Studying the Health Care Systems in Seven East Asian Countries by the Cluster Analysis

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Since Esping-Andersen (1990) presented the "three worlds of welfare capitalism" thesis based on his study of the OECD countries, there have been debates on whether East Asian countries form a separate world of welfare capitalism or not. The objective of this article is to demonstrate how the study of the health care systems in six East Asian countries (Hong Kong, Singapore, South Korea, Taiwan, Malaysia, and Thailand) plus Japan contributes to the debate on the existence of a distinct welfare regime in East Asia. This objective is met by mainly using the evidence provided by health care typologies to test two hypotheses: 1) There are significant similarities between some of the health care systems in eleven OECD countries and those in Hong Kong, Taiwan, Thailand, South Korea, Malaysia, and Singapore, and 2) there are significant differences in the health care systems between Hong Kong, Taiwan, Thailand, South Korea, Malaysia, and Singapore.

Keywords: *Cluster Analysis, Health Care Systems, East Asia*

Introduction

Since Esping-Andersen (1990) presented the "three worlds of welfare typology" thesis based on an examination of eighteen OECD members,[1] the study of welfare modelling has been dominated by extensive debate on his work (Bambra 2005*a*, 2005*b*; Powell and Barrientos 2011). There are two main criticisms of Esping-Andersen's thesis. Firstly, Esping-Andersen's attempt to develop the principle of classification pays insufficient attention to health care services (Bambra 2005*a*; Jensen 2008). Secondly, East Asian welfare countries are not sufficiently represented in the eighteen OECD members studied by Esping-Andersen in his 1990 book (Walker and Wong 2004; Ku and Jones Finer 2007; Yu 2012). In fact, of these eighteen OECD countries, only Japan is located in East Asia. In response to these two criticisms, this article intends to demonstrate that the study of health care systems in six East Asian countries (Hong Kong, Singapore, South Korea, Taiwan, Malaysia, and Thailand) contributes to whether the two essential conditions (internal homogeneity and external heterogeneity) exist for developing a distinct welfare regime in East Asia.

This article is organised into four parts. The first part discusses different views on the existence of the two essential conditions for developing a distinct welfare regime in East Asia. Two hypotheses will be drawn from the discussion of these views as follows:

Hypothesis I: There are significant similarities between some of the health care systems in eleven OECD countries and those in Hong Kong, Taiwan, Thailand, South Korea, Malaysia, and Singapore.[2]

Hypothesis II: There are significant differences in the health care systems between Hong Kong, Taiwan, Thailand, South Korea, Malaysia, and Singapore.

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[1] The eighteen OECD countries studied by Esping-Andersen (1990) are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the UK, and the United States, which makes Japan the only East Asian country in the eighteen OECD members studied by Esping-Andersen.

[2] Because of a lack of sufficient comparative data, the health care typologies developed for the current article do not cover Belgium, Canada, Denmark, Ireland, New Zealand, Sweden, and Switzerland.

The second part discusses the institutional features of the health care systems in six East Asian countries plus Japan. The discussion of these features provides the background information for selection of variables for building health care typologies. The third part is concerned with the methods for developing health care typologies. The fourth part demonstrates how the evidence provided by these health care typologies can be used to test the two hypotheses.

Before going into the details of these analytical tasks, it is worth discussing the reasons for focusing on health care and the six East Asian countries (Hong Kong, South Korea, Singapore, Taiwan, Malaysia, and Thailand). Analysts stress that health care is one of the largest areas of social welfare (Bambra 2005*a*)—for example, health care expenditure accounted for more than 10% of GDP in the EU member states in 2009 (WHO 2011*a*). Moreover, to find out whether East Asian countries can develop a unique welfare model, some analysts focus on studying their health care systems (Karim et al. 2010; Yu 2012). Social welfare is composed of a number of elements such as housing, education, and pension schemes. Hence, the way a government organises health care may not necessarily be the same as its way of organising other elements of social welfare. In view of the fact that health care is an important part of social welfare, however, it is reasonable to avoid taking the existence of an all-encompassing East Asian welfare regime for granted if there are important differences in the ways East Asian countries organise health care.

In discussing the existence of the East Asian welfare model, a number of analysts have studied these six East Asian countries (Holliday and Wilding 2003; Croissant 2004; Gough 2004; Chau and Yu 2013). Their works provide important groundwork for the examination of the health care systems in these countries. Certainly, the six countries do not represent all East Asian countries. Hence, even if these six countries can form a distinct welfare regime, it does not necessarily mean that there exists an all-encompassing welfare regime in East Asia. But it is reasonable to challenge the existence of an all-encompassing East Asian welfare regime if these six countries are too diverse to form a unique model in the area of health care.

Different Views on East Asian Welfare Regimes

In response to Esping-Andersen's "three worlds of welfare capitalism" thesis, there has been a growing interest in examining whether the welfare

arrangements in East Asian countries can be classified as the "fourth world of welfare capitalism" (Jones 1993; Kim 2008; Karim et al. 2010; Yu 2012). In order to classify welfare regimes into different groups, it is necessary to determine internal homogeneity and external heterogeneity of each group (Franzoni 2008; Yu 2012), that is, members of the same group share important similarities in organising welfare, and members of different groups share important differences in organising welfare. In view of these two essential conditions for developing a distinct welfare regime, studies on whether East Asian countries form the "fourth world of welfare capitalism" should focus on two issues: 1) whether there are significant differences in the welfare arrangements between the eighteen OECD countries studied by Esping-Andersen (1990) and the East Asian countries, and 2) whether there are important similarities in welfare arrangements between these East Asian countries. However, there is a lack of consensus on these two issues (Chau and Yu 2013).

