



**The acceptance on smoking free environment in urban
restaurant of Yunnan Province, China**

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**A Thesis Submitted to Partial Fulfilment of the Requirements
for the Degree of Master of Science in Epidemiology
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Title The acceptance on smoking free environment in urban
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ABSTRACT

Background

In recent years, smoking has become an important issue in China. With a population of 1.3 billion, China has 350 million smokers. The smoking prevalence in men and women aged 15 years or older is 57% and 3%, respectively. Smoking causes a serious health problem and a huge economic burden to Chinese society. The Chinese government is aware of the hazard from smoking and has started to implement some measures for tobacco control.

Restaurant is one of the most used public places where both workers and customers are most exposed to second hand smoke. However, China doesn't have national laws or regulations specifically banning smoking in public places including restaurant. Legislation is the best way to create a smoke-free environment. However, public attitudes are the foundation for law enactment and enforcement.

Yunnan province is situated in the south-western borderland of China, it is the biggest tobacco production province of China. Kunming city is the provincial capital of Yunnan Province. The prevalence of tobacco

use was reported nearly 30% among the city residents in 2008. Xishan district is one of four central districts of Kunming city. There are approximately four thousand restaurant registered a regularly inspected by the health bureau.

General objective

This research aims to measure the acceptance of managers, employees and customers on smoke-free environment in urban restaurants of Yunnan province, China.

Specific objectives

1. To investigate the attitudes of restaurant managers, employees and customers towards proposed smoking ban policies in restaurants.
2. To find the factors associated with attitudes supporting total smoking ban in involved restaurant business groups.
3. To explore if there are any difference among managers, employees and customers on attitudes towards proposed smoking ban policies.
4. To examine the influence power on investigation results to managers attitudes.

Study design and methodology

A restaurant based survey in an urban area of Kunming city was carried out from May to August 2009. 104 restaurants were randomly selected. The study population was consisted of the managers and the employees who were currently working in those restaurants, and their customers, aged 15 and above. All study participants were interviewed using a structured questionnaire. After finishing the investigation, a brief result on opinions of employees and customers were sent to manager, and managers were asked for their decision again.

Descriptive statistics were first used to breakdown by proportion of respondents. As gender, smoking status and education were potentially confounding, logistic regression was applied to identify independent predictor of preference of a total smoking ban. Since groups of employees and customers working or eating in the same restaurant environment might tend to given similar responses in the questionnaire, multilevel analysis was used. X^2 test was used to recognize the difference of opinions among the 3 groups. Kappa test was used to exam the attitudes changes of manager before and after investigated information feedback.

Results

The percentage of respondents preferring a total smoking ban in restaurants was 17% among managers, 13.4% among employees, and 16.6% among customers. The attitudes were different in employees from managers and customers. Multilevel analysis confirmed that respondents who did not smoke, were educated, and worked or dined at a restaurant with fewer than 200 seats were more likely to support a total smoking ban. Female customers had a lower preference towards a total smoking ban policy than males. The harmful effects of passive smoking were not well recognized by all groups. Kappa test result shows the managers opinions on smoke-free restaurant were agreement before and after research team feedback the investigation results.

Conclusions and recommendations

A total smoking ban policy in restaurants is unlikely to be supported by people involved in the restaurant business in the study area. This coincides with poor local awareness of the harm from smoking. Less educated people and females should be more concerned by health education program. Non-smoker's right should be emphasized to change the social

norm.

Key words: tobacco control, legislation, smoke-free environment,
survey, multilevel analysis, kappa test

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Chapter 1: Background

1. Smoking in China

With a population of 1.3 billion, China has 350 million smokers (30% of the world's smokers)^{1,2}. In 2004, the prevalence of tobacco current use from Shanghai city survey was 5.5% in youth aged 13 to 15 years³. In 2002, from the national survey the ever-smoking rate and current smoking rate were 66% and 57.4% in men and 3.1% and 2.6% in women aged 15 years and older respectively¹. The average starting age for smoking has dropped from 22.4 in the 1980s to around 19.7 years in 2002. The prevalence rises steeply between ages 15 and 25 and then remains at about 70% from age 30-60, after which it declines gradually in men^{1,4}. In recent years, smoking among young Chinese women has increased⁵.

2. Cigarette production and consumption

China is the world's largest tobacco producer and tobacco consumer. In 2000, China produced 2.66 million tons of tobacco leaf, about one third of the world's production⁶. The contribution of tobacco leaf to the Chinese agricultural provincial economy is about 1-2%⁷. To control the supply of tobacco leaf, a tobacco leaf production quota is determined by the State Tobacco Monopoly Administration (STMA). The Chinese Ministry of Agriculture does not have jurisdiction over the production, pricing, or marketing of tobacco leaf. The China National Tobacco Company (CNTC), a monopoly organisation under the STMA, controls all Chinese tobacco leaf production and cigarette marketing, producing 1722 billion cigarettes in 2002 and generating 140 billion Yuan (US\$17 billion), or about 7.4% of government revenue⁷.

In 2007, Chinese smokers consume 2163 billion cigarettes (37% of the world's cigarettes)⁶. The rapid increase in cigarette consumption in China has taken place since the 1970s. Less than 1% annual domestic cigarette production are explored, cigarette consumption of China increased 4 times from around 0.5 trillion sticks in 1978 to more than 2000 billion sticks in 2006⁸. While cigarettes were consumed primarily by men, the average consumption of cigarettes increased from 1 stick in 1952 to 15 sticks per day on the end of the last century in Chinese males⁴. A 3400 urban and rural household survey showed that lower income households with smokers paid less per pack and smoked fewer cigarettes than higher income households with smokers. Poor urban households spent an average of 6.6% of their total expenditures on cigarettes; poor rural households spent 11.3% of their total expenditures on cigarettes⁹.

3. Smoking culture in China

Smoking has become part of the culture in China. Offering cigarettes is an easy way to make a friend, solidify a bond or ease an introduction. Cigarettes are given as wedding gifts, presented to guests along with snacks at parties and left as offerings on the graves of men who have died of lung cancer. Smoking is a sign of machismo. Both Mao Zedong and Deng Xiaoping were heavy smokers. Many characters on television and film are heavy smokers. Cigarette is a method of bribing officials. One reason that half of Chinese doctors smoke is that relatives of patients often give cigarettes as a thank you gift. Restaurants are filled with smokers, some Chinese smoke and eat at the same time with chopsticks in one hand and a cigarette in an other.

4. Smoking hazard in China

Nearly one million people died from tobacco use every year during the last 8 years of this century¹⁰. The long term influence of tobacco use will be pronounced during the next several decades. If current trends continue, tobacco will kill more than 1/3 of males aged 35 to 69 years by 2030, while in 1990, this proportion was only 1/8⁸.

The three leading diseases associated with deaths attributable to smoking were lung cancer, stroke, and chronic obstructive pulmonary disease in men and chronic obstructive pulmonary disease, lung cancer, and stroke in women. Together, these diseases accounted for approximately 45.1% of deaths attributable to smoking in men and 31.8% of those in women¹¹.

Cigarette smoking costs an enormous economic burden in China through a huge number of preventable diseases, health care costs, premature deaths, and productivity losses. The total economic costs had grown from \$3.3 billion in 1989¹² to \$5.0 billion in 2000¹³. Since the health effects of smoking on morbidity and mortality are cumulative, China will bear a much heavier economic burden from cigarette smoking in the future if the current trends in smoking behaviour continue.

5. Anti-smoking campaigns in China

China doesn't have national laws or regulations specifically banning smoking in public places. The current Detailed Implementation Rules for the Public Place Hygiene Management Regulation provisions stipulate that smoking is banned in thirteen types of public places, including cinemas and theatres, video theatres, music halls, ballrooms, music

tea rooms, recreational halls, sports arenas, libraries, museums, fine art galleries, shops, bookstores, and waiting rooms for public transport, but enforcement is spotty. Local law enactment to ban smoking in public places first began in 1993. By October 2006, 154 cities across China had enacted regulations to ban smoking in public places. However, several deficiencies still remain. Only 45.7% of prefecture-level cities and above in China have tobacco control regulations. Workplaces, such as offices, are not included in any of the local regulations.

Tobacco advertising is banned on television and radio and cigarette packs are required to carry health warnings but the warning on cigarettes packs are small and not very explicit. One anti-cigarette activist tried to convince Communist leaders that restricting tobacco advertising served their interest by protecting the Chinese tobacco monopoly and shielding young people from foreign cigarette advertising.

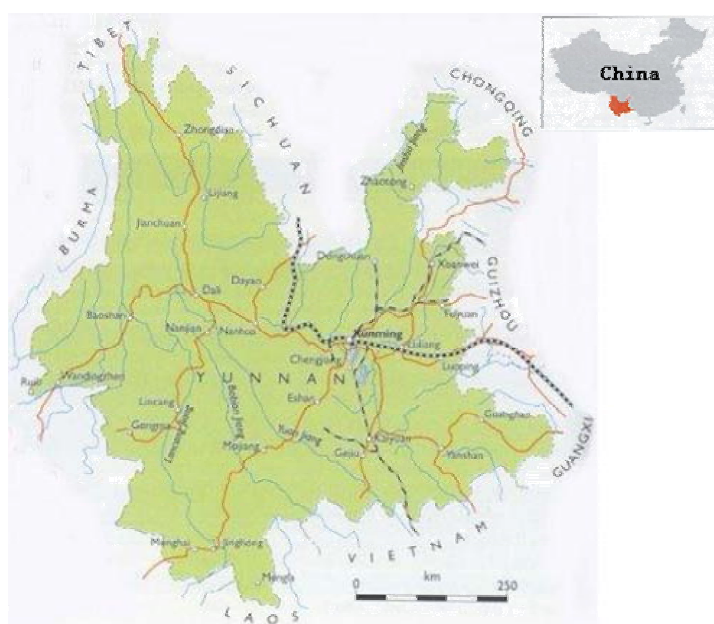
Anti-smoking education is also minimal. A survey shows that around 90% physicians know that active or passive smoking causes lung cancer, but only about 50% of them know that active or passive smoking causes heart disease¹⁴. China's largest anti-smoking organization has about a dozen employees and an annual budget of \$61,000, of which only a share comes from the government. Even some important public figures took negative effects, such as, the former health minister Gao Qiang, who used to smoke at meetings, the Olympic golden medal winning hurdler Liu Xiang, who plugs cigarettes made by the Baishan tobacco company.

China ratified the WHO Framework Convention on Tobacco Control (FCTC) in October 2005. Government will first implement non-price tobacco control options, such as banning smoking in public places, refusing to sell cigarettes to minors, and banning smoking advertisements. China announced it would ban smoking in all hospitals and medical facilities

and to change warning labels on the pack of cigarettes from 2011. While from January 2010, China expanded its crack down on smoking by banning smoking in public spaces in seven provincial capitals. The success of the effort could determine whether the move will be expanded. It is far away for smoking free to China.

6. Tobacco and smoking in Yunnan province

Yunnan province is situated in the south-western borderland of China with the high altitude and low latitude. Local geography, soil, climate, and other advantages are the best of China for tobacco cultivation. Since Yunnan started tobacco growing industries in 1914, currently, Yunnan is the biggest tobacco production province of China. Yunnan produces about 1/3 tobacco leaves of China annual and alone collected 62% of all tax revenue from tobacco leaf production in 2003⁹. Around seven million people were directly involved in this plantation or industry.



Kunming, which is the provincial capital of Yunnan Province, is the

politics, economy, culture, science, technology, transportation center of Yunnan Province. It is in the central part of Yunnan Province, the total area is 21,600 squared kilometres, the population is over 4.5 million. It governs five areas which are Panlong, Wuhua, Guandu, Xishan and Dongchuan, 1 City and 8 countries. The prevalence of tobacco use was reported nearly 30% among the city residents from a 2008 survey (unpublished), however not far from the 31% in general Chinese population.

Chapter 2: Literature Review

1. Hazard of exposure in second-hand smoking environment

When a cigarette is let it smoulders at an extremely high temperature (900°C), and produces a tobacco smoke that contains more than 4000 chemical substances, many of which are toxic and harmful, and over forty of which are carcinogenic¹⁵. It was clearly noted that second hand smoke contains hundreds of known toxic or carcinogenic substances, including formaldehyde, benzene, vinyl chloride, arsenic, ammonia, hydrocyanic acid, etc.

The density of visible tobacco smoke in indoor air is determined by the amount of smoke emission, area of the indoor space and extent of ventilation. Many people believe that as long as there are few smokers and the room is large enough, the hazards of second hand smoke can be minimized or even non-existent. However, the following scientific evidence shows that there are no 'safe' levels of exposure to second hand smoke¹⁵.

In 1981, Japanese scientist Hirayama T. published non-smoking wives of heavy smokers have a higher risk of lung cancer, he observed the deaths of 91,540 non-smoking married women from twenty-nine districts in Japan, and found that the standardized mortality rate for lung cancer among women married to non smoking men was 8.7/100,000, the standardized mortality rate for lung cancer among women married to men who smoked 1 to 19 cigarettes per day was 14/100,000, the relative risk being 1.61 and the standardized mortality rate for lung cancer among women married to men who smoked 20 or more cigarettes per day was 18/100,000, the relative risk being 2.08¹⁶.

