

# BMJ Open Effect of a brief intervention with small financial incentives on alcohol consumption in China: study protocol for a randomised controlled trial

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## ABSTRACT

**Introduction** Alcohol consumption is the seventh leading risk factor for disability-adjusted life years in the world, according to the Global Burden of Disease Study 2017. As the largest developing country, China has a substantial population of alcohol consumers who suffer from related health risks. Despite having made significant advancements in eradicating absolute poverty, many people still live in relative poverty, which suggests that the adverse health effects caused by alcohol consumption among vulnerable populations in China warrant more attention. This paper aims to provide an overview of alcohol consumption among ethnic populations in China and test the feasibility and efficacy of a brief advice intervention with a small financial incentive in reducing harmful drinking behaviours.

**Methods** This study is a three-arm, single-blinded, pragmatic, individually randomised controlled trial with follow-ups at 1, 2 and 3 months after randomisation. A total of 440 daily drinkers living in Xichang will be recruited and divided into three groups: brief intervention group, financial incentive group and control group. All participants will receive a urine ethyl glucuronide (EtG) test, which detects alcohol consumption in the past 80 hours. Additionally, participants in the brief intervention group will receive three free counselling sessions alongside multimedia messages on the topic of alcohol consumption after each session. The participants in the financial incentive group will receive the same interventions as well as cash incentives according to the results of the EtG test. The primary outcomes are the self-reported drinking quantity, binge drinking frequency, drinking intensity and the proportion of participants who pass the EtG test.

**Ethics and dissemination** This protocol was approved by the Peking University Health Science Center Institutional Review Board (IRB00001052-20049). Findings will be published in peer-reviewed journals and presented at local, national and international conferences to publicise and explain the research to key audiences.

**Trial registration number** NCT04999371.

## INTRODUCTION

According to the Global Burden of Disease Study 2017,<sup>1</sup> alcohol is the seventh leading risk factor for disability-adjusted life years (DALYs) in the world. In 2017, 2.84 million

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This trial examines the effectiveness of brief alcohol intervention on alcohol abuse behaviour by providing a personalised reminder with a financial incentive to reduce alcohol consumption and increase investment in health and education.
- ⇒ A personalised health reminder approach is very feasible and it also minimises the possibility of incorrectly interpreting information due to limited attention and redundancy neglect.
- ⇒ Using the urine ethyl glucuronide test as one of the primary outcomes increases scientific rigour and decreases participant misreporting.
- ⇒ This trial cannot completely disentangle the effect of financial incentives.
- ⇒ This study is unable to assess the long-term effects of intervention due to budget constraints.

deaths and 108.00 million DALYs globally were attributable to alcohol use.<sup>1</sup> Alcohol consumption is associated with health conditions such as gastric distress, hypertension, cardiovascular diseases, permanent liver damage, diabetes and cancer.<sup>2-4</sup> Furthermore, excessive drinking on a single occasion increases the risk of motor vehicle crashes, drowning, intimate partner violence, unprotected sex, and childhood sexual abuse.<sup>2,3</sup>

As the largest developing country, China has a substantial population of alcohol consumers who suffer from related health risks. For instance, in 2016, the total alcohol per capita consumption among the world's population aged 15 and older was 6.4 L. However, this quantity was 7.2 L in China, 12.5% higher than global consumption.<sup>5</sup> An increase in per capita alcohol consumption was also observed in recent years,<sup>5</sup> especially in regions inhabited by minority groups.<sup>6</sup>

From the perspective of decision-making, studies have shown that low-income groups are more inclined to pay attention to current goals and fail to make rational decisions.<sup>7,8</sup>

Despite China having made outstanding achievements in eradicating absolute poverty, many people are still living in relative poverty, which suggests that the adverse health effects caused by alcohol consumption among low-income populations in China warrant more attention.

Brief alcohol intervention is an effective way to reduce the amount of alcohol consumption, and its efficacy has been supported by a number of studies.<sup>9–12</sup> However, research has shown that alcoholic drinkers are reluctant to accept interventions.<sup>13 14</sup> A randomised controlled trial conducted in India indicated that financial incentives may serve as a feasible intervention for participants in low-income countries. Financial incentives are external motivators and may increase intervention adherence.<sup>15</sup> Contingency management is an approach to reinforcing participants' behaviours by delivering a reward only if the target behaviour occurs.<sup>16</sup> Studies have illustrated that contingency management is among the more effective ways to help people refrain from substance abuse.<sup>17–19</sup> Based on previous trials, it seems more effective to offer a financial incentive to reduce alcohol consumption among ethnic minority migrants.

