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The Implementation Of Indonesian Case-Based Groups (Ina-Cbg) Of Cesarean Section Patients In Poor Family Health Payment Assurance In Undata Hospital Of Central Sulawesi, Indonesia

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Abstract **-** Indonesian case-based groups (INA-CBG'S) was a payment system of health care for cesarean section patients indicative of pregnancy and laboring complication or case mix complication based on disease group. The payment system was in a package of fee for service and prospective payment system in which government provides those in poverty with health assurance.

The study aimed at finding out the patient action unit cost paid by government and the merit and the advantage and the implication of the policy of the implementation of Indonesian case-based groups (INA-CBG) in Indonesia. It used epidemiologic non-experimental design that examined the correlation of the risk factor and the effect of diseases in pregnancy with 62 respondents and its location was Undata Hospital of Central Sulawesi province. The results of the study showed that there were two indications of emergency type and effectiveness of cesarean section, viz.: 1) maternal indication and 2) infant indication. The biggest percentage of pregnant mother (66.7%) consisted of pre-eclampsia (43.5%) and placenta previa (26.7%) and the infant indication of transversal position (33.3%) and risky infant (66.7%). The ability of hospital to pay the cost for the patients because of the presence of the indication of emergency type and effective type at severe complication W/MCC affecting15 respondents with the action cost of $3285, and moderate complication W/CC affecting 20 respondents with the action cost of $3540, and light complication W/C affecting 24 respondents with the action cost of $3840. Thus, the total payment by the hospital for the 62 respondents of those in poverty was US$. The payment ability was classified into three disease groups, while the action cost was $11,145, and the mean action cost per patient was $180. The implementation of government policy of the implementation of INA-case-based groups in Indonesia would avoid over-utilization, unplanned and missed utilization so that the health cost for those in poverty would be more controlled and the quality of the health care for the health of mother and child would be higher in the future.

Keywords - cesarean section, Indonesian case-based groups, people health payment assurance.

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Introduction

Since the implementation of Indonesian diagnosis-related groups (INA DRG) by the Ministry of Health in 2008 and followed by Indonesian case-based groups (INA CBG) there was a transition period in 2011 with the use of the same costing system of the INA DRG. The effect of the change into the INA-CBG in the transition period has been being effective up to the end of December 2015. The health assurance for those in poverty was well-known as *JAMKESMAS* and it was followed by the INA-CBG on the basis of the circular of the Minster of Health of 2011. The circular described how the *Jamkesnas* used the CBGs because 1) CBGs enabled managerial and financial transparency of a hospital, 2) CBGs enabled teams to manage and to control the money expended to pay the health care cost of a hospital. For the payment of the health care cost for the patients in the *JAMKEMAS* the Minister of Health preferred the INA CBG to the INA DRG. It covered: a) prospective payment, b) cost analysis, c) contract model, d) managerial capability such as business planning, and e) the managerial capability to optimize institutional capacity (i.e., all actors) in managing the contract model in the form of expenditures and medical care services, and the CBGs helped the managing teams to predict what financial responsibilities must be accomplished by a hospital in the future, and the CBGs could decrease the mean health care cost of the patients in Indonesian hospitals.

The implementation of the CBG required adjustment in the fee for service system and prospective payment as efficient and good quality health care payment service provider. The efficiency included: length of stay (LOS) in care duration system, drug efficiency, and drug formulation based on the regulation of the Minister of Health, disposable medical items and instruments, the control of types of standardized materials and instruments, and supporting examination pursuant to the medical committee agreement, the types and the adequacy of medical examination and others such as overhead cost. In the last decade, health care service cost became global issue in Indonesia. Patients must pay expensive health care cost because of various factors such as the change in disease pattern and treatment pattern, increasingly sophisticated technology, the increase in the demand of people for health care and the change in global economy. Additionally, the capability to pay all of the costs has not been significantly improved, while it is expected based on government's policy in the area of health that health care providers should make their healthcare services closer to the people. It was necessary in responding various global challenges to formulate particular concepts to improve the efficiency in rationally using fund. Health economy as one of the methods in improving efficiency and in mobilizing fund resources could be used to help develop the particular concepts without ignoring the social aspects of the health sector (Mills.A, Lee, K.,1993) and health accountancy played an important role in managing the finance of a hospital and in finding out what was the financial capability of patients to pay special health care services such as cesarean section (Bastian, 2008).

