Health-Care Data Collecting, Sharing, and Using in Thailand, China Mainland, South Korea, Taiwan, Japan, and Malaysia

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A B S T R A C T

This article sought to describe the health-care data situation in six selected economies in the Asia-Pacific region. Authors from Thailand, China mainland, South Korea, Taiwan, Japan, and Malaysia present their analyses in three parts. The first part of the article describes the data-collection process and the sources of data. The second part of the article presents issues around policies of data sharing with the stakeholders. The third and final part of the article focuses on the extent of health-care data use for policy reform in these different economies. Even though these economies differ in their economic structure and population size, they share some similarities on issues related to health-care data. There are two main institutions that collect and manage the health-care data in these economies. In Thailand, China mainland, Taiwan, and Malaysia, the Ministry of Health is responsible through its various agencies for collecting and managing the health-care data. On the other hand, health insurance is the main institution that collects and stores health-care data in South Korea and Japan. In all economies, sharing of and access to data is an issue. The reasons for limited access to some data are privacy protection, fragmented health-

care system, poor quality of routinely collected data, unclear policies and procedures to access the data, and control on the freedom on publication. The primary objective of collecting health-care data in these economies is to aid the policymakers and researchers in policy decision making as well as create an awareness on health-care issues for the general public. The usage of data in monitoring the performance of the heath system is still in the process of development. In conclusion, for the region under discussion, health-care data collection is under the responsibility of the Ministry of Health and health insurance agencies. Data are collected from health-care providers mainly from the public sector. Routinely collected data are supplemented by national surveys. Accessibility to the data is a major issue in most of the economies under discussion. Accurate health-care data are required mainly to support policy making and evidence-based decisions.

Keywords: Asia Pacific, collection, health-care data, sharing, using

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Introduction

In the future, the Asia-Pacific region will be the habitat for more than half of the world's population. The economic growth rate of the economies in the region is astonishing. History predicts that as the wealth of an economy improves, there is a high demand for health-care services.

Many economies in the region have already made improvements in their health-care systems in terms of financing and provisions of health-care services. The supply of efficient and well-educated/trained human resource in health care has been substantial. Health-care facilities are continuously improving their capabilities to provide health-care services.

The fundamental foundation that will ensure long-term success in health-care delivery is lacking and, if available, is limited. The availability and accessibility of accurate and necessary data to aid the decision makers in health policy formulation and reforms is a major issue in these economies.

Analysis of health-care data sets translates into good health outcomes and reforms in health systems, thus improving the health-care environment of the economy. Also, the government will be aided in budgeting and allocating of funds and planning for health systems.

Data Collection

Thailand

The health-care system in Thailand is a public-private mix for both financing and providing of health care. Public financing has been increasing over time and has seen a marked increase after the introduction of the universal coverage policy in 2002—from 45% in 1994 to 63% in 2002 and 74% in 2008 [1].

The Ministry of Public Health (MoPH) owns the majority of public settings distributed throughout the country, including health

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Table 1 – Number of ambulatory care settings, hospitals, and beds, by sector in Thailand, 2007.			
	Public sector		Private sector
	MoPH	Other public	
Number of ambulatory care settings	9,758	311	16,800
Number of hospitals	882	128	318
Number of beds	88,683	18,391	30,564

Source: The 2007 Health Resources Survey, Ministry of Public Health.

centers, community hospitals, general hospitals, and regional hospitals. The private sector plays a dominant role in Bangkok and its vicinity, especially private hospitals, having 43% of total private hospital beds. The number of ambulatory care settings in the private sector, private clinic, is greater than that in the public sector; however, most of them, 78%, are located outside Bangkok and operated by public doctors before or after their working hours. In total, one-third of hospital beds are in the private sector (Table 1).

Having a centralized health-care system, health-care data of the MoPH facilities are collected and pooled at the ministry who not only acts as the owner of the facilities but is also responsible for the public health system.

An enabling law requires all health facilities to submit reports and information to the ministry. However, there is a lack of strong commitment on the part of the private sector and other public health facilities because the ministry never forces them to comply with the law [2]. Health-care data that are collected and available include routine reports on revenues, expenses, throughputs, and common diseases group of outpatient and inpatient departments; disease surveillance (legally required for notifiable diseases, routine reporting, and specific disease surveillance); patient registry, that is, cancer, diabetes, hypertension, and so on. Among all these data, active surveillance of new emerging communicable diseases, for example, bird flu and 2009 influenza, had better compliance from other public and private providers.

