

## **DETERMINANT FACTORS OF HOSPITAL'S PRICES WITH INA-CBGs PRICES FOR THYPOID FEVER**

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### **Abstract**

*Thyphoid fever was first rank of the top 10 disease hospitalizations at An-nisa Hospital. Still founded differences between hospital's price and INA-CBGs price, which can be impact to hospital's finance. The purpose of this study is to analyse determinant between hospital's price and INA-CBGs price and analyse influence factor of hospital's price. The study focus was hospitalize of thyphoid fever without complication at An-nisa Hospital. Research design is corelational-comparatif study. The number of sample was 320 medical record. Normality test was analyse with kolmogorov-smirnov test, correlational was analyse with spearman test and comparative test with wilcoxon test. The result showed that founded differences between hospital's price and INA-CBGs price, specially at medical fee, drugs cost, and others cost. The significant differences caused by difference way to count price, Hospital's price was based on unit cost. Meanwhile, INA-CBGs price was count by mean hospital's price from certain hospital. The result also founded correlation between accomodation, others cost, medical fee, drugs cost and supporting examination with hospital's price. The implication of this study is need more control of clinical pathway implementation, periodic audit of clinical pathway implementation and maximised function of case manager to cost control dan quality control of healthcare service.*

**Keyword** : *Determinant factors, Hospital's price, INA-CBGs price, demam tifoid*

### **Abstrak**

*Demam tifoid menduduki peringkat pertama dari 10 penyakit terbanyak di instalasi rawat inap RS An-nisa. Masih terdapatnya kesenjangan antara tarif RS dengan tarif INA-CBGs akan berdampak terhadap keuangan rumah sakit. Tujuan penelitian ini adalah untuk mengkaji determinan tarif RS dengan tarif INA-CBGs dan mengkaji faktor yang mempengaruhi tarif RS pada pasien dengan demam tifoid. Fokus studi adalah pasien rawat inap dengan diagnosa demam tifoid tanpa komplikasi di RS An-nisa Tangerang. Disain riset adalah riset korelasional-komparatif. Jumlah sampel adalah 320 rekam medis pasien. Dilakukan uji normalitas data dengan kolmogorov-smirnov test, uji korelasi dengan uji spearman dan uji komparatif dengan uji wilcoxon. Hasil penelitian menunjukkan bahwa terdapat perbedaan antara tarif RS dan tarif INA-CBGs, yaitu pada jasa medis, biaya obat-obatan dan biaya lain-lain. Perbedaan bermakna ini disebabkan perbedaan cara perhitungan tarif. Tarif RS ditentukan berdasarkan unit cost sesuai dengan clinical pathway RS. Sedangkan tarif INA-CBGs berdasarkan rata-rata biaya perawatan di RS setara berdasarkan standar cost regulasi. Terdapat hubungan antara akomodasi, biaya lain-lain, jasa medis, obat-obatan dan pemeriksaan penunjang dengan tarif RS. Implikasi dari penelitian ini adalah diperlukan pemantauan lebih baik terhadap clinical pathway, audit rutin pelaksanaan clinical pathway, serta memaksimalkan fungsi manajer pelayanan pasien dalam cost control dan quality control pelayanan pasien.*

**Kata kunci** : *Faktor determinan, tarif RS, tarif INA-CBGs, demam tifoid*

## **Introduction**

Typhoid fever was systemic infection that caused by *Salmonella enterica* serovar *typhi* (*S typhi*). It caused approximately 21.6 millions cases with 216.500 death in 2000. Incident of typhoid fever was high at Central Asia and South Asia, Southeast Asia and probably South Africa (Nelwan, 2012). In Indonesia, typhoid must get serious attention from various parties, because this disease is endemic and threatens public health. The problem was increasingly complex with the rise of carrier cases or relapse and resistance to the drugs used, making it difficult for treatment and prevention (Purba, Wandura, Nugrahini, Nawawi, & Kandun, 2016). The national prevalence for typhoid fever based on the basic health research results in 2007 was 1.60% with a range of 0.3% -3%. Banten Province is a province that has a prevalence above national prevalence (Departemen Kesehatan RI, 2007).

