

## Tobacco Use among Adults in Rural and Urban Areas of Visakhapatnam District

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### Abstract

**Background:** Tobacco use is one of the gravest public health challenges the world has ever confronted. More than five million people die of tobacco-caused illness each year – an average of one person every six seconds - and tobacco use accounts for 10% of adult mortality globally. Tobacco use is known or probable cause of about 25 diseases including heart disease, cancer, stroke, chronic obstructive pulmonary disease and digestive tract diseases. Smokeless tobacco use causes oral cancer in the lip, tongue, mouth and throat areas and digestive system cancers.

**Objectives:** 1) To study the socio-demographic profile. 2) To estimate and compare the prevalence of tobacco use among rural and urban population.

**Methods:** A Community based Cross-sectional study was conducted in randomly selected urban and rural areas among adult population. Study variables include age, educational status, tobacco use, current user or not, smoking or non-smoking form, etc. Statistical analysis was done using Microsoft excel and relevant statistical tests were applied.

**Results:** The overall prevalence of Tobacco use was 21.5% in urban and 29.2% in rural area. Prevalence of smoking form was found more in rural area than in urban area, whereas smokeless tobacco use was found more in urban area than in rural area. The mean age of initiation of smoking was 19.85 years in urban and 16.97 years in rural area. The mean age of initiation of smokeless tobacco use was 26.29 years in urban and 20.31 years in rural area.

**Conclusion:** There is an urgent need to take effective steps, especially on launching community awareness programs for public to educate them about the consequences of tobacco use, and on assessing their effectiveness in curbing the problem.

**Key words:** Prevalence, Tobacco use, Socio demographic correlates, Smoking form, Smokeless form, Cross sectional study.

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### I. Introduction

Globally, more than 5 million people die each year as a result of tobacco smoking. The number of deaths attributable to smoking is projected to increase to 8.3 million by 2030, with the largest increase in low- and middle-income countries. If current smoking patterns persist, it is estimated that 1 billion deaths will occur in this century as a result of tobacco use. The overall mortality and morbidity attributed to tobacco smoking have declined steadily during the past few decades in many Western countries; however, in Asia, a tobacco epidemic has developed rapidly<sup>1</sup>

Tobacco contains many carcinogens, with the most significant being polycyclic aromatic hydrocarbons, aromatic amines, and nitrosamine which cause cellular damage.<sup>2</sup> The smoking forms of tobacco contain more than 4000 different chemicals and at least 50 are known carcinogens, whereas smokeless tobacco contains 28 carcinogens.<sup>3</sup>

India is the second largest producer of tobacco in the world after china and the state Andhra Pradesh accounts for almost 40% of the country's tobacco production. India is also the second largest consumer of tobacco in the world, second only to China<sup>4,5</sup>

According to Tobacco Free Initiative, Global Adult Tobacco Survey India 2009-2010, with increase in age, smoking prevalence increases, and in India, males smoke more tobacco as compared with females. As compared with the urban area, there is more consumption of bidi and hookah in the rural areas. Daily cigarette smoking is about 6% compared with bidi smoking, which is 10%. In total, 63% of cigarette smokers smoke cigarette every day, whereas 81% of bidi smokers smoke bidi every day.<sup>6</sup>

Globally, about one third of adults are regularly exposed to second-hand tobacco smoke<sup>7</sup>. Also called passive smoking, environmental tobacco smoke, or second-hand smoke (SHS), world wide exposure to it caused nearly 603 000 premature deaths of non-smokers estimated in 2004<sup>8</sup>, which was about 1% of worldwide mortality<sup>8,9</sup>. Of the 603000 deaths, 47% occurred in women, 28% in children, and 26% in men<sup>8</sup>.

Exposure to tobacco smoke was estimated to have caused 379,000 deaths from ischemic heart disease, 165,000 from lower respiratory infections, 36,900 from asthma, and 21,400 from lung cancer<sup>8</sup>.

