【職場定着意欲】
職務への満足と職場定着意欲

- 今の仕事内容に満足している。
- 今の職場に満足しており、別の職場に移りたくない。

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群間比較

- [職場定着意欲](r=0.68, Cronbach's α=0.81)を3群(高中低)に分け、病院組織文化の各項目との関連に差があるかを検証

⇒全ての項目で有意差

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記述結果

	平均値	中央値	標準偏差	25パーセンタイル	50パーセンタイル	75パーセンタイル	N
チームワーク	74.4	75.0	16.1	62.5	75.0	87.5	5,225
情報共有	73.0	75.0	18.9	62.5	75.0	87.5	5,244
士気・やる気	76.6	75.0	15.6	66.7	75.0	83.3	5,234
プロとしての成長	71.4	75.0	19.0	58.3	75.0	83.3	5,237
資源(人材や機器の充実)	50.8	50.0	19.8	33.3	50.0	66.7	5,222
責任と権限	65.9	75.0	21.0	50.0	75.0	75.0	5,244
改善のシステム	66.6	68.8	18.0	56.3	68.8	75.0	5,218
業務改善	65.5	66.7	16.1	58.3	66.7	75.0	5,238
経営改善	61.5	66.7	17.4	50.0	66.7	75.0	5,233
仕事量と負担	31.6	25.0	17.9	25.0	25.0	50.0	5,270
安全の確保	68.3	75.0	16.7	62.5	75.0	75.0	5,261
計画実施	66.2	66.7	17.7	58.3	66.7	75.0	5,229
改善の成果	59.8	62.5	19.2	50.0	62.5	75.0	5,237
職務定着意欲	56.2	62.5	24.6	37.5	62.5	75.0	5,262

職場定着意欲と組織文化の関連

[ ]内は、Cronbach's α		チームワーク	情報共有	士気・やる気	プロとしての成長	資源	責任と権限	改善のシステム	業務改善	経営改善	仕事量と負担	安全の確保	計画実施	改善の成果
チームワーク	[0.80]													
情報共有	[0.75]	0.61**												
士気・やる気	[0.78]	0.61**	0.63**											
プロとしての成長	[0.82]	0.53**	0.44**	0.48**										
資源	[0.78]	0.39**	0.37**	0.39**	0.38**									
責任と権限	[0.80]	0.51**	0.46**	0.44**	0.47**	0.44**								
改善のシステム	[0.83]	0.47**	0.57**	0.60**	0.43**	0.48**	0.51**							
業務改善	[0.74]	0.53**	0.51**	0.60**	0.50**	0.47**	0.51**	0.62**						
経営改善	[0.78]	0.50**	0.49**	0.53**	0.48**	0.52**	0.48**	0.62**	0.76**					
仕事量と負担	[0.66]	0.01	−0.06	−0.07	−0.03	0.18*	0.04	−0.05	−0.05	0.004				
安全の確保	[0.86]	0.46**	0.53**	0.58**	0.43**	0.49**	0.45**	0.70**	0.59**	0.65**	−0.01			
計画実施	[0.81]	0.44**	0.39**	0.49**	0.39**	0.40**	0.47**	0.51**	0.66**	0.68**	−0.04	0.50**		
改善の成果	[0.78]	0.39**	0.38**	0.42**	0.40**	0.44**	0.42**	0.50**	0.62**	0.76**	0.01	0.54**	0.67**	
職務定着意欲	[0.81]	0.41**	0.31**	0.33**	0.48**	0.42**	0.45**	0.34**	0.42**	0.43**	0.18*	0.36**	0.38**	0.35**

** $p<0.01$

* $p<0.05$

質問項目の妥当性の検証

項目（項目数）	相関係数
職場定着意欲(2)	0.678
チームワーク(4)	0.339, 0.469, 0.582
情報共有(2)	0.601
士気・やる気(3)	0.456, 0.527,0.636
プロとしての成長(3)	0.561, 0.568, 0.699
資源(3)	0.454, 0.497, 0.695
責任と権限(2)	0.644
改善のシステム(4)	0.618, 0.627, 0.639, 0.672, 0.727
安全の確保(2)	0.759
仕事量と負担(2)	0.488
業務改善(3)	0.389, 0.398, 0.512, 0.559
経営改善(3)	0.602, 0.619, 0.629
計画実施(3)	0.360, 0.448, 0.514
改善の成果(2)	0.634

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Effect of certified training facilities for intensive care specialists on mortality in Japan

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ABSTRACT

Objective: To compare patient outcomes in hospitals certified by the Japanese Society of Intensive Care Medicine (JSICM) as training facilities for intensive care specialists with patient outcomes in hospitals not certified by the JSICM (non-CFs).

Design: A retrospective case–control study using administrative data.

Main outcome measure: Inhospital mortality.

Results: 164 803 intensive care unit admissions were identified between 1 April 2008 and 31 March 2010, of which 159 540 were for adults (≥ 18 years). A total of 50 875 patients in 125 hospitals were admitted to certified facilities (CFs) and 108 665 patients in 309 hospitals were admitted to non-CFs. Inhospital mortality rates were 9.9% and 10.6% in CFs and non-CFs, respectively ($P < 0.001$). After adjusting for age, emergency admission, admission route, use of vasopressors, mechanical ventilation, and renal replacement therapy, the odds ratio for hospital mortality in CF-treated patients was 0.81 (95% confidence interval, 0.78–0.85). The *c* statistic of the model was 0.881.

Conclusions: Patients admitted to the intensive care unit in CFs had better outcomes. To improve patient outcomes, more board-certified intensivists are required in Japan.

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The impact of intensive care physicians on patient outcomes is widely debated. Critical care represents a large percentage of health care spending, and improving the quality of care in intensive care units is essential, given that medical needs will increase as the population ages rapidly. However, as of August 2011, Japan had only 878 critical care specialists certified by the Japanese Society of Intensive Care Medicine (JSICM; referred to as "board-certified" intensivists) — only 0.3% of the total number of physicians.[1] This suggests that the majority of patients who need intensive care are treated by non-board-certified physicians. JSICM certifies training facilities for intensive care specialists. According to their rules for certification,[2] an ICU that is a certified facility (CF) has at least one board-certified intensivist. The question of whether more intensivists are needed must be addressed immediately, as intensivist training takes 5 to 10 years after graduation from medical school, and medical demand is estimated to peak in 2025 in Japan; however, it is difficult to answer this question, because few studies have investigated the impact of board-certified intensivists in Japan.