An-nisa Hospital is type C hospital that located in Tangerang, Indonesia. This hospital is role model hospital for implementation of national insurance in Indonesia. Typhoid fever was top first hospitalize disease at an-nisa hospital. In 2017, there was 1058 hospitalize typhoid fever case. The case of typhoid fever costs Rp. 3,440,122,246 in 2017 while the INA-CBGs price is Rp. 2,818,864,400, so there is a negative balanced of Rp. 621.257,846. The average hospital price for typhoid hospitalized at An-nisa Hospital in 2017 was Rp. 3,144,016. While the INA-CBGs prices for typhoid are included in the A-4-14 I grouping of other bacterial and parasitic infections (mild) for class III Rp.2,174,000, class II Rp.2,609,600, class I Rp. 3,044,500 (Peraturan Menteri Kesehatan RI No 76, 2016). Based on the data above, it can be concluded that the average price of hospitalize typhoid fever at An-nisa Hospital are higher than the INA-CBGs prices, even for the highest rates in class 1.

Still founded differences between hospital's rate and INA-CBGs rate, which

can be impact to hospital's finance. Unit costs are important for hospitals to determine hospital prices so that good prices can be obtained for services to patients at competitive prices. Based on that researcher was interested to study about analyse determinant between hospital's rate and INA-CBGs rate and analyse factors influence factor of hospital's rate. So we know which component that can significant impact to hospital's rate. Its purpose to control hospitalize cost.

## **Literature Review**

### **Cost**

The definition of costs is very diverse which is raised by several experts, including, according to Hansen (2009) costs are cash or the value of cash equivalents that are sacrificed to obtain goods or services that are expected to provide benefits today or in the future for the organization (Hansen & Mowen, 2009).

Costs can be classified in many ways, depending on the purpose of the analysis to be achieved. However, it is necessary to make equal perceptions among the parties concerned to prevent misunderstanding about costs incurred due to health services.

### **Hospital's Price**

Prices are rate in the value of money that consumers must pay to obtain or consume a commodity, namely goods or services. According to the Decree of the Minister of Finance No. S.60 / MK.011 / 1987 The definition of prices is part or all of the cost of carrying out medical and non-medical service activities that are charged to the community in return for the services they receive.

Hospital's price are benefits received by hospitals for services from non-service and non-service activities provided to service users. The prices of hospitals managed by the private company is determined by the head of the hospital or hospital director with the approval of the hospital owner (Armen &

Azwar, 2013). Hospital prices for service activities are calculated based on the components of service facilities and services in outpatient, inpatient and emergency care.

1. Components of means of services are compensation received by hospitals for the use of accommodation, non-medical materials, medicines, consumable materials / medical devices that are used directly in the framework of medical services and medical support services.
2. The service component is the reward received by service providers for services provided to patients in the context of medical services, medical support services and / or other services (Peraturan Menteri Kesehatan RI No 85, 2015).

### **INA-CBGs**

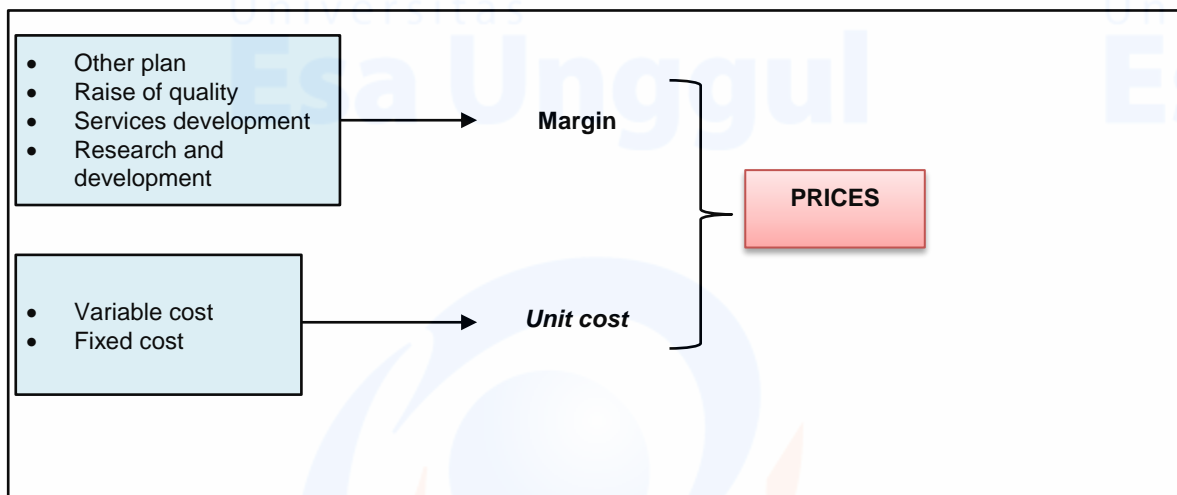
INA-CBGs or Indonesia Case-base Groups was a special casemix system developed by the United Nations University-International Institute for Global Health (UNU-IIGH), for the Ministry of Health of the Republic of Indonesia. UNU-IIGH is a research and