Apart from routine data, some periodic national surveys on health and welfare conducted by various agencies are available. Household income-expenditure surveys, health and welfare surveys, and elderly surveys are conducted by the National Statistic Office while health examination surveys are conducted by the National Health Examination Survey Office. The MoPH is responsible for the conduct of health resources surveys.

Following the development of third-party payer systems during the two previous decades, beneficiary databases have been fully developed for health insurance management. At present the country has different health insurance systems, namely, the Universal Coverage scheme, the Civil Servant Medical Benefit Scheme, and the Social Security Scheme. Administrative databases on inpatient care have been used for the development of a Thai case-mix system called the Thai Diagnosis Related Group [3]. It is currently being implemented in the country as a payment scheme for inpatient care for the beneficiaries of the health insurance systems. The health-care providers rendering health-care services to the beneficiaries of the insurer are not limited only to the MoPH providers but also include other public and private providers. Thus, the inpatient database is huge in terms of coverage. There is an issue, however, on data collection because the country has fragmented health insurance schemes, which has resulted in the separation of data collection. The same is the case with the collection of administrative data on outpatient care. For the Universal Coverage scheme and the Social Security Scheme members, data are also collected from contracted hospitals for additional performance payment by the National Health Security Office and the Social Security Office, respectively. The data component of the Civil Servant Medical Benefit Scheme outpatient database, which is fully used for fee-for-service reimbursement, is still limited. Prescription database has been developed in most big hospitals for dispensing purpose, but it has not been used for reimbursement. However, the Civil Servant Medical Benefit Scheme plans to develop this database for reimbursement and to control the pharmaceutical expenditure of the scheme due to rapid outpatient cost escalation (Table 2).

China mainland

National reforms in the health-care system aim to achieve universal coverage by 2020. The system transition of this round sets five priorities for the next 3 years: 1) expanding the health security system; 2) establishing a national essential medicines system; 3) strengthening the capacity of primary care facilities; 4) promoting equality of public health services; and 5) reviving financing mechanisms of public hospitals by reducing their dependence on drug revenues. In addition, based on the government's 11th Five-Year Plan, which forms the basis for social and economic policies, the requirements for health are the implementation, monitoring, and evaluation of the health reform plan. As a result, the systematic monitoring and evaluation for reform progress and outcomes, as well as common health status indicators, become more crucial in this context, which requires effective communication of information and data to all stakeholders to support evidence-based decision making.

Promotion of and improvement in this system are continually being undertaken. The Country Health Systems Surveillance platform is a multipartner effort that began in 2008, led by the World Health Organization for improving the availability, quality, and utilization of the data needed to inform the country's health-sector reviews and planning processes and to monitor health-system performance [4]. The three dimensions of the Country Health Systems Surveillance platform are strengthening the demand and use of information, improving the supply of quality data and statistics for decision making, and enhancing the institutional capacity for assessment and monitoring of performance [5]. In response to

Table 2 – Coverage of administrative data by collecting agency, Thailand.			
Collecting agency	Public providers		Private providers
	MoPH facilities	Other public facilities	
MoPH	OP and IP data of all users	–	–
NHSO	OP and IP data of UC	OP and IP data of UC	OP and IP data of UC from contracted hospitals
SSO	OP and IP data of SS	OP and IP data of SS	OP and IP data of SS from contracted hospitals
CGD	OP and IP data of CS	OP and IP data of CS	–

CGD, Comptroller General's Department; CS, Civil Servant; IP, inpatient; MoPH, Ministry of Public Health; NHSO, National Health Security Office; OP, outpatient; SS, Social Security; SSO, Social Security Office; UC, Universal Coverage.

these endeavors, a national comprehensive health information system was established and adopts indicators for monitoring health-care reform progress based on the proposed reform interventions by development partners. The country's health information system is composed of several subsystems: 1) the Routine Health Statistic Information System, which is annually collecting information and data on health facilities, human resources, and equipment and services provided to outpatients and inpatients; 2) the Disease Surveillance System, which is a Web-based system reporting on more than 30 infectious diseases; 3) the National Household Health Services Survey, which collects information on health status, access to care, satisfaction, demands and utilization, expenditure, and risk behavior such as smoking and alcohol use every 5 years; 4) the Maternal and Child Health Care Surveillance System, which annually collects information on maternal and child health care; and 5) the Health Supervision Information System, which annually collects information on food, public facilities, and schools as well as on environmental change [6].

