

The Public's Self-Avoidance and Other-Reliance in the Reporting of Medical Insurance Fraud: A Cross-Sectional Survey in China

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Purpose: To understand the public's self-willingness to report medical insurance fraud and their expectations on others, to provide a reference for the government to do a good job in medical insurance anti-fraud.

Methods: Data were obtained from a questionnaire survey of 846 respondents in China. Descriptive statistical analyses and multinomial logistic regression were used to analyze the different subjective attitudes of the public toward different subjects when faced with medical insurance fraud and the influencing factors.

Results: 511 (60.40%) respondents were willing to report medical insurance fraud, while 739 (87.35%) respondents expected others to report it. 485 (57.33%) respondents were willing and expected others to report medical insurance fraud, followed by those who were not willing but expected others to report it (254, 30.02%). Compared to those who were unwilling to report themselves and did not want others to report, those who believe their reporting is useless ($OR=3.13$, 95% $CI=1.15-8.33$) and those who fear for their safety after reporting ($OR=2.96$, 95% $CI=1.66-5.26$) were more likely to expect others to report. Self-reporting willingness was stronger among the public who were satisfied with the government's protective measures for the safety of whistleblowers ($OR=4.43$, 95% $CI=1.38-14.17$). The public who believe that both themselves and others have responsibilities to report medical insurance fraud were willing to report and expect others to do the same.

Conclusion: The public had a "self-avoidance" and "other-reliance" mentality in medical insurance anti-fraud. The free-rider mentality, lack of empathy, concerns about own risk after reporting, and the interference of decentralized responsibility were important factors contributing to this public mentality. At this stage, the government should prevent the public's "collective indifference" in medical insurance anti-fraud efforts. Improving the safety and protection of whistleblowers and making everyone feel more responsible and valued may be effective incentives to enhance the public's willingness to report.

Keywords: medical insurance, anti-fraud, whistleblower, subjective attitudes

Introduction

Countries around the world are facing serious medical insurance fraud problems,¹⁻³ which refers to the intentional deception or misrepresentation by a person or entity seeking an unauthorized benefit.⁴ Medical insurance fraud mainly affects developing countries with fewer resources,⁵ resulting in poor quality and inefficiency of health services.⁶ In some high-income countries, 3 to 10% of healthcare expenditures are lost due to medical insurance fraud each year, amounting to billions of dollars.⁷ In 2014, data from the Centers for Medicare & Medicaid Services (CMS) showed that abusive, fraudulent medical insurance in the United States accounted for about 1/3 of the \$2.8 trillion in total annual US healthcare spending. From 2018 to 2020, Chinese authorities, including the National Healthcare Security Administration, succeeded in recovering a total of RMB 34.875 billion (approximately \$5.396 billion) in medical insurance funds that had been used in violation of the law. Medical insurance fraud has a vicious impact on the

healthcare system and the public interest, it is urgent to combat medical insurance fraud to maintain an effective healthcare system and safeguard the public interest.⁸

Currently, the primary method for detecting medical insurance fraud in China is manual detection by government-organized experts, supplemented by some machine learning tools.⁹ However, influenced by factors such as the inter-regional use of medical insurance funds and the online settlement of medical expenses, the complexity and invisibility of medical insurance fraud are also increasing, which brings tremendous pressure on the government's anti-fraud work in medical insurance.^{10,11} As a quasi-public good, medical insurance funds deserve to be supervised by the public, and the value of public reporting in preventing and identifying medical insurance fraud has become commonly recognized and utilized in medical insurance anti-fraud efforts.^{12,13} Federal regulators in the United States take whistleblower information about medical insurance fraud seriously, with almost half of the medical insurance fraud losses recovered from 1996 to 2005 coming from lawsuits filed by whistleblowers.¹⁴ China has also taken various measures to encourage the public to report medical insurance fraud, mainly including offering financial rewards to whistleblowers and protecting their information.^{15,16} Public reporting is receiving increasing attention from policymakers and researchers as a medical insurance anti-fraud tool.