The existing alcohol intervention studies were mainly conducted in developed countries,<sup>11 12 20</sup> centred on school students,<sup>21</sup> or based on clinical settings and health-care service providers.<sup>10 22</sup> Few studies have focused on alcohol consumption among ethnic minority migrant populations in developing countries where residents have low education levels and the primary healthcare system is not well developed.<sup>23</sup> To address this gap, the research team aims to evaluate the effects of a brief intervention combined with a small financial incentive on alcohol consumption and health outcomes among the migrated population in Liangshan Prefecture. This study will be conducted in Liangshan Prefecture for two reasons. First, Liangshan is a region located southwest of Sichuan province, and it is populated by Yi ethnic minority. The average income in Liangshan is approximately two-thirds of the national average income.<sup>24</sup> Second, a previous study found that the drinking rate of Yi minority (47.9%) is higher than that of other regions in China.<sup>25</sup>

The aim of this paper is to test the feasibility and efficacy of small financial incentives with brief advice intervention in the targeted reduction of harmful drinking behaviours among ethnic minority migrants.

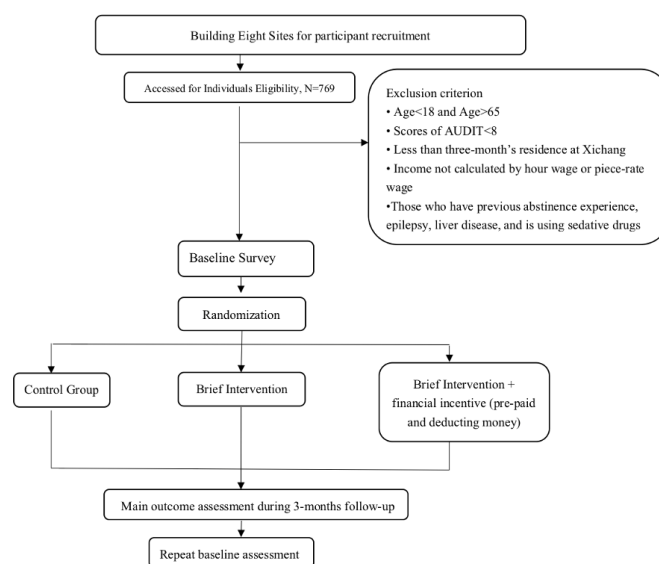
## METHODS AND ANALYSIS

### Study design

This is a three-arm, single-blinded, pragmatic, individually randomised controlled trial that aims to reduce alcohol consumption among residents. Figure 1 shows the Consolidated Standards of Reporting Trials flow diagram.

### Recruitment and participants

Recruitment activities will be conducted in building sites and villages (n=8) in Xichang, Liangshan Yi Autonomous Prefecture, south of Sichuan, China. Flyers and



**Figure 1** CONSORT flow diagram. This diagram shows all the processes of the three-arm, individual randomised controlled trial, including participants recruitment, baseline survey, randomisation, intervention, follow-up survey and final evaluation. AUDIT, Alcohol Use Disorder Identification Test; CONSORT, Consolidated Standards of Reporting Trials.

community posts will be used to encourage residents to take a quick Alcohol Use Disorder Identification Test (AUDIT) to determine whether they meet the criteria of an at-risk drinker. Respondents will be informed that the experiment involves a baseline assessment of alcohol consumption and irregular follow-ups through 3 months that require them to take alcohol tests and complete questionnaires. Eligible participants are workers aged between 18 years and 65 years, with scores of AUDIT  $\geq 8$ . Employees whose wages are calculated based on hourly or piece-rate wages will also be included in the study, such as hourly workers at construction sites, delivery men and more. Eligible participants agreeing to partake in this study should remain in Xichang for the next 3 months. Informed consent will be obtained before starting the trial (see online supplemental file 1). Respondents with abstinence experience or a history of epilepsy, liver disease and sedative drug use will be excluded from the study.

