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Legal aspects of processing patient data in health insurance according to Taiwan law

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Abstract

Universal Health Coverage required every nation to achieve “health for all”. It means, there are no people who need medical service find any difficulties to get the service due to financial limitation. Improving health system as well as the health insurance in every country is very important. Especially during the COVID-19 pandemic we have seen the need of having proper and integrated health system. Thus, digitization in healthcare is seen very important nowadays. Moreover, after we can see how digitizing the healthcare system is helping us cope with the pandemic in many ways, from simple functions such as electronic medical records to movement tracking functions. In the case of the settlement of health insurance claims, a complete medical record will help the insurance company to evaluate whether its clients meet the criteria to receive reimbursement or not. However, accessing patient data is regulated by the Taiwanese Personal Data Protection Act (PDPA). In the PDPA, both government and non-government institutions are regulated on terms and conditions in accessing and using patient data. What’s more, the strength of Taiwan’s National Health Insurance (NHI) system means that almost everyone living in Taiwan, whether citizens or not, is covered by the NHI. This situation makes private insurance only used by certain parties, thus making data breaches or violations committed by private parties either intentionally or unintentionally not clearly known. Therefore, the Taiwan government is continuously evaluating their PDPA to be on par with EU standards.

Key word: Health Insurance, Taiwan, Data Protection Act, data braches, insurance claim settlement

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1. Introduction

The COVID-19 pandemic has shown us the urgency of health system reform. Currently we clearly see that if health problems are not handled properly, it will have an impact on other sectors. Regulations regarding lockdown, work from home, and social distancing either directly or indirectly also affect social activities and people's daily lives. This rule even makes many people lose their jobs and no longer have the income to support themselves and their families. What's more, when they are infected with COVID-19 and need intensive care in the ICU, they also need a lot of money for these health services. This phenomenon is of course very contrary to the discourse on "health for all" which is the main goal of Universal Health Coverage (UHC). However, in the midst of all these problems, there are still opportunities and ways that can be done to come out and solve this problem (UN News, 2021; WHO, 2021, 2021a; World Bank, 2021b).

During the COVID-19 pandemic we are seeing how health systems in different parts of the world are being digitized. Unfortunately, not many of them have a proper and integrated system. Taiwan, is one of the most successful countries in controlling the COVID-19 pandemic in its territory. One of the keys to Taiwan's success is having a strong and well-integrated national health insurance system with a community participation rate of nearly 100%. With a quality health insurance system, the handling of COVID-19 patients and efforts to screen and track patients can also be carried out properly without significant obstacles. With the health system in Taiwan being all digital, it is even possible to update patient data in real-time. In addition, the current system is able to reduce the potential for errors that occur so that the Precision Medicine achievement target for improving the quality of health services can be achieved (Highlight, 2021; Taiwan, 2021).

Unfortunately, the digitization of the health system leaves problems related to the security of user data, including patient data breaches. Insurance companies as one of the sectors that most often access patient data for the purpose of settling insurance claims are certainly one of the parties that have the most potential to violate patient data. Therefore, this paper will briefly explain about UHC and various types of patient data, the current patient data breach problems, and an overview of Taiwan's healthcare system, including how they regulate the protection of patient data for the purpose of resolving health insurance claims and to prevent data breaches.

2. Universal health coverage and health insurance

Universal Health Coverage (UHC) is on the agenda to ensure everyone can receive the healthcare they need without experiencing financial hardship. It includes the full range of essential health services, from health promotion to prevention, treatment, rehabilitation, and palliative care. Protecting people from the financial consequences of paying for health services out of their own pockets reduces the risk that people will be pushed into poverty. Moreover, the scope of the UHC is relevant to Sustainable Development Goals (SDG) target. SDG 3.8 aims to "achieve universal health coverage, including financial risk protection, access to quality essential health care services, and

access to safe, effective, quality, and affordable essential medicines and vaccines for all”. While, SDG 1 aims to “end poverty in all its forms everywhere” could be in peril without UHC, as almost 90 million people are impoverished by health expenses every year. Furthermore, the burden caused by the pandemic force the nations to rapidly scale up their investments in essential public health functions. These include policy making based on evidence, communication including risk communication and community outreach to empower individuals and families to better manage their own health, information systems, data analysis, and surveillance, laboratory capacity for testing; regulation for quality products and healthy behaviors, and subsidies to public health institutes and programs. This situation show the urged of achieving UHC even more. It's because the three pillars of UHC, which are service delivery, health financing, and good governance, is highly important to help the countries to cope with the pandemic. In addition, the UHC is very important as it is not only focus on preventing and treating disease and illness, but also on helping to improve well-being and quality of life of the community (UHC 2030, 2018; WHO, 2021a, 2021; World Bank, 2021b).