Tobacco use is an important risk factor for numerous chronic diseases like cancer, diseases of the lungs, and cardiovascular diseases. According to NFHS-4 data, In India Men who use any kind of tobacco in urban area is 38.9% whereas in rural area it is 48% and an overall decline to 44.5% compared to 57% in NFHS-3 survey. According to NFHS-4 Andhra Pradesh data, Prevalence of tobacco use among men is 26.8% out of which 30.5% in rural area and 19.7% in urban area. Prevalence of tobacco use among women is 2.3% out of which 2.9% in rural area and 1% in urban area.<sup>10</sup>

Tobacco use is one of the gravest public health challenges the world has ever confronted. Because tobacco-related disease strikes people in the prime of their working lives, it also negatively impacts economic development. The present study aims to estimate and compare the prevalence of tobacco use and to study their socio-demographic correlates in rural and urban areas of Visakhapatnam District, Andhra Pradesh

## **II. Objectives**

- 1) To study their socio-demographic correlates
- 2) To estimate and compare the prevalence of tobacco use among rural and urban population.

## **III. Materials And Methods**

A Community based Cross-Sectional Study was Carried out in Nov 2017 to Oct 2018 where Population of aged between 20-59 years residing in urban and rural areas of Visakhapatnam district

### **SAMPLING FRAME**

**Rural area:** The total list of Primary Health Centres was obtained from the District Medical & Health Officer's office of Visakhapatnam district and by using simple random sampling method (lottery method), one PHC (PHC- Haripalem) was selected for the study.

**Urban area:** Total municipal wards list was obtained from GVMC (Greater Visakhapatnam Municipal Corporation) office and by using simple random sampling method (lottery method) one ward (ward no:41) was selected for the study.

### **SAMPLE SIZE CALCULATION**

By using  $n=4pq/l^2$ ,

P- positive factor (prevalence of risk factor)

For our study, prevalence of smoking according to IDSP-NCD Risk factor survey (phase-1) conducted in 2007-08<sup>11</sup>. Was taken to calculate the sample size

q= 100-P; l= allowable error (20% of 'P')

$n= 4*20*80/4*4 = 400$ .

A total of 800 were included in the study i.e.400 each from urban and rural area.

### **Method of data collection:**

#### **Selection of households:**

Average household size in A.P is 4.5 (DLHS-3)<sup>12</sup>.

Percentage of population aged 20-59 years (according to Census-2011) is 50.8%. Therefore 50.8% of 4.5 are 2.3. Required numbers of houses were calculated as  $400 / 2.3 = 173.9$  approximated to 174.

### **Based on systematic sampling:**

Every K<sup>th</sup> household was selected and individuals aged between 20-59 years were taken into study.

Selection of K<sup>th</sup> house:

Total number of houses in Ward no.41 = 4815

K<sup>th</sup> house= total number of houses/required number of houses.  $K = 4815/174 = 27.67$  (approximated to 28).

Every 28<sup>th</sup> house was selected from voter list.

Total number of houses in PHC-HARI PALEM area were =4166

$K = 4166/174 = 23.94$  (approximated to 24)

Every 24<sup>th</sup> house was selected from voter list.

For identification and initial contact, the help of the ANM, ASHA (Accredited Social Health Activist) was taken. Prior intimation was given to selected houses to minimize non response. Efforts were made to include

whole population of 20–59 years by visiting houses on two successive days. If the selected house was found to be locked, and if the members did not respond, the adjacent house was selected for the study. House visits were conducted by investigator between 8 am to 12 pm every day and on an average 10 houses were covered per day. **INCLUSION CRITERIA:** Individuals aged 20-59 years and who gave informed consent was included in the study.

**EXCLUSION CRITERIA:**

1. Pregnant women.
2. Bed ridden persons.
3. Paralytic persons.
4. Persons who refused to participate in the study

**STUDY TOOLS:**

A Pretested Semi structured questionnaire was used where the Study variables included are age, gender, educational status, occupation, economic status, tobacco use, smoker or not, using smokeless tobacco or not.

**OPERATIONAL DEFINITIONS**

**Tobacco:**

1. **Current smoker/ smokeless tobacco user:** Individual smokes/uses tobacco at the time of the study either daily or occasionally.
2. **Current daily smoker/smokeless tobacco user:** individual who smokes/uses tobacco every day (with rare exceptions like during the days of illness).
3. **Past smoker:** Individuals who were smoking in the past, but have not smoked in past 12 months.
4. **Non-smoker/never used smokeless tobacco:** individuals never smoked/used smokeless tobacco in the lifetime.
5. **Smoking form of tobacco:** cigarettes, bidis, chutta/cigar and any other smoked form.
6. **Smokeless form of tobacco:** chewable tobacco products like khaini (tobacco-lime mixtures), gutkha (tobacco with betel nut, catechu, lime, and flavorings), naswar (snuff), zardapaan (betel quid with tobacco).

