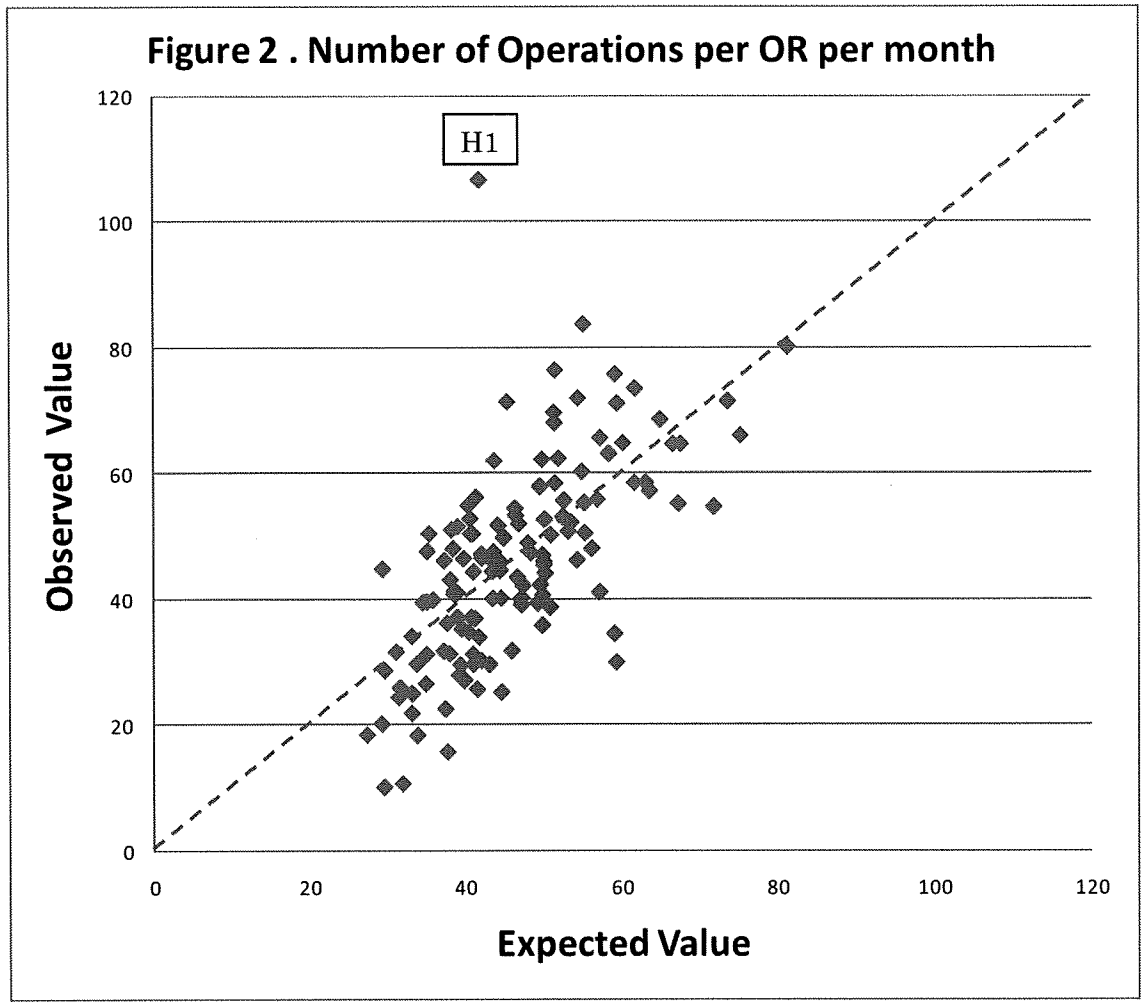
Figure 2 shows the comparison of the observed values and expected values of number of operations per OR per month of each hospital. Hospitals to the left of the main diagonal showed a higher observed number of operations per OR per month than their expected number of operations. Hospitals to the right of the main diagonal had a lower number of operations per OR per month when compared to its expected number of operations. Again, Hospital H1 had a much higher observed number of operations per OR per month than its expected number of operations.



【Discussion】

The OR management assessment method based on the standardized DPC data allows for meaningful multi-institutional comparisons. Comparisons of the expected and observed values of the indicators based on these data may provide greater insight into the target of the fee and the number of surgical operations of each hospital after taking into account inter-hospital variations, and therefore may be used as a tool in target management.

For example, our multi-institutional comparisons have enabled us to identify Hospital H1 as having a high degree of performance with regard to the two indicators that we had used. As such, a possible downstream step would be the quantitative analysis of this hospital, which may help us identify management and other characteristics that could be applied to improving the performance of other hospitals.

【Reference】

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25th PCSI WORKING CONFERENCE

Development of a method for assessing Operating management based on Diagnosis Procedure Combination E and F-file data

Masayuki Tanaka , Miho Sekimoto , Jason Lee , Yuichi Imanka

Dept. Healthcare Economics and Quality Management
Kyoto University Graduate School of Medicine

Background

- Due to rising health costs, hospitals are making efforts to assess and improve management efficiency.
- Operating Room is hi intensing Resources that began to gather more attention recently.

