.22  $\mu$ IU/L. In Females, Mean  $\pm$  SD for T3, T4 & TSH was 2.48  $\pm$  0.51ng/dl, 1.33  $\pm$  0.48 ng/dl & 2.09  $\pm$  1.31  $\mu$ IU/L. The mean value of TSH is elevated in females than males while T4 is slightly higher in males and T3 remained almost same in both genders.

**Table 1: Mean T3, T4 & TSH levels in different age groups**

Age	T3 (ng/dl)	T4 (ng/dl)	TSH ( $\mu$ IU/L)
<20 years	1.79 $\pm$ 0.51	1.53 $\pm$ 0.45	1.24 $\pm$ 0.45
20-30 years	2.94 $\pm$ 0.87	1.45 $\pm$ 0.53	2.44 $\pm$ 1.04
30-40 years	3.00 $\pm$ 0.94	1.48 $\pm$ 0.55	2.22 $\pm$ 0.96
41-50 years	2.16 $\pm$ 0.74	1.49 $\pm$ 0.48	1.68 $\pm$ 1.39
>50 years	2.83 $\pm$ 1.35	1.35 $\pm$ 0.88	0.51 $\pm$ 0.49

Table 1 shows variation in mean level of T3, T4 and TSH in different age group. It was observed that mean T3 level was highest in age group of 30-40 years and minimum in patients of <20 years age. Mean T4 level was highest in age group of 41-50 years and minimum in patients of >50 years age. Mean TSH level was highest in age group of 20-30 years and minimum in patients of >50 years age.

Table 2 shows the effect of seasons on the concentration of T3, T4 and TSH. The data indicated that serum TSH level is lowest in monsoon while

**Table 2: Season wise variation in Mean T3, T4 & TSH levels**

Seasons	Winter	Summer	Monsoon	F value	P value
<b>T3 (ng/dl)</b>	2.54±0.70	2.34±0.47	2.47±0.69	2.91	0.055
<b>T4 (ng/dl)</b>	1.26±0.30	1.51±0.68	1.42±0.45	7.13	0.0009
<b>TSH µU/L</b>	3.01±1.41	2.22±2.00	1.76±1.15	18.37	0.000000001

highest in winter. The concentration of serum T3 is stable in all the seasons, but highest in winter and lowest in summer. The serum T4 level is also nearly equal in all seasons, slightly lower in winter while highest in summer.

#### Discussion:

The present study was done to check the seasonal and age group wise variation in the level of thyroid hormones. The Mean  $\pm$  SD for T3, T4 & TSH was  $2.78 \pm 0.50$  ng/dl,  $1.54 \pm 0.78$  ng/dl &  $1.78 \pm 1.22$  µU/L. The mean value of TSH is elevated in females than males while T4 is slightly higher in males and T3 remained almost same in both genders. This observation is in accordance with previous work by Razzak et al<sup>[14]</sup> and Franklyn et al,<sup>[15]</sup> that in males the value of sex hormones increases the circulating level of Thyroxine Binding Globulin (TBG), which directly leads to increase in circulating level of T4.

The levels of thyroid hormones and TSH in different age groups are depicted in table 1. It was observed that mean T3 level was highest in age group of 30-40 years and minimum in patients of <20 years age. Mean T4 level was highest in age group of 41-50 years and minimum in patients of >50 years age. Mean TSH level was highest in age group of 20-30 years and minimum in patients of >50 years age. But previous studies by Razzak et al,<sup>[14]</sup> Muslim and Khalil et al<sup>[16]</sup> shows decreased value of TSH in last decade. While in males, TSH is lowest in fourth decade and highest in second group. This is in accordance with studies of Razzak et al<sup>[14]</sup> and Muslim and Khalil et al<sup>[9]</sup> While in previous work by Muslim and Khalil et al<sup>[9]</sup>, Franklyn et al<sup>[16]</sup> and Westgern et al<sup>[17]</sup> revealed lower level of T4 in first decade and increased T4 level as age advances.

The effect of seasons on concentration of T3, T4 and TSH is given in table 2, which shows that

serum TSH level is lowest in monsoon while highest in winter. The concentration of serum T3 is stable in all the seasons, but highest in winter and lowest in summer. The serum T4 level is also nearly equal in all seasons, slightly lower in winter while highest in summer. Seasons also have effect on T3, T4 and TSH which is in accordance with study done by Khan et al.<sup>[18]</sup>

#### Conclusion

From the present study it can be concluded that the age and seasons have appreciable effects on the level of T3, T4 and TSH.

#### Declaration:

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Conflict of Interest: Nil

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## Outcome Assessment of Children Registered for Special Supplementary Nutrition Programme (SSNP) At Village Child Nutrition Centres (VCNCs) of Taluka Kalol, Gandhinagar

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### Abstract:

**Introduction:** As per the National Family Health Survey (NFHS) 3 in Gujarat, proportions of stunted, wasted and underweight children (< 5 years) were 52%, 19% & 45% respectively. "Mission Balam Sukham" launched in January 2013 targeted undernourished children through supplementary feeds. **Objectives:** To study change in nutritional status after 1 month and 1 year after the enrolment at Village Child Nutrition Centres (VCNC). **Method:** Children (12 – 47 months) enrolled at 14 VCNCs from 2 PHCs of Gandhinagar were included in study. Demographic/ anthropometric information were taken by trained staff at start (day 0), completion of VCNC stay (1 month) and at 12 months. Data was analysed in MS excel 2007. **Results:** Of 193 children, based on "Weight For Age (WFA)" at day 0; 130 (67.5%) were underweight; at 1 month, proportion reduced to 61.8% (mean weight gain <5gram/kg/day). However, at 1 year, this proportion increased to 69.1%. As per "Weight For Height (WFH)" at day 0, 44.8% children were malnourished, at 1 month it reduced to 49.5% but increased to 52.6% at 1 year, it (40/76). Based on "Mid Upper Arm Circumference (MUAC)", 16.6% were undernourished at day 0. At 1 month, this proportion was 12.2% and at 1 year, it decreased further to 5.2%. Stunting, as assessed by "Height For Age (HFA)", was 77.9% at day 0, 74.2% at 1 month and 76.3% at 1 year. **Conclusion:** 3 criteria for under-nutrition (WFA, WFH & HFA) showed agreement amongst themselves while the MUAC did not. In general, children showed some improvement at end of VCNC stay but slumped back to under-nutrition at end of 1 year. Long term benefits of VCNC based intervention as per this study are not very encouraging.

**Key words:** Children, Nutritional status, Village Child Nutrition Center

### Introduction:

As per NFHS 3 (2005 – 06) in India, amongst <5 years children, 48% are stunted, 20% are wasted and 43% are underweight. <sup>[1]</sup>HUNGaMA report (2011) in same population also showed 42% underweight and 59% stunted. <sup>[2]</sup> In Gujarat, among similar children, these proportions were 52%, 19% and 45% respectively (NFHS 3). <sup>[3]</sup> Only 42% of children (6-23 months) are fed the recommended minimum times per day, 34% are fed from the minimum number of food groups and only 1 in 5 children are fed according to recommended Infant and Young Child Feeding (IYCF) practices. <sup>[3]</sup>

Keeping in view the high proportion of undernourished children in Gujarat, a 3 tier approach called "Mission Balam Sukham" (welfare of children) <sup>[4,5]</sup> - was launched in January 2013 for management of

Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM) children. It comprises of following strategies:-

- 1. Village Child Nutrition Centers (VCNCs)** at Anganwadi Kendra (AWKs): Children are admitted here and given supplementary nutrition 5 times a day for 30 days.
- 2. Child Malnutrition Treatment Centers (CMTCs)** at identified Community Health Centres (CHCs): Children are referred (those who do not respond to intervention at VCNC or develop some illness for duration of 21 days) here from VCNC.
- 3. Nutrition Rehabilitation Centres (NRCs)** at district/medical college hospitals: Children are referred here from CMTCs for 25 days.

Above strategies result immediate improvement but the long term impact depends on the dietary/ feeding advices given to the care givers and also to what extent these advices are complied with. There is paucity of data on long term outcomes of undernourished children after being treated at such nutrition centres. Hence, this study was conducted to find out the outcome of undernourished children after being treated at VCNC (at end of one month) and thereafter at one year.

#### **Method:**

**Study setting:** AWKs at 2 PHCs of Kalol block where VCNCs commenced from June – November 2013.

**Study design:** Prospective Study

**Study Method:** Total 14 VCNCs were selected which functioned for June - November 2013 (6 months) under 2 PHCs (Rancharda & Hajipur) in Kalol taluka, Gandhinagar and were selected due to the proximity to institute. On day 0, 193 children (12 – 47 months) were enrolled in study. Due to the loss during follow up, numbers of children at the end of 1 month were 154. However, 26 children attended the VCNC for < 22 days and for 5 children, the exact attendance information was not available. So these 31 children were excluded from the study. Children included in the analysis were 123 at the end of VCNC stay and 97 (26 loss to follow up) at the end of 1 year.

Inclusion criteria were (1) child > 12 month of age but < 48 months of age and (2) child who was registered and attended any VCNC under study at least for 22 days out of 30 days prescribed stay.

Exclusion criteria were (1) child who was not registered or had attended the VCNC for <22 days, and (2) child who was < 12 months of age or had completed 48 months at the time of joining the VCNC (day 0) and (3) child whose parents were unwilling.

**Anthropometric measurements of children enrolled under VCNCs:** Weight, Height and Mid Upper Arm Circumference (MUAC) were recorded in all children at start of VCNC (day 0 $\pm$ 2 days), on completion of VCNC (day 30 $\pm$ 2 days) and 1 year after start of VCNC ( $\pm$ 2 days) by trained paramedical workers during visits at VCNCs. Visits at 1 year were conducted at AWK. Weight was measured by digital

weighing scale; height by making a child stand against a scale prepared using simple measure tape and MUAC by Shakir's (tri-coloured) MUAC tape. For the analysis of height parameters, only the children, whose height could be taken appropriately, were included. Children were classified for their under nutrition based on WHO child growth standards.<sup>[6]</sup>

**Qualitative component:** Observations during visit to VCNCs and Focussed Group Discussions (FGD) with Anganwadi workers (AWW) & mothers (1 each) were done to know their perceptions regarding VCNC.

