Acceptance of and barriers to voluntary HIV counselling and testing among adults in Guizhou province, China

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Objectives: To find and compare the levels of acceptance of and barriers to voluntary counselling and testing (VCT) among adults in two different counties of Guizhou province, China, one in which the China CARES project was operating and the other in which it was not.

Design: A longitudinal design with two-stage cluster sampling was employed.

Methods: A total of 1012 participants were recruited in the two counties. All participants were interviewed, then given a coupon for free VCT after the interview. Participants were paid for returning the coupon within 2 months, whether tested or not. The uptake of VCT was measured within 2 months after the interview.

Results: The study found that the levels of HIV/AIDS knowledge and acceptability of VCT among the adults in both counties were low. Although 459 participants (43.5%) expressed an intent to use the VCT services, only 193 (16.5%) actually visited the VCT facilities, and only 42 (3.7%) actually took an HIV test within 2 months after the interview. The use of VCT was related to occupation, age, transportation difficulties, health status, ethnicity, and high-risk behaviors. The main barriers to HIV testing included perceiving oneself as low risk, fear of unsolicited disclosure, and fear of stigma and discrimination that would result from taking the test.

Conclusion: Education about HIV/AIDS and VCT needs to be improved, and levels of stigma and discrimination reduced, in order to enhance the uptake of VCT services, an essential step for the initiation of treatment.

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Introduction

Increased public awareness of HIV/AIDS, increasing numbers of individuals infected with and dying of AIDS, and knowledge of personal risk behaviors have resulted in an increased desire to learn one's HIV status. Many approaches to HIV prevention and care also require individuals to know their serostatus. In recent years,

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voluntary counselling and testing (VCT) for HIV has been acknowledged internationally as an effective and pivotal strategy for both HIV/AIDS prevention and the provision of care and treatment [1–3].

It is estimated that as many as 60% of individuals who are at risk of infection do not seek testing [4–6]. According to several studies, 25–33% of individuals tested at public clinics or testing sites never return for their results [6–8], and many learn of their HIV infection late in the course of the disease when treatment is less effective [9,10].

In many areas of China there are no effective VCT services, especially in rural areas [11]. In 2003, the Ministry of Health implemented the China CARES Program by establishing 51 community-based HIV/AIDS comprehensive care pilot centers in regions with the greatest number of HIV/AIDS cases. This programme includes provision of treatment with domestically produced antiretroviral drugs, healthcare and education, intervention programmes including stigma reduction and interventions to reduce mother to child transmission, and VCT [11]. HIV awareness interventions were rolled out in the general population in areas where the China CARES Program was operating. China CARES provides a counterpart fund to assist the worst affected counties by implementing the 'Four Frees and One Care' policy, which includes free VCT [12,13]. By the end of 2005, there were 2850 free VCT clinics throughout the country [14]. The rate of acceptance of VCT is unknown in some areas, however, and is known to be low in others.

There have been few studies on the acceptability of VCT in mainland China and Hong Kong [15–19]. In a study by Liu and colleagues [15], 88.1% of 653 participants who had heard of HIV/AIDS said they would be willing to be tested. The actual rate of VCT use in that study was, however, not tested. Another study in China found that only 8.5% of participating premarital couples chose to accept HIV testing [19]. Cost, gender, and low HIV/AIDS knowledge were associated with low acceptance rates.

The current study attempted to augment the limited data available on the acceptance of and barriers to VCT among adults in two different counties of Guizhou province, China.

Guizhou province is located in mountainous southwestern China. HIV infection was first reported in Guizhou in 1993. Since 1998, 76% of HIV infections have been associated with injecting drug use [11,20]. Guizhou is one of seven provinces estimated to have more than 10 000 HIV-positive drug users, and one of nine provinces reporting an HIV prevalence rate exceeding 5% among injection drug users (IDU) [11,14]. It is estimated that the actual number of HIV infections in Guizhou is approximately 30 000 [21].