The purpose of our study was to investigate the impact of board-certified intensivists in Japan, using administrative data. The study was approved and registered by the Kyoto University Graduate School and Faculty of Medicine Ethics Committee.

Methods

Data source

Data were obtained from the Diagnosis Procedure Combination (DPC) database, which is the national administrative database of a casemix classification system for acute inpatient care, developed in Japan and used since 2003.[3] The database consists of summarised clinical information and detailed health care claim data. Clinical information comprises key patient information on age, sex, primary diagnosis, comorbidities (as classified by the International Classification of Diseases, 10th revision), complications, surgeries, and the DPC code. The DPC code is a 14-digit code used for reimbursement, where the first two digits represent the 18 major diagnosis categories (MDC) comprising diseases that require the most medical resource expenditure. Health care claim data include detailed medical resources use, indexed in the original Japanese codes,[4] including diagnostic tests, all surgical or interventional procedures, medications, and the specified hospitalisation fees.

Hospital selection

All hospitals in the DPC database with at least one patient admitted to the ICU were included in this study. A list of CFs was obtained from the JSICM website.[5]

Patient selection

From all patients who were discharged between 1 April 2008 and 31 March 2010 we selected patients who were admitted to an ICU at any point during their hospitalisation. To focus on adult intensive care, patients younger than 18 years of age were excluded.

Table 1. Background of patients, by type of intensive care facility in Japan

	CFs (n = 50 875)*	Non-CFs (n = 108 665)*	$P^{\dagger}$
No. of hospitals	125	309	
Age (years)	67.2 (14.0)	68.3 (14.4)	< 0.001
Male	31 950 (62.8%)	64 306 (59.2%)	< 0.001
Emergency admission	24 042 (47.3%)	59 063 (54.4%)	< 0.001
Admission route to ICU			< 0.001
Post scheduled surgery	27 516 (54.1%)	52 716 (48.5%)	
Post emergency surgery	8 540 (16.8%)	18 483 (17.0%)	
Medical indication	14 819 (29.1%)	37 466 (34.5%)	
Major diagnosis category			< 0.001
Nervous system	6 314 (12.41%)	17 055 (15.7%)	
Eye	12 (0.02%)	20 (0.02%)	
Ear, nose, mouth and throat	572 (1.12%)	852 (0.78%)	
Respiratory system	4 461 (8.77%)	10 059 (9.26%)	
Circulatory system	20 601 (40.49%)	33 601 (30.92%)	
Digestive system	9 362 (18.4%)	23 765 (21.87%)	
Musculoskeletal system	1 203 (2.36%)	4 092 (3.77%)	
Skin and subcutaneous tissue	48 (0.09%)	89 (0.08%)	
Breast	58 (0.11%)	442 (0.41%)	
Endocrine and metabolic system	849 (1.67%)	1 789 (1.65%)	
Kidney and urinary system	2 114 (4.16%)	3 843 (3.54%)	
Female reproductive system	597 (1.17%)	1 546 (1.42%)	
Blood and immunological disorders	985 (1.94%)	1 603 (1.48%)	
Congenital disease	220 (0.43%)	262 (0.24%)	
Paediatric disease	25 (0.05%)	82 (0.08%)	
Injuries, burns and poisoning	1 756 (3.45%)	6 261 (5.76%)	
Psychiatry	36 (0.07%)	251 (0.23%)	
Others	1 657 (3.26%)	3045 (2.8%)	
Uncoded	5 (0.01%)	8 (0.01%)	

CFs = hospitals certified as training facilities for intensive care specialists by the Japanese Society of Intensive Care Medicine. ICU = intensive care unit.
* Categorical variables are given as no. of cases (%); continuous variable is given as mean (SD). † χ^2 test for categorical variables; Student *t*-test for continuous variables.

Patient outcomes

We evaluated ICU mortality and hospital mortality and compared patients who were treated in CFs with those who were treated in non-CFs.

We evaluated the impact of CFs on mortality using a two-step analysis. First we generated two models using multivariate logistic regression to adjust for casemix. One model (model A) included the variables age, emergency admission, admission source, treatments carried out in the ICU, such as mechanical ventilation, renal replacement therapy, and use of vasopressors. The other model (model B) included primary diagnosis in addition to the variables in model A. The forced-entry method was used in both models. In model B, MDCs constituting more than 1% of the total cases were selected, and the MDC "circulatory system" was used as the reference category. To check the discriminatory ability of the models, *c* statistics were calculated.

After calculating *c* statistics of the models, a binary variable was assigned to indicate the group to which the patient belonged. The *c* statistics of the models were calculated again.

Statistical analyses

Data were compared using the χ^2 test for categorical variables and the unpaired Student *t*-test for continuous variables. Data are expressed as mean (standard deviation [SD]) or number (%). $P < 0.05$ was considered significant. All statistical analyses were performed using SPSS 11.0J (SPSS Inc).

Table 2. Treatments and outcomes of patients, by type of intensive care facility in Japan

	CFs (*n* = 50 875)*	Non-CFs (*n* = 108 665)*	*P*
Vasopressor	24 147 (47.5%)	43 738 (40.3%)	< 0.001
Mechanical ventilation	14 503 (28.5%)	21 786 (20.0%)	< 0.001
Renal replacement therapy	2 420 (4.8%)	3 443 (3.2%)	< 0.001
Blood transfusion	11 688 (23.0%)	17 908 (16.5%)	< 0.001
Tracheostomy	1 843 (3.6%)	2 548 (2.3%)	< 0.001
Length of ICU stay (days)	3.1 (3.4)	3 (3.3)	< 0.001
Length of hospital stay (days)	28.8 (26.4)	27.7 (27.1)	< 0.001
Discharge to other hospitals	6 172 (12.1%)	15 351 (14.1%)	< 0.001
ICU mortality	2 407 (4.7%)	5 744 (5.3%)	< 0.001
Inhospital mortality	5 046 (9.9%)	11 540 (10.6%)	< 0.001

CFs = hospitals certified as training facilities for intensive care specialists by the Japanese Society of Intensive Care Medicine. ICU = intensive care unit.
* Categorical variables are given as no. of cases (%); continuous variables are given as mean (SD).

