

# Expenditure on health care, tobacco, and alcohol: Evidence from household surveys in rural Puducherry

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## ABSTRACT

**Background:** Healthcare expenditures exacerbate poverty, with about 39 million people falling into poverty every year because of such expenditures. Tobacco and alcohol consumption in addition to harmful health impact have economic consequences at household level. **Aim:** To evaluate healthcare, alcohol, and tobacco expenditures among households in rural Puducherry and their impact on household expenditure patterns. **Materials and Methods:** A community-based cross-sectional analytical study was conducted in selected villages within 5 km of a medical college hospital in Puducherry from September 2016 to June 2017. Sociodemographic details and various household expenditures were obtained from 817 households with 3459 individuals. Data were analyzed using STATA (v14). **Results:** Higher mean percentage of health expenditure was found among households with low socioeconomic status [17.7 (95% confidence interval (CI): 14–21.3)] and no health insurance schemes [13.4 (95% CI: 11.1–15.7)]. Households with low socioeconomic status [13.1 (95% CI: 7.5–18.7)] had higher tobacco-alcohol expenditure. Increased health expenditure among households was positively correlated with loan ( $r_s = 0.48$ ). Increased alcohol-tobacco expenditure among households was negatively correlated with food ( $r_s = -0.52$ ) and education ( $r_s = -0.70$ ) expenditure. **Conclusion:** Healthcare and alcohol-tobacco expenditure individually contributed to one-tenth of the household budget. Spending on healthcare, alcohol, and tobacco created significant negative influence on investment in human capital development.

**Keywords:** Costs of tobacco and alcohol, healthcare utilization, household expenditure, Puducherry

## Introduction

Extensive use of technology in diagnostics and treatment of diseases coupled together with the rising therapeutic knowledge and expectations of the population has led to an increase in the cost of healthcare, especially in low- and middle-income countries.<sup>[1]</sup> Increased healthcare expenditures exacerbate poverty, with about 39 million additional people falling into poverty every year globally because of such expenditures.<sup>[2]</sup> In India, only 5% of gross domestic product is spent on health and 80% of this is in form of out-of-pocket expenditure (OOPE).<sup>[3]</sup> More than 90% of the workforce in India is engaged in informal economic

activities. As insurance facilities are available only to workforce in formal sector, a majority of such households are not covered under any social protection scheme. In case of ill health, these households must spend from their own pockets. The high share of OOPE on healthcare along with inadequate provisioning of healthcare facilities further worsens the existing poverty.<sup>[4]</sup> The majority of households who are unable to pay for using healthcare services either do not seek care or resort to short-term coping strategies such as minimizing food expenses, using past savings, and removing children from school to manage the financial shortfall.<sup>[4,5]</sup> The growth of healthcare expenditures is of concern to rural populations whose incomes are significantly lower than their urban counterparts.<sup>[6]</sup>

Consumption of tobacco and alcohol, which are often termed “temptation goods,” is one of the foremost escapable causes of

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morbidity and mortality in the world.<sup>[7]</sup> In India, consumption of tobacco and alcohol is reported by at least one of the household members in more than 50% and 19% of the households, respectively.<sup>[8,9]</sup> To control or reduce consumption of temptation goods, public policies often use taxation as an instrument to make these costlier.<sup>[9]</sup> Yet, individuals exhibit imperfect self-control. This is of much concern for the poor who spend relatively more on consumption of temptation goods.<sup>[9]</sup> Given a fixed household budget, spending on these temptation goods may divert household economic resources from essential items, such as food, education, and healthcare, which are indispensable components of human development.<sup>[8,9]</sup> There is a lack of conclusive data related to healthcare, alcohol, and tobacco expenditure patterns among households in our setting. Viewing the above situation, this study was planned to assess the expenditure on healthcare, alcohol, and tobacco among households in selected villages of Puducherry and its impact on other household expenditures for human capital development.

## Objectives

- 1) To estimate the healthcare, alcohol, and tobacco share of household budget among various sociodemographic groups in rural Puducherry and
- 2) To evaluate the impact of healthcare, alcohol, and tobacco spending on household expenditure patterns.