Chinese researchers surveyed 60,377 women aged between forty and seventy from 1997 to 2000. The survey indicates that the risk of stroke in women exposed to passive smoking at home increases with the number of cigarettes their husbands smoke per day¹⁷. Another study by Chinese researchers used a statistical method to estimate the number of Chinese people dying from lung cancer and coronary heart disease due to passive smoking. The results show that 11,000 died from lung cancer and 31,300 died from coronary heart disease in 2002 due to passive smoking. They estimate that the number of people dying from passive smoking exceeded 100,000 in all¹³.

Passive smoking affects children's health in each stage of their growth and development. In the late 1980s, Chinese researchers surveyed the in-patient rate in Shanghai of children with respiratory diseases and its relation to smoking parents. They found that compared to children whose parents don't smoke, those children whose parents smoke have a 1.5 to 2 times higher in-patient rate due to respiratory diseases; among children with low birth weight, the ratio could be as high as 2.6 to 4.8¹⁸.

Siegel review shows the level of environment tobacco smoke in restaurant were 1.6 to 2.0 times higher than in other workplaces and 1.5 times higher than in home with at least one smoker. And a 50% increase in lung cancer risk among food service employees that is at least partly attributable to exposure to second-hand smoke in the workplace¹⁹.

2. Second hand smoke exposure rate

Second hand smoke exposure rates are 49.7% and 54.0%, respectively, in urban and rural areas. There are twenty provinces with more than 50% of the population exposed to second hand smoke. The rate is over

60% in Northern provinces such as Qinghai, Gansu, Shanxi, Shaanxi, Jilin, and Inner Mongolia¹. Homes, public places and workplaces are all spaces where people can risk being exposed to second hand smoke. A 2002 survey shows that among Chinese who were exposed to passive smoking, 82% were exposed at home, 67% in public places and 35% at workplaces. Among passive smokers, the rate of being exposed to second hand smoke at different places varies according to age, gender and occupation. Ninety percent of female passive smokers are exposed to second hand smoke at home. Male passive smokers aged between 20 and 59 are most exposed to second hand smoke at public places and workplaces. Compared to the survey results in 1996, the rate of exposure at public places increased in 2002^{1, 4}.

3. The interventions for tobacco control

The WHO Framework Convention on Tobacco Control (WHO FCTC) provides interventions for tobacco control. It includes monitor tobacco use, protect people from tobacco smoke, offer help to quit tobacco use, warn about the dangers of tobacco, enforce bans on tobacco advertising and promotion, and raise taxes on tobacco products².

Monitor tobacco use aims to obtain nationally representative and population-based periodic data on key indicators of tobacco use for youth and adults. In China, tobacco growing, production, and selling are under the control of government.

Completely smoke-free environment includes all in door public places and workplaces, restaurants and bars also are included in it. In high-income countries, smoke-free public places and workplaces have been shown to reduce tobacco consumption by 3-4%²⁰. Smokers who work in smoke-free workplaces are more than twice as likely to quit smoking

as those who work where smoking is permitted²¹. The enactment of smoke-free policies in restaurants, bars, clubs and casinos may be challenging. Policy makers worry about the business effect from smoking ban more than the health impact from smoking. In fact, from countries and subnational areas where have implemented total smoking ban policies, smoking ban is possible to enact and enforce effective bans in these establishments and that doing so is popular with the public, does not harm these businesses and improves health²².

Most tobacco users who quit do so without intervention, but assistance greatly increases quit rates²³. Because most tobacco users are dependent on nicotine, an addictive drug, it is difficult for them to quit even when they make a concerted effort to do so.

People can understand that the result of tobacco use is suffering, disfigurement and early death by high levels of awareness of the health risks of tobacco use. Warning labels on tobacco packs are a cost-effective method of advertising about the dangers of tobacco use, providing direct health messages to tobacco users as well as to non-users who see the packs²⁴. Public education through mass media about the health dangers of tobacco use smoking as well as second-hand smoke - can influence an individual's decision to start or continue to smoke. Anti-tobacco educational initiatives on children could weaken a more comprehensive population-wide approach that might have greater long-term impact²⁵.

In high-income countries, a complete ban that tobacco advertising, promotion and sponsorship covers all media and all uses of brand names and logos has been documented to decrease tobacco consumption by about 7%²⁶.

Raising the price of tobacco is most effective method to reduce tobacco

consumption, It is estimated that for each 10% increase in retail prices, consumption is reduced by about 4% in high income countries and by about 8% in low and middle income countries, Smoking prevalence is reduced by about half those rates²⁷.

4. Policies about smoke-free environment

The successful experience of some countries indicates that enacting a law is a key measure to achieve indoor smoke-free environments. In many countries, the public places where smoking is banned have expanded from public transport, cinemas, exhibition halls, shopping centres, banks, schools and hospitals, to workplaces, including government office buildings and business office buildings, and further to catering and entertainment places for the public, such as restaurants, bars, night clubs and massage saloons.

Singapore was one of the first countries to implement a comprehensive tobacco control programme. Its first legislation on smoke-free public places including in public transport, cinemas, and other designated places was implemented in 1970 and it was the first country to ban tobacco advertisements in 1971²⁸. With other intervention implemented, the prevalence of tobacco use reduced from 42% of Singapore's men and 4.5% of its women smoked in 1970 to 14% in a population of about 3.5 million in 2002.

In 1988, the Canadian Federal Parliament passed the Non-Smokers Health Protection Act, stipulating a smoking ban in public places and areas, including on airline flights. Canada was the first to introduce a smoking ban on international business class flights. The 21.7% of the Canadian population who were current smokers in 2001 were not all part of the 35.1% of current smokers in 1985²⁹.

In other countries of the world, such as Ireland, the UK, Denmark and Sweden, smoking is banned in public places. Similar bans are soon to be introduced in other countries including Holland and France. In USA, some states have total smoking bans in public places, including Arizona, California and New York.

In 1990, restaurant trade supported 'self regulation' approach to implementing smoke free areas in restaurants in Australia, but later research highlighted a large discrepancy between owner-perceived need and actual implementation³⁰. In 1994, Australian government banned smoking in restaurants. A 2002 evaluation of South Australia's smoke free dining laws found that the legislation had been adhered to by both the majority of restaurateurs and customers, and was inexpensive for restaurateurs to implement³¹. Smoke free dining legislation can be implemented with confidence.

5. Public opinion about smoke-free environment

When implementing legislation on smoke-free places, it is critical that governments generate broad public support³².

Public concerns about passive smoking have increased over the years from the late 1980s and public support for restrictions on smoking has increased in parallel. A 2003 systematic review of Australian studies found a 20% increase in support for bars and gaming venues to be entirely smoke-free³³.

A survey conducted in China in 2002 discovered that 61.6% of the people surveyed actively supported regulations to ban smoking in places such as schools, hospitals, government agencies, and public transportation¹. In 2006, China CDC conducted a survey of smokers and non-smokers in Beijing, Shanghai, Guangzhou, Changsha, Zhengzhou, Yinchuan and

Shenyang, and found that 90% of the people supported banning smoking on public transport, schools and hospitals. Over 80% supported a smoking ban in conference rooms and in workplaces. Public attitudes are the foundation for law enactment and enforcement. Although the rate of support for smoking bans in some public places such as restaurants and bars is not unanimous in China, international experience shows that, as enactment and enforcement are effectively put in place, the public, and especially smokers, will gradually change their attitude².

One year after a complete ban on smoking in workplaces was implemented in Ireland, support by smokers for smoking bans increased from 43% to 67% for workplaces, 45% to 77% for restaurants, and 13% to 46% for bars. Ninety-eight percent of people believe that workplaces are now healthier, including 94% of smokers, and 96% of people believe the ban was necessary and successful, including 89% of smokers³⁴.

Data from California showed the same results. Before and after smoking bans went into effect, customers' support for smoking bans at bars increased from 45.7% to 75.8%, and bar employees' support increased from 86.2% to 94.7%. Diners' support for smoke-free restaurants increased from 92.2% to 98.5%, and restaurant workers' support increased from 96.5% to 99.2%³⁵.

6. Factors associated with attitudes support smoke-free environment

Most of the studies on support smoke-free policy have taken place in western countries. Smoke-free policies have been got more support in both older^{36, 37} and youth population³⁸. Higher education³⁸ and income³⁹ have been found positive associations with support. Non-smoking status was among the strongest supporter for smoke-free policy^{40, 41}, when a

choice was given, non-smokers were more likely to prefer a total smoking ban. Sex did not steadily associate with support³⁶⁻³⁸. Some research also found that having more restrictive household smoking rules³⁷, and greater perceived danger associated with second-hand smoke exposure^{36,37} were positive associated with support for smoke-free policy.

Chapter 3: Rationale & Objective

1. Rationale

We found that most studies came from western countries where prevalence of smoking was lower than China, and Chinese smoking culture has great tolerance to smokers. We can consider that the situation for tobacco control in China is different from those western countries. And the result of the studies may not suitable for China. However, a few evidences can be provided to policy makers from China internal studies. On another hand, for smoke-free restaurant, most studies related to contextual effect were analyzed by a single-level analysis. Restaurant level factors did not have enough consideration. Smoke-free policy may be not generalized to all restaurants.

In 2003, the Chinese government signed the World Health Organization's Framework Convention on Tobacco Control (FCTC). China People's Congress ratified the treaty in 2005 and came to force in 2006. China is becoming a visible player on the world stage in addressing tobacco control problems.

According to the items of FCTC, signatory country can implement the non-price measures to reduce the demand for tobacco as beginning. Signatory country should change tobacco product packaging and labeling with warning labels within three years and implement the ban on advertising, promotion and sponsorship within five years after entry into force of this convention. In 2008, government has began implementing that refusing to sell cigarettes to minors, and some tobacco products have been changed the gorgeous packing with the evident warning words except pictures. In 2010, Chinese government plan banning smoking

advertisements in all media and banning smoking in public places. The power of control tobacco is being strengthened in China.

Restaurant is one of the most used public places where both workers and customers are most exposed to second hand smoke. Smoking ban in restaurant policy implementation needs the support from various associated groups. Restaurant owner or manager is a key stakeholder for policy implementation. Public attitudes are the foundation for law enactment and enforcement. While government controls the implementation of bans, the views of relative people can affect both their implementation and maintenance.

Examining variation in managers, employees and customers' support for smoke-free policies by restaurant is valuable because a separate regression model (multilevel analysis) can be fit within each restaurant, and the parameters from these restaurants can themselves be modeled as depending on restaurant characteristics.

2. Research questions

The above introduction leads to the research questions of this study, as following

- Would people involved into restaurant business welcome a comprehensive smoke-free policy? Is there any difference on preferring a smoke-free policy among those groups?
- What factors could influence the respondents support to a total smoking ban policy?
- Would managers change their opinion according to the current investigation results?
- What can be suggested to policy makers for policy improvement?

3. Objective

3.1 General objective

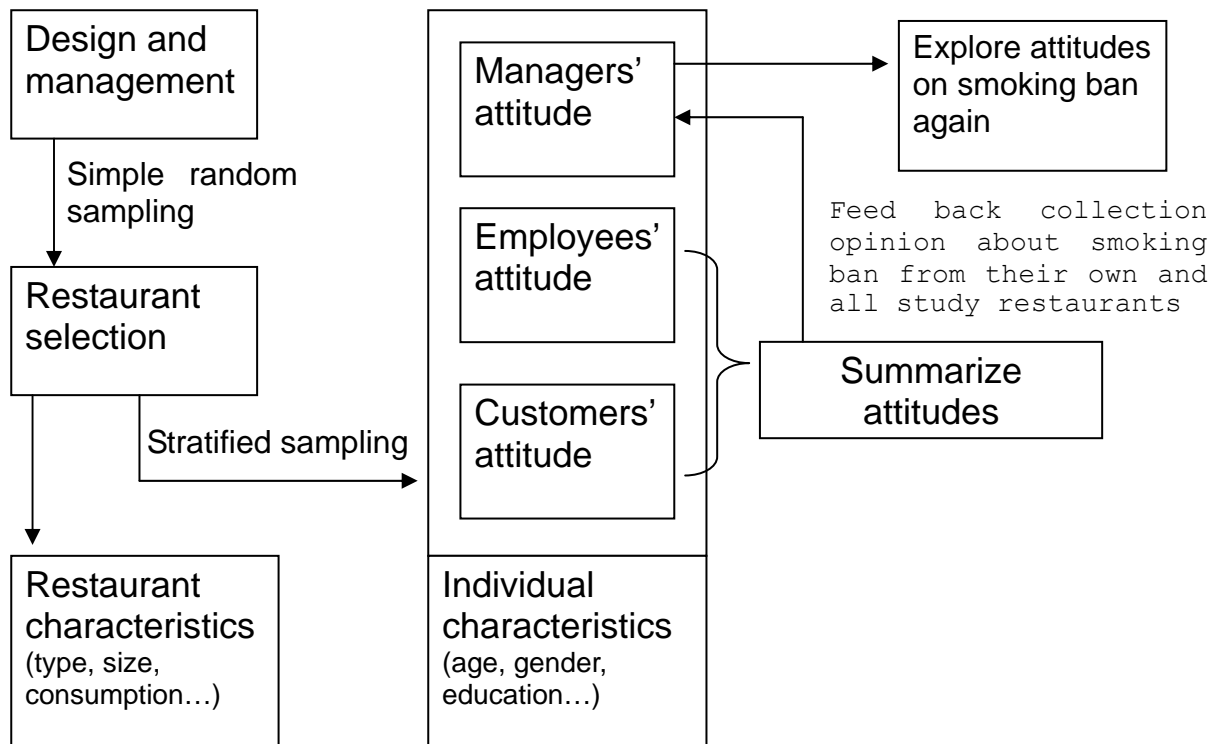
To measure the acceptance of managers, employees and customers on smoke-free environment in urban restaurants of Yunnan province, China.

