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## Influential Factors in gastric cancer

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# **RAPPORT DU STAGE**

**Influential Factors in gastric cancer**

**ZHANG MAN**

**STATISTIQUES**

# **Influential Factors in gastric cancer**

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# INTRODUCTION

The incidence and mortality rate of gastric cancer rank first among the malignant tumors in digestive system. The cause of gastric cancer is not yet known until today, although there is some progress at gastric cancer's pathogeny in China. The epidemiological research has revealed some suspicious element of stomach cancer: for example, the stomach's history of chronic disease, bad dietary habits, bad human relations, the unhealthy mode of life such as smoking, drinking, however, in terms of its danger factor is still unknown.

Gastric cancer is the fourth in the world of high malignancy, its mortality is the second in all cancer deaths. In China, the morbidity rate or fatality rate of gastric cancer rang the first in malignant tumor, the patients die of gastric cancer up to 160,000 each year. Early prevention early detection of gastric cancer is very important for patients' effective treatment. This internship's motive is discussing gastric cancer's danger factors in detail in order to providing references for the prevention of gastric cancer and health decision-making.

Epidemiological investigation of 100 patients with gastric cancer in hospital in Wenzhou, receiving gastroscopy or surgery, diagnosed by pathological examination, were carried out and 109 cases of chronic

superficial gastritis and chronic atrophic gastritis contemporarily diagnosed by gastroscopy were set as normal controls. And Logistic regression analysis of the epidemiological investigation result of the risk factors of gastric cancer is made, in order to discuss the relationship between the occurrence of gastric cancer and risk factors such as diet, emotion and living habits.

# **OBJET AND METHOD**

## **1.objects of study**

Epidemiological investigation of 100 patients with gastric cancer in hospital in Wenzhou, receiving gastroscopy or surgery, diagnosed by pathological examination, were carried out and 109 cases of chronic superficial gastritis and chronic atrophic gastritis contemporarily diagnosed by gastroscopy were set as normal controls. All the patients come from the hospitals of Wenzhou from 2009 to 2010.

## **2.the methods of study**

### **2.1.research project**

The research project including the general conditions of research object, family history, history of chronic gastritis (chronic gastritis, the stomach ulcers), and living habits and diet history. Through the anonymous questionnaire survey to obtain the data that we need. The table is below:

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## ***QUESTIONNAIRE***

***The patient's number:***

***Sex:***  *male*  *female*

***Groupe :***  *A*  *B*

<b><i>Immediate family member with malignant tumors:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>yes</i>
<b><i>Immediate family member with gastric cancer:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>yes</i>
<b><i>Drug allergy history:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>yes</i>
<b><i>Smoking:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>&lt; 20 days</i> <input type="checkbox"/> <i>&gt;20 days</i>
<b><i>Alcoholism:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>generale</i> <input type="checkbox"/> <i>many</i>
<b><i>Drink tea:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>yes</i>
<b><i>Psychic trauma:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>yes</i>
<b><i>Stress level:</i></b> <input type="checkbox"/> <i>Relax or general</i> <input type="checkbox"/> <i>nervous</i>
<b><i>Somnus:</i></b> <input type="checkbox"/> <i>good</i> <input type="checkbox"/> <i>bad</i>
<b><i>History of disease:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>yes</i>
<b><i>Ingestion of salt daily:</i></b> <input type="checkbox"/> <i>&lt;6 g</i> <input type="checkbox"/> <i>6-15 g</i> <input type="checkbox"/> <i>&gt;15 g</i>
<b><i>The habits of eating-quick:</i></b> <input type="checkbox"/> <i>no</i> <input type="checkbox"/> <i>yes</i>
<b><i>Hot food:</i></b> <input type="checkbox"/> <i>not often</i> <input type="checkbox"/> <i>often</i>



## **2.2.Statistical methods**

We use logistic regression analysis for handling the data that we collect.

When  $P < 0.05$ , we think that it's significant simultaneously; all the data is treated by the logiciel SPSS16.0.