3. Type of patient data in healthcare

Advances in technology and the digitization of the health system have led to the conversion of patient medical records from paper-based to digital-based (Seh et al., 2020). In general, there are 3 types of digital-based patient medical records, although in practice the use of the three terms often overlaps. Those are Electronic Medical Record (EMR), Electronic Health Record (EHR), and Personal Health Record (PHR). By definition, the EMR is defined as digital version of the paper charts in clinician offices, clinics, and hospitals. EMR contain notes and information collected by and for the clinicians in that office, clinic, or hospital and are mostly used by providers for diagnosis and treatment. The advantage of EMRs is that it is able to track the patient's data over time, so that health care providers can monitor and evaluate the quality of health services provided. Next is the EHR; it is built to provide a broader view of a patient's care. The EHR contain information from all the clinicians involved in a patient's care including laboratories and specialists. All authorized healthcare providers involved in a patient's care can access the information to provide care to that patient. The information in the EHR is often used for the purpose of identifying a person's health status across the country. Last is the PHR, it contains the same types of information as an EHR such as diagnosis, medications, immunizations, family medical history, and provider contact information. But, the PHR is designed to be set up, accessed, and managed by patients. Patients can use the PHR to maintain and manage their health information in a private, secure, and confidential environment. PHRs can include information from a variety of sources including clinicians, home monitoring devices, and patients themselves (HealthIT.gov, 2019).

In Taiwan, each NHI member has an electronic NHI card complete with a unique personal ID to be able to access health services. The card encodes personal information, insurance data, and notes from recent medical visits, diagnoses, drug prescriptions, drug allergies, major illnesses, organ donation consent, palliative care directives,

and public health records (including immunizations). With this type of information coverage, it can be interpreted that the NHI card can be used by the healthcare providers to access the insured's EMR. Then, Taiwan also has a cloud-based patient-centered drug information system that the National Health Insurance Administration (NHIA) introduced in 2013 so called the NHI PharmaCloud. PharmaCloud takes advantage of the vast database the NHIA has created to enable doctors and pharmacists to access a patient's medication history from the past three months. PharmaCloud also gives prescribers clinical recommendations and safe-use information to prevent adverse drug reactions and reduce unnecessary prescriptions. Next is My Health Bank. Being introduced in 2014, it is another cloud-based innovation that provides comprehensive health and medical records from the previous three years for any insured person on request. Records can be updated at any time. In addition to increasing the transparency of important personal health information, the initiative is intended to assist patients in managing their own health. A personal e-health record book contains the patient's complete medical history from the past year, which can be downloaded from the Web for the patient's own use. Recently, in 2015, the NHIA developed the NHI-MediCloud system, which incorporates patient data in the PharmaCloud system and in eleven additional records systems; the data includes Chinese medicine prescription use, examination and test results, surgeries, dental care and oral surgery, drug allergies, and hospital discharge summaries. However, even though all hospitals and clinics use electronic patient medical record, the lack of infrastructure investment makes NHI still has no systemwide interoperability, and the electronic exchange of patient medical records among hospitals is still limited (Commonwealth Fund, 2020b).

4. The current patient data breach problems

The United States Department of Health and Human Services defines a data breach as “the illegal use or disclosure of confidential health information that compromises the privacy or security of it under the privacy rule that poses a sufficient risk of financial, reputational, or other type of harm to the affected person” (Seh et al., 2020). The problem of data breaches is getting more attention with the increasing use of health information technology by health institutions and related business partners. Portable devices, desktop computers, and laptops were the top sources or locations of the breached information (Wikina, 2014). Based on the report of The Health Insurance Portability and Accountability Act of 1996 (HIPAA), healthcare industry has highest number of reported data breaches in 2021 globally and also estimated to be the most costly compared to other sectors (HIPAA Journal, 2021a; Liu et al., 2015; Ponemon Institute, 2015). In the US, between 2009 and 2020, there were at least more than 250 million health record data breaches, or equivalent to 80% of the US population. Then, compared to 2018, the daily data breach rate has doubled in 2020. Insurance companies are reported to experience more data breaches than healthcare institutions and related business partners. Moreover, most types of data breaches that occur in insurance companies are types of data hacking through various types of hacking mechanisms (CDC, 2019; HIPAA Journal, 2020). And what's worse is the lack of detail information

and data from other countries showing that the problem in the US is only the tip of an iceberg phenomenon of the overall global data breach problem.