3.2 Specific objectives

1. To investigate the attitudes of restaurant managers, employees and customers towards proposed smoking ban policies in restaurants.
2. To find the factors associated with attitudes supporting total smoking ban in involved restaurant business groups.
3. To explore if there are any difference among managers, employees and customers on attitudes towards proposed smoking ban policies.
4. To exam the influence power on investigation results to managers attitudes.

Chapter 4: Methodology

Study flow



1. Study design

This study was a cross-sectional study with a structured questionnaire investigation method.

2. Study population

The study populations included 3 groups involved in restaurant business. They were managers, employees and customers.

3. Investigation techniques

The managers of restaurant were investigated 2 times, first time by

face-to-face interview, and the second time by phone call investigation. The first time they were asked to answer their general information, restaurant information, personal perception on effects of smoking in restaurant and support about smoking ban policies in restaurant. The second time they were asked to answer their opinion about smoking ban policy in restaurant again after interviewer feed back the collected supports rate on smoking ban policies from employees and customers of their own and all study restaurants.

Workers who were working in those selected restaurant at interviewer visiting time were investigated by face-to-face interview.

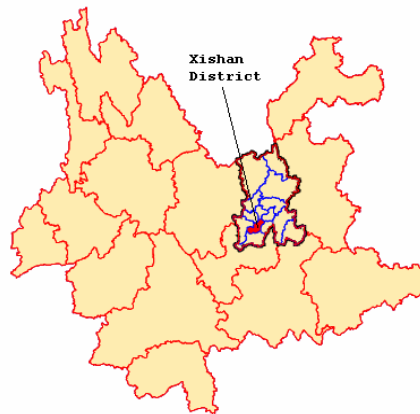
Customers who aged 15 and above were investigated by self-administered questionnaire, 40-100 customers were collected in each restaurant, and both employees and customers support were fed back to manager by a simple summary table;

All questionnaires were anonymity for real information, except manager for interviewer to feed back information.

4. Study setting

The study involved restaurants in Xishan district, Kunming city, Yunnan province, China.

Xishan district is one of the four central districts of Kunming city. There are approximately four thousand restaurant registered a regularly inspected by the health bureau.



5. Sample size

5.1 Formula

$$n = \frac{Z^2_{1-\alpha/2} p(1-p)}{d^2}$$

5.2 Sample size estimation

5.2.1 For the 1st interview in restaurant

P is the public support rate on smoking ban in restaurant⁴²

$$P = 44\%,$$

$$\alpha = 0.05,$$

$$Z_{1-\alpha/2} = 1.96$$

$$Z^2_{1-\alpha/2} = 3.84; \text{ and}$$

$$d = 0.1.$$

$$n = 95$$

Taking estimated 10% non-respondents into account. The rounded sample

sizes for different settings are:

restaurant : 104.

Thus, the study populations according to the settings above are stratified into:

Managers : 104

Workers in restaurant : at least the half workers in each restaurant were investigated; and

Customers : 40 to 100 customers were investigated in each restaurant.

5.2.2 for the 2nd interview in restaurant

P is the manager's change rate on support smoking ban policy in restaurant.

I suppose 50% managers who come through the 1st interview will change their support about smoking ban in restaurant after interviewer feed back the status of employees and customers. Because we can maximize the managers' sample size for the investigation if $p = 50\%$.

$$P = 50\%,$$

$$\alpha = 0.05,$$

$$Z_{1-\alpha/2} = 1.96$$

$$Z_{1-\alpha/2}^2 = 3.84; \text{ and}$$

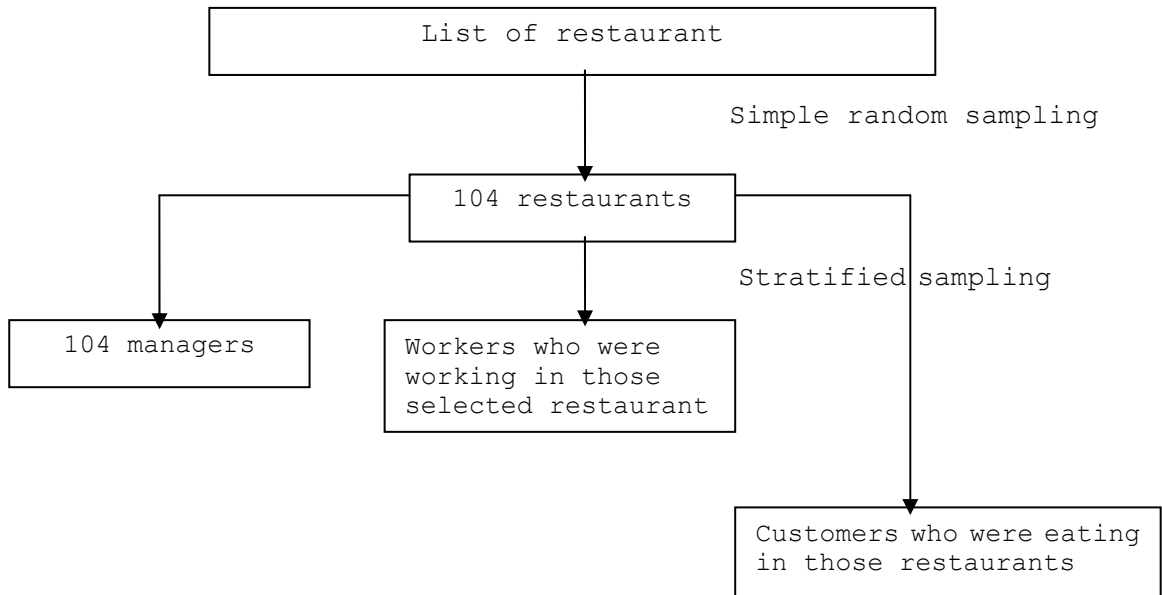
$$d = 0.1.$$

$$n = 96$$

Thus, 104 restaurants are enough for this investigation.

6. Sampling procedure

Stratified sampling and simple random sampling were used in this study. And the sampling procedure was dependent on the managers to connect with customers in their restaurants.



Of the 246 restaurants scheduled for inspection during May to August 2009, 104 were randomly selected.

And then the 3 groups involved in restaurant business were selected by stratified sampling.

All managers of restaurants were involved into this study,

Workers who were working in those selected restaurant at interviewer visiting time were investigated,

Customers who eat there were recruited in to investigation, and the interviewed customer's age was more than 15 years old,

And the amount of managers and workers of restaurant can be controlled in required range.

The needed sample size can be covered in my research by above sampling method.

7. Data collection

Managers and workers in a restaurant were investigated by face-to-face interview in selected restaurants by interviewer.

Customers who eat at the selected restaurants were distributed self-administered questionnaire. Restaurant managers were employed in this program to distribute the questionnaires.

8. Operating definitions

Smoking status is divided into 3 groups. It was determined by asking, "At the present time do you smoke cigarettes every day, occasionally or not at all?". Respondents were asked whether they had smoked in the last 30 days.

Daily smoker: refers to those who respond "every day" to the question;

Non-daily smoker: often referred to as "occasional" smoker, refers to those who respond "occasionally" to the question;

Non-smoker: refers to those who respond "not at all" to the question.

Restaurant type is divided into Chinese restaurant or foreign restaurant.

Personal perception on effects of smoking in restaurant include the person's right to smoking in restaurants, second hand smoking harm, economic interest to manager, safety and clearness problem to restaurant.

Group	Item
-------	------

Manager	Smoking in restaurant is the personal right of customer
	A customer smoking in restaurant may cause bad health to other customers
	A customer smoking in restaurant may cause bad health to employees
	Employees have the right to smoking in restaurants
	Smoking is associated with less hard-working
	Smoking is important to cleanness of restaurants
	Smoking is important to safety of restaurants
	Totally banning smoking may reduce the income of restaurants
Employee	Smoking in restaurant is the personal right of customers
	Employees have the right to smoke at restaurants
	A customer smoking in restaurant may cause bad health to other customers
	A customer smoking in restaurant may cause bad health to employees
	Smoking is associated with less hard-working
	Totally banning smoking may reduce the income of restaurants
Customer	Smoking in restaurant is the personal right of customer
	A customer smoking in restaurant may cause bad health to other customers
	A customer smoking in restaurant may cause bad health to employees

All interviewees were asked to state the level they agree with each item. The level divided into 5 levels strongly agree, agree, neutral, disagree, strongly disagree.

Acceptance on smoking ban environment in restaurants is divided into no ban (smoking is allowed anywhere), partial ban (designate smoking area) and total ban (smoking is not allowed anywhere). Respondents were asked whether they agree on smoking bans in the above environments.

9. Study variables

9.1 Independent variables

Individual characteristics:

Gender included male and female;

Age was actual value;

Education was answered as secondary school or below, high school, college or more;

Length of times employed in restaurant was asked only to employee;

Frequency of restaurant visits during one previous week was asked only for customer;

Smoking status;

Restaurant information:

Restaurant type;

Average consumption of per customer;

Restaurant size was recorded by the amount of seat in a restaurant.

Amount of workers, selling cigarette, and private compartments available.

9.2 Dependent variables

Interviewees' perception about different item;

Support on smoking ban: Respondent's support about no ban, partial ban and total ban of smoking in restaurant.

Secondary division about smoking ban: only for managers after they got the feed back information.

10. Data analysis

The results in the questionnaire were entered into a computer using Epi-data (version 3.1). All data were transferred into the R (version 2.10) for data exploration and analysis.

Data was analyzed in both descriptive and analytic.

A simple descriptive analysis was performed using percentage, mean, SD and median.

Analytic components were performed using χ^2 test, multilevel test when the records are related in clusters was taken into account, and kappa test for the agreement of managers' opinion before and after the information was fed back.

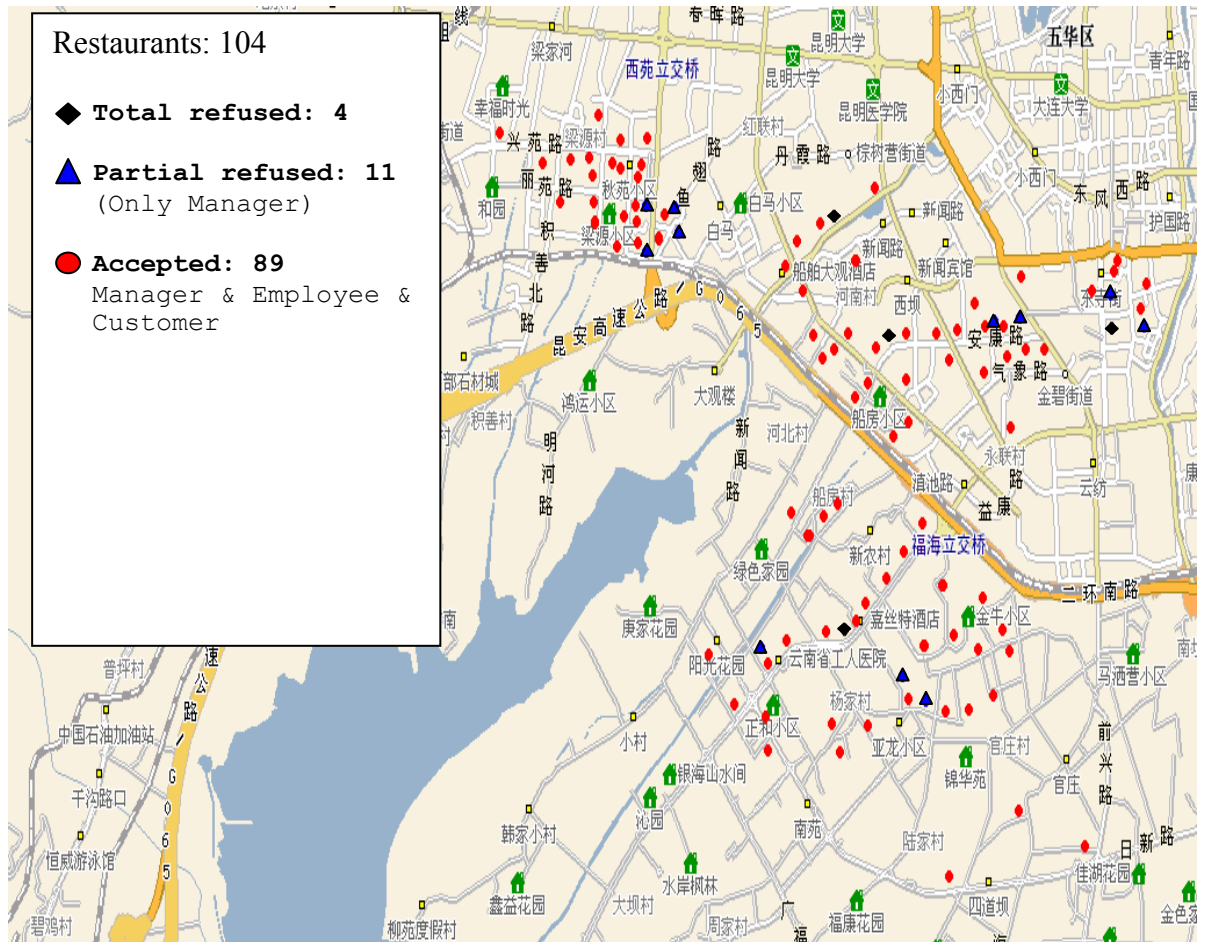
Chapter 5: Results

This part consists of six main sections; 1) overall subjects distribution, 2) description of restaurants and individual characteristics, 3) attitudes towards smoking ban among study groups, 4) perceptions on effects of smoking in restaurants, 5) associated factors on supporting total smoking ban policy in restaurants, and 6) managers' opinion change from investigation result.

