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# **The course and outcome of alcohol use disorders in men in Goa: A population-**

# based follow-up study

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## Abstract

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### **Background:**

Research on the natural history and long-term outcomes of alcohol use disorders (AUD) is important to guide health policy. However, attrition is a major challenge in longitudinal studies and can affect validity of findings.

### **Materials and Methods:**

A 4-year follow-up study was conducted on a randomly selected subgroup of a sample of men in rural and urban communities in Goa to assess attrition, preliminary

estimates of AUD outcomes, and chronic disease risk factors.

## **Results:**

Overall attrition rate was 16.7% with a higher attrition in AUD compared to abstainers or casual drinkers. Incidence of AUD at 4 years was 12.8% while the persistence rate of AUD was 53.9%. A trend for poorer health and health behaviors and higher blood pressure was observed in AUD.

## **Conclusion:**

The results of this study suggest a relatively low attrition rate despite the long follow-up period and support the feasibility of conducting a definitive cohort study with the entire sample.

**Keywords:** Alcohol use disorders, attrition, health outcomes, incidence

# **INTRODUCTION**

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The pattern of drinking in India is characterized by relatively high abstention rates and high rates of AUD among those who do drink.[1,2] This epidemiological pattern is associated with high rates of alcohol-attributable mortality and prevalence of AUDs, relative to the per capita alcohol consumption.[1] However, AUDs remain low on the Indian health policy agenda[3] and this could partly be due to the limited evidence on the impact of AUDs on health and socioeconomic outcomes.[2,4]

Evidence on the natural history and long-term outcomes of AUDs is of value to health policy makers. Such studies in developed countries have reported high rates of persistence of AUD and adverse health and social outcomes.[5,6,7,8,9,10,11,12] However, one of the challenges of conducting such studies is attrition. Attrition represents a potential threat of bias, if those who drop out of the study are systematically different from those who remain in the study, which is plausible in the context of AUD. There is now a general consensus that loss of contact with more than 30% of the original sample over

the course of a cohort study is unacceptable and will compromise the validity of conclusions drawn.[13]

The goal of this study was to estimate the attrition rates and reasons for attrition in a randomly selected subsample of a community cohort to inform the feasibility and methodology of a definitive evaluation of the course and outcomes of AUD in this population. We also planned to determine the participant's current drinking status, co-occurrence of chronic disease risk factors, health outcomes, and acceptability of collection of blood samples in future studies.

## **MATERIALS AND METHODS**

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### **Setting**

The study was conducted in the northern district of the state of Goa, India. The urban study areas included two beach areas popular among tourists and one urban residential area in Bardez taluka. The rural study areas

include six contiguous villages in Sattari and Bicholim talukas.

## **Sample**

In 2006, the Alcohol Research Group (USA) and Sangath, Goa, conducted the SAAHAS study, which included a cross-sectional survey in the populations mentioned above.[[14](#),[15](#)] Of the 1899 males that were screened for SAAHAS, 1859 (97.9%) consented or had not explicitly refused consent for follow-up contact. Alcohol use was assessed using the AUDIT.[[16](#)] It has been validated in India[[17](#)] and also specifically in Goa.[[18](#)] The WHO prescribed cut-off of 8 on AUDIT was used for detecting AUD. Participants who drank alcohol below this cut-off were coded as casual drinkers. Self-report of not having consumed any alcohol in the past year was coded as being abstainer. We selected a random sample of 50 men (25 each from rural and urban communities), from each of these subcategories, using random number tables, giving a total sample size of 150 men. As these data was collected

in 2010 our outcomes were assessed roughly 4 years following baseline measurement.

## **Measurements**

A questionnaire measuring attrition, alcohol use, and common chronic disease risk factors was developed, and translated into the vernacular, i.e., Konkani, Hindi, and Marathi.

Chronic disease risk factors included questions related to physical activity, disability, mobility, smoking, and self-reported anxiety or depression. Blood pressure was measured using a digital sphygmomanometer which met the standards of the International Validation Protocol of the European Society of Hypertension (ESH).[\[19\]](#) Weight was measured using digital weighing scales and height was measured using a portable stadiometer.

If the respondent was unavailable after five follow-up attempts, had migrated to a different area which was unreachable by the team, had died or refused to participate, then he was considered as lost to follow-up

and the reason for refusal or reason for loss to follow-up was recorded.

## **Ethics**

Ethical approval was obtained from Sangath's Institutional Review Board. Written informed consent was obtained from each respondent and men with AUD were offered feedback and advice about help-seeking from Sangath or the public health system.

## **Analyses**

Categorical variables were summarized in the form of frequencies and proportions with 95% confidence intervals (CI). All outcomes were analyzed separately for the three exposure groups. Analyses were performed using STATA 10.0 for Windows.

# **RESULTS**

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## **Attrition rates**

The overall attrition was 16.7% (95% CI 11.1-23.6). The reasons for attrition were as follows: address could not be traced 3.3%, migrated out of study area 6%, refused consent 5.3% and unavailable after five follow-up attempts 2%. The attrition in the urban centers was 28% ( $n = 21$ , 95% CI 18.2-39.6) and in the rural centers it was 5.3% ( $n = 4$ , 95% CI 2.2-14.9),  $P < 0.001$ . The attrition according to drinking status at baseline was 12% (95% CI 4.5-24.3) in abstainers, 16% (95% CI 7.2-29.1) in casual drinkers and 22% (95% CI 11.5-36) in AUD.