Willingness to report is the core prerequisite for promoting whistleblowing behavior,^{17,18} and research on the public's willingness to report medical insurance fraud is an important area of current interest among scholars. In 2022, Zhang, Zhang, Shi, Liu, Xu, Zhang, Wang, Tian, Wu, Kang¹⁹ found that the public's willingness to report medical insurance fraud was more related to whether they were direct victims. When medical insurance fraud causes a direct loss of personal benefit, the public is more likely to report it. Another study showed that the public's lack of knowledge of whistleblowing policies has a negative impact on their whistleblowing behavior. Concerns about the consequences of whistleblowing did not inhibit the public's whistleblowing behavior, while the inability to identify medical insurance fraud was a key barrier to converting willingness to report into behavior.²⁰

To the best of our knowledge, existing studies have focused more on the public's willingness to report medical insurance fraud, and no research has focused on the public's expectation on others to report when confronted with medical insurance fraud, let alone a comprehensive analysis of the public's self-willingness and expectation on others. Since the public lives in social contexts, when encountering social injustice events like medical insurance fraud, some people will be willing to report it themselves, while others will expect others to report it, and people tend to have different subjective attitudes toward different subjects. Not only in the area of medical insurance fraud reporting, but also in daily life, when the public is faced with smoking or queue jumping in public places and other uncivilized phenomena, they will also encounter similar problems. In such scenarios, when people are counting on having others report, social slackness arises,²¹ creating a free-rider problem.^{22,23} When people only have the will to report themselves and do not want others to report, the efficiency of the action also suffers. Therefore, it is necessary to figure out the public's self-willingness and expectations on others when making medical insurance anti-fraud reports.

In summary, to contribute to and update the knowledge about public participation in medical insurance anti-fraud. We focus on several questions that have not been considered to date: What is the public's willingness to report medical insurance fraud? What expectations do they have on others? Are there differences between the two? What factors influence the public's subjective attitudes toward different subjects? The study will provide insight into the psychological decision-making of individuals facing medical insurance fraud from a microscopic perspective, and provide a reference for governmental departments to formulate relevant reporting policies and do a good job in medical insurance anti-fraud. In addition, it is reasonable to assume that the results of this study will enrich the research results of social psychology and public administration and provide ideas for public participation in the governance of other events, especially unjust events.

Numerous behavioral science theories have informed our research. The Knowing, Believing, and Acting (KAP) model proposes that people adopt certain behaviors based on three stages: knowledge acquisition, belief generation, and behavior formation.^{24,25} Among them, "Knowing" is the knowledge and understanding of relevant knowledge, and "Believing" is the correct belief and positive attitude. Appropriate knowledge and the right attitude can lead people to take the right action with the right inclination.^{26,27} The Protective Action Decision Model (PADM) proposes a role for information processing and risk perception in human response to threats.²⁸ Perceived risks to behavior may prevent

people from making rational behavioral decisions,^{29,30} especially in the context of medical insurance anti-fraud efforts where the public is likely to bear the risk after reporting. In addition, Triandis introduced the factor of perceived consequences in his model of behavioral decision-making, arguing that any event can have positive or negative consequences and that the perception of such consequences directly affects an individual's willingness to act.^{31,32} Therefore, as shown in Figure 1, this study will build a KAP-RC model of public reporting of medical insurance fraud based on the KAP model, introducing the public's perception of the risk of reporting behavior and the perception of the consequences of medical insurance fraud, and analyzing the different subjective attitudes of the public towards different subjects and their influencing factors when making medical insurance anti-fraud reports.

Materials and Methods

Study Population and Data Collection

A cross-sectional questionnaire was used to investigate information about respondents' knowledge, attitudes, and willingness regarding whistleblowing medical insurance fraud. A pilot study was conducted before the formal survey in which 60 questionnaires were collected using convenience sampling to improve the design and questionnaire quality. The national survey was conducted from February 19 to September 20, 2022, through the "Questionnaire Star platform", a widely used online questionnaire platform in China.

According to the National Bureau of Statistics of China, the economic region was classified into four regions: Northeast, East, Central, and West.³³ Since the members of this study came from different provinces in China, to obtain a more credible sample and considering the accessibility of the participants, this study mainly collected data through the research members distributing the questionnaire links in their provinces and then collecting the data in a snowballing manner. Finally, Heilongjiang and Liaoning provinces were mainly selected as representatives in northeast China, Jiangsu and Shandong provinces in eastern China, Anhui and Shanxi provinces in central China, and Shaanxi and Guizhou provinces in western China. The public aged 18 years and older with normal cognitive abilities from four regions were selected to participate in the study on an anonymous basis. The introductory section of the questionnaire also provided written informed consent before the response. The following formula was followed in calculating the sample size for this sampling.

$$n = \frac{z^2 \times P \times (1 - P)}{d^2}$$

Where z determines the confidence level, and the z value is generally 1.96 corresponding to the 95% confidence level we choose. P is the percentage of a characteristic in the target population and is set to 0.5 because no prior data are available. d is the acceptable precision/accuracy level, generally, we take 0.04. Therefore, 601 samples should be investigated in this study according to the formula.