Results

A total of 164 803 ICU admissions in 434 hospitals were identified, of which 5266 cases (3.2%) were excluded because the patients were under 18 years of age. A total of 159 540 cases were included in our analysis.

A total of 50 875 patients in 125 hospitals were treated in CFs and 108 665 patients in 309 hospitals were treated in non-CFs. The two groups were not substantially different with respect to disease categories; however, a higher proportion of CF patients exhibited diseases and disorders of the circulatory system ($P < 0.001$) (Table 1).

The proportions of patients who needed special treatments in the ICU were higher in CFs than in non-CFs (Table 2). ICU mortality and inhospital mortality were slightly higher in non-CFs (ICU mortality: 4.7% in CFs, 5.3% in non-CFs; inhospital mortality: 9.9% in CFs, 10.6% in non-CFs).

Results of the logistic regression analysis are presented in Table 3. In the first step, both models exhibited a good discriminatory ability. In the second step, among CF-treated patients the odds ratios for ICU mortality were 0.78 in both models and the odds ratios for hospital mortality were 0.81 and 0.85 in models A and B, respectively.

Discussion

This is the first large-scale study to document the use of ICUs and focus on board-certified intensivists in Japan. According to the Ministry of Health, Labour and Welfare, 806 hospitals were equipped with ICUs in 2008;[6] therefore, these data are from more than half (53.8%) of the ICUs in Japan. Among the patients who needed critical care in our study, admission to hospitals whose ICUs were certified as training facilities for intensive care specialists had a positive effect on patient mortality, after risk adjustment.

Administrative data are easier and less expensive to collect than clinical data and are increasingly used in a variety of specialties. However, whether administrative data are suitable for risk adjustment in critically ill patients is debatable. A comparison between the performance of a model based on clinical data (customised Simplified Acute Physiology Score [SAPS] II) with that of a model based on administrative data (customised hospital standardised mortality ratio) in a Dutch ICU population showed that the clinical data-based model outperformed the administrative data-based model, particularly for high-risk patients.[7] On the other hand, a comparison between several models based on administrative data with three physiology-based scores (Acute Physiology and Chronic Health Evaluation [APACHE] II, SAPS II and SAPS III) concluded that the Charlson comorbidity index[8] combined with other administrative data predicted short- and long-term mortality in ICU patients as effectively as the physiology-based scores.[9]

In Japanese ICUs that are not certified as training facilities, physiological scores are not available for all patients, because there are no critical care specialists or such requirements. In general, physiological scores, such as the Sequential Organ Failure Assessment (SOFA) score[10] and APACHE II,[11] are preferred for clinical decision making, standardising research and comparing the quality of patient care across ICUs. We adjusted for the difference in casemix using ICU treatments because in our view each treatment reflects the severity of illness. The SOFA score comprises six elements: respiratory, renal, hepatic, cardiovascular, haematological and neurological. The predictive power of each element has been reviewed previously.[12] Entry criteria for each treatment vary somewhat between clinicians; some ICU treatments may be used as surrogates of the physiological score. For example, in the SOFA score, the use of mechanical ventila-

Table 3. Multiple logistic regression analysis of inhospital and ICU mortality

	Inhospital mortality, by model				ICU mortality, by model			
	A	A + certified status	B	B + certified status	A	A + certified status	B	B + certified status
Age	1.03*	1.03*	1.03*	1.03*	1.02*	1.02*	1.02*	1.02*
Emergency admission	2.20*	2.17*	2.13*	2.10*	2.09*	2.05*	2.01*	1.97*
Admission route								
Post scheduled surgery	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Post emergency surgery	2.11*	2.12*	2.05*	2.05*	3.93*	3.94*	3.70*	3.71*
Medical indication	6.01*	5.98*	5.18*	5.16*	9.22*	9.17*	9.17*	9.14*
ICU treatment								
Vasopressor	4.39*	4.41*	5.12*	5.13*	4.75*	4.78*	5.19*	5.20*
Mechanical ventilation	3.77*	3.85*	3.60*	3.65*	4.45*	4.55*	4.51*	4.62*
Renal replacement therapy	3.52*	3.57*	3.51*	3.54*	2.12*	2.15*	2.27*	2.30*
Major diagnosis category								
Nervous system			3.04*	3.00*			1.59*	1.56*
Respiratory system			2.46*	2.43*			0.71*	0.70*
Circulatory system			1.00	1.00			1.00	1.00
Digestive system			1.58*	1.57*			0.93	0.91*
Musculoskeletal system			1.28*	1.27*			0.61*	0.60*
Endocrine and metabolic system			1.47*	1.46*			0.78	0.78
Kidney and urinary system			1.32*	1.31*			0.71*	0.70*
Female reproductive system			1.41	1.4			0.53	0.52
Blood and immunological disorders			5.17*	5.19*			1.27*	1.28*
Injuries, burns and poisoning			1.67*	1.65*			1.23*	1.21*
Others			2.68*	2.67*			0.92	0.92
Other diagnosis categories†			1.01	1.02			0.56*	0.56*
Certified ICU, odds ratio (95% CI)		0.81 (0.78–0.85)		0.85 (0.81–0.88)		0.78 (0.74–0.82)		0.78 (0.73–0.82)
c statistic	0.881	0.881	0.892	0.892	0.892	0.881	0.902	0.902

ICU = intensive care unit. * $P < 0.05$. † Includes seven major diagnosis categories (eye; ear, nose, mouth and throat; skin and subcutaneous tissue; breast; congenital disease; paediatric disease; psychiatry), each of which consisted of less than 1% of total cases.

tion is about equivalent to a respiratory score of > 2, the use of renal replacement therapy is equivalent to a renal score of ⩾ 3, and the use of vasopressors is equivalent to a cardiovascular score of ⩾ 2. The *c* statistics for our models were high. Therefore, the use of ICU treatments as risk-adjustment variables is one option for countries where physiological scores are unavailable for evaluating the quality of care in a critical care setting.