### Randomisation and blinding

Randomisation occurs at the individual level. Participants within the same recruitment session will be individually randomised in a 1:1:1 ratio into two intervention groups and one control group (brief intervention group, financial incentive group, control group). The randomisation process will be generated using a web-based system ([www.sealedenvelope.com](http://www.sealedenvelope.com)) by an investigator who is not involved in participant recruitment. After the randomisation, the investigator will conduct a balancing test to ensure that participants in the intervention groups and the control group are comparable and they will notify the recruitment staff 1 day prior to the baseline investigation. The recruiting staff will then

inform the participants of the results of randomisation independently. Due to the nature of the intervention, the recruitment staff are also responsible for delivering the interventions and thus cannot be blinded from participant allocation. However, participants will not be informed about the treatment in the other groups. Outcome assessors and statistical analysts will be blinded to the random grouping.

## Sample size

The proportion of people who drink alcohol according to the ethyl glucuronide (EtG) test in the control group is 25%, and that in the brief intervention group is expected to be 10%. According to Eq (1), to achieve a 95% CI ( $\alpha=0.05$ ) and 80% power, the required sample size was calculated to be 100 in the brief intervention group. Assuming a retention rate of 90% during follow-up, the overall sample size of the study should be 333 for the three groups ((100×3 groups)/90% retention rate). Four hundred forty participants are anticipated to enrol in this study.

$$N = \frac{\left[ z_{\alpha} \sqrt{2p(1-p)} + z_{\beta} \sqrt{p_1(1-p_1) + p_2(1-p_2)} \right]^2}{(p_1 - p_2)^2} \text{Eq (1)}$$

where  $N$  is the sample size for one group,  $z_{\alpha}$  and  $z_{\beta}$  are the 5% and 20% percentile of the standard normal distribution, respectively,  $p_1$  and  $p_2$  are the proportion of people who drink alcohol in control and brief intervention groups, respectively,  $p$  equals to  $(p_1 + p_2)/2$ .

## Intervention

### Brief alcohol intervention

The participants in treatment group 1 will receive free monthly one-to-one consultation and multimedia messages via the WeChat app or SMS on alcohol consumption, including the harms of alcohol consumption, tips to reduce drinking, abstinence cases, and so on, each time after consultation. One-to-one counselling services will be provided via phone calls based on WHO recommendations.<sup>26</sup> A total of three counsels scheduled for the 2nd, 6th and 10th week after the baseline survey will be conducted.

Brief intervention counsellors are staff of the research team. All counsellors are required to attend a full-day workshop organised based on the scheme and teaching materials provided by Hongkong University. The contents of the workshop include: (1) the harms of excessive drinking and the benefits of controlling drinking; (2) an overview of AUDIT; (3) personalised alcohol reduction advice; and (4) a standard procedure of brief intervention. Counsellors will guide participants to evaluate their own drinking behaviours, offer them advice and provide encouragement.

An experienced research staff member will supervise and assist at each brief intervention session to ensure the accurate delivery of the intervention. All counsellors will follow a standardised process and complete a checklist table.

## Incentive group

The participants in one of the treatment groups will receive brief alcohol intervention with cash incentives according to the results of the EtG tests. Participants will receive a text message regarding the incentive treatment strategy promptly after the completion of the follow-up random urine test. The monetary incentive is described as losses based on the theory of framing effect. First, a voucher of RMB ¥490 (≈US\$77.5) will be given to the participants in this group, and ¥70 will be deducted every time their urine tests show positive results. Finally, the participants will receive cash equivalent to the remaining money in the voucher.

## Control group

No intervention or cash incentives will be provided to the participants in the control group. The general information of the participants in this group will still be collected, and an alcohol test will be performed. Therefore, RMB ¥20 (≈US\$3.2) compensation will be provided for participants in the control group (participants of the intervention group also will receive this part of the compensation).