### **Drinking outcomes at follow-up**

Of the 86 abstainers/casual drinkers at baseline 12.8% (95% CI 6.6-21.7) were classified as AUD at follow-up with a higher incidence among casual drinkers (6.8%, 95% CI 1.4-18.7 in abstinent vs 19.1%, 95% CI 8.6-34.1, in casual drinkers). Of those who had AUD at baseline 53.9% (95% CI 38.3-71.4) were classified as persistent AUD at follow-up.

### **Chronic disease risk factors**

Table 1 compares the various chronic disease risk factors between abstainers, casual drinkers and hazardous drinkers. Compared to abstainers or casual drinkers, a higher proportion of those with AUD had self-reported history of hypertension, diabetes mellitus, chest pain or discomfort, moderate to severe general body pain, and shortness of breath. A slightly higher proportion of those with AUD were current smokers compared to casual drinkers or abstainers. A higher proportion of those with AUD (3.1%) were not physically active compared to abstainers (2.2%) and casual drinkers (2.1%). A higher proportion of AUD had problems with daily activities and mobility compared to the other two groups. Participants with AUD reported higher levels of moderate-to-severe anxiety or depression compared to abstainers and casual drinkers. The mean diastolic BP in AUD was higher than in casual drinkers and abstainers. The mean systolic BP in casual drinkers (130.1; 95% CI 126.5-133.9) was higher than in AUD (129.8; 95% CI 125.3-134.2) and abstainers (124.1; 95% CI 119.5-128.6). The mean BMI in casual drinkers was higher than in AUD and abstainers.

## Other outcomes

A total of 96% of the pilot study participants were willing to participate in a further follow-up in 2 years time and 91.2% expressed a willingness to undergo blood tests as a part of follow-up.

## DISCUSSION

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The overall attrition rate in our sample was less than 20% at 4 years, the highest attrition being in AUD and lowest in abstainers; higher attrition was also observed in urban communities. Thus, we had a reasonably good retention rate at 4 years compared to previous longitudinal studies of drug and alcohol use which have reported attrition rates from 13% to 25% at 1 year.[[20](#),[21](#)] A meta-analysis of longitudinal psychoactive substance prevention studies reported that on average 78.3% of participants were retained at 6 months, 73.4% after a year and 71.% after 2 years, suggesting that the largest attrition tends to occur during the first 6 months of a study.[[22](#)] Our attrition rate

could be further reduced if we had resources to trace individuals who had migrated.

The incidence of AUD in our sample at 4 years was 12.8%. The only community-based Indian study that we identified reported an annual incidence rate of alcohol use disorders to be 4.2%.[\[23\]](#) In our sample, the abstinence rate in AUD was only 5.1% at 4 years. In the context of limited health services and large treatment gaps for AUDs, this is likely to approximate the rate of untreated abstinence. We do not have comparable studies in Indian populations but studies in developed countries in untreated samples report remission rates of 2-3%[\[24,25\]](#) at 1 year to 30% at 15 years.[\[26\]](#)

A higher proportion of those with AUD had adverse health and lifestyle outcomes compared to the other two groups. Although these findings are consistent with other studies[\[18,27,28,29,30,31,32,33,34,35,36,37\]](#) our small sample size restricts any inferences that we can draw from them. However, these findings do show a clear trend that AUD at baseline is associated with long-term adverse

health outcomes; these findings coupled with those of low attrition strengthen the case for conducting a definitive longitudinal study exploring the long-term course and outcome of AUD.

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## Footnotes

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## **Figures and Tables**

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## Table 1

Variable	Abstainers N=46 (36.8%) n (%), 95% CI	Casual drinkers N=47 (37.6%) n (%), 95% CI	Hazardous drinkers N=32 (25.6%) n (%), 95% CI
Hypertension	1 (2.2, 0.1-11.5)	6 (12.8, 4.8-25.7)	5 (15.6, 5.3-32.8)
Heart problem	3 (6.5, 1.4-17.9)	1 (2.1, 0.05-11.3)	1 (3.1, 0.07-16.2)
Diabetes mellitus	2 (4.4, 0.5-14.8)	4 (8.5, 2.4-20.4)	4 (12.5, 3.5-29.0)
Chest pain or discomfort	9 (19.6, 9.4-33.9)	7 (14.9, 6.2-28.3)	7 (21.9, 9.3-40.0)
Shortness of breath	9 (19.6, 9.4-33.9)	13 (27.7, 15.6-42.6)	11 (34.4, 29.8-74.3)
Current smoker	8 (17.4, 7.8-31.4)	11 (23.4, 12.3-38.0)	9 (28.1, 13.7-46.7)
Moderate to severe general body pain	19 (41.3, 27.0-56.8)	16 (34.0, 20.9-49.3)	19 (59.4, 40.6-76.3)
Problems with mobility and/or daily activities	7 (15.2, 6.3-28.9)	6 (12.8, 4.8-25.7)	11 (34.4, 18.6-53.2)
Moderate to severe anxiety or depression	16 (34.8, 21.4-50.2)	12 (25.5, 13.9-40.3)	22 (68.8, 50.0-83.9)
Mean diastolic BP	77.6 (74.7-80.5)	81.3 (77.6-85)	86.1 (15.2, 80.6-91.6)
Mean BMI	22.6 (21.4-23.8)	24.6 (23.4-25.8)	22.9 (21.4-24.4)

BMI – Body mass index; BP – Blood pressure

## Chronic diseases and risk factors

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