**Data collection and analysis:** Data was collected by trained paramedic staff under direct supervision of investigators after receiving necessary training on a pre-designed questionnaire for basic information of child and anthropometric measurements. Data was entered and analysed using MS Excel 2007. Outcome variables i.e. weight, height & MUAC of children were analysed at 1 and 12 months in relation to baseline indicators (day 0).

**Ethical issues:** Study was undertaken after informing Taluka Health Officer (THO) Kalol and Medical Officers of respective PHCs. Study involved only collection of anthropometric information from the children after obtaining informed consent from parents. Study intended to evaluate long term effect and sustainability of an established public health intervention; hence no ethical clearance was sought. Care givers were informed that every child or parent have full right to discontinue from the study at any stage without giving any reason. All information (personal information & measurements) were kept confidential and used only for research purpose.

#### **Results:**

In the study population (n=193) at start of VCNC, 62 (32.1%) were in 12-23 months, 72 (37.3%) were in 24-35 months and 59 (30.6%) were in 36-47 months with mean age of 29.6 + 10.1 months. Female proportion was 53.4% and male being 46.6%.

Out of 193 children (based on WFA), 130 (67.5%) were underweight. Proportion of underweight children at 1 month reduced to 61.8%.

**Table 1: Zone wise distribution of children as per Weight For Age**

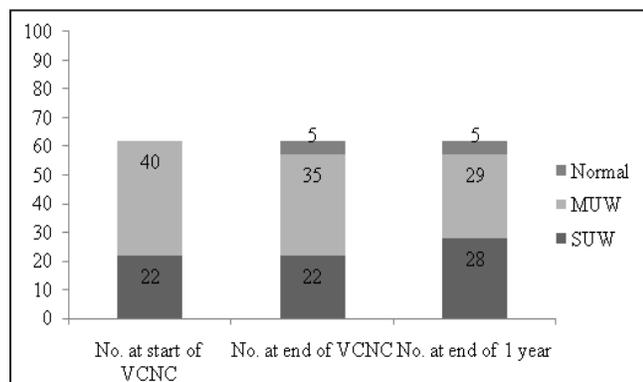
Zone as per WFA criteria	At start of VCNC No. (%)	At end of VCNC No. (%)	After 1 year of VCNC No. (%)
Green	63 (32.6)	47 (38.2)	30 (30.9)
Yellow- MUW	85(44.1)	44(35.8)	37 (38.2)
Red- SUW	45(23.3)	32 (26.0)	30 (30.9)
Total	193	123	97

Note: Children with z score up to - 2 SD are included in green, those with z-score between -2SD and -3SD in yellow and those with z-score below -3SD in the red zones.

However, at the end of 1 year, it got increased from 67.5% to 69.1% (Table 1). Till the end of 1 year, 62 underweight children including 22 severely underweight (SUW), 40 moderately underweight (MUW) could be followed. At the end of 1 month, out of 22 SUW, 17 remained SUW, 4 moved to MUW and 1 to Normal while out of 40 MUW, 31 remained MUW, 5 moved to SUW and 4 to normal. So total 22 were SUW, 35 were MUW and 5 were normal at end of 1 month (Figure 1). At end of 1 year, out of 22 SUW, 16 remained SUW, 3 moved to MUW and 3 to Normal and out of 40 MUW, 26 remained MUW, 12 downgraded to SUW and 2 moved to normal. So total 28 were SUW, 29 were MUW and 5 were normal at the end of 1 year. (Figure 1)

74 (60.2%) of eligible children showed weight gain during VCNC stay. Average weight gain in gm/kg/ day was 1.4 gm/kg/day only. Only 2 children

**Figure 1: Follow up status of UW children followed till 1 year (n=62) as per Weight For Age**



gained weight between 5-10 g/kg/day, while for the rest, weight gain was <5 gm/kg/ day. At start of VCNC mean weight of children (n= 97 who could be followed for 1 year) was 9.79 ± 1.80 kg, at 1 month 9.91 ±1.83 kg and at end of 1 year of VCNC, it was 11.06 ± 1.86 kg. The differences between the weights were statistically significant (on paired t test p<0.01).

**Table 2: Zone wise distribution of children as per Weight For Height**

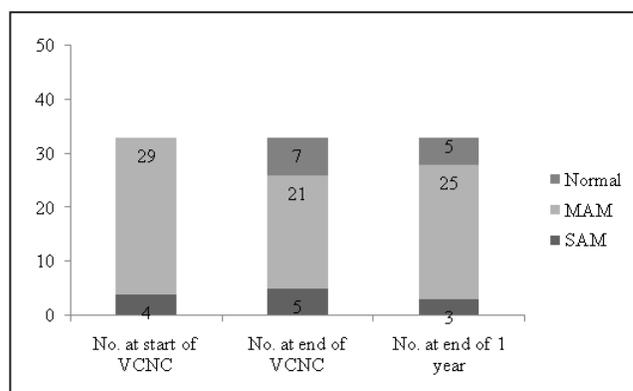
Zone as per WFA criteria	At start of VCNC No. (%)	At end of VCNC No. (%)	After 1 year of VCNC No. (%)
Green	95 (55.2)	49(50.5)	36 (47.4)
Yellow- MAM	65 (37.8)	38 (39.2)	32 (42.1)
Red- SAM	12 (7.0)	10 (10.3)	8 (10.5)
Total	172 (100.0)	97 (100.0)	76 (100.0)

Note:

- Children whose height could be measured properly were only taken into consideration.
- Children with z score above -2 SD are included in green zone, with z-score between -2SD & -3SD are included in yellow zone and those with z-score below -3SD are included in red zone.

Based on "Weight for Height", 77/172 (44.8%) children (12 SAM & 65 MAM) were malnourished at day 0. The proportion of malnutrition at the end of 1 month increased to 49.5% and at end of a year to 52.6%. (Table 2) Till the end of 1 year, 33 malnourished children (4 SAM, 29 MAM) could be followed. At the end of VCNC, 7 moved to normal. At the end of 1 year, 5 children were normal, rest were still SAM/MAM. (Figure 2)

**Figure 2: Follow up status of SAM & MAM children followed till 1 year (n= 33) as per Weight For Height**



Based on “MUAC”, 32 (16.6%) children were malnourished (6 SAM & 26 MAM) at start of VCNC. Overall proportion of malnutrition as per MUAC was 12.2% at the end of VCNC stay and further decreased to 5.2% at 1 year. (Table 3)

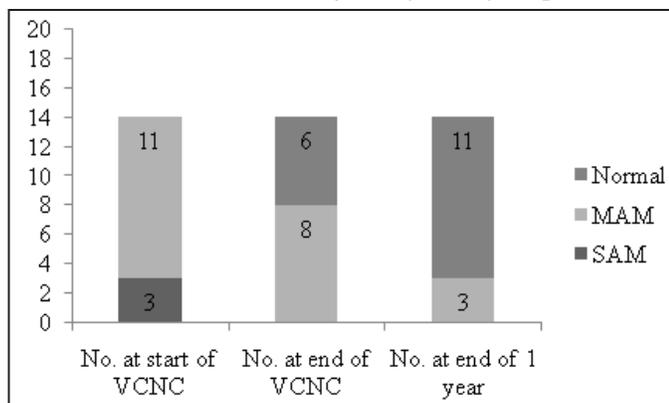
**Table 3: Zone wise distribution of children as per MUAC criteria**

Zone as per MUAC criteria	At start of VCNC No. (%)	At end of VCNC No. (%)	After 1 year of VCNC No. (%)
Green	161 (83.4)	108 (87.8)	92 (94.8)
Yellow- MAM	26 (13.5)	14 (11.4)	05 (5.2)
Red- SAM	06 (3.1)	01(0.8)	0
Total	193	123	97

Note: children with MUAC < 11.5 cm are in red zone; those with MUAC between 11.5 and 12.5 are in yellow and children with MUAC > 12.5 cm included in green zone.

Till the end of 1 year, 14 malnourished children (3 SAM, 11 MAM) could be followed. At the end of 1 year, 11 moved to normal and 3 remained MAM. (Figure 3)

**Figure 3: Follow up status of SAM& MAM children followed till 1 year (n= 14) as per MUAC**



At start of VCNC, mean MUAC of children (n= 97 who could be followed for 1 year) was 13.67 + 1.08 cm, at 1 month 13.71 + 1.01cm and at end of 1 year of VCNC, it was 14.06 + 0.99 cm. The difference between the MUAC at start and end of VCNC was not significant (p>0.05). But it was significant between start and end of VCNC to end of 1 year (on paired t test p<0.01).

Stunting was analysed by “Height for Age” criteria which showed 134 (77.9%) children were stunted at start of VCNC. At the end of 1 month stay at VCNC,

**Table 4: Zone wise distribution of children as per HFA criteria**

Zone as per H/A criteria	At start of VCNC No. (%)	At end of VCNC No. (%)	After 1 year of VCNC No. (%)
Green	38 (22.1)	25 (25.8)	18 (23.7)
Yellow	53 (30.8)	36 (37.1)	23 (30.3)
Red	81 (47.1)	36 (37.1)	35 (46.0)
Total	172	97	76

Notes: 1. Children whose height could be measured properly were only taken into consideration. 2. Children with z-score more than - 2 SD are included in green zone, those with z-score between -2SD and -3SD are included in yellow zone and Children with z-score < -3SD are included in red zone.

proportion of stunting was decreased to 74.2% while at the end of 1 year, it was 76.3%.(Table 4)

At start of VCNC mean height of children (n= 76 whose height could be taken properly and who could be followed for 1 year) was 83.4 + 8.4 cm, at 1 month 84.1+ 8.2 cm and at end of 1 year of VCNC, it was 90.2 + 7.6 cm. The differences between the heights from start to end of 1 month and to end of 1 year were statistically significant (on paired t test p<0.01).

**Major Findings of FGD with AWWs**

- Regarding timings of VCNC, AWWs felt that it was not convenient for themselves, children as well as for their mothers to stay for 9 am to 5 pm.
- On enquiring out of 5 meals how many meals children take, they mentioned that most children were unable to take all 5 meals; usually they take 3 meals. Rest they may take to home which whether child ate or not, cannot be confirmed.
- The reasons why children are not attending VCNC regularly were mothers do not bring their children or if mothers were laborers, they took children along.