Wang BB et al. J Med Syst 2001
Friedman DM et al.Ann Surg 2006
Marjamaa R et al. Acta Anaesthesiol Scand 2008
Berry M et al. Health care Manag Sci 2008
Macinati MS 2008

- Due to the lack of a common method of assessment based on standardized data available from all hospitals, meaningful comparisons were not conducted

Objective

The objectives of this study were to development a method of assessing Operating Room (OR) management based on standardized administrative data, and to apply this method in assessing and comparing OR efficiencies in a multi-institutional setting.

Methods

- Data

133 hospitals between April 2006 and March 2008
Diagnosis Procedure Combination (DPC) E, F files
(Such as general anesthesia duration and dosages for all medication prescribed)
Standard Surgery Duration from GAIHOREN
The Japanese Joint Committee of Social Insurance
by the Multidisciplinary Group of Surgical Associations

Methods

Indicators for assessing OR management

A) Number of operations per OR per Month
B) Sum procedural fees per OR per Month
C) Procedural fee per operation
D) Total utilization times of each OR per Month
E) Procedural fee per OR per Hour

Results I Descriptive Statistics

Table 1. Descriptive statistics of assessment indexes of operation management

	Mean	*Median*	*SD*	*Min*	*Max*
Number of operations per OR per month	46	46	16	10	107
Sum Procedural fees per OR per month (US$)	76,516	70,388	31,145	11,857	195,546
Procedural fee per number of operations (US$)	1,646	1,583	389	475	3,878
Total utilization time per one OR per month	63	60	27	13	149
Procedural fee per OR per hour(US$)	1,256	1,229	290	793	2,412

US$=96.75 yen (May 2009)

Results Ⅱ
Table2. Association of Indicators for assessing OR management and hospital resources

	Number of operations per OR per month	Sum procedural fee per OR per month
Number of surgeons per OR	**0.629****	**0.594****
Number of OR Nurse per OR	0.263*	0.148
Total number of beds	**0.467****	**0.569****
Mean of Length of Stay	−0.310**	−0.218*
Number of OR	0.268**	0.445**

$*P<0.05$ $**P<0.01$

Methods
Multiple linear regression analysis

Dependent variables

Number of operations per OR per month

Sum procedural fees per OR per month

Independent Variables

Number of surgeons per OR

Total number of beds

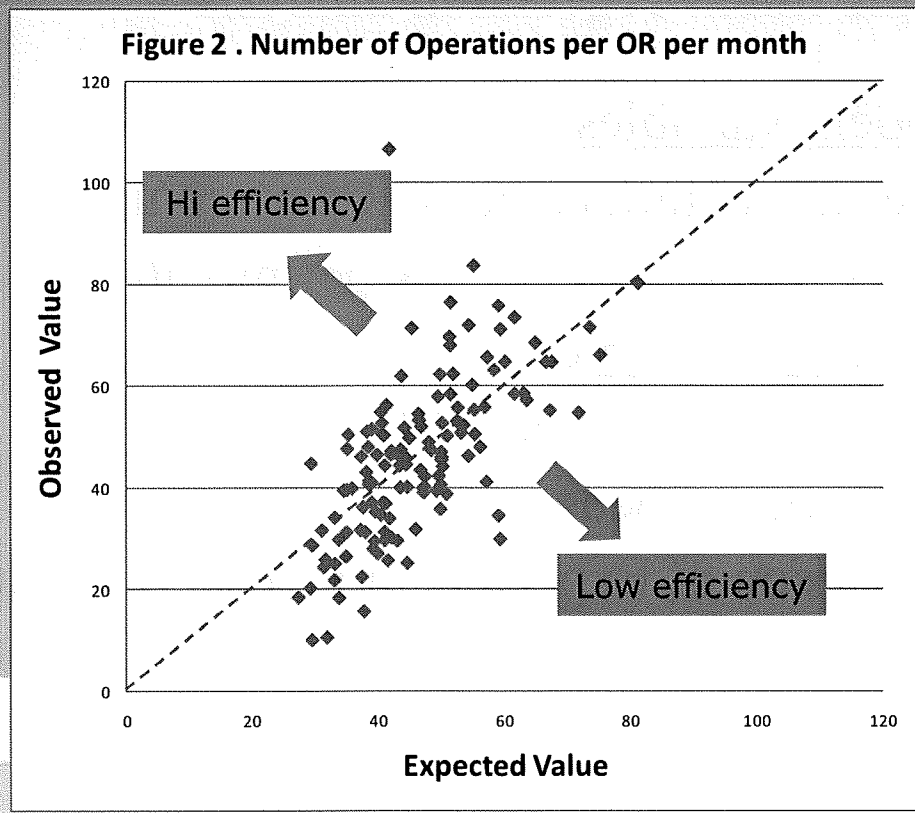
- Comparison of Expected and Observed values