## Procedures

Participants will be assessed at baseline and at the end of each month after treatment initiation (table 1). Participants are required to take a test four times a week for weeks 1–4, twice a week for weeks 5–8 and once a week for weeks 9–11. To prevent cheating by abstaining from alcohol only the day before the test, the programme team will randomly determine the time of each test. The baseline questionnaire measures participants' drinking behaviour, including daily alcohol consumption, age at first drink, the number of attempts at quitting or reducing drinking and methods for quitting used in the past. At weeks 2, 6 and 10 after the intervention initiation, trained counsellors will follow-up with participants via phone calls. The Prime Screen single-panel urine test paper will be used to conduct the EtG test.<sup>27</sup> Participants will be informed that they may withdraw from the study at any time without providing a reason. The researcher also has access to interim analyses and right to terminate the trial at their discretion. For subjects who withdraw from the study, information on the number of interventions, the duration of participation in the programme and the reasons for withdrawal (if willing to provide) will be collected. For subjects who are unavailable on survey day, the research team will schedule appointments with them via telephone.

Data will be collected via a web-based questionnaire, and the dataset will be accessible in real time. The project leader will manage the online dataset with a username and password. Logical checks will be conducted daily after fieldwork by a graduate student, and all unreliable or missing data will be corrected in time. A data management specialist will perform data desensitisation to protect the participants' personal information. All personnel

**Table 1** Schedule of baseline and follow-up assessments

Assessment	Baseline	1 Month	2 Month	3 Month
Informed consent	×			
Eligibility screen	×			
Randomisation	×			
Intervention initiation	×			
Sociodemographic characteristics	×			
Self-efficacy of reducing/quitting	×			×
Mental health	×			×
Quality of sleep	×			×
Drinking behaviour	×	×	×	×
Drinking knowledge				
Quit attempts	×	×	×	×
Biochemically validated abstinence (EtG)	×	×	×	×

Sociodemographic characteristics include age, gender, education level, marital status and household income.  
EtG, ethyl glucuronide.

attempting to access the data need to be approved by the project leader.

### Outcomes

The main focus is on alcohol use behaviour, health status, productivity and income, as well as household expenditure. The detailed outcomes are listed as follows:

Primary outcomes:

1. Self-reported drinking quantity (drinks per week).
2. Self-reported binge drinking frequency (number of binges per week), binge drinking is defined as four or more standard drinks on one occasion.
3. Self-reported drinking frequency (drinking days per week).
4. Self-reported drinking intensity (number of drinks per drinking day).
5. The proportion of people who drink alcohol according to the EtG test.

Secondary outcomes:

1. Health status indicators. Sleep quality will be measured by the Pittsburgh Sleep Quality index, a widely used instrument for evaluating sleep quality and linking findings to psychological disorders.<sup>28</sup> Mental health will be assessed by a short version of the Depression Anxiety Stress Scale-21, an internationally recognised method of assessing the risk of mental health outcomes.<sup>29</sup>
2. Life satisfaction will be assessed by the ONS questionnaire, which measures the respondent's life evaluations, positive emotions and negative emotions on an 11-point scale. A higher score indicates a greater extent of the respondent's life evaluations.<sup>30</sup>
3. Healthcare utilisation will be determined, including emergency/outpatient visits, medical hospitalisation, mean days in hospital in the past 1 month.

4. Productivity and income, which will be calculated as income per day and working hours per day in the past 1 month.
5. Household expenditure includes the daily expenditure for alcohol, children, parents and healthcare services in the past 1 month.
6. Score on the knowledge about the harm of alcohol consumption.

### Statistical analysis

The sociodemographic characteristics and baseline information, including sex, age and the indicators listed in the outcome section of the participants, will be reported. The differences in alcohol consumption capacity, sobriety status, health status, healthcare utilisation, daily working hours and income and household expenditure between the control and the intervention groups will be examined using t-tests and  $\chi^2$  test.

The effect of the intervention on alcohol consumption behaviours will be analysed using multiple linear regression models. Alcohol consumption capacity, drinking frequency and drinking intensity indicators are the dependent variables. Control versus intervention groups, the baseline level of the targeted outcome variable and sociodemographic characteristics (age group, sex, education, marital status, annual household income) and time between baseline and follow-up surveys are independent variables.