Suitable physician staffing in ICUs is widely debated. High-intensity ICU physician staffing has been shown to be associated with reduced hospital mortality.[13] However, it has also been reported that patients managed by critical care physicians had higher hospital mortality than those who were not.[14]

In our study, overall mortality was relatively low compared with that of other countries. An investigation of international variation in critical care services across North America and Western Europe found an inverse correlation between ICU beds per capita and hospital mortality.[15] In the United States, less than one-third of patients admitted to the ICU are from an operating room or related sources.[16] By contrast, in our study, about half of the patients in both groups were admitted to the ICU after a scheduled operation. Admission route has already been shown to be a risk factor for inhospital mortality,[17,18] so casemix may explain the fact that overall mortality among ICU patients is relatively low in Japan considering the number of ICU beds. However, this fact raises a new question: where are the other patients who suffer from severe diseases and need to be treated in the ICU?

The reason why better outcomes were achieved in CFs is unclear from this study, but possible explanations include implementation of best clinical practices, such as evidence-based treatments for acute lung injury and sepsis; prevention of ICU complications;[19] the educational role of ICU staff;[20] and quick responses to emergency situations.

Limitations

This study has several limitations. First, we did not consider the intensity of care provided by each physician, which may influence the result. The 24-hour availability of a consultant-level intensivist is considered ideal,[21] but in Japan physicians were not present in 21% of ICUs.[22] These variations in the intensity of care may decrease the effect. We used mortality as the outcome, but mortality alone is not sufficient to measure the quality of ICUs.[23] Activities of daily living after hospital discharge, the care process and costs should be evaluated in the future.

Second, the administrative data included information on a calendar-day basis rather than an hourly basis. We were therefore unable to distinguish between death in the ICU and death in the ward immediately after ICU discharge. But these deaths appear to indicate poor quality of care, given that a significant rate of readmission to the ICU within 48 hours is considered to indicate suboptimal clinical care.[21] Therefore, inclusion of these deaths in ICU mortality is not germane to our discussion.

Conclusion

In Japan, models that use administrative data to adjust for the casemix of ICU patients provide good discriminatory ability, and we have shown that ICUs that are certified as training facilities for intensive care specialists have a positive effect on mortality in Japan.

Competing interests

None declared.

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Importance of ambulance utilization for administration of tissue plasminogen activator for acute ischemic stroke

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Introduction

The administration of intravenous tissue plasminogen activator (t-PA) is an effective treatment for acute ischemic stroke if provided promptly. Since its application was approved in October 2005 in Japan, the number of use increases, however, overall use remains small.

Because the use of t-PA use is dependent on the elapsed time after stroke onset, emergency medical service infrastructure is an important factors to be considered in an analysis. Although several previous studies have addressed such a factor influencing t-PA administration, these studies have generally been conducted using relatively small sample sizes.

In this study, we analyze factors associated with t-PA administration using a large-scale administrative database, considering case-mixes adjusting patients stroke severities.

METHODS

In a cross-sectional retrospective analysis, we analyze acute ischemic stroke patients admitted between July 2010 and March 2011 using administrative claims data submitted by hospitals throughout Japan participating in the Quality Indicator/Improvement Project (QIP). We used a logistic regression model to analyze the factors influencing t-PA administration. These candidate factors included patient gender, age, severity of stroke symptoms, and arrival by ambulance. Stroke symptoms at admission included consciousness levels determined using the Japan Coma Scale, and physical impairment levels determined utilizing the modified Rankin Scale scoring system.

RESULTS

We analyzed 11,337 acute ischemic stroke patients from 113 hospitals. We observed 641 (5.7%) of these patients received t-PA treatment. Gender had no association with t-PA administration. Patients aged 75 years or more were found to be associated with decreased t-PA administration. Severe stroke, except for the most severe cases, and ambulance utilization were associated with increased t-PA administration. The regression model had a good level of discrimination with a c-statistic of 0.799.

CONCLUSION

Using a large-scale cross-sectional retrospective analysis of Japanese hospitals, administration of t-PA was found to be significantly associated with age and severity of stroke symptoms. Adjusted by patients' characteristics, administration of t-PA was found to be associated with ambulance use.

Importance of ambulance utilization for administration of tissue plasminogen activator for acute ischemic stroke

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Stroke and t-PA

- Tissue plasminogen activator (t-PA) is a thrombolytic agent
- One of the effective treatments for acute ischemic stroke
  - Approved in 1987 in the US as for AMI
  - additional approval for stroke in 1996
  - Approved in Europe in 2002
  - Approved in Japan in 2005
- Applicable only within a few hours (3h in Japan, ~4.5 in Europe)*
- Opportunities for t-PA administration are restricted
- Utilization remains unsurprisingly low

- Previous studies analyzing the factors affecting t-PA administration were mainly at the hospital or local regional level
- From the social and political perspective, national-level multi-hospital analyses are required to identify these factors in order to improve utilization

**Shinohara Y 2011; Adams Jr. HP 2007; The European Stroke Organization 2008*

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Diagnosis Procedure Combination/Per-Diem Payment System (DPC/PDPS)

- Reimbursement system introduced in Japan in 2003 for acute care hospitals nationwide
- DPC data: uniformly-formatted administrative claims data
  - ➢ Multi-hospital analyses
- From July 2010, additional information
  - – Includes neurological deficits and date of stroke onset in stroke patients
- Analysis of large-scale data while taking into account critical differences in patient case-mix has become possible

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Objective

- To identify factors associated with t-PA administration using a large-scale multi-hospital database
  - – To analyze the effect of ambulance utilization, while adjusting for case-mix, including stroke severity