1. Overall subjects

Among the 104 restaurants selected for the study, 4 refused to participate in the study. Of the remaining 100 restaurants, data collection was completed only from the managers but neither from employees nor customers in 11 restaurants. These 11 restaurants were similar in site with the remaining 89 where all three groups could be interviewed. Among the 1055 approached employees, the response rate was 100%. The response rate of the customers could not be assessed. But the total number of customer respondents was 5213.

Figure 1. The distribution of restaurants in Xishan district



2. Restaurant and individual descriptive characteristics

2.1 Restaurant characteristics

2.1.1 Restaurant size

Of these 100 investigated restaurants, the seats ranged from 50 to 1000, with a median of 200 seats and a mean of 274 seats.

2.1.2 Average spending per customer

Of these 100 investigated restaurants, the average spending per customer in each restaurant ranged from 10 to 300 China Yuan (CNY), with a median of 30 CNY and a mean of 38 CNY.

2.1.3 Tobacco selling status in restaurants

In these 100 restaurants, 40 restaurants had tobacco selling service, other 60 restaurants did not have. Tobacco selling in restaurants should get license from local Tobacco Monopoly Administration in China, and the tax of restaurant would be increased, some bosses of restaurant were reluctant to sell cigarettes in their own restaurant because of the additional tax, thus only less than half of the restaurants in our investigation had tobacco selling service.

2.1.4 Private compartment setting in restaurants

Of these 100 investigated restaurants, 82 restaurants had private compartments, other 18 restaurants did not have. The number of private rooms ranged from 2 to 40, with a median of 8 and a mean of 11.

2.1.5 The type of restaurants

In our study, 1 was Japanese restaurants, 2 were western restaurants, and others sold Chinese food.

Table1. The distribution of investigated restaurants characteristics

Variable		Min	Median (Mean)	Max	Frequency	%
Restaurant						
(n=100)						
Number of seats		50	200 (274)	1000	-	-
Average spending per customer (CNY)		10	30 (38)	300	-	-
Tobacco selling	No	-	-	-	60	60
	Yes	-	-	-	40	40
Private compartment	No	-	--	-	18	18
	Yes	-	-	-	82	82
Type	Chinese	-	-	-	97	97
	Others	-	-	-	3	3

2.2 Individual characteristics

2.2.1 Characteristics of managers

One hundred managers from these 100 restaurants involved in this study.

2.2.1.1 Gender

Of these 100 managers, half were males, and the other 50 were females.

2.2.1.2 Age

The age ranged from 19 to 65 years old, with a median of 29 and a mean of 31 years old.

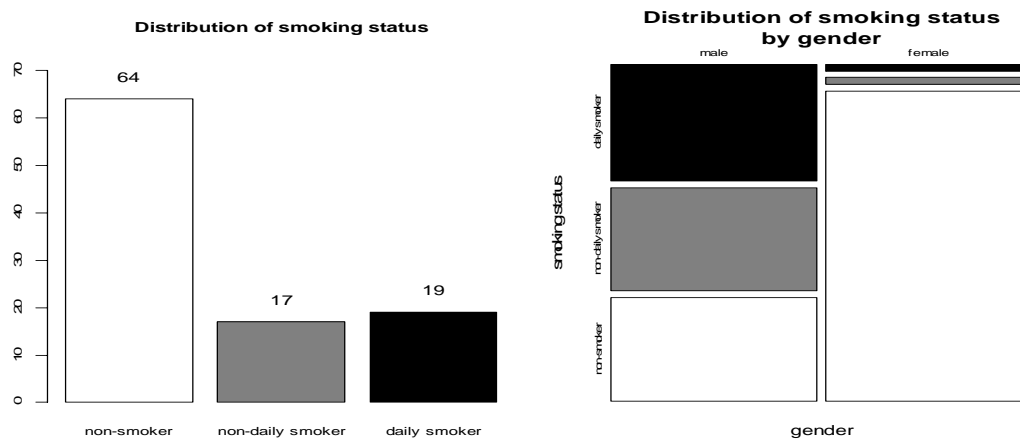
2.2.1.3 Education

There are 17 managers had college education, 53 had high school education, other 30 managers had primary or lower education.

2.2.1.4 Smoking status

Of these 100 managers, current smoking (daily smoker & non-daily smoker) rate was 36%, 68% male and 4% female managers were current smokers. Smoking was more popular in males than in females.

Figure 2. The smoking status of managers



2.2.2 Characteristics of employees

Of these 100 restaurants, 89 restaurant employees were investigated, the total number was 1055.

2.2.2.1 Gender

Sixty eight point seven (725/1055) employees were females. Other 31.3% (330/1055) were males. In China, female workers are more popular than males in food service business.

2.2.2.2 Age

Of these 1055 employees, the minimum age was 16 years old. Maximum was 53 years old, with a median of 20 and mean of 21 years old.

2.2.2.3 Education

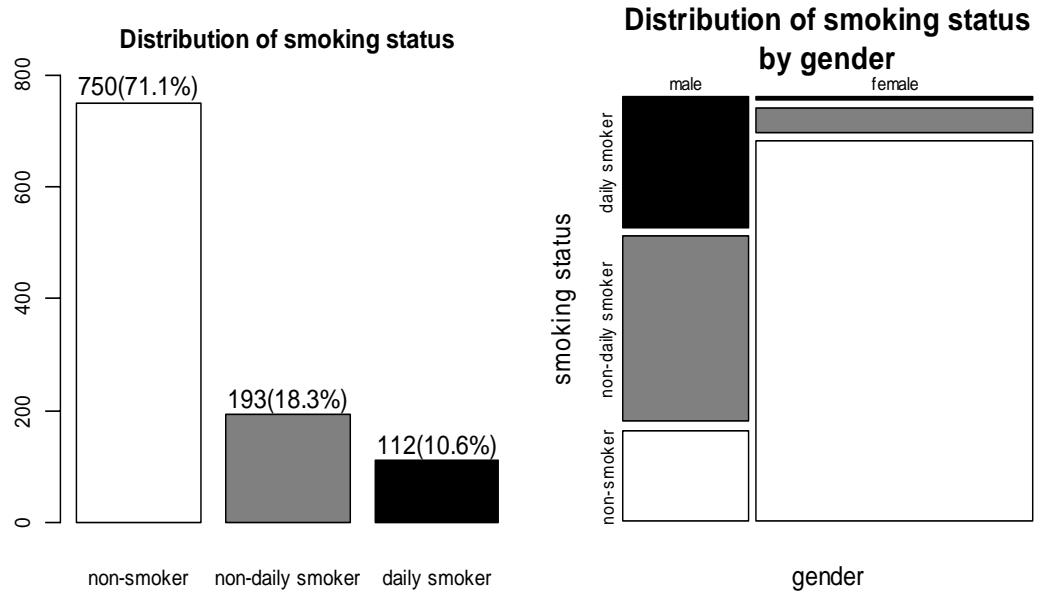
Five point two per cent (55/1055) employees had college education, 26.5% (280/1055) had high school education, 67.7% (714/1055) got secondary education or did not schooling education experience, and 6 employees did not give their education experience. A lot of employees had lower education in this study because food service is not high technique work with a relatively low salary. Many rural area youths have to work on food service after they came to urban area without any other technical capability. And restaurants employ these people by spending small salaries.

2.2.2.4 Smoking status

Seventy one point one per cent (750/1055) employees were non-smokers, 18.3% (193/1055) were non-daily smokers, and 10.6% (112/1055) were daily smokers. The current smoking rate was 77.6% in males and 6.7% in females,

respectively.

Figure 3. The smoking status of employees



2.2.2.5 Length of time employed in restaurant

Of these 1055 employees, 923 employees explored their length of time working on food service. 160 employees had less than one year experience worked at restaurant. The longest time was 30 years. Both the mean and median were 2 years.

2.2.3 Characteristics of customers

Of these 100 restaurants, customer's data was collected from 89 restaurants, the total number was 5213.

2.2.3.1 Gender

Thirty nine point nine per cent (2079/5213) of customers were females. 60.1% (3134/5213) of customers were males. This data shows a more frequently restaurant visit among males than females.

2.2.3.2 Age

Of these 5213 customers aged from 15 to 78 years old with a median of 29 and mean of 31 years old. Most of customers were youth.

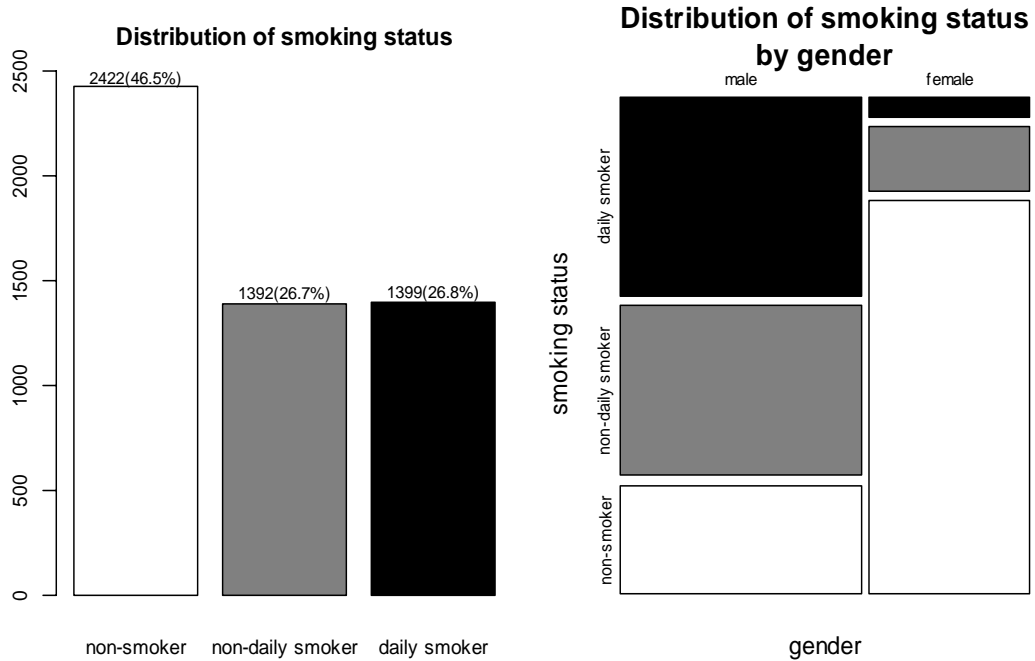
2.2.3.3 Education

Of these customers, the schooling experience respectively was 38.9% with college and higher education, 42.1% with high school education, and 18.2% with primary or lower education.

2.2.3.4 Smoking status

Forty six point five per cent (2422/5213) customers were non-smokers, 26.7% (1392/5213) were non-daily smokers, and 26.8% (1399/5213) were daily smokers. The current smoking rate respectively was 77.3% in males and 17.7% in females.

Figure 4. The smoking status of customers



2.2.3.5 Frequency of restaurant visit per week

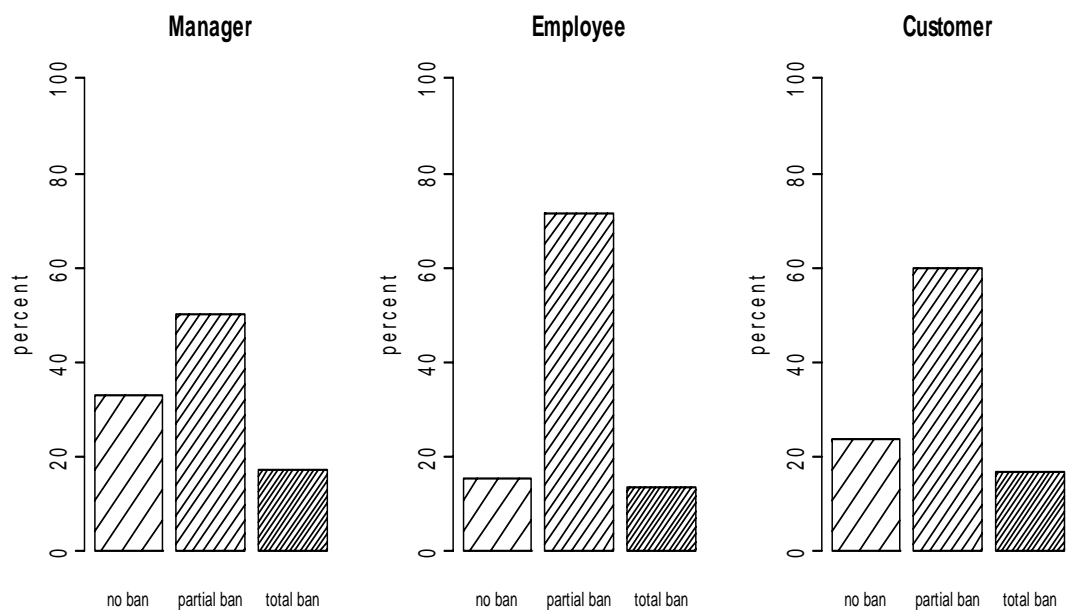
One hundred and three customers said they were less than once per week for dining in restaurant, and 27 persons ate both lunch and dinner during a whole week in restaurants. The median was twice per week and mean was 3 times per week on restaurant visit.