The effect of alcohol consumption on health, life satisfaction, alcohol-related traffic accident and harm, healthcare utilisation, productivity and household expenditure outcomes will be analysed with regression models with adjustments. All comparisons will use generalised estimating equation models (multiple linear models for continuous outcomes or logistic models for dichotomous



outcomes) to adjust for the participant's baseline alcohol consumption capacity and baseline sociodemographic characteristics (age group, sex, education, marital status, annual household income), and time between the baseline and follow-up surveys. Taking health status/life satisfaction/frequency of alcohol-related traffic accident and harm/healthcare utilisation/daily working hours/daily income/monthly expenditure for alcohol, children's education, parents and healthcare as dependent variables, alcohol consumption capacity as independent variables and controlling for individual fixed effect and all the baseline characteristics listed above.

To address the possibility of bias attributable to higher attrition rates among intervention participants, the research team will perform a 'worst-case' sensitivity analysis by assuming that 100% of study dropouts remain at the highest level of alcohol consumption. The intervention effect by subgroups will be assessed, respectively, including age group, sex, education level and household income. Statistical analyses will be conducted using Stata V.15.1 (Stata Corp, Texas, USA). The statistical tests are two-sided, and a  $p$  value  $< 0.05$  is considered as statistically significant.

### Patient and public involvement

No patient involved.

### Ethics and dissemination

This study received ethical approval from the Peking University Health Science Center Institutional Review Board. The trial is registered on ClinicalTrials.gov (registration number: NCT04999371; date of registration 5 August 2021). All participants gave their consent for their own involvement in the study. Authorship will be determined in accordance with the International Committee of Medical Journal Editors guidelines. If there are any changes to the protocol, we will report to the Peking University Health Science Center Institutional Review Board and inform the subjects. Findings will be published in peer-reviewed journals and presented at local, national and international conferences to publicise and explain the research to key audiences.

### DISCUSSION

This study entails a comparison of a control group with two different intervention arms, a brief intervention and brief intervention plus financial incentive, on improving drinking behaviours in Liangshan Prefecture to ameliorate residents' health capital and consumption behaviour. The effectiveness of the two interventions will generate valuable information for decision-makers and non-government organisations and encourage them to prioritise educational support on alcohol cessation services, which will ultimately decrease alcohol consumption.

There are four innovative aspects to this study. First, this is the first time a brief alcohol intervention will be conducted in a minority habitation in China. Second, a small financial

incentive will be integrated into the brief alcohol intervention to evaluate its effect on behavioural changes, which is crucial in changing health status and productivity performance. Third, by assessing the income and expenditure pattern, the research team is able to evaluate whether drinking reduction can make the subjects more productive and rational in decision-making. Last, the effectiveness of brief alcohol intervention with a small financial incentive will be assessed in the community rather than in clinical facilities, which will strengthen scientific evidence supporting the incorporation of community healthcare workers in carrying out the intervention.

This trial has several strengths. First, this is one of the first randomised controlled trials in China to explore the approaches to reducing alcohol consumption. The use of intervention in this study deserves extrapolation if proved effective. Additionally, the use of EtG test results as the financial incentive indicator will ensure the accuracy of the intervention. This is more beneficial for evaluation than using the self-reported alcohol consumption habit.<sup>19</sup> Finally, in order to further evaluate the effects of the alcohol intervention, the research team will also identify changes in individual income using a questionnaire to determine whether alcohol consumption affects work efficiency and, as a result, income.

This trial also has several potential limitations. First, this study is unable to assess the long-term effects of the intervention (eg, 12 months) due to budget constraints. Nevertheless, three consecutive follow-up surveys (at 1, 2 and 3 months) will allow the development of a basic understanding of how intervention can change participants' drinking behaviours. Second, the evidence of drinking behaviour is based on self-reporting which cannot be obtained by the research team directly. Third, the consumption of alcohol in Liangshan Prefecture is relatively high, which may limit the generalisability of study findings to other settings.

**Correction notice** The article has been corrected since it was published online. The statement on the equal contributorship for the paper between SL and ZW is reinstated.

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**Contributors** GL, ShanshanL and ZW contributed to the research concept and design, supervise the work and offered critical suggestions for revisions. ShanshanL, ZW, YS and SijiaL participated in conducting the study. ShanshanL, ZW and SijiaL conducted data analysis and drafted the manuscript. All authors have read and approved the manuscript.