Results Ⅲ Multiple Linear Regression

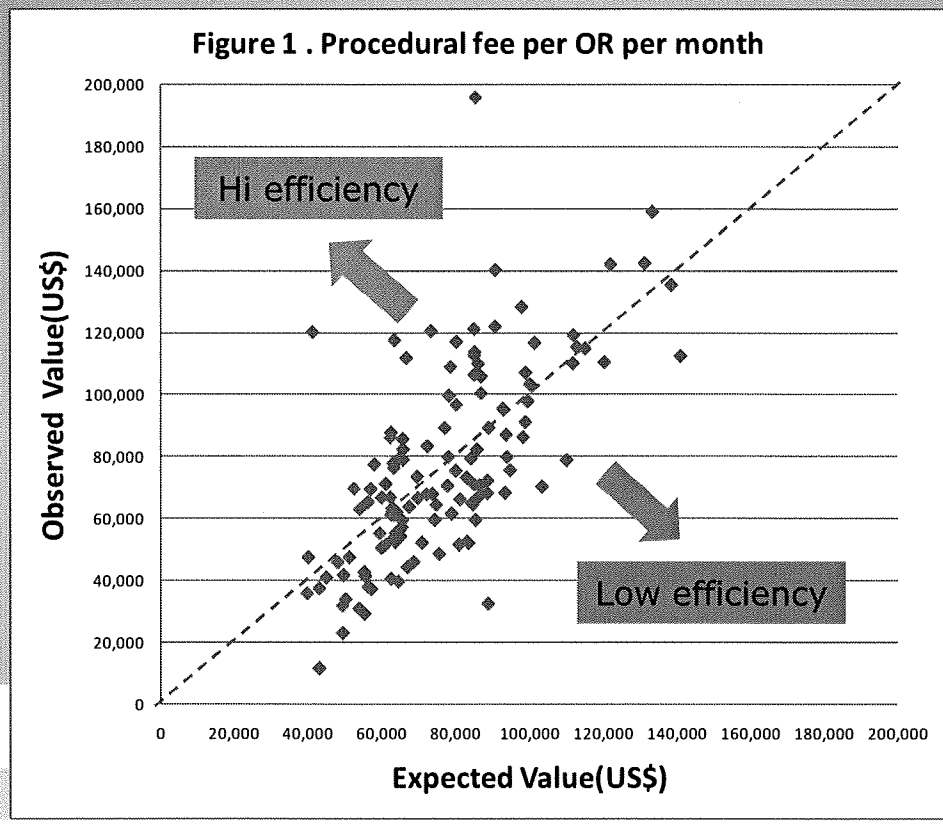
Table 3 Results of Multiple Linear Regression Analysis

		Dependent variable			
		Number of operations per OR per month		*Sum procedual fees per OR per month (US$)*	
		β	*P*	*β*	*P*
Independent variable	*Number of surgeons per OR*	0.217	0.004	0.360	<0.001
	Total number of beds	0.526	<0.001	0.423	<0.001
	R^2	0.453		0.432	

Results Ⅳ
Comparison of observed and Expected Values



Result V
Comparison of observed and Expected Values



Summary of Results

- The mean procedural fee per OR per month :US$76,516
- The mean operations per OR per month: 46 operations
- The mean procedural fee per number of operations: US$1,646
- The mean total utilization time per OR per month: 63 hours
- The mean procedural fee per OR per hour: US$1,256

- All 5 of these indicator showed large inter-hospital variation
- Multi-institutional comparisons have enabled us to identify having a high degree of performance and a low degree of performance

Discussion I

- Comparisons of the expected and observed values of the indicators based on these data may provide greater insight into the target of the fee and the number of surgical operations of each hospital after taking into account inter-hospital resource.
- They may be used as a tool in target management.

Discussion II

- As such, a possible downstream step would be the qualitative analysis of this hospital, which may help us identify management and other characteristics that could be applied to improving the performance of other hospitals.
- The OR management assessment method based on the standardized DPC data allows for meaningful multi-institutional comparisons.

Conclusion

- The indicators

1） Number of operations per OR per Month

2） Sum procedural fees per OR per Month

are associated with hospital resources(Hospital size, Number of surgeons)

- We proposed these value adjusted by the hospital resources as indicators for assessment of OR use efficiency
- They are expected to be useful in setting targets in OR management.