3. Opinions in the three groups

3.1 Opinions distribution

The percentage of respondents preferring smoking ban policies in restaurant were 33% (33/100), 15.2% (160/1055), and 23.7% (1235/5213) for no ban, 50% (50/100), 71.5% (754/1055), and 59.7% (3113/5213) for partial ban, and 17% (17/100), 13.4% (141/1055) and 16.6% (865/5213) for total ban respectively among manager, employee and customer groups.

Figure 5. The distribution of preference on smoking ban in restaurant of subjects



3.2 Difference between groups' opinion

The attitudes on smoking ban in restaurant were significant different between managers and employees, most of employees supported partial ban smoking in restaurant. But the difference of attitudes between managers and customers were not significant.

Table 2. The distribution of opinions by group

Group	Policy			Total
	No ban(%)	Partial ban(%)	Total ban(%)	
Manager	33 (33)	50 (50)	17 (17)	100
Employee	160 (15.2)	754 (71.5)	141 (13.4)	1055
Customer	1235 (23.7)	3113 (59.7)	865 (16.6)	5213

X-squared (total) = 61.1428, df = 4, p-value < 0.01

X-squared (manager VS employee)=53.9944, df = 2, p-value < 0.01

X-squared (manager VS customer)= 5.1285, df = 2, p-value = 0.08

4. The perception on effects of smoking in restaurants

Respondents' perception on the effects of smoking in restaurants was measured by a 5-point scale that marked from 1 ("strongly agree"), 2 ("agree"), 3 ("neutral"), 4 (disagree) to 5 ("strongly disagree"). The score mean and SD were calculated for the 3 groups respectively.

4.1 Manager

Managers agreed on the personal right of smoking in restaurants, they had some awareness on hazard of second hand smoking, employee's behavior of smoking in restaurant is unwelcomed in China, so most of managers do not allowed their employees to smoke in their restaurants, and they thought smoking could bring unsafe and unclean problems, most of managers thought that total smoking ban in restaurants may reduce their income, but the worry was not strong.

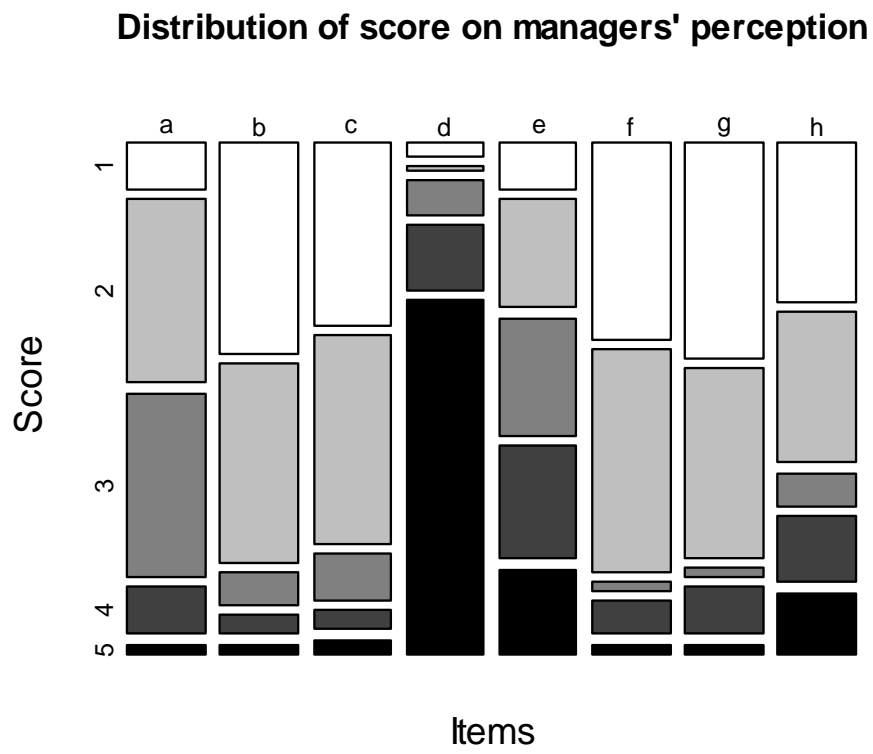
Table 3. Managers' perception on effects of smoking in restaurant

Item	N	Mean (SD) *
a.Smoking in a restaurant is the personal right of the customer	100	2.55 (0.88)
b.A customer smoking in a restaurant affects the health of other customers	100	1.76 (0.90)
c.A customer smoking in a restaurant affects the health of other employees	100	1.88 (0.96)
d.Employees have the right to smoke at restaurant	100	4.57 (0.90)

e.Smoking is associated with less hard-working	100	3.17 (1.26)
f.Smoking makes restaurant unclean	100	1.80 (0.93)
g.Smoking makes restaurant unsafe	100	1.82 (1.02)
h.Totally banning smoking may reduce the income of restaurant	100	2.40 (1.41)

*Rating score: 1,"strongly agree"; 2,"agree"; 3,"neutral"; 4,"disagree"; 5,"strongly disagree"

Figure 6. Distribution of score on managers' perception



4.2 Employee

Employees agreed on the customer's personal right of smoking in restaurants, but they supported banning smoking behavior of employees, they did not have clear awareness on hazard of second-hand smoking.

Table 4. Employees' perception on the effects of smoking in restaurants

Item	N	Mean (SD) *
a.Smoking in a restaurant is the personal right of the customer	1053	2.87(1.03)
b.Customer smoking in a restaurant affects the health of other customers	1051	2.22(1.06)
c.A customer smoking in a restaurant affects the health of other employees	1049	2.27(1.11)
d.Employees have the right to smoke at restaurant	1051	3.89(1.14)
e.Smoking is associated with less hard-working	1054	3.37(1.26)
h.Totally banning smoking may reduce the income of restaurant	1055	2.53(1.18)

*Rating scale: 1,"strongly agree"; 2,"agree"; 3,"neutral"; 4,"disagree"; 5,"strongly disagree"

Figure 7. Distribution of score on employees' perception



4.3 Customer

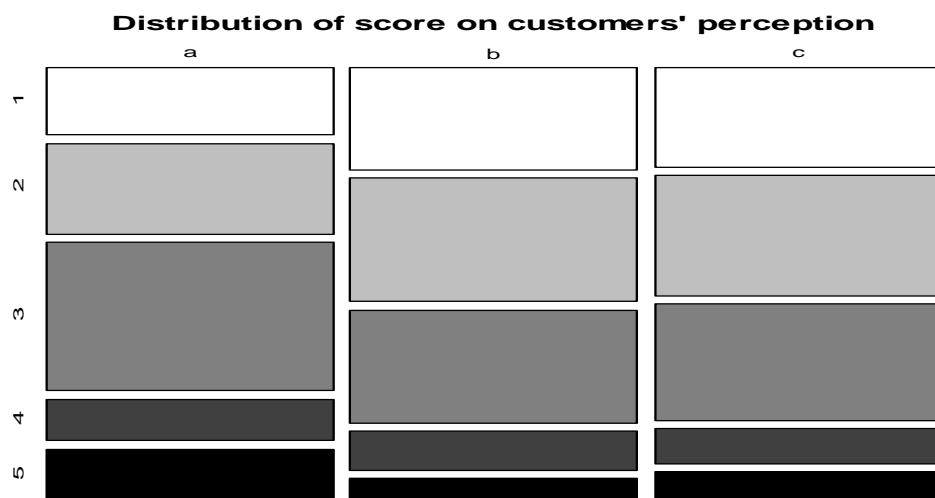
Most of customers supported that smoking in a restaurant was the personal right of the customer. They had low awareness on hazard of second hand smoking.

Table 5. Customers' perception on the effects of smoking in restaurant

Item	N	Mean (SD) *
a.Smoking in a restaurant is the personal right of the customer	5212	2.81 (1.22)
b.A customer smoking in a restaurant affects the health of other customers	5212	2.40 (1.13)
c.A customer smoking in a restaurant affects the health of other employees	5213	2.44 (1.17)

*Rating scale: 1,"strongly agree"; 2,"agree"; 3,"neutral"; 4,"disagree"; 5,"strongly disagree"

Figure 8. Distribution of score on customers' perception



5. Factors associated with total smoking ban policy support in restaurants

In the statistical modeling process, the opinions on smoking ban in restaurants were dichotomized into supporting a total ban or supporting less than a total ban (partial ban & no ban). Because perception variables had only a few items, and they are also outcome variables, these variables were not included in the models.

5.1 Manager

The column COR (crude odds ratio) in table 6 shows significant association between non-smoking status and supporting total smoking ban. When adjusted for other variables in the model by stepwise reduction method, the association between supporting total ban and non-smoker (AOR 21.3; 95% CI 2.31 to 196.3) and restaurant size (AOR 0.25; 95% CI 0.06 to 0.95) were farther away from unity.

Table 6. Predictors for managers' support of a total smoking ban in restaurants

Variable	Support/total (%)	COR (95%CI)	AOR (95%CI)
All subjects	17/100 (17)		
Sex			
Males	6/50 (12)	1	
Females	11/50 (22)	2.07 (0.7, 6.12)	NS
Age			
<30 years	9/51 (9.7)	1	
≥30 years	8/49 (16.3)	0.91 (0.32, 2.59)	NS
Education			
Secondary or lower	5/30 (16.7)	1	1
High	11/53 (20.8)	1.31 (0.41, 4.21)	4.02 (0.89, 18.13)
University	1/17 (5.9)	0.31 (0.03, 2.93)	0.65 (0.06, 7.42)
Smoking status			
Daily smoker	1/19 (5.3)	1 ^a	1 ^a
Non-daily smoker	0/17 (0)	-	-
Non-smoker	16/64 (25)	11.67 (1.48, 92.15)	21.3 (2.31, 196.3)
Restaurant size			
≤200 seats	12/51 (23.5)	1	1
>200 seats	5/49 (10.2)	0.37 (0.12, 1.14)	0.25 (0.06, 0.95)
Average spending			
≤30 CNY	12/55 (21.8)	1	
>30 CNY	5/45 (11.1)	0.45 (0.14, 1.38)	NS
Tobacco selling			
No	13/60 (21.7)	1	
Yes	4/40 (10)	0.4 (0.12, 1.34)	NS
Private compartment			
No	6/18 (33.3)	1	1
Yes	11/82 (13.4)	0.31 (0.1, 1)	0.32 (0.07, 1.43)

COR, crude odds ratio; AOR, adjusted odds ratio; NS, no significant

^a current smoker (daily smoker & non-daily smoker)

5.2 Employee

Support for total ban was associated with employee smoking status and university education background, even after adjustment for other employee's individual and restaurant level factors. Support of smoking restrictions in restaurants was greater among non-smoker than daily-smoker (AOR 7.95; 95% CI 1.61 to 39.30); and among those with university education than those with secondary school or low education background (AOR 5.46; 95% CI 2.01 to 14.84). The support was not significantly related to employee's gender, age and length of time in restaurants. Total smoking ban policy was less popular among employees who work at restaurants with compartment (AOR 0.30; 95% CI 0.12 to 0.76).

Table 7. Predictors for employees' support of a total smoking ban in restaurants

Variable	Support/total (%)	COR (95%CI)	AOR (95%CI)
All subjects	141/1055 (13.4)		
Sex			
Males	32/330 (9.7)	1	
Females	109/725 (15)	1.59 (1.02,2.49)	NS
Age			
<20 years	63/440 (14.3)	1	
≥20 years	76/581 (13.1)	0.96 (0.65,1.41)	1.02 (0.62,1.68)
Education			
Secondary or lower	100/714 (14)	1	1
High	26/280 (9.3)	0.64 (0.4,1.04)	0.84 (0.46,1.52)
University	14/55 (25.5)	2.58 (1.26,5.25)	5.46 (2.01,14.84)
Smoking status			
Daily smoker	2/112 (1.8)	1	1
Non-daily smoker	13/193 (6.7)	2.77 (0.59,12.95)	1.95 (0.34,11.08)
Non-smoker	126/750 (16.8)	8.97 (2.18,36.98)	7.95 (1.61,39.3)
Length of time			
<2 years	67/455 (14.7)	1	1
≥2 years	58/468 (12.4)	0.8 (0.55,1.18)	0.97 (0.59,1.61)
Restaurant size			
≤200 seats	54/350 (15.4)	1	
>200 seats	87/702 (12.3)	0.7 (0.47,1.02)	NS
Average spending			
≤30 CNY	78/457 (17.1)	1	
>30 CNY	63/598 (10.5)	0.63 (0.43,0.93)	NS
Tobacco selling			
No	89/ 479 (18.6)	1	
Yes	52/ 576 (9)	0.47 (0.32,0.7)	NS
Private			
No	39/ 116 (33.6)	1	1
Yes	102/ 939 (10.9)	0.47 (0.32,0.7)	0.3 (0.12,0.76)
ICC	41.64%		

COR, crude odds ratio; AOR, adjusted odds ratio; ICC, intraclass correlation coefficient

5.3 Customer

Support for total ban was associated with customer gender, age, smoking status, education background and eating frequency in restaurants per week, even after adjustment for other customer's individual and restaurant level factors. Association with supporting smoking restrictions in restaurant was negative among females (AOR 0.56; 95% CI 0.45 to 0.69). Support was greater among those with university education (AOR 1.87; 95% CI 1.40 to 2.49) and high school education (AOR 1.38; 95% CI 1.04 to 1.83) than secondary school or low education background, and also among non-smokers and non-daily smokers. Total ban smoking policy was less supported among customers who eat at restaurants with more than 200 seats (AOR=0.59; 95% CI 0.42 to 0.83).

