Effects of Incorporated Psychiatric Institutions' Internal and External Control on Their Local Distributions and Hierarchical Formation: Case of Osaka

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Abstract

Medical institutions in Japan can be classified as either public or private, with both being basically nonprofit organizations. However, most private medical institutions are incorporated and have equity; in this sense, they operate as for-profit organizations. Moreover, their data are not freely disclosed, making their internal controls too difficult to investigate. On the other hand, the Ministry of Health, Labour and Welfare control the public medical and care system either directly or indirectly; for example, the Ministry regularly revises the medical-fee system. However, it is difficult to decide whether this system works well or not because the system of medical institutions is too complex. To investigate a simpler model, this study examined private psychiatric hospitals. This study aimed to examine the local competitiveness of incorporated psychiatric hospitals, in order to reveal whether internal and external control works well or not. In this study, 30 out of 49 private psychiatric hospitals listed on the homepage of Osaka Association of Psychiatric Hospitals were investigated. The selected sample represents "dedicated" psychiatric hospitals, offering only psychiatric beds. "Having a license to charge a psychiatric emergency hospitalization fee" is an indicator of external control, and can be also considered as an indicator of clinical activity in each hospital. Distribution of psychiatric beds as well as of hospitals with the license was examined in each medical area. This study concluded that the uneven distribution of psychiatric beds as well as psychiatric emergency hospitals and the hierarchical formation of the incorporated psychiatric hospitals system can be observed.

Keywords

Incorporated medical institution, Psychiatric hospital, Control, Hierarchy, Distribution, Medical area

(1) Introduction

1. Equity and limitedly disclosed information

The total number of medical hospitals and clinics in Japan is 8,493 and 100,461, respectively, while incorporated medical hospitals and incorporated medical clinics total 5,721 and 39,455, respectively, as of the 1st of

October, 2014[1].

Most incorporated medical institutions in Japan are known to have equity. Typical incorporated medical institutions are called *Iryou-houjin* in Japanese. Kawabuchi reported that in 2014, of the total 49,889 *Iryou-houjins*, the number of incorporated foundations was 391, while the number of incorporated associations was 49,498. Of the 49,498 incorporated associations, 41,476 associations have equity, while the remaining 8,022 do not[2]. That is, 83% (41,476/49,889) of incorporated medical institutions own equity (Figure 1). However, data that would enable similar analysis of incorporated psychiatric institutions, whether hospitals or clinics, are not available; thus, it is not possible to compare equity status among other types of institutions.

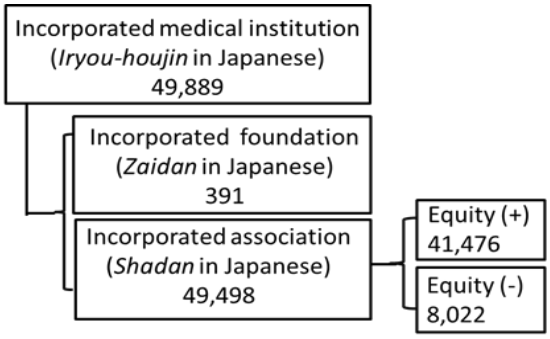

Figure 1. Incorporated medical institutions in Japan

Source: This figure is created by the author based on (Kawabuchi , 2014, p.43)

In this study, incorporated hospitals and incorporated psychiatric hospitals are defined as "hospitals" and "psychiatric hospitals" which belong to incorporated medical institutions, respectively. The data on each incorporated hospital that can be accessed by using registries (*Toukibo* in Japanese) are too limited. The number of the members of the board of directors (*Riji* in Japanese) within an incorporated medical institution is decided by law[3]. There must be three or more members of the board of directors, and at least one auditor (*Kanji* in Japanese). Registries only need to include the chief's (of the board of directors) (*Riji-chou* in Japanese) name but not those of all the members of the board of directors[4]. Registries are not required to state whether the hospital is an association or a foundation. Moreover, when an incorporated hospital is an association, its equity status is not disclosed in the registry. Similar to small and medium-sized enterprises, incorporated hospitals pose the problem of limited data.

2. Public roles of private psychiatric medical institutions

In this study, the term "private" is defined as "non-public" (in a broad sense).

Private psychiatric institutions play important roles in Japan. The total number of psychiatric beds in Japan is 338,174, with 267,578 of those operated by incorporated psychiatric hospitals. Therefore, incorporated psychiatric hospitals represent 79% of all psychiatric beds. The total number of psychiatric hospitals was 1,067, with 912 of them incorporated psychiatric hospitals. Therefore, 85% of psychiatric hospitals are incorporated psychiatric hospitals. These statistical data are accurate as of the 1st of

[1] *Toukei-Hyou* (in Japanese), the Ministry of Health, Labor and Welfare: http://www.mhlw.go.jp/toukei/saikin/hw/iryosd/14/dl/03_toukei.pdf

[2] Kawabuchi, 2014, pp.43-44

[3] *Iryou Hou* in Japanese: http://law.e-gov.go.jp/htmldata/S23/S23HO205.html

[4] *Kumiai-tou Touki Rei* (in Japansese) : http://law.e-gov.go.jp/htmldata/S39/S39SE029.html

October, 2014, according to the Ministry of Health, Labour and Welfare[5].