# DESCRIPTION AND RESULTS

## **1.General analysis**

100 cases of gastric cancer patients, male is 77% (77 cases), female is 23%(22 cases), the male to female ratio is 3.35:1. And the age is between 32 and 85( Average age is 62.7).

## **2.Logistic regression analysis of single factor**

In statistics, logistic regression (sometimes called the logistic model or logit model) is used for prediction of the probability of occurrence of an event by fitting data to a logit function logistic curve. It is a generalized linear model used for binomial regression. Like many forms of regression analysis, it makes use of several predictor variables that may be either numerical or categorical. Logistic regression is used extensively in the medical and social sciences as well as marketing applications such as prediction of a customer's propensity to purchase a product or cease a subscription.

## 2.1 Definition

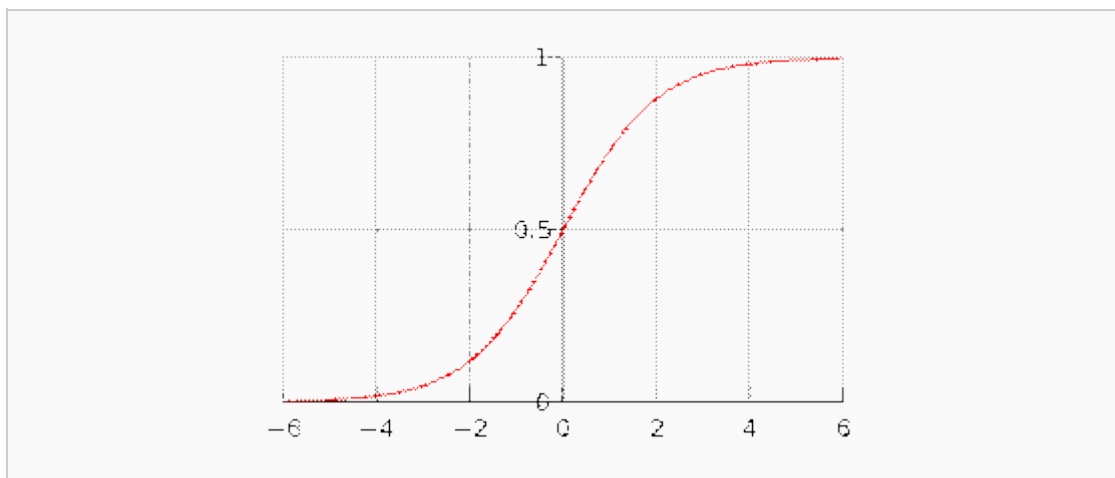


Figure 1. The logistic function, with  $z$  on the horizontal axis and  $f(z)$  on the vertical axis

An explanation of logistic regression begins with an explanation of the logistic function:

$$f(z) = \frac{e^z}{e^z + 1} = \frac{1}{1 + e^{-z}}$$

A graph of the function is shown in figure 1. The input is  $z$  and the output is  $f(z)$ . The logistic function is useful because it can take as an input any value from negative infinity to positive infinity, whereas the output is confined to values between 0 and 1. The variable  $z$  represents the exposure to some set of independent variables, while  $f(z)$  represents the probability of a particular outcome, given that set of explanatory variables. The variable  $z$  is a measure of the total contribution of all the independent variables used in the model and is known as the logit.

The variable  $z$  is usually defined as

$$z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots + \beta_k x_k,$$

where  $\beta_0$  is called the "intercept" and  $\beta_1, \beta_2, \beta_3$ , and so on, are called the "regression coefficients" of  $x_1, x_2, x_3$  respectively. The intercept is the value of  $z$  when the value of all independent variables is zero (e.g. the value of  $z$  in someone with no risk factors). Each of the regression coefficients describes the size of the contribution of that risk factor. A positive regression coefficient means that the explanatory variable increases the probability of the outcome, while a negative regression coefficient means that variable decreases the probability of that outcome; a large regression coefficient means that the risk factor strongly influences the probability of that outcome; while a near-zero regression coefficient means that that risk factor has little influence on the probability of that outcome.