## Materials and Methods

A community-based cross-sectional analytical study was conducted among households in four villages located within 5 km radius of a medical college hospital in Puducherry from November 2016 to August 2017. Puducherry is a union territory with four districts spread across the south Indian states of Tamil Nadu, Kerala, and Andhra Pradesh. The district of Puducherry is on the shores of Bay of Bengal, surrounded by Tamil Nadu on all the other three sides. The population of district of Puducherry is approximately 10 lakhs, with almost 65% residing in the urban areas. All households in the four villages were included for the study.

House-to-house visits were made in all the four villages by trained field staff. After establishing rapport with the village heads and individuals, the purpose and procedure of the study were explained. Data were collected from the available individuals (>18 years) in each household. If houses were locked or individual eligible for study was not present during the investigators' initial visit, two revisits were made. The identities of the household and individual were kept anonymous from the stage of data collection. Institutional Human Ethics Committee approval was obtained before the study.

A semi-structured interview schedule was used to collect information from the study participants. The questionnaire was converted into electronic format using Epicollect5 software and the mobile application was used to collect data. The study tool

included details on sociodemographic factors and household expenditure patterns. Information on religion, type of family, total family income, and number of individuals in the family were collected as part of sociodemographic details. Monthly expenditures on housing, food, education, health care, alcohol and tobacco, loan, savings, recreation, and others were collected to profile the expenditure pattern of the households. The households were classified into different socioeconomic classes based on modified BG Prasad's classification for the year 2018.<sup>[10]</sup>

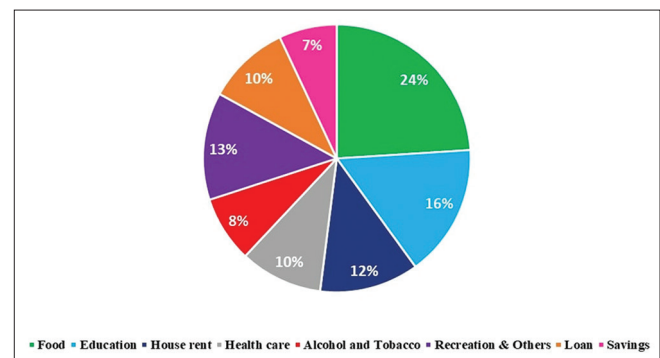
## Data entry and analysis

The electronically captured data were exported into Excel and analyzed using STATA (v14). Measures of central tendency, dispersion, frequency, and proportions were used to summarize data. 95% confidence interval (CI) was calculated for all outcomes of interest. The monthly expenditure on healthcare, alcohol, and tobacco was converted into percentage of total income for analysis. Since the distribution of percentage of expenditure on healthcare, alcohol, and tobacco was skewed, Kruskal–Wallis test was used to assess the association between the expenditure and selected sociodemographic characteristics. Spearman's rank correlation was used to evaluate the impact of healthcare, alcohol, and tobacco spending on the household expenditure patterns. We considered *P* value of less than 0.05 as significant.

## Results

Information on sociodemographic details and various household expenditures were obtained from 817 households consisting of 3459 individuals. Most of the households in the surveyed area were pucca in type (71.9%) with nuclear families (63.2%) belonging to Hindu religion (97.3%). The majority of the households belonged to middle class (27%), and 16.7% had health insurance schemes available. The mean per capita income of the households was INR 2428.6, and the monthly expenditure on healthcare and tobacco–alcohol was INR 226.5 and INR 191.71, respectively. On an average, a family spends around 10% on healthcare and 8% on alcohol and tobacco [Figure 1].

Bivariate analysis revealed significantly higher mean percentage of health expenditure ( $P < 0.05$ ) among households with joint families [17.5 (95% CI: 11.5–23.5)], kutcha type [14.7 (95% CI:



**Figure 1:** Expenditure patterns among household surveyed in rural Puducherry (N = 817)

11.1–18.3)], low socioeconomic status [17.7 (95% CI: 14–21.3)], and no health insurance schemes [13.4 (95% CI: 11.1–15.7)] on comparison to other subgroups. Significantly higher mean percentage of alcohol and tobacco expenditure ( $P < 0.05$ ) was found among household with nuclear families [9.4 (95% CI: 6.4–12.4)] and low socioeconomic status [13.1 (95% CI: 7.5–18.7)] [Table 1].