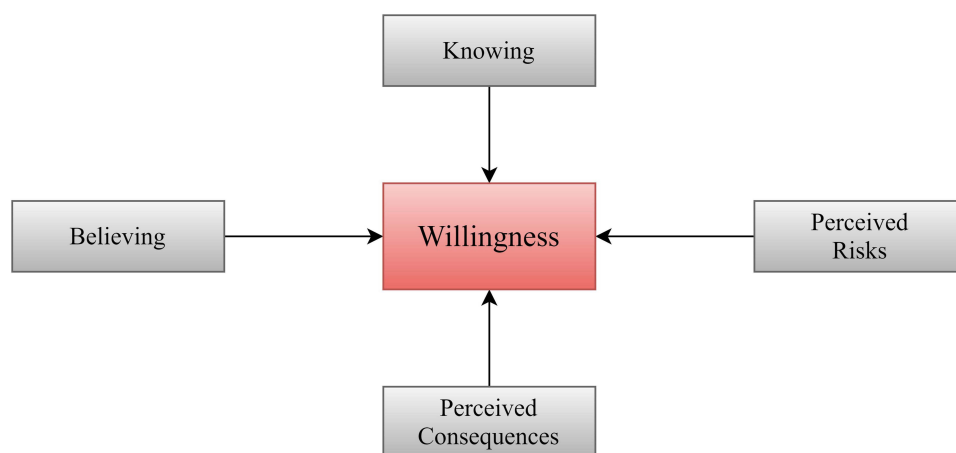


Figure 1 Overview of the KAP-RC framework.

According to the IP address recorded in the questionnaire, each participant could only answer once. If a questionnaire takes more than 10 minutes to complete (which is the shortest completion time our team tested) and the two logical questions are answered correctly, it is judged as valid and included in the analysis, otherwise, it will be removed. Finally, we surveyed 900 people, and based on the inclusion exclusion criteria and the quality screening, 54 samples were excluded, resulting in a total of 846 valid samples. The flowchart of the research sample is shown in Figure 2.

Measures

Dependent Variables

The dependent variables of the study were the subjective attitudes of the public towards different subjects when reporting medical insurance fraud, as measured by the questions “Would you like to report medical insurance fraud? (Yes/No)” and “Do you expect others to report medical insurance fraud when faced with it? (Yes/No)”. If respondents answered “Yes” to both questions, it can be assumed that the public is willing to report and expects others to report when faced with medical insurance fraud. In this way, the subjective attitudes of the public towards different subjects can be divided into four categories: Willing to report themselves and expect others to report (WRTEOR), Willing to report themselves but not expect others to report (WRTNEOR), Unwilling to report themselves but expect others to report (UWRTEOR), Unwilling to report themselves and not expect others to report (UWRTNEOR).

Independent Variables

Socio-Demographic Characteristics

The socio-demographic variables considered in this study were age, gender, marital status, education level, residency, residential economic region, and whether to be insured. Gender was defined as male and female. Marital status was