- On additional benefit of giving 5 times meals over regular 3 times meals of AWK, they opined that providing 3 meals as per routine schedule is enough.

### Major Findings of FGD with Mothers

- Regarding staying for 9 to 5 at VCNC, they said that usually children do not sit for this period and they did not have time to sit with them for this long time.
- Regarding changes in weight of child after VCNC, they were not much aware about it.

### Discussion:

In this study, mean age of children (n=193) admitted at VCNC was  $29.6 \pm 10.1$  months with female proportion being 53.4%. A study conducted in NRC in MP<sup>[7]</sup>, the mean age for the admitted children was  $23.9 \pm 13.7$  months with girls being about 52%.

Proportion of underweight children at 1 month reduced from 67.5% to 61.8%. However, at the end of 1 year, it got increased to 69.1% (Table 1). 60.2% of eligible children showed weight gain after 1 month of VCNC stay with average weight gain of 1.4 gm/kg/day which is considered to be poor as per the WHO Guidelines for the inpatient treatment of SAM child.<sup>[8]</sup> In a study done at Vadodara<sup>[9]</sup>, 83.7% children gained weight after 1 month of attending VCNC with mean weight gain of 1.56 gram/kg/day. Even though the weight gain per day was not satisfactory, the differences between the weights at start and end of VCNC and at the end of 1 year were statistically significant in the present study. Average weight gain difference for 1<sup>st</sup> month was not found statistically significant in Vadodara study.<sup>[9]</sup> However, in MP study<sup>[7]</sup>, difference in mean weights at admission and discharge was statistically significant.

Based on "Weight for Height", 77/172 (44.8%) children were malnourished at day 0. The proportion of malnutrition at the end of 1 month increased to 49.5% and at end of a year to 52.6% (Table 3). Out of 77, 33 could be followed till end of 1 year; of which only 7 (21.2%) moved to normal rest were still malnourished (figure 2). In a study in Vadodara<sup>[9]</sup>, according to weight for height criteria total 40/ 98

(40.8%) were malnourished in VCNC. At the end of 3 months 21(52.5%) children improved their malnutrition.

Based on "MUAC", 32 (16.6%) children were malnourished at start of VCNC. Overall proportion of malnutrition as per MUAC was 12.2% at the end of VCNC stay and further decreased to 5.2% at 1 year (Table 4). At start of VCNC mean MUAC of children (n=97 who could be followed for 1 year) was  $13.67 \pm 1.08$  cm, at 1 month  $13.71 \pm 1.01$ cm (average increase being 0.4 cm) and at end of 1 year of VCNC, it was  $14.06 \pm 0.99$  cm (average increase being 0.39 cm). The difference between the MUAC at start and end of VCNC was not significant. But it was significant between start and end of VCNC to end of 1 year. In a study in Vadodara<sup>[9]</sup>, among children admitted at VCNC, average increase in MUAC was  $0.1489 \pm 0.3347$  cm with no statistical significant difference over 3 months. In a study of MP<sup>[6]</sup>, mean MUAC at admission was  $11.32 \pm 1.18$  cm and at discharge it was  $11.94 \pm 1.38$  cm with statistically significant difference where, quite lower MUAC at admission may be because children admitted at NRC are those who have severe malnutrition.

134 (77.9%) children were stunted at start of VCNC. At the end of 1 month stay at VCNC, this proportion decreased to 74.2% while at the end of 1 year, it was 76.3%. (Table 5) The differences between the heights from start to end of 1 month and to end of 1 year were statistically significant ( $p < 0.01$ ).

In a study from Maharashtra<sup>[10]</sup>, out of total severely and moderately acute malnourished children admitted to VCDC, 76% got improved in total but still the individual indicators showed a piteous picture.

Qualitative findings similar to present study were found in a study at Vadodara<sup>[9]</sup> that it was difficult to make the children sit at Anganwadi centre without their parent (s) from 9 am - 5 pm. Mothers were less willing to be with their child for this much time because they leave their other children at home or had to go to farms during the sowing season. They also concluded that short term VCNC supplementary nutrition was helpful to borderline malnourished children to overcome/improve their malnutrition

grades in short period. Over a 3 months or long term period, VCNC supplementation for 1 month was not found adequate to give sustained result.

### Conclusion & Recommendations:

- Role of VCNC in this study in improving nutritional status of SUW/SAM and MUW/MAM children need a re-look; none of the outcomes, immediate and long term were promising.
- Reduction in weight at 1 year suggests focus was on feeding for instant gains and not on sustaining healthy eating habits. Hence along with the food supplementation, due importance is needed for parental counseling to improve food habits at home.
- Being easy to assess and most sensitive to detect under nutrition & impact of intervention, WFA was best indicator.
- Perceptions of beneficiaries and providers on VCNC were that it is good strategy but needs modifications to make it convenient for both the stakeholders in terms of timings. As per the AWWs, further strengthening the routine supplementary nutrition program at AWC is equally beneficial rather than starting a separate new program.
- AWCs reporting improvement in the nutritional status of children can be showcased and incentivize to motivate them to work effectively for malnutrition.
- It may be noted that assessment of nutritional status of these children is based purely on the anthropometric indicators.

### Limitations:

1. Children who were out of village on day of visit or migrated could not be followed up.
2. Actual number of hours of stay, number of meals and the quantity consumed by a child was not monitored.
3. Height was measured using simple measure tape with which it was difficult to measure height in uncooperative child leading to reduced denominator for HFA & WFH.

### Declaration:

Funding: Nil

Conflict of Interest: Nil

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## Effects of Exposure to Flour Dust on Respiratory Symptoms of Flour Mill Workers in Ahmedabad City

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### Abstract:

**Introduction** : Flour milling is a rampant industry in India where the workers are continuously exposed to dust. Workers engaged in flour milling are at risk of developing respiratory health problems due to high level of dust exposure. Our aim was to correlate the respiratory problems arising among flour mill workers with their exposure and habits. **Objective**: To assess the effect of exposure to flour dust on respiratory symptoms and additive effects of smoking and years of exposure. **Method**: It's a cross-sectional study. All six zone of Ahmedabad municipality were covered. 29 flour mills were covered. Total study population was 62 which included both owners and workers. **Results**: Current study population consisted of 29(46.77%) mill owners & 33(53.23%) mill workers. Majority of them belonged to above 35 years of age 20 (32.26%), 50(80.65%) were males and 12(19.35%) were females. Among the study population, 55(88.71%) were smokers and 43(69.35%) were working in mills for more than 10 years. Our survey revealed that none of them used any protective device against flour dust. In the study group 60(96.77%) were suffering from prolonged dry cough and 22(35.48%) had complains of dyspnea on and off. **Conclusion**: Prolonged exposure to flour mill dust do cause various respiratory problem among the mill workers and smoking has a synergistic effect on them.

**Key Words**: Flour dust, Respiratory symptoms, Smoking

Flour dust is seen across a range of food industries; its exposure may induce acute or chronic respiratory ailments. The term 'flour dust' refers to particles coming from finely milled cereal or non-cereal grains. Wheat flour contains at least 40 allergens which can cause adverse health effects in exposed workers. Proteins with potential allergenic activities represent about 10–15% of wheat grain dry weight. The aerodynamic sizes of flour dust particles vary between  $\leq 4$  and 30  $\mu\text{m}$ .<sup>[1]</sup>

Their kinetics in the lungs follows the pattern of other particulate aerosols of a similar type and their deposition within the respiratory tract is determined by the particle size, shape, density as well as by the respiration volume. Most particles greater than 10  $\mu\text{m}$ , and up to 80% of particles between 5 and 10  $\mu\text{m}$ , are trapped in the nasopharyngeal region due to inertial impaction and centrifugal condensation resulting from the anatomic formation of these parts of the respiratory tract. Particles trapped and

deposited in the upper parts of the respiratory tract are usually removed within a few hours by the mucociliary system or as a result of expectoration. Massive exposure may lower the ability of macrophages to eliminate particles, which may result in penetration of dust into the interstitium.

Inhaled particles with aerodynamic diameters equal or above 10  $\mu\text{m}$  cause eye or nose irritations. Particles with sizes between 5 and 10  $\mu\text{m}$  may provoke asthmatic reactions. Particles below 5  $\mu\text{m}$  may evoke an allergic alveolitis type of reaction.<sup>[1]</sup>

Three groups of workers have an increased risk of adverse health effect appearance when exposed to flour dust: (a) workers with a flour sensitization after repeated exposure to low levels of flour dust; (b) workers with an atopic status or an allergic constitution; and (c) workers with pre-existing asthma or those with more general respiratory symptoms. Epidemiological reports have

showed that asthma, conjunctivitis, rhinitis and dermal reactions are the major health effects of flour dust exposure.

**Method:**

Indian wheat flour is mostly ground in stone mills popularly called as chakkis. Chakkis is nothing but a pair of stones, of which, one is stationery and other is a rotating.

From all Ahmedabad Municipality Zone, Flour mills were selected randomly.

Sr.No	Zone	Flour milled surveyed	Person covered
1	North	5	13
2	East	5	7
3	West	5	12
4	South	5	11
5	Central	6	9
6	New West	3	10
	Total	29	62

All the workers were given pre designed questionnaires and data were analyzed using Microsoft excel. The co-authors assisted in designing the study, collecting data and analyzing the data.

**Results & Discussion:**

**Table 1: Age and sex wise distribution of study population.**

Age in years	Total	Male	Female
15 to 20	7(11.29%)	7	0
20 to 25	11(17.74%)	11	1
25 to 30	13(20.97%)	12	1
30 to 35	10(16.13%)	8	2
Above 35	20(32.26%)	12	8
Total	62	50(80.65%)	12(19.35%)

Table 1 shows age wise distribution of surveyed population with maximum 20(32.26%) of them lying above 35 years of age, followed by age group of 25 to 30 years 13(20.97%) and 20 to 25 years 11(17.74%). There were only 12(19.35%) female and they were nearly above 35 years of age group. In a study done by Meo SA all 46 workers were in age group of 18 to 65 years of age and all were males.<sup>[2]</sup>

**Table 2: Educational status of flour mill workers**

Education	Frequency	Percentage
Primary	17	27.42
Secondary	24	38.71
Higher secondary	20	32.26
Graduates and above	1	1.61

Table 2 shows that a total of 24 (38.71%) flour mill worker were educated till secondary schooling followed by 20 (32.26%) completed higher secondary schooling. Only one of the flour mill owner was graduate.