**DATA ANALYSIS**

Data was analyzed using SPSS software trial version-20 and MS-Excel 2007. Relevant statistical tests were applied and  $p < 0.05$  is considered as statistical significance.

**IV. Results And Discussion**

**Tables:**

**Table No 1: Gender wise distribution of Study Population (N=800).**

Gender	Urban	Rural	Total
	n (%)	n (%)	N (%)
Male	205 (51.2)	201 (50.2)	<b>406</b> (50.7)
Female	195 (48.8)	199 (49.8)	<b>394</b> (49.3)
Total	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)

In our study, the percentage of male 406 (50.7%) and female 394 (49.3%) population was almost equal with slight male preponderance in both urban and rural areas.

**Table No 2: Age wise distribution of study Population (N=800).**

Age group in years	Urban	Rural	Total
	n (%)	n (%)	N (%)
a) 20-29	108 (27.0)	160 (40.0)	<b>268</b> (33.6)
b) 30-39	101 (25.2)	91 (22.7)	<b>192</b> (24.0)
c) 40-49	94 (23.5)	60 (15.0)	<b>154</b> (19.2)
b) 50-59	97 (24.3)	89 (22.3)	<b>186</b> (23.2)

Total	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)
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The distribution of study population in various age groups was almost similar in the urban area, with slight predominance in the age group of 20-29 yrs. In rural area, 40% were in the age group of 20-29 yrs. The predominance of 20-29 years age group among other age groups was also reported by the DLHS-3 (2007-08)<sup>12</sup>, in Andhra Pradesh.. In the present study, Mean age of the rural Population was 36.45 years  $\pm$  1.38 and for the urban population, it was 39 years  $\pm$  1.02.

**Table No 3:** Community wise distribution of Study Population (N=800).

Community	Urban	Rural	Total
	n (%)	n (%)	N (%)
OC	64 (16.0)	04 (1.0)	<b>68</b> (8.5)
BC	263 (65.8)	242 (60.5)	<b>505</b> (63.1)
SC	68 (17.0)	154 (38.5)	<b>222</b> (27.8)
ST	5 (1.2)	0 (0)	<b>5</b> (0.6)
Total	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)

Majority (63.1%) of the study population belong to BC community i.e. 65.8% in urban area and 60.5% in rural area. According to DLHS-3(2007-08)<sup>12</sup> report, BC community accounts for 46.6% (urban-50.9% and rural-45.2%) and SC community of 22.3% (urban-14.4% and rural 25.1%) in Andhra Pradesh.

**Table No 4:** Distribution of Households according to Religion (N=300).

Religion	Urban	Rural	Total
	n (%)	n (%)	N (%)
Hindu	140 (84.3)	129 (96.3)	<b>269</b> (89.7)
Muslim	14 (8.5)	0 (0)	<b>14</b> (4.7)
Christian	12 (7.2)	5 (3.7)	<b>17</b> (5.6)
Others	0 (0)	0 (0)	<b>0</b> (0)
Total	<b>166</b> (100.0)	<b>134</b> (100.0)	<b>300</b> (100.0)

Majority population (89.7%) were Hindus (i.e.96.3% in rural area and 84.3% in urban area) followed by 5.6% were Christians and 4.7% were Muslims. Our study results are in concurrence with The IDSP-NCD risk factors Survey (2007-2008)<sup>11</sup> which reported that 82% of households were Hindus (Urban-81.6%; Rural-81.7%) in Andhra Pradesh.