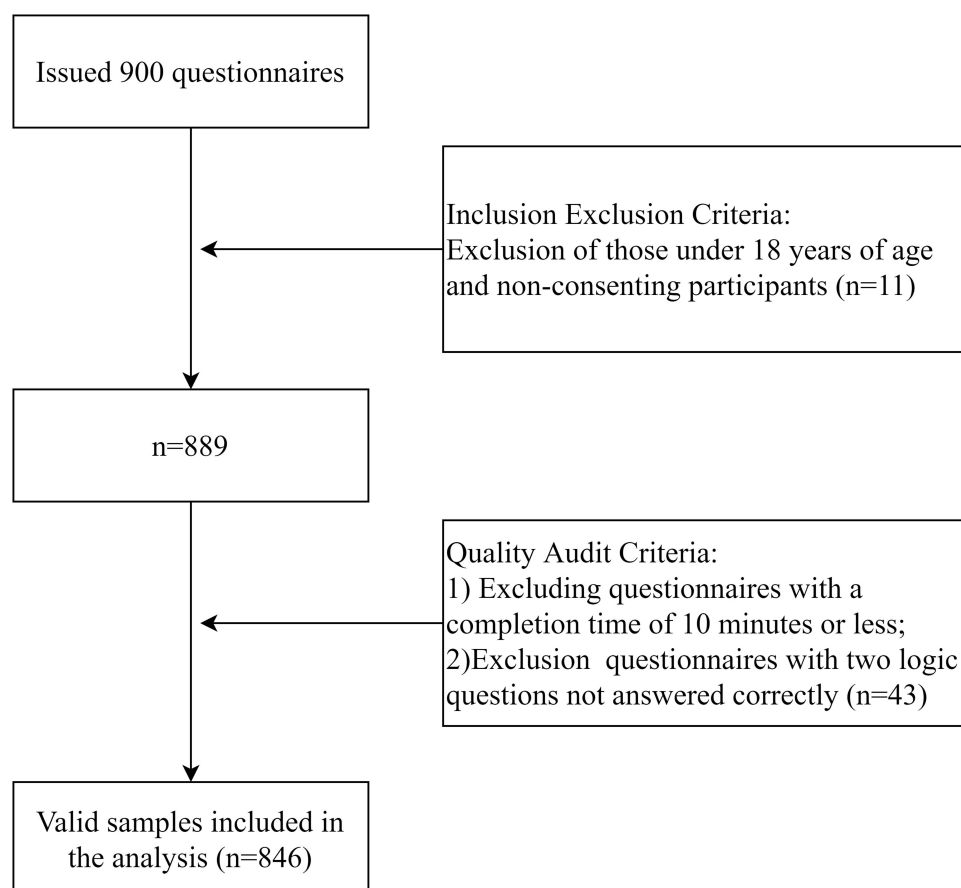


Figure 2 The flowchart of the research sample.

dichotomized into married or single, where single included those who are unmarried, divorced, and widowed. Education levels were divided into two groups: high school or below and college or above. Following the household information of the respondents, the place of residence was divided into rural or urban areas. The economic region was classified according to the National Bureau of Statistics of China into four regions: Northeast, East, Central, and West.³³ Based on their participation in basic medical insurance, respondents were classified as insured and non-insured.

Behavioral Decision Variables

Guided by behavioral science theories, we incorporated some behavioral decision-related variables to explain the factors influencing the public's willingness to report behavior, and the names and descriptions of the variables are shown in Table 1. Knowledge (KNOW) refers to the respondents' knowledge of public participation in medical insurance anti-fraud. Attitude towards Oneself (ATO) is the respondents' perceptions or attitudes towards their participation in medical insurance anti-fraud, Attitude towards the Public (ATP) is the respondents' perceptions or attitudes towards public participation in medical insurance anti-fraud, Perceived Risks (PRISK) is respondents' perceptions of risk after reporting, and Perceived Consequences (PCONSE) is respondents' perceptions of consequences of medical insurance fraud. Except for KNOW2, KNOW3, and KNOW4, which were dichotomous variables (No/Yes), all variables were measured by asking respondents to rate their approval of each item on a 5-point Likert scale (from 1 to 5 indicating a complete agreement to complete disagreement). Similar to other studies,^{34,35} scores above 3 were considered the high-level group, otherwise the low-level group.

Statistical Analysis

IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, N.Y., USA) was used for data cleaning and preprocessing. All tests were two-tailed, and the statistical significance level was set as *P*-value less than 0.05. Firstly, descriptive statistical analysis was used to describe the characteristics of the respondents. Secondly, we used Mann-Whitney *U*-test and chi-square tests to investigate the differences between the public's different subjective attitudes towards different subjects when making medical insurance fraud reports. Thirdly, multinomial logistic regression was

Table 1 Behavioral Decision Variables

Items	Code	Description
Knowledge (KNOW)	KNOW1	I understand some of the policies regarding public participation in medical insurance anti-fraud.
	KNOW2	I have followed the cases of medical insurance fraud disclosed by the Healthcare Security Administration.
	KNOW3	I know there can be a reward for reporting fraudulent insurance practices.
	KNOW4	I know that both anonymous and real-name reporting can be done.
Attitude toward Oneself (ATO)	ATO1	The safety of the medical insurance fund is very much linked to my interests.
	ATO2	It is my responsibility to maintain the safety of the medical insurance fund.
	ATO3	My involvement in medical insurance fund anti-fraud is very useful.
	ATO4	I have the ability to participate in medical insurance anti-fraud.
Attitude towards the Public (ATP)	ATP1	The public have responsibilities to participate in medical insurance fund anti-fraud.
	ATP2	It is very useful for the public to participate in medical insurance anti-fraud.
	ATP3	The channels for the public to report medical insurance fraud are very open.
	ATP4	It is very costly for the public to report medical insurance fraud.
Perceived Risks (PRISK)	PRISK1	I am very concerned about my safety after reporting.
	PRISK2	I am satisfied with the government's protective measures for the safety of whistleblowers.
Perceived Consequences (PCONSE)	PCONSE1	Medical insurance fraud is a common occurrence.
	PCONSE2	Medical insurance fraud is very egregious.
	PCONSE3	The consequences of medical insurance fraud are very serious.

constructed to investigate the factors that influence different reporting propensities. Multicollinearity test showed that all independent variables satisfied TOL (tolerance value) >0.1 and VIF (variance inflation factor) <10 , allowing the regression model to be built.^{36,37}

Results

Characteristics of Respondents

Table 2 demonstrates the basic characteristics of the respondents. Among the respondents, 61.23% were female, 44.09% were married, and 71.39% had a college degree or higher. In terms of place of residence, 85.94% of the respondents lived in cities and 40.43% were from Northeast China. 89.24% of the respondents were involved in basic medical insurance.