**Table 3: Years of exposure to flour dust on flour mill workers**

Years	Frequency	Percentage
< 10	19	30.65
≥ 10	43	69.35

As per table 3, 43(69.35%) mill workers were working in this occupation for more than 10 years. In Trithankar study the years of experience of workers were nearly 15.9 years<sup>[3]</sup> while in Mohammadien study group 104(48%) workers were with 10 years of experience.<sup>[4]</sup>

**Table 4: Working hours of flour mill workers in a day**

Hours	Frequency	Percentage
< 8 hours	5	8.06
≥ 8 hours	57	91.94

Table 4 says that 57 (91.94%) of mill workers work for more than 8 hours per day in the same exposed premises. None of the flour mill worker used any protective devices to protect them from flour dust. In the study conducted by Ghosh et al, workers work for 7 days a week with average duration of work per day is 12 hours.<sup>[3]</sup>

**Table 5: Smoking and tobacco chewing habits among the mill workers**

Habit	Male	Female	Total
Smoking	50(90.9%)	5(9.09%)	55(88.7%)
Chewing tobacco	36(75%)	12(25%)	48(77.41%)
Both	27(43.55%)	5(8.06%)	32(51.61%)

\*Multiple answers were accepted

(Table 5) Among flour mill workers 50(90.9%) were smokers & 36(75%) were having habit of chewing tobacco (guthka). In females 5(9.09%) had habit of smoking & 12(25%) had habit of chewing tobacco. 27(43.55%) male & 5(8.06%) females means total 32 (51.61%) had both habit of smoking & chewing tobacco. While in a study done in Egypt by Hamdy.A. Mahammadien 75% of their study population was smoker.<sup>[4]</sup>

There was statistically significant association between symptoms presentation & smoking & tobacco chewing in both the sexes with chi square 4.202, degree of freedom 1 p value 0.04404 which is significant. Similar findings were seen by Hamdy.A. Mahammadien in Egypt.<sup>[4]</sup>

In male there was association between any habit (smoking or chewing tobacco) and getting symptoms with chi square 9.3808, degree of freedom 1 p value is 0.002193 which is highly significant. No association was found between smoking and respiratory symptoms by Tirthankar Ghosh.<sup>[3]</sup>

Nearly all 60 (96.77%) of them complain of constant dry cough on working hours and 12(19.35%) do complain of productive cough. Dyspnea was another major complain of 22(35.48%) of those workers. In other studies similar respiratory symptoms cough (30%), phlegm (25%), dyspnea (21

**Table 6: Respiratory symptoms amongst flour mill workers ( n=62\*)**

Symptoms	Frequency	Percentage
Dry cough	60	96.77
Productive cough	12	19.35
Dyspnea	22	35.48
Wheezing	8	12.90
Others	3	4.84

\* Multiple Responses

) were reported among workers at a cement factory in a rapidly developing country.<sup>[5]</sup>

Wagh ND found that in their study population, 42% of flour mill workers were having shortness of breath, 34% have increased frequency of coughing and 19% shows respiratory tract irritation.<sup>[6]</sup>

A significantly higher prevalence of respiratory symptoms in flour mill workers was related to the shortness of breath, wheezes, productive cough (p < 0.0001), also there are highly statistically significant differences for wheezes, crackles, hyperinflation and radiological finding.<sup>[4]</sup>

**Table 7: Non-respiratory diseases or symptoms among flour mill workers ( n=62\*)**

Symptoms	Frequency	Percentage
Diabetes Mellitus	13	20.96
Hypertension	26	41.94
Asthma	7	11.29
Itching eyes	38	61.29
Skin allergy	24	38.71

\*Multiple Responses

Table 7 shows that 26(41.94%) of workers were suffering from hypertension & 13 (20.96%) were suffering from diabetes mellitus. 7 (11.29%) among them had history of asthma. Association of respiratory symptoms and diabetes & hypertension was not statistically significant. Itching of eyes 38(61.29%) and skin allergy 24 (38.71%) were other two common complain given by flour mill workers.

**Recommendation:**

We recommend the compulsory use of personal protective equipment (nose mask) by flour mill workers during working hours. This would help to protect the workers health from the flour dust prevalent in the workplace environment. A regular periodic examination is necessary to measure the impact of particulate matter on the health of the flour mill workers.

**Declaration:**

Funding: Nil

Conflict of Interest: Nil

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## Effect of Health Education on Grass root level Health Workers Regarding Pre-Conception and Pre-Natal Diagnostic Techniques Act (PCPNDT Act)

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### Abstract:

**Introduction:** The declining sex ratio of girls and women in India is a major concern for all. For proper implementation of PCPNDT Act health workers like medical, paramedical and grass root level health workers must have proper knowledge about the act. **Objective:** To assess the knowledge of grass-root level health workers regarding PCPNDT Act and to measure the improvement in knowledge after health education. **Method :** Interventional study was carried out at Sahaj Trust, Baroda. 30 workers who attended a workshop on 9<sup>th</sup> July, 2015 were administered a pre and post-test questionnaire. All workers were from different NGOs from all over Gujarat and all were working in maternal and child health services. After completion of their pre-test, all 30 participants were given an interactive talk on PCPNDT Act by expert. To prove the presumption that the health education had helped in improvement in knowledge all participants were asked to answer a similar questionnaire again. **Analysis:** Analysis was done using MedCalc software. Means and SD of Pre and Post intervention scores were calculated and paired t-test was applied. **Results:** Mean±SD of pre intervention questionnaire score was 17.23±3.97 and mean±SD of post intervention questionnaire score was 20.93 ± 3.29 (total score was 28). Analysis of these data on applying paired t-test showed that there is a significant improvement in the knowledge of health care workers after educating them on PCPNDT act. (p=0.0005) **Conclusion:** Health education of the grass root level health workers resulted in improvement of their knowledge about PCPNDT act. **Implication:** It is necessary to empower grass root workers by giving them health education on PCPNDT Act and improving their knowledge on regular interval.

**Key Words :** Grass root level health workers, Health education, Pre-conception and Pre-natal diagnostic techniques act

### Introduction:

The social, cultural and religious fibre of India is pre-dominantly patriarchal contributing extensively to the secondary status to women. The patrilineal social structure based on the foundation that the family line runs through a male makes a man a precious, another important pillar of the patriarchal structure is marriage wherein women are given a subordinate status. The dowry or groom price is so high irrespective of the class structure that generation may have to toil to repay the debts incurred during marriage. All of this has contributed to a low social status for women in society, to such an extent that even the birth of a girl child in a family is sought to be avoided. Common reason is basically that a girl is seen as liability-she will get married and leave the house, so cannot be counted for support in old age, needs to be protected much more, so makes it

difficult for both parents to work (i.e. somebody needs to be at home with the girl to make sure she is safe), much higher chances of bringing disgrace to the family if something goes wrong. Denial to a girl child of her right to live is one of the heinous violation of the right to life committed by society, Gender bias and deep rooted prejudice preference of male child have led to large scale female foeticide in the last decade. The main purpose of PCPNDT Act, 1994 has been to ban the use of sex selection techniques before or after conception as well as the misuse of Pre-natal diagnostic techniques for sex selective abortion and to regulate such techniques. <sup>[1]</sup>The declining sex ratio of girls and women in India is a major concern for all. Sex ratio in India has been declining through decades since 1903. <sup>[2]</sup> The census data indicate that female ratio has been declining at an alarming rate and this would lead a serious socio-cultural problem

including violence and population imbalance leads to domestic violence, rape, sexual abuse, dowry harassment, trafficking. There is increase demand for sex determination technology and therefore this would continue to be supplied. <sup>[3]</sup>The issue of survival of girl child is a critical one, deep rooted in the society which needs systematic efforts in mobilizing the community. In order to check female foeticide. the PNDT Act 1994 was enacted and brought into operation from 1<sup>st</sup> January, 1996. PNDT Act and rules were amended and amended act / rules came into force with effect from 14<sup>th</sup> February, 2003 as PCPNDT Act. <sup>[1]</sup> The census of 2011 showed that sex ratio was 943 girls / 1000 boys and child sex ratio was 919 / 1000. <sup>[4]</sup> This decline has been interpreted as the direct result of more sex selective abortions of female fetuses. Various factors that can be attributed to the decline in sex-ratio include increase sex selective female abortion and female foeticide. One of the most important preventable factors among these is the prevention of selective female abortion. <sup>[5]</sup> However, it is important to note that in India unlike most countries of the world more girls than boys have been dying during childhood and this contributes to a decline in child sex ratio. This is because of fetal sex determination was common, if the family already had daughters, sex determination seems to be driven by a desired to have sons, with socioeconomic status and education having little effect. <sup>[6]</sup> The Act was acting since last 20 years but there is no increase in sex ratio and sex selective abortion are increased. For proper implementation of this act health worker like medical, paramedical and grass root level health workers must have proper knowledge about the act. Medical and paramedical persons have knowledge but, do you think that grass root level health workers have proper knowledge about PCPNDT ACT and conveying right message to the community. Most of the people know about the Pre-natal sex determination and it was a punishable offense, still majority of the people preferred to know the sex of unborn child which shows the need to implement the act effectively. <sup>[7]</sup> Our study was conducted at Sahaj Trust, Vadodara (Gujarat) to assess the proper knowledge of grass root level health workers.

