ผลการปฏิบัติงานการจัดซื้อยาในโรงพยาบาลชุมชน
ภายใต้กลไกการควบคุมราคาในการจัดซื้อด้วยราคากลางยา
Operational Performance of Medicine Procurement in Community Hospital
under Price Control Mechanism using Medicine Estimated Cost

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาผลการปฏิบัติงานในการจัดซื้อยาตามระบบและกลไกการควบคุมราคาในการจัดซื้อด้วยราคากลางในด้าน (1) ความสามารถในการจัดหายา (2) คุณภาพ ความปลอดภัยทางยา (3) ราคายา (4) ความพึงพอใจของผู้ปฏิบัติงาน **วิธีการศึกษา:** ดำเนินงานวิจัยแบบผสมผสาน แยกเป็น 2 ระยะโดยการสนทนากลุ่ม และการสำรวจด้วยแบบสอบถามทางไปรษณีย์ ที่ได้พัฒนาขึ้นมาจากผลของการสนทนากลุ่ม กลุ่มตัวอย่างทั้งสองระยะตามลำดับ คือ เภสัชกรผู้จัดซื้อยาในโรงพยาบาลชุมชนเขตภาคเหนือตอนบน เลือกแบบเจาะจง และเภสัชกรผู้จัดซื้อยาของโรงพยาบาลชุมชนทั่วประเทศที่ได้จากการสุ่มเลือก เครื่องมือในการวิจัย ได้แก่ แนวคำถามเพื่อการสนทนากลุ่ม และแบบสอบถามทางไปรษณีย์ โดยคำตอบเป็นสเกลค่า 1 - 5 นำเสนอผลการศึกษาด้วยสถิติเชิงพรรณนา **ผลการศึกษา:** ทั้ง 2 ระยะ พบว่า การจัดซื้อด้วยราคากลางจะทำให้ (1) จัดหายาได้ 90 - 95% ของยาในบัญชียาโรงพยาบาล (2) เภสัชกรมั่นใจมากต่อคุณภาพยาที่จัดซื้อได้ที่ 3.75 จากเต็ม 5 คะแนน และพบปัญหาความปลอดภัยด้านยาปานกลางที่ 3.10 คะแนน ได้แก่ ยาชื่อพ้องมองคล้าย ยาขาดชั่วคราว ปัญหาคุณภาพยา และการรับรู้เข้าใจของผู้ป่วย (3) ราคากลางช่วยคุมราคาได้ 3.63 คะแนน และได้ราคาจัดซื้อที่เหมาะสมมากที่ 4.05 คะแนน (4) พอใจต่อผลงานการจัดซื้อปานกลางที่ 3.32 คะแนน เพราะอาจไม่ทันการณ์ จัดซื้อไม่ได้ ยาขาดชั่วคราว ไม่ครอบคลุมทุกบรรจุภัณฑ์ ไม่ยืดหยุ่นตามกลไกตลาด และจำกัดตัวเลือกในการซื้อ ส่วนความพึงพอใจต่อการควบคุมการจัดซื้อด้วยราคากลางที่ 3.56 คะแนน **สรุป:** การควบคุมการจัดซื้อยาด้วยราคากลางเป็นสิ่งที่พึงปฏิบัติตามโดยพอใจ ทำให้โรงพยาบาลสามารถจัดหายาคุณภาพดี ในราคาเหมาะสม นำไปสู่การควบคุมต้นทุนทางยาได้ดี แต่อาจก่อปัญหาความปลอดภัยทางยา และปัญหาในการจัดซื้อบางส่วน

คำสำคัญ: ราคากลางยา, ผลการปฏิบัติงานจัดซื้อยา, การควบคุมราคาในการจัดซื้อยา, โรงพยาบาลชุมชน