training center from United Nations University, one of the United Nations (United Nations) shade institutions.

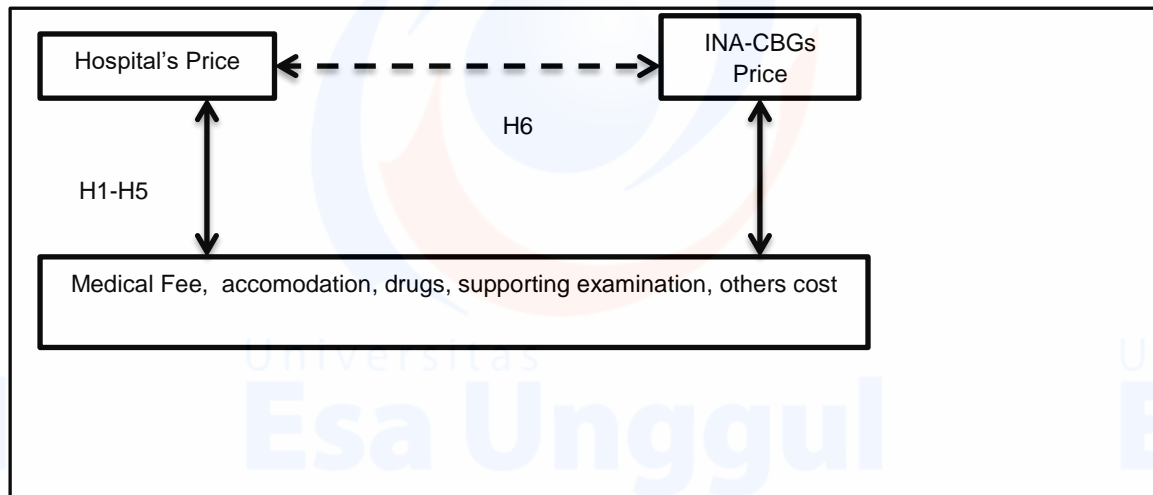
INA-CBGs were patient grouping systems based on specific cases and are not limited to diagnosis. Other factors used for this grouping include procedures for services, medicines, investigations, prostheses, and outpatient packages. Each group of INA-CBGs will have the same resources. INA-CBGs are developed for provider payments under the social insurance system for the poor or Jamkesmas in Indonesia. Patients in each group of INA-CBGs will need approximately the same costs, where they also have a similar clinical appearance (Aljunid, 2013).

### **Clinical Pathway**

Clinical pathways (CP) are structured multidisciplinary care plans used in health services to specify important steps in certain clinical problems. CP is a tool that has been used as evidence-based health service guidelines. CP has been implemented internationally since the 1980s (Kinsman, Rotter, James, Snow, & Willis, 2010; Rotter et al., 2010)



Picture 1  
Cost Theory Concept  
Source : (Armen & Azwar, 2013)



Picture 2.  
Research Model

**Hypotheses**

- H1 : there is a correlation between medical fee and hospital price.
- H2 : there is a correlation between accomodation and hospital price.
- H3 : there is a correlation between drugs and hospital price.
- H4 : there is a correlation between accomodation and hospital price.
- H5 : there is a correlation between supporting examination and hospital price.
- H6 : there is a differences between hospital price and INA-CBGs price.

**Methods**

This study was quantitative study with correlational-comparative type. Population of this study was medical record with criteria hospitalize typhoid fever without complication in January-June 2017. Population of this study was 580 medical record. Sample choose with purposive sampling technique. Sample of this study was 320 medical record. Data was analyse with SPSS 24.0, correlational test with spearman test, and comparative study with wilcoxon test.