Table 8. Predictors for customers' support of a total smoking ban in restaurants

Variable	Support/total (%)	COR (95%CI)	AOR (95%CI)
All subjects	865/5213 (16.6)		
Sex			
Males	444/3134 (14.2)	1	1
Females	421/2079 (20.3)	1.52 (1.29,1.79)	0.56(0.45,0.69)
Age			
<30 years	424/2473 (17.1)	1	1
≥30 years	365/2313 (15.8)	0.92 (0.78,1.08)	1.17(0.97,1.42)
Education			
Secondary or lower	117/951 (12.3)	1	1
High	342/2196 (15.6)	1.33 (1.03,1.72)	1.38(1.04,1.83)
University	399/2029 (19.7)	1.75 (1.37,2.25)	1.87(1.40,2.49)
Smoking status			
Daily smoker	59/1399 (4.2)	1 ^a	1 ^a
Non-daily smoker	157/1392 (11.3)	2.55 (1.81,3.58)	2.58(1.81,3.68)
Non-smoker	649/2422 (26.8)	7.7 (5.7,10.41)	11.57(8.24,16.26)
Frequency of visit			
<2 times/week	221/1098 (20.1)	1	1
≥2 times/week	527/3272 (16.1)	0.76 (0.63,0.91)	0.74(0.60,0.91)
Restaurant size			
≤200 seats	397/2077 (19.1)	1	1
>200 seats	468/3136 (14.9)	0.71 (0.6,0.84)	0.59(0.42,0.83)
Average spending			
≤30 CNY	462/2511 (18.4)	1	
>30 CNY	403/2702 (14.9)	0.79 (0.67,0.93)	NS
Tobacco selling			
No	501/2702 (18.5)	1	
Yes	364/2511 (14.5)	0.73 (0.62,0.86)	NS
Private			
No	176/ 850 (20.7)	1	
Yes	689/ 4363 (15.8)	0.73 (0.59,0.89)	NS
ICC	6.25%		

COR, crude odds ratio; AOR, adjusted odds ratio; ICC, intraclass correlation coefficient

6. The manager's opinion change from investigation result

6.1 Feed back the information from their own restaurants

The agreement of interviews before and after fed back was high with Kappa statistics of 0.885. The opinions of employees and customers on smoking ban in restaurants from the managers' own restaurants could not change their attitudes on smoking banning.

Table 9. The distribution of managers' attitudes on smoking ban before and after feed back the investigation result from their own restaurants employees and customers

Before	After			Total
	No ban	Partial ban	Total ban	
No ban	28	1	0	29
Partial ban	1	45	0	46
Total ban	0	4	10	14
Total	29	50	10	89

Observed agreement = 93.26 %

Expected agreement = 41.42 %

Kappa = 0.885

Standard error = 0.081 , Z = 10.973 , P value = < 0.001

6.2 Feed back the information from all study restaurants

The agreement of interviews before and after fed back was high with Kappa statistics of 0.866. The opinions of employees and customers on smoking ban in restaurants from the all study restaurants could not change managers' attitudes on smoking banning.

Table 10. The distribution of managers' attitudes on smoking ban before and after feed back the result from all study employees and customers

Before	After			Total
	No ban	Partial ban	Total ban	
No ban	26	3	0	29
Partial ban	1	45	0	46
Total ban	0	3	11	14
Total	27	51	11	89

Observed agreement = 92.13 %

Expected agreement = 41.45 %

Kappa = 0.866

Standard error = 0.08 , Z = 10.807 , P value = < 0.001

Chapter 6: Discussion

This part consists of two main sections; 1) summary of the overall findings, discussion, and recommendations of the study, and 2) strength and limitation of the current study.

1. Summary of the overall findings, discussion, and recommendations of the study

1.1 Summary of the findings

The supports on total smoking ban policy were low among the three groups of restaurant business in Kunming city. Employee group's attitude towards smoking ban was different from the other two groups. There was non-significant difference between managers and customers for policy preference.

Participants in this study did not have clearly ideas towards customers' smoking right in restaurant. Managers recognized the danger of second-hand smoking to health. However, employees and customers had low level of perception on passive smoking exposure hazard. Managers were more likely to think that smoking brings unsafe and unclean problems to their restaurants. Both managers and employees somewhat worried about the restaurant business decline from total smoking ban implementation.

Total smoking ban policy got more support from those who had high education, did not smoking, and worked or dined at smaller (less than 200 seats) restaurants. However, in customers, those who were female, or frequently visit restaurant have been found negative associations with support total smoking ban implementation.

After we fed back the investigation results to managers, their attitudes

towards smoking ban did not change.

1.2 Support to smoke-free restaurant

In our current study, the support rates to a total smoking ban are less than 20% in the all 3 groups. Similar results with our study was also demonstrated in California American³⁸. The support result was 17.3% among bar owners and staffs before a smoke-free law implemented in 1998. After a smoke-free bar law legislation, many health promotion approaches, including a statewide smoke-free bar project, a focused media campaign, a coordinated and sustained community level campaign, and enforcement activities sponsored by California Tobacco Control Program, have been employed to promote and facilitate implementing this law. And the support rate increased to 50.9% in 2002. And significantly more respondents were concerned about the effects of second-hand smoking on their health. When patrons smoked in the bar, bar owners or staff would ask them to stop or to smoke outside. However, in the bar patronages⁴³, the support rate before law implementation was 59.8% higher than bar owners and staffs, it rose to 73.2% after law implementation. And the Self-reported noncompliance decreased from 24.6% to 14.0%.

Researches on public attitudes before and after smoke-free law implementation from California⁴⁴ and Australia³¹ show that support rate on complete smoking ban in restaurant increased from 55.4% and 73.4% to 71.3% and 84.2% respectively.

Chinese social norm encourages smoking. But the prevalence of smoking is lower than 15% in both Hong Kong and Singapore, even they have same culture and race with China. In Hong Kong, 68.9% citizen supported a total smoke-free policy in restaurants⁴¹ and a completely smoke-free

restaurant policy was implemented from 2001. In Singapore, smoke-free legislation started from 1970. From 1 July 2007, it was extended to entertainment outlets⁴⁵.

Thus, from above researches' results we can optimistically estimate the future result on attitudes change to smoke-free restaurant in relative the business groups after law implementation. However, the current great challenge is low support rate among those participants.

Another findings from our research disclosed that the support rate was non-significantly different between customers and managers. Both of them were in a low level to support a total smoking ban policy. Generally, managers less support smoking ban in restaurant was associated with concern on business decline. The manager supports would have changed after a law implemented without any hurt to their business. Manager is a key stakeholder in the policy implementation. But customers' support is equally important. The reason behind less support a total smoking ban policy in customer group to will be discussed in the following parts.

1.3 Recognize passive smoking hazard

Increasing citizens' knowledge about the salience of second-hand smoking dangers will provide the foundation for communication strategies, because these dangers provide the pretext for smoke-free policies. The California campaign of the early 1990's concentrated on educating non-smokers about the dangers of secondhand smoke and discrediting the tobacco industry⁴⁶. During this period, tobacco consumption fell precipitously⁴⁷, faster than anywhere else in the world.

The non-smokers, after all, have not accepted the tobacco industry as

part of their personal life. More importantly, non-smokers constitute the majority. Non-smokers object to breathing secondhand smoke. The scientific evidence that involuntary smoking causes disease in non-smokers was mentioned and clean indoor air laws, policies, and regulations has been spread.

The hazard of passive smoking did not get fully realization in employees and customers in our study, this is one reason why the support of total smoking ban rate was low in those two groups and it reflected that the lack of education intervention in the general population of China.

1.4 Less educated population and females

In our research, most of employees were consisted of lower educated women. In general, less educated persons are more likely to smoke than better educated⁴⁸. They are less attached by health care system. It is difficult for them to be covered by traditional approaches to tobacco prevention and cessation. And they are less focus on their health status because of their socioeconomic status. These above reasons decided that they are fewer trends to a total ban smoking policy.

Current smoking epidemic is spreading from its original focus among men in high-income countries, to women in high-income countries and men in low-income countries⁴⁹. In our study, the female is an interesting factor in customers group. They are negatively associated with support a total smoking ban. People's living has been evidently improved from economic growth during last 30 years in China. Women acquire more independent in social and economic status than in the past. It has been found that smoking rate among young Chinese women has increase in the last decade⁵. On the other aspect, smoking is a sign of machismo, women like to stay with a men who smoke.

1.5 Non-smoker in policy implementation

As we expected, in our research, smoking status was among the strongest predictor for support of a total smoking ban. Non-smokers always support to create a free-smoke environment.

In developing a new strategy for tobacco control, the rights of non-smokers (especially children) to have smoke-free air had been deeply concerned as a important principle of the freedom from harm of second-hand smoking⁵⁰. And this principle has been used in some tobacco control movement, such as Canada's Non-Smokers Rights Association, and the USA's Americans for Non-smokers Rights. Even the tobacco control industry also declared that "personal liberty to take action" of individual right equation⁵¹. However, non-smoker's right to be free of harmful interference trump the right of others to be at liberty to smoke. Because prevention of illness has been accepted in human's modern living.

Another aspect of the individual rights question is the ability of employers to decide what services to offer at their own facilities, such as restaurants, what working conditions they need to provide to employees. This is a property right since it involves contracts and so it is subsidiary to rights of life and political liberty⁵². More and more evidence of harm⁵³ seems that employee exposure to the environment of tobacco smoking is a risk entirely unnecessary in the food, beverage, and entertainment industries. The rights of restaurant managers do not override the rights of customers and employees to an environmental free from environment tobacco smoke.

In developing countries where human rights are not a campaign issue, alternative strategies should be sought.

1.6 Restaurant conditions

A total smoking ban was got more support in those from smaller restaurants (≤ 200 seats) compare with those from bigger restaurants (> 200 seats) in our research.

People's attitude on smoking ban policy linked with poor air quality in closed public places where unacceptably high levels of nicotine have been found⁵⁴. People who have experiences of discomfort or dissatisfaction from exposure to passive smoking in restaurants are more likely to support a totally smoke-free policy⁴¹. It has been found that separating smokers and non-smokers within the same air space does not eliminate non-smokers' exposure to second-hand smoking⁵⁵. And smoking anywhere in a building significantly increases concentrations of second-hand tobacco smoke, even in parts of the building where people do not smoke⁵⁶. Thus, ventilation and designated smoking rooms do not prevent exposure to second-hand tobacco smoke⁵⁷. The only effective protection strategy is a 100% indoor smoke-free environment.

2. Strength and limitation of the current study

Among restaurant managers, there are fewer variables associated with total smoking ban than among the employees and customers. This might be due to smallness of sample size of managers in this study. In this study, it was also not possible to strictly randomly select the customers. However, low (6%) Intraclass Correlation Coefficient (ICC) indicates that customers are relatively independent from one another but not the employee among which ICC was 42%.

Chapter 7: Conclusion and Recommendation

The percentage of subjects preferring a total smoking ban in restaurant of Kunming city was low, and the attitudes on smoking ban policies in restaurant were non-significant between manager and customer groups. High support was accepted among more educated and non-smokers groups. And a narrow restaurant space is one reason letting people to choose a smoke-free environment. Low awareness of second-hand smoking hazard was found in employee and customer groups, it shows the lack of education intervention. Business decline from total smoking ban did not concerned too much by manager group. Managers opinion was not influenced by the investigation result of customers and employees.

Attempts to increase support for smoke-free legislation could be targeted towards the different population segments delineated by sociodemographic and behavioral dimensions. Increasing citizens' knowledge about and the salience of second-hand smoking dangers will provide the foundation for communication strategies. The target groups for smoking ban policies are less educated people and females. Non-smoker's health right issue should be emphasized to improve the social norm on unacceptability of smoking behaviour.

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Appendix I Invitation to Participate Form

Project name: Policies environment on tobacco control in Yunnan province

Dear Sir or Madam:

We are inviting you to voluntarily join this study on tobacco control policy. The decision to participate is entirely yours. If you decide to take part in the study, you will be asked to answer some questions, such as age, education, smoking status and knowledge of health hazards associated with smoking and second hand smoking. The questions will take about 5-10 minutes.

Some of the questions we will ask may be embarrassing but we will try our best not to confuse you. You may refuse to answer any question you do not want to.

Your decision to participate or refuse will not affect your current study or living.