第31回日本手術医学会総会

手術室運営効率性評価を用いた多施設間比較

京都大学　大学院医学研究科　医療経済学分野
田中 将之、関本 美穂、Jason Lee、今中 雄一

Kyoto University Graduate School of Medicine
Healthcare Economics and Quality Management

手術室運営における背景

- 手術室における医療の質の確保には
- 手術室における経済性の確保が前提
- 現状把握・目標設定を通じて
- 改善し、実績を評価する必要がある。

手術室における質

- Structure

  人員、設備等

- Process

  手術、麻酔、看護、スケジューリング、器材準備等

- Outcome

  5年生存率、術後在院日数、再入院率等

Donabedian, A. Medica Care1968

手術室に関する経済性

- <u>手術医療費</u>

  診療報酬⇒出来高払い制

  医療機関の総報酬と手術室報酬は相関関係

- <u>病院経営者の視点</u>

  手術実施件数を増加

  手術報酬の確保

  コストの削減(人件費や材料費等)

- 手術室運営における

  効率性の評価と目標管理

手術室の経済性の評価に関する課題

1）報酬や件数の評価
　各施設の時系列変化
　他施設の手術件数の実績の比較

2）施設間の医療資源には差異がある
　医師数・看護師数・手術室数・病床数が様々

<u>医療資限を考慮した比較に基づく評価が必要</u>

先行研究

- 本邦では、医事データのように全国の病院で利用可能な標準データセットを用い、かつ人員や設備などの資限を考慮した多施設間比較に基づく研究は報告されていない。
- 海外では、手術件数・手術報酬・手術時間を多施設間で比較するツールが近年増加傾向にある。

Wang BB et al. J Med Syst 2001
Marjamaa R et al. Acta Anaesthesiol Scand 2008
Friedman DM et al.Ann Surg 2006
Berry M et al. Health care Manag Sci 2008
Macinati MS 2008

目的

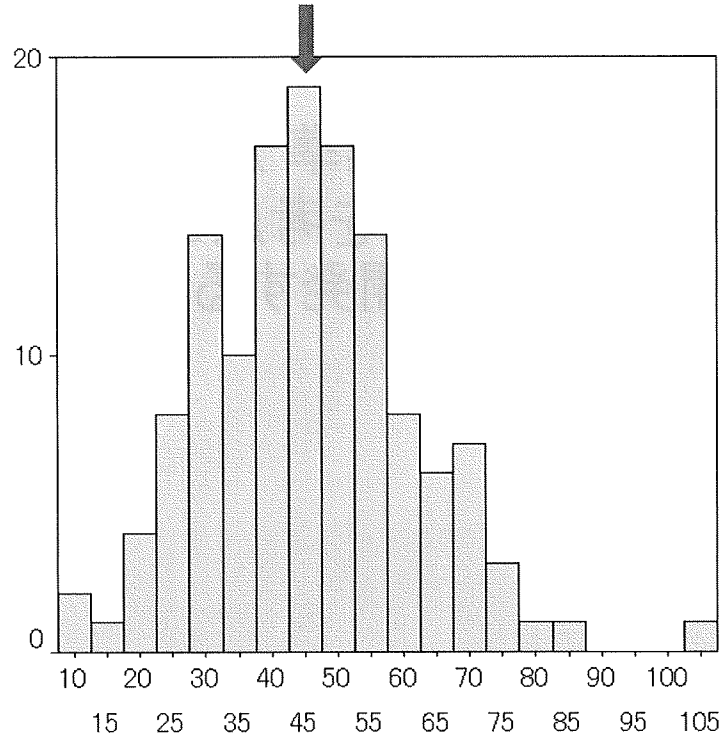
多施設間でも利用可能な標準データセットを用いて、各施設の医療資源を考慮した手術室運営の効率性評価方法を開発すること。

方法

- 対象：当教室　Quality Indicator/Improvement Projectに参加の自治体立、公的、私立の133病院
- 使用データ：DPC E,Fファイル
  ：外科系学会社会保険委員会連合 手術に関する診療報酬標準手術時間
- 期間：2006年4月～2008年3月

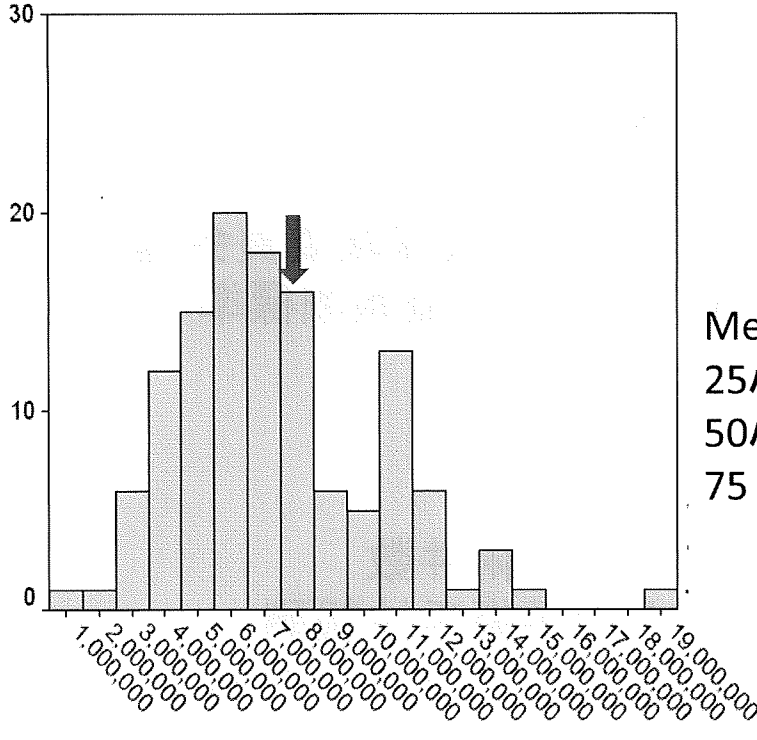
- 算出指標
  1ヶ月1手術室あたりの手術件数
  1ヶ月1手術室あたりの手術手技報酬
  1手術室使用1時間あたりの手術手技報酬
  1手術室あたりの稼働率