Some analysts (such as Jones 1993; Gough 2004; Aspalter 2006) support the existence of a distinct East Asian welfare regime. In response to the question of whether East Asian countries can be categorised into one of Esping-Andersen's "three worlds of welfare capitalism," Jones' argument is that they do not fit into these three worlds. Wilding (2000) draws attention to the common features of the welfare arrangements in East Asia—low public spending on welfare, stress on productivist social policy, general dislike of the term "welfare state," emphasis on welfare residualism, stress on the role of the family in providing welfare, and limited commitment to social citizenship. Gough (2004) argues that countries such as Malaysia, South Korea, and Thailand can be termed as productivist welfare regimes because they meet four of the criteria: stress on social policy as an instrument for giving legitimacy to the regime, focus of the state on the regulatory role rather than the role of provider, subordination of social policy to economic policy, and emphasis on social investment.

However, some investigators (for example, Kwon 1998; Croissant 2004; Kim 2008) argue that the two essential conditions of internal homogeneity and external heterogeneity for developing a distinct East Asian welfare regime do not exist. Kwon (1998) stresses that the welfare arrangements in East Asia are diverse and the similarities not sufficient to support an all-encompassing East Asian welfare model. Croissant (2004) argues that not all countries in East Asia share the same cultural background. Some investigators point out that even those East Asian countries (Hong Kong, Singapore, South Korea, and Taiwan) with the same cultural heritage do not

share the same way of organising welfare. For example, Kwon (2005) and Kim (2008) point out that South Korea and Taiwan are moving toward the inclusive type of developmental state while Singapore and Hong Kong maintain the main characteristics of their selective welfare states. Some analysts (for example, Walker and Wong 2004; Yu and Chau 2011) stress that the welfare arrangements in East Asia are far from unique. Instead, they have important similarities in common with welfare arrangements in European countries and members of the Anglo-Saxon world.

This article returns to an examination of the essential conditions for developing a distinct East Asian welfare regime after discussing the institutional characteristics of the health care systems in East Asian countries and the methods for developing health care typologies.

Health Care Systems in East Asian Countries

A number of analysts have discussed the health care systems in Hong Kong, Taiwan, Singapore, Malaysia, South Korea, Thailand, and Japan (Jeong and Hurst 2001; Ramesh and Holliday 2001; Savedoff 2004; Walker and Wong 2005; Dong 2006; Hughes and Leethongdee 2007; Tangcharoensathien et al. 2007; Wagstaff 2007; Barr 2008; Damrongplasit and Melnick 2009; Hakoyama 2010; Han 2010; Lee et al. 2010; Lu and Chiang 2011; Yu 2012). There are three main reasons for discussing their views on the health care systems in East Asia. Firstly, as discussed below, these analysts have shown that there are important differences between the seven East Asian countries in the way health care is financed and in the role played by the public sector in provisioning hospital beds. Their views justify the attempt made by the author to use variables concerned with these two aspects of health care systems for developing health care typologies. As discussed in other sections, evidence generated from the health care typologies built on these variables provides important insights into the condition of "internal homogeneity" for developing a distinct East Asian health care regime.

Secondly, as shown below, past studies reveal that some of the health care systems in East Asian countries are indebted to the experiences of Western countries such as the UK and Germany in financing and organising health care. This discovery justifies the attempt to develop typologies covering both East Asian countries and Western countries that, as shown in other sections, provides insights into the existence of the condition of "external heterogeneity" for developing a distinct East Asian health care

regime.

Thirdly, this discussion serves to draw our attention to the fact that different East Asian countries have made important health care reforms in different periods. As shown below, some countries such as South Korea and Taiwan developed their health care systems before the middle of 1990s, whereas some East Asian countries such as Thailand have attempted to make significant reforms on health care systems early on in the first decade of the new millennium. A discussion of the health care systems in these countries justifies the attempt to develop two typologies based on data from different years (1998 and 2009). As shown in other sections, this attempt contributes to identifying the dynamic dimensions of the health care typologies rather than taking for granted that they remain unchanged for a long period of time. A brief analysis of each of the countries considered is given below.

Japan

Japan is the first Asian country to have set up a comprehensive social insurance programme for financing health care based on the experiences of Germany (Jeong and Hurst 2001; Walker and Wong 2005; Wagstaff 2007; Hakoyama 2010). All companies employing five or more workers are legally required to contribute to a health insurance plan for their employees called the Employee's Health Insurance (EHI). Employees' contributions to the EHI are calculated in proportion to their monthly wages, with the employees paying up to one-half of the total contribution and the employers paying the rest (Jeong and Hurst 2001). Those not covered by their employers join the National Health Insurance (NHI) programme administered by the municipal governments and NHI associations. The monthly payment for the NHI plan depends on the residents' income. Because the NHI is managed by local governments and each government adopts its own system for calculating the cost, the premium varies widely depending on the place of residence. Like Germany, the public sector is not very keen on providing public hospital services, and hence, the majority of hospitals are privately owned (Hakoyama 2010). In 2009, it provided less than one-third of the total hospital beds (OECD 2011).

South Korea

Both South Korea and Taiwan have developed their health care systems with reference to the Bismarck model (Walker and Wong 2005). In South

Korea, a compulsory health insurance scheme was introduced in 1977. By 1990, about 94% of South Koreans were enrolled in a health insurance plan. Both employers and employees are required to contribute to the health insurance scheme, and the employers are responsible for paying 50% of the contribution of their employees (Han 2010). The Korean government heavily subsidizes those who are self-employed to contribute to the health insurance scheme (Wagstaff 2007). In 2007, 96% of South Korea's population was covered by the national health insurance programme, and the remaining 4% was covered by medical aid (Jeong 2011). The majority of health care facilities is owned and managed by the private sector (Han 2010). The public sector is not very keen to provide hospital beds. In 2009, less than 20% of the total hospital beds were provided by the public sector (WHO 2011a).