Cesarean section was a laboring process through surgical section of the laboring mother (i.e., laparatomy) and uterus (i.e., hysterectomy) to take the infant out. The cesarean section was conducted if the laboring process was postponed for longer period and would put the infant, the mother or both in danger, while it was impossible to safely undergo vaginal laboring process (Hakimi, 2000).

In 1970 the percentage of laboring process through cesarean section in United States was 5.5% and culminated in 1988 (24.7%) and in 1993 it was 22.8%. In the two decades maternal and perinatal mortality decreased Subsequently, the study was continued by Najini and Rechan (2000) in Pakistan suggesting that it was about 22%-31% higher than that in Indonesia (15%-20%). The cesarean section in Pakistan correlated to inflation factor, residential access, health care center and economic factor. It was then continued by Khawaja, Khasholian, Jurdi (2004), suggesting that the determinant factors of the cesarean section were medical and non-medical evidences. It was medically influenced by the laboring complications such as hemorrhage, sepsis, twin infants, dystocia, eclampsia, placenta previa, abruptio placenta, infant body weight more than 2500 gram and less than 2500 gram, while non-medical factors were influenced by social and demographical factors. Subsequently, Carayol and Zein (2008) conducted a study in Lebanon suggesting that the cesarean section was influenced by non-medical factor of geographical location.

A survey of the prevalence of the indication of cesarean section was conducted by WHO (1999) with 55 hospitals in 4 regions of 14 countries (Europe, East Mediterrania, Southeast Asia and West Pacific) suggesting that there was on average 8.7% of the patients affected by nosocomial infection and less than 1.4 million peoples all over the world affected by nosocomial complication. A high frequency of the nosocomial infection was reported in the hospitals in East Mediterania and Southeast Asia (11.8% and 10%), while the prevalences in Europe and West Pacific were 7.7% and 9.0% (Girard et. al., 2000), respectively. Secondary data was collected from Undata hospital of Central Sulawesi in 2008 involving 505 patients and 2010 the number of the patients increased to 559 patients and the prevalence of the cesarean section in Central Sulawesi province was 19.95% and it decreased in 2011 to 19.5%. The data included the proportion of the laboring through cesarean section to normal laboring and abnormal laboring. The graphic of the proportion and the percentage illustrated the number of the cesarean section.

The implementation of the case-based groups (CBGs) of the cesarean section in competitive grant study project funded by the Minister of Education and Culture in 2010 in Undata hospital in its relation with obstetric and gynecology could result in various types of pregnancy and laboring complication in the cesarean section patients on the basis of the action cost of the patients that was financed by the government of the Republic of Indonesia, especially the Ministry of Health of the Republic of Indonesia in 2010. The question was why it was necessary to study the INA-DRG or the newer system of INA-CBG in hospitals in Indonesia, especially in Central Sulawesi and how it was implemented in Indonesia. The INA-CBGs was highly required in Indonesia in the effort to (1) materialize the idea of efficient, accountable and transparent financial management (the Act No. 17 of 2000), (2) increasingly high cost as a result of high inflation rate, the change in demography, epidemiology and disease pattern, the change in the relationship between physicians and patients, the invention of new technology and the financial innovation of the health care services pursuant to the financial regulation of the Minister of Health of the Republic of Indonesia, and (3) monitoring the implementation of quality assurance program (Mukti, A.G., 2009).

Methodology

The materials and the data source in the study were obtained from medical records, the detail of drug costs in treatment ward and in operation room, and the receipts of the patients undergoing cesarean section in the Hospitalization Installation of Undata Hospital in 2010. The study

procedure of the cesarean section patients was an epidemiologic and non-experimental survey with analytic description and carried out by collecting data from the medical records, the detail of drug costs in the treatment ward and the operation room, and the patients' receipts. Subsequently, samples were drawn using random sampling and it gave 62 patients. Simple random sampling was chosen on the assumption that it would give 10% predictor below and above the real proportion at 95% confidence using Lemeshow's formula (1990) below.

$$N = \frac{Zt - \alpha /_{2P(1-P).N}}{d^2(N-1) + Z^2 1 - \alpha / 2P(1-P)} = 62 \; pasients$$

where:

P = population

d = may be determined in percentage

d = 10% = 0.1

β = 90%

Z^2 = 37.500

Z1α/2 = 1.96

   The data was analyzed by calculating the costs that must be paid by the cesarean section laboring patients in accordance with the existing disease compilation, which were severe, moderate and light complications per package established by the government in the health assurance for those in poverty of the Minister of Health of the Republic of Indonesia.