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Methods

- Cross-sectional retrospective analysis
- Quality Indicator/Improvement Project (QIP) database
  - Administrative claims data is routinely submitted by >300 voluntary participant hospitals throughout Japan
- Acute ischemic stroke patients admitted to QIP hospitals between July 2010 and March 2011
  - Principal diagnosis of stroke detected by ICD-10 code of "I63$", and stroke onset date = date of admission
- Data from only hospitals that had discharged one or more patients with t-PA administration
  - Japanese guidelines recommend their use in hospitals meeting a certain criteria, e.g., with CT or MRI scanners installed, or have Stroke Care Units
- Sample: **11,337 acute ischemic stroke patients** from **113 hospitals**

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Statistical Analysis

- Multivariable logistic regression analysis to identify independent factors associated with t-PA administration
- Candidate factors included patient gender, age, severity of stroke symptoms, and arrival by ambulance
  - Severity of stroke symptoms were analyzed as categories based on the combination of consciousness levels (Japan Coma Scale) and physical Impairment levels (modified Rankin Scale) at admission
- Two-tailed P-values of less than 0.05 indicated statistical significance
- Analysis conducted using SPSS Ver.19.0.0.2

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Results: Characteristics and t-PA Use of Acute Ischemic Stroke Patients

Variables			t-PA use	%	Total
Gender					
	Male		376	5.7%	6,624
	Female		265	5.6%	4,713
Age (years)					
	<65		137	6.0%	2,270
	65-74		157	5.5%	2,841
	75-84		243	6.2%	3,939
	>85		104	4.5%	2,287
Consciousness level and physical impairment level at admission					
	Consciousness	Physical impairment			
	Grade 0 (Alert)				
		Mild	19	0.7%	2,540
		Moderate	53	2.3%	2,283
		Severe	33	9.9%	335
	Grade I (Awake)				
		Mild	18	2.0%	915
		Moderate	132	5.9%	2,234
		Severe	146	11.5%	1,274
	Grade II (Arousable)		182	15.8%	1,153
	Grade III (Unarousable)		58	9.6%	603
Arrival by ambulance					
	No		76	1.5%	5,124
	Yes		565	9.1%	6,213
Total	(113 hospitals)		641	5.7%	11,337

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Results: Multivariable Logistic Regression Analysis of t-PA Utilization

Independent variables			OR	(95%CI)
Gender				
	Male		Reference	
	Female		0.936	(0.78-1.12)
Age (years)				
	<65		Reference	
	65-74		0.721*	(0.56-0.93)
	75-84		0.609***	(0.48-0.77)
	>85		0.308***	(0.23-0.41)
Consciousness level and physical impairment level at admission:				
	Consciousness	Physical impairment		
	Grade 0 (Alert)			
		Mild	Reference	
		Moderate	2.73***	(1.61-4.64)
		Severe	11.78***	(6.55-21.21)
	Grade I (Awake)			
		Mild	2.30*	(1.19-4.41)
		Moderate	7.20***	(4.40-11.78)
		Severe	13.90***	(8.46-22.82)
	Grade II (Arousable)		19.03***	(11.63-31.14)
	Grade III (Unarousable)		10.99***	(6.39-18.90)
Arrival by ambulance			3.85***	(2.99-4.95)

C-statistic: 0.799

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Discussion 1

- Association of increased age and decreased t-PA use were consistent with guidelines*
  - Advising limited indication to older patients
- Effects of the severity of stroke symptoms were also consistent with guidelines**
  - Do not recommend t-PA treatment for patients with minor neurological symptoms, and call caution for patients with major neurological symptoms

**The European Stroke Organization 2008, Ringleb PA 2008*
***Shinohara Y Dis 2011, Adams Jr. HP 2007*

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Discussion 2

- Previous studies have shown inconsistent effects of aging and gender on t-PA use*
- Aging has also been found to be associated with delays in seeking medical help and time to hospital arrival**
- Shorter times to treatment has been found to be associated with higher severity of stroke symptoms**

** De Silva DA 2009, Nagaraja N 2012, Allen NB 2009, Turtzo LC 2008, Singer OC 2012*
*** Chang KC 2004, Gargano JW 2011, Lichtman JH 2009, Hong ES 2011*

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Discussion 3

- Ambulance use was significantly associated with increasing t-PA administration (OR 3.85)
  - ➢ In multi-hospital nationwide database
  - ➢ Adjusting for patient case mix
- Possible effects of ambulance*
  - time before calling the ambulance
  - time during transportation
  - time between arrival and initial diagnosis or treatment
- Our results may underline the importance of improving education and awareness for the general public for using ambulance in suspected stroke cases

** Iguchi Y 2006, Morris DL 2000, Yoneda Y 2001*

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Limitations

- Our administrative data analysis does not include the clinical reasons of non-use of t-PA and the underlying reasons for ambulance use
  - Further studies are desirable to investigate these issues

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Conclusions

- Using a large-scale cross-sectional retrospective analysis of Japanese hospitals, we found that the administration of t-PA was significantly associated with age and severity of stroke symptoms, which are congruent with current guidelines.
- Even after adjusting for patients' characteristics, the administration of t-PA was found to be associated with ambulance use.

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- COI Disclosure
  - The authors have no financial conflict of interest to disclose concerning the presentation

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政策・資源と医療の費用・質

DPC/PDPS 導入の費用･質への影響、薬剤使用の効率改善の余地、療養病床の将来の地域別需給ギャップ、を定量化した。費用の把握方法を多角的に検討した。これらは、医療の資源や費用の管理の関連施策に重要な情報となる。