Taiwan

The National Health Insurance (NHI) programme in Taiwan was implemented in 1995 (Walker and Wong 2005; Lu and Chiang 2011). This programme covers more than 98% of the total population (Lee et al. 2010). The premium was shared by the insured, insuring agencies, and government subsidies at 38%, 37%, and 25%, respectively, in 2007 (BNHI 2007, p. 9). To embody the ideas of NHI social relief, the Taiwanese government plays an important role in providing financial subsidy which includes 10% of the NHI insurance premium for waged workers, 40% for self-employed workers and community workers, 70% for farmers and fishermen, and 100% for military servicemen, retired soldiers, and low-income families (Wang 2010). The NHI incorporates a co-payment of US$2 for each outpatient visit to clinics, US$5 for each visit to outpatient clinics, and 10% of co-insurance for inpatient services, but caps the total amount that a patient is required to pay for each admission at 6% and at 10% of the average national income per person per year (Lu and Chiang 2011). Like South Korea, Taiwan does not rely very much on the public sector to provide hospital beds (Yu 2012). In 2009, the public sector provided only one-third of the hospital beds (Department of Health 2010a).

Hong Kong

Hong Kong is a former British colony. Unlike its counterparts in South Korea and Taiwan, the Hong Kong government is not keen to develop social health insurance schemes. Instead, it provides tax-funded health care in

hospitals with reference to the health care systems in the UK. As discussed by analysts (for example, Dixon and Mossialos 2000; Yu 2012), those countries that attempt to provide the National Health Service (NHS) usually stress universal coverage. Hence, as in the UK, Hong Kong tries hard to enable all citizens to access hospital services. It does so by relying on the public sector in providing highly subsidised hospital services. In 2009 the public sector provided 26,872 hospital beds while the private sector provided 3,818 hospital beds (Hong Kong SAR Government 2010). Patients in public hospitals are charged HKD$100 (US$12.80) per night. This charge only meets a fraction of the total cost of service provided. On average, subsidized patients pay less than 5% of the cost for the use of public hospital services (Hong Kong SAR Government 2010).

Singapore

As a former British colony, the health care system in Singapore is to a certain extent indebted to the experience of the UK (Ramesh and Holliday 2001), and its public sector plays an important role in providing hospital beds (Yu 2012). In 2009, more than two-thirds of hospital beds were provided by the public sector. To finance its health care services, Singapore relies mainly on three schemes—Medisave, MediShield, and MediFund. Medisave is a compulsory saving scheme introduced in 1984 with the goal of helping the public save money on hospitalisation expenses. Every working person in Singapore is legally required to set aside 6%-8% of his/her income into a personal Medisave account, which can be used to pay for hospitalisation expenses of the enrolee and his/her immediate family members (Dong 2006). Medisave accounts on average for 40%-50% of the bill in a private hospital, 70%-80% in an unsubsidised ward of a public hospital, and the entire the bill in a subsidised ward of a public hospital (Barr 2008). It is important to note that the majority of the public hospital beds are subsidised by the government (Reisman 2006). Introduced in 1990, MediShield is an insurance scheme for covering catastrophic illnesses. This scheme is designed to help individuals meet the medical expenses for major or prolonged illnesses. While Medisave is mandatory, MediShield is voluntary. By 2005, MediShield reimbursed about 40% of medical bills. Medifund was introduced in 1993 with an initial endowment of SGD$200 million (US$163.2 million) from the government (Dong 2006). Patients who are unable to pay their hospital bills can apply for help from the Hospital MediFund Committees.

Malaysia

Malaysia provides both medical insurance and compulsory savings schemes (Account III within the Employees Provident Fund scheme). The Social Security Organisation (SOCSO) was set up in the late 1960s to provide work-related sickness, employment injury, and invalidity benefits to all employees earning less than RM 2,000 per month (US$317.20). The contribution rate for the Employment Injury scheme is approximately 1.25% of wages and is wholly paid by the employer. For the Invalidity Pension scheme, the rate of contribution is 1.0% of wages, shared equally by the employer and employee. In 1994, Malaysia established a separate savings account (Account III) within the Employees' Provident Fund (EPF) into which 10% of a member's funds are diverted to be used only for treatment of serious illness. Malaysia is a former British colony. It is thus not surprising to see that the country also emphasizes tax-based health care system (Savedoff 2004). Just like its counterparts in Hong Kong and Singapore, the public sector in Malaysia plays an important role in providing hospital beds; in 2009, more than 70% of the hospital beds were provided by the public sector. The public hospitals, especially those located in urban centres, levy different levels of user charges according to the class of ward chosen (Ramesh and Holliday 2001). It is important to note that more than 80% of all hospital beds are in third-class wards, which have negligible fees or no fees at all (Ramesh 2007).

Thailand

In 2002, Thailand attempted to make coverage of the healthcare system as wide as possible by providing a tax-funded health insurance scheme called the UC scheme (Tangcharoensathien et al. 2007). This scheme covers more than 70% of the population. At the beginning of this scheme, an individual was required to pay no more than 30 baht (about US$0.84) per visit for either outpatient or inpatient care, including drugs (Damrongplasit and Melnick 2009). The scheme finances hospital outpatient services based on the number of registered patients. For inpatient services, the diagnostic-related group (DRG) method is adopted (Hirunrassamee and Ratanawijitrasin 2009). Financing for this scheme comes mainly from public revenues, and co-payments cover less than two per cent of the cost (Hughes and Leethongdee 2007). The UC scheme operates in conjunction with two other

major public schemes of health security: the Social Security Scheme (SSS) and the Civil Service Medical Benefits Scheme (CSMBS). The SSS covers private business employees. It is financed by equal contributions from employees, employers, and the government. The CSMBS is a government fringe benefit package that pays for health services used by all current and retired government employees, including state enterprises and their dependents (Ramesh and Wu 2008; Hirunrassamee and Ratanawijitrasin 2009). It is a non-contributory programme funded almost entirely from public revenues. As with Malaysia, the public sector in Thailand plays a dominant role in the provision of hospital services. About 80% of hospital beds were provided by the public sector in 2009 (OECD 2011).