Methods

The objective of the current study was to explore adults' knowledge and perceptions of VCT in Guizhou province, to compare the acceptance of VCT among adults between areas in which China CARES is available and is not available, and to identify facilitators of and barriers to VCT in Guizhou province.

This study used a longitudinal design with two-stage cluster sampling to assess knowledge, attitudes, and acceptance of VCT.

Participants

We selected a county in Guizhou with the highest HIV prevalence among the China CARES counties, in which the HIV epidemic is driven by IDU. Another county with a similar estimated prevalence of HIV and IDU and similar demographic characteristics, but where the China CARES Program was not operating, was selected as the comparison county (control). Other programmes run by the Global Fund to Fight AIDS, Tuberculosis, and Malaria and the US Global AIDS Program of the US Centers for Disease Control and Prevention were, however, operating in the control area.

A two-stage cluster sampling strategy with probability proportionate to the size of population at the first stage and a constant number of subjects per cluster at the second stage was used to recruit participants in both counties. To comply with the statistical assumptions [22], we randomly sampled 25 geographically defined clusters (villages in rural areas and communities in urban areas) in each county. We then randomly sampled 20 participants in each cluster [23]. Inclusion criteria were: (i) having resided in the village/community for at least 6 months; (ii) being 18–45 years of age; and (iii) willingness to participate in the interview. Informed consent was obtained before the interview.

Data collection and management

The study instrument included a standardized questionnaire, which was administered face-to-face to all subjects. The questionnaire included demographic and socioeconomic characteristics, knowledge of HIV/AIDS, relationships with others, risk behaviors for HIV infection, and experience of and attitudes towards VCT. Sensitive information was collected using a self-administered questionnaire conducted using a CD player and earphones. The answer sheet had no identifying information and did not include the questions.

After administration of the questionnaire, each participant was offered a coupon for free testing and counselling services at designated facilities. The participant received an incentive for returning the coupon, even if he or she did not go for testing. HIV testing was anonymous and voluntary at the VCT. A brief follow-up interview was

administered when the coupon was returned, to ask the reasons why he or she did or did not undergo testing.

Data analysis

Both descriptive and multivariate analyses were conducted. Multilevel analyses were performed to adjust further for confounders. Random-effects logistic regression models for factors associated with testing were used to handle the problems of within-group dependence in this stage. The intraclass correlation coefficient was calculated to measure how much of the variability could be explained by the differences between clusters [24]. Variables to be included in the model were based on previous knowledge and the results of crude analysis.

Descriptive analyses and crude analyses were conducted using SAS version 9.1.3 software (SAS Institute, Cary, North Carolina, USA). To account for survey design factors, the new SURVEYMEANS, SURVEYFREQ, SURVEYREG, and SURVEYLOGISTIC programs were used. Multilevel analyses were conducted using the Stata version 8.0 software XTLOGIT command (StataCorp, College Station, Texas, USA) [25].

Human subject protection

This study was approved by the Institutional Review Boards of the University of California, Los Angeles and the National Center for AIDS/STD Control and Prevention, China.

Results

The China CARES county has an area of 2838 km^2, a population of 924 000, and a gross domestic product of 1.795 billion yuan (≈US$233 million). The first HIV infection there was reported in 1996, and the cumulative number of reported HIV infections was 321 (35/100 000 population). The control county has an area of 1964 km^2, a population of 463 500, and a gross domestic product of 1.622 billion yuan (≈US$216 million). The first HIV infection there was reported in 2000, and the cumulative number of reported HIV infections was 80 (17/100 000 population).

A total of 676 households were visited, in which 1289 eligible individuals were identified. A total of 1012 participants (78.5%) completed the main questionnaire, 500 in the China CARES county and 512 in the control county. Fifteen individuals (1.2%) refused to participate.