DPC/PDPS 政策導入の効果

「在院日数・医療費」と「医療の質」を評価

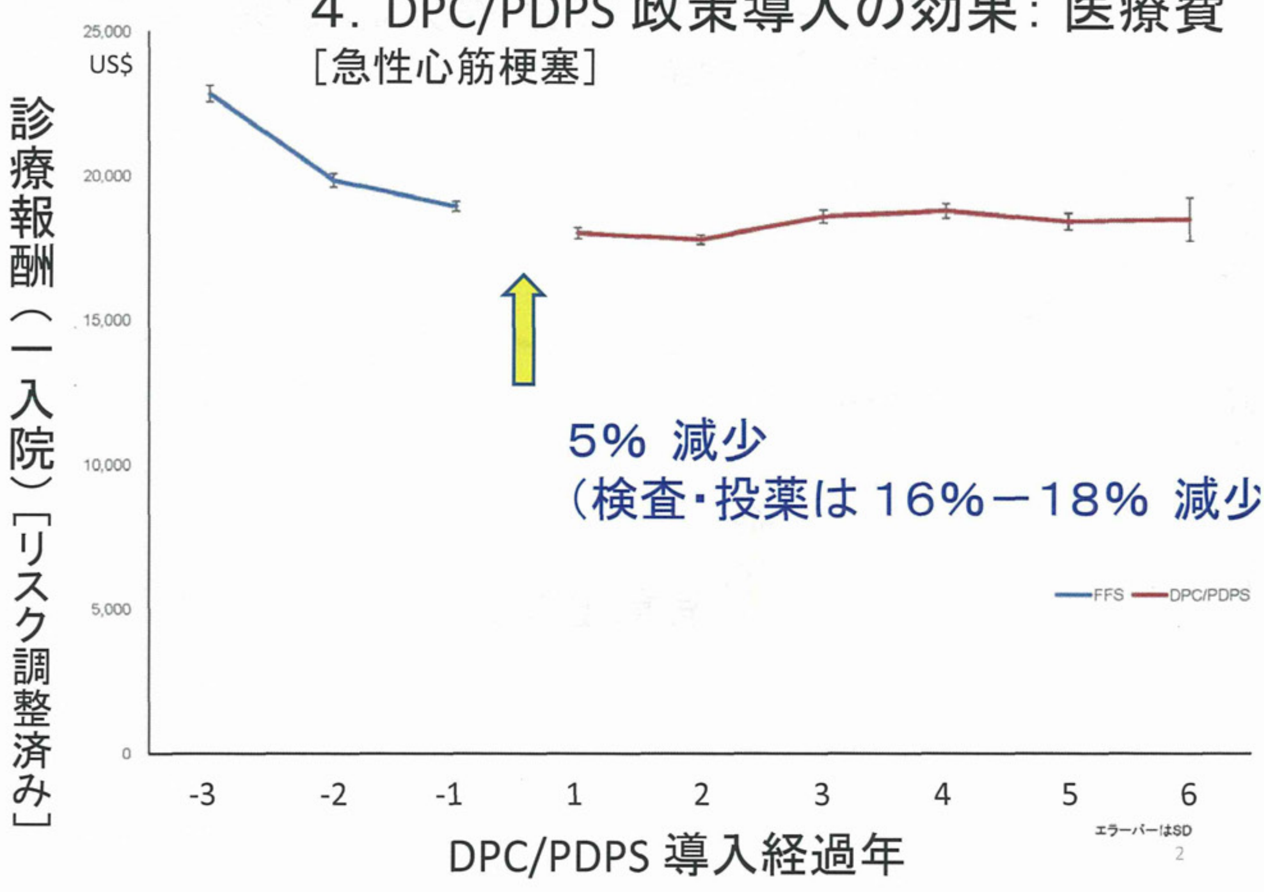
データ: 全国約300病院参加のDPCデータ (QIPプロジェクト)
DPC/PDPS導入前と後、両方のデータを提出した病院
(2001～2009年の急性心筋梗塞 11,159 症例)

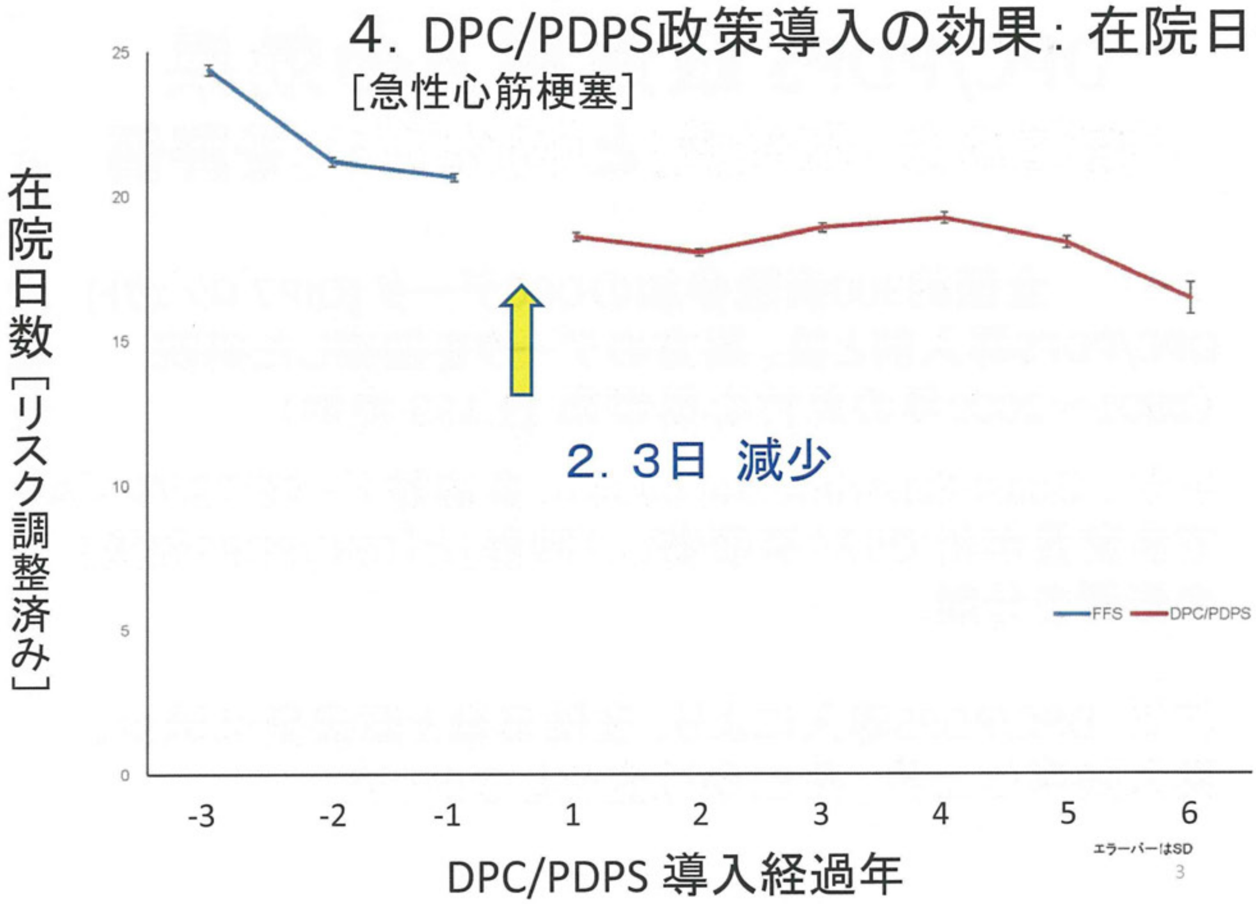
解析: Quasi-Experimental Design. 多施設データをマルチレベルで多変量解析でリスク等調整し、「時勢」と「DPC/PDPS政策」の影響を分離。