Table 2 Sample Characteristics and Prevalence of the Public's Different Subjective Attitudes (N=846)

	n	WRTEOR	WRTNEOR	UWRTEOR	UWRTNEOR	χ^2/H	P-value
Age, M (P25, P75)	27.00 (23.00, 43.00)	26.00 (23.00, 40.00)	29.50 (24.75, 44.25)	28.00 (24.00, 44.00)	27.00 (24.00, 47.50)	3.277	0.351
Gender						2.277	0.517
Male	328	179	9	105	35		
Female	518	306	17	149	46		
Marital status						2.894	0.408
Married	373	215	13	116	29		
Single	473	270	13	138	52		
Education level						7.779	0.051
High school or below	242	121	10	84	27		
College or above	604	364	16	170	54		
Residency						0.709	0.871
Urban	727	417	21	220	69		
Rural	119	68	5	34	12		
Residential economic region						20.742	0.014
Northeast China	342	179	14	106	43		
East China	242	152	9	63	18		
Central China	108	72	2	27	7		
West China	154	82	1	58	13		
Whether to be insured							
Insured	755	438	24	225	68	3.308	0.347
Non-insured	91	47	2	29	13		
KNOW1						73.688	<0.001
Yes	160	140	1	13	6		
No	686	345	25	241	75		
KNOW2						56.093	<0.001
Yes	393	275	12	90	16		
No	453	210	14	164	65		
KNOW3						69.306	<0.001
Yes	310	235	6	56	13		
No	536	250	20	198	68		
KNOW4						48.961	<0.001
Yes	431	297	11	96	27		
No	415	188	15	158	54		
ATO1						170.753	<0.001
Yes	564	400	7	142	15		
No	282	85	19	112	66		
ATO2						214.360	<0.001
Yes	493	384	9	88	12		
No	353	101	17	166	69		

(Continued)

Table 2 (Continued).

	n	WRTEOR	WRTNEOR	UWRTEOR	UWRTNEOR	χ^2/H	P-value
ATO3						71.996	<0.001
Yes	221	180	1	31	9		
No	625	305	25	223	72		
ATO4						110.899	<0.001
Yes	278	230	2	39	7		
No	568	255	24	215	74		
ATP1						81.888	<0.001
Yes	407	296	11	84	16		
No	439	189	15	170	65		
ATP2						78.022	<0.001
Yes	344	257	4	72	11		
No	502	228	22	182	70		
ATP3						72.434	<0.001
Yes	275	214	4	49	8		
No	571	271	22	205	73		
ATP4						22.238	<0.001
Yes	436	279	9	121	27		
No	410	206	17	133	54		
PRISK1						32.888	<0.001
Yes	566	337	13	183	33		
No	280	148	13	71	48		
PRISK2						91.992	<0.001
Yes	437	315	11	97	14		
No	409	170	15	157	67		
PCONSE1						3.235	0.357
Yes	225	139	8	60	18		
No	621	346	18	194	63		
PCONSE2						70.698	<0.001
Yes	781	469	18	234	60		
No	65	16	8	20	21		
PCONSE3						75.654	<0.001
Yes	739	453	16	219	51		
No	107	32	10	35	30		

The subjective attitudes of the public towards the subject of medical insurance fraud reporting were not exactly the same in different economic regions ($P=0.014$). In addition to the variable PCONSE1 (respondents' perception of the prevalence of medical insurance fraud), respondents' knowledge of public participation in medical insurance anti-fraud (KNOW), attitude toward their own participation in medical insurance anti-fraud (ATO), attitude toward public participation in medical insurance anti-fraud (ATP), perceived risks after reporting (PRISK), and perceived consequences of medical insurance fraud (PCONSE) were all correlated with their subjective attitudes ($P<0.001$).