Logistic regression is a useful way of describing the relationship between one or more independent variables (e.g., age, sex, etc.) and a binary response variable, expressed as a probability, that has only two possible values, such as death ("dead" or "not dead").

The logits, natural logs of the odds, of the unknown binomial probabilities are modeled as a linear function of the  $X_i$ .

$$\text{logit}(p_i) = \ln \left( \frac{p_i}{1 - p_i} \right) = \beta_0 + \beta_1 x_{1,i} + \dots + \beta_k x_{k,i}.$$

## **2.2.Odds ratio(OR)**

The odds ratio is one of a range of statistics used to assess the risk of a

particular outcome(or disease) if a certain factor (or exposure) is present. The odds ratio is a relative measure of risk, telling us how much more likely it is that someone who is exposed to the factor under study will develop the outcome as compared to someone who is not exposed.

### **2.3.results**

①.First of all, for every variable, we do single factor analysis in order to select the factors which is relevant to gastric cancer. We use chi-square test to do single factor analysis for counted data.

Table 1:

➤ **groupe \* Immediate family member with malignant**

**Crosstab**

			Immediate family member with malignant tumors		Total
			no	yes	
groupe	gastritis	Count	102	7	109
		% within groupe	93.6%	6.4%	100.0%
		% within Immediate family member with malignant tumors	57.3%	22.6%	52.2%
	gastric cancer	Count	76	24	100
		% within groupe	76.0%	24.0%	100.0%
		% within Immediate family member with malignant tumors	42.7%	77.4%	47.8%
Total	Count	178	31	209	
	% within groupe	85.2%	14.8%	100.0%	
	% within Immediate family member with malignant tumors	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	12.756 <sup>a</sup>	1	.000		
Continuity Correction <sup>b</sup>	11.403	1	.001		
Likelihood Ratio	13.281	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	12.695	1	.000		
N of Valid Cases <sup>b</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.83.

b. Computed only for a 2x2 table

According to the table 1, there are 209 cases, the number of patients whose Immediate family member has malignant tumors is 31, including 24 cases of Patients with gastric cancer (77.4%), the number of patients whose immediate family member has no malignant tumors is 178, including 76 cases of patients with gastric cancer (42.7%), the former was higher than the latter(  $\chi^2=12.756$ ,  $P=0.00$ ,  $<0.05$ ), The results indicated that immediate family member with malignant tumors has to do with

gastric cancer.

Table 2:

**groupe \* Immediate family member with gastric**

**Crosstab**

			Immediate family member with gastric cancer		Total
			no	yes	
groupe	gastritis	Count	105	4	109
		% within groupe	96.3%	3.7%	100.0%
		% within Immediate family member with gastric cancer	54.4%	25.0%	52.2%
	gastric cancer	Count	88	12	100
		% within groupe	88.0%	12.0%	100.0%
		% within Immediate family member with gastric cancer	45.6%	75.0%	47.8%
Total		Count	193	16	209
		% within groupe	92.3%	7.7%	100.0%
		% within Immediate family member with gastric cancer	100.0%	100.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.119 <sup>a</sup>	1	.024		
Continuity Correction <sup>b</sup>	4.009	1	.045		
Likelihood Ratio	5.298	1	.021		
Fisher's Exact Test				.035	.022
Linear-by-Linear Association	5.095	1	.024		
N of Valid Cases <sup>b</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.66.

b. Computed only for a 2x2 table

According to the table 2, there are 209 cases, the number of patients whose immediate family member has gastric is 16, including 12 cases of patients with gastric cancer (75.0%), the number of patients whose

immediate family member has no gastric is 193, including 88 cases of patients with gastric cancer (45.6%), the former was higher than the latter( $\chi^2=5.119$ ,  $P=0.024$ ,  $<0.05$ ), the results indicated that the factor of immediate family member with gastric has to do with gastric cancer.