Your decision and your content of answer will be maintained in confidence by the staff directly involved within The Yunnan Centre for Disease Control and Prevention and will not be released to anyone outside.

If you fully participate in the study, it will contribute to the tobacco control policy reform.

If you have any questions about this study, please contact the person who explained this in tobacco control programme at CDC at any time.

Thank you very much

Research team

Appendix II Consent Form

Project name: Policies environment on tobacco control in Yunnan province

I am (Miss, Mr, Mrs)..... (Participant's name) agree to join the project about which the researcher (name)..... (Position)....., has already explained the detail to me as in the invitation to participate form.

If I have any queries with respect to the procedures in the research project, I can ask research team at any time. If I am not satisfied with the performance of the research team, I have the right to notify Lulin (Director of Yunnan provincial CDC), telephone number (0871-3611746) or the president of the Ethics Committee (Dean of the Faculty of Medicine, Prince of Songkla University, Thailand: telephone number +66 74-451100). If I am still not satisfied with the project, I have the right to discontinue participation in this project at any time without any consequences.

I have read and understood all details of the project provided by the researcher, and that I can change the consent at any time if I wish. I voluntarily participate in the study.

..... (Signature of the participant) (Date of signature)

..... (Signature of the researcher) (Date of signature)

..... (Signature of the witness) (Date of signature)

Appendix III Questionnaire

Questionnaire for manager

ID -

Group-Restaurant

Please mark \checkmark in []

Part 1 General information

<p>1. Gender [] 1.Male [] 2.Female</p>	<p>gender <input type="checkbox"/></p>
<p>2. Age Years</p>	<p>age <input type="text"/><input type="text"/></p>
<p>3. Education [] 1.Secondary school or below [] 2.High school [] 3.College or more</p>	<p>edu <input type="checkbox"/></p>
<p>4. At the present time do you smoke cigarettes [] 1.Every day [] 2.Occasionally [] 3.not at all</p>	<p>smoke <input type="checkbox"/></p>

Part 2 restaurant information

<p>5. Average lowest consume of one customer in your restaurant? yuan</p>	<p>cus <input type="text"/><input type="text"/><input type="text"/></p>
<p>6. Restaurant type []1.Chinese []2.Others</p>	<p>type <input type="checkbox"/></p>
<p>7. How many seats are available in your restaurant? seats</p>	<p>seats <input type="text"/><input type="text"/><input type="text"/></p>
<p>8. How many employees in your restaurant? employees</p>	<p>wnumb <input type="text"/><input type="text"/><input type="text"/></p>
<p>9. Are you selling cigarette in your restaurant? []1.yes []2.no</p>	<p>sale <input type="checkbox"/></p>
<p>10. Is there compartments in you restaurant? []1.yes(go to 10.1) []2.no</p>	<p>comp <input type="checkbox"/></p>
<p>10.1 How many rooms? rooms</p>	<p>rooms <input type="text"/><input type="text"/></p>

Part 3 personal perception

How much do you agree or disagree with the following description?							
Items	strongly agree	agree	neutral	disagree	strongly disagree		
11.Smoking in restaurant is the personal right of customer	[]	[]	[]	[]	[]	b1	<input type="checkbox"/>
12.A customer smoking in restaurant may cause bad health to other customers	[]	[]	[]	[]	[]	b2	<input type="checkbox"/>
13.A customer smoking in restaurant may cause bad health to employees	[]	[]	[]	[]	[]	b3	<input type="checkbox"/>
14.Employees have the right to smoke at restaurant	[]	[]	[]	[]	[]	b4	<input type="checkbox"/>
15.Smoking is associated with less hard-working	[]	[]	[]	[]	[]	b5	<input type="checkbox"/>
16.Smoking is important to cleaning of restaurant	[]	[]	[]	[]	[]	b6	<input type="checkbox"/>
17.Smoking is important to safety of restaurant	[]	[]	[]	[]	[]	b7	<input type="checkbox"/>
18.Totally banning smoking may reduce the income of restaurant	[]	[]	[]	[]	[]	b8	<input type="checkbox"/>

Part 4 policy preference

19.What is your preference for a smoking condition in restaurant? (Tick one)	policy <input type="checkbox"/>
[] 1. Allowed smoking in anywhere	
[] 2. Set smoking table for smokers	
[] 3. Restrict smoking in all area	

Interviewer
.....

Date of interviewing
[] [] - [] [] - [] [] (DD/MM/YY)

Questionnaire for employee

ID --

Group-Restaurant-Employee

Please mark \checkmark in []

Part 1 General information

1. Gender [] 1.Male [] 2.Female	gender <input type="checkbox"/>
2. Age <p style="text-align: right;">.....Years</p>	age <input type="text"/> <input type="text"/>
3. Education [] 1.Secondary school or below [] 2.High school [] 3.College or more	edu <input type="checkbox"/>
4. Working life in restaurant <p style="text-align: right;">.....Years</p>	wlife <input type="text"/> <input type="text"/>
5. At the present time do you smoke cigarettes [] 1.Every day [] 2.Occasionally [] 3.not at all	smoke <input type="checkbox"/>

Part 2 personal perception

Items	strongly agree	agree	neutral	disagree	strongly disagree	
How much do you agree or disagree with the following description? 6.Smoking in restaurant is the personal right of customer	[]	[]	[]	[]	[]	b1 <input type="checkbox"/>
7.A customer smoking in restaurant may cause bad health to other customers	[]	[]	[]	[]	[]	b2 <input type="checkbox"/>
8.A customer smoking in restaurant may cause bad health to employees	[]	[]	[]	[]	[]	b3 <input type="checkbox"/>
9.Employees have the right to smoke at restaurant	[]	[]	[]	[]	[]	b4 <input type="checkbox"/>

10.Smoking is associated with less hard-working [] [] [] [] []	b5 <input type="checkbox"/>
11.Totally banning smoking may reduce the income of restaurant [] [] [] [] []	b8 <input type="checkbox"/>

Part 3 policy preference

12. What is your preference for a smoking condition in restaurant? (Tick one) [] 1. Allowed smoking in anywhere [] 2. Set smoking table for smokers [] 3. Restrict smoking in all area	policy <input type="checkbox"/>
--	---------------------------------

Interviewer

Date of interviewing

.....

-- (DD/MM/YY)

Questionnaire for customer

ID --
Group-Restaurant-Customer

Table

Please mark \checkmark in []
Part 1 General information

1. Gender <div style="display: flex; justify-content: space-around; margin-top: 10px;"> [] 1.Male [] 2.Female </div>	gender <input type="checkbox"/>
2. AgeYears	age <input type="text"/> <input type="text"/>
3. Education <div style="margin-top: 10px;"> [] 1.Secondary school or below [] 2.High school [] 3.College or more </div>	edu <input type="checkbox"/>
4. How many times do you eat at restaurant per week?Times/week	times <input type="text"/> <input type="text"/>
5. At the present time do you smoke cigarettes <div style="margin-top: 10px;"> [] 1.Every day [] 2.Occasionally [] 3.Not at all </div>	smoke <input type="checkbox"/>

Part 2 Personal perception

How much do you agree or disagree with the following description?					
Items	strongly agree	agree	neutral	disagree	
6.Smoking in restaurant is the personal right of customer	[]	[]	[]	[]	b1 <input type="checkbox"/>
7.A customer smoking in restaurant may cause bad health to other customers	[]	[]	[]	[]	b2 <input type="checkbox"/>
8.A customer smoking in restaurant may cause bad health to employees	[]	[]	[]	[]	b3 <input type="checkbox"/>

Part 3 policy preference

9. What is your preference for a smoking condition in restaurant? (Tick one) []1. Allowed smoking in anywhere []2. Set smoking table for smokers []3. Restrict smoking in all area	policy <input type="checkbox"/>
--	---------------------------------

Interviewer

.....

Date of interviewing

-- (DD/MM/YY)

Questionnaire for manager

(feedback information)

ID -
Group-Restaurant

Please mark \surd in []

Part 1 Feedback information from their own restaurant

Interviewee	Amount	Smoking ban support rate (100%)		
		Total ban	Partial ban	No ban
Manager				
Employee				
Customer				

Part 2 policy change information 1

1. If you want to change your opinion, which one do you support? (Tick one) [] 1. Allowed smoking in anywhere [] 2. Set smoking table for smokers [] 3. Restrict smoking in all area	policy2 <input type="checkbox"/>
--	----------------------------------

Part 3 Feedback information from total restaurants

Interviewee	Amount	Smoking ban support rate (100%)		
		Total ban	Partial ban	No ban
Manager				
Employee				
Customer				

Part 4 policy change information 2

2. If you want to change your opinion, which one do you support? (Tick one) [] 1. Allowed smoking in anywhere [] 2. Set smoking table for smokers [] 3. Restrict smoking in all area	policy2 <input type="checkbox"/>
--	----------------------------------

Interviewer
.....

Date of interviewing
-- (DD/MM/YY)

Appendix IV Manuscript

Attitudes toward of smoking ban in restaurant by managers, employees and customers: a survey in Kunming city, China

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Abstract

Objective: To investigate the attitudes of restaurant managers, employees and customers towards a total smoking ban policy in restaurants.

Method: A restaurant based survey in an urban area of Kunming city was carried out from May to August 2009. 100 managers, 1055 employees and 5213 customers aged 15 years or above were interviewed using a structured questionnaire

Results: The percentage of respondents supporting a total smoking ban in restaurants was 17% among managers, 13.4% among employees, and 16.6% among customers. Multilevel analysis confirmed that respondents who did not smoke, educated, and worked or dined at a restaurant with fewer than 200 seats were more likely to support a total smoking ban.

Conclusion: A total smoking ban policy in restaurants was unlikely to be supported by people involved in the restaurant business in the study area. This coincided with poor local awareness of the harm from smoking.

Background

Smoking in China has been estimated to cause about a million deaths a year^{1, 2} and huge economic burden³. The Chinese government has increased its awareness of the negative impacts from smoking, and has recently partially adopted smoking ban policies and performed the duty of ratifying the World Health Organization's Framework Convention on Tobacco Control (FCTC)⁴.

Amidst the high prevalence of tobacco use (31.4%)⁵, China does not have a comprehensive smoke free law at the national level. A national regulation on the sanitary administration of public places stipulates that smoking is banned in thirteen types of public places. Restaurants, one of the most used public places where both workers and customers are most exposed to second hand smoke⁶, is not included in the regulation.

Studies in the US and Australia on the implementation of legislative bans on smoking in restaurants have found that bans are accepted by the public^{7, 8}, without any loss of sales⁹. A smoke-free policy in restaurants would drastically improve air quality, reduce exposure to second hand smoke¹⁰ and improve the health of worker's¹¹. Furthermore, a smoke-free policy in restaurants may help to improve the social norm on unacceptability of tobacco use, and reduce the prevalence of tobacco use among the general people¹².

The above findings in the context of low smoking prevalence may not be generalized to China where the smoking prevalence is high. Studies are needed to assist policy makers before any new policy can be implemented. The objective of the current study is to assess the attitudes to a smoking ban policy among managers, employees and customers in urban restaurants of Kunming city, China.

Method

Study Setting

Yunnan is one of the poorest provinces in south-west China. More than 1/3 of tobacco leaves in China are produced there annually. All of the productions are under the government monopoly. Around seven million Yunnanese are directly involved in this industry.

Kuming is the capital of Yunnan province, well known for its mild temperate climate and relatively low level of air pollution from industries. In 2008, the reported smoking rate was nearly 30% among city residents, similar to the national adult average of 31.4%.

Xishan district, where this study was conducted, is one of four central districts of Kunming city. There are approximately four thousand restaurants registered and regularly inspected by the district health bureau.

Restaurant and respondents selection

Of the 246 restaurants scheduled for inspection during May to August 2009, 104 were randomly selected. The study population consisted of the managers and the employees who were currently working in those restaurants, and their customers, aged 15 and above.

Interview method

Data on demographic characteristics, personal smoking status, personal perceptions on effects of smoking in restaurants, and preference on proposed tobacco control policies were collected by face-to-face interview for managers and employees and by self-completing for customers.

Demographic factors assessed for all subjects were gender, age, and

education, as well as length of time worked in the restaurant for employees, and frequency of restaurant visit per week for customers. Current smoking status of the respondents was classified into daily smoker, non-daily smoker and non-smoker.

The respondents were requested to pick up one most supported choice of smoking ban policy in restaurants among 3 categories: no ban (smoking is allowed anywhere), partial ban (designate a no smoking area) and total ban (smoking is not allowed in anywhere). In the analysis this was dichotomized into support for a total ban or less than a total ban.

Perceptions on the effects of smoking in restaurants were measured on a 5-point scale ranging from "strongly agree", "agree", "neutral", and "disagree" to "strongly disagree". Due to the constraints the customers do not like to answer long questionnaire, the number of items in this part were kept minimized.

Data on restaurant characteristics were obtained from the managers' questionnaire. The variables included restaurant size (number of seats), average spending per customer, tobacco selling and private compartment setting status.

Statistic Analysis

Descriptive statistics were employed by computing the proportion of respondents. Cross tabulation was made between the respondent characteristics and the support toward a total smoking ban. Significance of associations was initially assessed with the χ^2 test.