Subjective Attitudes of the Public Towards Different Subjects When Making Medical Insurance Fraud Reports

Figure 3 illustrates the subjective attitudes of the public toward different subjects when making health insurance fraud reports. 511 (60.40%) respondents were willing to report medical insurance fraud, and 739 (87.35%) said they expected others to make medical insurance fraud reports. The largest number of respondents were those who were willing and expected others to report medical insurance fraud (485, 57.33%), followed by those who were not willing but expected others to report it (254, 30.02%). 81 (9.57%) respondents were neither willing themselves nor expected others to report, and 26 (3.07%) respondents were willing themselves but did not expect others to do so.



Figure 3 Subjective attitudes of the public toward different reporting subjects.

Results of Multinomial Logistic Regression

Table 3 shows the results of the multinomial logistic regression. Compared with those who were unwilling to report themselves and did not expect others to report, those who believe medical insurance is linked to their interests were more likely to expect others to make medical insurance fraud reports ($OR=3.47$, $P<0.001$), and those who believe their reports are useless ($OR=3.13$, $P=0.026$) and who fear for their safety after reporting ($OR=2.96$, $P<0.001$) were also more likely to expect others to become a whistleblower. The public who followed the cases of medical insurance fraud officially disclosed had a higher willingness to self-report ($OR=4.54$, $P=0.008$), and they were also satisfied with the government's measures to protect the safety of whistleblowers ($OR=4.43$, $P=0.012$).

The public who concerned about officially disclosed cases of medical insurance fraud ($OR=2.30$, $P=0.026$), who believe that medical insurance is highly associated with their interests ($OR=4.59$, $P<0.001$), and who perceive medical insurance fraud as egregious ($OR=3.46$, $P=0.019$) were willing to report themselves and expect others to report medical insurance fraud. Not only did they feel responsible and capable of making medical insurance fraud reports, but they also

Table 3 Multinomial Logistic Regression Analysis of the Public's Different Subjective Attitudes (Reference = UWRTNEOR)

Characteristics	WRTEOR			WRTNEOR			UWRTNEOR		
	OR	P-value	95% CI	OR	P-value	95% CI	OR	P-value	95% CI
Residential economic region									
Northeast China	1.02	0.961	(0.43,2.40)	6.69	0.096	(0.71,62.61)	0.69	0.359	(0.31,1.53)
East China	1.59	0.345	(0.61,4.15)	8.93	0.063	(0.88,90.11)	0.92	0.855	(0.37,2.28)
Central China	1.34	0.622	(0.42,4.31)	3.53	0.359	(0.24,52.39)	0.74	0.602	(0.24,2.28)
KNOW1	0.59	0.393	(0.17,1.99)	0.24	0.235	(0.02,2.53)	0.30	0.062	(0.08,1.06)
KNOW2	2.30	0.026	(1.11,4.80)	4.54	0.008	(1.50,13.78)	1.83	0.098	(0.90,3.74)
KNOW3	1.27	0.603	(0.51,3.16)	0.97	0.970	(0.23,4.12)	0.98	0.973	(0.40,2.41)
KNOW4	1.34	0.414	(0.66,2.70)	1.48	0.486	(0.49,4.48)	1.03	0.936	(0.53,2.00)
ATO1	4.59	<0.001	(2.24,9.41)	0.95	0.935	(0.29,3.11)	3.47	<0.001	(1.73,6.97)
ATO2	6.48	<0.001	(2.98,14.09)	2.98	0.073	(0.90,9.83)	1.66	0.205	(0.76,3.61)
ATO3	0.37	0.052	(0.13,1.01)	0.12	0.078	(0.01,1.27)	0.32	0.026	(0.12,0.87)
ATO4	2.98	0.041	(1.05,8.50)	0.55	0.533	(0.08,3.62)	1.63	0.361	(0.57,4.63)
ATP1	2.08	0.040	(1.03,4.20)	2.44	0.103	(0.83,7.11)	1.36	0.383	(0.68,2.71)
ATP2	2.71	0.021	(1.16,6.31)	1.01	0.984	(0.24,4.22)	1.98	0.107	(0.86,4.56)
ATP3	1.21	0.700	(0.46,3.17)	1.26	0.767	(0.28,5.67)	1.14	0.790	(0.44,2.96)
ATP4	1.51	0.196	(0.81,2.84)	0.87	0.790	(0.31,2.44)	1.25	0.462	(0.69,2.29)
PRISK1	2.89	0.001	(1.57,5.33)	1.62	0.324	(0.62,4.26)	2.96	<0.001	(1.66,5.26)
PRISK2	2.68	0.010	(1.27,5.66)	4.43	0.012	(1.38,14.17)	1.73	0.140	(0.84,3.60)
PCONSE2	3.46	0.019	(1.22,9.78)	0.74	0.665	(0.19,2.89)	2.16	0.102	(0.86,5.44)
PCONSE3	1.61	0.280	(0.68,3.81)	0.47	0.250	(0.13,1.70)	1.61	0.236	(0.73,3.52)

felt that it is responsible and useful for the public to do so. Even though they would be concerned about their safety after reporting ($OR=2.89$, $P=0.001$), satisfaction with government protection measures positively contributed to their willingness to report and the expectations of others ($OR=2.68$, $P=0.010$).