**Table No 5:** Distribution of study population according to Educational status (N=800).

Educational status	Urban	Rural	Total
	n (%)	n (%)	N (%)
Illiterate	96 (24.0)	196 (49.0)	<b>292</b> (36.5)
Primary	71 (17.7)	50 (12.5)	<b>121</b> (15.1)
High school	58 (14.5)	31 (7.7)	<b>89</b> (11.1)
Secondary	67 (16.7)	72 (18.0)	<b>139</b> (17.4)
Intermediate	40 (10.0)	27 (6.7)	<b>67</b> (8.4)
Degree	59 (14.7)	23 (5.7)	<b>82</b> (10.2)
Post-graduation	9 (2.3)	1 (0.3)	<b>10</b> (1.2)
Total	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)

In the present study, 36.5% were illiterates. More illiterates were seen in rural area (49%) as compared to urban area (24%). According to Census-2011<sup>13</sup>, the literacy rate in urban areas of Andhra Pradesh was 80.5% and illiteracy in rural areas of Andhra Pradesh was 52.3%. According to the IDSP-NCD Risk Factor Survey (2007-08)<sup>11</sup>, illiteracy was 26.1% in urban areas in Andhra Pradesh and these results were in concurrence with our study. DLHS report<sup>12</sup> shows the literacy rate in Visakhapatnam district was 60%. The IDSP-NCD risk factor survey (2007-2008)<sup>11</sup> reported that, over 70% were engaged in either agricultural, domestic works or manual work in Andhra Pradesh.

**Table No 6:** Distribution of Study Population according to Occupation (N=800).

Occupation	Urban	Rural	Total
	n (%)	n (%)	N (%)
Govt employee	29 (7.2)	8 (2.0)	<b>37</b> (4.6)
Non-Govt employee	83 (20.7)	45 (11.2)	<b>128</b> (16.0)
Home maker	157 (39.3)	109 (27.3)	<b>266</b> (33.2)
Retired	17 (4.2)	3 (0.7)	<b>20</b> (2.5)
Student	19 (4.7)	10 (2.5)	<b>29</b> (3.6)
Agriculture	0 (0)	35 (8.7)	<b>35</b> (4.4)
Manual Labourer	59 (14.8)	98 (24.5)	<b>157</b> (19.6)
Self employed	36 (9.0)	92 (23.0)	<b>128</b> (16.0)
Total	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)

In the present study, one third (33.2%) were homemakers (rural-27.3%; urban-39.3%) and manual labourers were 19.6% and 4.6% were government employees. In rural area, only 8.7% were engaged in agricultural work.

**Table No 7:** Distribution of study population according to economic status (N=800).

Economic class	Urban n (%)	Rural n (%)	Total N (%)
(i) Upper class	34 (8.5)	22 (5.5)	<b>56</b> (7.0)
(ii) Upper middle	92 (23.0)	69 (17.2)	<b>161</b> (20.1)
(iii) Lower middle	174 (43.5)	162 (40.5)	<b>336</b> (42.0)
(iv) Upper lower	90 (22.5)	131 (32.7)	<b>221</b> (27.6)
(v) Lower	10 (2.5)	16 (4.0)	<b>26</b> (3.2)
Total	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)

It was observed that, more than two fifth (42%) of study population belong to lower middle class; i.e. 43.5% in urban area and 40.5% in rural area. More than one fourth (27.6%) of study population belong to upper lower class (urban-22.5%; rural-32.7%). The mean income among urban population was 3054.46 and the mean income among rural population was 1907.97.

**Table No 8:** Distribution of study population according to Marital status (N=800).

Marital status	Urban	Rural	Total
	n (%)	n (%)	N (%)
Never married	48 (12.0)	33 (8.3)	<b>81</b> (10.1)
Married	317 (79.3)	330 (82.5)	<b>647</b> (80.9)
Separated	5 (1.2)	2 (0.5)	<b>7</b> (0.8)
Widowed	30 (7.5)	35 (8.7)	<b>65</b> (8.1)
Total	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)

The results showed that, 79.3% and 82.5% of study population were married in urban and rural area respectively and these results were in concurrence with the IDSP-NCD risk factor survey (2007-2008)<sup>11</sup> report, where around 70% (71.6% in urban; 71.7% in rural) were married people in Andhra Pradesh.