Theoretical Concept

The concept and the implementation of the Indonesian diagnosis-related Groups (INA DRGs) and the later Indonesian case-based groups (INA CBGs) in the context of *JAMKESNAS* in Indonesia from *ASKESKIN* program into the *JAMKESMAS* in 2008 followed by the change in various supporting system, including the payment system of the claim of the health care for those in poverty in a hospital (Mukti, A.G. 2009). The change in the payment system from the INA DRGs to the INA CBGs (Menkes, 2011) was very crucial to understand by a hospital because the system required financial managerial adjustment of the *Jamkesnas* program in a hospital. The new system resulted in serious apprehension of various parties related to the followings: 1) the INA DRGs or the INA CGBs was something new for *Pusat Pelayanan Kesehatan* (*PPK*), health care centers in general that it required sufficient socialization, 2) The preparedness of the existing human resouces of a hospital, 3) the INA DRGs required accurate and complete management information system MIS. *Askeskin* program represented a very strategic program in improving the health standard of those in poverty. The program has been pioneered in Indonesia since the country was hit by economic crisis and referred to as social safety net program in health area that was implemented in 2005 in which government was more involved in strengthening commitment, funding and managing those in poverty. The consequence was clearly observed. Bed occupancy rate of class three patients reached 100 percent. The use of the health care service for those in poverty drastically increased from 1.4 million in 2005 to 6.5 million users in 2007 (39.2%), hospitalization increased from 562,167 patients in 2005 to 2,431,139 patients in 2007 (43.2%). Thus, the program has reached the target of those in poverty and hence it was necessary to continue the program in the future. Also, it was necessary to regulate the effective management using INA CBGs that it became accountable and transparent.

The concept of Indonesian case-based groups (INA CBGs) was a health care payment system related to quality, even distribution and covering area and represented one of the elements of

mixed case-based patient financing and one of the methods to improve the health care standard of a hospital and to monitor the implementation of the quality assurance program. The statistic report of the Minister of Health of the Republic of Indonesia (2011) of the Indonesian case-based groups (INA CBGs) consisted of 23 codes and 1077 codes along with their health care rates classified into 789 codes for hospitalization, and 288 for outpatients. The health care rate included:

1. The hospitalization health care service was a package of health care, procedure, action, the use of instruments, hospitalization ward, drugs and other necessary media.
2. The outpatient service was a package of health care for outpatients hat included action procedure supporting examination service, and take-home drugs.

The structure of the INA CBGs in a hospital (*DEPKES,* 2011) for the hospital of types C, D, B and A based on the decree of the Minister of Health RS No. 1161/Menkes SK/X/2007 on the description of INA DRGs/INA CBGs was applied in hospitals, consisting of 4 parts:

1. *Ambulatory Medical* (*AM*) was used for outpatients at advanced level without any action with the last digital code 0.
2. *Ambulatory Procedure* (*AP*) was used for outpatients at advanced level with action with the last digital procedure code 0.
3. *Important Medical* (*IM*) was used for outpatients at advance level without any action/procedure and with the last digital procedure code 1.2.3 depending on severity level.
4. *Impatient Procedure* (*IP*) was used for hospitalization at advance level with action/procedure and the last digital code was 1/2/3 depending on severity level.
5. The concepts of patient form filling by physicians responsible for major surgery patients was that of international classification of disease (ICD-10 and ICD.9.CM), major diagnosis category (MDC), surgical/other/medical and diagnosis related groups, case mix and cost, and hospital medical treatment rate (Rivany, 2008, WHO, 2003, Blesser, L. DS, et. al., 2004).

The severity level was classified into 3:
1. Patient's severity without any comorbidity and complication.
2. Patient's severity with comorbidity and complication (w/cc).
3. Patient's severity with comorbidity and major complication (W/Mcc).
   The data of the INA CBGs was collected from the Undata hospital in the period of April 2009 to May 2010 consisting of 23 MDC and 1077 coded as INA DRGs/INA CBGs along with detailed medical treatment rate.