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**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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## REFERENCES

- GBD. Risk factor Collaborators. global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: a systematic analysis for the global burden of disease study 2017. *Lancet* 2017;(1474-547X (Electronic)).
- Centers for Disease Control and Prevention. *Planning and implementing screening and brief intervention for risky alcohol use: a step-by-step guide for primary care practices*. Atlanta, Georgia: Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities, 2014.
- Smyth A, Teo KK, Rangarajan S, et al. Alcohol consumption and cardiovascular disease, cancer, injury, admission to Hospital, and mortality: a prospective cohort study. *Lancet* 2015;386:1945-54.
- Seitz HK, Stickel F. Molecular mechanisms of alcohol-mediated carcinogenesis. *Nat Rev Cancer* 2007;7:599-612.
- World Health Organization. *Global status report on alcohol and health 2018*. Switzerland, 2018.
- Zhao Z, Wang L, Zhang M. Geographic distribution of alcohol use among Chinese Adults—China, 2015. *Age* 2020;3:3.7.
- Sheehy-Skeffington J, Rea J. *How poverty affects people's decision-making processes: Joseph Rowntree Foundation York*, 2017.
- Bernheim BD, Ray D, Yeltekin S. Poverty and self-control. *Econometrica* 2015;83:1877-911.
- Toumbourou JW, Stockwell T, Neighbors C, et al. Interventions to reduce harm associated with adolescent substance use. *Lancet* 2007;369:1391-401.
- Crawford MJ, Patton R, Touquet R, et al. Screening and referral for brief intervention of alcohol-misusing patients in an emergency department: a pragmatic randomised controlled trial. *Lancet* 2004;364:1334-9.
- Kuerbis AN, Yuan SE, Borok J, et al. Testing the initial efficacy of a Mailed screening and brief feedback intervention to reduce at-risk drinking in middle-aged and older adults: the comorbidity alcohol risk evaluation study. *J Am Geriatr Soc* 2015;63:321-6.
- Ettner SL, Xu H, Duru OK, et al. The effect of an educational intervention on alcohol consumption, at-risk drinking, and health care utilization in older adults: the project share study. *J Stud Alcohol Drugs* 2014;75:447-57.
- Cunningham JA, Breslin FC. Only one in three people with alcohol abuse or dependence ever seek treatment. *Addict Behav* 2004;29:221-3.
- Kuramoto SJ, Martins SS, Ko JY, et al. Past year treatment status and alcohol abuse symptoms among US adults with alcohol dependence. *Addict Behav* 2011;36:648-53.
- Schilbach F. Alcohol and self-control: a field experiment in India. *Am Econ Rev* 2019;109:1290-322.
- Higgins ST, Budney AF, Bickel WK, et al. Incentives improve outcome in outpatient behavioral treatment of cocaine dependence. *0003-990x*.
- Dutra L, Stathopoulou G, Basden SL, et al. A meta-analytic review of psychosocial interventions for substance use disorders. *0002-953x*.
- Lussier JP, Heil SF, Mongeon JA, et al. A meta-analysis of voucher-based reinforcement therapy for substance use disorders. *0965-2140*.
- Prendergast M, Podus DF, Finney J, et al. Contingency management for treatment of substance use disorders: a meta-analysis. *0965-2140*.
- Turrisi R, Larimer ME, Mallett KA, et al. A randomized clinical trial evaluating a combined alcohol intervention for high-risk college students. *J Stud Alcohol Drugs* 2009;70:555-67.
- Teesson M, Newton NC, Slade T, et al. Combined prevention for substance use, depression, and anxiety in adolescence: a cluster-randomised controlled trial of a digital online intervention. *Lancet Digit Health* 2020;2:e74-84.
- Ness J. Alcohol misuse and self-harm: an opportunity for early intervention in the emergency department. *Lancet Psychiatry* 2017;4:435-6.
- Nilsen P. Brief alcohol intervention-where to from here? Challenges remain for research and practice. (1360-0443).
- China Statistics Press. *China statistical Yearbook*, 2018.
- Jianzhong Y, Qi W, Xuehui Z. Drinking patterns and awareness of harm effect of alcohol among Yi people in Yunnan Province. *China Journal of Public Health* 2011;27:492-4.
- World Health Organization. *The alcohol use disorders identification test: guidelines for use in primary care*, 2001.
- Grodin EN, Nguyen X-T, Ho D, et al. Sensitivity and specificity of a commercial urinary ethyl glucuronide (ETG) test in heavy drinkers. *Addict Behav Rep* 2020;11:100249.
- Buysse DJ, Reynolds CF, Monk TH, et al. The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. *Psychiatry Res* 1989;28:193-213.
- Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety inventories. *Behav Res Ther* 1995;33:335-43.
- Luo R, Lyu Q, Rozelle S, et al. Early child development and caregiver subjective well-being in rural China. *China Agricultural Economic Review* 2021;13:302-18.