Discussion

Using a quantitative survey, this study innovatively explores the subjective attitudes of the public toward different subjects when facing medical insurance fraud and the influencing factors. Based on the actual situation, this study analyzed four different types of subjective attitudes of the public when reporting medical insurance fraud: Willing to report and expect others to report, Willing to report but not expect others to report, Unwilling to report but expect others to report, Unwilling to report and not expect others to report. The findings of the study will not only enrich the research results of public participation in medical insurance anti-fraud work and even in the field of public participation in social affairs governance, but also have important implications for the improvement of social psychology and public management theory.

An important contribution of this study is the detection of the “self-avoidance” and “other-reliance” psychology of the public in medical insurance anti-fraud, ie, when faced with medical insurance fraud, people are more likely to rely on others to report it than on themselves. We believe that this phenomenon may be equally applicable in other areas of social public governance, not only in the area of medical insurance anti-fraud. In the process of social public governance, people’s expectations of others’ behavior are always higher than their own behavioral willingness. For example, when someone smokes in a public place, people always expect someone to stop it, but they are often unwilling to do so themselves. When the vast majority of society is of this mentality, the phenomenon of “collective indifference” will arise. In 2021, China only recovered 0.76% of its medical insurance fund losses through public reporting.³⁸ The psychology of “self-avoidance” and “other-reliance” may be an important reason for the failure of public participation in medical insurance anti-fraud initiatives.

The public’s free-rider mentality, lack of empathy, concerns about their risks after reporting, and interference with decentralized responsibility may be important factors in the formation of this social phenomenon. In this study, 30% of the respondents said they were reluctant to report medical insurance fraud and simply wanted to take advantage of others’ efforts to fight medical insurance fraud, even though they believed that medical insurance funds were highly relevant to their interests. Such respondents have a significant opportunistic mentality of free-riding when it comes to medical insurance fraud reporting. It needs to be acknowledged that the public’s medical insurance anti-fraud effort is a large-scale collective action, which lacks clear quantitative assessment indicators, leading to the inevitable free-rider mentality of the public.³⁹ On the one hand, they believe that their participation in reporting is not effective, on the other hand, out of concern for their own risks after reporting, they are less likely to report.

Meanwhile, the study found that the willingness to self-report was stronger among the public who were satisfied with the government’s protective measures for the safety of whistleblowers, while the public who were concerned about their safety after reporting were more likely to expect others to report. We suggest that this may be a result of a lack of empathy on the part of the public. In many cases, people do not put themselves in the perspective of others, which is a manifestation of a lack of empathy.^{40,41} In the field of medical insurance anti-fraud, when people as bystanders only expect others to report, they tend to consider the benefits of this matter out of a sense of social justice and ignore the difficulty and cost of accomplishing this task. Once they become the subject of the action, their willingness to behave is influenced by many factors, including their ability, the cost of the action, the consequences of the action, the difficulty of the action, and so on.

Also, the study illustrates that the public’s concern about their own risk after reporting is an important factor influencing their subjective attitudes toward different reporting subjects, which is consistent with previous research findings.^{42–44} In a federal lawsuit against a US pharmaceutical manufacturer, Kesselheim, Studdert, Mello⁴⁵ conducted semi-structured interviews with 26 whistleblowers, 18 of whom reported that whistleblowing “put their careers at risk”. Fleming, Humm, Wild, Mohan, Hornby, Harries, Fitzgerald, Beamish⁴⁶ surveyed delegates attending the Association of Surgeons in Training (ASiT) and found that only 16% of respondents felt that National Health Service (NHS) protection for whistleblowers was adequate. As medical insurance anti-fraud is

social public governance, whistleblowers often report medical insurance fraud to protect the public interest rather than their private interests, and once they realize that they cannot avoid the risks or troubles they may encounter after reporting, they are bound to hesitate. Therefore, whistleblower protection may be a necessary element for the government to consider when encouraging public participation in medical insurance anti-fraud efforts.