Whether incorporated or not, hospitals providing psychiatric care in Japan must obey the Act on Mental Health and Welfare for the Mentally Disabled (*Seishin Hoken Fukushi Hou* in Japanese), which was enacted in 1995. Several laws mostly protecting human rights of psychiatric patients enacted after the end of the Second World War. These laws were responses to major violations of the human rights of psychiatric patients. There have been several revisions to this legislation over the years, leading it to evolve into the Act on Mental Health and Welfare for the Mentally Disabled (*Seishin Hoken Fukushi Hou*).

Thus, although psychiatric care is governed by Japan's public departments, most psychiatric-hospital treatment takes place in private hospitals, most of which are incorporated psychiatric hospitals. This presents a paradox.

3. Second medical areas in Japan

In Japan, 344 in 2013; medical administration areas called "second medical areas" [6] have been established to provide general hospital treatment, which is based on the Medical Care Act[7]. In Osaka prefecture, eight second medical areas were established in 2015[8]. Under the act, the number of hospital beds in each area is controlled and reviewed every five years by each prefectural governor. The same is also true for psychiatric hospital bed numbers. The number of beds that each hospital is allowed depends on the total number of beds in the area in which the hospital is located. Each hospital gets its share in competition with the other hospitals in the same area. However, this competition is not completely free, and strong vested interests may exist.

4. The competitive system among incorporated psychiatric hospitals

Medical fees for treatment covered by health insurance are the remit of the Ministry of Health, Labor and Welfare in Japan. Therefore, medical fees (excluding fees for medical treatment not covered by health insurance) are subject to a de facto official price, and in fact can be policy variables. The government is able to run and improve a medical policy by controlling the variables.

Medical treatments and technologies performed in general hospitals are generally more complex than those in psychiatric hospitals. Therefore, the medical-fee system of general hospitals is more difficult for nonprofessionals to understand. On the other hand, the medical-fee system in psychiatric hospitals is easier to understand because these hospitals' functions and abilities are simpler at a glance.

Therefore, to investigate the governance of incorporated hospitals, psychiatric hospitals were selected due to the narrower range of medical skills and technologies involved compared with general hospitals[9].

However, medical care in psychiatric

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[5] *Toukei-Hyou* (in Japanese) http://www.mhlw.go.jp/toukei/saikin/hw/iryosd/14/dl/03_toukei.pdf

[6] *Iseikyoku* (in Japanese), the Ministry of Health, Labor and Welfare: http://www.mlit.go.jp/common/001086652.pdf

[7] *Iryou Hou* (in Japanese): http://law.e-gov.go.jp/htmldata/S23/S23HO205.html

[8] Osaka Prefectural Government: http://www.pref.osaka.lg.jp/attach/2502/00118050/02_16_02_fuikiban_02_syou_03_setsu.pdf

[9] Takaya, 2016, p.41

hospitals has been differentiated and graded these days. For example, the system of needing a license to charge a psychiatric emergency hospitalization fee was established in the 2002 revision of medical fees[10].

Hospital systems (including the certification system of specialists) have evolved under the control of the Ministry of Health, Labor and Welfare since the Meiji government, a process that was discussed in terms of general hospitals[11]. Now, national and public hospitals play leading roles in providing clinical treatment, undertaking medical research, and offering specialist training. In contrast, psychiatric hospital systems have historically differed from those of general hospitals. Therefore, the system of competition among incorporated psychiatric hospitals seems different from that among general hospitals. However, investigation of the former could offer insight into the latter.

5. Literature Review of governance of incorporated medical institutions

5.1. Governance model of hospitals

When investigating the governance of incorporated hospitals, there are two theoretical approaches: the governance theory for nonprofit organizations and the governance theory for medical institutions. The former holds that no standard governance model fits all nonprofit organizations [12]. The latter is a theory specifically tailored to medical institutions.

Several previous studies about governance of medical organization were reviewed [13]. Fujioka described Japan's medical-institution governance models as reflecting two influences. One is the "clinical governance" model of the United Kingdom (UK), and the other is the "hospital governance" model of the United States (USA). The former focuses mainly on offering safe and high-quality health care, whereas the latter focuses on a governance style akin to those utilized by for-profit organizations[14]. Additionally, Fujioka referred to the internal control of medical organizations as risk-based by management, and opined that management solely by family groups (relatives) should be abolished in medical institutions[15]. However, governance theories such as that espoused by Fujioka[16] are confusing because they fail to distinguish between public and private hospitals when discussing governance, including internal and external sources of control. For example, Fujioka did not classify hospitals by type (e.g., general, special functioning)[17]. Matsubara, et al. discussed ideal governance styles of incorporated medical institutions in Japan. However, they used the term "public interest" in an ambiguous way without precisely defining it; they insisted on the necessity of governance only in incorporated medical institutions[18]