A brief discussion of the health finance and provision of hospital beds of the seven countries suggests that their health care systems are far from homogeneous. Rather, two major groups can be identified. The first group is formed by Hong Kong, Singapore, and Malaysia. This group is marked by the significant role the public sector plays as the provider of hospital services. The second group is formed by Japan, South Korea, and Taiwan. This group meets people's health care needs through health care insurance. Thailand provides an interesting case. It is related to both groups. Thailand shares an important similarity with Hong Kong and Malaysia with respect to the role played by the public sector in the provision of hospital beds, but Thailand is also keen to establish a comprehensive health care insurance. It is also important to note that, as the health care systems in some East Asian countries such as Hong Kong, Singapore, Japan, and Malaysia are indebted to Western countries, we should not take for granted the uniqueness of the health care systems in East Asia.

Methods for Developing Health Care Typologies

This section is concerned with methods for developing health care typologies. To build these typologies, four steps were taken: selecting the variables for developing the health care typologies, selecting the countries covered by the health care typologies, identifying the sources of data, and classifying countries with the aid of the cluster analysis technique.

Selection of Variables

An important function of welfare typologies is to help us see the forest

rather than the myriad unique trees (Esping-Andersen 1997). Hence, one of the important tasks of building health care typologies is to identify the important dimensions of health care systems, which is related to the selection of variables for developing welfare typologies. This selection is based on three criteria. The first criterion is concerned with the input elements of health care systems. Based on the above-mentioned discussion of health care finance and the role of the public sector in the provision of hospital beds, three variables were chosen for building the health care typologies.[3] The first variable is the public health care system coverage. This variable shows the extent of general access provided by the public health care system (Bambra 2005*a*). The second variable is the proportion of public hospital beds to the total number of beds. This variable shows the commitment of the public sector in providing hospital beds. The third variable is private health expenditure as a percentage of the GDP. This variable shows the extent of private financing by identifying the extent of a country's total income that is spent on private health care (Bambra 2005*a*).

The second criterion is concerned with the outcome elements of the health care system. Bambra (2005*a*) argues that the classification of health care systems should focus not only on what types of services they provide but also on what they actually do. Based on this view, Karim et al. (2010) provide two variables to measure what the health care systems have achieved—infant mortality rate and life expectancy. The former refers to the probability of dying between birth and exactly age 1 expressed per 1,000 live births, and the latter refers to the average number of years a newborn infant can expect to live if prevailing patterns of age-specific mortality rates at the time of his/her birth were to stay the same throughout his/her life. These two variables are

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[3] Definitions of the five variables are as follows:
  i. Private health expenditure as a percentage of GDP:
    Private entities spending on managing health funds and purchasing or paying for health goods and services, expressed as a percentage of GDP (WHO 2011*a*).
  ii. Public hospital beds as a percentage of total bed stock:
    Beds in hospitals that are owned or controlled by a government unit or another public corporation, expressed as a percentage of total bed stock (OECD 2011).
  iii. Public health care system coverage as a percentage of the population:
    The share of the population eligible for health care goods and services that are included in total public health expenditure, expressed as a percentage of the population (OECD 2011).
  iv. Infant mortality rate:
    The probability of a child born in a specific year or period dying before reaching the age of one, expressed as a rate per 1,000 live births (WHO 2011*a*).
  v. Life expectancy at birth (years):
    The average number of years that a newborn could expect to live (WHO 2011*a*).

also used to build health care typologies for this article.

The third criterion is concerned with the availability of data. As shown in other sections concerning identifying the sources of the data by note 4, there is sufficient data available for building health care typologies based on these five variables.

Selection of Countries

As mentioned above, Esping-Andersen (1990) developed the thesis of the "three worlds of welfare capitalism" based on the studies of eighteen OECD countries. These countries were classified into three categories: the Liberal (Australia, Canada, Ireland, New Zealand, the UK, and the USA), the Conservative (Austria, Belgium, France, Germany, Italy, Japan, the Netherlands, and Switzerland), and the Social Democratic (Denmark, Finland, Norway, and Sweden). Due to insufficient data covering all eighteen OECD countries studied by Esping-Andersen (1990), the typologies developed for this article do not include the following seven OECD countries: Denmark, Ireland, Canada, Switzerland, Belgium, New Zealand, and Sweden. It is important to note that the rest of the eighteen OECD countries cover those identified by Esping-Andersen (1990) as members of the "three worlds of welfare capitalism." Hence, by comparing the similarities and differences in the health care systems between these eleven countries and six East Asian countries, we can explore whether there are sufficient conditions for the East Asian countries to form a separate world of welfare capitalism in the area of health care. As mentioned in previous sections, the health care systems in the six East Asian countries plus Japan are far from the same. Developing health care typologies covering these countries can thus provide insights into whether the condition of "internal homogeneity" for developing a distinct East Asian health care regime exists or not.

Identifying the Sources of Data

Most of the data used for building the health care typologies come from the data sets provided by WHO (2011*a*, 2011*b*) and OECD (2011). The data for each of the health factor measures are outlined in table 1.[4]

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[4] Sources of Data
   a) Sources of data for building the typology of 2009:
     i) Variable one (private health expenditure as a percentage of GDP)
      - Data for all countries except Hong Kong and Taiwan are from the World Health Statistics

published by WHO (2011*a*).