Abstract

Objective: To determine the operational performance of medicine procurement under price control mechanism using medical estimated cost in 4 dimensions, namely91) access to medication (i.e., ability to provide medicines for patients), (2) medication quality and safety, (3) medication prices, and (4) pharmacist's satisfaction. **Methods:** Based on a mixed method design, 2 phases were used: a focus group discussion and a questionnaire mail survey using questions developed from information from the focus group. Participants in both phases were hospital pharmacists responsible for medicine procurement. Specifically, those from hospitals in upper north region and those in all community hospitals nationwide were participants in phases 1 and 2 respectively. Participants in phase 1 were selected purposively. Study instruments were probe questions for phase 1 and postal questionnaires based on information from phase 1 for phase 2. Response format for survey questionnaire was a scale raning from 1 to 5. Results were presented as descriptive statistics. **Results:** Estimated cost offered (1) ability to provide 90 - 95% of medications in hospital medicine list. (2) Pharmacists were very confident with the medicine quality (3.75 out of 5 points). Medication safety problem was found at a moderate level (3.10 points), e.g., look-alike sound-alike drugs, shortage of medicines, quality problem, and patients' perception. (3) Estimated cost could control medication expenses (3.63 points) and make procurement costs very appropriate (4.05 points). (4) Satisfaction was at a moderate level (3.32 points) due to late procurement, inability to procure the products, shortage of supply, poor coverge of some package types, inflexibility to market mechanism, and limited buying options. Satisfaction towards procurement control using estimated cost was at a high level (3.56 points). **Conclusion:** Medicine procurement control using estimated cost should be followed. It allows hospitals to obtain good quality products with affordable prices. However, it still could cause certain safety and procurement problems.

Keywords: medicine estimated cost, medicine procurement operational performance, price control, community hospital

Introduction

In Thailand, transparency control in medicine procurement of the government sector is legally conducted through the Regulations of the Office of the Prime Minister on Procurement B.E.2535 (1992).[1] The bill mandates all government agencies to purchase medicines in the National List of Essential Medicine (NLEM) according to the single

estimated cost specified by the National Committee on Drug System Development.[2,3] This mandate is to ensure government hospitals purchase medicines with affordable and fair prices that will lead to a control of expenditure on medicines, one of the country's health expenditures.

Determination of medicine estimated cost aims to enable hospitals or government agencies to purchase medicines with affordable and fair prices consistent with economic situations and competition in medication market.[4] The government shall update the estimated cost every 6 months[5] to ensure adequate and fair access to essential medicines.[4] As the medicine estimated cost has not been revised for such a long time since 2010, it has been regularly updated since October 2014, both for medications with and without existing regulation.

The list of estimated cost was scheduled to update every six months. With no update of estimated cost since 2010, cost had been revised regularly since October 2014. At present, the estimated cost announced in April 2019 contains a total of 293 items for update.[6] Currently, according to the Public Procurement and Supplies Administration Act B.E. 2560 (2017), 6 meanings of the estimated cost are provided.[7] Drug product quality has been taken into consideration in establishing estimated costs, especially for original drugs with their generic products counterarts.[4] In the past, estimated cost was considered from numerical measurs such as mode, median and mean of the market price.[8]

Previous research reflected problems related to the control of medicine procurement using medicine estimated cost such as risks for acquiring medicine estimated cost calculated from the mode of all price data in the market[5] regardless of competition conditions in the pharmaceutical industry, quality and efficacy of medicines, and production process.[9] Such method is not appropriate as price war of generic drugs would occur, causing medicine prices to be lower than they should be and the estimated cost to decrease over time.[9] Since estimated cost has not been updated continuously[10], certain unacceptable low and high costs are found. Some hospitals could not purchase medicines according to notified prices. With a fear of being considered violating the regulation, such purchase was not reported.[5]

Medicine estimated cost did not represent real market conditions.[10] Random selection of medicine prices in the market revealed the increased price. However, the mutual agreement on price revision between pharmaceutical companies and public sector was rare. Manufacturers viewed

the process as difficult since it required complete relevant data and involved complicate steps. As a result, most manufacturers avoid formal price raising procedure and the revision of estimated costs was further carried out inevitably by the National Committee on Drug System Development.[5]

However, as the context has changed and there has not been any studies on (1) advantages, benefits, and positive effects from medicine procurement according to the control policy on medicine procurement prices using estimated cost and (2) effects of decision-making on various methods for medicine procurement compliant with rules and regulations. Based on a considerate impact of the matter on healthcare system of Thailand, there was a need to study operational performance according to the price control mechanism in medicine procurement using medicine estimated cost from the point of view of the pharmacist responsible for the task.

The **main objective** of this research was to determine the operational performance of medicine procurement under price control mechanism using medical estimated cost in 4 dimensions, namely access to medication (i.e., ability to provide medicines for patients), medication quality and safety, medication prices, and pharmacist's satisfaction towards rules and regulations.