**Objectives:**

To assess the knowledge of grass root level health workers regarding PCPNDT

To measure the improvement in knowledge after education

**Method:**

Current interventional study was conducted at Sahaj trust, Vadodara. Workshop was done on maternal and child health on 9<sup>th</sup> July, 2015. Sahaj trust contacted about 100 NGOs related to maternal and child health from all over Gujarat. These NGOs were requested to send their workers whoever active in maternal child health to the Sahaj trust facility in Vadodara. On the Day of workshop, 9<sup>th</sup> July, 2015, 30 grass root workers working in maternal and child health were come and they were segregated and involved in the study. Out of these 30 Grass root level health workers 22 were females and only 8 were male health workers. To evaluate their Knowledge regarding PCPNDT Act they were introduced to a pre-tested semi structured questionnaire after taking their oral consent. There were 14 questions. Each question carries 2 marks. After completion of their test, all 30 participants were shown a video of 10-15 minutes, video contain the information regarding sex ratio, common problems society faced after declining sex ratio, information regarding PCPNDT Act, after completion of the video they were given an interactive talk in which the topics covered were: why do we need the act, discuss about current sex ratio, what is the drawback of decreasing sex ratio, impact of sex determination technique and sex selective abortion on decreasing sex ratio, about pre-natal diagnostic technique and in which condition we can use it, what is the procedure for registration, legal initiative, process of registration, renewal of registration, prohibition of act on place and persons by expert from health institution. To prove presumption that the education had helped in improvement in knowledge, all participants were asked to answer a similar questionnaire again. Analysis was done by using MedCalc software. Means and SD of Pre and Post intervention scores were calculated first. Then a paired t-test was applied on these data to see if the improvement in the knowledge is significant or not.

**Results:**

All the participants in our study knew that sex ratio in our country is low. Out of these 30 participants 22 were female and 8 were male. Age of the participant ranged between 21 to 45 years. Majority of the participants were between 30 to 40 years of age group. Mean age of the study participants was around 33.13 year (SD=6.61). Most of the

**Table 1: Socio-demographic Factors (N=30)**

Variable / Factor		No. of Participants
Age (Mean $\pm$ SD ) in years		33.13 $\pm$ 6.61
Sex	Female	22 ( 73.33 % )
	Male	8 ( 26.66 % )
Age Group in years	21-25	4 ( 13.33 % )
	26-30	8 ( 26.66 % )
	31-35	9 ( 30 % )
	36-40	3 ( 10 % )
	41-45	6 ( 20 % )
Education	Passed 10th Standard	( 10 % ) 3
	Passed 12th Standard	( 30 % ) 9
	Graduate	18 ( 60 % )
Monthly Income of Family (INR)	<3000	5 ( 16.66 % )
	$\geq$ 3000	4 ( 13.33 % )
	$\geq$ 5000	15 ( 50 % )
	$\geq$ 10000	6 ( 20 % )

participant were educated up to graduate (18) followed by 12<sup>th</sup>(9) and 10<sup>th</sup>(3) standard.50 % participants had income between Rs5000 to Rs. 10000.

Table 1 shows the socio-demographic profile of the participants. Results of pre-intervention questionnaire showed that grass root workers could score only 17.23 (mean) marks out of maximum of 28 marks. Before health education 86 % of the

participants knew that sex determination was illegal after health education this response was increase to 93 %. Among the participants 70 % had difficulty in answering question regarding punishment (n=21 couldn't answer) and 43 % of the participants had difficulty in question regarding who can actually lodge complaint (13 couldn't answer) and after health education, these responses improve to 93 % of them knew punishment and 60 % knew where to lodge complaints against sex determination. 66 % of the participants knew that they couldn't advertise for the sex determination and after health education this response increase to 70 %. After the intervention in form of health education, the answer revealed an increase in basic knowledge of PCPNDT Act, which can be due to the intervention (health education). Significant differences were seen between before and after the health education.

Table 2 shows the knowledge of the participants before and after intervention. Mean  $\pm$  SD of Pre-intervention questionnaire score was 17.23  $\pm$  3.97 and Mean  $\pm$  SD of Post-intervention questionnaire score was 20.93  $\pm$  3.29. Analysis of these data on applying paired t-test showed that there is a significant improvement in the knowledge of health care workers after health educating them on PCPNDT Act (p=0.0005).

**Discussion:**

This study revealed that mean knowledge score regarding PCPNDT Act among grass root level health workers was 17.23 and there was significant increase to 20.93 after health education (p=0.0005). Main source of spreading knowledge among lay people and illiterate people are grass root level health workers. In rural India for most of the people source of information were grass root level health workers. All of the participants know that sex ratio in our country is very low. As to basic medical knowledge 86.6 % of the workers knew before intervention that sex determination was an illegal act and this knowledge increase to 93.3 % after health education. Before intervention 80 % of the workers knew that sex determination was a punishable offence, this rate increase to 93.33 % after health education. But in our study only 30 % of the participants knew that what

**Table 2: Knowledge of Health Workers before and after intervention**

Question	Response	Pre-test Participants (Percentage)	Post-test Participants (Percentage)
1. Do you think that sex determination is legal?	Know Don't Know	26 (86.66) 4 ( 13.33 )	28 (93.33) 2 ( 6.66 )
2. Who is responsible for girl or boy child?	Father Don't Know	19 (63.33) 11 ( 36.66 )	19 (63.33) 11 (36.66 )
3. Do you know that sex determination is punishable?	Know Don't Know	24 (80) 6 (20 )	28 (93.33) 2 ( 6.66 )
4. Can we sex advertise for determination?	Yes No	10 (33.33) 20 ( 66.66 )	9 (30) 21 ( 70 )
5. What are the punishment for sex determination?	Imprisonment /Fine Don't Know	9 (30) 21 ( 70 )	28 (93.33) 2 (6.66 )
6. Who have right to complaint against sex determination	Anyone Don't Know	17 (56.66) 13 ( 43.33 )	18 (60) 12 ( 40 )

was the punishment for violation of act and after intervention this knowledge was increase to 93.33 %. Whereas in studies conducted at Hussan and Mumbai only half of the participants knew that prenatal sex determination was a punishable offence.<sup>[8-10]</sup> In our study majority of the participants knew that ultrasonography is the technique used for sex determination. This observation was similar to that reported in a study conducted in Mumbai, Maharashtra.<sup>[8]</sup> In our study 66.66 % of the participants had knowledge about that they couldn't advertise for sex determination, after health education this knowledge increased to 70 %. Nearly half (56.6%) participants had not knowledge about who have right to complaint against sex determination, after health education their knowledge increased to 60 %.

**Conclusion:** Health education of the grass root level health workers result in improving their knowledge about PCPNDT Act.

**Recommendation:** Grass root people are in direct contact with community and if they don't have proper knowledge; how can they convey right message to the community? So, it is necessary to empower grass root level health workers by giving them health education and improving their knowledge on regular interval.

**Acknowledgement:**

The authors would like to acknowledge "SAHAJ" NGO for giving an opportunity of interactive talk on PCPNDT act with grass root level health workers and giving the permission for doing the study.

**Declaration:**

Funding: Nil

Conflict of Interest: Nil

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## An Assessment of Health Status and Standard of Living of Rag pickers in an Urban Area of Ahmedabad

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### Abstract :

**Introduction:** We are in era of “Swatch Bharat Mission” and emphasized to keep clean our surroundings. The rag pickers are the main pillars of it but the irony of present times is; they are highly neglected. **Aims and Objectives:** 1. To study socio demographic profile of rag pickers. 2. To assess the health status of rag pickers. 3. To study standard of living of rag picker families. 4. To evaluate utilization of health services. **Method:** The study design adopted for present study is cross sectional study. The study population included rag pickers residing in Bhavaninagar and Bapunagar area of Ahmedabad. The sample size was 100 which were selected by purposive sampling. The study period spanned from August 2016 to September 2016. The statistical analysis was done using appropriate software. The exclusion criteria for the current study is non consenting family members, closed houses, houses in which no adult family member was there to answer. **Results:** Out of total 119 rag pickers, 78% were female. 34.45% of rag pickers were of 40 to 49 years age group. 48% rag pickers was illiterate. As oral tobacco consumption (58.3%) was higher among male while female were used to have snuffing (28%). 68.37% rag pickers were hypertensive. Rag- pickers were mostly suffering from body ache (34%) and also suffered from backache (20%), dizziness (20%) and skin allergy (19%). The rag pickers got 8 kg/day of waste on an average. **Conclusion:** Female predominance was seen in rag picking. Illiteracy rate was higher than urban population. Living condition of rag pickers was poor and some of them did not have access to basic amenities like toilet and sufficient safe drinking water supply and separate bathing facilities.

**Key words :** Addiction, Health services, Health status, Literacy, Rag pickers

### Introduction:

Round the clock 24 by 7 a lot of waste is generated by the community. The waste material can be a nuisance and the sources of pollution in air, water and soil, if not treated appropriately. Consequently, a high incidence of illness is caused, such as dysentery, typhoid, fever, enteritis, cholera and diarrhea. It is very common to find large heaps of garbage lying in a disorganized manner in and around the cities due to the inability of municipal corporations to handle the large quantity of waste.<sup>[1]</sup> It is a matter of great importance that how this waste is being managed. Numbers of people are working for the removal of this waste from the street the betterment of the society by disposing off the waste the community generates. They are rag pickers; correctly called as the invisible environmentalists who have adapted waste collection and disposal as their mode of living.

Most of the rag-pickers are extremely poor, illiterate, and belong to rural immigrant families. Many commence their profession at the young age of five to eight years. Most of them never attend any school or have any formal education.<sup>[1]</sup> In Ahmedabad, more than 50,000 rag pickers slog daily to unload at local garbage collectors.<sup>[2]</sup> They work for a meager income but have an irreplaceable impact on our lives. As they are exposed to number of health hazards, they are prone to get many communicable and non-communicable diseases. Although these are the people who help in keeping the environment clean, the irony of present times is that; this group of people is highly neglected by the health system. Apart from the health problems, they also face many social problems like social stigma. It is a need of the hour to focus on this particular group of the society so that they too can enjoy a healthy life full of dignity. The

current study was carried out to obtain the health status of the rag picker families and the problems confronted by them.

#### Objectives:

1. To study socio demographic profile of rag pickers.
2. To assess the health status of rag pickers.
3. To study standard of living of rag picker families.
4. To evaluate utilization of health services.

#### Method:

The study design adopted was the cross sectional study type. The population selected was rag pickers residing in Bhavaninagar and Bapunagar area of Ahmedabad. The exclusion criteria for this study is non consenting family members, closed houses, houses in which no adult family member was there to answer. The sample size of the study was 100 and the sampling technique was purposive sampling. Only those participants were selected who had at least one family member working as rag picker. The study used a semi structured questionnaire. The consent of study population was ensured to conduct the study and the permission was taken also from concerned Medical Officer of respective Urban Health Center. The Statistical analysis was done using appropriate statistical parameter.

First of all the areas in which the rag pickers were residing were identified namely Viratnagar and Bapunagar. Medical officers of both the UHC's were contacted and requested to facilitate the survey. The information was gathered by house to house survey. Interview of one family member was taken using the study questionnaire.