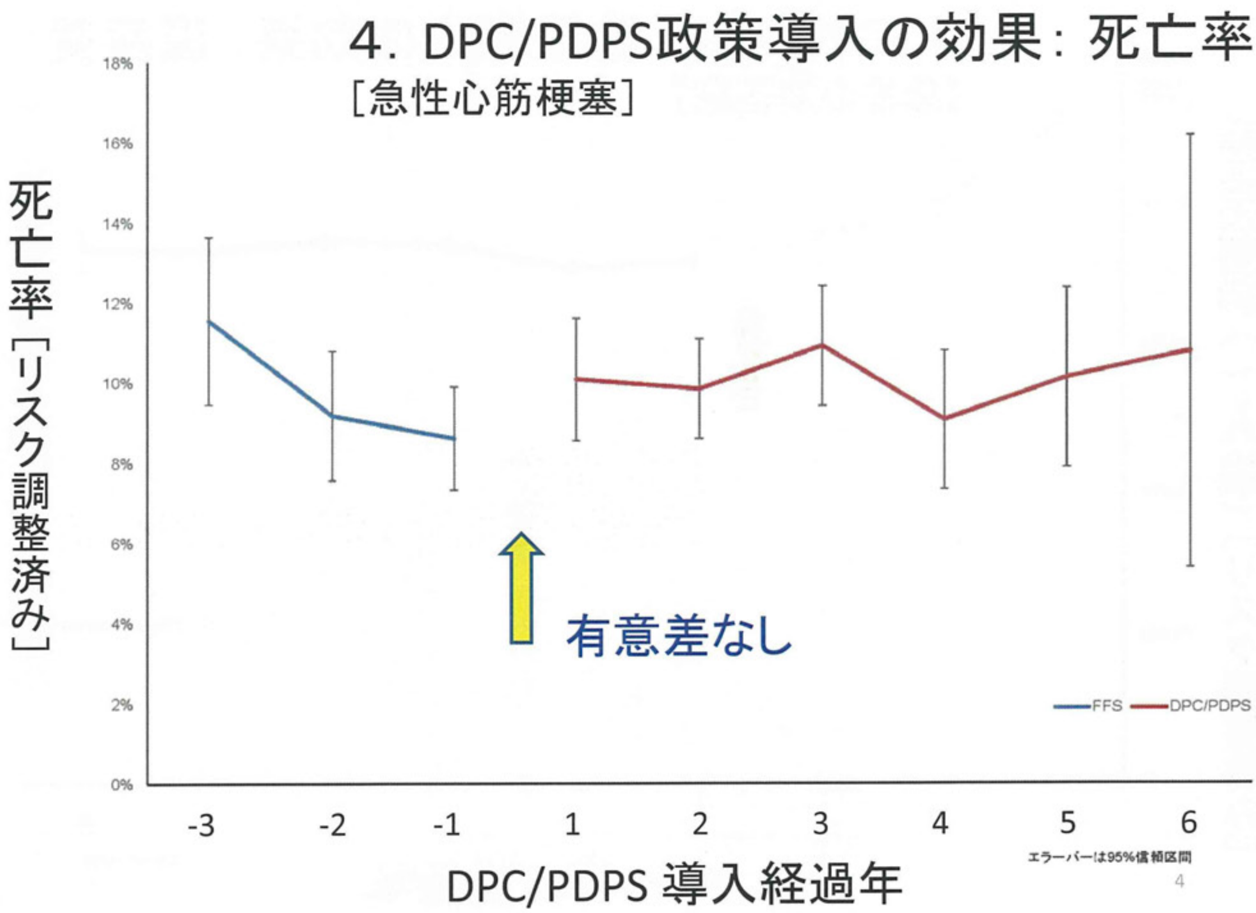
結果: DPC/PDPS導入により、在院日数と医療費は減少、再入院率は上昇、死亡率は変化しなかった。