Table 3:

**groupe \* Drug allergy**

**Crosstab**

			Drug allergy history		Total
			no	yes	
groupe	gastritis	Count	94	15	109
		% within groupe	86.2%	13.8%	100.0%
		% within Drug allergy history	51.9%	53.6%	52.2%
	gastric cancer	Count	87	13	100
		% within groupe	87.0%	13.0%	100.0%
		% within Drug allergy history	48.1%	46.4%	47.8%
Total	Count	181	28	209	
	% within groupe	86.6%	13.4%	100.0%	
	% within Drug allergy history	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.026 <sup>a</sup>	1	.872		
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.026	1	.872		
Fisher's Exact Test				1.000	.518
Linear-by-Linear Association	.026	1	.872		
N of Valid Cases <sup>a</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.40.

b. Computed only for a 2x2 table

According to the table 3, there are 209 cases, the number of patients



who have drug allergy history is 28, including 13 cases of patients with gastric cancer (46.4%), the number of patients who have no drug allergy history is 181, including 87 cases of patients with gastric cancer (48.1%), the former was lower than the latter ( $\chi^2=0.026$ ,  $P=0.872$ ,  $>0.05$ ). The results indicated that the factor of drug allergy history has nothing to do with gastric cancer.

Table 4:

**groupe \***

**Crosstab**

			Smoking			Total
			no	<20 days	>20 days	
groupe	gastritis	Count	72	32	5	109
		% within groupe	66.1%	29.4%	4.6%	100.0%
		% within Smoking	63.7%	44.4%	20.8%	52.2%
	gastric cancer	Count	41	40	19	100
		% within groupe	41.0%	40.0%	19.0%	100.0%
		% within Smoking	36.3%	55.6%	79.2%	47.8%
Total		Count	113	72	24	209
		% within groupe	54.1%	34.4%	11.5%	100.0%
		% within Smoking	100.0%	100.0%	100.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.204 <sup>a</sup>	2	.000
Likelihood Ratio	17.825	2	.000
Linear-by-Linear Association	17.051	1	.000
N of Valid Cases	209		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.48.

According to the table 4, there are 209 cases, the number of patients who were heavy smokers is 24, including 19 cases of patients with gastric

cancer (79.2%), the number of patients who have little smoke is 72, including 40 cases of patients with gastric cancer (55.6%), the number of patients who were no-smokers is 113, including 41 cases of patients with gastric cancer (36.3%),  $\chi^2=17.204$ ,  $P=0.000$ ,  $<0.05$ . The results indicated that the factor of smoking has something to do with gastric cancer.

Table 5:

**groupe**

**Crosstab**

			Alcoholism			Total
			no	general	many	
groupe	gastritis	Count	93	8	8	109
		% within groupe	85.3%	7.3%	7.3%	100.0%
		% within Alcoholism	59.6%	28.6%	32.0%	52.2%
	gastric cancer	Count	63	20	17	100
		% within groupe	63.0%	20.0%	17.0%	100.0%
		% within Alcoholism	40.4%	71.4%	68.0%	47.8%
Total	Count	156	28	25	209	
	% within groupe	74.6%	13.4%	12.0%	100.0%	
	% within Alcoholism	100.0%	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.790 <sup>a</sup>	2	.001
Likelihood Ratio	14.045	2	.001
Linear-by-Linear Association	11.220	1	.001
N of Valid Cases	209		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.96.

According to the table 5, there are 209 cases, the number of patients who were heavy drinkers is 25, including 17 cases of patients with gastric cancer (68.0%), the number of patients who were regular drinkers is 28,

including 20 cases of patients with gastric cancer (71.4%), the number of patients who were non-drinkers is 156, including 63 cases of patients with gastric cancer (40.4%),  $\chi^2=13.790$ ,  $P=0.001$ ,  $<0.05$ . The results indicated that the factor of alcoholism has something to do with gastric cancer.