Most Japanese incorporated medical institutions are managed by family groups (relatives), and information about them is closely held, thus frustrating attempts at data collection. This may make studies of management of incorporated medical institutions too difficult. On the other hand,

[10] On the psychiatric Emergency Care system: http://www.mhlw.go.jp/shingi/2009/03/dl/s0326-8c.pdf
[11] Takaya, 2015, pp.108-120
[12] Hotta, 2012, p.787
[13] Fujioka, 2013, pp.167-197
[14] Fujioka, 2013, pp.151-166
[15] Fujioka, 2013, pp.167-181
[16] Fujioka, 2013, pp.151-198
[17] Fujioka, 2013, pp.167-197
[18] Matsubara, et al. 2004, pp. 4-8.

case studies of non-incorporated medical institutions have examined successful innovations by way of internal control systems implemented in hospitals[19].

The Medical Care Act (*Iryou Hou* in Japanese), which was established in 1948, has been improved several times, including establishment of rules that should be applied to incorporated medical institutions; however, these were later revised for the sake of "public interest" in Japanese medical systems[20]. As a result, even now, information on incorporated medical institutions is not sufficiently disclosed, as mentioned above.

Though the discussion on whether non-profit medical institutions are better has been long-running, no clear conclusion has emerged in a theoretical sense. This is partly because the term "public interest" cannot be defined strictly in theoretical economics[21]. However, in Japan, medical institutions need to be officially non-profit, whether or not they are incorporated. As mentioned above, most medical institutions in Japan are substantially incorporated enterprises. The separation of ownership and management is not realized for many small and medium-sized institutions, which is also true of incorporated psychiatric medical institutions.

5.2. Relationship between governance and activities of private psychiatric hospitals

Takaya investigated the relationship between the separation of ownership and management of the incorporated psychiatric medical institutions in Osaka, Japan, and their institutional activities by examining the possession of three elements: (1) a license to charge a psychiatric emergency hospitalization fee, (2) a specialist psychiatry training facility authorized by the Japanese Society of Psychiatry and Neurology (JSPN), and (3) authorization from the Japan Council for Quality Health Care (JCQHC). The first represents the hospital's clinical competence[22]. The second represents the educational competence of the hospital's specialists. The third represents overall hospital competence[23]. It is not impossible to conclude that the separation of ownership and management in incorporated psychiatric hospitals bears a relation to any of these three activities[24]. The reasons for this can be thought of as follows. First, the separation of ownership and management of incorporated psychiatric medical institutions may be only nominal and, in fact, cannot be performed. Second, hospital activities might be influenced by the inter-relationship of administrative units, which helps establish medical facilities or controls their activities and competence[25].

6. Aim of this study

As mentioned earlier, the activities and competences of incorporated psychiatric hospitals cannot be determined based on the separation of ownership and management. This suggests that other factors may influence competitiveness among incorporated psychiatric hospitals in Japan.

This study investigated private psychiatric hospitals in Osaka prefecture, Japan. In the first phase, the private psychiatric hospitals were surveyed, most of which are incorporated

19 Matsuo, 2009, pp.1-223
20 *Iryou Hou* (in Japanese): http://law.e-gov.go.jp/htmldata/S23/S23HO205.html
21 Takaya, 2015, pp.108-109
22 Takaya, 2016, pp.42-47
23 Takaya, 2016, pp.42
24 Takaya, 2016, pp.46-47
25 Takaya, 2016, pp.40-49

hospitals. In the second phase, a sample of "dedicated" psychiatric hospitals was selected, and their local distribution and hierarchical structures were investigated, using cross-sectional data.

(2) Empirical analysis

In this study, statistical analysis was performed using the software jmp10 (SAS Institute Inc., Cary, NC, USA).

1. Private psychiatric hospitals in Osaka, Japan

Psychiatric hospitals in Japan are generally classified as in Figure 2, according to their types of establishers.

Psychiatric Hospitals
1. National psychiatric hospitals
2. Public psychiatric hospitals
3. Incorporated medical institutions
etc.

Figure 2. Types of psychiatric hospitals in Japan.
Source: This Figure is modified from the original version shown in the website;
http://www.mhlw.go.jp/toukei/saikin/hw/iryosd/14/dl/03_toukei.pdf

The website of the Osaka Association of Psychiatric Hospitals [26] lists 49 private psychiatric hospitals as members (Table 1). In Table 1, the column "Name of hospital (Abbreviation)" shows alphabetical abbreviations of corresponding hospital names in Japanese.

The terms A, B, and C in "governance type" mean, respectively, "the chief of the board of directors (*Riji-chou* in Japanese) and the director of the hospital (Byuoin-chou in Japanese) is the same person," "the chief of the board of directors is thought to be a relative of the director of the hospital," and "the chief of the board of directors is not the same as, nor is a relative of the director of the hospital." "Psychiatric emergency beds" in Table 1 is the numbers of beds for which a psychiatric emergency fee can be charged (approved by a regulatory agency). This approval represents psychiatric hospitals' clinical activity (or competence) [27]. "Approval year" indicates the year when each hospital was licensed to collect the psychiatric emergency fee. "Opening year" is chiefly based on the homepage of each hospital. Cases when "the opening year" cannot be found are denoted by a " * " symbol.