1ヶ月1手術室あたりの手術件数



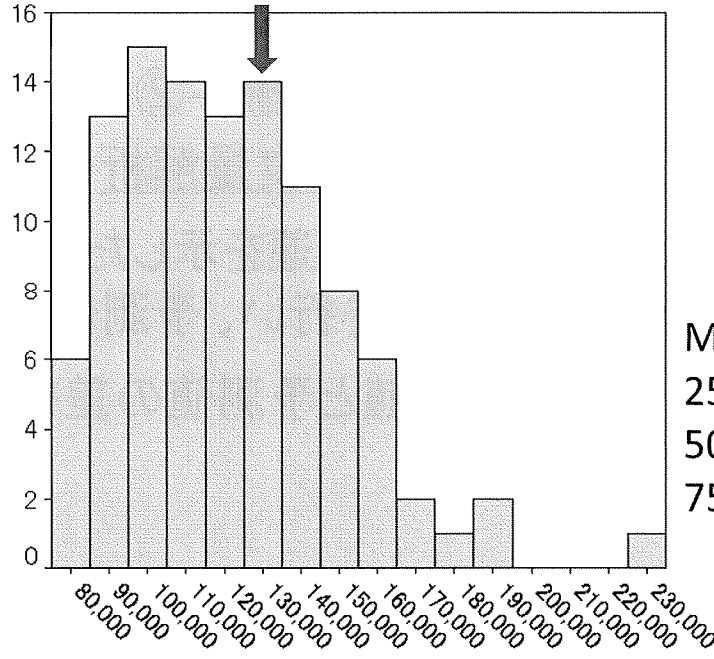
Mean: 46件
25パーセンタイル : 35件
50パーセンタイル: 46件
75 パーセンタイル :55件

1ヶ月1手術室あたりの手術手技報酬(yen)



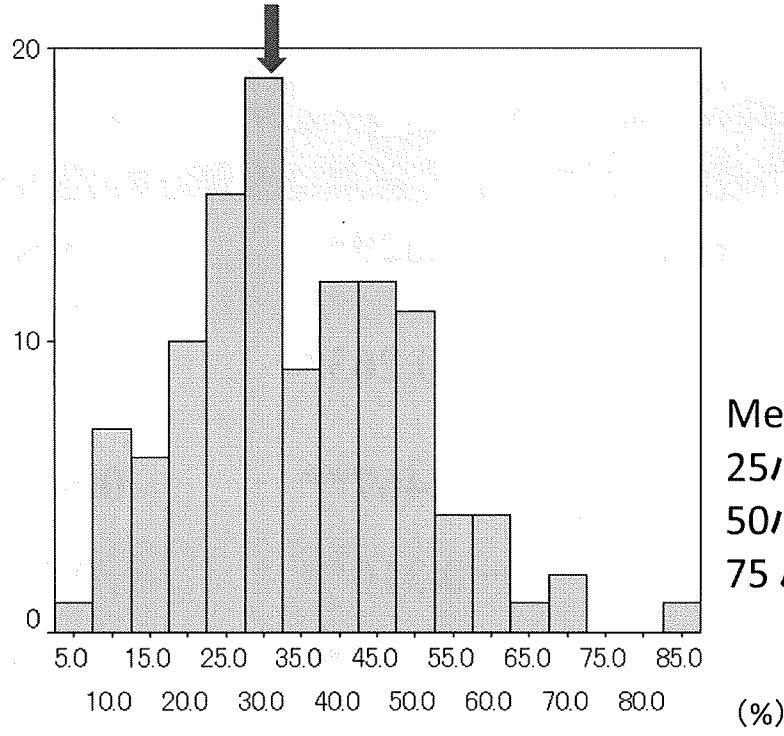
Mean: 7,402,884
25パーセンタイル : 5,221,019
50パーセンタイル: 6,810,085
75 パーセンタイル : 9,414,375

1手術室使用1時間あたりの手術手技報酬(yen)



Mean: 121,511
25パーセンタイル : 98,504
50パーセンタイル: 118,948
75 パーセンタイル : 139,556

1手術室あたりの稼働率(%)