Results

The Prevalence of Cesarean Section in Undata Hospital Indonesia

World Health Organization predicted that there was 10% to 15% of the laboring through cesarean section procedure of all of the laboring process in developing countries compared to Great Britain (23%). In 2000 Canada had the prevalence of 21%. Various considerations of the results of the WHO's report showed that the cesarean section process was often used because of medical reason and many criticism were put forward that it was used because it was profitable for hospitals. It was easy and did not take long time for obstetricians to finish the process. Other critics suggested that the laboring mothers requested the cesarean section procedure because they did not want to experience excessive pain of normal laboring process. The collected data included the proportion of the cesarean section laboring among pregnant mothers and those with normal laboring process and also those with abnormal process in the period of 2009 to 2010 or in 24 months. The data was used to calculate the prevalence of the cesarean section in the hospital.

The prevalence of the cesarean section was useful to find out whether the cesarean section in the hospital was under the control so that the cesarean section procedure was not overly used. The analysis and the interpretation of the data were indicative of the proportion of the cesarean section to the number of the laboring cases in the hospital.

The calculation of the prevalence of the cesarean section laboring was made using the data of the number of the patients in 2009, which was 365 patients and its percentage reached 19% of the number of the normal laboring and it increased in 2010 to 433 patients or 19.7%. The increase in the cesarean section resulted from the indication of the complication taking place to the mothers and the infants. (Siti Rahmawati,Atjo, 2011).

The results of the study showed that in the INA CBGs program there were 3 categories: (1) severity level 1 (W/C), (2) severity level 2 (W/CC) and (3) severity level 3 (W/MCC) in which there were confounding diseases found in the patients.

The indication of the cesarean section patients found in the INA CBGs was the classification of diseases and the procedure with ICD-X code (WHO, 1993). The results of the study were classified using case mix grouping of the diseases and the complication in the pregnancy and the laboring. There was 54.8% pregnant mothers with the indication for the cesarean section and there was 45.2% infants with the indication for the cesarean section. There were 34 patients with indication of emergency laboring and confounding severe complication coded INA CBGs (W/MCC) or 56.6%. The results of clinical diagnosis made by obstetrician and gynecologist showed that the highest percentage was found in the pre-eclampsia case taking place in 6 patients (40%) and placenta previa case taking place in 4 patients (26.7%), eclampsia case taking place in 4 patients (26.7%) and the case of the complication of anesthetics taking place in 1 patient (6.6%). Meanwhile, the highest percentage (45%) was found in the case of the mothers with the indication of light complication coded INA CBGs (W/CC), while uteri rupture 15.8% and hypoxia case taking place in 2 patients (5%). More complete data of mother indication and infant indication were summarized in the table below.

Hospital's Capability to Finance Patients' Cesarean Section Service

The studies by Sarwono Prawiraharjo (2002) and Chunningham (2002) described that each mother affected by complication through cesarean section should be treated under stricter monitoring of vital status, drugs and antibiotics, health supporting instruments used by nurses or midwives. It was because the absence of the monitoring would result in difficulties in operation wound recovery and hence prolonged the medical health care duration. Petrou et. al. (1999) suggested that it must be establish whether the laboring process was planned using elective laboring surgery or emergency laboring surgery and whether the operation was conducted ante partum or intrapartum. Based on the limited literature Petrou recommended that an economic analysis related to the capability of hospital to pay the health care service for the patients must be made by identifying the resources necessary in the laboring process and the payment standard of the cesarean section must also be established. All of the costs of the cesarean section were aggregated to determine product/service cost in a hospital and it was influenced by the activities during the operation. The table below summarized the mean costs in the hospitalization package

of the cesarean section patients that were classified on the basis of the existing payment system in the hospital using Indonesian Case-Based Groups (INA CBGs,) ,Siti Rahmawati Atjo, 2012).

The capability of the hospital to pay the cost of the cesarean section service for the patients was calculated using the INA CBGs package in which there were two payment methods: 1) the payment per unit cost for each patient and 2) the calculation of three disease groups of severe complication (W/MCC), moderate complication (W/CC), and light complication (W/c). The mean capability to pay the cost of the medical action was average of $180 per patient.