Table 6:

**groupe \* Drink**

**Crosstab**

			Drink tea		Total
			no	yes	
groupe	gastritis	Count	80	29	109
		% within groupe	73.4%	26.6%	100.0%
		% within Drink tea	56.7%	42.6%	52.2%
	gastric cancer	Count	61	39	100
		% within groupe	61.0%	39.0%	100.0%
		% within Drink tea	43.3%	57.4%	47.8%
Total	Count	141	68	209	
	% within groupe	67.5%	32.5%	100.0%	
	% within Drink tea	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.650 <sup>a</sup>	1	.056		
Continuity Correction <sup>b</sup>	3.107	1	.078		
Likelihood Ratio	3.656	1	.056		
Fisher's Exact Test				.076	.039
Linear-by-Linear Association	3.633	1	.057		
N of Valid Cases <sup>b</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 32.54.

b. Computed only for a 2x2 table

According to the table 6, there are 209 cases, the number of patients who drink tea is 68, including 39 cases of patients with gastric cancer (57.4%),

the number of patients who have not drink tea is 141, including 61 cases of Patients with gastric cancer (43.3%), the former was lower than the latter(  $\chi^2=3.650,P=0.056,>0.05$ ).The results indicated that the factor of drink tea has nothing to do with gastric cancer.

Table 7:

**groupe \* Psychic**

**Crosstab**

			Psychic trauma		Total
			no	yes	
groupe	gastritis	Count	108	1	109
		% within groupe	99.1%	.9%	100.0%
		% within Psychic trauma	53.7%	12.5%	52.2%
	gastric cancer	Count	93	7	100
		% within groupe	93.0%	7.0%	100.0%
		% within Psychic trauma	46.3%	87.5%	47.8%
Total	Count	201	8	209	
	% within groupe	96.2%	3.8%	100.0%	
	% within Psychic trauma	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.242 <sup>a</sup>	1	.022		
Continuity Correction <sup>b</sup>	3.719	1	.054		
Likelihood Ratio	5.795	1	.016		
Fisher's Exact Test				.029	.024
Linear-by-Linear Association	5.216	1	.022		
N of Valid Cases <sup>b</sup>	209				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.83.

b. Computed only for a 2x2 table

According to the table 7, there are 209 cases, the number of patients who have psychic trauma is 8, including 7 cases of patients with gastric cancer

(87.5%), the number of patients who have no psychic trauma is 201, including 93 cases of patients with gastric cancer (46.3%), the former was higher than the latter ( $\chi^2=5.242$ ,  $P=0.022$ ,  $<0.05$ ). The results indicated that the factor of psychic trauma has something to do with gastric cancer.

Table 8:

**groupe \* Stress**

**Crosstab**

			Stress level		Total
			relax	nervous	
groupe	gastritis	Count	78	31	109
		% within groupe	71.6%	28.4%	100.0%
		% within Stress level	50.0%	58.5%	52.2%
	gastric cancer	Count	78	22	100
		% within groupe	78.0%	22.0%	100.0%
		% within Stress level	50.0%	41.5%	47.8%
Total	Count	156	53	209	
	% within groupe	74.6%	25.4%	100.0%	
	% within Stress level	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.143 <sup>a</sup>	1	.285		
Continuity Correction <sup>b</sup>	.828	1	.363		
Likelihood Ratio	1.148	1	.284		
Fisher's Exact Test				.340	.182
Linear-by-Linear Association	1.137	1	.286		
N of Valid Cases <sup>a</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.36.

b. Computed only for a 2x2 table

According to the table 8, there are 209 cases, the number of patients who have mental stress is 53, including 22 cases of patients with gastric cancer

(41.5%), the number of patients who have no stress is 156, including 78 cases of patients with gastric cancer (50.0%), the former was lower than the latter ( $\chi^2=1.143$ ,  $P=0.285$ ,  $>0.05$ ). The results indicated that the factor of stress level has nothing to do with gastric cancer.