During the COVID-19 pandemic, in health sector only, there was a 51% increase in the proportion of data breaches compared to last year's report. The report found that the COVID-19 pandemic engendered new vulnerabilities in the digital ecosystem for threat actors to exploit, resulting in items like vaccines, fraudulent vaccine certificates, and other COVID-19 related items being sold in dark marketplaces and underground forums. The report stated that the sale of vaccine certificate for an average price of \$22.35, and the COVID-19 antigen test sells for an average price of \$25. Moreover, by hacking vaccine company systems (such as API keys), doses of vaccines such as AstraZeneca, Pfizer, Moderna, and Sputnik are sold on some black markets from \$8 to nearly \$850. The phenomenon of data breaches as mentioned above has an impact on events that are very detrimental to patients. For example, when a patient's medical record data is lost or suddenly changed because someone else has used it to create a fake certificate in his name, neither the doctor nor the insurance company will be able to access the real owner of the data. In addition, the report also mentions the threat of Artificial Intelligence (AI) development to cybersecurity by showing evidence of data breaches caused by malicious impersonation using "deepfake" technology. This phenomenon makes the authentication process for data owners or parties who want to access data from the database system more vulnerable to being faked. Therefore, the quality of system security must be improved (CLOUDFLARE, 2021; HealthITSecurity, 2021; Intelligence, 2021).

Vaccine certificate-related data breaches have been widely reported worldwide. These violations are often carried out with various motives, both in developed and developing countries (Check Point Software, 2021). However, efforts to track data breaches in various countries have not been done much and are not as good as that of the US. Unfortunately, with complete reports and data, it is clear how high cases of data breaches are in the US. Based on the 2021 report, instead of reducing data breaches, they are increasing every year. The Cybersecurity and Infrastructure Security Agency (CISA) has created the new Insider Threat Risk Mitigation Self-Assessment Tool. This tool will help Public and private sector organizations to assess their level of vulnerability to insider threats and develop prevention and mitigation programs. Furthermore, October is designated as cybersecurity awareness month. This is done in order to increase public awareness and related agencies to jointly maintain data security, in an effort to overcome the problem of boating in data occurring (HIPAA Journal, 2021b, 2021c, 2021d).

5. Healthcare system in Taiwan

Taiwan's healthcare system is one of the best in the world. Under the online database's Health Care Index category for 2021, Taiwan has been named the country with the best health system in the world for the third time in a row. Taiwan's health system has the highest score in the world, beating the big countries that are also famous for their good health systems such as South Korea, Australia, Japan, Denmark, and even Finland. Health Care Index category is a rating of the "overall quality of the healthcare

system, including health care professionals, equipment, staff, and doctors” (T. News, 2021; Numbeo, 2021). In general, single-payment system of Taiwan NHI is similar to UK NHS. However, in term of the providers, Taiwan NHI is more similar to NHI system in Canada. In the UK, healthcare providers under their NHS are public sector, so it has longer waiting time and limited services. On the other hand, in Taiwan most of the providers are private sector that freely compete to become the part of Taiwan NHI (Wu et al., 2010). This fact makes Taiwan’s health system interesting to study its development so that it becomes one of the best in the world with all the threats and shortcomings that Taiwan also has.