Hospitals whose "Governance type" is classified into "B" were excluded from this study because the separation of ownership and management is unclear even in a nominal sense. Hospitals 16 and 17 are run by the same chief of the board of directors, as are Hospitals 18-20. In Hospitals 16 and 18, the chief of the board of directors holds the director of the hospital. Therefore, Hospitals 17, 19, and 20 were removed from the analysis to reduce complexity.

We usually maintain the phrase "psychiatric hospitals." but psychiatric hospitals are not precisely defined. Some general hospitals have psychiatric beds, and some hospitals, for example Hospital 48 in Table 1, are thought to be "psychiatric hospitals" even though they can be classified as "general hospitals." Therefore, "psychiatric hospitals" are defined in this empirical analysis as hospitals that provide psychiatric beds only. According to this definition, 13 hospitals in Table 1 were ex-

[26] http://www.daiseikyo.or.jp/

[27] Takaya, 2016, pp.42-47

Table 1. Private psychiatric hospitals in Osaka, Japan

Number	Name of hospital (Abbreviation)	Governance type	Opening year	Regular doctor	Psychiatric beds	Recuperation beds	Beds for general patients	Total beds	Psychiatric emergency beds	Approval year
1	Mizuma	A	1959	11	541	0	0	541	0	*
2	Kijima	A	1963	13	492	0	0	492	0	*
3	Yoshimura	A	1976	6	222	0	0	222	0	*
4	Sakane	A	1965	3	150	0	0	150	0	*
5	Tamenaga	A	1965	7	266	0	50	316	0	*
6	Watanabe	A	1965	9	336	100	0	436	0	*
7	Keihan	A	1954	9	306	0	0	306	0	*
8	Shichiyama	A	1599	13	640	0	0	640	48	2011
9	Neyagawa	A	1965	10	267	0	0	267	60	2014
10	Kaizukachuou	A	*	9	406	0	0	406	0	*
11	Orenji	A	1965	3	240	0	0	240	0	*
12	Kumeda	A	1962	9	494	0	0	494	0	*
13	Osakasayama	A	1966	6	279	0	0	279	0	*
14	Kosaka	A	1948	17	537	0	0	537	0	*
15	Kouai	A	1964	10	221	0	0	221	0	*
16	Sawa	A	1953	30	455	0	0	455	114	2005
17	Hokuto	C	*	8	50	0	0	50	50	2008
18	Aobaoka	A	1986	16	357	270	54	681	0	*
19	Aino	C	1965	45	600	144	225	969	0	*
20	Ainohanazono	C	1984	13	606	0	0	606	0	*
21	Esaka	B	1965	8	360	0	0	360	0	*
22	Ibaragi	B	1952	8	350	0	0	350	0	*
23	Kokubu	B	1961	9	201	0	0	201	48	2008
24	Hanna	B	1967	5	213	48	0	261	0	*
25	Kanaokachuou	B	*	10	486	0	0	486	0	*
26	Shinseikai	B	1981	3	148	0	0	148	0	*
27	Kansaisanatoriumu	C	1968	2	192	0	0	192	0	*
28	Kansaikinen	C	1983	4	270	0	46	316	0	*
29	Sakamoto	C	1892	16	546	0	0	546	0	*
30	Hanwaizumi	C	1965	11	354	90	0	444	0	*
31	Mikunigaoka	C	1960	5	144	0	0	144	0	*
32	Hannan	C	1956	46	690	0	0	690	168	2007
33	Kokoroa	C	*	11	450	0	0	450	0	*
34	Izumichuou	C	*	5	206	0	0	206	0	*
35	Mihara	C	1963	5	562	0	0	562	0	*
36	Higashikori	C	*	10	38	39	45	122	0	*
37	Minou	C	1960	8	345	0	0	345	0	*
38	Yao	C	1913	14	513	0	0	513	0	*
39	Kaede	C	*	4	150	0	0	150	0	*
40	Shinabuyama	C	1971	8	273	0	0	273	0	*
41	Tanpisou	C	1956	12	310	0	0	310	0	*
42	Shirai	A	1965	9	322	48	29	399	0	*
43	Kisen	C	1967	3	260	0	0	260	0	*
44	Hamadera	C	1930	20	749	0	0	749	0	*
45	Ozone	C	1956	16	557	0	0	557	0	*
46	Izumigaoka	C	1963	6	257	0	4	261	0	*
47	Shionomiya	C	1969	10	384	60	0	444	0	*
48	Asakayama	C	1922	67	948	38	185	1171	102	2008
49	Hirakataryoiku	C	1969	28	50	0	440	490	0	*

Source:

(1) Table 1 is a modified version of the original table in (Takaya, 2016, p.44)

(2) Statistical data are derived from the homepage of each hospital and the following websites:

Osaka Association of Psychiatric Hospitals: http://www.daiseikyo.or.jp/

Kinki Regional Bureau of Health and Welfare: https://kouseikyoku.mhlw.go.jp/kinki/