Housing condition was observed to evaluate quality of life. To get better quality of information the help of ASHA workers was taken.

#### Measurements:

Standard of living: Based on their housing condition

Basic amenities: Inspection

Blood pressure: Using sphygmomanometer

Vaccination status: Mamta card, Verbal questioning

Social stigma: Interview of rag pickers

Utilization of services: Asking for cards

#### Result:

Total 100 houses in which at least one of the family members was engaged in the profession of rag picking were visited. There were total 119 rag pickers from 100 houses. Female preponderance was seen as out of total 78 % rag pickers were females. All rag pickers were following Hindu religion. Half of the rag pickers had own houses while half of them were living in a rented house. 51 families were BPL card holder while 96 families and 51 families had at least one member holding Election card and Aadhar card respectively. Average family size was 4.6% persons /family

Table 1 shows that nearly one third of rag pickers were in age group from 40 to 49 years (34.45%). It was also found that in a house five year old child was accompanying her grandma for rag picking as there was no body to take his care.48% of them were illiterates.

As observed in figure 1, Out of 119 rag pickers 46.21 % rag pickers had addiction of tobacco or alcohol. 57 % male and 40 % female rag pickers had atleast one addiction. As oral tobacco consumption (58.3%) was higher among male while female were used to have snuffing (28%). Out of total 119, 98 rag pickers were present at home at the time of survey and could be interviewed and screened for health status.

Table 2 shows Distribution according to blood pressure measured among rag picker. As per JNC-7 criteria of hypertension, out of them 68.37 % rag pickers were hypertensive. Among them 69.05 % females had hypertension while 64.29 % males had hypertension.

Table 3 shows For Major illness 57% families preferred a Government Hospital followed by Municipal clinics 22%, private clinics 17%. Only 1% family preferred Trust and 3% preferred others for major illness.

All Rag-pickers were asked about health problems and social stigma they perceived because of rag picking. Table 4 shows Rag-pickers mainly

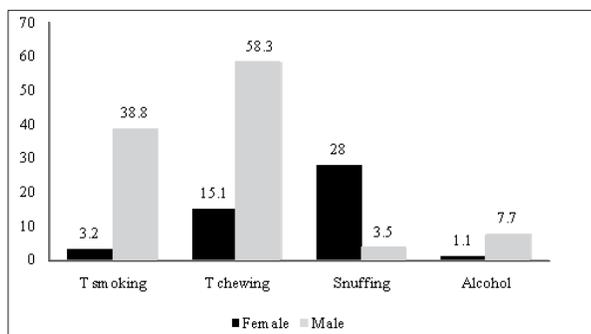
**Table 1: Socio demographic profile of Rag Pickers**

Age in years	Female		Male		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
<20	1	1.1	5	19.2	6	5.04
20-29	12	12.9	6	23.1	18	15.12
30-39	23	24.7	2	7.7	25	21
40-49	33	35.5	8	30.8	41	34.45
50-60	19	20.4	3	11.5	22	18.48
>60	5	5.4	2	7.7	7	5.88
Total	93	100	26	100	119	100
<b>Education grade</b>						
Illiterate	50	53.76	7	26.92	57	47.90
Primary	30	32.26	11	42.31	41	34.45
Secondary	12	12.9	7	26.92	19	15.97
Higher secondary	0	0	1	3.85	1	0.84
College	1	1.08	0	0	1	0.84
Total	93	100	26	100	119	100

**Table 2: Distribution of study participants according to blood pressure measured**

Blood Pressure	Female		Male		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Hypertensive	58	69.05	9	64.29	67	68.37
Normotensive	26	30.95	5	35.71	31	31.63
Total	84	100	14	100	98	100

**Figure 1: Type of addiction among rag pickers**



suffered from bodyache which was almost 34%. And also suffered from backache and dizziness which was 20% followed by Skin allergy which was 19%. These problems, they perceived because of rag picking. While none of the Rag-pickers felt any social rejection because of rag picking.

As observed in figure 2, 12% houses were no sanitary latrine facilities, 33% Houses had no bathing facility and 36 % houses had inadequate water

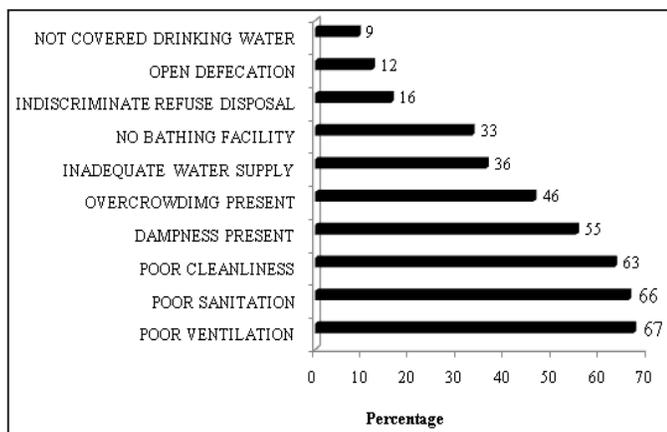
**Table 3: Distribution according to illnesses suffered and services preferred by participants**

Hospital	Major illness		Minor illness	
	Frequency	Percentage	Frequency	Percentage
Government /municipal /trust	80	80	71	71
Private hospitals	17	17	23	23
Others	3	3	6	6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Table 4: Perceived Health problems because of rag picking among study subjects**

Perceived Health problems	Frequency	Percentage
Backache	20	20
Body ache	34	34
Dizziness	20	20
Headache	4	4
Leg pain	3	3
Skin allergy	19	19
<b>Total</b>	<b>100</b>	<b>100</b>

**Figure 2 : Housing Condition of study participant**



supply. 66% household had poor sanitation and 67% of them had poor ventilation facilities.

**Discussion:**

In our study out of total 119 rag pickers 78.2% were female while In a study conducted by Chandramohan in Tamil Nadu, men constituted 53%. In the same study 46% of the rag-pickers were between 30–50 years of age which was similar to present study in which majority (55.5%) belonged to 30-50 years age group. <sup>[3]</sup> About 47.90% rag pickers was illiterate. Over all literacy rate was 52.1%. Literacy among male (73.08%) rag pickers was significantly higher than female (46.24%) rag pickers. ( $\chi^2$  value 17.6 at d.f. =1, p < 0.001) The male literacy rate in Ahmedabad is 88.16% and female literacy rate is 83.48%<sup>[4]</sup>. In study conducted by Chandramohan in Tamil Nadu the rag pickers, 71% were uneducated and the remaining had education below 10th standard (15%, 5th and below 5th; 14%, between 5th and 9th)<sup>[3]</sup> in our study As oral tobacco consumption (58.3%) was higher among male while female were used to have snuffing (28%). 56.3% rag pickers were hypertensive. Rag-pickers were mostly suffering from body ache (34%) and also suffered from backache (20%) and dizziness (20%) followed by skin allergy which was 19%, 40% suffered from skin allergies; another 40% from a mixture of illnesses; 15% suffer from asthma and 5% from whooping cough. The rag pickers get 8kg/day of waste on an average. In same study of conducted by Chandramohan in Tamil Nadu on an average, each rag-picker removes 13.6 kg day<sup>[3]</sup> Most of the families preferred government hospital for major and minor illness.

Majority of the families preferred a Government hospital for minor illness and it was about 44% which was followed by Municipal clinics 24%, Private clinics 23%. Only 3% family preferred Trust and 6% preferred others for minor illness. In males tobacco chewing (58.3%), smoking (38.8%) and alcohol consumption (7.7%) was more. And among the females Snuffing (28%) was more.  $\chi^2$  value at d.f=1 P value >0.05. Among females the habit of snuffing was predominant and among males tobacco chewing was prevalent. The rag-pickers, 46% were found with the habit of chewing betel leaves, 19% smoking and drinking alcohol.

**Conclusion:**

Female predominance was seen in rag picking. Illiteracy rate was higher than urban population. Living condition of rag pickers was poor and some of them did not have access to basic amenities like toilet and sufficient safe drinking water supply and separate bathing facilities. All of them did not feel any social stigma because of their profession.

**Declaration:**

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Conflict of interest: Nil

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## Knowledge and Awareness regarding HIV/AIDS Prevention, Diagnosis & Treatment among Pregnant Women of Belagavi city, Karnataka, India

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### Abstract:

**Introduction:** Globally, there were 35 million people living with HIV, in 2013. According to the HIV estimates in the year 2015, number of people living with HIV/AIDS in India was 21.17 lakh. Pregnant mothers having HIV have additional risk of transmitting infection to offspring. Knowledge about correct practices for HIV can substantially reduce risk of HIV transmission and improve compliance to medicine. Present study tries to assess awareness and misconceptions regarding HIV/AIDS among pregnant women in Urban Health Centre in Karnataka. **Method:** A cross sectional study was conducted on 400 pregnant women attending antenatal clinic at urban health centre, Ramnagar of Belgaum city. Data was collected using a pre-designed and pre-tested structured questionnaire. **Results:** Most of pregnant women (95%) were in the age group of 19-29 years; with 56% Muslims and 43% educated up to secondary level. All 400 pregnant women had heard about HIV/AIDS. Anganwadi/ASHA/Health worker (53%) were among the most common source of information. Knowledge about the different modes of transmission by unprotected sex (88%), untested blood transfusion (68%), sharing of infected needle (83%) and mother to child transmission were (82%). Similarly, misconceptions regarding sharing food, clothes and handshake (5%), mosquito bite (10%) and houseflies (2.5%) were also present in pregnant women. 72% women knew about free testing at government institutions while only 42% knew about ICTC centres and 33% knew about PPTCT services. Knowledge regarding prevention of HIV through blood testing before transfusion and avoiding multiple partners was significantly associated with socio economic status. **Conclusion:** There is increased awareness and knowledge about HIV/AIDS in pregnant women. Health workers/ASHAs/Anganwadi workers are the major source of information for pregnant mother. Yet there are misconceptions which are present in pregnant mothers. Further focus needs to be given to develop appropriate communication strategy for pregnant mothers for improving knowledge and practices related to HIV/AIDS transmission prevention.