**Table No 9:** Distribution of households according to Type of housing (N=300).

Variable	Urban	Rural	Total
	n (%)	n (%)	N (%)
<b>Type of House:</b>			
Pucca	117 (70.4)	79 (59.0)	<b>196</b> (65.3)
Semi-pucca	47 (28.3)	38 (28.3)	<b>85</b> (28.3)
Kuccha	2 (1.2)	17 (12.7)	<b>19</b> (6.3)
Total	<b>166</b> (100.0)	<b>134</b> (100.0)	<b>300</b> (100.0)
<b>Kitchen:</b>			
Separate	107 (64.5)	53 (39.6)	<b>160</b> (53.3)
Not separate	59 (35.5)	81 (60.4)	<b>140</b> (46.7)
Total	<b>166</b> (100.0)	<b>134</b> (100.0)	<b>300</b> (100.0)
<b>Sanitary latrine:</b>			
Present	156 (94.0)	60 (44.8)	<b>216</b> (72.0)
Absent	10 (6.0)	74 (55.2)	<b>84</b> (28.0)
Total	<b>166</b> (100.0)	<b>134</b> (100.0)	<b>300</b> (100.0)

According to census 2011<sup>13</sup>, percentage of married people in India was 46.2% and in Andhra Pradesh it was 50.9%. In our study, majority of the houses were Pucca type (urban-70.4%; rural-59%) followed by Semi-pucca houses (urban- 28.3%; rural-28.3%). Most of the households had Separate kitchen facility (urban-64.5%; rural-39.6%) and majority of (94%) households in urban area had sanitary latrine facility compared to rural area (44.8%).

According to DLHS-3(2007-2008)<sup>12</sup>, In Andhra Pradesh, 36% of households had provision for toilet and 41% of households were Pucca houses and similarly IDSP-NCD risk factors Survey (2007-2008)<sup>11</sup> reported that, 54% of households had pucca houses (urban-70%; rural 49%) in Andhra Pradesh. According to Census 2011<sup>13</sup>, in India, only 46.9% households had toilet facility (Urban-87.3%; Rural-32.7%) and in Andhra Pradesh 49.6% households had toilet facility (Urban-90.1%; Rural-34.9%), 61% of households had separate kitchen facility (urban-79%; rural-53%) and these results were in concurrence with our study.

**Table No 10:** Prevalence of tobacco use among study population in urban and rural area (N=800).

Tobacco use	Urban n (%)	Rural n (%)	Total N (%)	$\chi^2$ value
<b>Users</b> (current and past)	86 (21.5)	117 (29.2)	<b>203</b> (25.4)	$\chi^2$ value=6.32; df=1; P value <0.001
<b>Never users</b>	314 (78.5)	283 (70.8)	<b>597</b> (74.6)	
<b>Total</b>	<b>400</b> (100.0)	<b>400</b> (100.0)	<b>800</b> (100.0)	

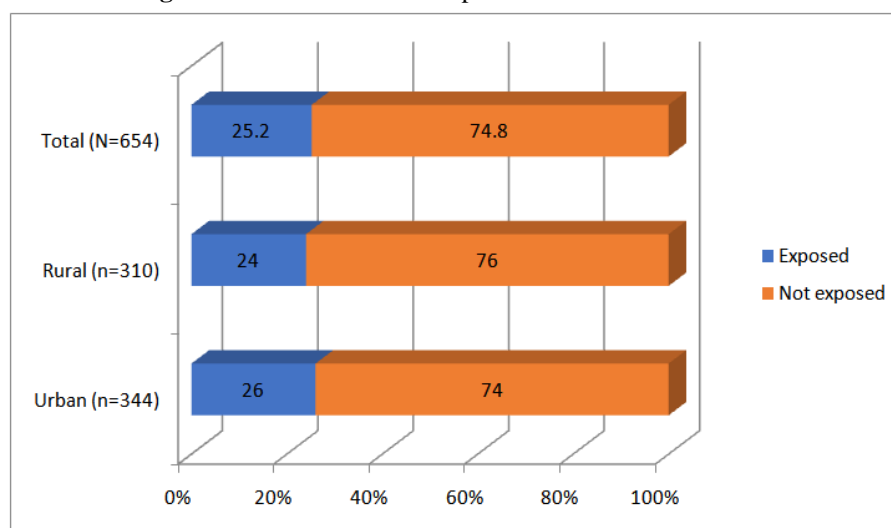
In our study, prevalence of tobacco use was 25.4%. The higher prevalence was seen in rural area (29.2%) compared to urban area (21.5%) and this difference was found to be statistically significant ( $p < 0.001$ ). These results were in concurrence with a study done by Soumya Deb et al<sup>14</sup> (2008) where the prevalence of smoking was 21% in New Delhi and also Thankappan K.R et al (2010)<sup>15</sup> reported that, the prevalence of tobacco use was 28% (Urban-22.6%; rural-24.3%) in Kerala.