Since the medicine procurement process has been evolved continuously, a comprehensive CIPP model was selected for this investigation. CIPP is an evaluation model that can cover all aspects of a given system, specifically context or environment (C), primary factor or input (I), process (P), and product (P).[11] Each of the four aspects of CIPP model was consistent with our study objectives. With a dynamic nature of CIPP, data from the evaluation were employed as a guideline for the new decision making or repeated decision making to improve quality of the project.[12]

The study was divided into 2 phases as focus group discussion and postal questionnaire survey. Both phases were done with pharmacists in community hospitals to obtain a firm opinion representing one unique context. Operational performance of medicine procurement in community hospitals under price control mechanism using medicine estimated cost was refered to operational performance and outcomes from medicine procurement using medicine estimated cost according to National List of Essential Medicine in 4 dimensions as follows.

First, access to medicines (ability to provide medicines to patients) meant effects on medicine reserve or shortage at

points of dispensing in government community hospitals when medication procurement is under the governance and the price control mechanism using medicine estimated cost according to the Regulations of the Office of the Prime Minister on Procurement.

Second, quality and safety of medications meant confidence in the quality of medicines from medicine procurement including other medication safety issues resulting from medicine procurement under the price control mechanism using medicine estimated cost according to the Regulations of the Office of the Prime Minister on Procurement.

Third, medicine prices was refered to effects on budget control for medicine procurement. It was mainly how much the expenditure on medicines based on estimated cost could be controlled and whether the purchase was based on affordable prices. Fourth, pharmacist's satisfaction meant satisfaction of pharmacists who perform their duty in purchasing medicines under the governance framework and medicine procurement towards their procurement performance and operational performance according to the Regulations of the Office of the Prime Minister on Procurement.

Methods

The study was conducted using a mixed method design in accordance with the exploratory sequential approach and instrument-development design.[13] Findings from the quantitative part were considered the main outcomes. Qualitative data collected from the early stage of the study were used to develop a research instrument for the later quantitative part.

Data collected from the two parts were based on the framework, specifically context (C-context of medicine procurement), Input (I-input for the medicine procurement process), process (P-procurement process), and product (P-results of the medicine procurement process which can be subdivided into advantages and impacts, each with positive and/or negative connotation).

The research study was divided into 2 phases of focus group discussion and postal questionnaire survey as follows.

Phase 1: Focus group discussion

In this phase, a qualitative design through focus group discussion aimed to explore primary data and variables in the study for a comprehensive coverage in addition to variables found in literature review. The obtained data were used to develop a questionnaire for the second phase.

For the practicality, the participants for the focus group discussion were limited within the areas of the upper north region of Thailand. Purposive sampling method was used to select heads of pharmacy departments from all hospitals in the region. These pharmacists had direct experience and expertise in medicine procurement. All hospitals in the region were invited and 12 of them agreed to participate in the focus group discussion. All of the participants worked in community hospitals affiliated with the Ministry of Public Health.

Instruments

Instruments used in the focus group discussion included voice recorders, question and answer forms, and focus group discussion questions. These questions were tested for content validity by 3 experts who were hospital pharmacists responsible for medicine procurement. The validity of these questions was at least at the acceptable level with index of item-objective congruence (IOC) of each item ranging from 0.67 to 1. The questions were in line with the CIPP framework and some examples were as follows.

In terms of the context, how differences in procurement policies, procurement methods, and workplaces of various hospitals could result in procurement performance. For input, the participants were asked to name the important and necessary input factors, to state how sufficient these input factors were, and to report kinds of supportive factors that were given by the government. Regarding the process of medicine procurement, the participants were asked how difficult and complicate the procurement methods were, how to solve problems caused by the procurement rules and regulations. For purchasing performance, participants were asked how well these provisions were implemented (quality of medicines under estimated cost, medicine prices, and pharmacist's satisfaction according to the regulations). They were also asked about the advantages of using medicine estimated cost to control medicine procurement and kinds of problems and obstacles they found.

Data collection procedure

The focus group discussion was held after the research was approved by the Research Ethics Committee on Research Involving Human Subjects, Faculty of Pharmacy,

Chiang Mai University (February 11, 2016). Two sessions of focus group discussion of 6 participants each were held. Closed room was used for discussion with no disturbance and distraction.