The good achievements made by Taiwan’s health system cannot be separated from the quality of their National Health Insurance (NHI) system. The current NHI system embryo is a system created after the Second World War that has successfully overcome various epidemics such malaria, plague, and cholera to health promotion campaign in the form of vaccination (衛生福利部中央健康保險署, 2016). Since it was first introduced in 1995, now NHI has become the backbone of Taiwan’s health system with coverage of more than 23 million participants or almost 100% of the entire population of Taiwan. The high number of insured participants is not solely due to government regulations, but because people are satisfied with the services they receive if they become NHI members. Some of the advantages of NHI include: good accessibility, comprehensive coverage, short waiting times, and low cost. In addition, the high number of NHI participants makes NHI have a national database that is useful for academic purposes, such as research for evidence-based policy making (Wu et al., 2010). In addition, this good system even makes health expenditures relatively low and does not burden the state budget. It’s reported that Taiwan’s national health expenditures totaled 6.4 percent of GDP in 2017, of which NHI accounted for 53.7 percent, representing approximately 3.4 percent of GDP. Moreover, the NHI system does not burden the state budget because more than 80% of revenues come from premiums charged to the insured. While, the additional revenues come from the non-salary income sector, such as large bonuses, rent, interest, dividends, honoraria, and income from second and third jobs, as well as additional government premium subsidies, tobacco taxes, and taxes on lottery gains. Although the main source of income comes from the community, it does not burden them because the amount of premiums that must be paid is adjusted to their occupation and socio-economic status (Commonwealth Fund, 2020b).

6. Regulations on the use and processing of patient data in Taiwan

In general, Taiwan centralized and integrated electronic patient databases through their National Health Insurance (NHI) system. However, there are different mechanisms between the use of data for healthcare purposes and for research purposes. For research purposes, the patient data was available at National Health Insurance Research Database (NHIRD). However, the patient data contained in NHIRD is not updated in real-time. A study stated that there is a lag time of about 2 years in the availability of NHIRD data, which may hinder rapid research-based policy-making (Hsieh et al., 2019). Meanwhile,

for health care purposes, Taiwan's NHI maintains real-time electronic medical records of all residents allowing healthcare providers to access their medical information, including visits, prescriptions, and vaccinations. This kind of system is one of the strengths that Taiwan has in controlling COVID-19 (Commonwealth Fund, 2020a; Li et al., 2015).

Furthermore, the existence of a single player under the Ministry of Health of Taiwan in the field of health services through the NHI system allow the protection and monitoring of patient data easier to manage (Wu et al., 2010). In the National Health Insurance Act document which was last updated in January 2021, there are comprehensive regulation on matters related to NHI. This includes regulation of the use and processing of data, the rights and obligations of the insurer and the beneficiaries, requirements and regulations regarding contracted health facilities, strategies applied in evaluating and monitoring system implementation, as well as sanctions and consequences for violating applicable regulations (Ministry of Justice, 2012, 2018, 2021b).

In addition, there is also the Personal Data Protection Act (PDPA), which is enacted to regulate the collection, processing and use of personal data to prevent harm to personality rights, and to facilitate the proper use of personal data. The PDPA applies not only to the government agency but also to non-government agency who wish to use patient data for various purposes. Specifically for the use and collection of patient data by non-governmental sector, the terms and conditions are regulated in Article 6 of the PDPA, and more detail in its Chapter 2, article 19 to 27. In the article it is explained that personal data referred to here is data related to a person's medical record, health care, genetics, sex life, physical examination, and criminal record. All types of data can be collected, processed or used if the agency who wants to use the data meets the criteria stated in the article. Based on the PDPA law, patient personal data can be collected, processed, and used when it is expressly required by law. Other than a law request, the use of data can only be done if it has obtained the consent of the data owner. On the other hand, even with the consent of the data owner, if the scope of the data to be collected or used is outside the scope permitted by applicable law, then such activities are also prohibited (Ministry of Justice, 2015).

Furthermore in article 25 of PDPA, it is mentioned that in case that non-government agency violated the PDPA, the related public authority may impose fines on them who break the law. In addition, non-government agency will also be temporarily prohibited from collecting, processing or using personal data. Then they must also perform deletion and destruction of personal data and personal data files that have been collected and processed. Finally, the competent authority must disclose to the public if there are violations committed by non-governmental organizations and the name of the non-governmental organization (Ministry of Justice, 2015).

7. The use of patient personal data for the settlement of health insurance claims and potential data breaches in Taiwan

In general, the rules regarding health insurance in Taiwan are regulated in the Section 2 of the Insurance Act about health insurance, articles 125 to 129. The articles

briefly describe the rights and obligations of health insurers, as well as further terms and conditions related to the settlement of health insurance claims for any medical procedures and expenses (Ministry of Justice, 2021a). Furthermore, regarding the settlement of health insurance claims, both NHI and private insurance must be able to access the patient's personal data, including medical records, so that it can be known whether the patient meets the reimbursement criteria stipulated in the regulations or not. In the NHI system, all matters relating to the settlement of health insurance claims are formulated by NHIA, while for private insurance companies, it is regulated in the article 177-1 of Insurance Act (Ministry of Justice, 2013, 2021a). This article states which parties can access and use patient data, provided that they must comply with and not violate the PDPA. Thus, as long as the insurer complies with and does not violate the PDPA, there will be no problem using patient data for purposes permitted by law, including for the payment of health insurance claims. However, whether the submission of a health insurance claim will be approved or not, it must again refer to the law that regulates reimbursement (Ministry of Justice, 2013, 2017, 2021a).