Demographic characteristics

Approximately half of the participants in our study were 30–40 years of age. The mean age of participants in the China CARES county was 33.5 years, and in the control county, 32.5 years. More female participants were sampled in the control county (55.8 versus 49.7%, $P = 0.008$). Family incomes in the control county were higher than those in the China CARES county (Wilcoxon rank-sum test, $P < 0.001$). Education levels were also higher in the control county (Wilcoxon rank-sum test, $P < 0.001$). The proportion who were farmers was higher in the China CARES county (55.8 versus 32.8%, $P = 0.047$). The majority of participants (80.1%) were Han, the ethnic majority in China. The percentage of participants belonging to ethnic minorities was higher in the China CARES county (26.0 versus 10.8%, $P = 0.002$). Approximately 10% were single.

Voluntary counselling and testing-related knowledge

A total of 372 participants (37.8%) did not know where to ask questions about AIDS, and 338 participants (34.2%) did not know where to get an HIV test. A total of 213 participants (23.1%) thought there was no benefit to being tested for HIV or did not know the benefits of being tested. Only 308 participants (27.1%) thought that there was no negative effect from being tested for HIV. Residents in the control county had more VCT-related knowledge than those in the China CARES county (for these questions, P values were 0.033, 0.059, < 0.001, and < 0.001, respectively). The level of knowledge among rural participants was lower (all P values < 0.001). Further analysis indicated that VCT-related knowledge was closely related to education level (all P values < 0.001).

Voluntary counselling and testing-related attitudes

When asked their reaction to seeing someone being tested for HIV, 18.3% of participants thought the individual being tested must have been engaged in 'dirty' behavior (Jian Bu De Ren; 22.3% in the China CARES county and 12.3% in the control county; $P < 0.001$), and 13.2% thought the person being tested must have AIDS. As before, the difference was more significant among rural than urban participants, and negative attitudes were closely related to low education levels (P values < 0.001 for most questions).

Intention of accepting voluntary counselling and testing

Only 56.2% of all participants said they would ask questions related to HIV, and only 43.5% would be willing to be tested. Residents in the control county reported being more willing to accept HIV counselling and testing (all P values < 0.001; Table 1). Both acceptance of counselling and willingness to be tested were related to education level; the higher the education level, the higher the acceptance proportion (P values < 0.001).

The top three reasons why a participant would not ask questions relating to HIV were: 'Not necessary, because not at risk' (78.9%), 'afraid of being infected' (9.6%), and 'not necessary, because know enough' (8.1%). The top three reasons why a participant would not be willing to be tested for HIV were: 'no risky behaviors' (86.5%), 'do not

Table 1. Intention of accepting voluntary counselling and testing among participants in two counties.

	China CARES ($n=500$)		Control ($n=512$)			
	N	%[a]	*N*	%[a]	Chi square[b]	*P* value
Would you like to ask questions about HIV/AIDS?						
Yes	247	49.6	336	65.9	22.6	<0.001
No or don't know	250	50.4	175	34.1		
Would you be willing to be tested?						
Yes	181	36.4	278	54.1	75.6	<0.001
No	314	63.6	234	45.9		
Would you suggest that your sex partner(s) be tested?						
Yes	82	17.0	157	33.2	23.3	<0.001
No or don't know	385	83.0	319	66.8		
Visited VCT sites						
Yes	35	7.0	158	30.7	28.8	<0.001
No	465	93.0	354	69.3		
Was tested for HIV						
Yes	12	2.5	30	5.6	2.8	0.098
No	488	97.5	482	94.4		
Would you suggest that your sex partner(s) be tested?						
Yes	82	17.0	157	33.2	23.3	<0.001
No or don't know	385	83.0	319	66.8		

VCT, Voluntary counselling and testing.
[a]Weighted percentage accounting for study design.
[b]All χ^2 statistics are Rao–Scott chi-squares.

have time' (9.8%), and 'afraid of being seen by friends' (7.5%).

Uptake of voluntary counselling and testing

Thirty-five participants (7.0%) in the China CARES county and 158 participants (30.7%) in the control county visited a designated VCT site within 2 months of the interviews, and of these, 12 (2.5%) and 30 (5.6%), respectively, were tested for HIV (Table 1). Therefore, only 22% of participants visiting the VCT sites were actually tested. The proportion visiting the VCT site in the entire sample was 16.5% (10.4%, 22.6%), and the proportion tested, 3.7% (1.7%, 5.8%; Table 1). Design effects were 6.77 and 2.88, respectively. None of the participants tested positive for HIV.