Japanese Association for Emergency Psychiatry: http://www.jaep.jp/

Table 2. Private Psychiatric Hospitals with Psychiatric Beds Only

Number	Name of hospital (Abbreviation)	Governance type	Medical area	Opening year	Regular doctor	Psychiatric beds	Psychiatric emergency beds	Approval year	Approved training facility	Accredited facilitity
16	Sawa	A	**A**	1953	30	455	114	2005	1	1
20	Ainohanazono	C	**A**	1984	13	606	0	*	1	0
37	Minou	C	**A**	1960	8	345	0	*	1	0
45	Ozone	C	**A**	1956	16	557	0	*	0	0
11	Orenji	A	**B**	1965	3	240	0	*	0	1
15	Kouai	A	**B**	1964	10	221	0	*	1	0
40	Shinabuyama	C	**B**	1971	8	273	0	*	1	1
7	Keihan	A	**C**	1954	9	306	0	*	1	0
9	Neyagawa	A	**C**	1965	10	267	60	2014	1	1
14	Kosaka	A	**D**	1948	17	537	0	*	1	1
29	Sakamoto	C	**D**	1892	16	546	0	*	1	0
38	Yao	C	**D**	1913	14	513	0	*	1	0
3	Yoshimura	A	**E**	1976	6	222	0	*	1	0
13	Osakasayama	A	**E**	1966	6	279	0	*	1	0
41	Tanpisou	C	**E**	1956	12	310	0	*	1	1
31	Mikunigaoka	C	**F**	1960	5	144	0	*	1	1
32	Hannan	C	**F**	1956	46	690	168	2007	1	1
35	Mihara	C	**F**	1963	5	562	0	*	1	0
1	Mizuma	A	**G**	1959	11	541	0	*	1	0
2	Kijima	A	**G**	1963	13	492	0	*	1	1
4	Sakane	A	**G**	1965	3	150	0	*	0	0
8	Shichiyama	A	**G**	1599	13	640	48	2011	1	1
10	Kaizukachuou	A	**G**	*	9	406	0	*	1	0
12	kumeda	A	**G**	1962	9	494	0	*	0	0
27	Kansaisanatoriumu	C	**G**	1968	2	192	0	*	0	0
33	Kokoroa	C	**G**	*	11	450	0	*	1	0
34	Izumichuou	C	**G**	*	5	206	0	*	1	1
39	Kaede	C	**G**	*	4	150	0	*	1	0
43	Kisen	C	**G**	1967	3	260	0	*	1	0
44	Hamadera	C	**G**	1930	20	749	0	*	1	1

Source:

(1) This table has been modified from one presented by (Takaya, 2016, p.45).

(2) Data for analysis are derived from the homepage of each hospital and the following websites:

Osaka Association of Psychiatric Hospitals: http://www.daiseikyo.or.jp/

Kinki Regional Bureau of Health and Welfare: https://kouseikyoku.mhlw.go.jp/kinki/

Japanese Association for Emergency Psychiatry: http://www.jaep.jp/

Osaka Prefectural Government: http://www.pref.osaka.lg.jp/iryo/keikaku/keikaku2013to2017.html

The Japanese Society of Psychiatry and Neurology: https://www.jspn.or.jp/

Japan Council for Quality Health Care: http://jcqhc.or.jp/

cluded from the analysis. Following these exclusions, 30 private psychiatric hospitals remained, as listed Table 2. Values of 1 and 0 for "approved training facility" mean, respectively, that the Japanese Society of Psychiatry and Neurology approved or did not approve of each facility as a psychiatric specialist training facility. Values of 1 and 0 for "accredited facility" mean, respectively, that Japan Council for Quality Health Care (JCQHC) has or has not accredited the facility (hospital).

Notations "A"–"G" for "medical area" in Table 2, which correspond to those in Figure 3 and Table 3, indicate the second medical areas in Osaka, Japan, to which each hospital belongs. Medical areas are arranged alphabetically. Figure 3 displays Osaka's medical areas geographically.

2. Uneven distribution of private psychiatric hospitals in terms of clinical activity

As mentioned above, Takaya pointed out that it is not possible to say that having a license to charge a psychiatric emergency hospitalization fee, which represents clinical activity, is related to either a hospital's governance type or the separation of ownership and management[28]. Takaya also pointed out that except for the Mishima and Minamikawachi medical areas, every medical area has at least one hospital licensed to charge a psychiatric emergency hospitali-zation fee[29]. These are shown in Figure 3 and Table 3, where each "hospital number" corresponds to that used in Table 1 and Table 2. Hospitals with numbers in parentheses in Table 3 are included in Table 1 but not in Table 2.

