

A Study of Health Insurance Fraud in China and Recommendations for Fraud Detection and Prevention

Jie Li, Hebei University of Technology, China

Qiaoling Lan, Tianjin University, China

Enya Zhu, Brown University, USA

Yong Xu, Hebei University of Technology, China

Dan Zhu, Iowa State University, USA*

ABSTRACT

Healthcare insurance fraud influences not only organizations by overburdening the already fragile healthcare systems, but also individuals in terms of increasing premiums in health insurance and even fatalities. Identifying the behavioral characteristics of fraudulent claims can help shed light on the development of artificial intelligence and machine learning technologies to detect fraud in health information system research. In this paper, a theoretical model of medical insurance fraud identification is proposed that characterizes the judgment variables of fraud from the three dimensions of time, quantity, and expenses. The model is verified with large-scale, real-world medical records. The study shows that, in comparison with claims made by normal people, fraudulent claims usually have a greater frequency of hospital visits, more medical bills, and higher medical expenses. An interesting discovery is that the price per bill for fraudulent cases is not statistically different from the normal cases.

KEYWORDS

Anti-Fraud, Characteristics of Fraud, Drugs, Electronic Medical Records, Fraudulent Behaviors, Fraudulent Claims, Medical Insurance, Statistical Analysis

INTRODUCTION

Healthcare loss due to fraud has risen steadily across the globe (Shiau et al. 2021). Healthcare insurance fraud will influence not only organizations by overburdening the already fragile healthcare systems, but also individuals in terms of increasing premiums in health insurance and even fatalities. In particular, China is an example of a country with almost universal coverage and a public institution of medical insurance. This means that the majority of the population relies on government subsidies for medical coverage. Thus the existence of medical insurance fraud greatly harms the health care of the entire citizenry of the country.

Since the 1990s, China has been making strides to establish a basic national medical insurance system to meet the medical needs of citizens suffering from illness or injury (Pan et al., 2016, Wang et al., 2014). China's public health insurance programs are based on employment status and/or the

DOI: 10.4018/JOEUC.301271

*Corresponding Author

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Hukou system (a system of household registration used in mainland China) (Fang et al., 2017). The three main categories of health insurance programs in China are 1) the Urban Employees Basic Medical Insurance (UEBMI) covering urban employees; 2) the Urban Resident Basic Medical Insurance (URBMI) for urban residents who are not employed; and 3) the New Rural Cooperative Medical System (NCMS) providing insurance for the rural population (Pan & Lei, et L., 2016, Zhou et al., 2014, Yip & Hsiao, 2020, Yu, 2015, Zhao et al., 2014).

Employer and employee payroll taxes are the main funding source for UEBMI, but URBMI and NCMS are primarily funded by government subsidies (Meng et al., 2015). However, the continued increases in healthcare costs and rampant insurance fraud threaten the economic foundation of health insurance in China. (He & Wu, 2017). Compared to other types of fraud, healthcare insurance fraud is particularly damaging due to the sheer number of people who rely on government funds for medical care (He & Wu, 2017). For the many countries that have achieved universal coverage under a public healthcare system, fraud continues to reduce cost-effectiveness and erodes trust between all entities in the health care system (WHO 2011). Therefore, safeguarding medical insurance is essential not only to protect public health but for promoting and protecting economic development (Mesters et al., 2021).

According to the National Health Care Anti-Fraud Association in Washington D.C., “health care fraud is an intentional deception or misrepresentation that the individual or entity makes, knowing that the misrepresentation could result in some unauthorized benefit to the individual, or the entity, or to some other party” (NHCAA, 2020, Yang & Hwang 2006). And healthcare abuse is defined as “the provider practices that are inconsistent with sound fiscal, business, or medical practices, and result in an unnecessary cost, or in reimbursement of services that are not medically necessary or that fail to meet professionally recognized standards for health care” (NHCAA, 2020, Yang & Hwang 2006). Medical insurance fraud in this study refers to a broad definition, e.g. any intentional abuse or fraudulent use of the medical insurance fund caused by behaviors that do not conform to the normal medical treatment rules is regarded as medical insurance fraud.

Healthcare fraud, a significant problem affecting the quality of healthcare services, has caused huge financial loss and is also putting patients’ health at risk (Settipalli & Gangadharan, 2021). According to reports in major Chinese cities, losses caused by medical insurance fraud account for about 7-8% of domestic medical expenses (Peng & You, 2016). Moreover, medical insurance fraud has been a source of serious damage for health care systems worldwide. Although the exact sums can only be estimated, large amounts of money are wasted by the US health care system through fraud (Hoffer, 2019). Thus, further investigation of healthcare fraud in diverse clinical settings can offer insight into cost-effective national healthcare system practices.

Due to the high degree of loyalty and professionalism in the medical industry and the unique nature of each medical record, it is difficult to detect health insurance fraud. Previous methods of detection relied mainly on the thorough examination of individual medical records, which was time-consuming and inefficient (Wang et al., 2017). Commonly used indicators for medical insurance fraud assessment may cause personal privacy issues and fail to consider the potential behavior patterns implied in the patients’ treatment history. Many recent studies have explored the application of data mining methods for intelligent identification of medical insurance fraud (Rawte & Anuradha, 2015, Tomar & Agarwal, 2013). However, most of these studies concentrated on identifying fraudulent claims; few studies attempted to extract the behavior characteristics of those committing fraud. Thus, these studies may not provide all of the pieces of the puzzle which are needed to establish effective anti-fraud measures.

While the focus of the research on fraud theory represented by the fraud triangle model is to explain why fraudsters commit fraud (Dorminey et al., 2012), it is of little value in the recognition of fraud behaviors. On the contrary, the lesser-known triangle of fraud action (Albrecht et al. 2015) can provide us with certain theoretical guidelines for identifying fraud. The act, concealment, and conversion are three components of the triangle model of fraud action. The act is the most critical procedure for health insurance fraud, which would be recorded as medical transaction data. Abnormalities

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