Barriers to voluntary counselling and testing

When asked 'what prevents people from having an HIV test?', the most important barrier was believing 'no risky behaviors' (62.4%). Other barriers included: 'afraid of being seen by friends' (22.5%), 'people might think I have AIDS' (21.0%), 'afraid that health personnel would not keep the test result confidential' (15.1%), and 'fear of discrimination if positive' (13.1%).

The most frequent reasons for visiting the VCT site or getting tested were having the coupons (72.9%) and 'being in the research study' (35.6%). The reasons for being testing were the same, 62.7 and 40.5%, respectively. More visitors in the China CARES county went to the VCT sites because they knew someone who had AIDS ($P=0.024$). The top three reasons they gave for not being tested were 'no risk behaviors' (84.9%), 'do not have time' (14.2%), and 'afraid of needles' (8.2%).

Predictors of being tested for HIV

Table 2 presents the results of the random effects logistic regressions. In the China CARES county, being older and being a farmer were significantly related to being tested. In the control county, significant factors included difficulty in travelling to the VCT site, poor health, ethnicity other than Han, and having risk behaviors. Unsafe sex was the most frequent risk behavior among testees in the control county: Five of 30 testees had ever had sex with person(s) other than their spouse, three testees had ever had anal sex, and three testees had had diagnosed sexually transmitted diseases. Only one individual who had ever shared needles with others came to the VCT site, but he did not get tested. For random effects, models for the control county had higher level 2 (cluster) random effects, with an intraclass correlation coefficient of 0.206 and 0.362 ($P=0.001$), indicating very high correlation within clusters.

The intention to be tested was related to visiting the VCT site ($P=0.010$) and being tested ($P=0.013$). Stratified analysis, however, showed that the relationships were not significant in either county. In the China CARES county, the *P* values were 0.42 and 0.33, respectively; in the control county, the *P* values were 0.54 and 0.075, respectively.

Discussion

To our knowledge, this is the first study about the acceptance and attitudes of the general public regarding free VCT in areas with a relatively high prevalence of HIV

Table 2. Selected characteristics associated with being testing for HIV: random effects logistic regression.

	China CARES		Control	
	Adjusted OR[a] (95% CI)	*P* value	Adjusted OR[a] (95%CI)	*P* value
Fixed effect				
Age	1.12 (1.00–1.26)	0.046	1.04 (0.97–1.12)	0.30
Race				
Others	0.49 (0.09–2.56)	0.40	3.97 (1.09–14.42)	0.043
Han	1.00		1.00	
Occupation				
Farmer	5.48 (1.06–28.36)	0.042	1.05 (0.20–5.46)	0.95
Others	1.00		1.00	
Travel to VCT site				
Difficult	[c]		11.69 (1.62–84.55)	0.015
Easy	1.00		1.00	
Level 2 random effect	Variance component	SE	Variance component	SE
τ_0^2	0.33	0.72	0.86	0.59
Intraclass correlation coefficient	0.091	0.21		
Fixed effect				
Ever had risk behaviors[b]				
Yes	4.17 (0.67–26.1)	0.127	3.06 (1.14–8.21)	0.026
No	1.00		1.00	
Health status				
Poor	[c]		4.82 (1.42–16.4)	0.012
Good	1.00		1.00	
Level 2 random effect	Variance component	SE	Variance component	SE
τ_0^2	0.94	0.59	1.87	0.71
Intraclass correlation coefficient	0.22	0.36		

CI, Confidence interval; OR, odds ratio; VCT, voluntary counselling and testing.
[a]Adjusted for demographic characteristics.
[b]Had one of the following behaviors: sharing needles, having sex with individual other than spouse in past year, having sex with sex workers, having sex with individual who is the same sex, having sex for money or drugs, having sex with a person living with HIV/AIDS, having sex with injecting drug users, having anal sex, having diagnosed sexually transmitted disease, spouse tested for HIV, spouse was HIV positive.
[c]Not in model.

in China. The information gathered on the acceptability of VCT, as well as facilitators and barriers to VCT, can be used to develop more effective VCT services and intervention and prevention programmes in China.