4. DPC/PDPS 政策導入の効果: 医療費

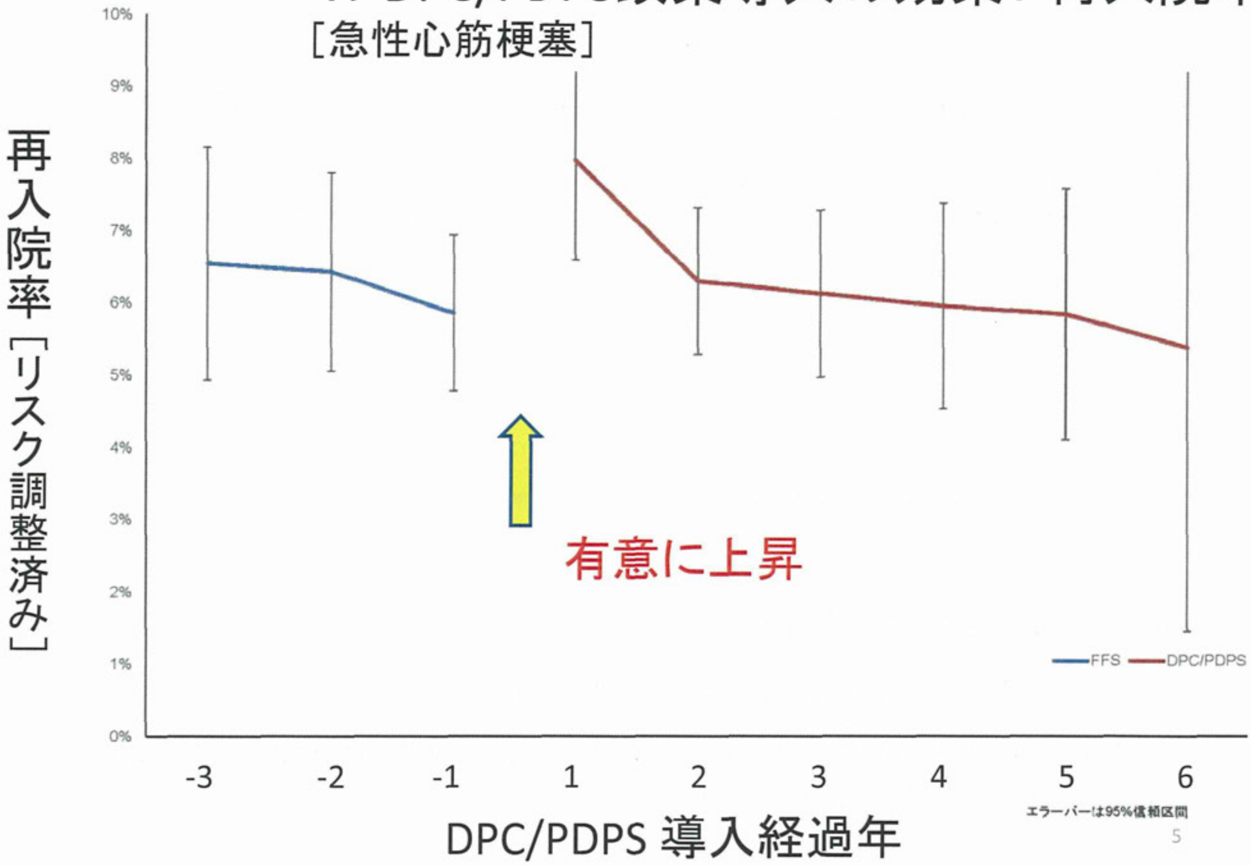
[急性心筋梗塞]




4. DPC/PDPS政策導入の効果：在院日
[急性心筋梗塞]
在院日数［リスク調整済み］
25
20
15
10
5
0
2. 3日 減少
FFS
DPC/PDPS
-3
-2
-1
1
2
3
4
5
6
DPC/PDPS 導入経過年
エラーバーはSD
3


4. DPC/PDPS政策導入の効果：死亡率
[急性心筋梗塞]
死亡率［リスク調整済み］
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
有意差なし
FFS
DPC/PDPS
-3
-2
-1
1
2
3
4
5
6
DPC/PDPS 導入経過年
エラーバーは95%信頼区間
4

4. DPC/PDPS政策導入の効果：再入院率
［急性心筋梗塞］



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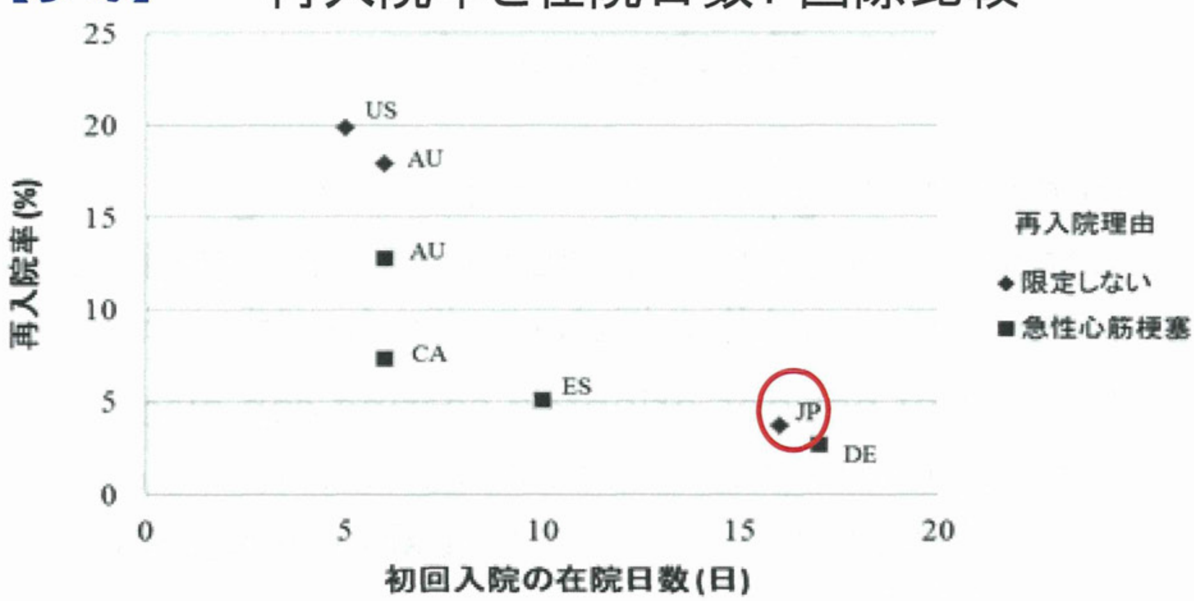
【参考】 再入院率と在院日数：国際比較



国名コード	国名	再入院理由	参照年度	再入院率の引用元*
US	アメリカ	限定しない	2009	U.S. Department of Health and Human Services.
AU	オーストラリア	限定しない	1999-2000	Scott I,et al. Qual Saf Health Care. 2004
AU	オーストラリア	急性心筋梗塞	1999-2000	Scott I,et al. Qual Saf Health Care. 2004
CA	カナダ	急性心筋梗塞	1998	Canadian Institute for Health Information.
ES	スペイン	急性心筋梗塞	1992-1994	Lupón J,et al. J Am Coll Cardiol. 1999
DE	ドイツ	急性心筋梗塞	2000-2006	Schreyögg J,et al. Health Serv Res. 2010
JP	日本	限定しない	2009	Present study

*: 在院日数は、日本を除くいずれの国においてもKaul P,et al. Lancet. 2004.を参照した。

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