- Data for Hong Kong are from the Health Statistics published by the Food and Health Bureau (2011) and Hong Kong Statistics published by the Census and Statistics Department (2011).
- Data for Taiwan are from the Statistics on National Health Expenditure published by the Department of Health, Executive Yuan, R.O.C. Taiwan (2010*b*).

ii) Variable two (public hospital beds as a percentage of total bed stock)
- Data for all countries except Hong Kong, South Korea, Singapore, Taiwan, Malaysia, and Thailand are from the OECD Health Data published by OECD (2011).
- Data for Hong Kong are from the Health Indicators database provided by WHO (2011*b*).
- Data for South Korea are from the World Health Statistics published by WHO (2011*a*).
- Data for Singapore and Malaysia are from the World Health Statistics published by WHO (2011*a*).
- Data for Taiwan are from the Health Statistics in Taiwan published by the Department of Health, Executive Yuan, R.O.C. Taiwan (2010*a*).
- Data for Thailand are from the Thailand Health Profile published by the Bureau of Policy and Strategy, Ministry of Public Health (2010).

iii) Variable three (public health care system coverage as a percentage of the population)
- Data for all countries except Hong Kong, Singapore, Malaysia, Thailand, and Taiwan are from the OECD Health Data published by OECD (2011).
- Data for Hong Kong, Singapore, and Malaysia are from the Health Indicators database provided by WHO (2011*b*).
- Data for Thailand are from the Thailand Health Profile published by Bureau of Policy and Strategy, Ministry of Public Health (2010).
- Data for Taiwan are from the Health Statistics in Taiwan published by the Department of Health, Executive Yuan, R.O.C. Taiwan (2010*a*).

iv) Variable four (infant mortality rate)
- Data for all countries except Hong Kong and Taiwan are from the World Health Statistics published by WHO (2011*a*).
- Data for Hong Kong and Taiwan are from the Health Statistics published by the Food and Health Bureau (2011).

v) Variable five (life expectancy at birth (years)—both sexes
- Data for all countries except Hong Kong and Taiwan are from the World Health Statistics published by WHO (2011*a*).
- Data for Hong Kong and Taiwan are from the Health Statistics published by the Food and Health Bureau (2011).

b) Sources of data for building the typology of 1998:
i) Variable one (private health expenditure as a percentage of GDP)
- Data for all countries except Hong Kong and Taiwan are from the World Health Statistics published by WHO (2011*a*).
- Data for Hong Kong are from the Health Statistics published by the Food and Health Bureau (2011) and the Hong Kong Statistics published by the Census and Statistics Department (2011).
- Data for Taiwan are from the Statistics on National Health Expenditure published by the Department of Health, Executive Yuan, R.O.C. Taiwan (2010*b*).

ii) Variable two (public hospital beds as a percentage of total bed stock)
- Data for all countries except Hong Kong, South Korea, Singapore, Taiwan, Malaysia, and Thailand are from the OECD Health Data published by OECD (2011).

TABLE 1
DATA ON FIVE VARIABLES FOR BUILDING TWO TYPOLOGIES

Country	Private health expenditure as a % of GDP		Public hospital beds as a % of total bed stock		Public health care system (% of population)		Infant mortality rate (per 1,000 live births)		Life expectancy at birth (years) - both sexes	
Year	1998	2009	1998	2009	1998	2009	1998	2009	1998	2009
Australia	2.6	2.8	45.1	69.6	100	100	5	4	80	82
Austria	2.2	2.5	70.3	71.5	99	99	5	4	78	80
Finland	1.7	2.3	95.3	96	100	100	4	6	78	80
France	2.2	2.6	64.6	63.4	99.5	99.9	4	6	79	81
Germany	2.3	2.7	49.9	40.7	92.2	89.2	4	6	78	80
Italy	2.3	2.1	76	68.3	100	100	5	6	79	82
Japan	1.6	1.7	28.8	26.5	100	100	3	5	81	83
Netherlands	2.4	1.7	0	0	72	98.8	5	4	78	81
Norway	1.3	1.5	99.7	90.8	100	100	4	6	79	81
UK	1	1.6	96.3	100	100	100	6	5	78	80
USA	7.5	9.2	18.4	25.8	45	26.4	7	7	77	79
Hong Kong SAR	2.2	2.6	91.5	89.2	100	100	3	1.7	81	83
South Korea	2.1	2.9	14.1	14.2	100	100	6	5	76	80
Singapore	1.47	2.6	81.4	72.5	100	100	3	1	78	82
Taiwan	1.99	2.9	38.5	33.6	93.1	98.3	6	4.1	77	79
Malaysia	1.2	2	78.6	76.4	100	100	9	6	72	73
Thailand	1.69	1.1	77.4	79.4	28.4	96.1	7	12	68	70
Mean	2.2	2.6	60.3	59.9	90	94.6	5.6	4.2	77.5	79.8

Source.—Please refer to note 4.

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- Data for Hong Kong are from the Health Indicators database provided by WHO (2011*b*).
- Data for South Korea and Singapore are from the World Health Statistics published by WHO (2011*a*).
- Data for Malaysia are from the World Health Statistics published by WHO (2011*a*).
- Data for Taiwan are from the Health Statistics in Taiwan published by the Department of Health, Executive Yuan, R.O.C. Taiwan (2010*a*).
- Data for Thailand are from the Thailand Health Profile published by the Bureau of Policy and Strategy, Ministry of Public Health (1998).
iii) Variable three (public health care system coverage as a percentage of the population)
- Data for countries except Hong Kong, Singapore, Malaysia, Thailand, and Taiwan are from the OECD Health Data published by OECD (2011).
- Data for Hong Kong, Singapore, and Malaysia are from the Health Indicators database provided by WHO (2011*b*).
- Data for Thailand are from the Thailand Health Profile published by the Bureau of Policy and Strategy, Ministry of Public Health (1998).