Mean: 34.5%
25パーセンタイル : 24.5%
50パーセンタイル: 32.1%
75 パーセンタイル : 44.4%

解析方法

1）1ヶ月・1手術室あたりの手術手技件数—①
1ヶ月・1手術室あたりの手術手技報酬—②
上記変数と各施設資源を用いた単変量解析

2)上記変数①、②を目的変数とし、関連を示した資源情報を説明変数とする重回帰分析を行い、予測値を算出。

3）実測値と予測値の比及び実測値と予測値の差を用い、多施設間で比較した。

結果
評価指標と医療資源　単変量解析

	1ヶ月・1手術室あたり手術件数	1ヶ月・1手術室あたり手術手技報酬
外科系医師数／手術室数	**0.629****	**0.594****
手術室看護師数／手術室数	0.263*	0.148
病床数	**0.467****	**0.569****
平均在院日数	−0.310**	−0.218*
手術室数	0.268**	0.445**

＊$P<0.05$　＊＊$P<0.001$

手術室運営効率性評価指標
予測値の算出方法

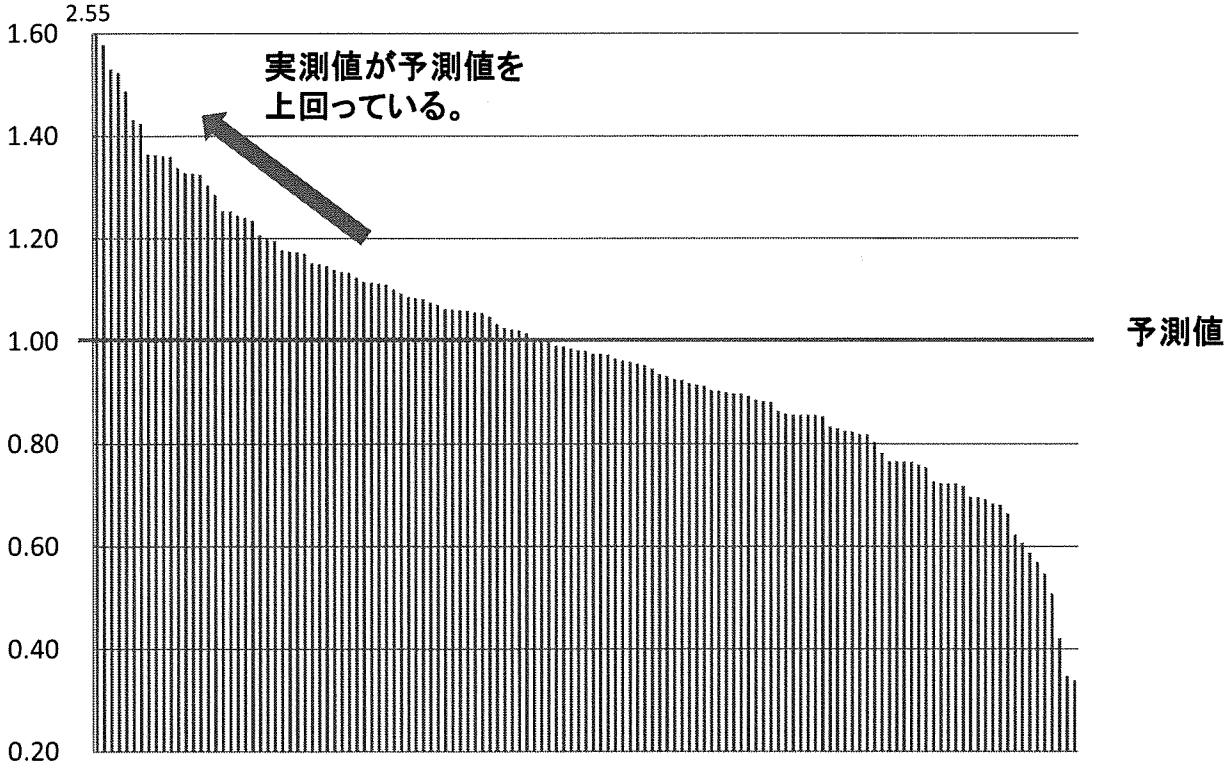
目的変数:1ヶ月・1手術室あたりの手術件数
1ヶ月・1手術室あたりの手術手技報酬