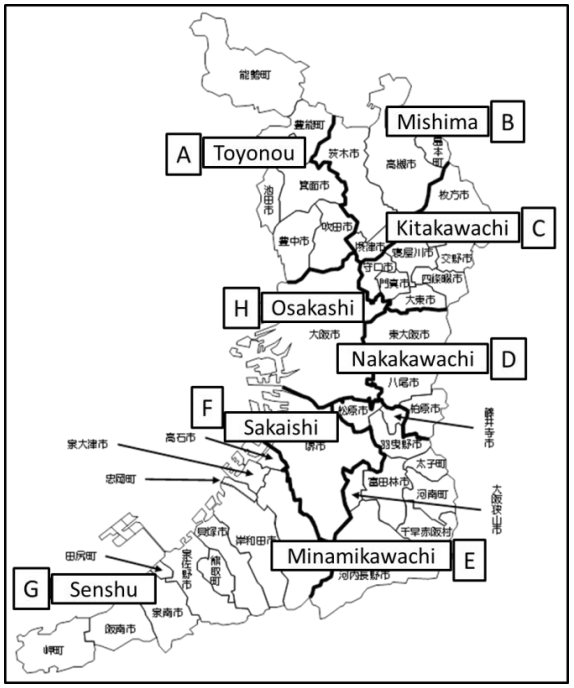

Figure 3. Second Medical areas in Osaka, Japan.
Source: This Figure is modified, by the author, from the original version shown in the data in the website; http://www.pref.osaka.lg.jp/iryo/keikaku/keikaku2013to2017.html

Table 3. Private hospitals licensed to charge a psychiatric emergency hospitalization fee and their medical areas

Medical area	Japanese name of a medical area	Hosiptal number
A	Toyonou	16
B	Mishima	
C	Kitakawachi	9
D	Nakakawachi	(23)
E	Minamikawachi	
F	Sakaishi	32, (48)
G	Senshu	8
H	Osakashi	(17)

Source: This Table is modified from Tables 1 and 2, and Figure 3.

According to Table 3, an uneven distribution of hospitals having "a license to charge a psychiatric emergency hospitalization

[28] Takaya, 2016, pp.41-47

[29] Takaya, 2016, p.48

fee" can be observed among each medical area.

3. Relationship between the numbers of regular doctors and psychiatric beds

This study considers having a license to charge a psychiatric emergency hospitali-zation fee as an indicator of clinical activities in each hospital. Each hospital is assigned a specific number of hospital beds by each prefectural government, a number that is indirectly, under the control of the Ministry of Health, Labour and Welfare. The allocated number of beds corresponds to the area of the hospital wards. Therefore, the number of beds can be considered as an initial value. On the other hand, the number of regular doctors can be considered a variable in each hospital's evolutional process because each hospital can or should recruit or control the number of the doctors in order to improve its activity. However, Takaya found multico-llinearity between number of beds and number of regular doctors in the 30 private psychiatric hospitals[30].

4. Clinical competence and the number of regular doctors or psychiatric beds

The result of bivariate logistic regression analysis between the number of regular doctors (independent valuable) and having a license to charge a psychiatric emergency hospitalization fee (dependent valuable) showed no significant correlation (parameter estimate: −0.2020, p-value: 0.0525). Neither did the result of bivariate logistic regression analysis between the number of psychiatric beds (independent valuable) and having a license to charge a psychiatric emergency hospitalization fee (dependent valuable) show (parameter estimate: −0.00485, p-value: 0.1638).

5. Overall hospital competence and the number of regular doctors or psychiatric beds

The result of bivariate logistic regression analysis between the number of regular doctors (independent valuable) and JCQHC authorizations (dependent valuable) showed no significant correlation (parameter estimate: −0.1183, p-value: 0.0922). Neither did the result of bivariate logistic regression analysis between the number of psychiatric beds (independent valuable) and JCQHC authorizations (dependent valuable) show (parameter estimate: −0.0013, p-value: 0.5459).

6. Competitiveness in each medical area

6.1. Clinical competence as a result of internal control

The relationship between clinical activity and number of regular doctors in private psychiatric hospitals will be discussed below by medical area, based on the data in Table 2.

Of the four hospitals in medical area A, hospital 16 has the most stable number of doctors (30). In medical area C, Hospital 9 has the most stable number of doctors (10). In medical area F, Hospital 32 has the largest number of regular doctors (46), and in medical area G, Hospital 8 has the second highest number of regular doctors of all 12 hospitals.

These results suggest that the number of regular doctors seems to have an important effect on the clinical activities of each medical area's hospitals. A strict standard is imposed to obtain a license to charge a psychiatric emergency hospitalization fee. This organizational hurdle can be an indicator for the

[30] Takaya, 2016, p.46

presence of internal control as well as external control; however, the mechanism of this internal control is unclear.

6.2. Overall hospital competence as a result of internal control

On the other hand, the factor "accredited facility," which indicates JCQHC approval, can be an indicator representing the outcome of hospitals' activities as well as an indicator of external control. In Table 2, all hospitals licensed to charge a psychiatric emergency hospitalization fee are "accredited facilities" according to JCQHC. However, not all hospitals approved by JCQHC have a license to charge psychiatric emergency hospitalization fee. Therefore, a license to charge a psychiatric emergency hospitalization fee is more difficult to get.

6.3. Relationship between internal and external control

Official information and data for each private hospital are too limited, as mentioned above, and internal control mechanisms and governance functions are not revealed: therefore, we cannot help consider the mechanism of internal control as being performed in a "black box". Therefore, indicators for external controls described above could be a useful tool for estimating the results of internal controls.