Classifying Countries with the Aid of the Cluster Analysis Technique

The Ward cluster analysis technique was used in this study to interpret
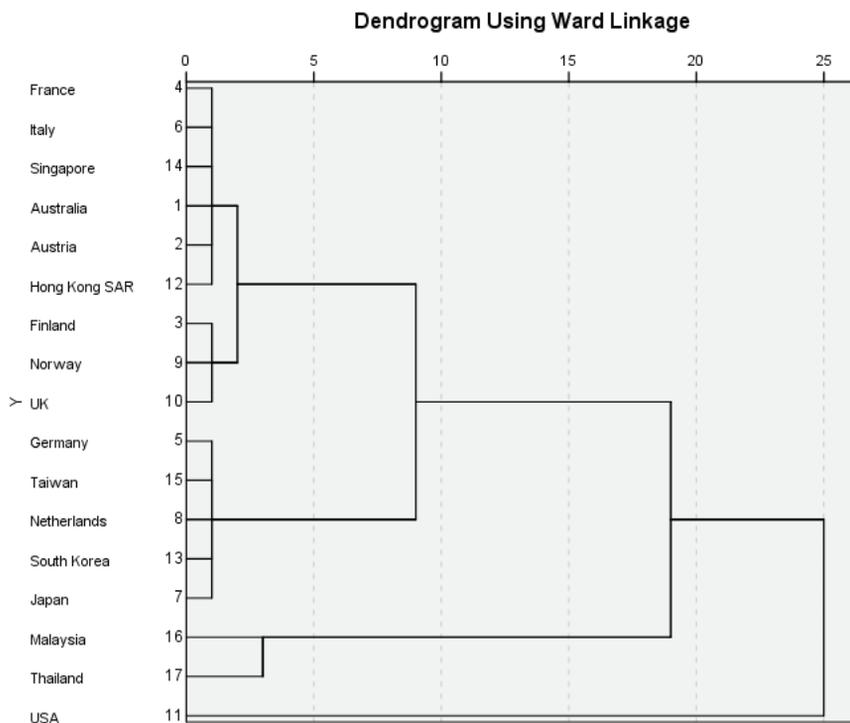
Dendrogram Using Ward Linkage

FIG. 1.—Dendrogram (2009).

- Data for Taiwan are from the Health Statistics in Taiwan published by the Department of Health, Executive Yuan, R.O.C. Taiwan (2010*a*).

iv) Variable four (infant mortality rate): Because of insufficient data for variable four for the year 1998, data from the year 2000 was used.

- Data for all countries except Hong Kong and Taiwan are from the World Health Statistics published by WHO (2011*a*).
- Data for Hong Kong and Taiwan are from the Health Statistics published by the Food and Health Bureau (2011).

v) Variable five (life expectancy at birth in years): Because of insufficient data for variable five for the year 1998, data from the year 2000 was used.

- Data for all countries except Hong Kong and Taiwan are from the World Health Statistics published by WHO (2011*a*).
- Data for Hong Kong and Taiwan are from the Health Statistics published by the Food and Health Bureau (2011).

TABLE 2
FOUR CLUSTERS FORMING THE HEALTH CARE TYPOLOGY OF 2009

Cluster 1	Cluster 2	Cluster 3	Cluster 4
USA	Malaysia	Germany	Australia
	Thailand	Japan	Austria
		Netherlands	Finland
		South Korea	France
		Taiwan	Hong Kong
			Italy
			Norway
			Singapore
			UK

data and classify countries. Cluster analysis has been used by a number of analysts to construct and review welfare typologies (Powell and Barrientos 2004; Bambra 2007; Wendt 2009). Ward's method is a commonly used form of cluster analysis. On the basis of the data collected for building the health care typologies, this method was used to classify the seventeen countries examined in this study into different clusters according to the five variables outlined above. This analysis starts out with each country forming a cluster of its own, and then joining other countries gradually to form clusters of similar countries until, finally, all cases come together within one group. Analysis was carried out using IBM SPSS Statistics Version 20. The result of the work based on the Ward linkage is presented in the dendrogram (figure 1) and the hierarchical cluster (see table 2).

Components of Health Care Typology of 2009

The seventeen countries studied are classified by the Ward linkage cluster analysis into three clusters (see table 2). USA is the only country in cluster one. Its private health expenditure as a percentage of GDP is higher than the rest of the seventeen countries, whereas its public health care system coverage is lower than the rest of the seventeen countries. Moreover, its infant mortality rate is higher than the average of the seventeen countries, whereas its life expectancy score is lower than the average of the seventeen countries. In terms of infant mortality and life expectancy score, performance of the health care system in the USA is the poorest among the ten non-Asian OECD countries. This finding is in line with the points made by other

TABLE 3
K-MEANS CLUSTER (2009)

Two Clusters			Three Clusters			Four Clusters		
K	Country	Distance NOTE	K	Country	Distance NOTE	K	Country	Distance NOTE
1	USA	0	1	Australia	0.6	1	Australia	0.6
2	Australia	0.8		Austria	0.6		Austria	0.6
	Austria	0.4		Finland	1.2		Finland	0.6
	Finland	1.2		France	0.2		France	0.6
	France	0.6		Germany	0.9		Hong Kong	0.9
	Germany	1.0		Hong Kong	0.3		Italy	0.5
	Hong Kong	1.6		Italy	0.5		Norway	0.6
	Italy	0.8		Japan	1.4		Singapore	0.6
	Japan	1.7		Netherlands	2.0		UK	1.1
	Malaysia	2.2		Norway	1.1	2	USA	0
	Netherlands	2.1		Singapore	0.8	3	Malaysia	1.3
	Norway	1.2		South Korea	0.7		Thailand	1.3
	Singapore	1.1		Taiwan	1.1	4	Germany	0.8
	South Korea	1.7	2	UK	1.6		Japan	1.1
	Taiwan	1.0	3	USA	0.0		Netherlands	0.9
	Thailand	4.4		Malaysia	1.3		South Korea	0.7
	UK	1.4		Thailand	0.3		Taiwan	0.7