Table 9:

**groupe \***

**Crosstab**

			somnus		Total
			good	bad	
groupe	gastritis	Count	61	48	109
		% within groupe	56.0%	44.0%	100.0%
		% within somnus	48.4%	57.8%	52.2%
	gastric cancer	Count	65	35	100
		% within groupe	65.0%	35.0%	100.0%
		% within somnus	51.6%	42.2%	47.8%
Total	Count	126	83	209	
	% within groupe	60.3%	39.7%	100.0%	
	% within somnus	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.779 <sup>a</sup>	1	.182	.204	.117
Continuity Correction <sup>b</sup>	1.421	1	.233		
Likelihood Ratio	1.784	1	.182		
Fisher's Exact Test					
Linear-by-Linear Association	1.770	1	.183		
N of Valid Cases <sup>b</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 39.71.

b. Computed only for a 2x2 table

According to the table 9, there are 209 cases, the number of patients who have bad somnus is 83, including 35 cases of patients with gastric cancer (42.2%), the number of patients who have good somnus is 126, including

65 cases of patients with gastric cancer (51.6%), the former was lower than the latter ( $\chi^2=1.779$ ,  $P=0.182$ ,  $>0.05$ ). The results indicated that the factor of somnus has nothing to do with gastric cancer.

Table 10:

**groupe \* History of**

**Crosstab**

			History of disease		Total
			no	yes	
groupe	gastritis	Count	72	37	109
		% within groupe	66.1%	33.9%	100.0%
		% within History of disease	52.6%	51.4%	52.2%
	gastric cancer	Count	65	35	100
		% within groupe	65.0%	35.0%	100.0%
		% within History of disease	47.4%	48.6%	47.8%
Total	Count	137	72	209	
	% within groupe	65.6%	34.4%	100.0%	
	% within History of disease	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.026 <sup>a</sup>	1	.873		
Continuity Correction <sup>b</sup>	.000	1	.988		
Likelihood Ratio	.026	1	.873		
Fisher's Exact Test				.885	.494
Linear-by-Linear Association	.026	1	.873		
N of Valid Cases <sup>b</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 34.45.

b. Computed only for a 2x2 table

According to the table 10, there are 209 cases, the number of patients who have history of disease is 72, including 35 cases of patients with

gastric cancer (48.6%), the number of patients who have no history of disease is 137, including 65 cases of Patients with gastric cancer (47.4%), the former was higher than the latter( $\chi^2=0.026$ ,  $P=0.873$ ,  $>0.05$ ). The results indicated that the factor of history disease has nothing to do with gastric cancer.

Table 11:

**groupe \* Ingestion of salt**

**Crosstab**

			Ingestion of salt daily			Total
			<6 g	6-15 g	>15 g	
groupe	gastritis	Count	10	61	38	109
		% within groupe	9.2%	56.0%	34.9%	100.0%
		% within Ingestion of salt daily	50.0%	50.4%	55.9%	52.2%
	gastric cancer	Count	10	60	30	100
		% within groupe	10.0%	60.0%	30.0%	100.0%
		% within Ingestion of salt daily	50.0%	49.6%	44.1%	47.8%
Total	Count	20	121	68	209	
	% within groupe	9.6%	57.9%	32.5%	100.0%	
	% within Ingestion of salt daily	100.0%	100.0%	100.0%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.563 <sup>a</sup>	2	.755
Likelihood Ratio	.564	2	.754
Linear-by-Linear Association	.456	1	.500
N of Valid Cases	209		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.57.

According to the table 11, there are 209 cases, the number of patients who consume exceed 15g every day is 68, including 30 cases of patients with



gastric cancer (44.1%), the number of patients who consume exceed 6-15g every day is 121, including 60 cases of patients with gastric cancer (49.6%), the number of patients who consume less than 6g every day is 20, including 10 cases of patients with gastric cancer (50.0%), the former was higher than the latter ( $\chi^2=0.563$ ,  $P=0.755$ ,  $>0.05$ ). The results indicated that the factor of ingestion of salt daily has nothing to do with gastric cancer.