Data analysis

Qualitative data were analyzed using analytic induction including interpreting and summarizing data obtained from the focus group. The data were arranged and key words were specified. Groups of data were organized. The data were analyzed by checking their reliability and comparing data of the similar topics from many participants from the two focus groups. The data were synthesized and summarized in accordance with the research conceptual framework of CIPP components.

Phase 2: Postal questionnaire survey

Descriptive research was employed using a questionnaire survey aiming to magnify the study outcomes from the focus group discussion to population using a quantitative method.

In this quantitative phase, the study population was all 770 pharmacists in charge of medicine procurement in community hospitals in Thailand. The sample size was calculated using Yamane's formula of $n = N/(1+Ne^2)$, where e = 0.05. As result, a total of 264 participants were required. However, based on the research review using questionnaires with pharmacists across the country, it was found that the response rate ranged from 28.77% to 58.4%.[14-18] Since we expected the response rate to be 30%, all 770 pharmacists were included in the study sample to compensate for such low response rate.

Instruments

The postal questionnaire was developed from the results of focus group discussion. The questionnaire was divided into 5 parts. Part 1 collected general information of the respondents. Part 2 asked about context or environment of medicine procurement based on CIPP model. It included medicine procurement policies at various levels (i.e. district, provincial and hospital levels), medicine procurement governance, patterns and methods of electronic procurement that have been changed, and geographical characteristics of the hospital.

Part 3 asked about input factors in the medicine procurement system. These included supportive factors to the procurement system, information communication from the central government and supportive factors from the government sector when changes occurred to procurement policies. In Part 4, the respondents were asked about the process of medicine procurement consisting of characteristics of the medicine procurement process, feedback from the medicine procurement process, and problem-solving of the procurement.

Finally, Part 5 asked about the operational performance, advantages, and impacts from the medicine procurement system including satisfaction towards the operational performance of the medicine procurement, and problems and obstacles in the medicine procurement process. Satisfaction questions were with a 5-point Likert-type rating scale ranging from 1-not all satisfied, 2-slightly satisfied, 3-moderately satisfied, 4-very satisfied, and 5-extremely satisfied. Based on the evaluation by three experts in medicine procurement, questions in the whole questionnaire were at an acceptable to high level of validity with the index of item-objective congruence (IOC) of all items ranging from 0.67 to 1. The questionnairs also had a acceptable internal consistency reliability Cronbach's alpha coefficients of 0.738, 0.740, 0.697, and 0.725 for part 2 to 5, respectively.

Data collection procedure

With the complete contact information coverage it could provide, postal mailing was chosen as a means for the survey over online survey methods. The researcher sent the questionnaire to pharmacy department of all community hospitals by postal mailing. The qualification of questionnaire respondent was identified as pharmacists who were responsible for hospital medicine procurement. A pen was provided in the postal package. The questionnaire completion and back-mailing was reminded twice.

Data analysis

The quantitative data were analyzed using descriptive statistics in the form of frequency with percentage, and mean with standard deviation for general information and the respondent's opinions. Opinion levels of agreement (or satisfaction) were categorized as 0.50 - 1.50, 1.51 - 2.50, 2.51 - 3.50, 3.51 - 4.50 and 4.51 - 5.50 points for not at all, slightly, moderately, very, and extremely satisfied/agreed, respectively. Since the lowest and highest score points of the Likert-type rating scale were 1 and 5, such categories were further

adjusted to 1.00 - 1.50, 1.51 - 2.50, 2.51 - 3.50, 3.51 - 4.50, and 4.51 - 5.00 points, respectively.[19]

Results and Discussions

Of the 770 prospective respondents for the mail survey, a relatively low response rate of 181 respondents or 23.5% was found. Of the 12 and 181 participants in the focus group and mail survey, they were more likely to be women (75.0% and 66.3%, respectively) (Table 1). Of the 12 participants in the focus group session, there were 6 heads of pharmacy department each from Chiang Mai province and Chiang Rai province. Since participants in the focus group were pharmacy department heads, they had a fewer years of experience of medicine procurement than those from the mail survey who were directly responsible for the task (8.25 and 11.91 years, respectively).

Table 1 General characteristics of the participants.