As gender, smoking status and education were potentially confounding, logistic regression was applied to identify independent predictors for support of total smoking ban. Since groups of employees and customers working or eating in the same restaurant environment might tend to give

similar responses in the questionnaire, a multilevel mixed effects logistic regression model was used.

In this modelling process independent variables have fixed effects to all subjects, whereas subjects from the same restaurant share restaurant specific variables. For example, employees of the same restaurant share the same base line odds of preferring smoking ban. The same assumption was also applied in the customer group. All independent variables were first included in the model with subsequent backward elimination approach. Those having P value greater than 0.05 were removed one-by-one by the descending order of their P values until the models consisted of only the significant covariate. As we had only few items on perception, and they are also outcome variable, these variable were not included in the models.

Epidata¹³ was used for data entry, and R software¹⁴ was used for all statistical analysis. The package lme4¹⁵ was used for mixed effects models.

Results

Among the 104 restaurants selected for the study, 4 refused to participate in the study. Of the remaining 100 restaurant, data collection was allowed only from the manager in 11 sites. These 11 restaurants were similar in site with the remaining 89. Among the 1055 approached employees, the response rate was 100%. The response rate of the customers could not be assessed. But the total number of customer respondents was 5213.

Characteristics of restaurants and respondents

Table 1 summarizes the characteristics of the restaurants and the respondents. The study restaurants were mostly of moderate to large

size with relatively high spending by customer. Most respondents were young adults. While the managers were balance in gender, females predominated among employees and male among the customers. High smoking rate followed the distributed of males in there three groups.

Individual characteristics in relation to total smoking ban policy

Table 2 examines relationship between characteristics of respondents and the support for a total smoking ban. Among managers, smoking status was the only significant factor. This factor was also consistently significant in all other two groups. University graduates had the high rate of supporting a total smoking ban among employees and customers. The same is true among the customers, among whom females had high support rate than males and those who visited the restaurant less often than twice per week was also the supporting a total smoking ban.

Table 3 shows the result of fitting the logistic regression model to the data. For the employees and customers group, random effects (intercepts) were also added. Since the interactions among these covariates were not statistically significant, they were not included in the model.

Basically, this table give similar conclusion with the preceding univariate analysis. The predictors of supporting a total ban were non-smoker in all groups, high education among employees and customers, and less frequent restaurant visit among customers. However after adjustment for these factors, female customers were less likely to banning than their male counterparts. Moreover, customers who dinned at large restaurants (>200 seats) were less likely to support a smoking ban.

The intraclass correlation coefficient (ICC) among employees (41.6%)

was much higher than that among customers (6.3%) indicating that the preference of an employee was similar to his/her peer in the same restaurant but that of the customer was relatively more independent.

Perception on effects of smoking in restaurant

Table 4 summarizes respondents' perception on effects of smoking in restaurants. Most managers forbid smoking behaviours of employees in restaurants, but were reluctant to comment on customers' personal rights of smoking in the restaurant. Managers had a relative strong perception that second hand smoking caused bad health to employees and customers. They were also concerned that smoking brings unclean and unsafe to restaurants. Managers and employees were not strongly worried about the effect that a total smoking ban would have on the income. Of the restaurant employees and customers, however, were not strongly concerned on the harmful effects of passive smoking.

Discussion

Of these 100 restaurants managers, over 1000 employees and over 5000 customers, a low support for a total smoking ban was found among all three subject groups. The ban policy was significantly more popular among female employees and customers in the crude analysis. However, after adjustment for other factors, the reverse was true in the final model for the customer. Both the manager and the customer in large restaurant were less likely to prefer total smoking ban. These low level of supports of the ban coincided with low level of perception of adverse effects of health smoking among employees and customers but not the managers.

Table 5 ^{7, 8, 16-20} compares the current study and other similar previous studies. In pre-legislation period, the acceptance rate of smoking was

low. After bans were implemented, the percent of acceptance become high. Thus low prevalence of acceptance of total smoking banning in Kunming should be considered as a challenge rather than predict future result from smoking ban.

The sex effect in this study is interesting. Other strong predictors such as smoking status and education have confounded the effect of sex. Crude cross tabulation misled readers that females were likely to ban smoking because of the confounding effects of these two variables. After adjustment, the independent effect of females was in fact negative on the ban. In contrast, in western countries²¹ and Hong Kong¹⁸, researches shows non-significant effect of female on support for total ban. In these areas, the prevalence of tobacco use was relatively low. Smoking is a more unacceptable behaviour in the society. In China, smoking is a usual behaviour, and can be accepted beyond their direct health effects. A recent study showed that the ever-smoking rate among young Chinese women has increased in the last decade²², and they are less aware of the harm caused by smoking. In our study, most of the subjects were young. The negative impact on total ban in females reflects the loss of tobacco control interventions.

We found the restaurant characteristics had an effect on the subjects' supports. Diners who eat at small restaurants prefer a total ban. This finding may be linked with poor air quality in enclosed public places where unacceptably high levels of nicotine have been found²³. People who have experiences of discomfort or dissatisfaction from exposure to passive smoking in restaurants are more likely to support a total smoke-free policy¹⁸. Some studies have found that separating smokers and non-smokers within the same air space does not eliminate non-smokers' exposure to second-hand smoking. The only effective

protection strategy is a 100% indoor smoke-free policy.

As expected, smoking status was among the strongest predictors for support of a total smoking ban. Non-smokers were more likely to favour a total ban. The public health establishment is deeply concerned with human rights, and emphasizes as a core principle of the freedom from harm²⁴. In western countries, the right of non-smokers (especially children) to breathe smoke-free air have been emphasized, and the tobacco control movement's dedication to rights is visible in the names of the leading pro-control groups, such as Canada's 'Non-Smokers' Rights Association', and the USA's 'Americans for Non-smokers' Rights'. Human rights can be an invaluable adjunct to a wide range of tobacco control movement²⁵. In developing countries where human rights are not a campaign issue, alternative strategies for campaign should be sought.

There are certain limitations in our study. Identification of restaurant manager is related variables fewer than on the employee and customer due to smallness of sample size of the manager. It was also not possible to strictly randomly select the customers. However, low ICC (6%) indicates that customers are relatively independent from one another but not the employee among which ICC was 42%.

Conclusion

The percentage of subjects' supporting a total smoking ban in restaurants of Kunming was low although support was more common among non-smokers and highly educated people. The low level of support coincides with the poor perception of harm from second-hand smoke. Implementation of a total ban smoking policy may be better to precede with public health education campaigns to those important groups.

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Table 1 - Characteristics of restaurants and subjects

Variable	Min	Median	Max	No.	%
Restaurant (n=100)					
Number of seats	50	200	1000	-	-
Average spending per customer (CNY)	10	300	30	-	-
Tobacco selling					
No	-	-	-	60	60
Yes	-	-	-	40	40
Private compartment					
No	-	-	-	18	18
Yes	-	-	-	82	82
Manager (n=100)					
Age	19	29	65	-	-
Sex					
Male	-	-	-	50	50
Female	-	-	-	50	50
Education					
Secondary or lower	-	-	-	30	30
High school	-	-	-	53	53
University	-	-	-	17	17
Smoking status					
Daily smoker	-	-	-	19	19
Non-daily smoker	-	-	-	17	17
Non-smoker	-	-	-	64	64
Employee (n=1055)					
Age	16	20	53	-	-
Sex					
Male	-	-	-	330	31.3
Female	-	-	-	725	68.7
Education					
Secondary or lower	-	-	-	714	67.7
High school	-	-	-	280	26.5
University	-	-	-	55	5.2
Smoking status					
Daily smoker	-	-	-	112	10.6
Non-daily smoker	-	-	-	193	18.3
Non-smoker	-	-	-	750	71.1
Length of time employed in restaurant (years)	<1	2	30	-	-
Customer (n=5213)					
Age	15	29	78	-	-
Sex					
Male	-	-	-	3134	60.1
Female	-	-	-	2079	39.9
Education					
Secondary or lower	-	-	-	951	18.2
High school	-	-	-	2196	42.1
University	-	-	-	2029	38.9
Smoking status					
Daily smoker	-	-	-	1399	26.8
Non-daily smoker	-	-	-	1392	26.7
Non-smoker	-	-	-	2422	46.5
Frequency of restaurant visit (times/week)	<1	2	14	-	-

CNY, China Yuan

Table 2 - Individual characteristics in relation to a total smoking ban policy

Variable	Manager		Employee		Customer	
	Support/total (%)		Support/total (%)	χ^2 test P	Support/total (%)	χ^2 test P
All subjects	17/100 (17)		141/1055 (13.4)		865/5213 (16.6)	
Sex		0.287		0.024		<0.001
Male	6/50 (12)		32/330 (9.7)		445/3134 (14.2)	
Female	11/50 (22)		109/725 (15)		422/2079 (20.3)	
Age		0.928		0.632		0.218
<30 years	9/51 (17.6)		63/440 (14.3) ^a		423/2473 (17.1)	
≥30 years	8/49 (16.3)		76/581 (13.1) ^b		365/2313 (15.8)	
Education		0.364		0.004		<0.001
Secondary or lower	5/30 (16.7)		100/714 (14)		117/951 (12.3)	
High school	11/53 (20.8)		26/280 (9.3)		343/2196 (15.6)	
University	1/17 (5.9)		14/55 (25.5)		400/2029 (19.7)	
Smoking status		0.02		<0.001		<0.001
Daily smoker	1/19 (5.3)		2/112 (1.8)		59/1399 (4.2)	
Non-daily smoker	0/17 (0)		13/193 (6.7)		157/1392 (11.3)	
Non-smoker	16/64 (25)		126/750 (16.8)		649/2422 (26.8)	
Length of time employed in restaurant				0.348		
<2 years	-		67/455 (14.7)		-	
≥2 years	-		58/468 (12.4)		-	
Frequency of restaurant use						0.003
<2 times/week	-		-		221/1098 (20.1)	
≥2 times/week	-		-		527/3272 (16.1)	

%, prefers rate for a total smoking ban

^a<20 years; ^b ≥20 years

Table 3 - Predictors for support of a total smoking ban policy in restaurants

Variable	Manager	Employee	Customer
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Individual level variables			
Sex			
Male			1
Female	NS	NS	0.56 (0.45, 0.69)
Age			
<30 years		1	1
≥30 years	NS	1.02 (0.62, 1.68) ^b	1.17 (0.97, 1.42)
Education			
Secondary or lower	1	1	1
High school	4.02 (0.89, 18.13)	0.84 (0.46, 1.52)	1.38 (1.04, 1.83)
University	0.65 (0.06, 7.42)	5.46 (2.01, 14.84)	1.87 (1.40, 2.49)
Smoking status			
Daily smoker	1	1	1
Non-daily smoker	-	1.95 (0.34, 11.08)	2.58 (1.81, 3.68)
Non-smoker	21.3 (2.31, 196.3) ^a	7.95 (1.61, 39.30)	11.57 (8.24, 16.26)
Length of time employed in restaurant			
<2 years	-	1	-
≥2 years	-	0.97 (0.59, 1.61)	-
Frequency of restaurant use			
<2 times/week	-	-	1
≥2 times/week	-	-	0.74 (0.60, 0.91)
Restaurant level variables			
Restaurant size			
≤200 seats	1		1
>200 seats	0.25 (0.06, 0.95)	NS	0.59 (0.42, 0.83)
Average spending per customer			
≤30 CNY			
>30 CNY	NS	NS	NS
Selling tobacco in restaurant			
No			
Yes	NS	NS	NS
Private compartment in restaurant			
No	1	1	
Yes	0.32 (0.07, 1.43)	0.30 (0.12, 0.76)	NS
ICC	-	41.64%	6.25%

AOR, adjusted odds ratio; CI, confidence interval; NS, non-significant

ICC, intraclass correlation coefficient; CNY, China Yuan

^anon-smoker VS smoker; ^b<20 years VS ≥20 years

Table 4 - Perception on effects of smoking in restaurant

Item	Manager		Employee		Customer	
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)
Smoking in a restaurant is the personal right of the customer	100	2.55 (0.88)	1053	2.87(1.03)	5212	2.81(1.22)
A customer smoking in a restaurant affects the health of other customers	100	1.76 (0.90)	1051	2.22(1.06)	5212	2.40(1.13)
A customer smoking in a restaurant affects the health of other employees	100	1.88 (0.96)	1049	2.27(1.11)	5213	2.44(1.17)
Smoking makes restaurant unclean	100	1.80 (0.93)	-	-	-	-
Smoking makes restaurant unsafe	100	1.82 (1.02)	-	-	-	-
Totally banning smoking may reduce the income of restaurant	100	2.40 (1.41)	1055	2.53(1.18)	-	-

Rating score: 1 = "strongly agree" 2 = "agree" 3 = "neutral" 4 = "disagree" 5= "strong disagree"

Table 5 - Support for comprehensive smoking ban in bars and restaurant before and after implementation in various studies

Study	County / Region	Subjects	Percentage of support (%)	
			Pre-legislation	Post-legislation
current	Kunming	restaurant manager	17	-
		restaurant employee	13.4	-
		restaurant customer	16.6	-
previous	Mongolia	restaurant owners and managers	87.8	-
	California	bar owners or staff	17.3	50.9
	Ireland	bar workers	59.5	76.8
	Australia	public	73.4	84.2
	California	public	55.4	71.3
	Hong Kong	public	68.9	-
	Russia	public	30	-