A strength of the study was that not only was the intention to be tested assessed, but it also assessed the actual uptake of testing and factors associated with doing so. The proportion of participants who indicated an intention to be tested for HIV was lower than the proportion in the study conducted by Liu *et al.* [15] (88.1%). The actual uptake was even lower; less than 20% of participants came to the VCT sites, and only 3.7% of them were tested for HIV, which was similar to the findings in a study carried out be Lam *et al.* [16], and lower than in a study carried out by Wu *et al.* [19] (8.5%). As HIV epidemics have been driven by IDU in both counties, and the IDU were reluctant to use VCT in general health services, targeted peer interventions with IDU and implementing VCT as part of methadone replacement and syringe exchange programmes might be an effective approach to increase the acceptance of VCT. The engagement of non-governmental organizations experienced with outreach to IDU also shows promise [26].

The uptake of VCT was lower among participants in the China CARES county than in participants in the control county, although there was no significant difference in the number of people tested for HIV ($P = 0.098$). Possible explanations include higher levels of education and HIV/AIDS knowledge among participants in the control county, the presence of other intervention programmes such as the Global Fund and the US Global AIDS Program in the control county without China CARES, and antiretroviral treatment not yet being available in the China CARES County when our study was conducted.

The intention to be tested was not a predictor of being tested, and only 5.9% of participants who intended to be tested actually were. This result was similar to a study by Fylkesnes *et al.* [27]. This suggests that the act of being tested for HIV is a complex behavior influenced by many factors, not just the intention to do so. Studies of intention may be of limited value for predicting behaviors, and probably tell us more about social desirability bias than behavior change.

Our study also showed that for individuals with a low risk of being infected, the decision to be tested for HIV was

influenced by the people around them; those who were tested came from a few clusters in both counties. As many as eight individuals were tested in some clusters, whereas there were also quite a few clusters from which nobody came to the VCT sites. This indicates that peer education might be an effective way to increase the acceptance of VCT in this population. It also emphasizes the importance of community acceptance and involvement; i.e. testing needs to be made a community 'norm'.

Among barriers to VCT, the perception of having no risk behaviors was the most popular reason for not being tested. In addition, although many of the participants said that they would not look down on people who received testing, they perceived that they themselves would be stigmatized if tested. The fear of discrimination thus represents another important barrier to testing and counselling [1].

The study has certain limitations; for example, information bias. Our questionnaire might not reflect all aspects of people's attitudes and perceptions of VCT, or participants might have misunderstood some of the questions. Our follow-up period in the last phase may have been too short to detect the actual acceptance rate of VCT. Some measures that were taken to reduce information bias were using local health providers and well-trained interviewers, asking few questions that required recall, and using a CD player to administer sensitive questions. A comparison of more than just two counties with different programmatic interventions is desirable for more definitive process and outcome evaluation.

In conclusion, China has implemented a policy of free care for HIV/AIDS patients who cannot afford to pay. This policy will not succeed unless infected individuals know that they are infected. It has been estimated that less than 25% of HIV-infected Chinese know their status [13]. Given the results elucidated in this study, we recommend: (i) increasing HIV/AIDS and VCT knowledge among adults in rural areas, especially among those engaging in high-risk behaviors; (ii) implementing VCT in methadone replacement and syringe exchange programmes; (iii) making VCT a routine part of health services, especially in areas where many high-risk individuals reside; (iv) promoting strategies to increase the understanding of and sympathy for HIV-infected individuals; (v) ensuring that the public is aware that they will be treated if found to be HIV infected; and (vi) involving the community in decision-making regarding testing and treatment.

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Conflicts of interest: None.

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