The Center for Health Statistics and Information was set up under the supervision of the Ministry of Health (MoH) to take the administrative responsibility of collecting data from health facilities and summarizing data from other departments. It includes a branch of statistics, monitoring data collection, and a branch of surveys and evaluation, which ensures information quality and publishes reports.

South Korea

South Korea is one of the countries in the Asia-Pacific region to have attained extensive universal health insurance coverage through the National Health Insurance (NHI) system, with the National Health Insurance Corporation (NHIC) as the major payer for health and the Health Insurance Review and Assessment Service (HIRA) for reviewing claims data. The remaining 3% of the total population, usually those who have no capability to pay for the contribution, is covered by the Medical Assistance Program. The method of reimbursement is mainly through fee-for-service scheme while seven disease areas are paid under the diagnosis related group scheme. The NHIC database represents the total Korean population. HIRA's data include patient's demographic information, medical utilization/transaction information, and insurer's payment coverage as well as patient's out-of-pocket payments. The data also include diagnostic code, procedures code, and pharmacy claim records. In addition to the data available in HIRA, the NHIC database is the only source that stores information on residents' income level as well as information about medical checkups and screening of eligible residents. These two data sets are not shared with HIRA.

The NHI database represents the total Korean population; thus, it is considered a population-based database. There are some limitations, however. The data set captures the utilization data only for services covered by the NHI, and the utilization data for non-reimbursed services are not available in the NHI database. Jeong and colleagues [7] reported in 2008 that about 28% of total health-care expenditure occurred in the nonreimbursed sector, which means that our data set could underestimate the overall utilization pattern. Another issue is the internal validity of diagnosis codes found in the claims database—it does not contain the records of medical conditions because these data sets were created for claims purposes only. According to Park et al. [8], about 70% of primary diagnosis codes concurred with medical records. Furthermore, the consistency of clinical definition has been an issue as well because of subjective diagnosis criteria. Therefore, case definition, followed by validation, should be considered before using the NHI database.

Taiwan

There have been significant advances in public health in Taiwan over the past decades partially due to the establishment and full utilization of an excellent health-care data system for clinical and research purposes. Of the various health-care databases in Taiwan, these data sets (also referred to as "real-world data") provide a valuable source for decision making in the health-care sector.

The ISPOR Real-World Task Force Report [9] identifies the following seven sources of real-world data: supplements to traditional registration randomized controlled trials, large simple trials, registries, administrative data, health surveys, electronic health records, and medical chart reviews. Taiwanese researchers extensively adopt these sources of real-world data.

The NHI claims data set is the most well-known health-care data set in Taiwan. Administrative data are collected by the NHI through the claims for reimbursements. The NHI administrators in regional bureaus collect the insurance claims and send the electronic files to the central bureau to maintain them in a data warehouse.

Among the data available in the claim database are the characteristics and lists for all institutions (e.g., number of beds and specialty services provided) and medical personnel (e.g., board-certified specialists); original claims for inpatient care, ambulatory care, and emergency care; and respective orders for the claims. Commissioned by the Bureau of National Health Insurance, the National Health Research Institute (NHRI) prepares routine sets of a sampled data set annually for fulfilling most research requirements, including a systematic sampling of ambulatory care visits (0.2%, or 1 of 500 visits) and inpatient care (5%, or 1 of 20 episodes); records extracted by specific diseases or subjects (14 "specific subject data sets," including all claims of dental care and all outpatient visits of cancer patients); and all claims data (expenditure data as early as year 1996, detailed order records start from 1997) of sampled individuals from all beneficiaries of the year 2000 (Longitudinal Health Insurance Database 2000) and samples of 2005.

Of the other administrative health-care data sets available, a "labor insurance claim data set" collected by the Bureau of Labor Insurance monitors labor safety and occupational diseases in Taiwan [10]. To control communicable diseases, the Center for Disease Control has established several surveillance systems to actively monitor disease epidemics and/or outbreaks community-wide [11].