General information	Results from the focus group discussion (N = 12)	Results from the questionnaire survey (N = 181)
Gender, N (%)		
Male	3 (25.0)	61 (33.7)
Female	9 (75.0)	120 (66.3)
Experience in medicine procurement operations, year, mean (SD)	8.25 (4.14)	11.91 (8.17)

The focus group discussion provided the results on the context of medicine procurement specific to the sample, supportive factors for the medicine procurement system, the medicine procurement process, and the medicine procurement operational performance. The questionnaire developed from these findings contained 5 parts. Part 1 asked about general information of the respondents. In parts 2 to 5, the questions asked the respondents about the context or environment in working on medicine procurement (17 items), primary factors or input factors in the medicine procurement system (10 items), the process of medicine procurement (8 items), and operational performance, advantages, and impacts from the medicine procurement system (13 items), respectively. Question items in parts 2 to 5 were corresponding to the C-context, I-input, P-process and P-product components of the CIPP model, respectively. The answer for each item was given in a rating scale format. In addition to the rating scale, parts 4 and 5 also contained opended questions. Questions in part 5 (operational performance, advantages, and impacts from the medicine procurement system, or the P-product of the CIPP model) served the study main objective as shown in the following section.

Opinions on the medicine procurement operational performance

The main study objective was achieved based on the opinions of the respondents on the questions in part 5 (operational performance, advantages, and impacts from the medicine procurement system, or the P-product of the CIPP model). The advantages and impacts both positive and negative connotation were taken into account. The mean scores of the four dimensions of operational performance of medicine procurement under price control mechanism using medication estimated cost are presented in Table 2 and elaborated as follows.

Table 2 Mean scores of opinion on operational performance and advantages from the medicine procurement system (P-product of the CIPP model) (N = 181).

Dimensions	Response rate, n (%)	Mean score (SD)
Dimension 1: access to medication (i.e., ability to provide medicines for patients)		
• Ability to provide medicines or access to medicines	154 (85.1)	3.55 (0.82)
Dimension 2: medication quality and safety		
• Confidence in the quality of procured medicines	154 (85.1)	3.69 (0.73)
• Medication safety problem	154 (85.1)	3.10 (1.07)
Dimension 3: medication prices		
• Control of expenditure on medicines	155 (85.6)	3.63 (0.81)
• Effects of the estimated cost on prices of procured medicines	173 (95.6)	4.05 (0.84)
Dimension 4: pharmacist's satisfaction towards rules and regulations		
• Satisfaction towards operational performance according to the policy	154 (85.1)	3.32 (0.79)
• Satisfaction towards the control policy on medicine procurement prices using estimated cost	153 (84.5)	3.56 (0.78)

Dimension 1: Access to medicines or ability to provide medicines to patients

It was found from the focus group and mail survey that when the operations followed the Regulations of the Office of the Prime Minister on Procurement, medicines could be

reserved for patients by 90 - 95% of a list of medicines available in a hospital. The pharmacists very agreed that when the operations followed the regulations, hospitals could largely reserve medicines for patients (3.55 out of 5 points). There was however a few items of medications with procurement of which very few items lasted a prolonged period throughout the year. For medications with the cost higher than the estimated cost, they were mostly procured and reserved with no prolonged shortage. However, certain items with no available product substitutions could not be procured in a timely fashion. These items were sometimes purchased at the cost higher than the estimated cost. This was because pharmacists put the patient's therapeutic needs before the need to follow the protocol mandated by the Office of the Prime Minister on Procurement.

Dimension 2: Medication quality and safety

With a mean score of 3.68 out of 5 points, pharmacists were very confident in the quality of procured medicines. This was because these medications were manufactured by manufacturers with good manufacture practice certification and pharmacists were able to use product quality analysis data to monitor and select medicinal products. For medication safety, it was perceived to be a moderate problem with a mean score of 3.10 out of 5 points. These unsolved problems included, for example, the acquisition of look-alike sound-alike drugs, changes in medicine packaging, and changes in pharmaceutical companies to be able to purchase medicines at the estimated cost. These problems could damper the patients' perception, understanding, and acceptance on the prescribed medicines.

Dimension 3: Medicine procurement prices and control of expenditure on medicines

Results from the focus group discussion indicated that the estimated cost could partially help control expenditure on medicines because the expenditure on medicines was associated with other factors. Results from the survey showed that pharmacists moderately agreed that the estimated cost could considerably help control the expenditure on medicines (3.63 out of 5 points).