Spearman's rank correlation was used to evaluate the impact of healthcare, alcohol, and tobacco spending on other household expenditure patterns [Table 2]. Increased health expenditure among the households was positively correlated with loan ( $r_s = 0.48$ ;  $P = 0.022$ ) and alcohol–tobacco ( $r_s = 0.79$ ;  $P = 0.007$ ) expenditure. Increased alcohol–tobacco expenditure among the households was negatively correlated with food ( $r_s = -0.52$ ;  $P = 0.038$ ) and education ( $r_s = -0.70$ ;  $P = 0.013$ ) expenditure while positively correlated with loan ( $r_s = 0.455$ ;  $P = 0.029$ ) expenditure.

## Discussion

The healthcare share of the household budget was 10% in this study. Similarly, T V Shekar reported that OOPE on

health amounted to an average of 10% of the total household expenditure among households in six states in India.<sup>[11]</sup> The expenditure on tobacco and alcohol was about 8% of the household budget which was higher when compared with a study by Jumrani *et al.* in rural India where alcohol and tobacco contributed only to 4.5% of the household expenditure.<sup>[9]</sup> The average healthcare spending among the households in this study was higher than the spending on alcohol and tobacco. In contrast, a survey by a Delhi-based research firm among 50,000 villages in 19 states of India found out that rural homes spend more money on alcohol and tobacco (12%) than on healthcare (9%).<sup>[12]</sup>

The average per capita expenditure on healthcare among households in this study (INR 226.5) was more than two-fold on comparison to the Consumer Expenditure Survey (CES) report 2009–2010 value of INR 96 for Puducherry.<sup>[13]</sup> The change in reference period, growth in population since the year 2009, and the rising cost of healthcare could be the possible reasons for the increase in the per capita expenditure on health in this study.

There was significantly higher mean percentage of health expenditure among households with joint families, kutch type, low socioeconomic status, and no health insurance schemes on

**Table 1: Healthcare, alcohol, and tobacco expenditure among various sociodemographic groups (N=817)**

Characteristics	Total, N (%)	Mean percentage of expenditure			
		Healthcare, mean (95% CI)	P-value*	Alcohol and tobacco, mean (95% CI)	P-value*
Family type					
Nuclear	516 (63.2%)	9 (7.9–10.2)	0.001	9.4 (6.4–12.4)	0.045
Joint	266 (32.6%)	17.5 (11.5–23.5)		5.6 (1.4–9.8)	
Extended	35 (4.3%)	11.5 (9.5–13.5)		7.8 (6.4–9.2)	
House type					
Pucca	587 (71.9%)	10.6 (8.9–12.3)	0.033	7.9 (5.1–10.7)	0.566
Semi-pucca	141 (17.3%)	8.9 (6.3–11.5)		8.4 (5.5–11.3)	
Kutch	89 (10.8%)	14.7 (11.1–18.3)		10.2 (5.6–15.8)	
Religion					
Hindu	795 (97.3%)	10.2 (9.2–11.3)	0.793	8.4 (5.6–11.2)	0.597
Christian	17 (2.1%)	6.8 (1.8–11.8)		9.6 (3.6–15.6)	
Muslim	5 (0.6%)	8.4 (1.4–15.4)		5.1 (1.5–8.7)	
Socioeconomic status					
Upper	118 (14.4%)	3.9 (2.6–5.2)	<0.001	1.9 (0.9–2.9)	<0.001
Upper middle	158 (19.3%)	6.7 (4.9–8.5)		2.7 (1.8–3.6)	
Middle	224 (27.4%)	8.9 (7.2–10.6)		5.7 (4.5–6.9)	
Lower middle	198 (24.2%)	13.6 (11.1–16.1)		9.2 (4.8–13.6)	
Lower	119 (14.6%)	17.7 (14–21.3)		13.1 (7.5–18.7)	
Health insurance					
Yes	136 (16.7%)	4.6 (1.7–7.5)	<0.001†	7.8 (4.9–10.7)	0.893†
No	681 (83.3%)	13.4 (11.1–15.7)		8.2 (6.5–9.9)	

CI: confidence interval, \*P-value by Kruskal–Wallis test; †P-value by Mann–Whitney U test

**Table 2: Correlation of healthcare, alcohol, and tobacco spending on household expenditure patterns (N=817)**

Expenditure on	Food $r_s$ (P-value)*	Education $r_s$ (P-value)*	Loan $r_s$ (P-value)*	Alcohol and tobacco $r_s$ (P-value)*
Healthcare	-0.093 (0.66)	-0.151 (0.07)	0.48 (0.022)	0.79 (0.007)
Alcohol and tobacco	-0.52 (0.038)	-0.70 (0.013)	0.455 (0.029)	1