According to the Global Adult Tobacco Survey (2009-2010)<sup>6</sup> 35% of adults were using tobacco in India and Chow C et al (2007)<sup>16</sup> reported that, prevalence of smoking was 20% in rural India, these results were similar to our study results.

**Table No 11:** Distribution of tobacco users according to form of tobacco use (N=203).

Form of tobacco Use	Urban area (n=86) n (%)	Rural area (n=117) n (%)	Total (N=203) n (%)
Smoking	49 (57.0)	79 (67.5)	<b>128</b> (63.0)
Smokeless	24 (28.0)	24 (20.5)	<b>48</b> (23.6)
Both	07 (8.1)	11 (9.4)	<b>18</b> (8.9)
Past users	06 (6.9)	03 (2.6)	<b>09</b> (4.4)
Total	<b>86</b> (100.0)	<b>117</b> (100.0)	<b>203</b> (100.0)

In our study, proportion of smoking among tobacco users was 63% i.e.57% in urban area and 67.5% in rural area. 23.6% of tobacco users were using tobacco in smokeless form i.e.28% in urban area and 20.5% in rural area. Mean age of initiation of smoking in urban area was 19.85 yrs and in rural area was 16.97 yrs; whereas the mean age of initiation of smokeless tobacco use in urban area was 26.29 yrs and 20.31yrs in rural area. Gupta et al (2010)<sup>17</sup> reported that, trends for use of smoked tobacco were more in rural areas and smokeless tobacco were more in urban area. The Global Adult Tobacco Survey, India (2009-2010)<sup>6</sup> reported that 9% of the adults were using tobacco only in the form of smoking, 21% were using only smokeless tobacco and 5% were using both forms of tobacco.

**Figure No 1:** Non-smokers exposed to second hand smoke.


In the Present study, 25.2% of the non-smokers were exposed to second hand smoking. It is 26% in urban area and 24% in rural area and these results were slightly higher than the results of IDSP-NCD risk factor survey (2007-2008)<sup>11</sup> in Andhra Pradesh where 20% of non smokers were exposed to second hand smoke (urban -19%, rural-20%) and the GATS 2009<sup>6</sup> where 29% of adults in India were exposed to second hand smoke .WHO report on the global tobacco epidemic 2009 revealed that about one third of adults were regularly exposed to second hand smoke (SHS) globally. Krishna Mohan palipudi et al (2009)<sup>18</sup> reported that, nearly three in five adults were exposed to second hand smoke in Bangladesh.

## V. Summary And Conclusion

The overall prevalence of Tobacco use was 21.5% in urban and 29.2% in rural area. 40% of men in the urban area and 46.7% of rural men were using tobacco. The prevalence of smoking was 15.2% and 23% in urban and rural areas respectively. Prevalence of smoking was found more in rural area than in urban area. Smokeless tobacco use was found almost equally among both areas (urban-8%; rural-9%). Usage of only smokeless tobacco was found same in both areas (urban-6% and rural-6%). Using both smoking and smokeless form of tobacco was found slightly higher in rural area (2.7%) than in urban area (1.8%). The mean age of initiation of smoking was 19.85 years in urban and 16.97 years in rural area. The mean age of initiation of smokeless tobacco use was 26.29 years in urban and 20.31 years in rural area.

## VI. Recommendations

Information, Education and Communication (IEC) activities in the community to be intensified to inform about the seriousness of the risk factors for NCDs. Priority should be given to the primary prevention approaches which are practical and affordable like -- protecting people from tobacco smoke; warning about the

dangers of tobacco; restricting access to usage. Emphasis to be placed on the surveillance of both behavioural and metabolic risk factors. The peripheral health workers should be sensitized about the burden and the measures for the prevention and control of risk factors in the community.

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