NOTE. —Figures rounded to 1 decimal place.

analysts such as Karim et al. (2010) and Davis et al. (2007). The second cluster is composed of Germany, Japan, the Netherlands, South Korea, and Taiwan. The proportion of the number of hospital beds provided by the public sector to the total number of hospital beds in the member countries in this cluster is lower than the third and fourth clusters. The third cluster is composed of Malaysia and Thailand. The infant mortality rate of these two countries is higher than the average of the seventeen countries, whereas their life expectancy scores are lower than the average of the seventeen countries. The fourth cluster is composed of nine countries (Australia, Austria, Finland, France, Hong Kong, Italy, Norway, Singapore, and the UK). This cluster is marked by a high proportion of the number of public hospital beds provided by the public sector to the total number of hospital beds. The infant mortality rate of the member countries in this cluster is lower than the average of the seventeen countries, whereas their life expectancy rate is higher than the

TABLE 4
Three Clusters Forming the Health Care Typology of 1998

Cluster 1	Cluster 2	Cluster 3
Thailand	Australia	Austria
USA	Germany	Finland
	Japan	France
	Netherlands	Hong Kong
	South Korea	Italy
		Malaysia
		Norway
		Singapore
		UK

average of the seventeen countries.

In order to conduct a post-hoc analysis, the K-means technique was adopted. The K-means cluster analysis confirms the results of the hierarchical analysis (see table 3). The health care typology produced by the K-means cluster analysis is identical with the clusters produced by the Ward linkage cluster analysis. It shows that nine countries (Australia, Austria, Finland, France, Hong Kong, Italy, Norway, Singapore, and the UK) are clustered together throughout this analysis regardless of the changing numbers of clusters. The USA remains isolated throughout the K-means, even in K = 4. Five countries (Germany, Japan, the Netherlands, South Korea, and Taiwan) moved from cluster 1 to cluster 3 when the number of cluster changed from K = 3 to K = 4. Malaysia and Thailand remain in the same cluster when the number of the cluster changed from K = 3 to K = 4.

Moreover, in order to find out whether the health care typology of 2009 developed for this article can stand the test of time, the same seventeen countries were classified based on the data from 1998. The findings of this health care typology are shown in table 4.

Discussion of the Findings of Health Care Typologies

Earlier in this article, two inter-related hypotheses were outlined: 1) There are significant similarities between some of the health care systems in the eleven OECD countries and those in Hong Kong, Taiwan, Thailand, South Korea, Malaysia, and Singapore, and 2) there are significant differences in the health care systems between Hong Kong, Taiwan, Thailand, South

Korea, Malaysia, and Singapore. If the two hypotheses are confirmed to be valid, it could be argued that the two essential conditions (internal homogeneity and external heterogeneity) for the six East Asian countries to form a distinct welfare regime in the area of health care do not exist.

The evidence provided by the health care typology of 2009 confirms the first hypothesis. South Korea shares the same life expectancy rate with Austria, Finland, Italy, and the UK (see table 1). Singapore shares the same infant mortality rate with Austria, Finland, Germany, and the UK (see table 1). Hong Kong and Singapore share important similarities with Australia, Austria, Finland, France, Italy, Norway, and the UK especially in the role of the public sector in the provision of hospital beds. The similarities between them to a great extent explain why they are members of the same cluster. South Korea and Taiwan share important similarities with Germany, the Netherlands, and Japan in the role of the public sector in the provision of hospital beds. Moreover, these five countries are to be found in the same cluster.

Evidence generated from this health care typology also confirms the second hypothesis. The governments of Taiwan and South Korea are less keen than the other four East Asian countries in providing public hospital beds. The proportion of the number of hospital beds provided by the public sector to the total number of hospital beds in Taiwan and South Korea is lower than the average of the seventeen countries. The proportion of the number of public hospital beds provided by the public sector to the total number of hospital beds in Hong Kong, Singapore, Thailand, and Malaysia is higher than the average of the seventeen countries. The public health care system coverage in Hong Kong, South Korea, Singapore, and Malaysia is 100% while that in Taiwan and Thailand is less than 100%. Public health expenditure as a percentage of GDP in South Korea and Taiwan is higher than the average of the seventeen countries, that in Hong Kong and Singapore is the same as the average of the seventeen countries, and that in Malaysia and Thailand is lower than the average of the seventeen countries. The performance of the health care systems in the six countries also varies in terms of infant mortality rate and life expectancy score. The infant mortality rate of Hong Kong, Singapore, and Taiwan is lower than the average of the seventeen countries, whereas the infant mortality rate of South Korea, Malaysia, and Thailand is higher than the average of the seventeen countries. The life expectancy score of Hong Kong, South Korea, and Singapore is higher than the average of the seventeen countries while the life expectancy score of Taiwan, Malaysia, and Thailand is lower than the average of the

seventeen countries. It is also important to note that the six countries (Hong Kong, Singapore, Thailand, Malaysia, South Korea, and Taiwan) are not concentred in one cluster. Instead, they spread into three different clusters. This means that the health care systems in these six countries are significantly different and, thus, do not form one distinct health care regime.