The Cancer Registry is often used for epidemiological data in assessing anticancer products. The government mandates that a hospital with a 50-bed capacity or higher should provide detailed information on a newly diagnosed cancer patient (e.g., patient characteristics, diagnosis, and treatments used) to the Cancer Registry team commissioned by the Bureau of Health Promotion (BHP). The submitted data are verified for their accuracy and routinely analyzed.

Many health surveys in Taiwan are annually conducted by governmental officials, academics, or the private sector. Some economy-wide surveys were conducted by Academia Sinica twice (1993–1996 and 1998–2002). The Nutrition and Health Survey in Taiwan has collected data in a questionnaire form on areas such as diet, disease history, and respondents' knowledge of nutrition [12]. Furthermore, data surveys called the National Health Interview Survey were conducted in 2001 and 2005 by the NHRI and the BHP, respectively, to study the general health status, health-care expenditure, and health behavior in a representative sample of 25,000 individuals. A household survey of hypertension, hyperglycemia, and hyperlipidemia [13], which collected data on the respondents' blood pressure, took blood samples, and asked questions regarding familial or disease history, was also conducted by the Department of Health, Taiwan, in 2002.

Japan

The Japanese Ministry of Health, Labour and Welfare (MHLW) is the main institution that conducts several surveys and collects health-care data. There are many other health-care databases in Japan; however, this article focuses only on the health insurance claims database because claims data are one of the most important sources for pharmacoeconomics and outcomes research. Apart from Taiwan and South Korea, Japan is one of the countries in the region with universal coverage of health insurance. The total number of claims is about 1.6 billion per year in Japan. Each participating medical institution and pharmacy issues claims reimbursement every month for each patient. On the side of the insurer, such as municipalities and health insurance societies, these claims are used to make payments to medical institutions and pharmacies. Because of several numbers of insurers, claims coming from different institutions and multiple periods of care are merged for one patient to analyze the whole resource use and cost of one episode of disease management. Japan utilizes a case-mix system called the Diagnosis-Procedure Combination (DPC) to pay the health-care providers. This patient classification system was launched in 2002 by the MHLW, and it was linked with a lump-sum payment system from 2003. The number of participating hospitals is 1391, which includes 82 university hospitals because they are obliged to adopt the DPC system. The number of inpatients represented approximately 50% of all inpatient admissions to acute care hospitals in Japan. A survey of DPC hospitals is conducted between July and December every year by the MHLW.

Not only administrative claims data are found in the DPC databases but also detailed patient data (age and sex; main diagnoses, comorbidities at admission, and complications; procedures; duration of anesthesia; drugs and devices used; volume of blood transfusion; length of stay; in-hospital mortality; and hospital charges) are collected for all inpatient discharges. Japan uses *International Statistical Classification of Diseases*, 10th Revision (*ICD-10*), codes and text data in the Japanese language, and procedures are coded with the Japanese original codes in their records. The physicians in charge are mandated to submit data on diagnoses with reference to medical charts. Hospital staff should record the dates when all procedures and examinations are performed and when drugs and devices are used. The physicians and hospital staff have good compliance with data entry because they are required to submit accurate data to receive reimbursement.

Malaysia

The MoH is the main government agency responsible for the health-care system in Malaysia that collects morbidity and mortality data on a regular basis. All discharges in the inpatient care are supposed to be coded by using *ICD-10* codes while sample of cases are selected from ambulatory care services. The manual method of collecting data was shifted to a digital system called the Electronic Health Management Information System. Almost all 130 public hospitals with more than 33,000 beds, which represent 75% of the total hospital beds in the country, are linked to the MoH headquarters through the Electronic Health Management Information System [14].

At the primary-care level, administrative data are routinely collected from the health centers/rural health units and manually submitted to the state level and subsequently to the central level. With the implementation of the teleprimary care information technology system, 7% of the 808 health centers [15] send their data electronically to the district health offices, state offices, and MoH headquarters in Putrajaya, the administrative city [16].

There are at least five different sources of data from the surveillance system [17] in which four of these are collected by vari-ous departments under the supervision of the MoH. Laboratory-based surveillance is responsible for data on specific diseases such as HIV/AIDS, severe acute respiratory syndrome, and Nipah virus infections.