6.4. Evolution of private psychiatric hospitals

Private "psychiatric hospitals" (in a broad sense) in Japan were founded after the Second World War perhaps in response to the public demand. This can be considered "the initial state" of the subsequent evolutionary path of the modern Japanese psychiatric hospital system. Most private psychiatric hospitals were founded in the 1950s and 1960s (Kazamatsuri, 2001, p.68). As indicated in Table 1, seven hospitals were founded in the 1950s and 23 in the 1960s (in all, opening-year data was available for 26 hospitals). Thirty hospitals out of 42 (71%) were founded in the 1950s or 1960s. As shown in Table 2, six hospitals were founded in the 1950s, and 12 hospitals in the 1960s (in all, opening-year data was available for 26 hospitals) Eighteen hospitals out of 26 (69%) were founded in the 1950s or 1960s.

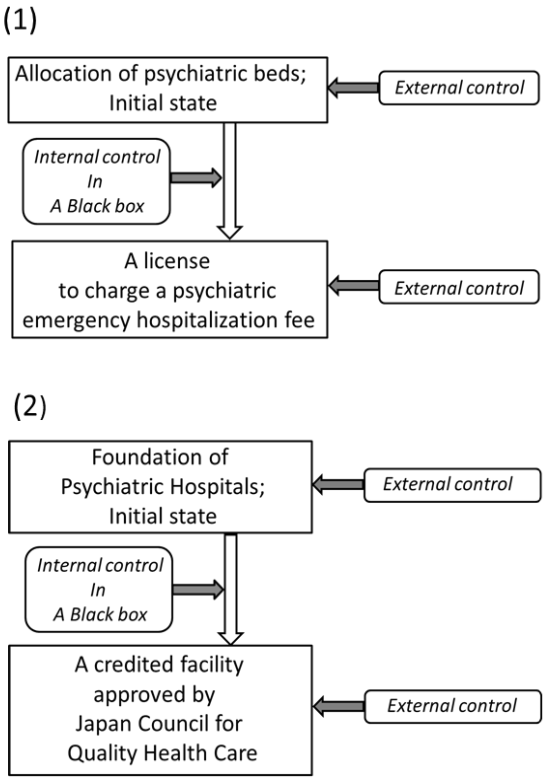

Figure 4. Evolutional processes under a combination of internal and external controls, about (1) the hospital's clinical competence and (2) the overall hospital's competence

Source: Author

The discussions in Sections 5-1, 5-2, and 5-3 are depicted by Figure 4. Numbers (1) and (2) in Figure 4 show the systematic evolutional processes of private psychiatric hospitals in

terms of internal and external controls. From an external perspective, internal control is usually conducted in a "black box" region because the data and information are tightly held as confidential to the institution.

On the other hand, external control, which is usually performed by regulatory agencies or the like, is exerted in the presence of available information. The term of "external control" shown in (1) and (2) in Figure 4 seems different from "external control" defined in (Fujioka, 2013, p.197), but can be an indicator of external control or official approval from external regulatory agencies or the like. In this sense, the system of private psychiatric hospitals has evolved by strengthening internal controls in each hospital, and by receiving a license to and/or official accreditation as excellent hospitals.

7. Hierarchical formation in terms of clinical competence

Despite multiple attempts by the author, previously disclosed data and information related to the number of regular doctors and number of psychiatric beds has been elusive to retrieve, even from disclosure system of the regulatory agency. Therefore, a cross-sectional study was conducted to investigate hierarchical formation of the private psychiatric hospital system in this study.

Table 4 is modified version of Table 2, in that the PB/RD Ratio (PB:RD), which is defined as psychiatric beds per regular doctor, and PED/PB Ratio (PEB:PB), which is defined as psychiatric emergency beds per psychiatric bed, are calculated, and the PB/RD Ratio column rearranged in ascending order (unnecessary columns in this section are omitted).

The first, second, and fifth-ranking hospitals in PB: RD in Table 4 (Hospitals 32, 16, and 9, respectively) are licensed to charge a psychiatric emergency hospitalization fee. The PEB: PB of these hospitals is 0.24, 0.25, and 0.22, respectively. Hospital 8 (Shichiyama) is an exception because it's PED: PB is 0.075, which is much lower than those of the other three hospitals mentioned above.