In light of the statistical evidence provided by the health care typology of 2009, it is safe to argue that the conditions of internal homogeneity and external heterogeneity for the six East Asian countries to form a distinct welfare regime in the area of health care do not exist. This argument is supported by the above-mentioned studies of the institutional characteristics of the health care systems of the six East Asian countries plus Japan (Ramesh and Holliday 2001; Walker and Wong 2005; Yu 2012). As discussed above, these studies draw our attention to two points. Firstly, in developing their health care systems, some governments in East Asia used ideas from other countries (Walker and Wong 2005; Yu 2012). For example, Hong Kong and Singapore have developed their health care systems with reference to the NHS in the UK (Ramesh and Holliday 2001), and the health care systems in South Korea and Taiwan are indebted to the Bismarck welfare model (Walker and Wong 2005). Hence, unsurprisingly, South Korea and Taiwan share the same cluster with Germany, and Hong Kong and Singapore share the same cluster with the UK in health care typology. Like the UK, Malaysia is also keen to provide a lot of public hospital beds. However, because the performance of its health care system in terms of infant mortality rate and life expectancy score is much poorer than the equivalent systems in Hong Kong, Singapore, and the UK, it does not belong to the same cluster as the three countries.

The second point is concerned with the attempts made by East Asian countries to develop different kinds of health care systems. As mentioned in previous sections, both the governments of South Korea and Taiwan rely on health insurance systems to finance people to use private hospital services, whereas the government of Hong Kong is not very keen to develop social insurance schemes to finance health care services. Hence, it is not surprising to see that Hong Kong, South Korea, and Taiwan do not belong to the same cluster.

As mentioned above, the author of this article has attempted to provide supplementary information for the analysis of the existence of essential conditions for developing a distinct East Asian health care regime and to identify the dynamic dimension of the health care typology. For these purposes, a health care typology was developed based on the data from 1998

(see table 4). This typology is composed of three clusters. The first cluster is made up of Thailand and the USA. The second cluster is composed of Australia, Germany, Japan, the Netherlands, South Korea, and Taiwan. The third cluster is made up of nine countries: Austria, Finland, France, Hong Kong, Italy, Malaysia, Norway, Singapore, and the UK.

As with the health care typology built on the data from 2009, empirical evidence provided by the health care typology based on the data from 1998 does not support the existence of the conditions of internal homogeneity and external heterogeneity for the six East Asian countries to form a distinct health care regime. Firstly, there are significant differences between the six East Asian countries. This observation is supported by the fact that these six countries are not concentrated in one cluster. Secondly, there are important similarities between the six East Asian countries and some of the non-Asian OECD countries. This observation is justified by the fact that each of the three clusters is composed of both East Asian countries and non-Asian OECD countries. In light of this, it is safe to argue that, for a long time now, the conditions required to say that the six East Asian countries form an all-encompassing health care model have not been met.

It is also important to note that there are significant differences between the health care typology built on the data from 2009 and the one built mainly on the data from 1998. The case of Thailand is particularly worth highlighting because the discussion of this case provides insights into the dynamic development of the East Asian welfare regimes. As mentioned in a previous part of this article, Thailand introduced the tax-funded health insurance scheme in 2002. The changes brought about by this scheme are reflected in the statistics. The coverage of the public health care system increased from 28.4% in 1998 to 96.1% in 2009 (see table 1). In view of these statistics, it is not surprising that Thailand has moved from one health care group to another. In the health care typology of 1998, Thailand formed a cluster with the USA. The average coverage of the public health care system of these two countries in 1998 was 36.7%, whereas in the health care typology of 2009, Thailand formed a cluster with Malaysia. As discussed above, the public sector in this cluster plays a much more important part in the provision of health care. The case of Thailand provides support for the view that welfare typologies may not remain intact over time (Kasza 2002; Bambra 2005*a*). Hence, we should not rule out the theoretical possibility of the existence of the conditions of internal homogeneity and external heterogeneity if some of the seventeen countries attempt to make significant reforms on the health care system in the future.

Conclusion

Current article has shown that the study of the health care systems in East Asian countries contributes to whether the essential conditions for developing a distinct welfare regime in East Asian exist or not. Based on the evidence provided by the health care typology of 2009, it has tested two hypotheses: 1) There are significant similarities between some of the health care systems in the eleven OECD countries and those in Hong Kong, Taiwan, Thailand, South Korea, Malaysia, and Singapore, and 2) there are significant differences in the health care systems between Hong Kong, Taiwan, Thailand, South Korea, Malaysia, and Singapore. The implementation of these analytical tasks shows that there is a lack of essential conditions (internal homogeneity and external heterogeneity) for the six East Asian countries to form a distinct welfare regime in the area of health care. Due to the fact that health care is an important element of social welfare, it is important to avoid taking the existence of a distinct welfare regime in East Asia for granted.

As the final part of this article, the author would like to suggest the following agenda for future research. Firstly, as mentioned in previous sections, social welfare is composed of a number of elements such as education, housing, and pension schemes. It is worth developing welfare typologies that cover East Asian countries. By doing so, more evidence can be provided to inform the debates on the existence of the essential conditions for developing a distinct welfare regime in East Asia.

Secondly, as shown by the ecological framework on health (Bingham et al. 2009), how health is organised is shaped by a number of factors—for example, the individual factor, the interpersonal factor, the community factor, and the national factor. So far, this article has focused on comparing the national health inputs and national health outcomes—public health care system coverage, the proportion of public hospital beds to the total number of beds, private health expenditure as a percentage of the GDP, and infant mortality rate and life expectancy score (see table 1). It is suggested that more comparative studies could be done on other factors such as individual health-seeking behaviours and how these behaviours are influenced by interpersonal relationships. By doing so, more data about the seventeen countries can be generated.

Thirdly, it is worth studying more East Asian countries. By doing so, we may not only be able to gain more data to inform the debate on the existence of an all-encompassing East Asian regime but may also be able to identify

significant sub-groups in East Asia.

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