Finally, the study found a vague sense of public responsibility in medical insurance anti-fraud reporting. Respondents who believe that both they and others have a responsibility to report medical insurance fraud were not only willing to report medical insurance fraud themselves, but this sense of responsibility also raises public expectations of the behavior of others. It has been pointed out that when the sense of responsibility of each individual in a group is blurred, it means that a person does not have the idea and attitude of taking responsibility, which can also be said to be a lack of responsibility and can easily lead to inaction when the public is confronted with unethical behavior.⁴⁷ According to the “Bystander Effect” by John Darley and Bibb Latane,⁴⁸ when responsibility for medical insurance anti-fraud is apportioned to each individual, people tend to perceive themselves as less responsible and thus less likely to act. Based on this, it is essential to raise the public’s awareness of responsibility in the face of medical insurance fraud, to avoid the public’s “self-avoidance” and “other-reliance” mentality due to the interference of decentralized responsibility, and to improve the efficiency of medical insurance anti-fraud.

The study sheds some policy light on public participation in medical insurance anti-fraud efforts. Although the government has been emphasizing the importance of having the public as a significant force in medical insurance anti-fraud, it may indeed be a long process to achieve promising effects. According to our findings, Making the public feel more responsible and valued is an important means of improving the effectiveness of medical insurance anti-fraud, which is also consistent with the Pygmalion effect, causing an increase in performance by raising expectations for employees.^{49,50} In addition, the security protection of whistleblowers cannot be ignored.⁵¹

Our cross-sectional study provides an in-depth understanding of public participation in the supervision of medical insurance funds, but there are important aspects that we need to consider when discussing the external validity of the results. Firstly, our research object is the psychology of the general public, so the results may be generalizable. Secondly, there is a lack of research on the same subject so far, with only some studies on public participation in the governance of public affairs, such as food safety governance, environmental governance, and financial governance. Tavares, Lima, Michener⁵² found that in public service, women tend to report unlawful behavior less frequently than men, and that fear of retaliation reduces their willingness to engage in whistleblowing. External auditors also act in the public interest and Alleyne, Hudaib, Pike⁵³ found that perceived responsibility for whistleblowing and the cost of whistleblowing had a direct effect on their willingness to report. Compared to their study, we observed partial similarities. However, the study identified the “self-avoidance” and “other-reliance” mentality of the public in medical insurance anti-fraud, and the external validity of this finding in these areas may require further testing.

It is also important to note that some of the design choices in our study may have implications for the external validity of the results, which are some of the limitations of this study. On the one hand, the self-reported questionnaire approach of respondents is somewhat subjective, and subsequent studies could be based on scenario experiments or situational simulations to show the public’s psychological decision-making more realistically. On the other hand, the factors influencing the willingness to report included in the study may not be comprehensive enough. In addition to the psychosocial factors already considered in this study, the effects of social trust, the influence of others, and situational judgment on willingness to report are also worth further exploration in subsequent studies.^{54,55} Public reporting of medical insurance fraud is still in its infancy in China, and many other topics have not been explored to date. Despite these limitations, we believe that our research framework and findings will contribute to the field of public participation in social governance.

Conclusion

In summary, our study found that when confronted with medical insurance fraud, the respondents’ willingness to expect others to report it was significantly higher than their own willingness. The public had a “self-avoidance” and “other-

reliance” mentality in medical insurance anti-fraud, and the free-rider mentality, lack of empathy, concerns about their own risk after reporting, and interference with decentralized responsibility were important factors that caused the public to develop this mentality. About 30% of the public were reluctant to self-report but expected others to report, reflecting the existence of the public free-rider mentality in medical insurance anti-fraud. Publics who were satisfied with government protection measures were more willing to self-report, while public who were concerned about their safety after reporting were more likely to expect others to report, which may be the result of the public’s lack of empathy. For those who themselves were willing and expected others to report medical insurance fraud, their awareness of responsibility played an important role. At this stage, the government should prevent the public’s “collective indifference” in medical insurance anti-fraud efforts. Good protection of whistleblowers’ safety and making everyone feel more responsible and valuable may be effective incentives to increase the public’s willingness to report.

Ethics Approval and Consent to Participate

Ethics approval for the study protocol was obtained from the Ethics Committee of Harbin Medical University. A written informed consent form was provided in the introductory section of the questionnaire to explain the purpose of the questionnaire to the participants before the survey began, and informed consent was obtained from all participants through online responses.

Acknowledgments

The authors thank all participants in this study, as well as all the interviewers for data collection. We are also grateful to all the reviewers for their insightful comments and suggestions.

Funding

The research was supported by: (1) National Natural Science Foundation of China (72074064,71573068); (2) National Social Science Fund of China (19AZD013).

Disclosure

The authors report no conflicts of interest in this work.

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