Pharmacists very agreed that the estimated cost played an important role in making medicine prices suitable for procurement through price negotiation (4.05 out of 5 points). This could be because the estimated cost could increase the bargaining power of buyers and offer a price ceiling effect. In addition, the estimated cost had been used for procurement budget planning.

Dimension 4: Pharmacist's satisfaction towards following the Regulations of the Office of the Prime Minister on Procurement

Satisfaction towards operational performance of medicine procurement as a whole was at a moderate level (3.32 out of 5 points). This could be due to the factors related to medication safety mentioned earlier. Moreover, pharmacists were satisfied with the procurement price control policy using the estimated cost at a high level (3.56 out of 5 points). This policy could be followed in a practical manner and did not make the operations difficult. It made the operational performance (the procured medicines) satisfactory. However, sometimes it obstructed the procurement because the estimated cost was not revised to meet selling prices. Pharmacist responsible for medicine procurement task could be more satisfied with the operations according to the policy if the estimated cost could be revised by the National Committee on Drug System Development to be up-to-date according to action plans, i.e., every 6 months.

It was speculated that estimated costs of some medications were not revised by the National Committee on Drug System Development but announced as such. Therefore it was suggested that estimated costs of all announced medications be revised. If the committee cannot comply with the action plans, causes of and solutions for the problems should be provided. In addition, estimated cost should be set for all package sizes available in the market. Cost per unit should be clearly specified. Most importantly, estimated costs shouldbe revised more frequently and problems if any should be solved comprehensively at the national level.

Conclusion

Based on the major objective of the research and research results, it can be concluded that the estimated cost performed its duty very well in operational performance in the quality and procurement prices. This was because estimated cost played an important role in controlling prices via being reference or price ceilings mechanism. It also helped facilitate and increase bargaining power of buyers. Although the procurement has been controlled under the estimated cost, hospitals were able

to provide and reserve medicines for patients with a huge portion of medicines. These products were quality medicines procured at affordable prices, contributing to controllable expenditure on medicines according to the budget plan.

Operational performance in procurement was satisfactory in some extent. Estimated cost allowed pharmacists to frame and dictate direction in the procurement plan. Hence, the operation was highly practical. However, there was certain problem with the supplier which made the satisfaction at a moderate level. For some medication products, they could be procuded from certain suppliers with estimated cost. However, there were the times that the products could not be procured with the estimated cost for whatever reasons, or the products were out of stock. In such situation, sometimes the pharmacists could not find other suppliers who were willing to sell the products with the estimated cost.

The unavailability of the medicine product from a given supplier could lead to the change of the product procured from other suppliers. Such change could lead to safety issues regarding look-alike sound-alike problem. In addition, subtherapeutic efficacy of pharmacotherapy could arise because of unacceptance of the patients on the changed product of a given medicine. Non-compliance in a form of not taking the medicine as prescribed could arise. Such non-compliance especially among psychiatric patients could kead to the unacceptance among physicians. All of these circumstances made the respondent pharmacists felt moderately satisfied with their operationa perforamance under the estimated cost mandating regulation. It also suggested that pharmacists gave importance to quality over quantity of their service.

Another point was that each revision of estimated costs should cover all medicines and all package size of the products. The lack of such coverage caused certain problem in procurement. The estimated cost should not be a single price for a medicine product with various package sizes.

This study had certain limitations. The opinion was limited to pharmacists responsible for the government hospital medicine procurement. Opinion from other stakeholders involving the market availability and procurement such as policy maker on the estimated cost mandating policy, pharmaceutical manufacturers, medicine product suppliers and private hospitals. This study reflected only the circumstances at public community hospitals. With differences in various aspects of hospitals at different levels of healthcare

service, especially medicine items included in the hospital formulary, our finding could only represent opinion at the public community hospitals.

In terms of policy suggestion, the estimated cost should be revised to cover all package sizes for given medicines fpr convenience. Estimated cost revision of medicines in the National List of Essential Medicine should be identified. The government should issue a management system to handle the medicine sales with the price higher than the estimated cost with a timely manner. Decision making and problem solving should be conducted once the problem is reported to the government. This will help prevent or reduce shortage of medicines at points of dispensing in hospitals and will increase satisfaction towards the policy and operational performance.

Lastly, future research should emphasize the use of procurement data from hospital database to evaluate effects of price control mechanism in medicine procurement using the estimated cost in a tangible manner with empirical evidence.

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