Mandatory Notification Disease Surveillance under the Prevention and Control of Infectious Disease Act (1988) [18] requires doctors in hospitals and clinics managing 24 types of infections diseases to notify the district health office. Following notifications, the authority will take appropriate actions to control the spread of these diseases. Information on Mandatory Notifications Disease Surveillance is kept in each district health office and sent to the state health office as well as the Disease Control Division of the MoH in the headquarters. Although it is an offence if the practitioners do not notify these diseases, the laws related to this practice are rarely enforced. Reasons for non-notifications by practitioners include unconfirmed diagnosis, cases being referred to hospitals or other facilities, unclear notification procedures, and patients' refusal to be notified for fear of social stigma [19]. Clinic-based surveillance includes sentinel surveillance and national syndromic surveillance, which are being carried out in the specific clinics, wards, and even facilities. Community-based surveillance is done in response to major outbreak of infectious diseases. Community members may report to health personnel on suspicious cases of certain diseases. A source of surveillance outside the MoH is the Department of Veterinary, which can provide data on diseases that are zoonotic in origin (Nipah virus, Japanese B encephalitis, and H1N1 swine flu).

Another source of data comes from foreign workers' medical examination. The government commissioned the Foreign Workers Medical Examination Agency to conduct health screening of foreign workers. This agency reports to the MoH and is a good source of information on certain communicable diseases such as tuberculosis, sexually transmitted diseases, and hepatitis B.

Data from disease registries are maintained and developed by the MoH and professional bodies. Clinical Research Centre of the MoH listed 25 disease registries [20]. Data collection from surveys is done every 10 years under the supervision and responsibility of the National Public Health Institute of the MoH. The most important survey in Malaysia is the National Health and Morbidity Surveys. The latest survey is the Third National Health and Morbidity Survey, which was undertaken in 2006 [21]. The surveys utilized a multistage sampling technique covering more than 15,000 respondents. Data from the surveys include illness load, risk factors, health expenditure, and health utilization. National estimates of the incidence and prevalence of acute illnesses such as acute respiratory diseases and acute diarrheal disease; chronic illnesses such as diabetes mellitus, hypertension, chronic pain, asthma, and psychiatric morbidity; and injuries are covered in the survey. Prevalence risk factors of major illnesses, for example, hypercholesterolemia, obesity, and those related to smoking, alcohol consumption, and lack of physical activities, are available in the survey.

Although the process of collecting the data is established, issues of documentation, quality, accuracy, and sources of administrative data are compromised. Most of the data come from the services provided by the hospitals and clinics in the public sector. Less than 40% of private hospitals participate in sending data to the MoH. The accuracy of the data is also one of the concerns in the country. Coding of diagnosis is done by health-care workers with little or without formal training in *ICD* coding. In the country, only about 60% of deaths are medically certified because of lack of professional certification on causes of deaths. Thus, uncertified deaths are not accurately documented in the death certificates, which go into the database submitted to the MoH. Documentation of diagnosis both in hospitals and in health centers is limited to single primary diagnosis. Information on surgical and medical procedures is never collected. The lack of documentation or in-

complete collection of data deprives the researchers and decision makers of the information regarding the complexity and severity of cases managed. Furthermore, this may limit the use of information for planning, budgeting, and quality-monitoring purposes. Most of the data submitted to the central headquarters are in aggregated form. Patient-level data are not routinely collected both at the state level and at the central level. Thus, this limits the data for research and policy development.

Data Sharing

Thailand

Surveillance data on serious and emerging communicable diseases are shared and reported from private and other public hospitals to the MoPH and related institutions such as local governments for controlling and preventing these diseases.

Sharing of administrative databases remains limited because of the fragmented health-care system in terms of financing and health-care service provision. Only the three main funders for health share their beneficiary databases for administrative purpose because of the portability of members between schemes during a year. Recent development, however, had resulted in cooperation between the MoPH and payers in data sharing. To access the administrative databases of each health insurance scheme, a request is made and approval is granted on a case-by-case basis of each scheme. The issue on difference in data component and structure makes it difficult to pool the data.

Data surveys such as household income-expenditure surveys and health and welfare surveys conducted by the National Statistic Office are more accessible for researchers. Some databases on other conducted surveys, however, are difficult to access.

China mainland

Through the establishment of and improvement in the national health information system, wider information covering all aspects of the national health system both for policy makers and for researchers from national and international communities is available and accessible. There is public access to summary data, however, only in the Chinese version of health fact sheets in series through the Web site of the MoH. Original databases of health facilities, professionals, equipment, and admissions and discharges are maintained by the MoH. Moreover, public access is through the Web site of the National Bureau of Statistics China, which provides annual tabulations for 13 indicators in health, as well as ones in other sectors [22].