Table 12:

**groupe \* The habits of**

**Crosstab**

			The habits of eating-quick		Total
			no	yes	
groupe	gastritis	Count	49	60	109
		% within groupe	45.0%	55.0%	100.0%
		% within The habits of eating-quick	50.5%	53.6%	52.2%
	gastric cancer	Count	48	52	100
		% within groupe	48.0%	52.0%	100.0%
		% within The habits of eating-quick	49.5%	46.4%	47.8%
Total		Count	97	112	209
		% within groupe	46.4%	53.6%	100.0%
		% within The habits of eating-quick	100.0%	100.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.195 <sup>a</sup>	1	.659		
Continuity Correction <sup>b</sup>	.091	1	.762		
Likelihood Ratio	.195	1	.659		
Fisher's Exact Test				.679	.381
Linear-by-Linear Association	.194	1	.660		
N of Valid Cases <sup>b</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 46.41.

b. Computed only for a 2x2 table

According to the table 12, there are 209 cases, the number of patients who have the habits of eating-quick is 112, including 52 cases of patients with gastric cancer (46.4%), the number of patients who haven't the habits of eating-quick is 97, including 48 cases of patients with gastric cancer (49.5%), the former was lower than the latter ( $\chi^2=0.195$ ,  $P=0.659$ ,  $>0.05$ ). The results indicated that the factor of the habits of eating-quick has nothing to do with gastric cancer.

Table 13:

**groupe \* Hot**

**Crosstab**

			Hot food		Total
			not often	often	
groupe	gastritis	Count	74	35	109
		% within groupe	67.9%	32.1%	100.0%
		% within Hot food	55.6%	46.1%	52.2%
	gastric cancer	Count	59	41	100
		% within groupe	59.0%	41.0%	100.0%
		% within Hot food	44.4%	53.9%	47.8%
Total		Count	133	76	209
		% within groupe	63.6%	36.4%	100.0%
		% within Hot food	100.0%	100.0%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.781 <sup>a</sup>	1	.182		
Continuity Correction <sup>b</sup>	1.418	1	.234		
Likelihood Ratio	1.782	1	.182		
Fisher's Exact Test				.197	.117
Linear-by-Linear Association	1.773	1	.183		
N of Valid Cases <sup>b</sup>	209				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 36.36.

b. Computed only for a 2x2 table

According to the table 13, there are 209 cases, the number of patients who often eat hot food is 76, including 41 cases of patients with gastric cancer (53.9%), the number of patients who not often eat hot food is 133, including 59 cases of patients with gastric cancer (44.4%), the former was lower than the latter ( $\chi^2=1.781$ ,  $P=0.182$ ,  $>0.05$ ). The results indicated that the factor of the habits of eat hot food has nothing to do with gastric

cancer.

②According the following table, we know that the factors of Immediate family member with malignant tumors, immediate family member with gastric cancer, smoking, alcoholism and psychic trauma were strongly associated with increased the risk of gastric cancer.

		GROUPE A (N=100)	GROUPE B (N=109)	OR(ODDS RATIO)
Immediate family member with malignant tumors	NO	76(76.0%)	102(93.6%)	4.602
	YES	24(24.0%)	7(6.4%)	
Immediate family member with gastric cancer	NO	88(88.0%)	105(96.3%)	1.115
	YES	12(12.0%)	4(3.7%)	
Drug allergy history	NO	87(87.0%)	94(86.2%)	0.936
	YES	13(13.0%)	15(13.8%)	
Smoking	NO	41(41.0%)	72(66.1%)	2.195
	<20 DAYS	40(40.0%)	32(29.4%)	
	>20 DAYS	19(19.0%)	5(4.5%)	
Alcoholism	NO	63(63.0%)	93(85.4%)	3.690
	GENERAL	20(20.0%)	8(7.3%)	
	MANY	17(17.0%)	8(7.3%)	
Drink tea	NO	61(61.0%)	80(73.4%)	1.764
	YES	39(39.0%)	29(26.6%)	
Psychic trauma	NO	93(93.0%)	108(99.1%)	8.129
	YES	7(7.0%)	1(0.09%)	
Stress level	RELAX OR GENERAL	78(78.0%)	78(71.6%)	0.710
	STRESS	22(22.0%)	31(28.4%)	
Somnus	GOOD	65(65.0%)	61(56.0%)	0.684
	BAD	35(35.0%)	48(44.0%)	
History of disease	NO	65(65.0%)	72(66.1%)	1.048
	YES	35(35.0%)	37(33.9%)	
Ingestion of salt daily	<6 G	10(10.0%)	10(9.2%)	0.984
	6-15 G	60(60.0%)	61(56.0%)	
	>15 G	30(30.0%)	38(34.8%)	
The habits of	NO	48(48.0%)	49(45.0%)	0.885