**Key words:** AIDS, ANC, Awareness, HIV, Pregnancy

### Introduction:

Globally, in 2013, there were 35 million people living with HIV. <sup>[1]</sup> India has the third highest number of HIV+ve persons in the world. According to the estimates in the year 2015, number of people living with HIV/AIDS in India was 21.17 lakh. <sup>[2]</sup> According to HSS (HIV Sentinel Surveillance) 2012-2013, the overall HIV prevalence among ANC

attendees continued to be low at 0.35% in the country, with an overall declining trend at the national level. The highest prevalence in ANC mothers was recorded in Nagaland (0.88%), followed by Mizoram (0.68%), Manipur (0.64%), Andhra Pradesh (0.59%) and Karnataka (0.53%). <sup>[3]</sup> Karnataka has fifth highest prevalence of HIV in ANC. In Karnataka the number of people living with

HIV/AIDS were 2, 09,366 among them 83,917 were females. The number of children living with HIV/AIDS was 14,195. The HIV prevalence among the antenatal clinic attendees in Karnataka was 0.5-0.74 % according to household survey 2012–2013 and in Belgaum district it was 0.5-0.99 % among antenatal clinic attendees. [4] Pregnant women can transmit infection to the fetus and hence provide an unique opportunity for implementing preventive strategy against HIV infection of newborn babies. [5] in order to devise strategies for prevention of transmission of HIV infection, current level of knowledge and awareness needs to be understood. Present study tries to understand the knowledge and awareness of the pregnant women about HIV/AIDS.

**Method:**

A cross sectional study was conducted in Ramnagar urban health center, which is an urban field practice area of J.N. Medical College Belgaum, which has a population of 32,815 and comprises 16,213 females and 5200 eligible couples and 1025 pregnant women. Assuming that the prevalence of awareness of HIV/AIDS among pregnant women to be 50%, sample size was estimated to be 400 pregnant women attending clinic using 4pq/D<sup>2</sup> formula.

Permission was taken from Institutional Ethical Committee for undertaking this study. Prestructured questionnaire was devised and pilot tested on 10 pregnant mothers initially. Necessary corrections were done in questionnaire after receiving feedback from pregnant mothers. All mothers were requested to provide consent for participation in present study. Those who provided written informed consent were included in the study. There were no exclusion criteria for enrollment in the study except for the denial for informed consent. Present study was undertaken for a period of 12 months from February 2015 to January 2016. Information on socio demographic variables and awareness and misconceptions of HIV/AIDS was collected. Socio economic status was classified by using modified B.G. Prasad's classification 2015. Data was analyzed by using SPSS software version 20 using percentage and Chi-Square tests were used to find out

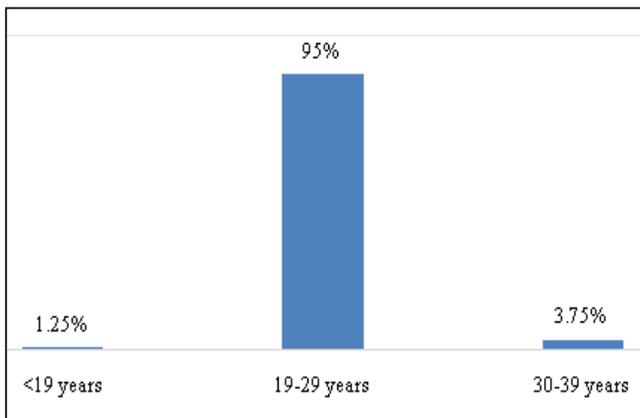
the association between awareness of HIV/AIDS and various socio demographic variables.

**Results:**

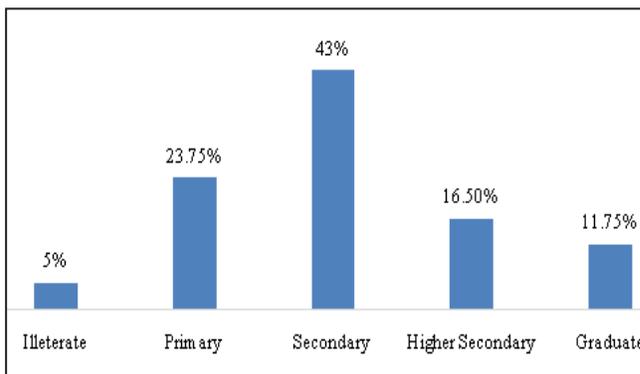
**Socio Demographic Profile**

A total of 400 pregnant females attending the antenatal clinic participated in the study. 95% participant were in the age range of 19–29 years (Figure 1). Around 5% of the respondents had no formal schooling while 43% had undergone secondary education (Figure 2). 95.25% of the females were housewives while only 4.75% were employed.

**Figure 1: Age distribution of the participants (n=400)**

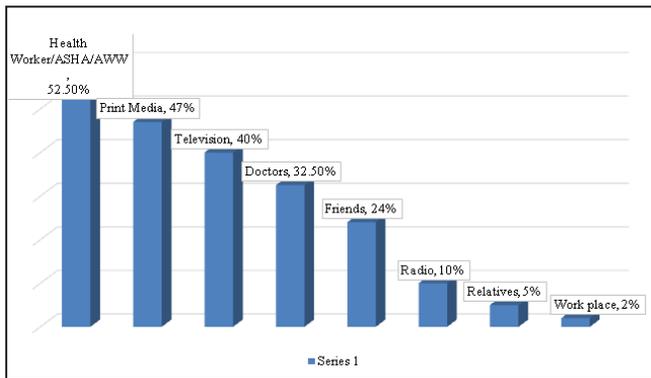


**Figure 2: Educational status of the participants (n=400)**



All respondents (400) had heard of HIV. Figure -3 describes sources of information regarding knowledge of HIV/AIDS among pregnant mothers (as there are multiple sources of information, percentage may not add up to 100).

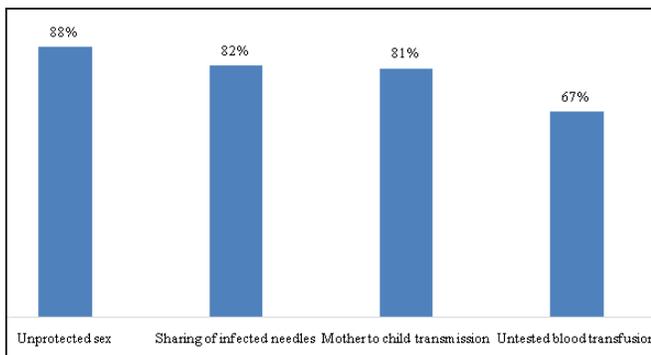
**Figure 3: Source of Information for HIV/AIDS Knowledge**



**Knowledge about HIV/AIDS**

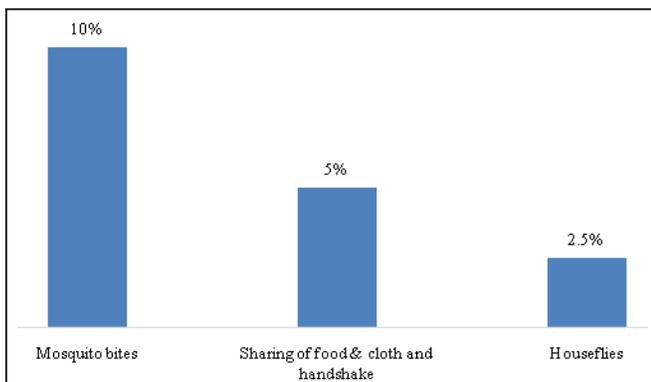
Figure -4 summarizes correct knowledge about the transmission of the HIV through unprotected sex, untested blood transfusion, sharing of infected needles and mother to child transmission.

**Figure 4: Correct knowledge regarding HIV transmission (n=400)**



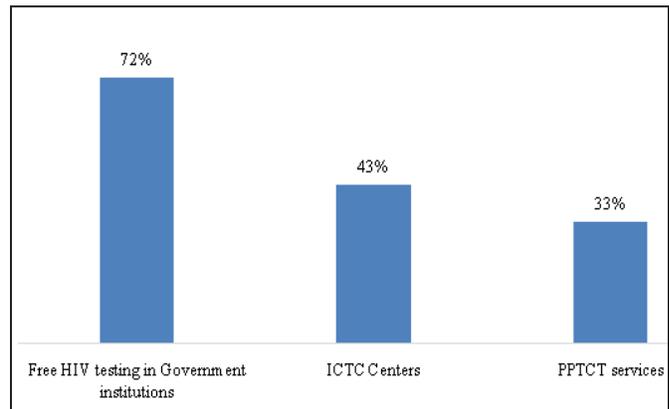
At the same time, there were misconceptions as well regarding spread of HIV/AIDS through mosquito bite, sharing of cloths-foods-hand shake and spread through house flies (Figure – 5).

**Figure 5: Misconceptions regarding spread of HIV (n=400)**



72% women knew availability of free testing for HIV/AIDS in government institutions. However, only 42% women knew about ICTC and 33% knew about PPTCT services (Figure

**Figure 6: Correct knowledge of testing and treatment (n=400)**



**Association of HIV prevention with Socio Economic Status**

There was statistically significant difference in knowledge about HIV prevention strategies based on socio economic status. Knowledge increased substantially with increase in socio economic status. Table 1 & 2 presents association of socio economic status with prevention of HIV by blood testing before transfusion and avoiding multiple sex partners respectively.