Statistical reports are published officially based on the data from system databases, among which the Chinese Health Statistical Digest provides abundant information through many indicators and tables with trend data. The electronic version could be found on the Chinese MoH Web site [23]. Other reports, including China Health Statistical Yearbook, summary reports on disease risks by the Chinese Centre for Disease Control and Prevention, and international works such as the annual MDG report and UNGASS HIV/AIDS 2008 report, also provide useful knowledge for the public.

Data from the information system is accessible to facilitate academic research nationally and internationally. Recent series in international journals had provided extensive syntheses of the available information [24]. Articles related to the health situation and reforms, especially in the field of financial risks of households, were also published for reference [25].

South Korea

NHI claims database has been employed in producing publicly available information, such as the annual National Health Statistics Report [26]. It provides aggregated statistics, such as demographic information, the number of clinics by specialty, and the number of health-care professionals in each province. The number of visits, as well as the total number of claims, is also provided for categories paid under diagnosis related group. Information on the total number of visits and the amount paid in Korean currency is also provided on the basis of disease categories and age groups (similar to ICD, called 298 classification). Some information in the report has English subtitles, yet disease categories are written only in Korean.

Administrative data are immensely useful for economic evaluation analysis; however, access to raw data by researchers is more complicated. The issue of privacy protection has been a regular topic on the annual Congressional Audit on HIRA and NHIC, and all attention has been focused on data sharing and privacy protection by Congressmen and nongovernment organizations. Thus, privacy protection awareness has been more sensitive than ever.

Taiwan

Taiwan has a well-established process for data sharing. Within the Department of Health, the Office of Statistics has initiated the Health Information Project system to gather all health-care data (including NHI claims) collected by government and link these data by national ID. This project has already established a collaboration center to facilitate data management and provide related services. This service is open to the public [27]. Also, in response to academia requests, the Bureau of National Health Insurance is collaborating with the NHRI in providing sets of sampled claims data set for research use. Since 1990, the NHRI has prepared and maintained the sampled claimed data sets (National Health Insurance Research Database [28]), subsequently releasing them annually.

The NHI encrypts the data on individual patients and care providers (institutions and physicians) before the claims data are sent to the NHRI. The NHRI performs the secondary encrypting before the data set is sent to the applicants. The administrative data sets are provided to local researchers. Similar data sets are also accessible by private sectors, but identification fields are removed by the NHRI. Many journal articles cite the National Health Insurance Research Database as the main data source [29]. Also, the National Health Insurance Research Database has played a pivotal role in health-care research in Taiwan. Routine statistical information of administrative data can be accessed freely through its Web site. However, data sets are generally inaccessible for academic research or public use because its original intention is established for governmental use only.

Health policy decision makers and academics can access the registries data files through certain application processes in the BHP. The annual BHP report provides accessible data on the number of patients, incidences, and the distributions of histological types through BHP's Web site or in printed form [30]. The other health-care registry databases that public health officials or academics use frequently include the National Register of Deaths and Multiple Causes of Death Database, Birth Certificate Database, Rare Disease Registry, and Dialysis Patient Registry. These data sets are generally inaccessible to the general public.

Japan

Aggregated data are published on the Web site and in printed reports. Researchers can request more detailed data, but it is not always allowed. Researchers can also access some available commercial databases of claims, primarily for pharmaceutical companies, but most of these are small scale and are generally expensive.

Malaysia

In general, procedures on data sharing between the MoH and researchers outside the agency are unclear and complicated. Researchers have the chance to know and access the availability of such data through their personal contacts. The MoH is committed to publicize the kind of data available and accessible to public. Normally to obtain specific data, a request should be made to specific units in the MoH. In case the request is made through a research project, a proposal has to be prepared and cleared by the MoH Research and Ethics Committee. Also, it is a common practice that researchers are required to sign an agreement with the MoH to seek approval from it prior to publication of the data. This control on the freedom of publication is a major deterrent for researchers to use data from the MoH.