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## INFORMED CONSENT FORM

Dear Subjects,

By reading the informed consent form carefully below, you are agreeing that: (1) you have read and understood all the information, (2) you know your rights, (3) questions about your participation in this study have been answered satisfactorily (if you have any question at any time, you can require researchers to explain), (4) you are aware of the potential risks (if any) and benefits, and (5) you are willing to take part in this research.

The project is led by Professor Gordon Liu who works in the National School of Development (NSD), Peking University and funded by the National Natural Science Foundation of China.

1. Why is this study being conducted?

Under the national policy of "Health China 2030", one of the top priorities is how to effectively promote targeted poverty alleviation. At present, residents in poverty are mainly from bankruptcy through medical bills in Liangshan Yi Autonomous Prefecture. Therefore, this study will intervene in residents' health in Liangshan Prefecture based on big data, and explore whether improving health can break the vicious cycle of "poverty caused by disease and disease caused by poverty" through the method of experimental economics. The data will be used to help formulate policies related to health management in poor areas and promote the goal of poverty eradication.

2. Who will be invited to participate in this study?

Our survey will be conducted in Liangshan Yi Autonomous Prefecture, Sichuan Province. The number of randomly selected households is twenty in each village. They are volunteered to participate in the study. Exceptionally, all households residing in Liangshan Prefecture for at least six months of the year will be included in the study sample.

3. How many people will participate in the study?

Those with drinking habits will be invited to participate in urine testing on a voluntary basis, and no more than 440 subjects are planned to be enrolled in this project with urine testing.

4. What is included in this study?

The study aims to explore intervention methods to promote the health level of local residents through health information interventions in cooperation with local health commission, which could reduce the incidence of diseases, improve the health and productivity of local populations, and provide scientific suggestions to the government to address poverty alleviation due to diseases. The team will design a questionnaire based on the objectives and content of the study and provide standardized training to the village doctors and local university students. The village doctors and researchers will collect data based on the questionnaire in a one-on-one manner, and the researchers will be responsible for urine retention and observation of the subjects. The EtG test strips were used for urine alcohol testing, and the cost of urine testing was borne by the project team. The five-year study is to collect data in every six months, and the content of each follow-up visit will be basically the same except for basic household information.

5. How long will the study last?

The duration of this alcohol consumption study is three months (including baseline research,

42 intervention and 7 follow-up visits), and each questionnaire will take approximately 20-60  
43 minutes to complete. You may withdraw during the process of the study and your benefits will  
44 not be affected in any way.

45 6. What are the risks of participating in this study?

46 This study mainly involves information intervention and health education, mainly to provide  
47 you with information to improve your health and health behavior and to help you learn more  
48 about your health, and will not cause you any harm. To ensure that you can fully understand the  
49 information content of the intervention, the intervention will be conducted through information  
50 platforms, voice or on-site.

51 To achieve the goal of this study, we will regularly collect information about your health and  
52 other information, which may cause inconvenience to your life if the information is  
53 inadvertently disclosed. In order to properly control this risk, all information will only be  
54 collected through local village doctors, and the information collected will only be used for  
55 research, not for commercial purposes, and the team is committed to not disclose your personal  
56 information in any papers and reports.

57 7. What are the benefits of participating in this study?

58 We will follow up on your health status to fully protect your rights. By participating in this  
59 program, you are likely to learn more about health and hygiene information. That can help you  
60 change your bad habits, reduce the incidence of disease, and improve your personal health.

61 8. Is it mandatory to participate in and complete this study?