**Result**

**Patient's Characteristic**

From studied of 320 medical record, 39,4% was man and 60,6% was woman. Furthermore, from range of age, showed that most of thypoid fever occured at people with school age, 5-14 years old (34.4%). Meanwhile rest of other sample showed that 21.6% was pasien with age 1-4 years old, 17.8% patient was 15-24 years old, 14.4% patient was 25-34 years old, 8.1% patient was 35-44 years old, 1.9% patient was 45-54 years old, 1.3% patient was less than 1 years old and 0.6% patient was 55-64 years old. No patient in range 65-74 years old and above 75 years old.

The result from this study was appropriate with distribution of typhoid fever patient at Banten Province, Indonesia. Which is most of thypoid fever patient was in age's range 5-14 years old. This result was appropriate with prevalence of typhoid fever at Tangerang City, which is the most of typhoid fever's patient was in school age.

Based on room's type, showed that from 320 patient, there was 71.9% patient at type II, 14.7% patient at room type I and 13.4% patient at room type III. Result of study also showed that from 320 medical record, minimum lenght of stay (LOS) was 2 days, maximum was 10 days, mean 4 days.

Descriptive Statistic

Table 1  
Descriptive Analysis of Variable's Study

Variable	Minimum	Maximum	Mean	Std. Deviation	Proportion to Hospital's Price
Fee of medical staff	466.155	1.958.702	792.109	167.417	26%
Accommodation	400.000	5.400.000	1.073.672	535.960	35%
Drugs	166.043	2.532.428	669.619	324.220	22%
Supporting Examination	0	1.063.000	284.025	177.910	9%
Others	0	748.714	230.224	87.681	8%
Hospital's Price	1.418.613	10.073.893	3.049.648	1.025.158	
INA-CBGs Price			2.567.527		

Based on table 1, showed that mean hospital's rate was bigger than INA-CBGs rate. So there was negative balance amount Rp 482.122. This was still can accepted because An-nisa Hospital take profit margin approximately 30%, which already counting to hospital's rate. So that based rate to typhoid fever is approximately Rp 2.134.754. If we compared to INA-CBGs rate (Rp 2.567.527), there was positif balance about Rp 423.773.

The top first proportion of hospital's rate was accommodation (35%), followed by fee of medical staff (26%), drugs (22%), and then supporting examination (9%), and the last one was others (8%). Accommodation has the biggest proportion of hospital's rate, it caused that cost covered room charge, electrical cost, water cost, maintenance cost and reduction cost.

**Normality Test with Kolmogorov-Smirnov Test**

Based on result of normality test with Kolmogorov-Smirnov test showed that all variable has abnormal distribution, so statistics test was done with non parametric test, correlation analysis with rank spearman test and comparison analysis with Wilcoxon test.

**Hypotheses Test**

1. Correlation Analysis with Spearman Test

Based on result of spearman test between medical fee and hospital's price, showed that p-value 0,000, it means medical fee and hospital's price have significant correlation. Value of spearman correlation is 0,695, it means positive correlation and moderate of strength correlation value. Meanwhile, spearman test between accommodation and hospital's price showed that p-value 0,000, it means accommodation and hospital's price have significant correlation. Value of spearman correlation is 0,857, it means positive correlation and strong of strength correlation value. Meanwhile, spearman test between drugs and hospital's price showed that p-value 0,000, it means drugs and hospital's price have significant correlation. Value of spearman correlation is 0,719, it means positive correlation and moderate of strength correlation value.

Meanwhile, spearman test between supporting examination and hospital's price showed that p-value 0,000, it means supporting examination and hospital's price have significant correlation. Value of spearman correlation is 0,560, it means positive correlation and moderate of strength correlation

value. Meanwhile, spearman test between other cost and hospital's price showed that p-value 0,000, it means other cost and hospital's price have significant correlation. Value of spearman correlation is 0,933, it means positive correlation and strong of strength correlation value.

## 2. Comparison Analysis with Wilcoxon Test

From result of Wilcoxon test of hospital's price and INA-CBGs price, showed that p-value 0,000, because  $p < 0,005$ , so statistically there is significant differences between hospital's price and INA-CBGs price. After that, researcher continue to studied factors that make differences. So the Wilcoxon test was carried out between the components of hospital's price and component of INA-CBGs price.