eating-quick	YES	52(52.0%)	60(55.0%)	
Hot food	NOT OFTEN	59(59.0%)	74(67.9%)	1.469
	OFTEN	41(41.0%)	35(32.1%)	

### 3. Logistic regression analysis of multiple factors

We use Logistic regression analysis of multiple factors to analyse the factors of immediate family member with malignant tumors, immediate family member with gastric cancer, smoking, alcoholism and psychic trauma.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	x1	1.362	.481	8.017	1	.005	3.902	1.521	10.015
	x2	.985	.640	2.364	1	.124	2.677	.763	9.391
	x4	.789	.236	11.153	1	.001	2.202	1.386	3.500
	x5	.679	.228	8.846	1	.003	1.972	1.261	3.084
	x7	1.726	1.139	2.295	1	.130	5.618	.602	52.408
	Constant	-1.091	.229	22.685	1	.000	.336		

a. Variable(s) entered on step 1: x1, x2, x4, x5, x7.

From this table blow, we know that the factors of immediate family member with malignant tumors, smoking, alcoholism have a very bad effect on the morbidity of gastric cancer. And the factors of immediate family member with gastric cancer and psychic trauma increase the risk of gastric cancer disease.

## **SUMMARY**

Through a series of investigation and analysis, we get a general idea of the important risk factors of occurrence of gastric cancer. According to the statistical result of the data provided by the questionnaire, we found that the incidence in female was lower than that in male. Analysing the causes, probably it's because men like smoking and drinking more than women do, men also take more stress and there is psychological disparity between men and women.

In Inherited respect, in 100 patients with gastric cancer, immediate family member with malignant tumors(24%), immediate family member with gastric cancer (12%), however, in control group, immediate family member with malignant tumors(6.4%), immediate family member with gastric cancer (3.7%), show that the people who have familial history of cancer is more likely to suffer gastric cancer.

Smoking is closely associated with gastric cancer, this survey show that people who smoke more than 20 every day increase their risk of having gastric cancer by nearly 3 times. Drinking moderately administer to people's health, but excessive drinking can increase significantly risk of developing gastric cancer. As to the spirit, psychic trauma is related to gastric cancer.

## **DIFFICULTIES**

Because we only finished 209 questionnaires, so these limites affect more or less accuracy of analysis. Due to the limitation in knowledge,time and energy, this report remains open to a further discussion and improvement in the future.

# REFERENCE

## **Internet:**

1. [http://en.wikipedia.org/wiki/Logistic\\_regression](http://en.wikipedia.org/wiki/Logistic_regression)
2. Care of older people, 2001 Blackwell Science Ltd, Journal of Clinical Nursing, 10, 257-269

## **Books:**

1. Sun Zhenqiu, <<Medical Statistics(Second Edition)>>, The People's Medical Publishing House
2. Zhang Wentong, <<Learn SPSS>>, Academic Press



## **APPENDIX**

In order to make sure that data can be analysed easily by SPSS software, we suppose that "YES=1", "NO=0", "Group A(patients with gastric cancer)=1", "Group B(patients with gasreitis)=0", "<20 days=1", ">20 days=2", "general=1", "many=2", "relax or general=1", "stress=2", "good=1", "bad=0", "<6 g=0", "6-15 g=1", ">15 g=2"