説明変数: 外科系医師数／手術室数
病床数

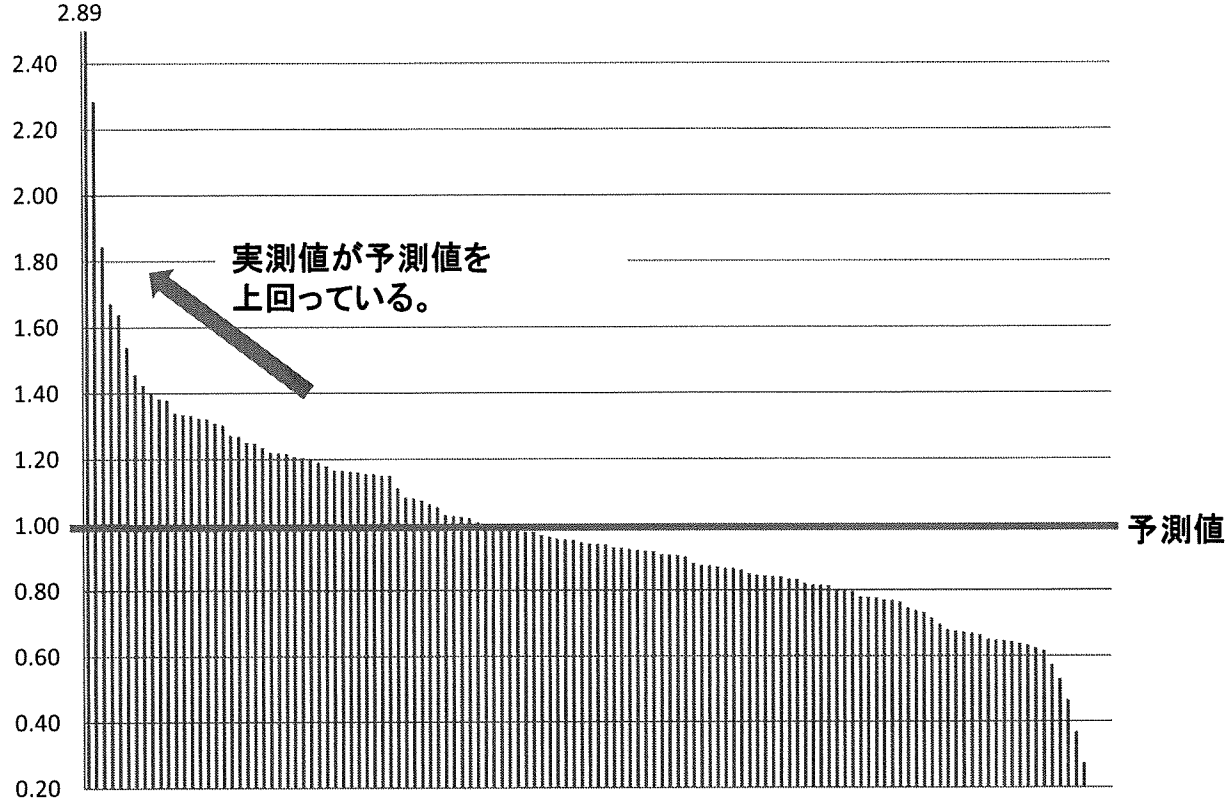
OE比= 実測値(Observed Value)／予測値(Expected Value)

OE差= 実測値(Observed Value)－ 予測値(Expected Value)