Based on result of Wilcoxon test showed that differences component of hospital's price and INA-CBGs price is medical fee, drugs and other cost. Mean while there is no significant differences in component of accommodation and supporting examination.

## Discussion

After proven of hypotheses in this study, founded that there was significant differences between hospital's rate and INA-CBGs rate, component that caused significant differences was fee of medical staff, drugs and others cost. Medical fee on this studied was fee of medical specialist's visit, fee of general practitioner, nursing services fee and other fee of medical services as long as hospitalization. The longer length of stay, the higher cost of medical specialist's visit, fee of general practitioner, nursing services fee and other fee of medical services. The result of the descriptive analysis showed that length of stay patient with typhoid fever in An-nisa Hospital was large variation, between 2 days to 10 days, with means length of stay is 4 days. This affects the amount of medical service cost for patients. So that in the end it will also affect hospital's prices. Therefore, the implementation of

clinical pathway with function of planning, implementing, monitoring, and evaluating medical service for typhoid fever patients is very important to control the length of stay and the cost of medical services.

This significant differences caused by differences way to count rate in hospitalize typhoid fever. Hospital's rate make by hospital based on unit cost with basic standard cost appropriate with hospital's clinical pathway. Meanwhile INA-CBGs rate fixed by mean of hospital's prices that not covered all hospital's prices. So it can caused variation of hospital's prices. Cost component that has significant correlation to hospital's rate was accommodation, others cost, drugs, fee of medical staff, and supporting examination. Accomodation and others cost has strong correlation with hospital's rate, meanwhile drugs, medical staff fee and supporting examination has moderate correlation.

The cost of accommodation in this study was the cost of facilities for patient's room that were worn every day as long as patient is treated. The longer length of stay, the higher cost of accommodation. The result of the descriptive analysis showed that length of stay patient with typhoid fever in An-nisa Hospital was large variation, between 2 days to 10 days, with means length of stay is 4 days. This greatly affects the cost of accommodation in typhoid fever patients. Therefore, the implementation of clinical pathway with function of planning, implementing, monitoring, and evaluating medical service for typhoid fever patients is very important to control the length of stay. so that it can reduce the cost of accomodation .

Composition of accommodation costs by 35%, was the largest composition because the accommodation costs include room rent, electricity costs, maintenance costs and building depreciation. In this study it can be concluded that accommodation is a factor that greatly determines the amount of hospital's prices. The greater cost of accommodation, the greater hospital's prices. Control length of stay has

significant influence to control hospital's prices. So very important, all medical professional must take part to medical care based on clinical pathway.

### **Conclusion**

Medical fee, accommodation, drugs, supporting examination and other costs has significant correlation with hospital's price. Accommodation and other costs has strong of strength correlation value, meanwhile medical fee, drugs and supporting examination has moderate of strength correlation value. There is significant differences between hospital's price and INA-CBGs price. Component that make significant differences is medical fee, drugs and other costs. It cause by differences way to count rate in hospitalize typhoid fever. Hospital's rate make by hospital based on unit cost with basic standard cost appropriate with hospital's clinical pathway. Meanwhile INA-CBGs rate fixed by mean of hospital's prices that not covered all hospital's prices. So it can caused variation of hospital's prices. Suggestion, Hospital need to build team of Anti Microbial Resistance Control Program to prevent antimicrobial resistance caused by antibiotic that not based on standard. Because the review estimated that antimicrobial resistance (AMR) could cause 10 million deaths a year by 2050 (de Kraker, Stewardson, & Harbarth, 2016). Fixed minimum standard of length of stay in clinical pathway, so it can reduce readmission risk and patient treatment not only cost effective but also good quality. Clinical Pathway must be obeyed by all paramedics, to make patient care straight to the standard. Measuring real cost with ABC methods to see all treatment activity appropriate with clinical pathway standard. Measuring financial hospital's work in national insurances era not only by negative balance of hospital's rate and INA-CBGs rate but with counting balance of unit cost in patient's treatment with INA-CBGs rate. Because hospital's rate was sum of unit cost plus margin that hospital's wanted. So that negative balance not

certain make deficite. Using six sigma methods in hospital's management to reduce variation in hospitalization. To next researcher, suggestion to analyse differences real cost of hospital with INA-CBGs rate, using unit cost of hospitalization.

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