Table 4. Psychiatric Beds per Regular Doctor and Psychiatric Emergency Beds per total bed (PB/RD ratio and PED/PB ratio, respectively)

Number	Hospitals (Abbreviation)	Medical district	Regular doctor (RD)	Psychiatric beds (PB)	PB/RD Ratio	Psychiatric emergency beds (PEB)	PEB/PB Ratio
32	Hannan	F	46	690	**15**	168	0.24
16	Sawa	A	30	455	**15.2**	114	0.25
15	Kouai	B	10	221	**22.1**	0	0
41	Tanpisou	E	12	310	**25.8**	0	0
9	Neyagawa	C	10	267	**26.7**	60	0.22
31	Mikunigaoka	F	5	144	**28.8**	0	0
14	Kosaka	D	17	537	**31.6**	0	0
7	Keihan	C	9	306	**34**	0	0
40	Shinabuyama	B	8	273	**34.1**	0	0
29	Sakamoto	D	16	546	**34.1**	0	0
45	Ozone	A	16	557	**34.8**	0	0
38	Yao	D	14	513	**36.6**	0	0
3	Yoshimura	E	6	222	**37**	0	0
39	Kaede	G	4	150	**37.5**	0	0
44	Hamadera	G	20	749	**37.5**	0	0
2	Kijima	G	13	492	**37.8**	0	0
33	Kokoroa	G	11	450	**40.9**	0	0
34	Izumichuou	G	5	206	**41.2**	0	0
37	Minou	A	8	345	**43.1**	0	0
10	Kaizukachuou	G	9	406	**45.2**	0	0
13	Osakasayama	E	6	279	**46.5**	0	0
20	Ainohanazono	A	13	606	**46.6**	0	0
1	Mizuma	G	11	541	**49.2**	0	0
8	Shichiyama	G	13	640	**49.2**	48	0.075
4	Sakane	G	3	150	**50**	0	0
12	kumeda	G	9	494	**54.9**	0	0
11	Orenji	B	3	240	**80**	0	0
43	Kisen	G	3	260	**86.7**	0	0
27	Kansaisanatoriumu	G	2	192	**96**	0	0
35	Mihara	F	5	562	**112.4**	0	0

Source: This Table is modified from Table 2.

Hospital 8 (Shichiyama) in Table 4 is located in medical area G in Figure 3. The PB: RD of Hospital 8 is ranked eighth among all 12 hospitals in medical area G (Table 2), which means Hospital 8 seems to be an ordinary private psychiatric hospital. On the other hand, Hospitals 32, 16, and 9 have top-ranked PB:RD in their respective medical areas (F, A, and C).

In this sense, PB:RD=49.2 and PEB:PB=0.075 for Hospital 8 may be an outlier among Hospitals 32, 16, 9, and 8.

Hospital 16 in Table 2, 3 and 4 is the only private psychiatric institution licensed as a Social medical corporation (*Shakai Iryou-houjin* in Japanese), which suggests the hospital undertakes a very high level of public-interest activity. The system of social medical corporation was established in 2008[31]. This system aims to act strongly in the public interest. The number of social medical corporations in Osaka, Japan is 31 as of 1 April, 2016[32].

Hospital 14 in Table 2 and 4 is the only hospital established by Social Welfare Corporation (*Shakaifukushi-houjin* in Japanese)[33]. The other hospitals in Table 2 and 4 are established by incorporated medical institutions.

8. Uneven distribution of psychiatric beds

A working paper No. 352 of the Japan Medical Association Research Institute reported the distribution of psychiatric beds in Osaka (www.jmari.med.or.jp). The reported deviation value of the number of psychiatric beds per person for each medical area is shown in Table 5,. Letters A–H in Table 5 corresponds to the letters in Figure 3, and Tables 3 and 4. In Table 5, the deviation values were derived based on the averages and standard deviations in Japan.

Table 5. Uneven distribution of psychiatric beds

Medical area	A	B	C	D	E	F	G	H
Deviation value of the number of psychiatric beds per population	47	54	45	48	50	54	69	37

Source: This Table is created based on the data in the website; www.jmari.med.or.jp.

The deviation value of medical area G and H is significantly high and low, respectively, which shows the uneven distribution of psychiatric beds in Osaka, Japan. The causal factors for situation remain to be investigated, though the result here is similar to that offered in the discussion of Table 4. Medical area G received excessive total psychiatric beds (Table 5), but was not successful in obtaining psychiatric emergency beds (Table 4).

(3) Conclusion

This study showed that, psychiatric beds as well as incorporated psychiatric hospitals that have "a license to charge a psychiatric emergency hospitalization fee," are distributed unevenly among medical areas in Osaka.

On the other hand, a hierarchical structure of private psychiatric hospitals was observed in each medical area where an incorporated psychiatric hospital possessing "a license to charge a psychiatric emergency hospitalization fee" is located.

The result of this study might provide a framework for investigating other types of hospitals in the absence of internal hospital data.

A limitation of this study is that the internal controls utilized in each hospital could not be discerned because of too limitedly disclosed data, and that the hierarchical formation process of incorporated psychiatric

[31] http://www.mhlw.go.jp/topics/bukyoku/isei/igyou/dl/shakaiiryouhouzin1.pdf

[32] http://www.mhlw.go.jp/file/06-Seisakujouhou- 10800000-Iseikyoku/0000073016_10.pdf

[33] The Ministry of Health, Labor and Welfare: http://www.mhlw.go.jp/bunya/seikatsuhogo/shakai-fukushi-jigyou3.html

hospitals could not be investigated utilizing time-series data.

In the future, the process formation of the psychiatric hospital system remains to be investigated from an historical viewpoint in order to reveal the systems influencing Japan's medical institutions.

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