Table1. Hospital's Capability to Finance Patients' Cesarean Section Service in Central Sulawesi Indonesia

No.	Cesarean Indication	Total per patient (N)	(%)	ICD 9-10	Cost ($)	Unit Cost X N (USD$)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A.	Type Emergency Maternal indication (W/MCC)Type Severe Complication					
1.	Pre- eclampsia	6	40	O14.9	$219	$ 1314
2.	Placenta previa	4	26.7	O44.1	$219	$ 876
3.	Complication of Anesthetics	1	6.6	O75.6	$219	$ 219
4.	Eclampsia	4	26.7	O14.8	$219	$ 876
	Total	15	100			$ 3285
B.	Maternal indication Severe complication (W/CC)					
1.	Dystocia	3	15	O66.4	$177	$ 531
2.	Rupture uteri	6	30	O42.9	$177	$ 1062
3.	Cesarean section wound recovery	9	45	O82.9	$177	$1593
4.	Hypoxia	2	10	O36.8	$177	$ 354
	Total	20	100			$3540
C.	Light complication (W/C)					
1.	Infant emergency	4	16.7	O68.9	$160	$ 640
2.	Fetal distress	3	12.5	O32.9	$160	$ 480
3.	Abruption placenta	17	70.8	O.33.9	$160	$ 2720
	Total	24	100			$ 3840
D.	ELECTIVE TYPE - INFANT INDICATION					
1.	Arubtion placenta	1	33.3	O33.9	$160	$160

N o.	Cesarean Indication	Total per patient (N)	(%)	ICD 9-10	Cost ($)	Unit Cost X N (USD$)
2.	Infant Emergency	2	66.7	O68.9	$160	$320
	Total Infant Indication	3	100			$ 480
1.	Maternal Indication	35	56.5			
2.	Infant Indication	27	43.5			
	Total cost	62	100			$ 11,145
	Average cost of patients					$ 180

Resource : Primary data, 2011 in Undata Hospital Central Sulawesi of Indonesia.
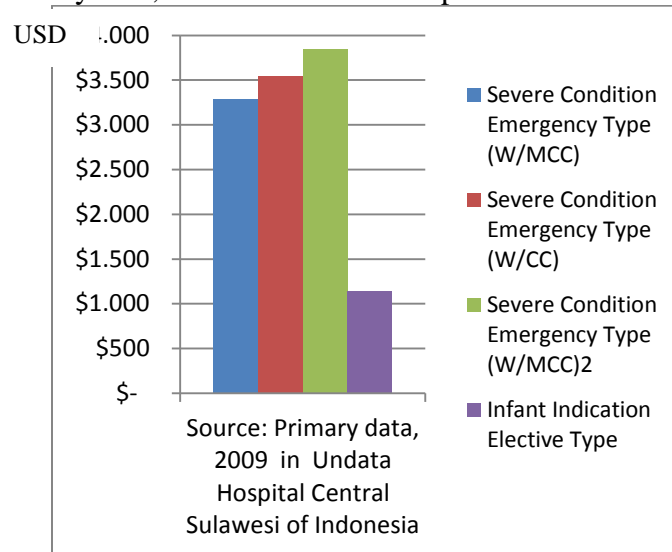

Figure: 1. Health Payment Assurance (US$) in Undata hospital Indonesia

The capability of the hospital to pay was calcul ated and the results of the calculation might be observed by considering 2 aspects of infant indication on the basis of case mix group 3 (with 3 diseases), which were severe complication and case mix of severe pregnancy and laboring complication with confounding diseases, consisting of 1) pre-eclampsia with the total payment of the action cost $1,314, 2) placenta previa $876, 3) anesthesia complication $219. 4) eclampsia $876 and the total payment of the severe complication was $3,540. Meanwhile, other indication was moderate complication (W/CC) consisting of 1) dystocia with the action unit cost $531 and the payment of the rupture uteri cost $1062 cesarean section wound recovery $1,593 and hypoxia cost $354. The capability of the hospital to pay the medical action for the patients with the light complication (W/C) and the indication of infant emergency was $640, fetal distress $480, and abruption placenta $2,720 , and the total cost was $3,840. From the point of view of the aspect of the infant indication of the elective type it was clear that the payment of the medical action for the abruption placenta was $160 and the infant emergency was $320, while the total cost for the medical action of the infant indication of the abruption placenta was $480. The total cost for the patients was $11,145 with the mean payment for each patient $180. The calculation of the medical action cost had significant impact on the group of the diseased affected the patients. The

difference in the calculation of the diseases depended on the resources necessary in the cesarean section from the primary activities to secondary ones, consisting of 8 stages:

1) Registration activity included interview with patients/their relatives and patients' identity, the finding of the status of prior patients, delivery, and the negotiation of hospitalization ward with patients.
2) Preparation activity included the delivery of medical services in the hospitalization ward and the preparation of bed by nurses.
3) Examination by physician included consulting session with specialist physicians, prescription writing, and medical record equipment preparation for outgoing patients.
4) The activities of nutrient intake for patients included food distribution by nutrient room employees.
5) Supporting activities included the handling of laboratory examination results by nurses by taking a note of patients' status.
6) The activities of drugs application included the preparation of the drugs for patients, the distribution of the drugs and drug injection.
7) Administration activities related to the outgoing patients included paper works related to patient's invoice, the calculation of the total medical care costs, and the payment of the invoice by the patient.
8) Cleaning activities included hospitalization ward cleaning and bed cover removal.

The description of the cost structure consisted of admission procedure into emergency installation and polyclinics with elective type because there was a difference in the cost structure. The diagnosis was established by taking the biggest operational cost into account and this step took place in obstetric and gynecology room. The cost components included the operational cost of human resources of employees and specialist physician staffs because the calculation of the direct costs of drugs, nutrition, laundry, medical equipment, non-medical instruments, and therapy would be separated from the indirect cost of building maintenance, salary expense, water, telephone, sanitation and ambulance. The results of the study showed that there was a difference in the cost of each disease because each variable of the disease and the resource for each patient was different that the determination of the cost of the treatment of each patient was also different.

The Advantages and the Uses of the Implementation of the INA DRGs/INA CBGs in Indonesia

a) General advantages of the implementation of the INA DRGs/INA CBGs in Indonesia
1. More transparent medical care service rate was useful for hospitals.
2. More objective calculation of medical care service rate was based on real costs.
3. Hospitals managed funding based on real work load.
4. The quality of hospitals and the medical care efficiency were significantly improved.

b) The uses of the INA DRGs/INA CBGs for patients
1. The INA DRGs/INA CBGs put the priority on patients on the basis of the severity of the disease.
2. The patients got better quality of medical care services.

c) The uses for the office of health
1. The INA DRGs/INA CBGs was useful in evaluating and comparing hospital performance.
2. They represented clinical audit area.
3. They improved clinical framework and service sequence.
4. They standardized health care service process and government health assurance in hospitals.

D. The implication of the policy of the INA DRGs/INA CBGs

The effort to control the medical care cost of cesarean section in a hospital was made by considering the parties concerned in producing medical care services and it was not justified to sacrifice quality because it related to patients' comfort and safety and hospital managerial safety assurance. The INA CBGs was successfully implemented using Malay software with the patients coming from those in poverty whose medical care service of cesarean section was paid by government. It was noteworthy that the implementation of the quality medical care service for pregnant mothers and the efficiency in hospital cost were given the biggest priority to avoid medical error in surgical operation of patients and the wasting of the existing resources of the hospitals. The implication of the policy was indicative of four objectives in the implementation of the INA CBGs:
1. To shorten the hospitalization period of the patients.
2. To decrease the maintenance cost of hospital's resources.
3. To improve clinical quality.
4. To improve the satisfaction of those in poverty because they got free medical care services.

Conclusion and Recommendation
Conclusion

The government of the republic of Indonesia established group diagnosis system appertaining to the INA DRGs/INA CBGs and it represented case mix-based medical care service on the basis of the payment of the claim of service providers. It consisted of three disease complication components of pregnant complication and cesarean section laboring procedure with diagnosis codification (ICD-10) and the medical action procedure was conducted by physicians through prescription written by obstetricians and gynecologists using ICD-9 CM. It was considered as the best solution provided by the decree of the Minister of Health of the Republic of Indonesia No. 1663/MENKES/SK/XII/2005 as the basis of the payment claim of the patients coming from those in poverty.

Recommendation

The payment of the *JAMKESMAS* by the government of the republic of Indonesia should be continued because it improve economic condition considering the increase in the health care service cost as a result of economic crisis. Additionally, the funding capability of the government was limited for the finance sector of hospitals and the role of the people has not been maximal.

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