In the context of Taiwan, all Taiwanese citizens, even expatriates living in Taiwan are members of the NHI system. This is not only because it is required by law, but because the community is satisfied with the services provided. Therefore, becoming a member of private health insurance is not a priority choice for Taiwanese citizens, but is voluntary and only used by certain parties. Usually those who decide to become participants in private health insurance want to get health services that are not covered by NHI scheme, or who do not have sufficient requirements to have an NHI or who do not have sufficient requirements to have an NHI, such as people living in Taiwan less than 4 months or those who come to Taiwan just for a business trip. In addition, there are also people who have NHI but still have private health insurance, they do it because they want better health care. Because many NHI users complain about the short consultation time with doctors (Pacific Prime, 2021; Wu et al., 2010).

So far, there are not many known problems and obstacles in terms of accessing data by related parties for the settlement of health insurance claims. Perhaps one of the reasons is because the majority of Taiwanese people use NHI as their main health insurance which is a main player in Taiwan's health system. Not only in the public sector, but also whether there are obstacles or problems faced by private insurance companies in using data to settle health insurance claims is also unclear. We assume that there are no reported problems accessing the data as those who join private insurance voluntarily have also given permission to the insurer to use their data for insurance claim settlement purposes. However, the absence of clear reports on data access barriers can be a good indicator, but it can also be an indicator of system vulnerability, where it is easy for someone's data to be accessed by foreign parties simply because the authorities do not have strong data protection system. Because in reality, amidst the absence of reports of data breaches in the healthcare system, reports of data breaches are common in other sectors of Taiwan. This is demonstrated by data breaches reported in other sectors, including reports of cyber-attacks on Taiwan's major oil refineries and the Presidential

Office, as well as data theft from fast food outlet systems (Commonwealth Fund, 2020b; Haddon, 2021; T. News, 2020).

Thus, even though the efforts made by the Taiwanese government have been quite good, we consider that there is still room for evaluation and improvement of the quality of the current data protection system, especially in terms of preventing data breaches carried out using AI-based technology. In our opinion, the data protection system should be more sophisticated and modern with several security systems, because nowadays even facial authentication can be faked with AI technology such as “deepfake” (CLOUDFLARE, 2021). Because of these things, we assume that if the government does not immediately evaluate and implement more modern data protection laws, the quality of the health system in Taiwan, which has been known to be very good, will decline significantly. Therefore, we assess the steps of the Taiwanese government to improve the quality of the patient data protection system, as well as prevent potential data breaches, are quite concrete by submitting its application to the EU for an adequacy decision pursuant to the General Data Protection Regulation (Regulation (EU) 2016/679) (GDPR) and continues to dialog with EU in this regard (DataGuidance, 2021).

8. Conclusion

Procedures for using patient data and criteria for reimbursement of medical expenses are regulated in different laws. So, parties who want to use patient data, including for the purpose of settling health insurance claims, must comply with the PDPA legislation. In the Taiwan context, as private insurance is not very popular with most people, so that data breaches and barriers to accessing and using patient data by private insurance companies are not clearly identified. However, data breaches have the potential to widen as the adoption of digital systems expands worldwide. The current reports of data breaches in health sector only show the tip of the iceberg phenomenon. In Taiwan, with a comprehensive law on the NHI system and individual data protection regulations, the extent of the problem regarding data breaches in the health sector is not yet known with certainty. However, similar problems also occur in other sectors, and this indicates a potential problem that has not been fully identified. That is why the Taiwanese government still needs to further modernize their data protection laws as the healthcare system digitizes in order to keep up with the types of data breaches that are currently rampant by technology abuse. Therefore, we consider that one of the efforts made by the Taiwanese government by continuously evaluating existing laws and regulations and standardizing them with EU standards is a concrete action to improve their data protection system.

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