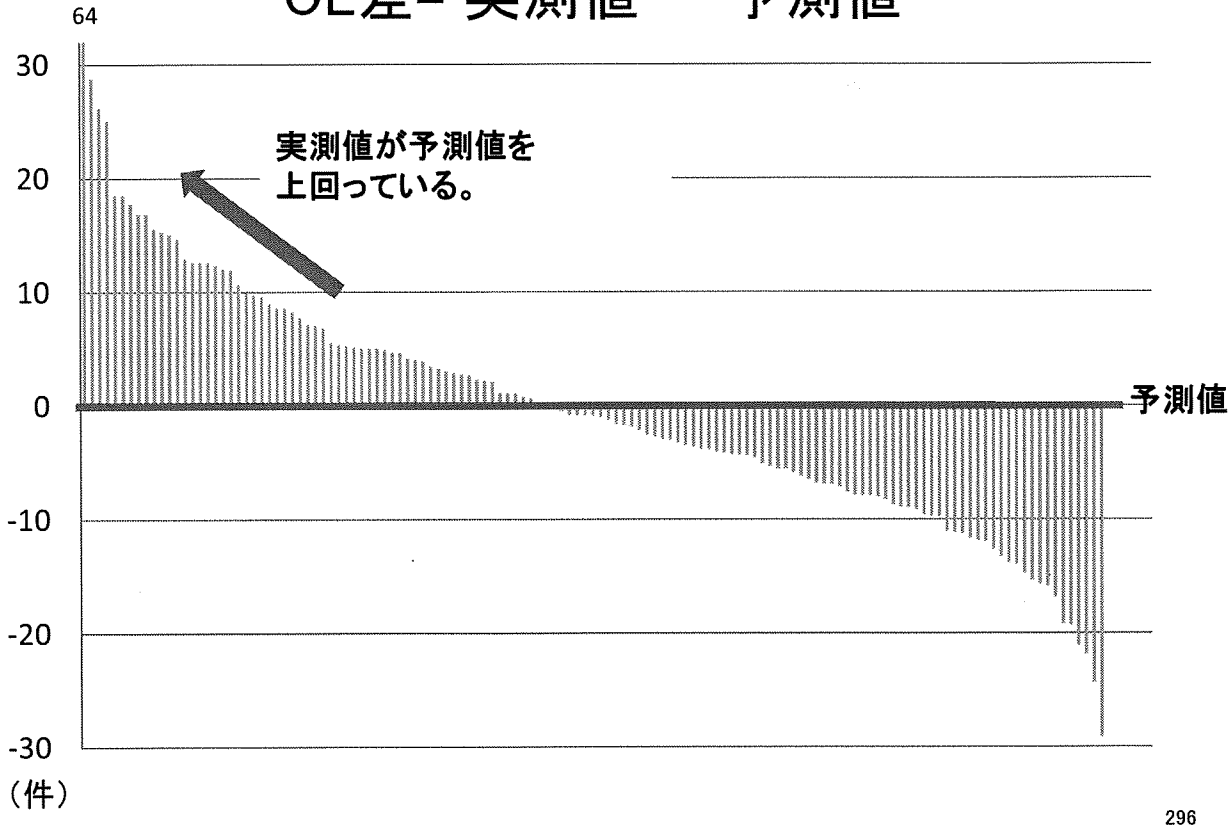
1ヶ月1手術室あたりの手術件数
OE比= 実測値 /予測値



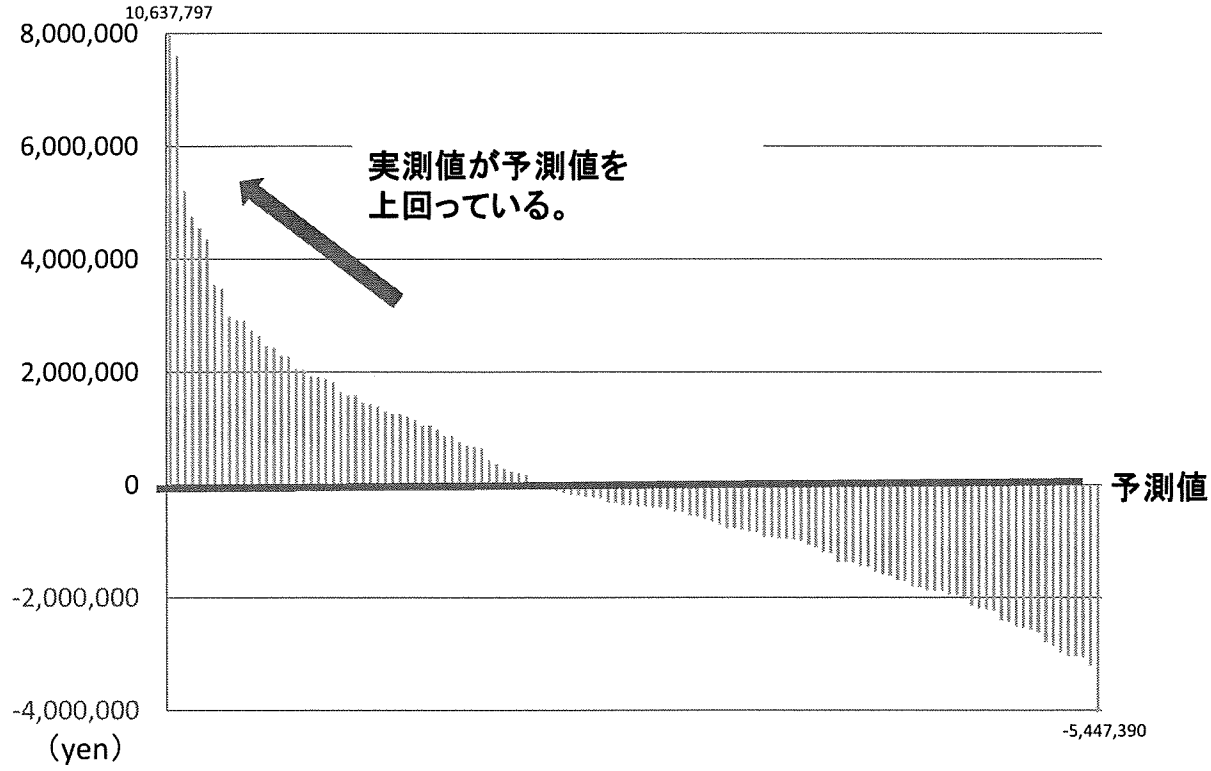
1ヶ月1手術室あたりの手術手技報酬
OE比= 実測値 /予測値



1ヶ月1手術室あたりの手術件数
OE差= 実測値 － 予測値



1ヶ月1手術室あたりの手術手技報酬
OE差= 実測値 － 予測値



結果のまとめ

- 各指標の平均値

  1ヶ月1手術室あたりの手術件数　46件

  1ヶ月1手術室あたりの手術手技報酬　7,402,884円

  1手術室使用1時間あたりの手術手技報酬 121,511円

  1手術室あたりの稼働率　34.5%

- 手術室の報酬や件数は、外科系医師数／手術室数、病床数、つまり、人的資源や施設の規模に影響がある。