Use of Health-Care Data

Thailand

Reports on the routine data of the MoPH are mainly used for administration and monitoring of performance of its own facilities. Surveillance data are used for monitoring, controlling, and prevention of particular diseases or conditions. In addition, these data are used for the development of health policy and planning by the ministry.

Health-care utilization databases of each health insurance scheme are solely used for financial management such as calculating and allocating the budget and paying the providers. Use of these databases for monitoring the performance of the systems remains limited [31] and is in the process of development.

Survey data have been widely used along with routine reports at the time when administrative databases on utilization were not available for calculating the capitation of the Universal Coverage scheme [32–34] and assessment of the impact of providing universal coverage in Thailand [35,36].

China mainland

Enormous data from the databases provided effective communication information and data to all stakeholders to support evidence-based decision making. Furthermore, these data are useful for systemic monitoring and evaluation of the progress, performance, and outcomes of reforms.

South Korea

HIRA's NHI claims database was initially produced for the purpose of NHI reimbursement decision, and because of the development of information technology, most of the claims are submitted electronically. Because the NHI database covers almost all the population of the country, it is a valuable source of information for estimating the burden of disease on a national level. However, the internal validity of the claims database has been questioned, because of inaccurate or incomplete coding.

HIRA's database has been used in two burden of disease studies, namely, on osteoporosis [37] and gastric ulcer [38]. Identification of the target population was based not only on the diagnosis code but also on the disease-specific interventions received by the patients.

Taiwan

Health-care data sets coming from various agencies in Taiwan provide a valuable source for decision making in the health sector. Furthermore, these health-care data sets are being used in health-care research as well as in health technology assessment, which aims to support evidence-based decision making. These health-

care data or real-world data provide valuable information on current knowledge of the disease or the product/comparator usage.

Japan

The primary objective of surveys done by the Japanese MHLW is for use in policy decision making. The MHLW has conceptualized the implementation of the National Claims Database, which is tasked to evaluate the government's Medical Care Expenditure Regulation Plan starting from 2008. The Medical Care Expenditure Regulation Plan has two main targets: the prevention of lifestyle diseases and the shortening of the hospital length of stay. Furthermore, the data gathered from the DPC hospitals during the surveys conducted by the MHLW are mainly used for profiling of practice patterns, refinement of case-mix classifications, and health policy planning such as resource allocation.

Malaysia

Evidence-based policy making has been promoted by many international agencies to enhance relevance in health policy formulation. This remains, however, a rhetoric in many developing countries including Malaysia. Use of data for policy decision is quite rare in Malaysia although it has a disease registry, which can be a good source of data to support research and policy making. Policymakers in the country were usually influenced by other means in developing policies in health care. Lack of data sharing even among various government ministries and between different units in the MoH itself limits the use of data for effective policy decision. Capacity to conduct deeper analysis on available data is lacking in the MoH. Most trained researchers with technical capacity are located in universities. The link between universities and the MoH in carrying out joint research projects using readily available data is very weak.

Conclusions

In this article we described the manner of collecting, sharing, and utilizing of health-care data in Thailand, China Mainland, South Korea, Taiwan, Japan, and Malaysia.

A wide range of health-care data sets are routinely collected, and these are supplemented by national surveys in which the frequency of surveys depend on the economy's perspective. Health-care providers, specifically from the public sector, and payers for health services are the main source of data. The MoH and health insurance agencies play a major role in data collection and management. The data collected both from the ministry and from health insurance agencies have several limitations. Administrative data mainly cover health services provided by clinics owned and managed by the public sector. Another concern is the accuracy in the coding of diseases and procedures, which is often done by health staff with little or no training in coding. Difficulty in collecting and merging is also an issue due to the fragmented health-care system in terms of financing and heath-care provisions. Data coming from health insurance agencies include only the services covered by the payer, and nonreimbursed services are not found in the health insurance database.

Data sharing is a major issue for all the economies included in this article. Although data are accessible, these are in the aggregated format, which makes it difficult and time consuming for the researchers. Privacy protection is also one of the regular issues on the sharing of data. Health policy makers, researchers, and academics can access the data files only through certain application processes, which are sometimes unclear and complicated. Publication of data coming from the government agencies also needs to be approved by the MoH prior to publication.

In general, health-care data sets are tools utilized by decision makers in policy formulation and reforms. Also evidence-based

decisions can be carried out if these data sets are accurate and available at all times to the researchers. Various data sets contributed in health technology assessments.

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