**Table 1: Association between socio economic status and prevention of HIV by blood testing before transfusion**

Socio economic status	Prevention by testing blood before transfusion				
	Yes		No		Total
	Number	%	Number	%	
Class I & II	26	72.2	10	27.8	36
Class III	74	68.5	34	31.5	108
Class IV	84	54.9	69	45.1	153
Class V	54	52.4	49	47.6	103
Total	238	59.5	162	40.5	400

**Chi-square = 9.544, p value= 0.023**

**Table 2: Association between socio economic status and avoiding multiple sex partners**

Socio economic status	Prevention by avoiding multiple sex partners				
	Yes		No		Total
	Number	%	Number	%	Number
Class I & II	36	100	0	0	36
Class III	102	94.4	6	5.6	108
Class IV	138	90.2	15	9.8	153
Class V	87	84.5	16	15.5	103
Total	363	90.8	37	9.2	400
<b>Chi-square = 10.327, p value= 0.016</b>					

**Discussion:**

In a study conducted in Osogbo, Southwest Nigeria [6] it was observed that 81.9% of pregnant women were aware of maternal to child transmission. A study conducted in Kazakhstan [7] observed that 89% knew that unprotected sex was a mode of transmission for AIDS and 86% knew about unsterilized needles as a mode of transmission. In a study conducted in Nigeria [8] it was revealed that 74.7% of pregnant women were aware of untested blood transfusion as a mode of HIV transmission, which is similar to our study. In a study conducted in Iran it was observed that 10.8% and 5% of pregnant women felt that AIDS also spreads by mosquito bites and using shared clothes respectively. [9] It has been noted that pregnant women who had completed secondary education and above were more likely to be aware of HIV as compared to pregnant women who had completed primary education. [10] In federal medical centre in Nigeria, pregnant women completed secondary education had knowledge (66.7%) which also showed that proportion of pregnant women with high knowledge of HIV/AIDS increased with increase in education status. [11] In our study, association of knowledge regarding spread of HIV by untested blood transfusion and avoiding multiple sex partners was significantly associated with socio economic status. In Jharkhand it was found that, socio economic status plays an important role in creating good concept of HIV/AIDS. It showed that illiterate women with high wealth index were more

likely to have knowledge than less wealth index pregnant women. [12] Higher level of education and SES increase the likelihood of knowledge about HIV/AIDS. [12]

**Conclusion:**

Majority of pregnant mothers were aware about the HIV/AIDS and mode of transmission. This is positive step towards implementation of program. However, programmatic knowledge with reference to ICTC centers and PPTCT services was found to be poor. This requires focused attention on communication strategies not just on prevention of HIV but also on available services for diagnosis and management of HIV in pregnancy.

Health workers are the most common source of information regarding HIV/AIDS for pregnant mothers. Strategies to keep health workers updated with further improve knowledge in pregnant mothers. At the same time mass media communication strategies which are wide spread are also likely to yield desired outcomes.

Further research needs to be done in order to understand vulnerabilities among lower socio economic groups regarding poor knowledge about HIV/AIDS and its prevention strategies. It will enable for further strategic approach development to deliver customized communication strategies targeted to this vulnerable population.

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## One more step to bid Good Bye to Polio – Switch from t-OPV (trivalent- Oral Polio Vaccine) to b-OPV(bivalent – Oral Polio Vaccine)

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Poliomyelitis, a crippling infectious disease caused by any one of the three polioviruses – poliovirus type 1, type 2 or type 3. Vaccination of child against polio is the most effective and important preventive measure to fight against the occurrence of this disease. The battle against this disease is on and we are almost on the verge of eradication of this disease globally. So, meticulous and detailed planning is required at this juncture. Hence, Polio Eradication and Endgame Strategic Plan 2013-2018 has begun globally to break the chain of all poliovirus transmission and robust system for the lifesaving polio vaccine.<sup>[1]</sup>

The vaccine t-OPV contains three poliovirus serotypes (type 1, 2 and 3) and this vaccine was used in almost 145 countries in routine immunization programs. It has helped in the eradication of wild poliovirus type 2 and the last case was seen in 1999. But, the type 2 component of t-OPV has not only lead to a rise in 90% of cVDPV(circulating Vaccine Derived Polio Virus) cases and nearly 40% of VAPP (Vaccine Associated Paralytic Poliomyelitis) cases globally but also interferes with the immune response to poliovirus types 1 and 3. Due to the risk of VDPV and VAPP, the goal is to stop the use of oral polio vaccines by 2020.<sup>[2]</sup> However, the herd immunity is one of the important factors favoring OPV so the immediate shifting from OPV to IPV (Inactivated/Injectable Polio Vaccine) is not a safe strategy from the viewpoint of epidemiologists. Hence, the shift from OPV to IPV is to be done in phased manner.

The current focus is replacement of t-OPV with b-OPV in all countries using OPV. The vaccine b-OPV contains two polio serotypes; type 1 and type 3. Such replacement of t-OPV with b-OPV has to be done in routine immunization activities and also in SIAs

(Supplementary Immunization Activities) in all the countries simultaneously to ensure that no country is put at risk of importing cVDPV2 from another country that continues to use t-OPV. This action is already taken in April 2016 globally over a period of two week time as per the recommendations by WHO (World Health Organization).<sup>[3]</sup>

### Any risk with b-OPV? If so, what NEXT?

Such switch from t-OPV to b-OPV may impose risk of cVDPV type 2 leading to cVDPV type 2 outbreaks since the number of children susceptible to poliovirus type 2 will increase. This risk was already anticipated and as a part of risk mitigation strategy, it was already recommended by WHO to introduce at least one dose of IPV (inactivated polio vaccine) containing all 3 polioviruses (types 1,2 and 3) in all countries by end of 2015.<sup>[3]</sup>

IPV introduction will help to reduce this risk of cVDPV 2 associated with the switch from t-OPV to b-OPV and also boost immunity to all three polioviruses types 1, 2 and 3. b-OPV will further continue to protect against transmission of Wild Polio Virus 1 and 3. At one stage, when all wild polio viruses will be fully eradicated, all Oral Polio Vaccines will be withdrawn.<sup>[2]</sup>

Based on this rationale and these recommendations by Global Alliance for Vaccines and Immunization (GAVI) and WHO; Ministry of Health and Family Welfare, Government of India (GoI) has already carried out this action on 25<sup>th</sup> April 2016 National Switch Date and we have switched from t-OPV to b-OPV in the entire nation.<sup>[4]</sup> After the switch date, only b-OPV is used both in routine immunization programs and SIAs including polio campaigns.

### Take Home Messages

- For polio eradication end game strategy, all doses of OPV needs to be stopped.
- Immediate replacement of OPV by IPV is not wise decision, hence it has to be done in phased manner.
- Switch from t-OPV to b-OPV as type 2 is already eradicated.
- Simultaneous introduction of atleast one dose of IPV to mitigate the risk associated with switch from t-OPV to b-OPV.
- By 2020, goodbye to all OPVs and use of only IPV for protection against polio among children.

Polio eradication is difficult to achieve by the actions of Government alone. It is essential for various stakeholders to join hands for this mission. In my view point, private pediatricians and practitioners are also important key personnel to support this mission of polio eradication. Awareness

regarding such national initiative among them is very important which can be achieved by close liaison with associations like Indian Academy of Pediatrics (IAP) and Indian Medical Association (IMA). Together we can achieve this goal and will be able to witness the historical eradication of this disease Poliomyelitis in the coming years!

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## Tuberculosis – Recent Expansion of Services in a Lens of Surveillance

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National Consultant- Revised National Tuberculosis Control Program

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Tuberculosis is a public health problem in India and globally. Recent estimates have given some more understanding how we measure burden of this age old disease. This is in particular in India. The Global TB Report from World Health Organization documented the revision in estimates of TB in India to be on higher side. As per this report, it is estimated to be 28 lac cases of TB occurred in 2015 and 4.8 lac patients died due to TB.<sup>[1]</sup>

TB is one of the top 10 causes of deaths worldwide and TB now causes more deaths than HIV annually. In India, TB is the leading cause of death among infectious disease in the age group of 15-49 years.<sup>[2]</sup> This toll of death can only be prevented if we reach to each and every TB patients to act upon.

Currently, the Revised National TB Control Programme reports 17 lac TB patients, largely from public health system.<sup>[3]</sup> It means the system is missing almost a million TB patients in a year. There are important gaps in the surveillance system. TB cases that are diagnosed in private health care providers are unreported or TB patients go undiagnosed either they are not accessing health care services or are not identified by the health system (public or private).

There have been efforts to improve the TB surveillance system in India in the recent past. TB has been made a notifiable disease in 2012. Since then, trend of reporting of TB patients is increasing, largely from private sector with consistent reporting from public sector. Interventions like provision of free anti-TB drugs and effective use of ICT systems have gained considerable success at Patna, Mehsana and Mumbai in attracting private health care providers to notify TB patients and provide patient support till treatment outcome. Use of drug sale data has given a different dimension to how disease is measured and also, a good tool to scale of the coverage.

Recently, to reach to patients who are not accessing health care or seeking care late, the programme is encouraging systematic active TB case screening. TB case finding efforts generally remained passive i.e. patients presenting with TB symptoms to health care facilities evaluated for TB. First among the active efforts of case finding are defined in the revised Technical and Operational Guidelines in 2016<sup>[4]</sup> and now, the Government has launched the 15 days drive of active TB case finding in 50 districts.

One more step to reach among missing TB patients is provision of high sensitive diagnostic tools for diagnosis of TB among People Living with HIV and among children and access to rapid diagnostics at decentralized level. These tools are expected to increase diagnosis and reporting of TB and drug resistant TB cases.

While all these strategies will increase service delivery scope and will bring improvement in the surveillance of the disease, but the question remains about the scale. Out of 17 lac reported patients in the country last year, 2 lac were from private health care providers.<sup>[3]</sup> In comparison to the estimated TB patients in private sector, this looks minuscule. The Notification of TB Order does not have a spike of enforcement; the attractive interventions like Universal Access to TB Care are covering merely 2% population of the country and active TB case finding campaigns are just commencing.

Opportunities are plenty to enhance scope of surveillance for TB in India. The case based web based electronic system – NIKSHAY has already registered more than 1 lac private health care providers, more than any other surveillance system in India. There are more than 13,000 microscopy centres, 628 CBNAAT laboratories, 68 Culture and

DST laboratories and more than 10,000 private laboratories registered in NIKSHAY<sup>[3]</sup>, a potential scope of laboratory surveillance. Use of provisions under H1 schedule of Drugs and Cosmetic Act offer a prospect of sustainable drug sale surveillance. In addition, recent revisions in technical and operational guidelines of conducting post treatment follow up of TB patients up to 2 years, will take the TB surveillance beyond treatment completion. Expanded diagnostic algorithms are taking diagnosis of drug resistant TB beyond Rifampicin resistance. This will give a pattern of drug resistance on a regular basis and not merely restricting to the drug resistance survey.

Matter of the fact remains is effective implementation, the coverage and synergy of all

health care providers. The world aims to End TB by 2035 and so, does India.<sup>[5]</sup> But, as John Lennon says famously, a dream you dream alone is only a dream. A dream you dream together is reality. Let's all aim and work to end TB in our country.

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