$r_s$ : Spearman's coefficient; \*P-value: Spearman's correlation

comparison to their counterparts. Few studies reported that increased health expenditure was more common among the poor,<sup>[13,14]</sup> while others report it being more common among the rich.<sup>[8,15]</sup> Special focus must be given to financing the healthcare needs of the disadvantaged sections of the population, as health expenses can push these households into greater risk of poverty through mobilizing funds to cater their healthcare needs. Healthcare financing system should focus on achieving vertical equity (households of unequal ability should be treated unequally), horizontal equity (households of the same ability should be treated equally), and progressivity in healthcare expenditure.<sup>[16]</sup> Significantly higher mean percentage of alcohol and tobacco expenditure was found among household with nuclear families and low socioeconomic status. Similarly, Jumrani *et al.* also reported that expenditure shares of both tobacco and alcohol were also higher among households which are found toward the bottom of the income and social hierarchy.<sup>[9]</sup>

The negative impact of expenditure on healthcare, alcohol, and tobacco on the other essential household consumption has been described as the “crowding-out effect.”<sup>[17]</sup> In this study, increased health expenditure among the households was positively correlated with increased repayment of loans. The effect may be attributed to nonavailability of the government health insurance schemes in the district. Health insurance schemes are only available from the private sector which are not affordable to all sections. If the national health package as recommended by the high-level expert group of universal health coverage is brought into practice, OOPE, at least due to nonhospitalized cases, might most likely show a significant drop.

Similarly, increased alcohol and tobacco expenditure significantly resulted in decreased food and education expenditure among the households surveyed. It also led to increased loans and healthcare costs. The findings were in line with a study by Jumrani *et al.* in rural India where consumers of both tobacco and alcohol traded-off more on food grains, healthcare, and education expenditure when compared with their nonconsuming counterparts. In addition, the crowding effects were larger for tobacco than alcohol and were stronger for households belonging to the lower rungs of both income and social pecking order.<sup>[9]</sup> Such crowding-out effects of consumption of temptation goods can have far-reaching intergenerational consequences for poverty, food and nutritional security, and human capital. Our key recommendations from the finding are that interventions to curb tobacco or alcohol consumption will be more effective if these target the groups and their group leaders. Targeted interventions through peer effects would work like positive externalities, which can lead to large differences in such consumption behavior through social multiplier effects.

The crowding effects of healthcare, alcohol, and tobacco expenditure on other household expenditures for human capital development are evident from this study. The finding highlights the urgent need for policy interventions at the national and state levels and financial redesigns to reduce the OOPE on

healthcare, alcohol, and tobacco among households, with more focus on economically disadvantaged groups. Involvement of public health professionals and family physicians in designing these policies is essential. They form a key role in provision of good-quality, subsidized, public health facilities reaching the households, thereby reducing healthcare costs. In addition, they are important in building awareness campaigns, rehabilitation camps, and other educational programmes/interventions aimed at curbing alcohol and tobacco consumption at the household level.

However, the study was subjected to some limitations. Foremost, causal inference is precluded by the cross-sectional study design. As the study was conducted in limited rural field practice area, the results may not be applicable for the whole district. The study tried to analyze only the absolute burden of healthcare spending and could not categorize the healthcare expenditures among the households. The household expenditure incurred was assessed as self-reported that could be unverifiable. Apart from that, household income and expenditure patterns could also be underreported due to respondents’ recall bias.

## Conclusion

In this study, healthcare and alcohol–tobacco expenditure individually contributed to about one-tenth of the household budget. The expenditure was greater for households belonging to lower social order. Spending on healthcare, alcohol, and tobacco created significant negative influence on investment in human capital development. Higher public expenditure on health and the provision of affordable healthcare are required. In addition, governments should provide financial protection through viable prepayment mechanisms and risk-pooling and ensure health security. To achieve equity in healthcare financing, public policy should focus on economically disadvantaged groups. Insurance coverage and the provision of good-quality, subsidized, public health facilities will both improve access to healthcare and protect the poor against financial catastrophe. It is equally important that all the awareness building campaigns, rehabilitation camps, and other educational programmes/interventions aimed at curbing alcohol and tobacco consumption should be oriented toward the targeted disadvantaged sections of the population.

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## Conflicts of interest

There are no conflicts of interest.

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