62 Your participation in this study is completely voluntary. If you do not want to, you can refuse  
63 to participate and this will not have any negative impact on you. Even after you have agreed to  
64 participate, you may change your mind at any time and tell the investigator to withdraw from  
65 the study, and your withdrawal will not affect your access to normal medical services. In  
66 principle, after you have withdrawn, the researchers will keep your information in strict  
67 confidence and will not use or disclose it further during this period. However, in the following  
68 circumstances, the researchers can continue to use information about you even after you have  
69 withdrawn from the study or the study has ended. These circumstances include:

70 (1) Removal of your information would affect the scientific validity of the study results or the  
71 evaluation of the security of the data.

72 (2) Providing some limited information for research, teaching, or other activities (this  
73 information will not include your name, ID number, or other personal information that  
74 identifies you).

75 (3) If something happened can affect your decision to continue participating in that research,  
76 we will inform you.

77 9. About the study cost and compensation

78 There is no fee involved in participating in this study, and the team mainly collect data by  
79 visiting the household, and minimize disturbance to farmers as much as possible. Additionally,  
80 if reasonable costs are incurred due to this study, such as transportation costs incurred by



81 farmers in order to cooperate with the research, the project will provide some compensation  
82 with advance notice.

83 10. Do subjects receive compensation for participating in this study?

84 No compensation will be paid for participation in this study.

85 11. What happens in case of research-related injuries?

86 In the event of an accidental injury resulting from the performance of the study, we provide  
87 the necessary medical treatment, cover the appropriate medical expenses and provide  
88 appropriate financial compensation in accordance with the relevant laws and regulations of  
89 China.

90 12. Will my information be kept confidential?

91 If you decide to participate in this study, your participation in the study and your personal  
92 information during the study will be confidential. Any information that identifies you will not  
93 be disclosed to members outside of the research team without your permission. All study  
94 members and study-related parties will keep your identity confidential as required. Your file  
95 will be kept securely and will be accessible only to the researcher. To ensure that the research  
96 is conducted in accordance with regulations, members of the government administration, school  
97 authorities or ethics committee will have access to your personal information at the research  
98 unit as required. When the results of this study are published, no personal information about  
99 you will be disclosed.

100 Information about you will only be used for research purposes, and when researchers publish  
101 public articles or reports, the data will be encrypted and no personal information about you will  
102 appear.

103 13. Who do I contact if I have any question?

104 If you have any questions related to this study, please contact Shanshan Li.

105 E-mail: [lishanshan7@pku.edu.cn](mailto:lishanshan7@pku.edu.cn)

106 Tel: 010-62757318

107

108 If you have questions related to the subject's own rights, you may contact the Biomedical Ethics  
109 Committee of Peking University.

110 E-mail: [llwyh@bjmu.edu.cn](mailto:llwyh@bjmu.edu.cn)

111 Tel: 010-82805751

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## 116 Investigator's Statement

117 *I have informed the subject of the background, purpose, risks and benefits of the study,*  
118 *given him/her sufficient time to read the informed consent form, discuss with others, and*  
119 *answered his/her questions about the study; I have informed the subject that he/she could*  
120 *contact Dr. Gordon Liu at any time when he/she encountered problems related to the study and*  
121 *the Biomedical Ethics Committee of Peking University at any time when he/she encountered*  
122 *problems related to his/her rights/rights, and provided accurate contact information; I have*  
123 *informed the subject that he/she could withdraw from the study; I have informed the subject*  
124 *that he/she would be given a copy of this informed consent form, which contains my signature*  
125 *and his/her signatures.*

126

127

128 Signature

Date

129

## 130 Subject Statement

131 *I have been informed of the background, purpose, risks and benefits of the study. I was given*  
132 *sufficient time and opportunity to ask questions and I was satisfied with the answers to my*  
133 *questions. I was also told who to contact if I had questions, difficulties, concerns, suggestions*  
134 *about the study, or if I wanted further information or help with the study. I have read this*  
135 *informed consent form and agree to participate in this study. I understand that I may withdraw*  
136 *from this study at any time during the study without any reason. I am informed that I will be*  
137 *given a copy of this informed consent form containing my signature and that of the researchers.*

138

139

140 Signature

Date

141

142 Signature of the legal agent

Date

143

144 Relationship to the subject

145

146 Subject's signature (10 years old and above)

Date